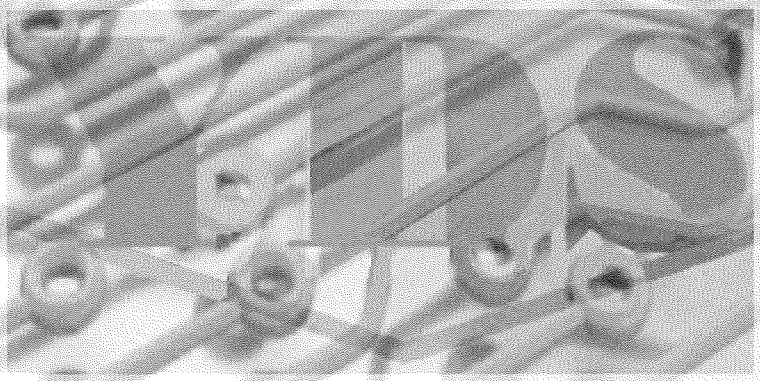
ISUUE 11-2015

YDS

Products Catalog

High Frequency & Power with Thin Film Technology



横浜電子精工株式会社

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mail : info@yds.co.jp

Yokohama Denshi Seiko Co., Ltd

私たち横浜電子精工㈱は、主に産業機器や社会共有設備に使用される高精度で信頼性の高い部品を手がけております。そして、次に掲げる5Hの製品作りを通し、社会に貢献することを目的とした製品作りを進めております。多様化する社会情勢の中で常に協調と独自性を持ち、地道な努力と柔軟な思考から発せられる閃きにより、新たな製品開発に取り組んでまいります。

高 周 波 (High Frequency)

近年、携帯電話や衛星通信など高度通信技術が一般に普及し生活に変化をもたらしています。更に高度な通信のため、より高い周波数で使用できる部品が要求されています。YDSでは10年以上前から薄膜の特性を生かした高周波用の部品を手がけてきており、更に高い周波数で機能する部品作りを進めています。

高　速 (High Speed)

高速で変化する電気信号を忠実に扱う、大量の情報を短時間に処理する、温度変化を高速に感知する、など多くの機器が高速で動作することが求められています。YDSでは薄膜の特性を生かした高速で動作する部品作りを進めています。

高 精 度 (High Precision)

正確に制御する、正確に測定する、正確に処理する、機器が正確に動作するために高精度の部品が使用されます。YDSは長年薄膜の特性を生かした高精度部品を手掛けてきました。更に高精度の部品作りを進めています。

高信頼性 (High Reliability)

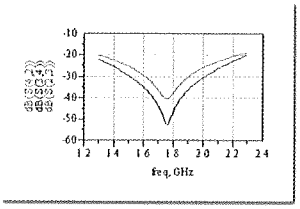
優れた機器でも故障すれば大変な迷惑をかけてしまいます。YDSではISO9001の認証取得を始め、設計から製造まで一貫した品質管理システムにより製品の高信頼性を確保しております。更に高信頼度を追求し、グローバルスタンダードな品質システムの習得と独自な管理手法を充実させています。

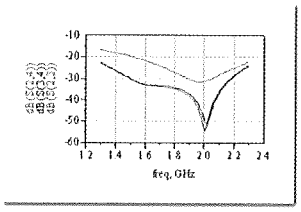
高 密 度 (High Density)

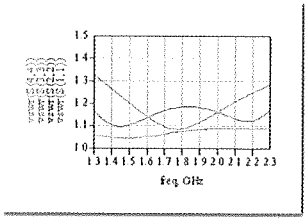
社会の要求により、機器の小型・軽量化が益々進んでいます。小型化するためには機器の中で高密度な部品配置が必要になります。YDSでは世界最小の減衰器(PAT0510)の開発など機器の小型化の要求に応えるべく高密度実装が可能な部品作りを進めています。

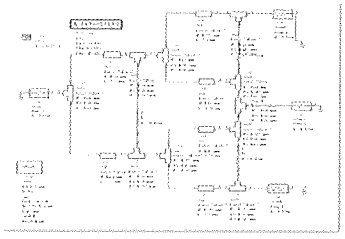
カスタム対応

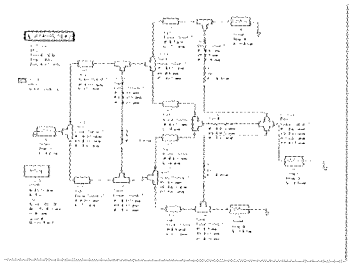
薄膜の特性を応用したカスタム部品の製作に前向きに取り組みます。
高周波部品では電磁界シミュレーションにより設計し、薄膜作成プロセスによる微細パターン加工を施し目的の特性を得ます。お客様の仕様に合わせた製品が安価に製作可能です。











YDS Thin Film Products List

YOKOHAMA DENSHI SEIKO Co.,Ltd.

YDS 薄膜応用部品 ＜目次＞ -1

■ 高周波アナログ用途

■高速デジタル信号用途

■熱対策用部品

■高周波 高電力用途

YDS 薄膜応用部品 ＜目次＞ -2

■高周波 高電力用途

■超精密級抵抗器

■電流検出

■取扱注意事項

注意事項

1. 本カタログの記載内容は参考仕様であり、やむなく予告なしに変更する場合がございます。製品仕様については正式に取り交す仕様書に基づくものとします。ご注文に際しては、営業担当者にご確認ください。
2. 本カタログに記載しております製品は一般電子機器に使用されることを意図しています。原子力、宇宙等 特別な品質、信頼性が要求される機器へのご検討は、事前にご相談をお願いします。
3. ご設計に際しては、最大定格、動作温度等 保証範囲内でご使用ください。保証範囲を超えた使用、誤った使用などに起因する製品の損失等につきましては、責任を負いかねますのでご了承ください。
4. 本カタログの記載内容を当社の許可なく転載・複写することを禁止します。

使用上的注意

＜実装上の注意＞

(1)実装時やその前後では抵抗器の保護コート或いは外装面に傷をつけないように注意してください。傷をつけると耐湿性が劣化する場合があります。
(2)はんだこてを使用してはんだ付けを行う場合、加熱はランド上で行い、こて先が抵抗器本体に当らないようにしてください。また、こて先温度が高い条件で作業する場合は、できるだけ短時間(350℃以下で3秒以下)で、はんだ付けを行ってください。
(3)フラックスが残留すると、腐食及び吸湿導電性の発生による耐湿特性劣化の原因になることがあります。特に、塩素系など活性度の高いフラックスを使用する場合は、事前の確認を行ってください。
(4)イオン性不純物の付着・残留も腐食及び吸湿導電性の発生による耐湿性劣化の原因となりますので、実装前後に発汗した素手などで触れて汚染させることを避けてください。
(5)はんだ付けに際しては、高温度で長時間になると、電極食われを起こす場合があります。
(6)抵抗器を実装後、樹脂などに埋め込む必要がある場合は、コーティング樹脂の耐熱性、耐湿性、緩衝性がよいこと、或いはイオン性不純物を含まないことなど、選定には注意が必要です。

＜使用環境、条件＞

(1)特殊環境下での使用及び条件では、事前に性能及び信頼性を十分調査確認する必要があります。特殊環境には次のようなものがあります。
①水、塩水、油、酸、アルカリ、有機溶剤などの液体中または液体のかかる所
②直射日光、屋外での暴露、塵埃中
③結露状態になる所
④有害ガス(潮風、HCl、Cl2、SO2、H2S、NH3、NOxなど)が多い場所
(2)高温、高湿環境下での使用
⑤高温環境下で使用する場合は、周囲部品の発熱の影響も含め、想定される部品周囲温度に対して、規定の負荷軽減曲線に基づいて負荷電力を軽減してください。
⑥高湿度雰囲気又は結露状態で通電使用すると、抵抗値の増大、断線に至ることがあります。
(3)電力、パルス印加 定格電力以下でご使用ください。パルス印加時もピーク電圧は定格電圧以下に押さえてください。

＜高電力品＞

・高電力品の部品選定、ご使用にあたっては、Hipower Notesをよくご確認の上、現品による事前評価を必ず行って下さい。

■Disclaimer and handling care of our products

Disclaimer

1. The contents of this catalogue are only for reference purposes and its contents may be changed without prior notification. Oficial specifications will be submitted to each customer. For ordering, please contact our sales representatives.
2. The products listed in this catalogue are for general purpose electronic equipment. Please consult with us if you require specific qualities or reliability as in nuclear or aerospace applications.
3. When you incorporate our products in your design, please utilize them within their specified operating conditions such as rated power and recommended operating temperature. We cannot guarantee our products and cannot take responsibility for the failure of our products if they are used under improper conditions or outside of the parameters of our specified conditions.
4. No part of this publication may be reproduced by any means without the permission of Yokohama Denshi Seiko Co. ltd.

Handling and care

＜Consideration during mounting＞

(1)Before, during and after mounting, take care not to damage the protective coating of the products. Damage to the protective coating may result in weakening the humidity tolerance.
(2)When using a soldering iron, the heat should be applied to the land pattern not directly to the component. The tip of the soldering iron should not touch the resistors directly.
(3)Flux residue can cause corrosion and electro-migration resulting in the deterioration of humidity tolerance. If you utilize highly activated flux, such as flux containing chlorine, please consult with us prior to usage.
(4)Ionized foreign material contamination or residue can also cause corrosion and electro-migration resulting in the deterioration of humidity tolerance. Do not touch the components with bare hands prior to or after mounting.
(5)If the soldering operation takes place at very high temperatures and for a prolonged period of time, the terminal may dissolve into the solder.
(6) When mounted components are embedded into resin or polymer, the resin/polymer selection must consider heat tolerance, humidity tolerance, mechanical properties, and chemical or ion composition.

＜Operating environment; condition＞

(1)If these components are utilized for unusual conditions, the reliability and characteristics should be verified in advance.
Such conditions include:
①Exposure of the component to water, salt water, oils, acids, alkaline, or solvents
②Exposure of the component to direct sunlight, outdoor weather conditions, or heavy dust
③Exposure to frost
④Possible exposure to corrosive air or gas such as a marine atmosphere, HCl, Cl2, H2S, NH3, and NO
(2)Usage under high temperatures and high humidity
⑤When components are used under high temperature conditions, assess the potential temperatures surrounding the components considering the other heat-producing neighboring components, and regulate your power usage following the specified derating curve.
⑥If the components are used under high humidity conditions or at temperatures below the dew point, the products can experience positive resistance drift or even an open circuit.
(3)Use our products under the rated power when the pulse current or voltage is applied. The peak voltage of the pulse should remain under the rated voltage.

＜High Power Products＞

Please see HIGH POWER NOTES for component selection.
Need test for your design with correct part.

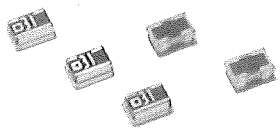
Thermo Variable Attenuators (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

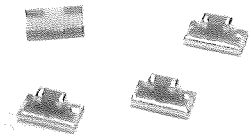
温度可変型減衰器 DC to 6GHz

PXV1220S series
PBV1632S series
PAV3137 series

RoHS Compliance | Pb Free | ※Halogen Free



PXV1220S



PBV1632S

特徴

・アンプ回路などの温度変化による出力変化(低下)を逆特性の減衰量変化によりアナログ的に補正することができます。
・周波数特性に優れています。
・他の温度補正方式に比べ、簡素で煩わしさが少なく、また係数の変更が容易です。

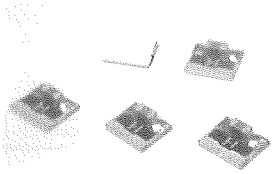
※PBV1632SとPAV3137Sはハロゲンフリーです。

Features

For example, the output power change (loss) caused by temperature shift in the amplifier circuit, is corrected by the reversed temperature attenuation characteristics. Excellent high frequency characteristics Compared to other temperature compensation methods, this is simpler and the coefficient can be altered easily.

※PBV1632S and PAV3137S are Halogen Free

PAV3137S



電気特性 Electrical characteristics

new

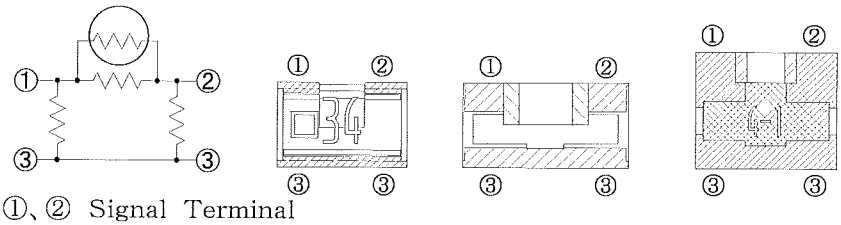
Series	PXV1220S	PBV1632S	PAV3137S
Rated Input Power	63mW	100mW	1W (※)
Size in mm (inch)	2012 (0805)	3216 (1206)	3731 (1512)
Frequency range	DC to 3GHz		DC to 6GHz
Attenuation	1 to 10dB (1dBstep)	1 to 10 (1dBstep),16dB	1 to 10 (1dBstep)
Attenuation tolerance	±0.5dB (@25℃ no-load)		
Impedance	50Ω		
VSWR	<1.3 (@25℃)		
Thermo Sensitive characteristic	N1~N8 (1~3dB:N1~N9)	ex : 6dB	
		N1 0.0119dB/dB*℃ N2 0.0088dB/dB*℃ N3 0.0062dB/dB*℃	
		N4 0.0047dB/dB*℃ N5 0.0041dB/dB*℃ N6 0.0035dB/dB*℃	
		N7 0.0026dB/dB*℃ N8 0.0019dB/dB*℃	
Operating Temperature	-40 to +100℃		
Packaging	100pcs/Bulk , 1,000pcs/reel	20pcs/bulk , 1,000pcs/reel	

Detail specifications for individual part-number showing temperature characteristics of the attenuation are available. Contact us !
減衰量の温度変化特性の詳細など個別の仕様を用意しています。お気軽にお問い合わせください。

外形寸法 Dimmensions

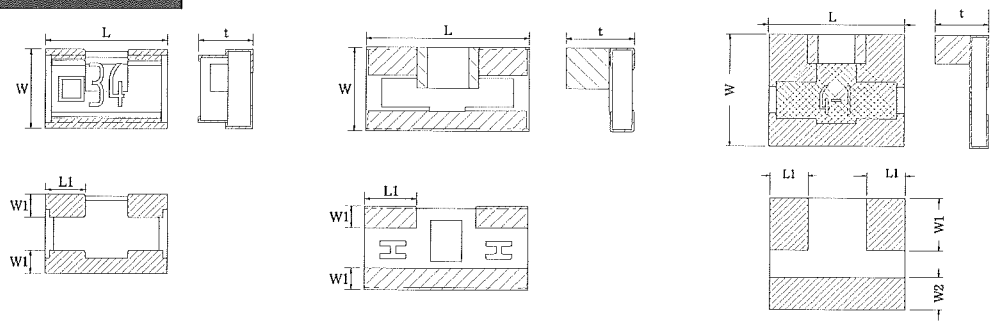
Dimension (mm)	PXV1220S	PBV1632S	PAV3137S
L	2.0±0.2	3.2±0.2	3.7±0.2
W	1.25±0.2	1.6±0.2	3.1±0.2
L1	0.65±0.35	1.0±0.2	1.05±0.25
W1	0.35±0.2	0.4±0.2	1.5±0.2
W2	---	---	0.85±0.2
t	0.9±0.2	1.5max.	1.5max.
(Size in inch)	0805	1206	1512

Circuit Diagram



①、② Signal Terminal
③ Ground Terminal

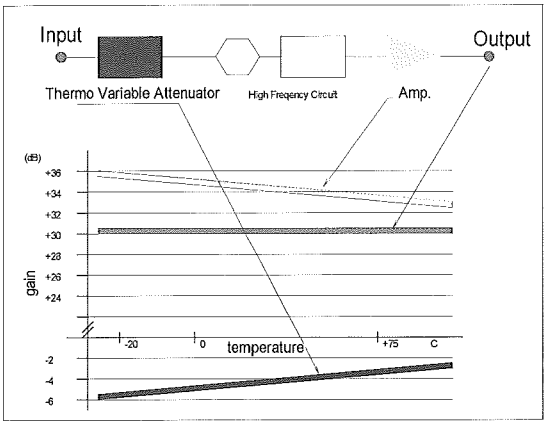
Terminal Number



PXV1220S PBV1632S PAV1632S

Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

動作概要

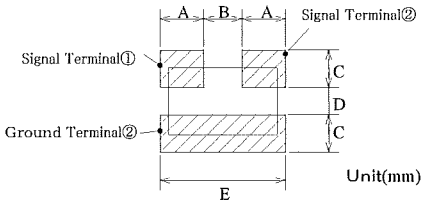


高周波の増幅回路に使用されるアンプ(GaAs素子など)は一般的に高温になるほどゲインが低下する傾向の温度特性を持っています。厳しい電波出力制限が必要なアンプ回路で最高の効率を維持するためには温度補償回路が必要となります。YDSの温度可変減衰器はアンプの温度特性と逆の特性(高温になるほど減衰量が減る)を持っており、回路の入力部にアンプと直

Recommended Land Patern

※PXV1220S、PBV1632Sシリーズは、
固定チップATT PAT1220シリーズ、PAT1632シリーズと
同一のランド上で ご使用可能です。

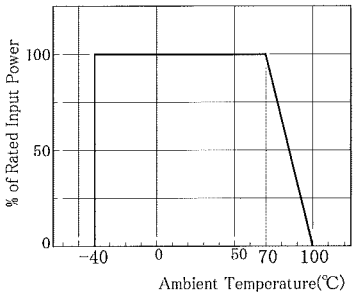
Fixed chip atenuattor PAT1220,1632series (0 to 10dB) could be mounted on same land patern for PXV1220S and PBV1632series



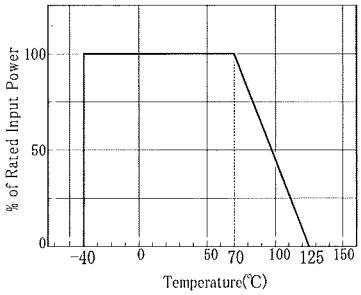
P/N	A	B	C	D	E	P/N
PXV1220S	0.8	0.7	0.7	0.5	0.3	PAT1220
PBV1632S	1.2	1	0.8	0.65	3.4	PAT1632

Derating Curve

PXV1220S,PBV1632S



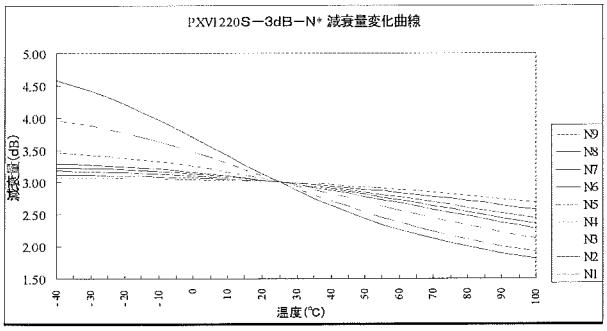
PAV3137S



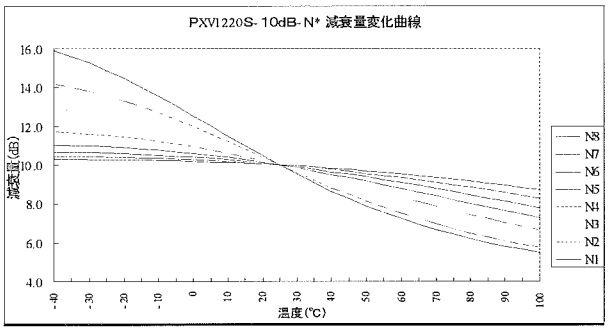
減衰量温度特性 (例)

※ 1dB～10dB、各8～9種類 ＝ 計80種類の温度係数を用意しております。

Ex(1). 3dB N1～N9



Ex(2). 10dB N1～N8



型名構成 Part Number

PXV 1220S — 3dB N1 — T1

Series | Size in mm
PXV 1220S
PBV 1632S
PAV 3137

Attenuation
1～10dB

Thermo Sensitive Characteristic
1～3dB: N1～N9
4～10dB: N1～N8

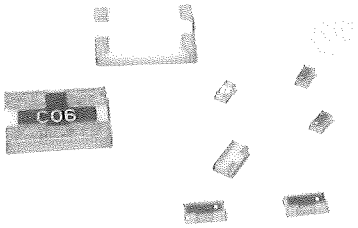
Packaging
T1: 1,000pcs/ reel
T5: 5,000pcs/ reel
B: Bulk

Thin Film
Fixed Chip Attenuators (1/2)

YOKOHAMA DENSHI SEIKO Co., Ltd.

薄膜チップ固定減衰器 DC～10GHz (MAX)

PAT series -Wrap Round-



RoHS Compliance | Pb Free | Halogen Free

特徴

・減衰器素子1個で高性能な減衰特性を得ることができます。
・周波数帯域が広く異なる周波数を扱う回路での性能確保が容易です。
・個別抵抗器を組み合わせて減衰回路を構成する場合に比べ、寄生L、Cの影響がなく設計通りの性能が得られます。
・スペースメリットが大きく回路の小型化に寄与し、取り付け接点数の減少により回路信頼性、性能をUPさせます。
・1005サイズから3042サイズまで一般チップ同様のコの字電極を持ち 実装

Features

You can obtain excellent attenuation performance with one attenuator. Very wide functional frequency range. Fit for circuit that handles different frequencies. Compared to the attenuation circuit consisting of a combination of discrete resistors, with this attenuator, the true designed value is attained due to much less parasitic capacitance/inductance. Due to its small size and equivalence to 3 discrete resistors, the space saving is significant and the circuit reliability improves with fewer soldering joints. We offer sizes from 1005(0402) to 3042(1612) with typical wrap around termination found in common chip components, allowing easy mounting on boards and high reliability.

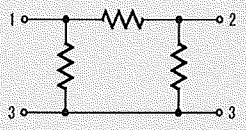
電気特性 Electrical characteristics

Series	PAT0510S	PAT0816	PAT1220	PAT1632	PAT3042S
Rated input power	32mW	64mW	100mW	125mW	250mW
Size in mm (inch)	1005 (0402)	1608 (0603)	2012 (0805)	3216 (1206)	4230 (1612)
Frequency range	DC - 10GHz	DC - 10GHz	DC - 10GHz	DC - 3GHz	DC - 3GHz
Attenuation	0-10dB 1dB Step	0-10dB 1dB Step	0-10dB 1dB Step	0-10(1dB Step) ,16dB	0-10(1dB Step) 16,20dB
Tolerance	±0.3dB (0-3dB) ±0.5dB (4-7dB) ±1.0dB (8-10dB)	±0.3dB (0-3dB) ±0.5dB (4-7dB) ±1.0dB (8-10dB)	±0.3dB	±0.3dB ±0.5dB (16dB)	±0.3dB
Impedance	50Ω	50Ω	50Ω	50Ω	50Ω
VSWR	1.3 (D-6GHz) 1.5 (6-10GHz)	1.3 (DC-6GHz) 1.5 (6-10GHz)	1.3 (DC-6GHz) 1.5 (6-10GHz)	1.3	1.2
Operating	-55°C to +125°C				
Packaging / reel	10,000 / reel	1,000pcs / reel , 5,000pcs / reel			1,000pcs / reel
Packaging / bulk	—	100pcs	100pcs	100pcs	20pcs

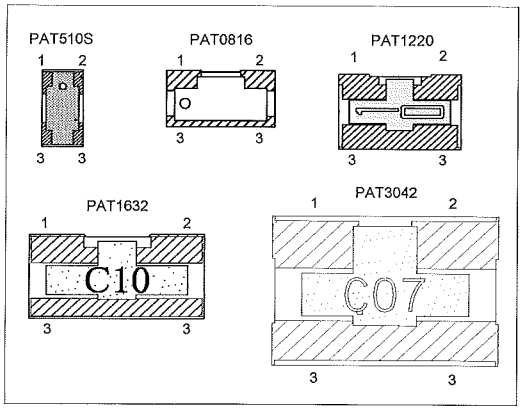
If you require attenuation, frecuency range, or tolerance out side of the product specifications, please contact us !
範囲外の減衰量、周波数範囲、精度などご要望がございましたらお気軽にお問い合わせください。

等価回路 Circuit Diagram

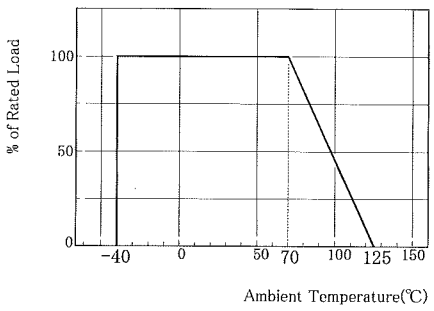
(*) Thin Film Technology



(*)薄膜スパッタリング製法によりセラミック基板上に形成された金属膜を抵抗体として使用。
抵抗膜が純粋な金属で形成されることから

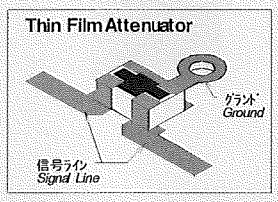


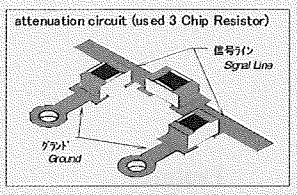
Derating Curve



＜単体抵抗器の組み合わせとの違い＞

・チップ減衰器は1つの素子で入出力端子とグランド端子を持っていますので、使用されるプリント基板の定数により設計されたマイクロストリップラインに適合させやすく、性能がでやすくなります。単体抵抗の組み合わせでは各抵抗器の電極部分が多く存在することによる寄生のキャパシタンスやインダクタンスが多くなり周波数特性が悪くなることが考えられます。また回路設計でもチップ減衰器の使用により簡略化することが可能となります。単体抵抗器を組み合わせた場合とチップ減衰器を使用した場合のイメージを下図に示します。





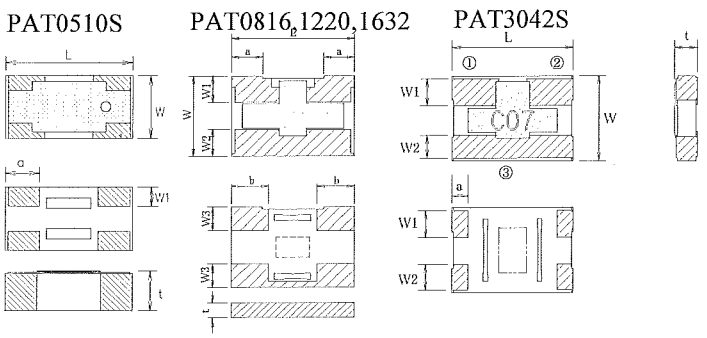
・回路内での部品点数削減により、PC基板上での専有面積及び部品重量の減少、実装回数の低減が可能となります。単体抵抗器を3個使用して減衰回路を構成した場合とチップ減衰器を使用した場合の占有面積及び重量比を下表に示します。

YDS PATシリーズの場合		単体抵抗器 複数個使用の場合		
シリーズ名	素子サイズ	比較単体抵抗器	実装面積比	重量比(体積比)
PAT0510	0.5×1.0×0.3mm	0603チップ抵抗×3個	約50%	約90%
〃	〃	1005チップ抵抗×3個	約20%	約33%
PAT1220	1.25×2.0×0.4mm	1005チップ抵抗×3個	約100%	約200%
〃	〃	1608チップ抵抗×3個	約40%	約65%
〃	〃	2125チップ抵抗×3個	約26%	約33%
PAT1632	1.6×3.2×0.4mm	1608チップ抵抗×3個	約73%	約130%
〃	〃	2125チップ抵抗×3個	約50%	約70%
〃	〃	3216チップ抵抗×3個	約17%	約33%

注:比率は単体抵抗器の組み合わせを基準とした割合を示します。重量比には取り付けに使用される半田分を含みません。

外形寸法 Dimensions

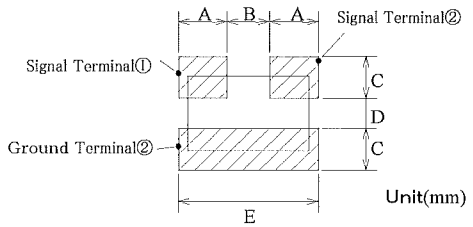
Dimension (mm)	PAT0510S	PAT0816	PAT1220	PAT1632	PAT3042
L	1.00±0.05	1.6±0.1	2.0±0.2	3.2±0.2	4.2±0.2
W	0.50±0.05	0.8±0.1	1.25±0.20	1.6±0.2	3.0±0.2
a	0.27±0.05	0.5±0.15	0.6±0.2	1.0±0.25	0.3±0.2
W1	0.12±0.04	0.25±0.1	0.4±0.2	0.55±0.25	0.55±0.2
W2		0.15±0.1	0.4±0.2	0.42±0.25	0.6±0.2
W3		0.20±0.1	0.35±0.2	0.4±0.2	
t	0.34±0.05	0.4±0.1	0.4±0.1	0.4±0.1	0.8±0.15
(Size in inch)	0402	0603	0805	1206	1612



Recommended Land Patern

※PAT1220、PAT1632シリーズは、
温度可変型ATT PXV1220Sシリーズ、PBV1632シリーズと
同一のランド上で ご使用可能です。

PAT1220S,1632series (0 to 10dB) could be mounted on same land patern for Thermo variable attenuator PXV1220S and PBV1632series



P/N	A	B	C	D	E	P/N
PXV1220S	0.8	0.7	0.7	0.5	0.3	PAT1220
PBV1632S	1.2	1	0.8	0.65	3.4	PAT1632

型名構成 Part Number

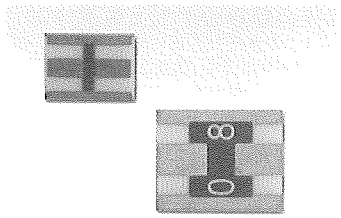
PAT — 1220 — C — 3dB — T1

Series	Size in mm	Impedance	Attenuation	Packaging
PAT	Wrap around	50Ω		T1: 1,000pcs / reel
	0510S			T5: 5,000pcs / reel
	0816			B: Bulk
	1220			
	3042S			

Thin Film
Fixed Chip Attenuators (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

薄膜チップ固定減衰器 DC to 10GHz (Max)



PAT Wseries

RoHS Compliance | Pb Free | Halogen Free

特徴

・減衰器素子1個で高性能な減衰特性を得ることができます。
・周波数帯域が広く異なる複数の周波数を扱う回路での性能確保が容易です。
・個別抵抗器を組み合わせて減衰回路を構成する場合に比べ、寄生L、Cの影響がなく設計通りの性能が得られます。
・中心に信号端子、両端にグランドが配置されており、コネクターへの組み込みなどが容易です。

Features

You can obtain highly accurate attenuation with one attenuator.
Very wide functional frequency range. Fit for circuit that handles different frequencies.
Compared to the attenuation circuit consisting of a combination of discrete resistors, with this attenuator, the true designed value is attained due to much less parasitic capacitance/inductance.
One center signal terminal and two ground side terminals offer easy integration within connectors etc.

電気特性 Electrical characteristics

new

Series	PAT3042	PAT4556	PAT3060H
Rated Input power	250mW	500mW	5W
Size in mm	3042	4556	3060
(inch)	1612	2218	2412
Attenuation	0-10, 16, 20dB		3,6dB
Attenuation Tolerance	*See Chart (1)		±0.5dB
Impedance	50Ω (C)		50Ω (C)
Frequency range	DC - 10GHz		DC - 6GHz
VSWR	<1.1(DC - 2GHz) <1.2(2 - 5GHz) <1.3(5 - 10GHz)		<1.2
Operating Temperature	-55 to +125℃		
Rated ambient temperature	70℃		
Packaging form	1,000pcs/reel 50pcs/Bulk		1,000pcs/reel 100pcs/bulk

*CHART (1)

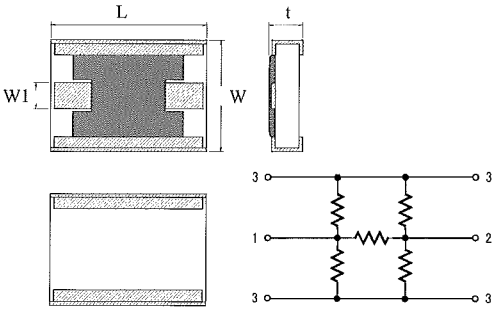
Attenuation torelance			
Tolerance Rank	DC～2GHz	2～5GHz	5～10GHz
0-10dB (A)	±0.1dB	±0.2dB	±0.4dB
(B)	±0.2dB	±0.3dB	±0.5dB
16, 20dB (B)	±0.2dB	±0.3dB	±0.5dB

外形寸法 Dimensions

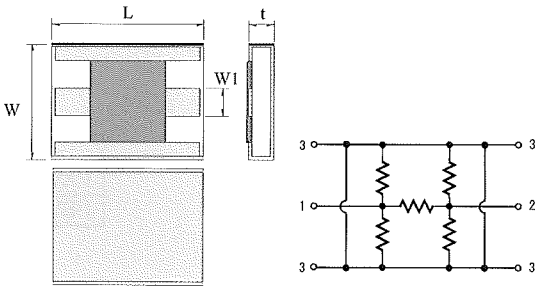
Dimension (mm)	PAT3042		PAT4556		PAT3060H
L	4.2±0.2		5.6±0.2		6.0±0.2
W	3.0±0.2		4.5±0.2		3.0±0.2
t	0.8±0.15		0.8±0.15		0.70±0.15
W1	0dB, 1dB	0.66±0.1	0dB	0.64±0.1	0.80±0.15
	2～10dB	0.90±0.1	1～10dB	1.3±0.1	
	16～20dB	0.90±0.1	16～20dB	1.3±0.1	
(Size in inch)	1612		2218		2412

等価回路 Circuit Diagram

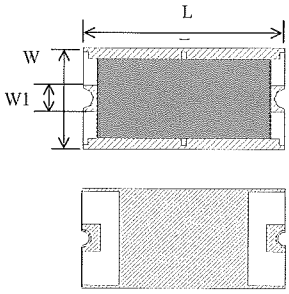
PAT4556



PAT3042S



PAT3060H new

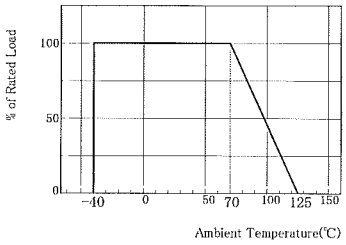


型名構成 Part Number

PAT 4556 – C – 3dB – Attenuation – T1

Series	Size in mm	Impedance	Attenuation	Attenuation Tolerance	Packaging
PAT	Coaxial 3042 4556 5260	50Ω			T1: 1Kpcs/ reel T5: 5Kpcs/reel B: Bulk

Derating Curve



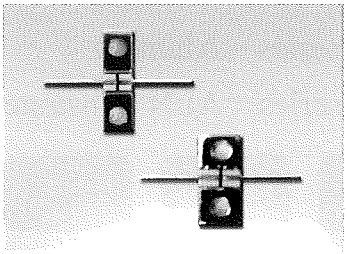
Thin Film
Flanged Attenuators (1/2)

YOKOHAMA DENSHI SEIKO Co., Ltd.

フランジ型 薄膜パワー減衰器

DC to 10GHz (Max)

PAT****P series



RoHS Compliance | Pb Free | Halogen Free

特徴

YDSの電力型減衰器は放熱器に取り付けることにより高電力で使用できる固定減衰器です。熱効率の良い放熱板に取り付けることにより放熱効果を高め、高電力で使用できるように設計されています。
高電力機器の小型化に効果があります。

Features

YDS' s PAT power type attenuator is a fixed attenuator for use in high power applications where it is mounted on to heat sink.
•It is designed for high power use with the mounting flange of higher heat transfer put on to enhance thermal dissipation effect.
•It gives a big effect on miniaturizing high power equipments.

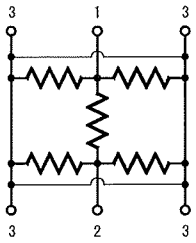
電気特性 Electrical characteristics

Series	PAT3042P	PAT3060P
Rated Input power	1W (max5W)※	1.5W (max10W) ※
Size in mm	3042	4556
(inch)	1612	2218
Attenuation	0-10, 16, 20dB	
Attenuation Tolerance	*See Chart (1)	
Impedance	50Ω (C)	
Frequency range	DC - 10GHz	
VSWR	<1.1(DC - 2GHz)	
	<1.2(2 - 5GHz)	
	<1.3(5 - 10GHz)	
Operating Temperature	-55 to +125℃	
Rated ambient	70℃	
Packaging form	50pcs/tray(min)	

※最大電力はヒートシンク取り付け時のものです。
※ご使用の際には十分な放熱を行ってください。

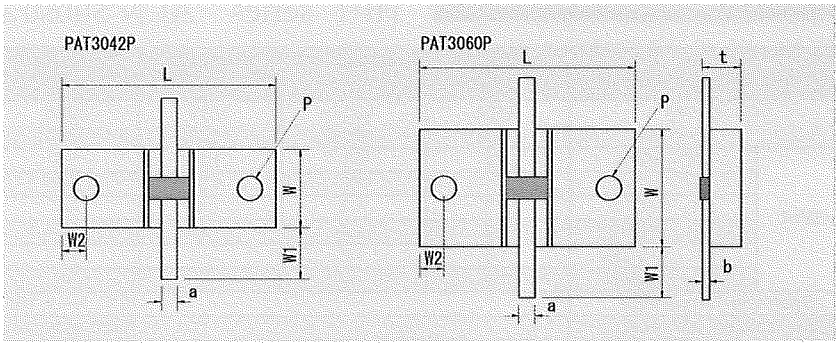
Tolerance Rank	DC～2GHz	2～5GHz	5～10GHz
0-10dB (A)	±0.1dB	±0.2dB	±0.4dB
(B)	±0.2dB	±0.3dB	±0.5dB
16, 20dB (B)	±0.2dB	±0.3dB	±0.5dB

等価回路 Circuit Diagram



外形寸法 Dimensions

Dimension (mm)	PAT3042P	PAT3060P
L	15.0±0.3	13.0±0.3
W	4.2±0.3	6.0±0.3
a	(0.4)	
p	2-2.5±0.2Φ	2-2.5±0.2Φ
W1	5.0min	
W2	2.5±0.3	
t	2.5max	
b	(0.2)	

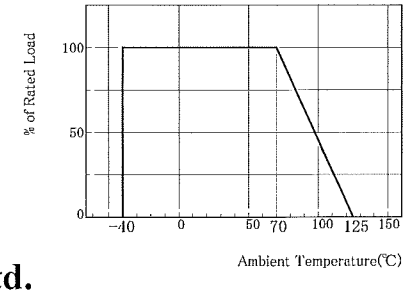


型名構成 Part Number

PAT3042P – C – 3dB – A

Series	Impedance	Attenuation	Attenuation Tolerance
PAT3042P PAT3060P	50Ω		

Derating Curve



Thin Film
Power Chip Terminations (1/2)

YOKOHAMA DENSHI SEIKO Co., Ltd.

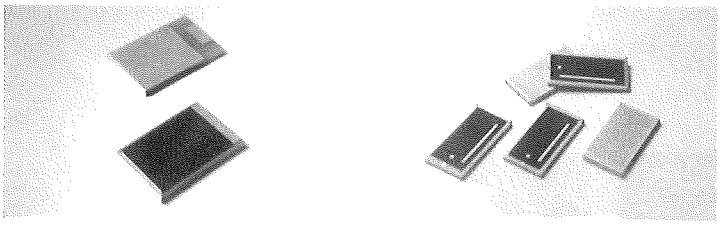
高電力 薄膜チップ終端器

SMD ～100W DC to 15GHz (Max)

PCS series－Alumina

HPT series－ALN Substrate

RoHS Compliance | Pb Free | Halogen Free



特徴

・窒化アルミ基板(ALN)および、アルミナ基板を使用した小型高電力の薄膜チップ終端器です。
・薄膜の優れた性能とパターンデザインにより、良好な高周波特性を持ちます。
・良好な放熱性能により、高電力、高パルス負荷耐性に優れます。
・コ字電極を持ち実装が容易で実装後の信頼性も高くなっています。
・薄膜抵抗体は応力を持たず、繰り返し負荷の連続に対しても疲労が蓄積することなく、インピーダンス変化が起こりません。

Features

・High power small thin film chip termination on Alumina and ALN substrate Thin film elements and special patterning offer small size, high power and excellent high frequency performance.
・Good heat dissipation guarantees excellent ability against high power and high pulse.z
・Wrap-around terminals offer easy mounting and high reliability.
・Thin film register has an excellent feature against stress. Impedance is stable against repeated load without accumulate fatigue.

電気特性 Electrical characteristics

PCS series－Alumina

Series		PCS1608	PCS2012	PCS3216	PCS5025	PCS6432
Power		500mW	1W	2W	5W	10W
Size in mm		1608	2012	3216	5025	6432
(inch)		(0603)	(0805)	(1206)	(2010)	(2512)
VSWR	DC - 3GHz	1.2	1.2	1.2	1.3	1.2
	3.1 - 5GHz	1.2	1.3	1.3	1.4	1.5
	5.1 - 7.5GHz	1.3	1.3	1.4	1.5	---
	7.6 - 10GHz	1.3	1.4	1.5	---	---
	10.1 - 12.5GHz	1.4	1.5	---	---	---
	12.6 - 15GHz	1.5	---	---	---	---
Operating Temperature						
Rated ambient temperature						

notes: while this componet is fully powered, make sure the soldered surface temperature does not exceed 80℃
注意： 定格電力を印加した状態で取付面の温度が80℃を超えないようご配慮ください。

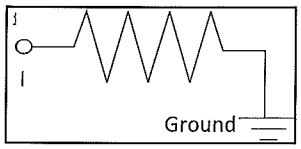
電気特性 Electrical characteristics

HPT series－ALN Substrate

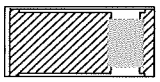
Series		HPT1608	HPT2012	HPT3216	HPT5025	HPT6432	HPT6464	HPT9464H
Power		2.5W	5W	10W	20W	30W	60W	100W
Size in mm		1608	2012	3216	5025	6432	6464	9464
(inch)		(0603)	(0805)	(1206)	(2010)	(2512)	(2525)	(3725)
VSWR	DC - 3GHz	1.2	1.2	1.2	1.3	1.3	1.3	1.3
	3.1 - 5GHz	1.2	1.3	1.3	1.5	1.5		
	5.1 - 7.5GHz	1.3	1.3	1.4	---	---	---	---
	7.6 - 10GHz	1.3	1.4	1.5	---	---	---	---
	10.1 - 12.5GHz	1.4	1.5	---	---	---	---	---
	12.6 - 15GHz	1.5	---	---	---	---	---	---
Operating Temperature		-40℃ to ＋155℃						
Rated ambient temperature		+100℃ at terminals						

notes: while this componet is fully powered, make sure the soldered surface temperature does not exceed 100℃
注意： 定格電力を印加した状態で取付面の温度が100℃を超えないようご配慮ください。

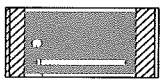
等価回路 Circuit Diagram



PCS 1608

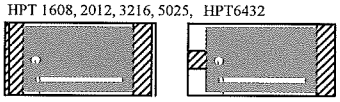


PCS 2012, 3216, 5025

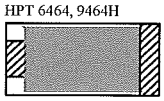


PCS 6432

HPT 1608, 2012, 3216, 5025, HPT6432



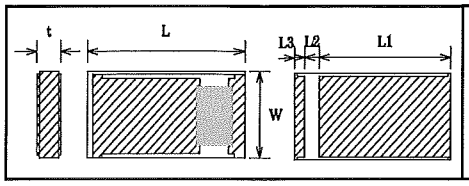
HPT 6464, 9464H



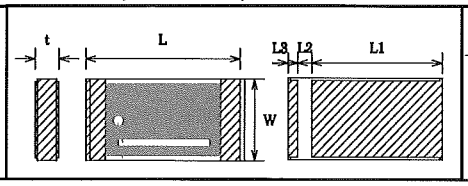
外形寸法 Dimmensions

*Reference only,Please contact us for individual data sheets

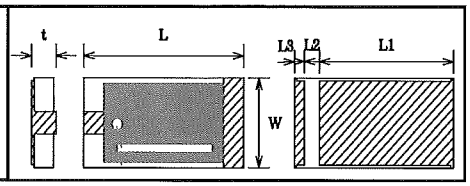
PCS1608



PCS2012, PCS3216, PCS5025

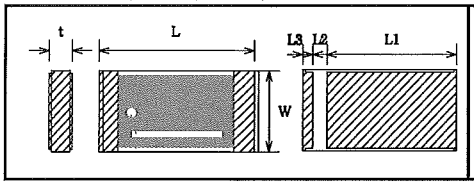


PCS6432

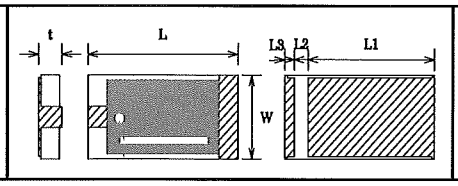


Dimension (mm)	L	W	L1	L2	L3	t	(Size in inch)
PCS1608	1.6±0.15	0.8±0.15	1.1±0.15	0.3±0.15	0.2±0.15	0.4±0.1	0603
PCS2012	2.0±0.15	1.25±0.15	1.5±0.15	0.3±0.15	0.2±0.15	0.4±0.1	0805
PCS3216	3.2±0.2	1.6±0.2	2.7±0.2	0.3±0.15	0.2±0.15	0.4±0.1	1206
PCS5025	5.0±0.2	2.5±0.2	4.3±0.2	0.4±0.15	0.3±0.15	0.4±0.1	2010
PCS6432	6.4±0.2	3.2±0.2	5.7±0.2	0.4±0.15	0.3±0.15	0.4±0.1	2512

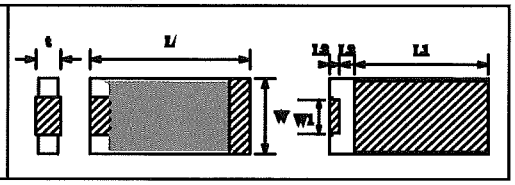
HPT1608, 2012, 3216, 5025



HPT6432



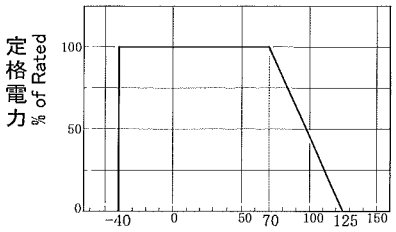
HPT6464, 9464H



Dimension (mm)	L	W	L1	L2	L3	t	(Size in inch)
HPT1608	1.6±0.15	0.8±0.15	1.1±0.15	0.3±0.15	0.2±0.15	0.4±0.1	0603
HPT2012	2.0±0.15	1.25±0.15	1.5±0.15	0.3±0.15	0.2±0.15	0.4±0.1	0805
HPT3216	3.2±0.2	1.6±0.2	2.7±0.2	0.3±0.15	0.2±0.15	0.4±0.1	1206
HPT5025	5.0±0.2	2.5±0.2	3.6±0.2	0.9±0.15	0.5±0.15	0.65±0.1	2010
HPT6432	6.4±0.2	3.2±0.2	5.5±0.2	0.7±0.15	0.2±0.15	0.65±0.1	2512
HPT6464	6.3±0.2	6.3±0.2	4.9±0.2	0.65±0.15	0.75±0.15	0.65±0.1	2525
HPT9464H	9.4±0.2	6.3±0.2	7.1±0.2	1.15±0.15	1.15±0.15	0.65±0.1	3725

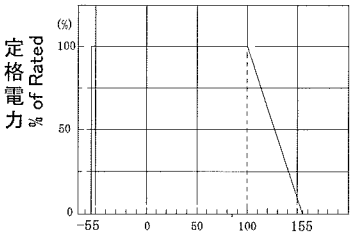
Derating Curve

PCS series



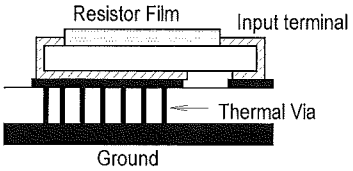
周囲温度 (℃)
Ambient Temperature (℃)

HPT series



端子温度 (℃)
Terminal Temperature (℃)

Mounting Example



素子の裏グランド面から放熱させるためサーマルビアなど熱伝導性を確保(熱抵抗を小さく)した面に取り付けるようにご配慮ください。

Dissipation mainly occurs from the bottom ground terminals. Please consider mounting this component on surfaces where heat dissipation is designed in, such as adding thermal via.

型名構成 Part Number

HPT 3216 – 50 – T1

Series
PCS
HPT

Size in mm	
1005	6432
1608	6464※
2012	9464※
3216	

※HPT series only

Impedance

Packaging
T1: 1,000pcs / reel
T5: 5,000pcs / reel
B: Bulk

Thin Film Chip Terminations

YOKOHAMA DENSHI SEIKO Co.,Ltd.

薄膜チップ終端器 コプレーナタイプ

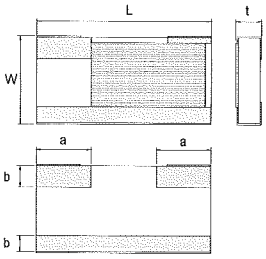
PCS****S series

RoHS Compliance | Pb Free | Halogen Free

型名構成 Part Number

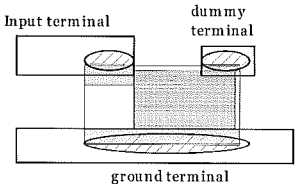
PCS	1632S	–	50Ω	–	T1
Series: ELT	Size in mm: Ex. 1.6 x 3.2		Impedance: 50Ω, 75Ω		Packaging: T1: 1,000pcs/ reel; T5: 5,000pcs/ reel

外形寸法 Dimmensions



Dimension (mm)	PCS0816S	PCS1220S	PCS1632S	PCS3042S
L	1.6±0.15	2.0±0.15	3.2±0.2	4.2±0.2
W	0.8±0.15	1.25±0.15	1.6±0.2	3.0±0.2
a	0.4±0.15	0.4±0.15	0.55±0.25	1.2±0.2
b	0.2±0.15	0.3±0.15	0.4±0.2	0.4±0.2
t	0.4±0.10	0.4±0.10	0.4±0.1	0.4±0.1
(Size in inch)	0603	0805	1206	1612

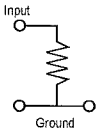
Mounting Example



コプレーナラインまたはマイクロストリップラインに取り付けます。マイクロストリップラインの場合は裏面からグランド電極を接続します。ダミーの取り付け電極は位置精度を上げるためのものです。

Mount on co-planer lines or micro strip lines. With micro-strip lines, connection to the ground terminal is done from the back side. Dummy pattern is given to improve accuracy of positioning.

Circuit Diagram



電気特性 Electrical characteristics

Series		PCS0816S	PCS1220S	PCS1632S		PCS3042S	
Rated Power		63mW	100mW	125mW		250mW	
Size mm (inch)		0816 (0603)	1220 (0805)	1632 (1206)		3042 (1612)	
Impedance		50Ω	50Ω	50Ω	75Ω	50Ω	75Ω
VSWR	DC～2GHz	1.2	1.2	1.2	1.3	1.2	1.3
	2.1～3GHz	1.2	1.3	1.3	---	1.4	---
	3.1～6.0GHz	1.3	1.3	1.4	---	---	---
	6.1～10GHz	1.3	1.4	---	---	---	---
Operating Temperature		-55℃ to +125℃					
Rated ambient temperature		+70℃					

特徴

・小型の薄膜チップ終端器です。
・薄膜の性能とパターンデザインにより、高周波特性に優れます。
・コ字電極を持ち実装が容易で実装後の信頼性も高くなっています。

Feature

Small thin film chip termination.
Precise pattern design and thin film elements offer high frequency performance.
Wrap around termination allows easy mounting and high reliability.

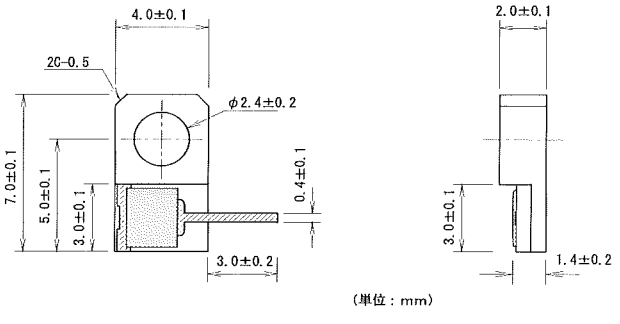
Thin Film Flanged Terminations

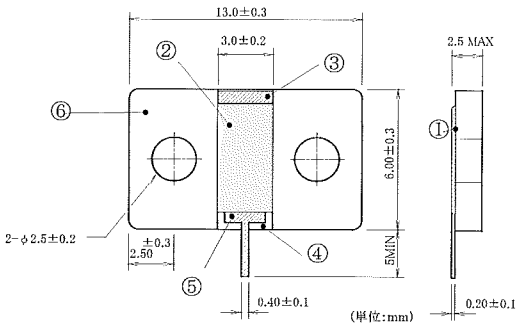
フランジ型 薄膜パワー終端器

(Reference Only)

RoHS Compliance | Pb Free | Halogen Free

PCS****P series





電気特性 Electrical characteristics (reference)

(Reference Only)

Series	PCS****P
Impedance	50Ω
V S W R	≦1.1(DC to 3GHz)
	≦1.3(DC to 3GHz～10GHz)
Frequency Range	DC to 10GHz
Rated power	1.5W (10W max on heat sink)
Rated ambient temperature (flange temperature at Max power)	≦65℃
Operating Temperature	−55 to125℃

特徴

YDSの電力型終端器放熱器に取り付けることにより高電力で使用できるパワータイプの終端器です。熱効率の良い放熱板に取り付けることにより放熱効果を高め、高電力で使用できるように設計されています。

Feature

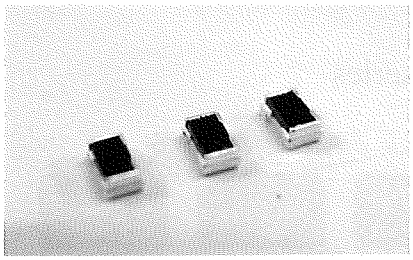
YDS's PCS***P type is a flanged termination for use in high power applications where it is mounted on to heat sink.
·It is designed for high power use with the mounting flange of higher heat transfer put on to enhance thermal dissipation effect.

High Frequency Thermistors

YOKOHAMA DENSHI SEIKO Co.,Ltd.

高周波サーミスタ　DC to 10GHz

HFT Series



RoHS Compliance　Pb Free

特徴

・一般サーミスタは周波数上昇に伴い抵抗値が減少しますが、高周波サーミスタ」は抵抗値の減少がなく高周波帯域(～10GHz)で使用可能なサーミスタです。
・一般チップ部品と同様なコの字電極(表面錫メッキ)で自動実装が　容易です。
・サーミスタ部を強固なセラミックで保持した高信頼パッケージを採用 し、耐環境性能の向上及び衝撃に強い構造となっています。
・RoHS指令に対応しています。 またサーミスタでありながら完全な鉛フリーを実現しています。

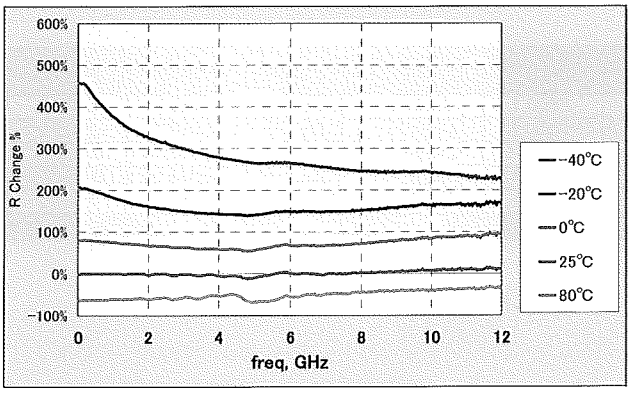
Features

Registance remain nearly unaffected by increase of frequency with HFT series.(In case of regular thermistor, reduction of registance is observed with increase of frequency) Usable in high-frequency band(～10GHz).・Wrap-around terminals (tinned surface) same as regular chip components offer easy mounting and high reliability.・Highly reliable package sustaining thermistor with firm ceramic has been adopted, so that firm structure has been realized against environmental influence and phisical impact. ・RoHS compliance. Perfect lead-free has been fulfilled although it is difficult with a thermistor.

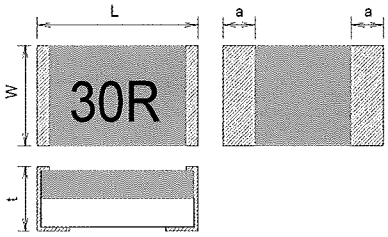
電気特性　Electrical characteristics

Series	HFT1220-15R0-J	HFT1220-30R0-J	HFT1220-40R0-J	HFT1220-50R0-J	HFT1220-60R0-J
R25	15Ω	30Ω	40Ω	50Ω	60Ω
Size in mm (inch)	2012 (0805)	2012 (0805)	2012 (0805)	2012 (0805)	2012 (0805)
R25 Tolerance	±5%				
B-constant (DC R25～R50)	1950±5%	2150±5%			
Frequency Range	DC to 10GHz				
Operating Temperature	-40℃ to +125℃				
Packaging	100pcs/Bulk, 1000pcs/reel, 5,000pcs/reel				

周波数温度特性　Frequency:Thermostatic characteristic



外形寸法　Dimmensions



Dimension (mm)	HFT1220
L	2.0±0.2
W	1.25±0.2
a	0.4±0.2
t	0.9MAX
(Size in inch)	0805

型名構成　Part Number

HFT　1220　－　50R0　－　J　－　T1

Series	Size in mm	R-25 Resistance	R25 Tolerance	Packaging
HFT	1220	50R0: 50Ω	J: ±5%	T1: 1,000pcs / reel T5: 5,000pcs / reel B: Bulk

等価回路　Circuit Diagram

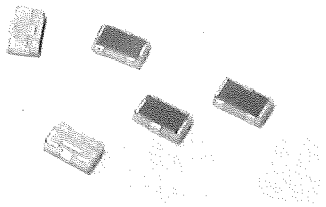
Thin Film Power Spliters

YOKOHAMA DENSHI SEIKO Co.,Ltd.

電力2分配素子

超広帯域 DC to 20GHz　100m to 500mW 低反射

PS series



RoHS Compliance　Pb Free　Halogen Free

特徴

・直流から20GHzまでの周波数レンジをカバーします。
・帯域が広いことからデジタル信号の矩形波鈍りなどの変化や時間の遅れによるジッタの発生がありません。
・小型で実装が容易です。
・適正な設計と薄膜の特性で低反射です。
・自らグランド面を持つタイプと、ご使用の基板にあわせて提供する二つのタイプを準備しております。

Features

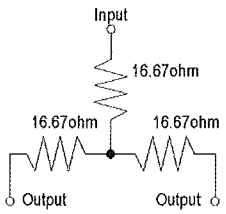
This product functions over the frequency range from DC to 20 GHz.
Because of its wide frequency range, it does not cause jitters by delays nor distortions of square wave.
Small and easily mounted. on PC boards.
The thin film design has low reflection
Two types are offered: one with ground, the other to fit your board design.

電気特性 Electrical characteristics

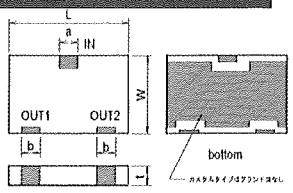
Series	PS1005 (※)	PS1608	PS2012	PS3216	PS5025
Frequency Range	DC - 20GHz	DC - 20GHz	DC - 17.5GHz	DC - 15GHz	DC - 10GHz
Size mm (inch)	1005 (0402)	1608 (0603)	2012 (0805)	3216 (1206)	5025 (2010)
Rated Input Power	100mW	100mW	125mW	250mW	500mW
Insersion Loss※1	6dB±0.5dB (B)	6dB±0.5dB (B)	6dB±0.5dB (A)	6dB±0.5dB (A)	6dB±0.5dB (A)
	6dB±1.0dB (D)	6dB±1.0dB (D)	6dB±1.0dB (C)	6dB±1.0dB (C)	6dB±1.0dB (B)
	6dB±2.0dB (F)	6dB±2.0dB (F)	6dB±2.0dB (F)	6dB±2.0dB (F)	6dB±2.0dB (F)
Balance※1	within 0.5dB (B)	within 0.5dB (B)	within 0.3dB (A)	within 0.3dB (A)	within 0.3dB (A)
	within 1dB (F)	within 1dB (F)	within 1dB (F)	within 1dB (F)	within 1dB (F)
VSWR※1	1.3 (B)	1.3 (B)	1.3 (A)	1.3 (A)	1.3 (A)
	1.5 (D)	1.5 (D)	1.5 (C)	1.5 (C)	1.5 (B)
	1.7 (F)	1.7 (F)	1.7 (F)	1.7 (F)	1.7 (F)
Operating Temp. Range	Operation Temperature Range -40℃ to +125℃				

※1 Frecuency Range　A:DC－5.0GHz 、B: －7.5GHz 、C: －10GHz 、D: －15GHz 、F: －MAX frequency
※2 PS1005series has no ground terminal

等価回路 Circuit Diagram

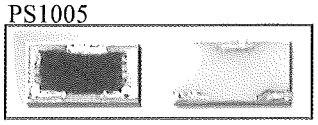


外形寸法 Dimmensions



Dimension (mm)	PS1005	PS1608	PS2012	PS3216	PS5025
L	1.0±0.1	1.6±0.15	2.0±0.15	3.2±0.1	5.0±0.2
W	0.5±0.1	0.8±0.15	1.25±0.15	1.6±0.1	2.5±0.2
a	0.40±0.1	0.45±0.1	0.45±0.15	0.35±0.15	0.50±0.2
b	0.2±0.1	0.35±0.15	0.35±0.15	0.40±0.15	0.75±0.2
t	0.3±0.1	0.4±0.1	0.4±0.1	0.4±0.1	0.4±0.2
(Size in inch)	0402	0603	0805	1206	2010

PS1005



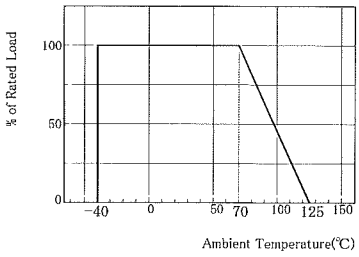
PS1005 シリーズはグランド無しタイプとなります。

型名構成 Part Number

PS　1608　G　T2　－　R50　T5 (T1)

Series	Size in mm	Tye	Number of Output Terminals	Impedance	Packaging
	1005 1608 2012 3216 5025	G: Standard Nx: Custom			T1: 1,000pcs/ reel T5: 5,000pcs/ reel

Derating Curve



new

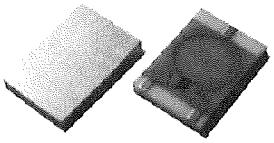
Semi - Custom Power Divider　Wilkinson Type

YOKOHAMA DENSHI SEIKO Co., Ltd.

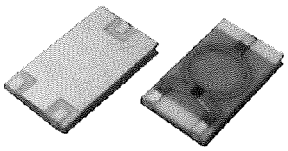
セミカスタム分配器　3G to 13GHz

MMD series

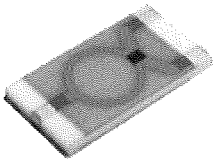
RoHS Compliance



6GHz Microstrip



6GHz SMT



7GHz SMT

特徴

・本ウィルキンソン電力分配器は、Ghz帯を中心に、20%のバンド幅で設計されています。マイクロストリップと表面実装の2種類の形態があります。
・アルミナ基板と独自の抵抗フィルムが、損失を少なく小型にしています。個体間でも高い再現性を実現しています。
・中心周波数で、デバイスのサイズ、挿入損失が変わります。
・周波数など、ご要望に応じます。お問い合わせください。

Features

Thick film Wilkinson power dividers are designed for GHz center frequency with a 20% bandwidth. There are Microstrip type and SMT type.
Alumina construction and high conductivity proprietary conductive films provide for a compact low loss device, which exhibits a high level of unit-to-unit performance repeatability.
Generally, center frequency determines the size and the insertion loss of these

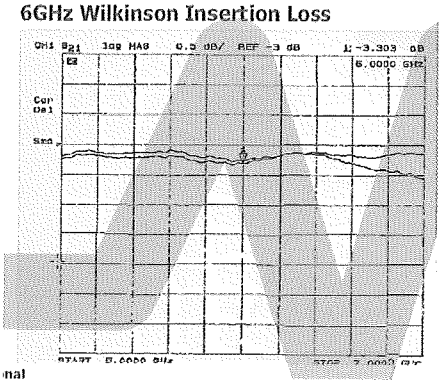
分配器設計対応可能範囲 Design capabilities

本特性は概算であり、保証値ではありません。 These values are approximate.

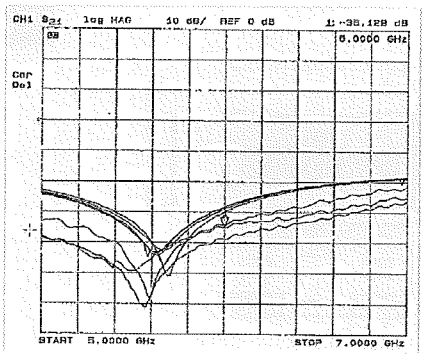
MMD Series design capabilities			
Items	Quadrature	Willkinson	RatRace
Center Freq. Range	2-16Ghz	3-13Ghz	6-20Ghz
Bandwith	10%	20%	10%
Typ.Ins.Loss	0.5dB	0.5dB	0.7dB
Design	1/4 Wave	1/4 Wave	3/4Wave
Term Style	Microstrip or SMT		

製品例 Design Example

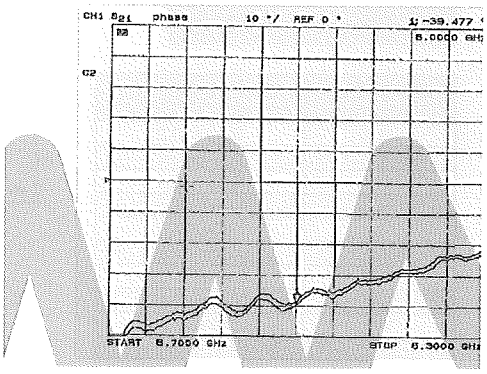
6GHz Wilkinson Insertion Loss



6GHz Wilkinson Input Isolation

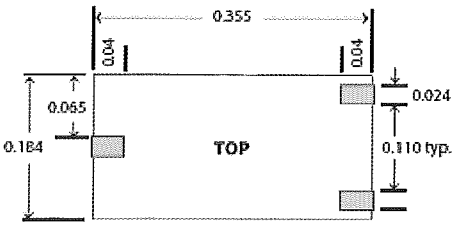


6GHz Wilkinson Phase Differential

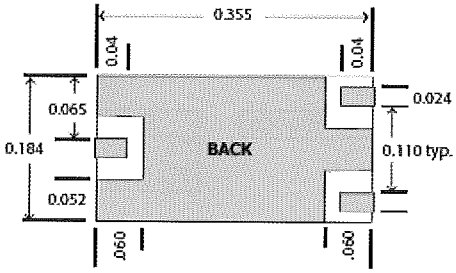


外形寸法 Dimmensions

Dimensions IMD2660 (in inches)[3]



Dimensions IMD2613 (in inches)[3]



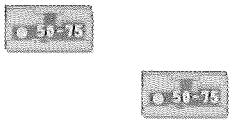
Thin Film
Impedance Converters

YOKOHAMA DENSHI SEIKO Co.,Ltd.

インピーダンス変換器 〈インピーダンス整合素子〉

高周波数、広帯域で使用可能 回路間インピーダンス不整合を解消 カスタム対応可

PCH series



RoHS Compliance | Pb Free | Halogen Free

特徴

・インピーダンスの異なる回路間でインピーダンスを整合させ、信号をスムーズに伝送することができます。
・薄膜抵抗器の優れた特性と高周波用の設計によりDCから高周波数まで広帯域で使用可能です。
・小型で一般チップ同様のコ字電極形状により実装が容易で高信頼です。
・50Ω－75Ωインピーダンス変換以外のインピーダンス整合素子及び回路間マッチング用のATTも可能です。

Features

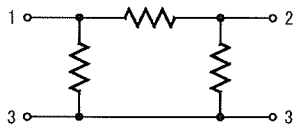
This component matches impedance between circuits that differ in their impedance allowing signals to transmit smoothly with less reflection.
Thin film resistive elements and design for high frequency provide a wide functional range from DC to high frequency.
Small size with typical wrap around termination found in common chip components, allowing easy mounting and high reliability
Non 50 ohm-75 ohm impedance matching components and inter-circuit matching ATT possible.

電気特性 Electrical characteristics

Series	PCH1632
Rated Power	125mW
Size in mm (inch)	3216 (1206)
Conversion impedance	50Ω/75Ω
Insertion Loss	6+/-0.3dB
Frecuency Range	DC to 1.5GHz
Rated ambient temperature	70℃
Operating temperature	-55 to 125℃

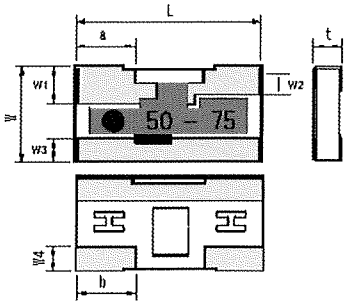
他のインピーダンス変換、マッチング用ATTも製作可能です。お気軽にご相談ください。

等価回路 Circuit Diagram

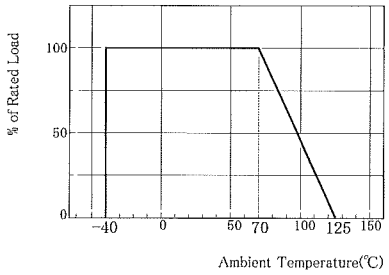


外形寸法 Dimmensions

Dimension (mm)	PCH1632
L	3.20+/-0.2
W	1.60+/-0.2
t	0.50+/-0.1
a	1.00+/-0.25
b	1.00+/-0.25
W1	0.60+/-0.25
W2	0.45+/-0.25
W3	0.40+/-0.25
W4	0.40+/-0.25
(Size in Inch)	1206



Derating Curve



型名構成 Part Number

PCH 1632 – 50/75 – T1

Series	Size in mm	Impedance	Packaging
PCH	1632		T1: 1,000pcs/ reel T5: 5,000pcs/ reel

Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

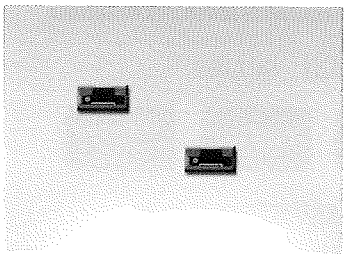
Thin Film
Terminations of ECL Logic

YOKOHAMA DENSHI SEIKO Co.,Ltd.

ECLチップ終端器

Y branched PECL output terminating element
- conventional type -

ELT series



RoHS Compliance | Pb Free | Halogen Free

特徴

・ECLロジック用の小型で高性能な終端素子です。
・1パッケージ内に3素子または2素子の薄膜抵抗器が同一セラミック上に同時に形成されていることから、相対性能が極めて優れています。
・薄膜抵抗体及びパターンデザインにより優れた周波数特性を持ちます。(周波数依存性が少なく広帯域の周波数成分を制御する)
・電極は一般チップと同様なコ字電極なっており実装性と信頼性に優れています。

Features

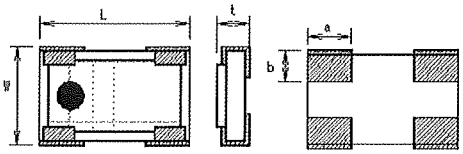
Small high performance terminator specially designed for ECL logic circuit.
One component contains 2 or 3 resistive elements on the same surface formed at the same time allowing excellent matching characteristics among the resistive elements.
Thin film and special resistive pattern design offer excellent high frequency performance (minimum change over a wide range of frequency)
Wrap-around terminals offer easy mounting and high reliability.

電気特性 Electrical characteristics

Series	1608	2012	3216
Rated Power	64mW	100mW	125mW
Size mm (inch)	1608	2012	3216
	(0603)	(0805)	(1206)
Resistance tolerance	±1%		
Tracking Resistance	±0.1%		
TCR	±50ppm/℃		
Tracking TCR	±10ppm/℃		
Operating Temperature	-55℃～+125℃		
Rated ambient Temperature	+70℃		

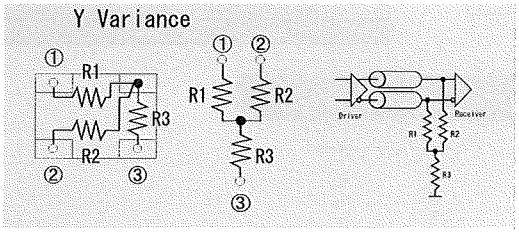
Series	Ecc	Impedance	Type	Resistance (Ω)			Chip Size		
				R1	R2	R3	1608	2125	3216
Y25V50Z	2.5V	50Ω	Y Variance	50	50	21.2	O	O	--
Y25V75Z	2.5V	75Ω	Y Variance	75	75	31.8	O	O	--
Y33V50Z	3.3V	50Ω	Y Variance	50	50	46	O	O	O
Y33V75Z	3.3V	75Ω	Y Variance	75	75	68	--	O	O
Y50V50Z	5.0V	50Ω	Y Variance	50	50	112	--	--	O
Y50V75Z	5.0V	75Ω	Y Variance	75	75	166	--	--	O
T25V50Z	2.5V	50Ω	Thevenin	250	62.5	---	O	O	O
T25V75Z	2.5V	75Ω	Thevenin	375	93.8	---	O	O	O
T33V50Z	3.3V	50Ω	Thevenin	127	83	---	O	O	O
T33V75Z	3.3V	75Ω	Thevenin	190	123	---	O	O	O
T50V50Z	5.0V	50Ω	Thevenin	83	125	---	O	O	O
T50V75Z	5.0V	75Ω	Thevenin	125	188	---	O	O	O

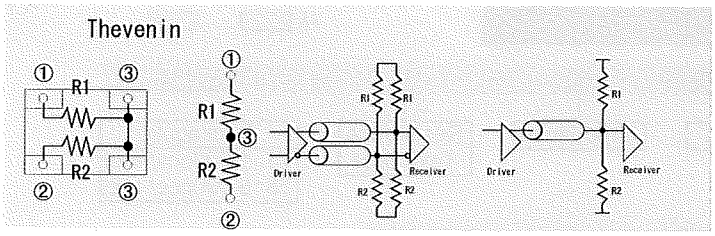
外形寸法 Dimmensions



Dimension (mm)	W	L	a	b	t
1608	1.6±0.15	0.8±0.15	0.4±0.15	0.2±0.15	0.4±0.15
2125	2.0±0.2	1.25±0.2	0.5±0.15	0.4±0.15	0.4±0.15
3216	3.2±0.2	1.6±0.2	0.8±0.15	0.4±0.15	0.4±0.15

等価回路 Circuit Diagram



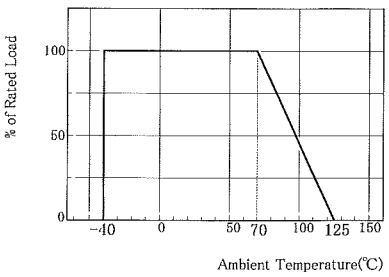


型名構成 Part Number

ELT — 1608 — N1 — T1

Series	Size in mm	Type	Packaging
ELT	1608 2012 3216	Y25V50Z	T1: 1,000pcs/ reel T5: 5,000pcs/ reel

Derating Curve



Thin Film Termination of ECL Logic

PECLチップ終端器

Y branched PECL output terminating element
– conventional type –

RN1632F series

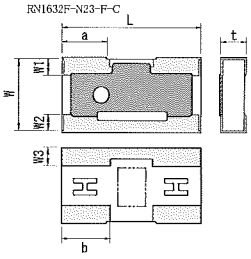
RoHS Compliance | Pb Free | Halogen Free

型名構成 Part Number

RN1632F – N23 – F – C

- Series: RN1632F
- Resistance: N23
- Resistance Tolerance: F
- TCR: C: ±25ppm/℃

外形寸法 Dimmensions

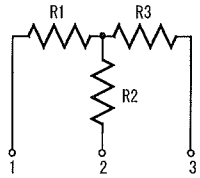


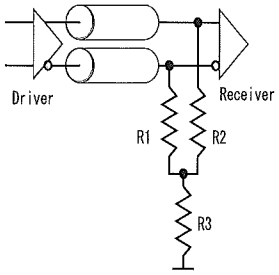
Dimension (mm)	RN1632F-N23
L	3.2±0.2
W	1.6±0.2
t	0.4±0.1
a	1.0±0.25
b	1.0±0.2
W1	0.55±0.25
W2	0.4±0.25
W3	0.4±0.2
(Size in inch)	1206

電気特性 Electrical characteristics

Series	RN1632F-N23
Rated Power	42mW / element , 125mW /chip
Size mm (inch)	1632 (1206)
Resistance	R1=50Ω,R2=46.4Ω,R3=50Ω
Tolerance	±1%(F)
TCR	±50ppm/℃ (C)
Operating Temperature	-55 to +125℃
Rated Ambient Temperature	70℃
Packaging	5,000pcs / reel

等価回路 Circuit Diagram





特徴

・薄膜で構成された高速ECL出力終端用のネットワーク抵抗器で高速のデジタル処理に優れています。
・薄膜で構成されており、小型で高性能です。
・チップ抵抗器と同様にコ字電極をゆうしており、実装が容易です。

Feature

Thin film resistor network for terminating high speed ECL output that excels high speed digital processing. This film design offers small size and high performance.
This component has wrap-around terminals same as typical chip resistors and is easily mounted on the PC boards.

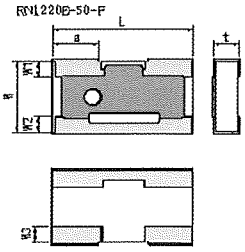
Chip Power Spliter (△型回路)

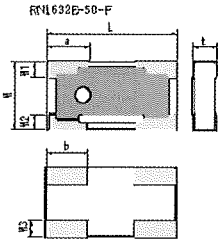
薄膜チップ分配器

Low frequency two-way power splitter from DC to 2GHz

RN1632E series

RoHS Compliance | Pb Free | Halogen Free





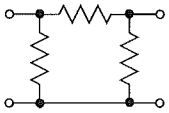
Dimension (mm)	RN1220E	RN1632E
L	2.0±0.1	3.2±0.2
W	1.25±0.1	1.6±0.2
t	0.4±0.1	0.4±0.1
a	0.5±0.2	1.0±0.25
b	0.6±0.2	1.0±0.2
W1	0.3±0.2	0.4±0.25
W2	0.3±0.2	0.4±0.25
W3	0.35±0.2	0.4±0.2
(Size in inch)	0805	0805

型名構成 Part Number

RN1632E – 50 – F – T5 (T1)

- Series: RN1632E
- Impedance: 50
- Resistance Tolerance: F
- Packaging: T1: 1,000pcs/ reel; T5: 5,000pcs/ reel

等価回路 Circuit Diagram



電気特性 Electrical characteristics

Series	RN1220E	RN1632E
Rated Power	100mW	125mW
Size mm (inch)	1220 (0805)	1632 (1206)
Insertion Loss	6±03dB	
VSWR	< 1.3	
Frequency Range	DC to 2GHz	
Resistance Tolerance	±1% (F)	
Rated ambient Temp.	70℃	
Operating Temp. Range	-55 to +125℃	
Packaging	1,000・5,000pcs/reel	

特徴

・高精度薄膜で構成された小型で高性能な分配器です。
・反射が小さく、高周波特性に優れています。
・小型で高密度実装が可能です。

Feature

Splitter consisting of precise thin film patterns offers small size and excellent performance.
Excels in high frequency performance with small reflection
Small size allows high density board mounting.

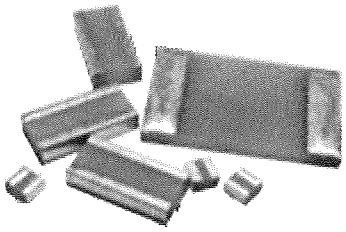
new

Therma-Bridge™ (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

サーマブリッジ

MBG series



RoHS Compliance

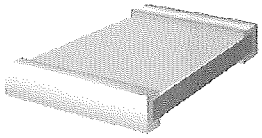
特徴

・サーマブリッジは発熱する素子の熱を電気絶縁状態で、別の場所へ伝えることが
できます。 片側を熱源素子に、反対側をサーマルプレーンや、ヒートシンクに接触
させます。
・窒化AL基板を使用し、端子素材,および、基板の厚さを選択し、最適な熱コ

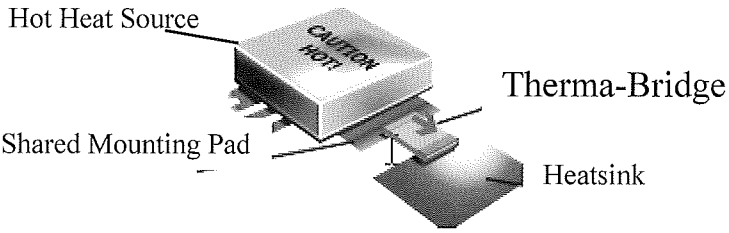
Features

Therma-Bridge can transport heat generated by heat element from one place to another with electrically isolated. Therma-bridge place to have contact to the heat source element on one side and to at thermal plane or a heat sink on opposite side.
With the AlN substrate, it is possible to optimize thermal control with selecting a thickness of the base and also a terminal material.
The custom size is also available on your request.

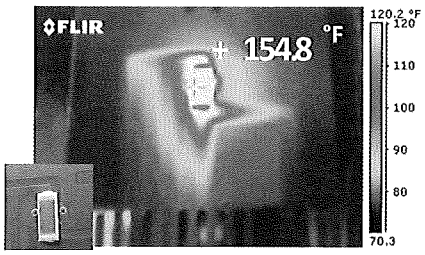
構成 Configuration



応用例 Application Example

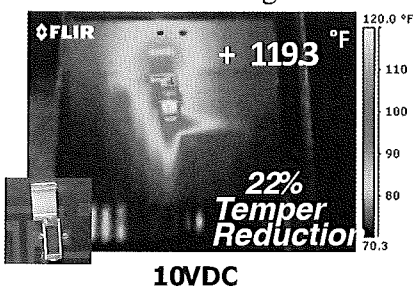


Without Terma-Bridge



10VDC

With Terma-Bridge



10VDC

電気特性 Electrical characteristics

本特性は概算であり、保証値ではありません。 These values are approximate.

Size	Thermal resistance (℃/W)		Normalized Thermal Conductivity (mW/℃)		Capacitance (pF)	
	Hight option					
	D	G	D	G	D	G
0505	9	–	110	–	0.15	–
0510	4.6	–	215	–	0.3	–
0603	18	–	53	–	0.075	–
0805	14	–	71	–	0.075	–
1005	18	–	56	–	0.075	–
1206	19	–	53	–	0.075	–
1010	9	6	110	167	0.150	0.24
1020	4.5	3	210	330	0.3	0.48
2010	19	12	53	83	0.075	0.12
2512	19	12	53	83	0.075	0.12
2525	9	6	110	167	0.15	0.24
3725	14	9	71	110	0.1	0.16

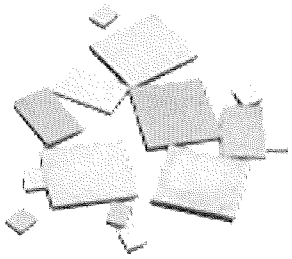
new

Therma-Plane (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

サーマプレーン

MBT series



RoHS Compliance

特徴

・サーモプレーンは発熱する素子の熱を電気絶縁状態で、別の場所へ伝えることができます。 片側を熱源素子に、反対側をサーマルプレーンや、ヒートシンクに接触させます。

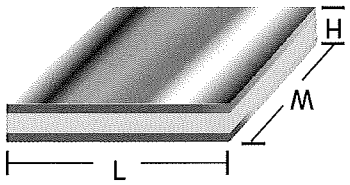
・窒化AL基板を使用し、端子素材を選択できます。

・基板の厚さを選択し、グランドからの距離を調節し、インピーダンスを最適化することが可能です。 カスタムサイズも承ります。

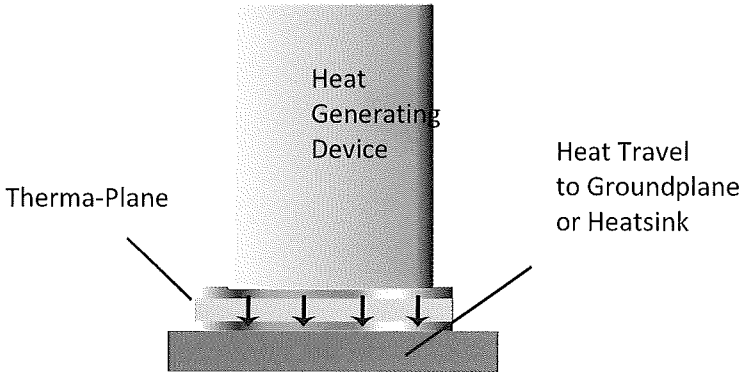
Features

Therma-Plane can transport heat generated by heat element from one place to another with electrically isolated. Therma-Plane place to have contact to the heat source element on one side and to a thermal plane or a heat sink on opposite side.
It can select termination material with AlN base.
It is possible to optimize impedance with selecting a thickness of the base to adjust distance from ground.
The custom size is also available on your request.

構成 Configuration



応用例 Application Example



電気特性 Electrical characteristics

本特性は概算であり、保証値ではありません。 These values are approximate.

Size	Capacitance (pF) 1)			Thermal resistance (℃/W) 2)			Normalized Thermal Conductivity (W/℃)		
	Hight option								
	D	G	T	D	G	T	D	G	T
0505	0.33	0.20	–	1.39	2.32	–	0.72	0.43	–
0805	0.53	0.32	–	0.87	1.45	–	1.15	0.69	–
1005	0.67	0.40	–	0.70	1.16	–	1.43	0.86	–
1206	1.06	0.64	–	0.45	0.75	–	2.22	1.33	–
2010	2.57	1.54	0.97	0.17	0.29	0.46	5.88	3.45	2.17
2512	4.00	2.40	1.50	0.12	0.19	0.31	8.33	5.26	3.23
2525	–	5.00	3.13	–	0.09	0.15	–	11.10	6.67
3725	–	7.50	4.69	–	0.06	0.10	–	16.67	10.00

High Power Notes

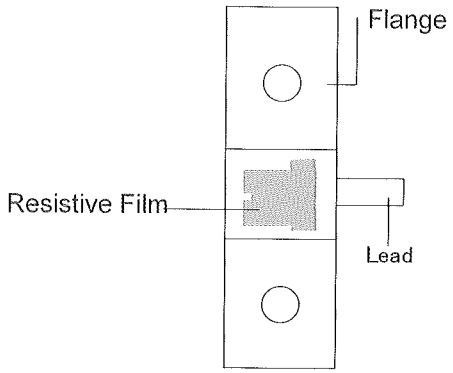
Heat Sink Characteristics: The primary thermal transfer mechanism for these devices is conduction through the mounting flange.
The derating curve for each device shows the effect of elevated temperature on power handling capability. It is imperative that the heat sink be designed to maintain the design temperature while accepting the power dissipated by the device.

Circuit Construction: The electrical performance of these resistive products can vary significantly depending upon the parameters of the stripline or microstrip circuitry to which they are connected. We have extensive experience in the design of high frequency circuits in many media and can provide assistance if desired.

Mounting Method: The use of a thermal conducting compound or preform between the mounting flange and the heat sink surface is strongly recommended. This greatly decreases the thermal resistance and therefore, the film temperature of the device. Make sure that the devices are mounted on flat surfaces, .001" under the device, to optimize the heat transfer.
Drill and tap the heat sink for the appropriate thread size to be used. Position device on mounting surface and secure using socket head screws, flat and split washers. Torque screws to the appropriate value. Make sure that the device is flat against the heat sink.

Care should be taken to avoid upward pressure of the leads. Form leads to allow a small strain relief and solder leads in place using a 60/40 type solder with a temperature controlled soldering iron (210 C). Keep lead length as short as possible for RF applications. Use minimal amounts of flux and remove with solvent.

Film Temperature: As power is dissipated in the resistive film, its temperature increases until thermal equilibrium is reached. Excessive film temperature is the principal cause of device failure. Maintaining the
temperature at the bottom of the flange, at or below the rated value, will ensure that the film temperature is maintained at an acceptable value.



Typical Resistive Device

These notes apply to products for CONTINUOUS WAVE applications, pages 23 thru 40 of this catalog.
For applications requiring PULSED POWER or CYCLED products, see pages 25-26 of this catalog. It is also recommended
that you consult us with your design requirements so that we may recommend the product best suited for your PULSED POWER or CYCLED application.

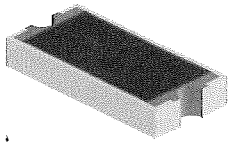
Power Surface Mount Resistors and Terminations (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

高電力 面実装型パワーチップ抵抗器・終端器

RE(C) Series
RZ(C) Series
RY(C) Series

1W to 150W



RoHS Compliance

Pb Free

特徴

・面実装型(Wrap aroundタイプ)のパワー抵抗器。
・抵抗材料に厚膜を採用した高電力シリーズです。
・独自のThermal Designにより、極めて放熱性に優れた構造。
・3つの電極形状を用意しています(RE,RZ,RYC)
・実装基板側へ熱を伝える能力が高く、小型の形状で高電力での使用が可能です。 (～150W)
・優れた高周波デザインにより、広帯域で使用いただけます。
・BeO基板による製品供給も可能です。お問い合わせ下さい

Features

・Surface mount type (Wrap around termination) with high power handling
・Thick Film material and technology
・Excellent thermal dispersion through proprietary thermal design.
・Three options for termination configuration (RE,RZ, RYC)
・High capability in thermal conductivity out to PWB achieves high power use on miniaturized package. (・150W)
・Use in broader band by excellent RF design
・BeO substrate can be available on request.

Part Number

RZC — 2010 — CT — 50R0 — JN — 2S — TR

Configration	
RE	REC
RZ	RZC
RY	RYC

Size in inch
0805
1005
1206
2010
2525
3725

Termination material and Finish
CT : Tin over Nickel over Silver

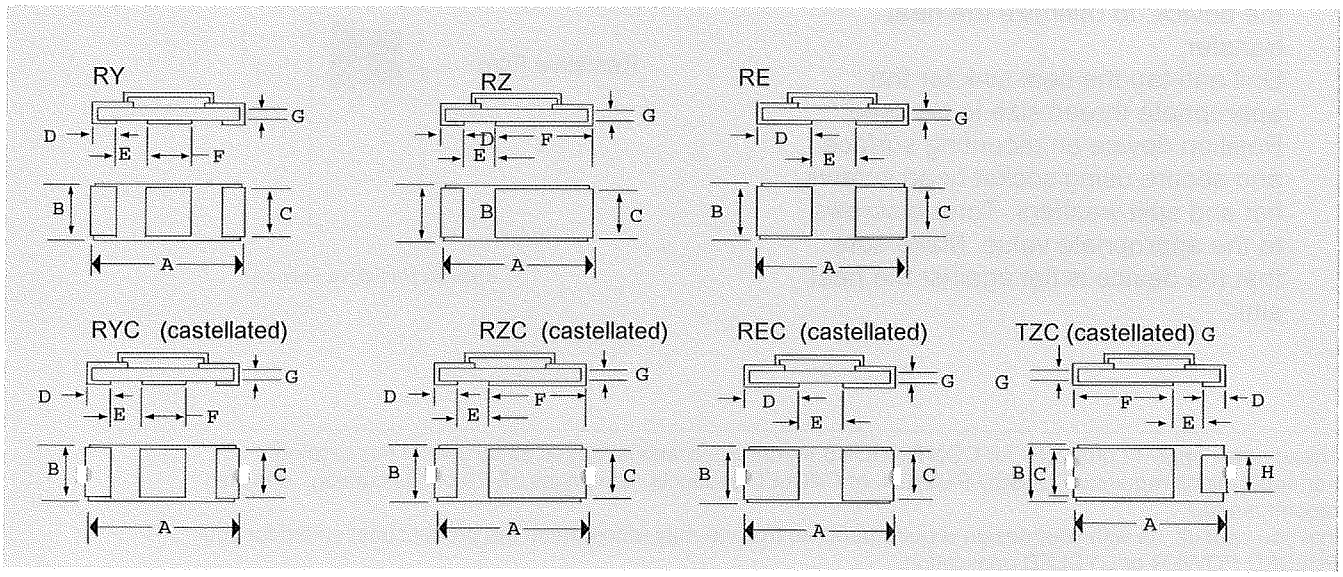
Resistance 4 digits
XXXX = Values in ohms
50R0 = 50 ohms
1000 = 100 ohms

Established by factory

Substrate
ALN: 2S, 2T, 2T-01, 2T-02
Alumina 83, 83-01

Packaging
Bulk: No Code is giving
TR: Taping reel

Configuration

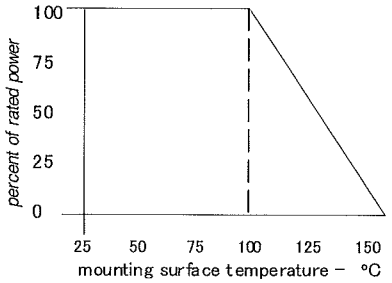


Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

General Notes

- Power rating assumes that the PC board thermal resistance is such that mounting surface is maintained at or below the temperature indicated in the derating curve, while dissipating the rated (CW) power.
- Circuit land areas should be designed in accordance with IPC-SM-782.
- Solder joint design should assure a maximum solder thickness of .002" and voids not to exceed 30%.

Derating Curve



For operations outside the derating curve, please consult with one of our application engineers.

Power Surface Mount Resistors & Terminations
— ALN —

※Product on BeO substrate available , Please cantact us

CW Power Rating	size (mm)	Part Number CFG	size inch	code	Resistancde	code	substrate	Dimensions A	B	C	D	E	F	G	H
5W	(2012)	RY	0805	CT-	XXXX	JN-	2S	.080	.050	.048	.013	.020	.014	.025	_
5W	(2012)	RZ	0805	CT-	XXXX	JN-	2S	.080	.050	.048	.013	.020	.047	.025	_
5W	(2012)	RE	0805	CT-	XXXX	JN-	2S	.080	.050	.048	.030	.020	_	.025	_
8W	(2512)	RY	1005	CT-	XXXX	JN-	2S	.100	.050	.046	.015	.025	.020	.025	_
8W	(2512)	RZ	1005	CT-	XXXX	JN-	2S	.100	.050	.046	.015	.025	.060	.025	_
8W	(2512)	RE	1005	CT-	XXXX	JN-	2S	.100	.050	.046	.0375	.025	_	.025	_
10W	(3216)	RYC	1206	CT-	XXXX	JN-	2S	.120	.062	.060	.018	.025	.034	.025	_
10W	(3216)	RZC	1206	CT-	XXXX	JN-	2S	.120	.062	.060	.018	.025	.077	.025	_
10W	(3216)	REC	1206	CT-	XXXX	JN-	2S	.120	.062	.060	.0475	.025	_	.025	_
30W	(5025)	RYC	2010	CT-	XXXX	JN-	2T	.206	.100	.090	.035	.030	.070	.040	_
30W	(5025)	RZC	2010	CT-	XXXX	JN-	2T	.206	.100	.090	.020	.035	.151	.040	_
30W	(5025)	REC	2010	CT-	XXXX	JN-	2T	.206	.100	.090	.085	.030	_	.040	_
100W	(6464)	TZC	2525	CT-	XXXX	JN-	2T-02	.250	.250	.240	.030	.040	.180	.040	.120
150W	(9464)	TZC	3725	CT-	XXXX	JN-	2T-01	.375	.250	.240	.050	.050	.275	.040	.135

50 ohm and 100 ohm are standard values; other values and substrate thicknesses available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms). Available in bulk, waffle pack or tape and reel.

Power Surface Mount Resistors & Terminations
— Alumina —

CW Power Rating	size (mm)	Part Number CFG	size inch	code	Resistancde	code	substrate	Dimensions A	B	C	D	E	F	G	H
1W	(2012)	RY	0805	CT-	XXXX	JN-	83	.080	.050	.048	.013	.020	.014	.025	_
1W	(2012)	RZ	0805	CT-	XXXX	JN-	83	.080	.050	.048	.013	.020	.047	.025	_
1W	(2012)	RE	0805	CT-	XXXX	JN-	83	.080	.050	.048	.030	.020	_	.025	_
5W	(3216)	RYC	1206	CT-	XXXX	JN-	83	.120	.062	.060	.018	.025	.034	.025	_
5W	(3216)	RZC	1206	CT-	XXXX	JN-	83	.120	.062	.060	.018	.025	.077	.025	_
5W	(3216)	REC	1206	CT-	XXXX	JN-	83	.120	.062	.060	.048	.025	_	.025	_
10W	(5025)	RYC	2010	CT-	XXXX	JN-	83	.206	.100	.090	.035	.030	.070	.040	_
10W	(5025)	RZC	2010	CT-	XXXX	JN-	83	.206	.100	.090	.020	.035	0.151	.040	_
10W	(5025)	REC	2010	CT-	XXXX	JN-	83	.206	.100	.090	.085	.030	_	.040	_
40W	(6464)	RYC	2525	CT-	XXXX	JN-	83	.250	.250	.240	.035	.040	.090	.025	.070
50W	(6464)	TZC	2525	CT-	XXXX	JN-	83-01	.250	.250	.240	.030	.040	.180	.025	.120

50 ohm and 100 ohm are standard values; other values and substrate thicknesses available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms). Available in bulk, waffle pack or tape and reel.

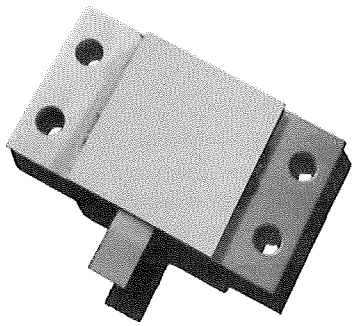
Pulsed Power Products (1/2)

YOKOHAMA DENSHI SEIKO Co., Ltd.

耐パルス フランジ型パワー抵抗器・終端器・減衰器

Pulsed Power - Resistors
- Terminations
- Attenuators

*BeO substrate
40W to 1500W



※RoHS Compliance　※Pb Free

※Differs from Part Number, Please consult with one of our application engineers

特徴

銅タングステン合金をフランジに使用することにより、フランジとチップ部(セラミック)の熱膨張をマッチングさせた製品です。
フランジ型の抵抗器(および終端器、ATT)では、定格電力が大きくなるほど、大きなセラミックチップが必要になります。
このことは熱膨張のマッチングはとても重要ですが、パワーサイクル、または温度サイクルでの使用を考えた場合,より重要なものとなります。
耐パルス品 "Pullsed Power Product" はこれらの問題を解決し、10秒on/10秒off 等のパルス用途においても、極めて優れた耐性を持つ。高信頼の製品です。

Features

- CTE matched device between flang and ceramic chip
- by using CuW alloy for flange material.
- Anti-pulsed device "Pulsed Power Product" sereis offfers high reliability and extremely excellent durability for the use in such as 10sec on/10sec off cycles under pulsed level in decadal magnitude against rated power.
- Tried-and-true solution for power handling vs. ceramic chip size efficiency over CTE matching issue on flange type resistor,termination, attenuator.
- BeO Substrate

Part Number

T ※ — 50R0 — 100 — 25E

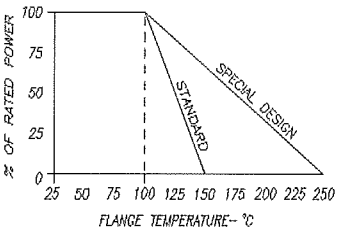
Device Type	Values	Power (W)	Established by factory
R: Flanged Resistor	(Ω) (dB)		
T: Flanged Termination	50R0 = 50ohms 3000 = 30dB		
A: Flanged Attenuator	1000 = 100ohms 0100 = 1dB		

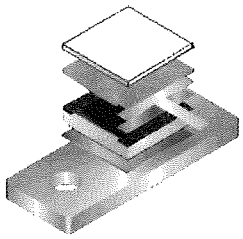
*BeO substrate

Please contact factory for individual data sheets.

Utilizing a proprietary flange composite, YDS offers BeO Resistors and Terminations that are ideal for Pulsed Power/Cycled Applications.
The devices feature all brazed construction which ensure that the assembly stays intact during interface. Devices are rated for operation at full power to 100 C and derated to 250 C.

DERATING CURVE:





PULSED POWER APPLICATIONS

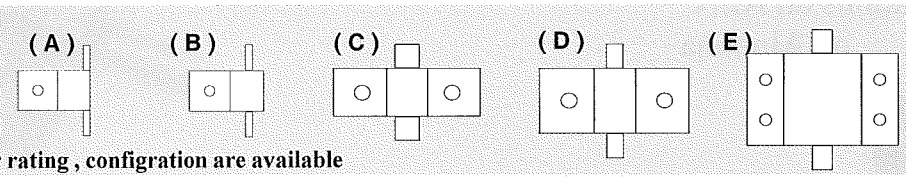
Pulsed power applications present a unique set of thermal problems. Frequent cycling of power can cause materials to expand rapidly. Sometimes with destructive effects.
By closely matching the Coefficient of Thermal Expansion (CTE) of adjoining materials, catastrophic failures can be eliminated.
Materials with different CTE's expand and contract in an unequal manner. Thermal gradients result in different expansions and contractions in regions of the device with different temperatures.

HIGH POWER PULSED CONSTRUCTION

To minimize CTE mismatch and increase thermal conductivity, a AU-GE eutectic is used to bond the BeO to the flange. To further minimize CTE mismatch, a Copper/Tungsten flange is used.
The AU-GE layer is chemically compatible with the AU plated adjoining layers, and no embrittling metallics will form. The AU matrix exhibits outstanding ductility, corrosion resistance, low diffusivity and low toxicity, as opposed to lead.

Pulsed Power Attenuator and Resistors

Configration



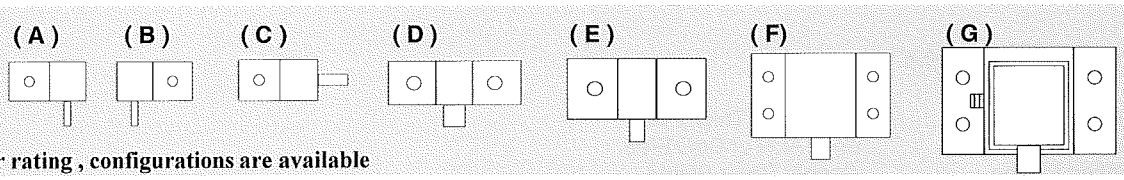
Other values , power rating , configration are available

CW Power Rating	Device Type	CFG	Part Number Code	Values (Ω or dB)		Power Rating		code	Dimensions Flange Length	Flange Width	Flange Thickness	Chip Dimensions	Max. Height	Lead Width	HoleDim.
40W	Attenuator	A	A	3000	–	40	–	3E	.515	.250	.062	.250x.250	.140	.048	.130
100W	Attenuator	C	A	0100	–	100	–	3E	.800	.230	.062	.230x.350	.14	.040	
30W	Resistor	B	R	XXXX	–	30	–	3E	.515	.250	.062	.250x.250	.140	.060	.130
50W	Resistor	B	R	XXXX	–	50	–	2E	.560	.375	.125	.375x.250	.200	.120	.161
50W	Resistor	B	R	XXXX	–	50	–	3E	.515	.250	.062	.250x.250	.140	.060	.130
50W	Resistor	B	R	XXXX	–	50	–	5E	.515	.250	.125	.250x.250	.200	.060	.130
80W	Resistor	B	R	XXXX	–	80	–	3E	.515	.250	.062	.250x.250	.160	.060	.130
150W	Resistor	C	R	XXXX	–	150	–	4E	.800	.230	.062	.230x.350	.140	.120	
150W	Resistor	D	R	XXXX	–	150	–	8E	.870	.375	.062	.375x.250	.140	.120	.161
150W	Resistor	C	R	XXXX	–	150	–	15E	.975	.250	.062	.375x.250	.140	.120	
250W	Resistor	C	R	XXXX	–	250	–	5E	.975	.375	.125	.375x.375	.190	.120	.130
400W	Resistor	C	R	XXXX	–	400	–	1E	1.1	.500	.125	.500x.500	.200	.250	.170
800W	Resistor	E	R	XXXX	–	800	–	1E	1.9	1.04	.125	1.00x1.04	.250	.250	.170

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Pulsed Power Terminations

Configration



Other values , power rating , configurations are available

CW Power Rating	Device Type	CFG	Part Number Code	Values (Ω or dB)		Power Rating		code	Dimensions Flange Length	Flange Width	Flange Thickness	Chip Dimensions	Max. Height	Lead Width	HoleDim.
60W	Termination	A	T	XXXX	–	60	–	49E	.515	.250	.062	.250 x.250	.140	.060	.130
60W	Termination	B	T	XXXX	–	60	–	50E	.515	.250	.062	.250 x.250	.140	.060	.130
100W	Termination	C	T	XXXX	–	100	–	21E	.515	.250	.062	.250 x.250	.140	.040	.130
100W	Termination	A	T	XXXX	–	100	–	28E	.560	.375	.062	.375 x.250	.140	.040	.161
100W	Termination	B	T	XXXX	–	100	–	29E	.560	.375	.062	.375 x.250	.140	.040	.161
150W	Termination	D	T	XXXX	–	150	–	10E	.800	.230	.062	.230x.350	.140	.040	
200W	Termination	D	T	XXXX	–	200	–	1E	.800	.230	.062	.230x.350	.140	.040	.130
250W	Termination	D	T	XXXX	–	250	–	23E	.975	.375	.062	.375 x.375	.140	.040	.130
350W	Termination	E	T	XXXX	–	350	–	1E	1.1	.500	.125	.500 x.500	.200	.060	.170
800W	Termination	F	T	XXXX	–	800	–	1E	1.9	1.04	.125	1.00 x1.04	.250	.250	.170
1500W	Termination	G	T	XXXX	–	1500	–	1E	1.9	1.64	.125	1.00 x1.50	.220	.240	.170

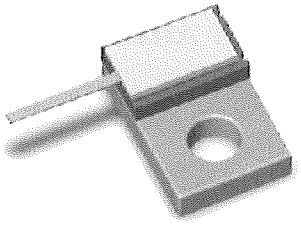
50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Flanged Power Terminations (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

フランジ型パワー終端器 30W to 1000W

Flanged Terminations on ALN on Alumina



RoHS Compliance

Pb Free

特徴

・フランジ型(ネジ止め型)のパワー終端器です。
・抵抗材料に厚膜を採用した高電力シリーズです。
・独自のThermal Designにより、極めて放熱性に優れた構造。
・ヒートシンクへ熱を伝える能力が高く、小型の形状で高電力での使用が可能です。(～1000W)
・優れた高周波デザインにより、広帯域で使用いただけます。
・BeO基板による製品供給も可能です。お問い合わせ下さい。

Features

・Flange setscrew type high power attenuator.
・Thick Film material and technology
・Excellent thermal dispersion through proprietary thermal design.
・High capability in thermal conductivity out to PWB achieves high power use on miniaturized package. (～1000W)
・Use in broader band by excellent RF design
・BeO substrate can be available on request.

Part Number

T — A — 50R0 — 150 — 10X

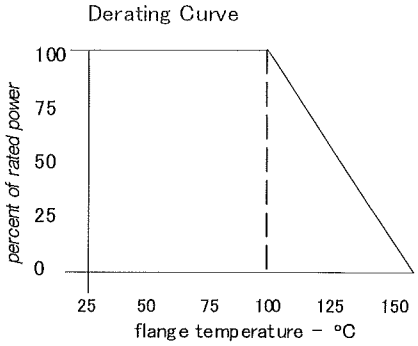
Device Type	Substrate	Values	CW Power Rating	Established by factory
T: Flanged Termination	A: ALN ※no code is giving for Alumina	(Ω) 50R0 = 50ohms 1000 = 100ohms		

General Specifications

Resistive Element.....Proprietary Thick Film
Substrate .....BeO, ALN or BeO Free
Mounting Flange .....Copper Silver Plated
Leads .....Copper (.005" thick) Silver Plated

General Notes

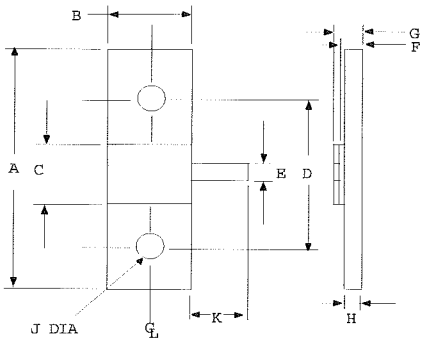
- All power ratings assume an operating base plate temperature of 100 C
- All dimension are in inches.
- Resistance Tolerance: standard is +/- 5%; +/-2% available.
- Resistance Range: 0.5 to 20,000 ohms. Standard values: 50 & 100 ohms.
- Mechanical Tolerance: +/-. 010, unless otherwise specified.
- Minimum lead length on all devices is .125 inches.
- Individual drawings available upon request.
- Other configurations available, custom requests welcome.



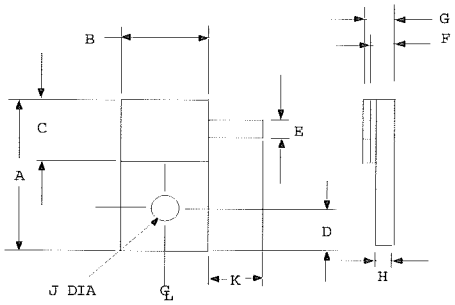
For operations outside the derating curve, please consult with one of our application engineers

Configuration

Configuration A



Configuration B



Flanged Terminations — ALN —

※Product on BeO substrate available , Please cantact us

CW Power Rating	CFG	Frequency Range	Typical VSWR	A	B	C	D	E	F	G	H	J	K	Part Number
30W	B	DC-2.5GHz	1.15:1	.515	.250	.250	.125	.600	.105	.140 max	.062	.130	.370 max	TA50R0-30-10X
40W	A	DC-2.5GHz	1.20:1	.800	.230	.350	.560-.600	.040	.105	.140 max	.062	.130	.370 max	TA50R0-40-1X
60W	B	DC-2.5GHz	1.15:1	.515	.250	.250	.125	.060	.105	.140 max	.062	.130	.370 max	TA50R0-60-3X
100W	B	DC-2.0GHz 2.0-3.5GHz	1.20:1 1.10:1	.560	.375	.250	.155	.040	.105	.140 max	.062	.160	.370 max	TA50R0-100-24X *
100W	B	DC-2.0GHz 2.0-3.5GHz	1.20:1 1.10:1	.560	.375	.250	.155	.040	.105	.140 max	.062	.160	.370 max	TA50r0-100-25X**
100W	A	DC-4.5GHz 4.5-6.0GHz	1.15:1 1.30:1	.800	.230	.350	.560-.600	.040	.105	.140 max	.062	.130	.370 max	TA50R0-100-27X
150W	A	DC-3.0GHz	1.10:1	.800	.230	.350	.560-.600	.040	.105	.140 max	.062	.130	.370 max	TA50R0-150-10X
150W	A	DC-2.0GHz 2.0-3.5GHz	1.20:1 1.10:1	.870	.375	.250	.560-.600	.040	.105	.140 max	.062	.160	.370 max	TA50R0-150-25X
250W	A	DC-2.5GHz	1.25:1	.870	.375	.250	.560-.600	.040	.105	.140 max	.062	.160	.370 max	TA50R0-250-21X
250W	A	DC-3.0GHz	1.25:1	.975	.375	.375	.725	.120	.105	.140 max	.062	.130	.370 max	TA50R0-250-12X
800W		DC-860MHz 860MHz-1GHz	1.10:1 1.20:1	Contact us for Data Sheet										TA50R0-800-10X
1000W		DC-860MHz 860MHz-1GHz	1.10:1 1.20:1	Contact us for Data Sheet										TA50R0-1000-2X

* Lead comes off the left. **Lead comes off the right.

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Flanged Terminations — Alumina —

CW Power Rating	CFG	Frequency Range	Typical VSWR	A	B	C	D	E	F	G	H	J	K	Part Number
30W	B	DC-2.5GHz	1.15:1	.515	.250	.250	.125	.040	.105	.140 max	.062	.130	.370 max	T 50R0-30-27X
40W	B	DC-5.0GHz	1.20:1	.515	.250	.250	.125	.040	.105	.140 max	.062	.130	.370 max	T 50R0-40-13X
40W	A	DC-2.5GHz	1.20:1	.800	.230	.350	.560-.600	.040	.090	.125 max	.062	.130	.370 max	T 50R0-40-14X
50W	B	DC-5.0GHz	1.20:1	.515	.250	.250	.125	.040	.090	.125 max	.062	.130	.370 max	T 50R0-50-14X
50W	A	DC-2.0GHz	1.20:1	.800	.230	.350	.560-.600	.040	.105	.140 max	.062	.130	.370 max	T 50R0-50-15X
70W	A	DC-2.75GHz	1.10:1	.870	.375	.250	.560-.600	.040	.090	.125 max	.062	.160	.370 max	T 50R0-70-16X
100W	A	DC-2.0GHz	1.10:1	.870	.375	.250	.560	.040	.090	.125 max	.062	.160	.370 max	T 50R0-100-22X

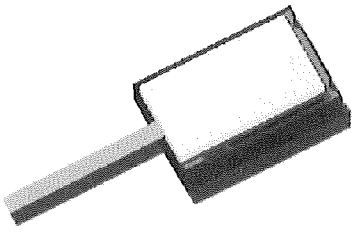
50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Leaded Power Terminations (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

リード型パワー終端器 10W to 250W

Leaded Power Terminations on ALN
on Alumina



RoHS Compliance

Pb Free

特徴

・リード型のパワー終端器です。
・抵抗材料に厚膜を採用した高電力シリーズです。
・独自のThermal Designにより、極めて放熱性に優れた構造。
・ヒートシンクへ直接取り付けることにより、フランジ型と比較し小さなスペースでのご使用が可能です。(～250W)
・優れた高周波デザインにより、広帯域で使用いただけます。
・BeO基板による製品供給も可能です。お問い合わせ下さい。

Features

・Leaded type termination with high power handling
・Thick Film material and technology
・Excellent thermal dispersion through proprietary thermal design.
・Space conscious by direct mounting use on to heat sink (compared to flange tyep) up to 250W.
・Use in broader band by excellent RF design
・BeO substrate can be available on request

Part Number

D 06 Z - 50R0 J 2T - 05 C 36 - X

D	06	Z	50R0	J	2T	05	C	36	X
Device Type	Chip Size in inch	Code	Values (Ω)	Code	Substrate	Code	Lead (inch) width	Lead (inch) Length	Established by factory
A: Leaded Termination	01= .01x.05		50R0 = 50ohms		2Q: .015" ALN		A: .025	36: .36	
B: Leaded Termination with Castellations	02= .12x.06		1000 = 100ohms		2S: .025" ALN		C: .040		
D: Leaded Termination with Castellations and a cover.	05= .20x.10				2T: .040" ALN				
	06= .25x.25								
	07= .37x.25								
	08= .37x.37								

83 giving Alumina

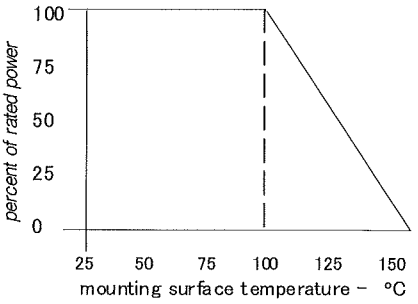
General Specifications

Resistive Element.....Proprietary Thick Film
Substrate .....BeO, ALN or BeO Free
Leads .....Copper (.005" thick) Silver Plated
Y at the end of part # .....Indicates part does not take a cover, but may include a dab of epoxy

General Notes

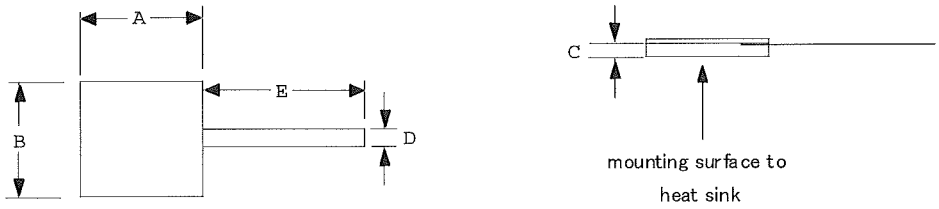
- All power ratings assume an operating base plate temperature of 100 C
- All dimension are in inches.
- Resistance Tolerance: standard is +/- 5%; +/-2% available.
- Resistance Range: 0.5 to 20,000 ohms. Standard values: 50 & 100 ohms.
- Mechanical Tolerance: +/-. 010, unless otherwise specified.
- Minimum lead length on all devices is .125 inches.
- Individual drawings available upon request.
- *Outline depicts a covered device, castellations where used are not shown.*
- *Power ratings over 250 watts available upon request, contact us.*
- Other configurations available, custom requests welcome.

Derating Curve



For operations outside the derating curve, please consult with one of our application engineers.

Configuration



Leaded Power Terminations
— ALN —

※Product on BeO substrate available , Please cantact us

CW Power Rating	Frequency Range	Typical VSWR	A	B	C	D	E	Part Number
10W	DC-3.0GHz	1.15:1	.100	.050	.015	.025	.370 max	A01Z-50R0J2Q-01A36-Y
20W	DC-3.0GHz	1.20:1	.120	.060	.025	.040	.370 max	B02Z-50R0J2S-00C36-Y
30W	DC-2.0GHz	1.15:1	.200	.100	.040	.040	.370 max	D04Z-50R0J2T-01C36-X
100W	DC-4.5GHz 4.5-6.0GHz	1.15:1 1.30:1	.230	.350	.040	.040	.370 max	D05Z-50R0J2T-14C36-X
150W	DC-2.5GHz	1.15:1	.250	.250	.040	.040	.370 max	D06Z-50R0J2T-04C36-X
150W	DC-2.5GHz	1.15:1	.230	.350	.040	.040	.370 max	D05Z-50R0J2T-05C36-X
150W	DC-2.0GHz 2.0-3.5GHz	1.20:1 1.10:1	.375	.250	.040	.040	.370 max	D07Z-50R0J2T-01C36-X
250W	DC-3.0GHz	1.25:1	.375	.250	.040	.040	.370 max	D07Z-50R0J2T-09C36-X
250W	DC-3.0GHz	1.25:1	.370	.370	.040	.040	.370 max	D08Z-50R0J2T-04C36-X

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Leaded Power Terminations
— Alumina —

CW Power Rating	Frequency Range	Typical VSWR	A	B	C	D	E	Part Number
30W	DC-2.5GHz	1.15	.250	.250	.250	.040	.370max	D06Z-50R0J83-02C36-X
40W	DC-2.5GHz	1.20:1	.230	.350	.025	.040	.370max	D05Z-50R0J83-03C36-X
50W	DC-2.0 GHz	1.20:1	.230	.350	.250	.040	.370max	D05Z-50R0J83-07C36-X
60W	DC-5.0 GHz	1.20:1	.250	.250	.250	.040	.370max	D06Z-50R0J83-03C36-X
100W	DC-2.0GHz	1.20:1	.370	.370	.025	.040	.370max	D08Z-50R0J83-03C36-X

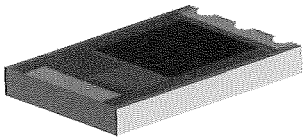
50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Power Chip Terminations (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

チップ型パワー終端器 10W to 250W

Power Chip Terminations on ALN
on Alumina



RoHS Compliance

Pb Free

特徴

・チップ型のパワー終端器です
(リードtabを取り付けてご使用下さい)
・抵抗材料に厚膜を採用した高電力シリーズです。
・独自のThermal Designにより、極めて放熱性に優れた構造。
・ヒートシンクへ直接取り付けることにより、フランジ型と比較し小さなスペースでのご使用が可能です。(～250W)
・優れた高周波デザインにより、広帯域で使用いただけます。

Features

・Chip tyep high power terminaiton(lead tab attachable type)
・Thick Film material and technology
・Excellent thermal dispersion through proprietary thermal design.
・Space conscious by direct mounting use on to heat sink (compared to flange tyep) up to 250W.
・Use in broader band by excellent RF design
・BeO substrate can be available on request.

Part Number

TVC 2010 CT - 50R0 JN - 2T - 01

- TVC: Device Type
- 2010: Chip Size in inch (Ex. 2010 =0.2 x 0.1)
- CT: Termination material and Finish (CT : Tin over Nickel over Silver)
- 50R0: Values (Ω) (50R0 = 50ohms; 1000 = 100ohms)
- JN: Code
- 2T: Substrate (2Q: .015" ALN; 2S: .025" ALN; 2T: .040" ALN)
- 01: Established by factory

83 giving Alumina

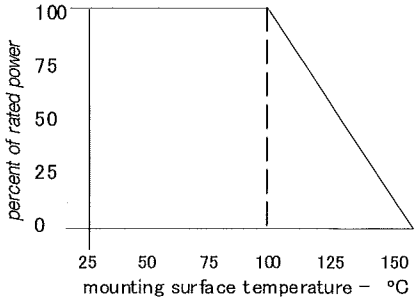
General Specifications

Resistive Element.....Proprietary Thick Film
Contact Pads .....Silver
CT = ...Solderable Finish, Matte Tin over Nickel over Silver
Substrate .....BeO, ALN or BeO Free

General Notes

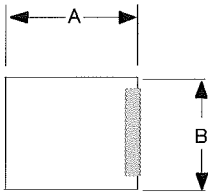
-All power ratings assume an operating base plate temperature of 100 C
- - All dimension are in inches.
- Resistance Tolerance: standard is +/- 5%; +/-2% available.
- Resistance Range: 0.5 to 20,000 ohms. Standard values: 50 & 100 ohms.
- Mechanical Tolerance: +/-. 010, unless otherwise specified.
- Individual drawings available upon request.
- *Outline depicts a basic chip, castellations where used are not shown.*
- *Power ratings over 250 watts available upon request, contact us.*
- Other configurations available, custom requests welcome.

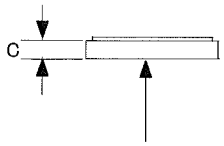
Derating Curve



For operations outside the derating curve, please consult with one of our application engineers.

Configuration





mounting surface to heat sink

Power Chip Terminations
— ALN —

※Product on BeO substrate available , Please cantact us

CW Power Rating	Frequency Range	Typical VSWR	A	B	C	Part Number
10W	DC-3.0 GHz	1.15:1	.100	.050	.015	TV1005CT-50R0JN-2Q-01
20W	DC-3.0 GHz	1.20:1	.120	.060	.025	TVC1206CT-50R0JN-2S
30W	DC-2.0 GHz	1.15:1	.200	.100	.040	TVC2010CT-50R0JN-2T-01
150W	DC-2.5 GHz	1.15:1	.250	.250	.040	TVC2525CT-50R0JN-2T-04
150W	DC-2.5 GHz	1.15:1	.230	.350	.040	TVC2335CT-50R0JN-2T-05
150W	DC-2.0GHz 2.0-3.5 GHz	1.20:1 1.10:1	.375	.250	.040	TVC3725CT-50R0JN-2T-01
250W	DC-2.5 GHz	1.25:1	.375	.250	.040	TVC3725CT-50R0JN-2T-09
250W	DC-3.0 GHz	1.25:1	.375	.375	.040	TVC3737CT-50R0JN-2T-04

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Power Chip Terminations
— Alumina —

CW Power Rating	Frequency Range	Typical VSWR	A	B	C	Part Number
5W	DC-4.0 GHz	1.20:1	.060	.050	.025	TV0605CT-XXXXJN-83
5W	DC-4.0 GHz	1.20:1	.100	.050	.025	TV1005CT-XXXXJN-83
5W	DC-4.0 GHz	1.20:1	.120	.060	.025	TVC1206CT-XXXXJN-83
10W	DC-3.0 GHz	1.25:1	.190	.075	.025	TVC1907CT-XXXXJN-83
12W	DC-2.0 GHz	1.20:1	.190	.075	.025	TVC1907CT-XXXXJN-83-01
20W	DC-2.0 GHz	1.30:1	.180	.120	.025	TVC1812CT-XXXXJN-83
30W	DC-2.5 GHz	1.15:1	.250	.250	.025	TVC2525CT-XXXXJN-83-02
40W	DC-2.5GHz	1.20:1	.230	.350	.025	TVC2335CT-XXXXJN-83-03
50W	DC-5.0 GHz	1.20:1	.250	.250	.025	TVC2525CT-XXXXJN-83-03
50W	DC-2.0 GHz	1.20:1	.230	.350	.025	TVC2335CT-XXXXJN-83-07
70W	DC-1.0 GHz	1.20:1	.350	.180	.025	TVC1835CT-XXXXJN-83
100W	DC-2.0 GHz	1.20:1	.370	.370	.025	TVC3737CT-XXXXJN-83-03

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

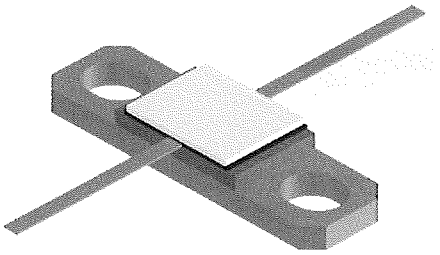
Low Capacitance Power Resistors
-Flanged -Leaded , & Chip (1/2)

YOKOHAMA DENSHI SEIKO Co., Ltd.

低容量パワー抵抗器
-フランジ型、リード型、チップ型-

20W to 100W

※リード型、チップ型の外形は、寸法図をご覧ください。



Low Capacitance Resistors - ALN

RoHS Compliance **Pb Free**

特徴

・独自の高周波設計により、低容量にデザインされた パワー抵抗器です。
・フランジ型、リード型、チップ型、を用意しています。
・Wilkinson合成、分配に最適です。
・独自のThermal Designにより、極めて放熱性に優れた構造。
・ヒートシンクへ熱を伝える能力が高く、小型の形状で高電力での使用が可能です。
・BeO基板による製品供給も可能です。お問い合わせ下さい。

Features

・Lower capacitance high power resistor terminaiton by proprietary RF design.
・Each of flange, leaded, chip type is available.
・Suitable for Wilkinson combiner and splitter.
・Excellent thermal dispersion through proprietary thermal design.
・High capability in thermal conductivity on to heak sink.
・BeO substrate can be available on request.

Part Number

R	A	1000	–	100	–	8X
Device Type B: Flanged Resistor	Substrate A: ALN ※no code is giving for Alumina	Values (Ω) 50R0 = 50ohms 1000 = 100ohms		CW Power Rating		Established by factory

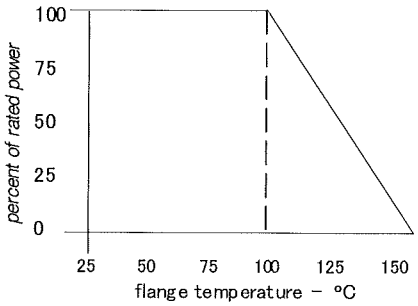
General Specifications

Resistive Element.....Proprietary Thick Film
Substrate .....BeO or ALN
Mounting Flange.....Copper Silver Plated
Leads.....Copper (.005" thick) Silver Plated
Contact Pads .....Silver
CT =.....Solderable Finish, Matte Tin over Nickel over Silver

General Notes

-All power ratings assume an operating base plate temperature of 100 C
-All dimension are in inches.
- Resistance Tolerance: standard is +/- 5%; +/-2% available.
- Resistance Range: 0.5 to 20,000 ohms. Standard values: 50 & 100 ohms.
- Mechanical Tolerance: +/-. 010, unless otherwise specified.
- Minimum lead length on all devices is .125 inches.
- Individual drawings available upon request.
- Outline depicts a basic chip, castellations where used are not shown.
- *Power ratings over 200 watts available upon request, contact us.*
- Other configurations available, custom requests welcome.

Derating Curve



or Mounting Surface Temperature for Leaded and Chip

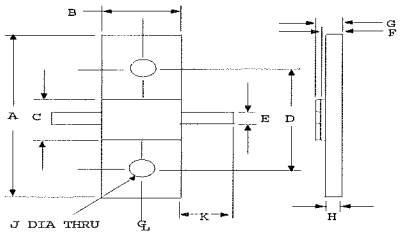
For operations outside the derating curve, please consult with one of our application engineers

Flanged Low Capacitance Power Resistors — ALN —

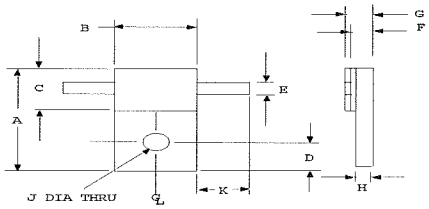
※Product on BeO substrate available , Please cantact us

Configuration

Configuration A



Configuration B



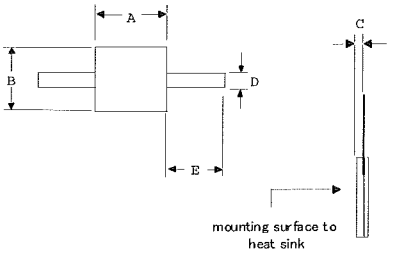
CW Power Rating	CFG	Capacitance at 1MHz	A	B	C	D	E	F	G	H	J	K	Part Number
20W	B	0.73	.300	.200	.100	.100	.040	.105	0.140 max	.062	.116	.375 max	RA1000-20-8X
50W	A	1.37	.800	.230	.350	.560-.600	.040	.105	0.140 max	.062	.130	.370 max	RA1000-50-10X
50W	A	1.42	.800	.230	.350	.560-.600	.040	.125	0.170 max	.062	.130	.370 max	RA1000-50-11X
50W	B	1.37	.575	.230	.350	.100-.120	.040	.105	0.140 max	.062	.130	.370 max	RA1000-50-13X
50W	B	1.37	.575	.230	.350	.100-.120	.040	.125	0.170 max	.062	.130	.370 max	RA1000-50-14X
100W	A	1.73	.800	.230	.350	.560-.600	.040	.105	0.140 max	.062	.130	.370 max	RA1000-100-8X
100W	A	1.58	.800	.230	.350	.560-.600	.040	.125	0.170 max	.062	.130	.370 max	RA1000-100-9X

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Leaded Low Capacitance Power Resistors — ALN —

※Product on BeO substrate available , Please cantact us if you need

Configuration



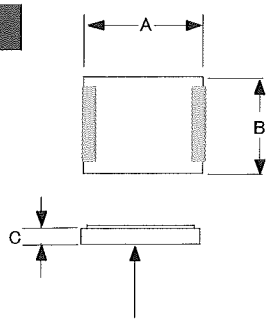
CW Power Rating	A	B	C	D	E	Capacitance at 1MHz	Part Number
20W	.200	.100	.040	.040	.375 max	.73	K04Z-1000G2T-02C36-X
50W	.230	.350	.040	.040	.370 max	1.34	K05Z-1000G2T-05C36-X
50W	.230	.350	.060	.040	.370 max	1	K05Z-1000G2U-02C36-X
100W	.230	.350	.040	.040	.370 max	1.73	K05Z-1000G2T-01C36-X
100W	.230	.350	.060	.040	.370 max	1.73	K05Z-1000G2U-03C36-X

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

Chip Low Capacitance Power Resistors — ALN —

※Product on BeO substrate available , Please cantact us if you need

Configuration



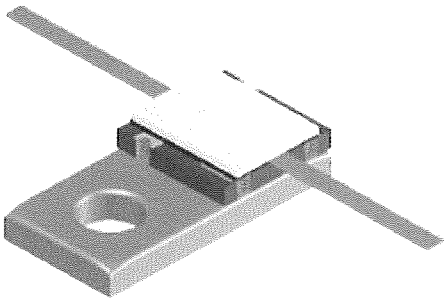
CW Power Rating	A	B	C	Capacitance at 1MHz	Part Number
20W	.200	.100	.040	.73	RM2010CT-1000GN-2T-02
50W	.230	.350	.040	1.34	RM2335CT-1000GN-2T-05
50W	.230	.350	.060	1	RM2335CT-1000-GN-2U-02
100W	.230	.350	.040	1.73	RM2335CT-1000GN-2T-01
100W	.230	.350	.060	1.73	RM2335CT-1000GN-2U-03

50 ohm and 100 ohm are standard values; other values available.
XXXX = Values in ohms (50R0 = 50 ohms; 1000 = 100 ohms)

YOKOHAMA DENSHI SEIKO Co., Ltd.

フランジ型パワー減衰器 10W to 250W

Flanged Power Attenuators - ALN



RoHS Compliance

Pb Free

特徴

・フランジ型(ネジ止め型)のパワー減衰器です。
・抵抗材料に厚膜を採用した高電力シリーズです。
・独自のThermal Designにより、極めて放熱性に優れた構造。
・ヒートシンクへ熱を伝える能力が高く、小型の形状で高電力での使用が可能です。(～250W)
・優れた高周波デザインにより、広帯域で使用いただけます。
・BeO基板による製品供給も可能です。お問い合わせ下さい。

Features

・Flange setscrew
・Thick Film material and technology
・Excellent thermal dispersion through proprietary thermal design.
・High capability in thermal conductivity out to PWB achieves high power use on miniaturized package. (・250W)
・Use in broader band by excellent RF design
・BeO substrate can be available on request.

Part Number

A	A	3000	–	40	–	3X
Device Type A: Flanged Attenuator	Substrate ALN: A	Values (dB) 3000 = 30dB 2000 = 20dB 0300 = 3dB		CW Power Rating		Established by factory

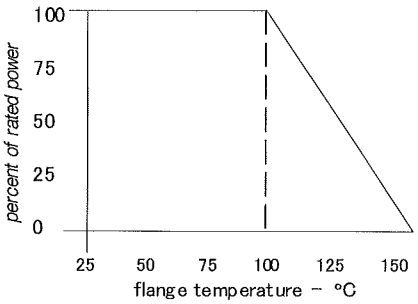
General Specifications

Resistive Element.....Proprietary Thick Film
Substrate .....BeO or ALN
Mounting Flange .....Copper Silver Plated
Leads .....Copper (.005" thick) Silver Plated

General Notes

- All power ratings assume an operating base plate temperature of 100 C
- All dimension are in inches.
- Resistance Tolerance: standard is +/- 5%; +/-2% available.
- XXXX = Value in decibels (2000=20dB; 3000=30dB; 0300=3dB)
- Mechanical Tolerance: +/-. 010, unless otherwise specified.
- Minimum lead length on all devices is .125 inches.
- Individual drawings available upon request.
- *Power ratings over 250 watts available upon request, contact us.*
- Other configurations available, custom requests welcome.

Derating Curve

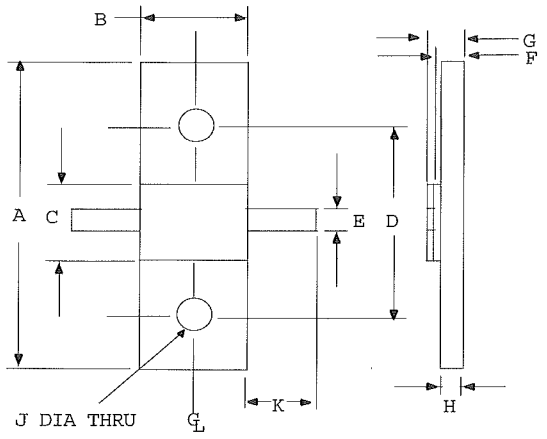


For operations outside the derating curve, please consult with one of our application engineers

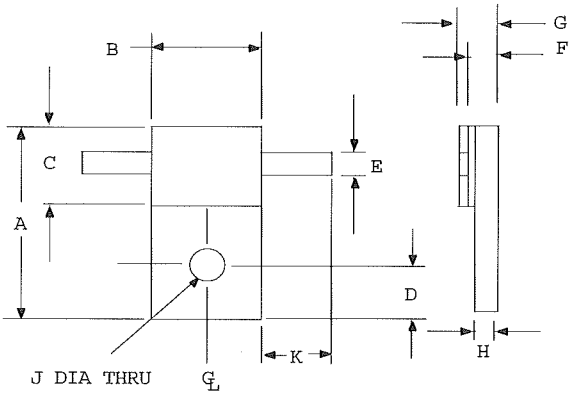
Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

Configuration

Configuration A



Configuration B



Flanged Power Attenuator — ALN —

※Product on BeO substrate available , Please cantact us if you need

CW Power Rating	CFG	(※)Frequency Range	Typical VSWR	Values dB	Dimensions in inch										Part Number
					A	B	C	D	E	F	G	H	J	K	
10W	B	DC-3.0GHz	1.30:1	1-30dB	.300	.200	.100	.100	.040	.105	.140 max	.062	.116	.370max	AAXXXX-10-3X
20W	B	DC-3.0 GHz	1.20:1	1-30dB	.515	.250	.250	.125	.048	.105	.140 max	.062	.116	.370 max	AAXXXX-20-3X
40W	B	DC-2.0 GHz	1.25:1	1 -5, &11-30dB	.515	.250	.250	.125	.048	.105	.140 max	.062	.116	.370 max	AAXXXX-40-3X
100W	A	DC-2.0GHz	1.20:1	1 -10dB	.800	.230	.350	.560 -.600	.040	.105	.140max	.062	.130	.370max	AAXXXX-100-9X
100W	A	DC-2.0 GHz	1.20:1	11 -30dB	.800	.230	.350	.560 -.600	.040	.105	.140 max	.062	.130	.370 max	AAXXXX-100-8X
150W	A	DC-2.0 GHz	1.20:1	1,3-15 &20dB	.800	.230	.350	.560 -.600	.040	.105	.140 max	.062	.130	.370 max	AAXXXX-150-1X
150W	A	DC-2.5 GHz	1.10:1	30dB	.800	.230	.350	.560 -.600	.040	.105	.140 max	.062	.130	.370 max	AA3000-150-5X
250W	A	DC-2.5 GHz	1.17:1	5dB	.975	.375	.375	.725	.040	.125	.170 max	.620	.130	.370 max	AA0500-250-10X
250W	A	DC-2.0 GHz	1.30:1	30dB	.975	.375	.375	.725	.040	.105	.140 max	.062	.130	.370 max	AA3000-250-6X

(※) Representative only, varies by frequency range and dB value.

Leaded Power Attenuators
Chip Power Attenuators

(1/2)

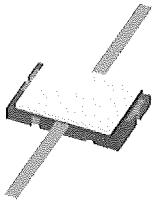
YOKOHAMA DENSHI SEIKO Co.,Ltd.

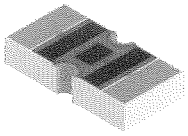
リード型パワー減衰器 | チップ型パワー減衰器

Leaded Power Attenuators - ALN
Chip Power Attenuators - ALN

RoHS Compliance

Pb Free





特徴

・リード型、および チップ型のパワー減衰器です。
(チップ型はリード(tab)を取り付けてご使用ください)
・抵抗材料に厚膜を採用した高電力シリーズです。
・独自のThermal Designにより、極めて放熱性に優れた構造。
・ヒートシンクへ直接取り付けることにより、フランジ型と比較し小さなスペースでのご使用が可能です。(～250W)
・優れた高周波デザインにより、広帯域で使用いただけます。

Features

・Chip (lead tab attachable type and leaded type high power attenuator.
・Thick Film material and technology
・Excellent thermal dispersion through proprietary thermal design.
・Space conscious by direct mounting use on to heat sink (compared to flange tyep) up to 250W.
・Use in broader band by excellent RF design
・BeO substrate can be available on request.

Part Number for Power Chip Attenuator

AVC 2335 CT - 3000 JN - 2T - 04

- AVC: Device Type — AB, AVC
- 2335: Chip Size in inch — Ex. 2010 =0.2 x 0.1
- CT: Termination material and Finish — CT : Tin over Nickel over Silver
- 3000: Values (Ω) (dB) — 3000 = 30dB, 2000 = 20dB, 0300 = 3dB
- JN: Code
- 2T: Substrate — 2Q: .015" ALN, 2S: .025" ALN, 2T: .040" ALN
- 04: Established by factory

Part Number for Power leaded Attenuator

H 05 Z - 3000 J 2T - 04 C 36 - X

- H: Device Type
- 05: Chip Size in inch — 04= .20x.10, 05= .23x.35, 06= .25x.25, 08= .37x.37
- Z: Code
- 3000: Values (Ω) — 50R0 = 50ohms, 1000 = 100ohms
- J: Code
- 2T: Substrate — 2T: .040" ALN
- 04: Code
- C 36: Lead (inch) — width: A: .025, C: .040; Length: 36: .36
- X: Established by factory

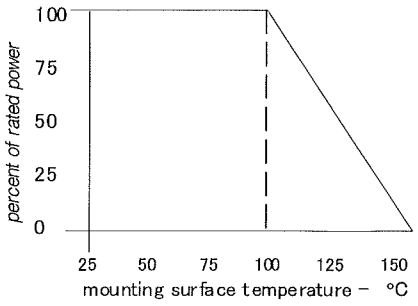
General Specifications

Resistive Element.....Proprietary Thick Film
Substrate .....BeO or ALN
Mounting Flange .....Copper Silver Plated
Leads .....Copper (.005" thick) Silver Plated
Contact Pads .....Silver
CT = ...Solderable Finish,
Matte Tin over Nickel over Silver

General Notes

- All power ratings assume an operating base plate temperature of 100 C
- All dimension are in inches.
- Resistance Tolerance: standard is +/- 5%; +/-2% available.
- XXXX = Value in decibels (2000=20dB; 3000=30dB; 0300=3dB)
- Mechanical Tolerance: +/-. 010, unless otherwise specified.
- Minimum lead length on all devices is .125 inches.
- Individual drawings available upon request.
- *Power ratings over 250 watts available upon request, contact us.*
- Other configurations available, custom requests welcome.

Derating Curve



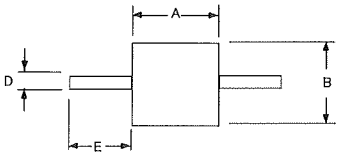
For operations outside the derating curve, please consult with one of our application engineers

Leaded Power Attenuator — ALN —

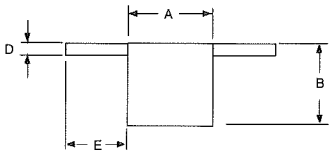
※Product on BeO substrate available , Please cantact us

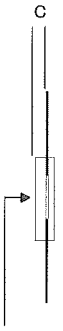
Configuration

Configuration A



Configuration B





mounting surface to heat sink

CW Power Rating	CFG	(※)Frequency Range	Values dB	Typical VSWR	Dimensions in inch					Part Number
					A	B	C	D	E	
10W	A	DC-3.0GHz	1-30 dB	1.30:1	.200	.100	.040	.040	0.370 max	H04Z-XXXXJ2T-00C36-X
20W	A	DC-3.0GHz	1-30dB	1.20:1	.250	.250	.040	.040	.370max	H06Z-XXXXJ2T-**XX*****C36-X
40W	A	DC-2.0GHz	1- 5,& 11-30 dB	1.25:1	.250	.250	.040	.040	.370max	H06Z-XXXXJ2T-**XX*****C36-X
100W	A	DC-2.0GHz	1-10 dB	1.20:1	.230	.350	.040	.040	.370max	H05Z-XXXXJ2T-23C36-X
100W	A	DC-2.0GHz	11-30 dB	1.20:1	.230	.350	.040	.040	.370max	H05Z-XXXXJ2T-04C36-X
150W	A	DC-2.0GHz	1-3 dB	1.20:1	.230	.350	.040	.040	.370max	H05Z-XXXXJ2T-04C36-X
150W	A	DC-2.0GHz	15 dB	1.20:1	.230	.350	.040	.040	.370 max	H05Z-1500J2T-10C36-X
150W	A	DC-2.0GHz	20 dB	1.20:1	.230	.350	.040	.040	.370 max	H05Z-2000J2T-03C36-X
150W	A	DC-2.5GHz	30 dB	1.20:1	.230	.350	.040	.040	.370 max	H05Z-3000J2T-09C36-X
150W	A	DC-3.0GHz	30 dB	1.20:1	.230	.350	.040	.040	.370 max	H05Z-3000J2T-17C36-X
250W	A	DC-2.0GHz	30 dB	1.30:1	.375	.375	.040	.040	.370 max	H08Z-3000J2T-02C36-X

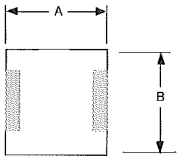
(※) Representative only, varies by frequency range and dB value.
*** XX = Design number assigned by Engineering.

Chip Power Attenuator — ALN

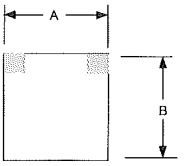
※Product on BeO substrate available , Please cantact us

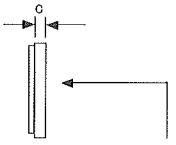
Configuration

Configuration A



Configuration B





mounting surface to heat sink

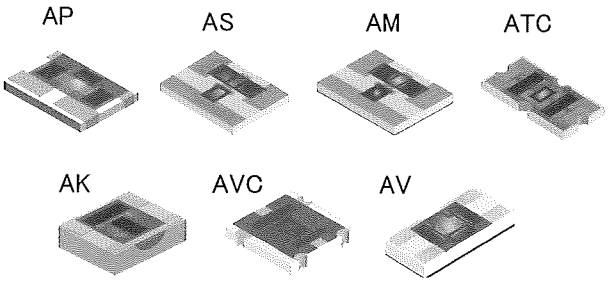
CW Power Rating	CFG	(※)Frequency Range	Typical VSWR	Values dB	Dimensions in inch			Part Number
					A	B	C	
10W	A	DC-3.0 GHz	1.30:1	1-30dB	.200	.100	.040	ABC2010CT - XXXXJN-2T
20W	A	DC-3.0 GHz	1.20:1	1-30 dB	.250	.250	.040	AVC2525CT -XXXXJN-2T-XX***
40W	A	DC-2.0 GHz	1.25:1	1-5 dB, 11-30 dB	.250	.250	.040	AVC2525CT -XXXXJN-2T-XX***
100W	A	DC-2.0 GHz	1.20:1	1-10dB	.230	.350	.040	AVC2335CT -XXXXJN-2T-23
100W	A	DC-2.0 GHz	1.20:1	11-30dB	.230	.350	.040	AVC2335CT -XXXXJN-2T-04
150W	A	DC-2.0 GHz	1.20:1	1-3dB	.230	.350	.040	AVC2335CT -XXXXJN-2T-04
150W	A	DC-2.0 GHz	1.20:1	15 dB	.230	.350	.040	AVC2335CT -1500JN-2T-10
150W	A	DC-2.0 GHz	1.20:1	20 dB	.230	.350	.040	AVC2335CT -2000JN-2T-03
150W	A	DC-2.5 GHz	1.20:1	30 dB	.230	.350	.040	AVC2335CT -3000JN-2T-09
150W	A	DC-3.0 GHz	1.20:1	30 dB	.230	.350	.040	AVC2335CT -3000JN-2T-17
150W	A	DC-2.0 GHz	1.06:1	30 dB	.375	.250	.040	AVC3725CT -3000JN-2T -07
150W	A	DC-2.0 GHz	1.30:1	30 dB	.375	.375	.040	AVC3737CT -3000JN-2T-02

* Representative only, varies by frequency range and dB value.
*** XX = Design number assigned by Engineering.

YOKOHAMA DENSHI SEIKO Co.,Ltd.

チップ減衰器 オプション

Chip Attenuator Options



※RoHS Compliance　※Pb Free

※Differs from Part Number, Please consult with one of our application engineers

特徴

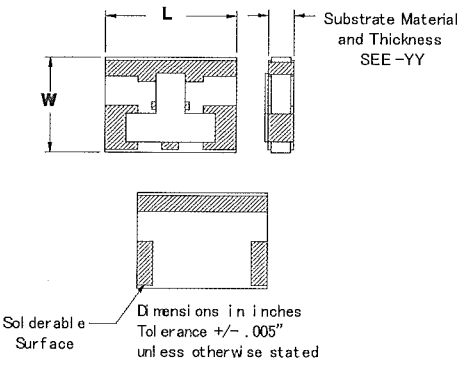
・厚膜抵抗を使用したチップタイプの減衰器です。
・チップ形状、基板材料、端子電極(メッキ)、ともに複数のカスタムオプションを用意しており、お客様のあらゆる実装環境に対応いたします。
・チップ形状ではFull Wrap around形状, Flip Chip形状など7種類のOPTIONを用意しています。
・アルミナ基板、窒化アルミ基板のほかに、BeO(酸化ベリリウム)基板での作成も可能です。
・優れた高周波デザインにより、広帯域で使用いただけます。
・金メッキやパラジウム銀による電極加工も可能です。

Features

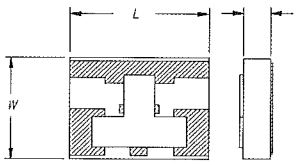
・Chip type attenuator through thick film technology
・Multiple options are available for Chip configuration, substrate material, termination(including plating) to meet customers various mounting conditions.
・Seven options are available for chip configuration (full wrap around, flip chip types and so on.)
・BeO substrate is available besides, alumina and AIN substrate on request.
・Au, AgPd metalization for Termination finish also available.
・Use in broader band by excellent RF design.

Configuration OPTIONS

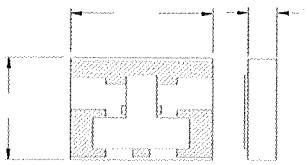
AP series － Full Wrap around －



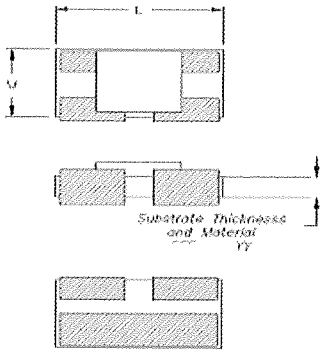
AM series － Flip Chip



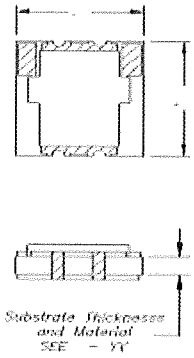
AS series － Flip Chip



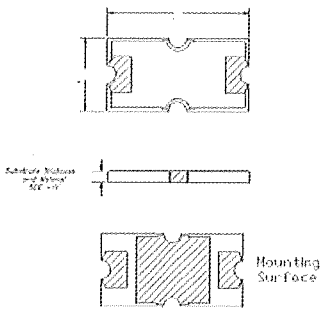
AT series － 3 sided Wrap －



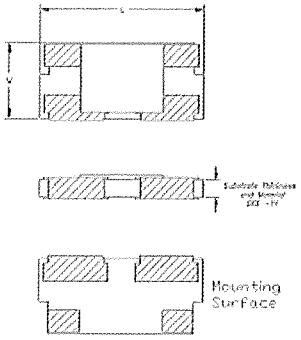
ATC series － 3 sided Wrap －



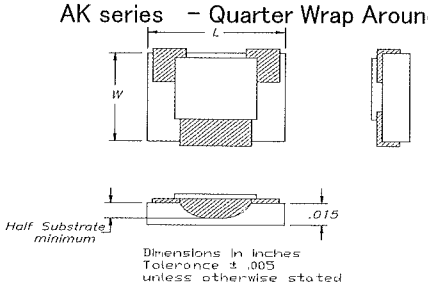
ATC Series



AT Series



AK series － Quarter Wrap Around －



Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp　e-mail: info@yds.co.jp

Part Number

AS 0706 CT - **** W N - **

- **Device Type**: AP, AV/AVC, AK, AT/ ATC, AM, AS
- **Chip Size in inch**: Ex. 706 =0.7 x 0.6
- **Termination material and Finish**: CT : Tin over Nickel over Silver
- **Values (dB)**: (dB) 3000 = 30dB, 2000 = 20dB, 0300 = 3dB
- **Tolerance**: F: +/-0.25dB, G: +/-0.50dB, J: +/-1.00dB, K: +/-1.50dB, L: +/-2.00dB
- **Normal Inspection**
- **Substrates**

Substrate Options

Code	Substrate	AP	AV'(C)	AK	AT'(C)	AM	AS
90	.010" Alumina	Yes	Yes		Yes	Yes	Yes
91	.015" Alumina	Yes	Yes	Yes	Yes	Yes	Yes
93	.025" Alumina	Yes	Yes		Yes		
94	.040" Alumina	Yes	Yes		Yes		
95	.010" BeO	Yes	Yes		Yes	Yes	Yes
96	.015" BeO	Yes	Yes		Yes	Yes	Yes
98	.025" BeO	Yes	Yes		Yes		
99	.040" BeO	Yes	Yes		Yes		
9F	.060" BeO		Yes		Yes		
2S	.025" ALN	Yes	Yes		Yes		Yes
2T	.040" ALN		Yes		Yes		

Metalization Schemes

Code	Termination Material / Finish	*Configurations						RoHs	Alumina	Solder	Epoxy	Wirebond
		AP	AV'(C)	AK	AT'(C)	AM	AS					
AS	Tin Lead over Platinum Palladium Gold	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
BA	Palladium Silver	Yes	Yes	—	Yes	Yes	Yes	Yes	Yes	No	Yes	No
CB	Tin Lead over Nickel over silver	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No
CT	Matte Tin over Nickel over silver	—	Yes	—	Yes	Yes	Yes	Yes	Yes	Yes	No	No
EA*	Gold II/O with Palladium Silver Ground	Yes	Yes	—	—	Yes	—	Yes	Yes	Yes(GND)	Yes	Yes (I/O)
FA*	Gold II/O with Palladium Gold Ground	Yes	Yes	—	—	Yes	—	Yes	Yes	Yes(GND)	Yes	Yes (I/O)
GA	Gold	Yes	Yes	—	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
HA*	Ground	—	Yes	—	—	Yes	—	Yes	No	Yes(GND)	Yes	Yes (I/O)
JA	Gold over Platinum Palladium Gold	—	Yes	—	—	Yes	—	Yes	No	No	Yes	Yes

*I/O = Input / Output Pads

*Not all options available in all packages

Part Number Example (reference)

Part Num ber (example)	Substrate	Frecuency	Attenuation	tolerance	Return Loss		Power
					In	Out	
ATC2010CT-0050JN-93	ALUMINA	DC to 3GHz	0.5dB	+1dB	20	20	5
ATC2010CT-0200JN-93	Alumina	DC to 3GHz	2dB	±1dB	20	20	5
ATC2010CT-0100JN-93	Alumina	DC to 3GHz	1	+1dB	20	20	5
ATC2010CT-0300JN-93	Alumina	DC to 3GHz	3	±1dB	20	20	5
ATC2010CT-0400JN-93	Alumina	DC to 3GHz	4	±1dB	20	20	5
ATC2010CT-1000JN-93	Alumina	DC to 3GHz	10	±1dB	20	20	5
ATC2010CT-2000JN-93	Alumina	DC to 3GHz	20	±1dB	20	20	5
ATC2010CT-3000JN-93	Alumina	DC to 2.5GHz	30	±1dB	13	13	5
ATC2525CT-1000JN-94	Alumina	DC to 2GHz	10dB	±1dB	19	19	15
AV0904GA-XXXXJN-90	Alumina	DC to 18GHz	0.25 to 30dB	±0.5dB	-	-	0.75

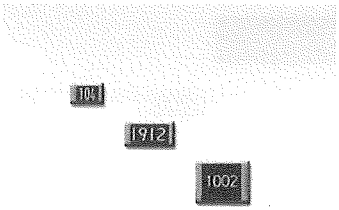
Thin Film
Chip Resistors (1)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

超精密級 薄膜チップ抵抗器

抵抗値許容差±0.05%, 抵抗温度係数±5ppm/℃ 低ノイズ

RN73 2X series
RR series



RoHS Compliance | Pb Free | Halogen Free

特徴

・薄膜スパッタリング製法によりセラッミク基板上に形成された金属膜を抵抗体として使用。
・純粋な金属で抵抗膜が形成されることから、極めて高性能。高信頼。
・電流ノイズが少なく、回路ノイズの減少に効果があります。
・抵抗値許容差±0.05%、抵抗温度係数 ±5ppm/℃まで可能です。
・薄膜の特徴で優れた性能を低価格で提供いたします。

Features

We offer absolute resistive tolerance up to ±0.05%, and a temperature coefficient of resistance up to ±5ppm/C.
Thin film performance with low cost.
Low noise. Helps reduce the noise from the circuits.
Easy to be mounted on the PC boards and highly reliable.

型名構成 Part Number

RR 1632 P – 1001 – D – (M) – (T5) ***

Series	Size	T.C.R (ppm/℃)	Resistance (※1)	Tolerance	4digits codes (※2)	Packaging /reel	3 digits codes (※3)
RR	2632	V: ±5	3digits (Ex) 102 = 1KΩ	B: ±0.1%	Only Added for RR1220 E-96	RR1632, RR2632 T1: 1Kpcs T5: 5Kpcs	Only Added for RR0816 E-96
	1632	N: ±10	4digits (Ex) 1021 = 1.02KΩ	D: ±0.5%		RR0306, RR0510 RR0816, RR1220 No code is given	
	1220	P: ±25		F: ±1.0%			
	0816	Q: ±50					
	0510	R: ±100					
	0306						

(※1)
3digits = RR0306, RR0510, RR0816, RR1220 E-24series
4ditgis = RR0306, RR0510, RR0816, RR1220 E-96series
RR1632, RR2632

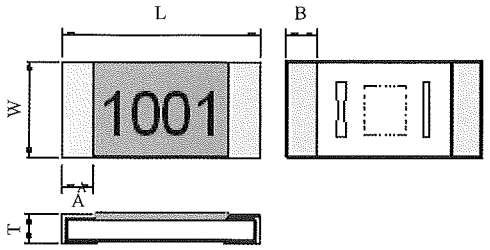
電気特性 Electrical characteristics

Series		RR0306		RR0510		RR0816		RR1220	
Rated Power (W)		1/20W		1/16W		1/16W		1/10W	
Size mm (inch)		0603 (0201)		1005 (0402)		1608 (0603)		2012 (0805)	
E-series		E-24		E-24 , E-96					
Resistance Range (Ω)		10 - 30	33 - 22K	10 - 91	100 - 100K	10 - 91	100 - 360k	10 - 91	100 - 1M
Tolerance (%)	±0.1%(B)	–	–	–	–	–	–	–	–
	±0.5%(D)	–	○	○	○	○	○	○	○
	±1.0%(F)	○	–	–	–	–	–	–	–
T.C.R. ppm/℃)	±5(V)	–	–	–	–	–	–	–	–
	±10(N)	–	–	–	–	–	–	–	–
	±25(P)	–	○	–	○	–	○	–	○
	±50(Q)	–	–	–	–	○	–	○	–
	±100(R)	○	–	○	–	–	–	–	–
Maximum Voltage		15V		25V		75V		100V	
Operating Temperature		-55℃ to 125℃							
Rated Ambient Temperature		+70℃							
Packaging		5,000pcs/reel		10,000pcs/reel		5,000pcs/reel		5,000pcs/reel	

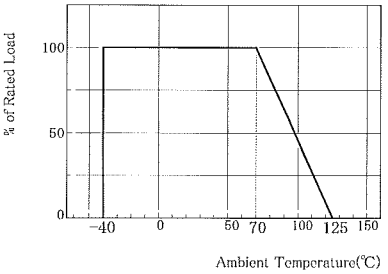
・Contact us if you do not find what you need (resistance value, tolerance, etc.) in our standard series resistors.
シリーズ外及び範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせください。

Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

外形寸法 Dimensions



Derating Curve



Dimension (mm)	RR0306	RR0510	RR0816	RR1220	RN73 2X	RR1632	RR2632
L	0.60±0.05	1.00±0.05	1.60±0.20	2.00±0.20	2.00±0.20	3.20±0.20	3.20±0.20
W	0.30±0.05	0.50±0.05	0.80±0.20	1.25±0.20	1.25±0.20	1.60±0.20	2.60±0.20
A	0.12±0.05	0.20±0.10	0.30±0.20	0.40±0.20	0.40±0.20	0.50±0.20	0.50±0.20
B	0.12±0.05	0.25±0.05	0.30±0.20	0.40±0.20	0.40±0.20	0.45±0.20	0.45±0.20
T	0.23±0.03	0.35±0.05	0.40±0.10	0.40±0.10	0.40±0.10	0.40±0.10	0.40±0.10
(Size in inch)	0201	0402	0603	0805	0805	1206	1210

型名構成 Part Number

RN73 V 2X – 1001 – D – (T5)

Series	T.C.R	Size in mm	Resistance	Tolerance	Packaging / reel
RN73	(ppm/℃) V: ±5 N: ±10	2X: 2012	4digits (Ex) 1021 = 1.02KΩ	B: ±0.1% D: ±0.5%	RN73 T1: 1,000pcs T5: 5,000pcs

電気特性 Electrical characteristics

Series		RN73 2X			RR1632			RR2632		
Rated Power (W)		1/10W			1/8W			1/4W		
Size mm (inch)		2012 (0805)			3216 (1206)			3216 (1210)		
E-series		E-24 , E-96								
Resistance Range (Ω)		10 - 47	51 - 1M	100 - 200k	10 - 47	51 - 1M	100 - 200k	10 - 47	51 - 1M	100 - 200k
Tolerance (%)	±0.1%(B)	–	–	○	–	–	○	–	–	○
	±0.5%(D)	○	○	–	○	○	–	○	○	–
	±1.0%(F)	–	–	–	–	–	–	–	–	–
TCR ppm/℃)	±5(V)	–	–	○	–	–	○	–	–	○
	±10(N)	–	–	○	–	–	○	–	–	○
	±25(P)	–	○	○	–	○	○	–	○	○
	±50(Q)	○	–	–	○	–	–	○	–	–
	±100(R)	–	–	–	–	–	–	–	–	–
Maximum Voltage		150V			150V			200V		
Operating Temperature		−55℃ to +125℃								
Rated Ambient Temperature		+70℃								
Packaging		5,000pcs/reel			5,000pcs/reel			5,000pcs/reel		

・Contact us if you do not find what you need (resistance value, tolerance, etc.) in our standard series resistors.

シリーズ外及び範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせください。
6.4mm x 3.2mm 0.5～1W定格品もご相談ください。

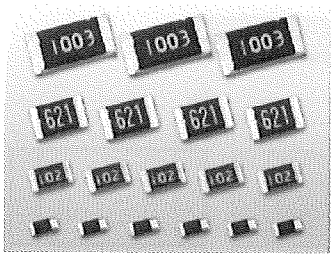
Thin Film
Chip Resistors (Ultra-precision) (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

超精密級 薄膜チップ抵抗器(高信頼)

AEC-Q200 Compliance

※信頼性試験10,000時間後 変化率±0.1%



抵抗値許容参±0.02%, 抵抗温度係数±5ppm/℃

RG series

RoHS Compliance | Pb Free | Halogen Free

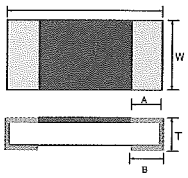
特徴

無機質の保護膜を採用し、薄膜技術を結集した究極のチップ抵抗器。
10,000時間の信頼性試験で抵抗値変化±0.1%を実現する高信頼性のチップ抵抗器です。
抵抗値許容差±0.02%、抵抗温度係数±5ppm/℃を実現しています。
耐サージ性に優れ、高信頼性を要求される自動車関連機器、工業計測、工業計器から民生品まであらゆる電子機器に最適です。

Features

Ultimate chip resistors: the result of all of our thin film technology expertise including inorganic passivation. Resistance drift: less than +/-0.1% after 10000 hour accelerated reliability test. +/-0.02% of resistance tolerance and +/-5ppm/° C of temperature coefficient of resistance. Excellent tolerance to power surges
Applications: Any applications that require precision resistors such as utomotive electronics, industrial test and measurement equipment, and

外形尺寸 Dimensions



Dimension (mm)	RG1005	RG1608	RG2012	RG3216
L	1.00±0.05	1.6±0.2	2.0±0.2	3.2±0.2
W	0.5±0.05	0.8±0.2	1.25±0.2	1.6±0.2
A	0.2±0.10	0.3±0.2	0.4±0.2	0.5±0.25
B	0.25±0.05	0.3±0.2	0.4±0.2	0.5±0.2
T	0.35±0.05	0.4±0.1	0.4±0.1	0.4±0.1
(Size in inch)	0402	0603	0805	1206

電気特性 Electrical characteristics

Series		RG1005				RG1608					
Rated*1 power	High power application	1/8W(OLD:RGH1005-2B)				1/6W(OLD:RGH1608-2C)					
	Regular power application	1/16W				1/10W					
	High precision	1/32W				1/16W					
Size	mm (inch)	1005 (0402)				1608 (0603)					
E-series		E-24, E-96									
Resistance range(Ω)		10 - 46.4	47 - 97.6	100 - 2.94k	3k - 100k	10 - 46.4	47 - 97.6	100 - 4.99k	5.1k - 270k	274 - 332k	340 - 360k
Resistance tolerance (%)	±0.02%(P)	–	–	O	–	–	–	O	–	–	–
	±0.05%(W)	–	O	O	O	–	O	O	O	–	–
	±0.1%(B)	–	O	O	O	–	O	O	O	O	–
	±0.25%(C)	–	O	O	O	–	O	O	O	O	–
	±0.5%(D)	O	O	O	O	O	O	O	O	O	O
TCR (ppm/°C)	±5(V)	–	–	O	–	–	–	O	–	–	–
	±10(N)	–	O	O	O	–	O	O	O	–	–
	±25(P)	–	O	O	O	–	O	O	O	O	O
	±50(Q)	–	–	–	–	O	–	–	–	–	–
	±100(R)	O	–	–	–	–	–	–	–	–	–
Maximum voltage		25V				75V					
Operating temperature		-55°C to 155°C				-55°C to 155°C					
Packaging	5,000pcs	CodeT5				CodeT5					
	10,000pcs	CodeT10				–					

Series		RG2012					RG3216			
Rated*1 power	High power application	1/4W					–			
	Regular power application	1/8W					1/4W			
	High precision	1/10W					1/8W			
Size	mm (inch)	2012 (0805)					3216 (1206)			
E-series		E-24, E-96								
Resistance range(Ω)		10 - 46.4	47 - 97.6	100 - 10k	10.2k - 475k	487k - 1M	10 - 46.4	47 - 97.6	100 - 33.2k	34k - 1M
Resistance tolerance (%)	±0.02%(P)	–	–	O	–	–	–	–	O	–
	±0.05%(W)	–	O	O	O	–	–	O	O	O
	±0.1%(B)	–	O	O	O	O	–	O	O	O
	±0.25%(C)	–	O	O	O	O	–	O	O	O
	±0.5%(D)	O	O	O	O	O	O	O	O	O
TCR (ppm/°C)	±5(V)	–	–	O	–	–	–	–	O	–
	±10(N)	–	O	O	O	–	–	O	O	O
	±25(P)	–	O	O	O	O	–	O	O	O
	±50(Q)	O	–	–	–	–	O	–	–	–
Maximum voltage		100V					150V			
Operating temperature		-55°C to +155°C					-55°C to +155°C			
Packaging	5,000pcs	CodeT5					CodeT5			

*1Depending on customer's reliability requirements, power rating betweenhigh power and regular power can be selected.
・Contact us for RG3225 with 1/2W rated power.

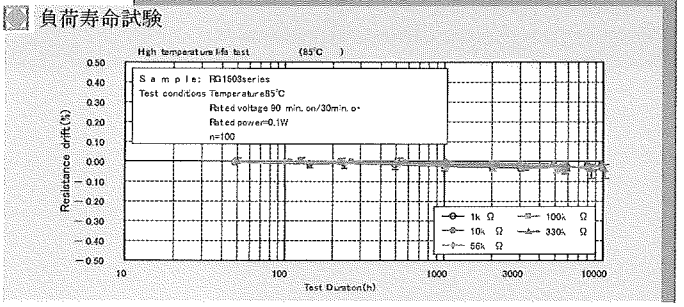
Reliability characteristics

Item	Test Method	Specification: drift limits for each power rating						(Typical)
		Low		Regular		High		
		≦47Ω	≧47Ω	≦47Ω	≧47Ω	≦47Ω	≧47Ω	
Short time Overload	Applied voltage :2.5Xrated voltage or 2 X Maximum operating voltage which ever is less test duration: 5 seconds	±0.1%	±0.05%	±0.1%	±0.05%	—	±0.1%	±(0.01%)
Load Life	Test Temperature : 85℃ Applied voltage: rated voltage Test period : repeat 1000 cycle as follow : 90 min./30 min. off cycled	±0.25%	±0.1%	±0.5%	±0.25%	—	±0.5%	±(0.01%)
Moisture load life	Test condition : 85℃ 85% RH Applied power: 1/10 rated Power Test period : repeat 1000 cycle as follow : 90 min./30 min. off cycled	±0.25%	±0.1%	±0.5%	±0.25%	—	±0.5%	±(0.05%)
Temperature Cycle	Repeat 1000 cycle as follow : ? 55℃(30min.)/RoomTemp.(2min.)/+125℃(30min.)/RoomTemp.(2min.)	±0.25%	±0.1%	±0.25%	±0.1%	—	±0.1%	±(0.01%)
High temperature Exposure	+155℃for 1000 hours with no load	±0.25%	±0.1%	±0.25%	±0.1%	—	±0.1%	±(0.01%)

10,000 hour reliability test data 信頼性試験

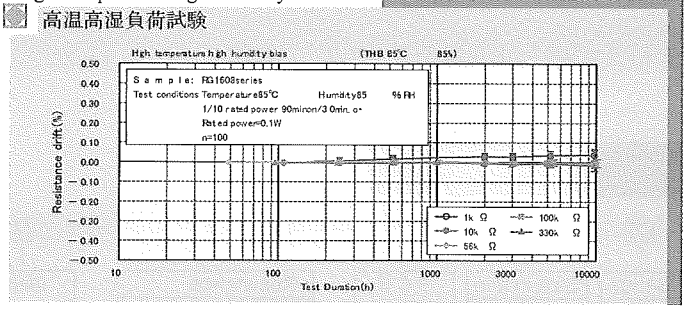
Life test

負荷寿命試験



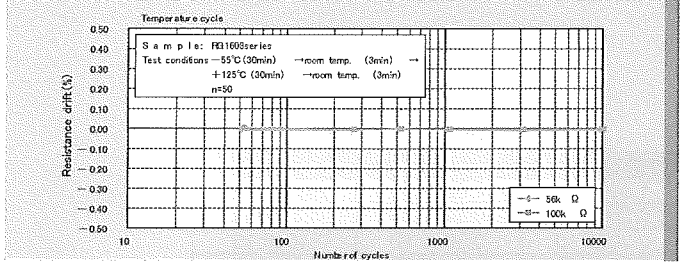
High Temperature high humidity bias test

高温高湿負荷試験



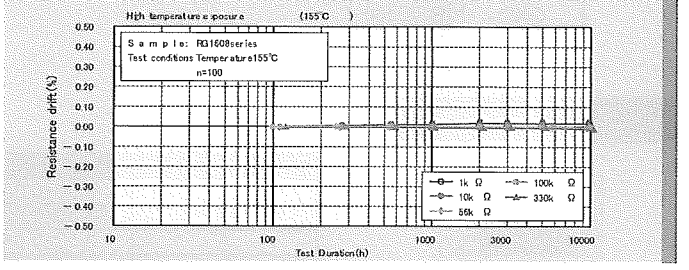
Temperature cycle test

温度サイクル試験

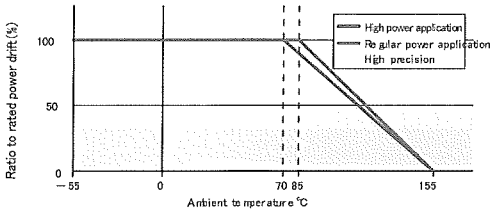


High temperature exposure test

高温放置試験

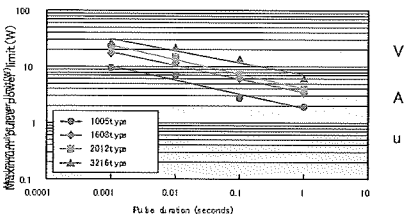


Power derating characteristics



Power derating curve

Maximum pulse power limit



試験方法
評価基板に搭載した供試抵抗にパルス電圧1回印加し抵抗値の変化率を測定する。
これを抵抗値変化率が±0.5%を超えるまで印加電圧を順に上げ抵抗値変化率が±0.5%以内である上限の電力をパルス限界電力とする。

Test procedure

oltage pulse is applied to the test samples mounted on the test board.fter each pulse, resistance drift is measured. Pulse voltage is increased ntil the drift exceeds +/-0.5%. The power at that voltage is defined as the maximum pulse power.

型名構成 Part Number

RG — 1608 — N — 102 (※1) — B — (T5) (※1)

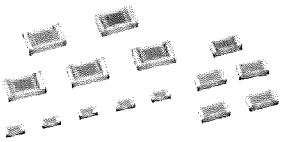
Series	Size in mm	T.C.R (ppm/℃)	Resistance	Tolerance	Taping Reel
RG	1005 1608 2012 3216	V: ±5 N: ±10 P: ±25 Q: ±50 R: ±100	E-24: 3digits (Ex) 102 = 1KΩ E-96: 4digits (Ex) 1021 = 1.02KΩ RG3216: all 4digits (Ex) 1021 = 1.02KΩ	P: ±0.02% W: ±0.05% B: ±0.1% C: ±0.2% D: ±0.5%	T5: 5,000pcs T10: 10,000pcs

Thin film trimmable chip resistors

YOKOHAMA DENSHI SEIKO Co.,Ltd.

薄膜トリマブルチップ抵抗器

RT series



RoHS Compliance | Pb Free | Halogen Free

特徴

独自のトリミングメカニズム(特許1921853)により高いトリミング精度と
トリミング後の高信頼性、およびトリミング時間の短縮を実現
0.6×0.3mmのトリマブルチップ抵抗器も用意しています。

自動車関連機器等の高信頼性を要求するセンサー回路
携帯電話のPAモジュール
マイク等強振動でも変化しては困る機器などに最適です。

Features

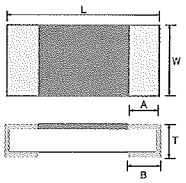
Patented triming method (patent# 1921853) allows high trimming accuracy, excellent reliability after trimming and short trimming time
Small sizes down to 0.6mm x 0.3mm available
*Applications
-Sensor circuits that require high precision such as atuomotive electonics
-PA modules in mobile phones
-Devices that require strong vibration tolerance such as micrphones

型名構成 Part Number

RT 0816 P – 102 – M

Series	Size in mm	T.C.R (ppm/℃)	Resistance	Initial Tolerance
RT	1220	P: ±25	3digits	M: ±20%
	0816	Q: ±50	(Ex) 102 = 1KΩ	
	0510	R: ±100		
	0603			

外形寸法 Dimensions



Dimension (mm)	RT0603	RT0510	RT0816	RT1220
L	0.60±0.05	1.00±0.07	1.60±0.20	2.00±0.20
W	0.30±0.03	0.50±0.07	0.80±0.20	1.25±0.20
A	0.12±0.05	0.20±0.10	0.30±0.20	0.40±0.20
B	0.15±0.05	0.25±0.20	0.30±0.20	0.40±0.20
T	0.25±0.03	0.35±0.05	0.40±0.10	0.40±0.10
(Size in inch)	0201	0402	0603	0805

電気特性 Electrical characteristics

Series		RT0603			RT0510			RT0816					RT1220							
Power		1/20W			1/16W			1/16W					1/10W							
Size in mm (inch)		0603 (0201)			0510 (0402)			0816 (0603)					1220 (0805)							
Initial resistance value(Ω)		150	330	1.5k	100	270	1.5k	100	330	1.0k	3.3k	10k	33	100	330	1.0k	3.3k	10k	33k	100k
Targeted resistance Value (Ω)		1.0k	1.9k	10k	820	2.1k	10k	2.7k	8.0k	8.8k	37k	40k	4.7k	8.2k	15k	15k	100k	120k	120k	220k
Initial value tolerance(%)		±20%(M)			±20%(M)			±20%(M)					±20%(M)							
TCR (ppm/℃)	±25(P)	○	○	–	○	○	–	○	○	○	–	–	–	○	○	○	–	–	–	–
	±50(Q)	–	–	–	–	–	–	–	–	–	–		○	–	–	–	–	–	–	–
	±100(R)	–	–	○	–	–	○	–	–	–	○	○	–	–	–	–	○	○	○	○
Maximum voltage		15V			25V			75V					100V							
Operating Temperature		-55℃ to 125℃			-55℃ to 125℃			-55℃ to 125℃					-55℃ to 125℃							
Packaging	5,000pcs	–			–			○					○							
	10,000pcs	–			○			–					–							
	15,000pcs	○			–			–					–							

Thin Film
Chip Network Resistors (1)

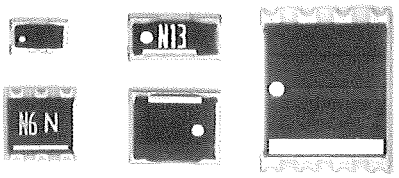
YOKOHAMA DENSHI SEIKO Co., Ltd.

超精密級 薄膜チップネットワーク抵抗器

※凹型金メッキ電極、 高精度・高信頼品

多素子間相対精度: 相対許容差±0.05%, 相対温度係数±5ppm/℃

RA series



RoHS Compliance | Pb Free | Halogen Free

特徴

・同一パッケージ内の抵抗素子は同一セラミック基板上に同時に形成されて いるため、初期的な特性の相対(抵抗値、TCR)及び、経時変化性能や環境に対する耐性の相対が優れており、初期から長期に渡り相対値が確保されます。
・端子は特殊製法により銅-Ni-金(表面層)の構造をもち、一般的にバレルメッキ法などで問題になるメッキ厚バラツキによる端子部のトラブルがなく極めて高い信頼性があります。
・表面層の金は極めて薄く金の混入によるはんだの変質による問題はなく、錫などにくらべ保管性に優れ、取付後の端子間トラブルもありません。

Features

All thin film resistors are formed on the same ceramic substrate at the same time and demonstrate extraordinary matching characteristics: not only initial resistance value and TCR matching but excellent matching maintained with environmental fluctuations and aging offering very long-term matching performance. Proprietary technology forms highly reliable Cu-Ni-Au (surface) terminals that are free of metal thickness variation often observed with some methods such as barrel plating. Surface gold is very thin and does not lead to serious issues caused by melting gold

電気特性 Electrical characteristics

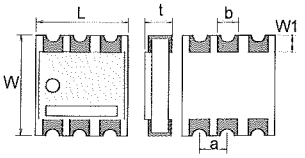
Type	RA1632	RA2020	RA2525	RA4556
Rated Power	30mW/element	42mW/element		50mW/element
Size in mm (inch)	3216 (1206)	2020 (0808)	2525 (1010)	5645 (2218)
Number of Terminal	8	6	6	8
Number of Resistor	4	3	3	4
Resistance Range	50 -100kΩ	100 - 120kΩ	100 - 180kΩ	50 - 500kΩ
Absolute torelance	±0.1%(B) , ±0.5%(D)			
Tracking Tolerance	±0.1%(B) , ±0.2%(C)			
Absolute TCR	±25ppm/℃			
Tracking TCR	±5ppm/℃(V) , ±10ppm/℃(N)			
Operating Temperature	-55℃ to +125℃			
Rated ambient temperature	+70℃			

Combination of different resistance values or different circuitry possible.
Resistance matching +/-0.05% possible. Please contact us

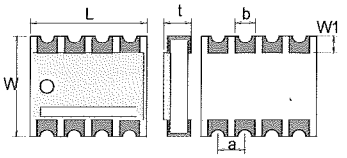
異種抵抗値、異種回路も製作できます。相対抵抗値許容差±0.05%も可能です。お気軽にお問い合わせください。

外形寸法 Dimensions

RA2020 , RA2525



RA1632 , RA4556



Type	RA1632	RA2020	RA2525	RA4556
L	3.2±0.1	2.0±0.1	2.54±0.1	5.6±0.2
W	1.6±0.1	2.0±0.1	2.54±0.1	4.5±0.2
t	0.4±0.1	0.4±0.1	0.4±0.1	0.5±0.2
b	0.6±0.2	0.36+0.1/-0.05	0.43+0.1/-0.05	1.0±0.1
a	0.8±0.1	0.72±0.1	0.86±0.25	1.4±0.1
W1	0.4±0.2	0.4±0.1	0.4±0.1	0.8±0.2
(Size in inch)	(1206)	(0808)	(1010)	(2218)

型名構成 Part Number

抵抗値および組み合わせ、素子数、チップサイズ、回路、その他のカスタム対応もご相談ください

RA 1632 – 10K – B – V B – T1

Series	Size in mm	Resistance or Part Number	Absolute Tolerance	Tracking T.C.R	Tracking Tolerance	Packaging
RA	1632	Ex. 10K	B: ±0.1%	V: ±5 ppm/℃	B : ±0.1%	T1: 1,000pcs/ reel
	2020	=R1=R2,,.Rx=10KΩ	D: ±0.5%	N: ±10ppm/℃	C : ±0.2%	T5: 5,000pcs/ reel
	2525					
	4556					

Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

Thin Film
Chip Network Resistors (1)

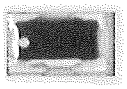
YOKOHAMA DENSHI SEIKO Co.,Ltd.

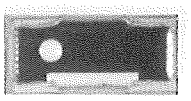
超精密級 薄膜チップネットワーク抵抗器

コノ字電極、多素子、多連タイプ

多素子間相対性能: ±0.05%, ±5ppm/℃

RN series
RN W series





RoHS Compliance | Pb Free | Halogen Free

特徴

・薄膜チップネットワーク抵抗器のすべての抵抗体は 同一のセラミック基板上に同時に形成され、極めて優れた 相対性能を有します。
・相対性能は初期特性の相対(抵抗値、TCR)は当然ですが、経時変化性能や環境に対する耐性の相対も優れており、長期に渡り相対値が確保されます。
・優れた薄膜の性能により低ノイズで高信頼です。また コノ字電極を有し実装が容易で高信頼です。
・電力的に余裕が必要な場合、高抵抗値の組み合わせが必要な場合、複雑な回路を1パッケージにしたい場合などのために少し大型の

Features

All thin film resistors are formed on the same ceramic substrate at the same time and demonstrates extraordinarily matching characteristics (initial characteristics and long term characteristics)
Thin film design offers low noise and high reliability. Wrap around terminals offer easy and reliable mounting on PC boards.

Offering a slightly larger network package for higher power requirements, combinations of higher resistance values, and packaging complicated network circuits. (RN2632, RN4556series)

型名構成 Part Number

抵抗値および組み合わせ、素子数、チップサイズ、回路、その他のカスタム対応もご相談ください

RN — 1632 — A — 10K — B — V — B — T1

Series	Size in mm	Circuit	Resistance or Part Number	Absolute Tolerance	Tracking T.C.R	Tracking Tolerance	Packaging
RN	0816 1220 1632 1632W 2632 4556	A,B,C,D or F	Ex. 10K =R1=R2,,.Rx=10KΩ	B: ±0.1% D: ±0.5%	V: ±5 ppm/℃ N: ±10ppm/℃	C : ±0.2% D: ±0.5%	T1: 1Kpcs/ reel T5: 5Kpcs/reel

電気特性 Electrical characteristics

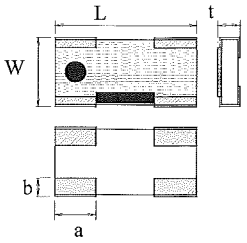
Series		RN0816	RN1220	RN1632			RN1632W			
Circuit		A , B	A , B	A , B	C	D	A	B	C	F
Rated Power	/ Element	32mW	50mW	64mW	42mW	42mW	25mW	42mW	25mW	カスタム
	/ Package	64mW	100mW	125mW	125mW	125mW	125mW	125mW	125mW	—
Size in mm		1608	2012	3216			3216			
(inch)		(0603)	(0805)	(1206)			(1206)			
Terminal Number		4	4	4	4	4	6	6	6	6
Resistor Number		2	2	2	3	3	5	3	5	カスタム
Resistance Range		50Ω to 15KΩ	50Ω to 100KΩ	50Ω to 200KΩ	50Ω to 110KΩ	50Ω to 110KΩ	150Ω to 33KΩ	50Ω to 110KΩ	150Ω to 33KΩ	カスタム カスタム
Absolute Tolerance %	±0.1(B)	○	○	○	○	○	○	○	○	○
	±0.2(C)	○	○	○	○	○	○	○	○	○
	±0.5(D)	○	○	○	○	○	○	○	○	○
Tracking Tolerance %	±0.1(B)	○	○	○	○	○	○	○	○	○
	±0.2(C)	○	○	○	○	○	○	○	○	○
	±0.5(D)	○	○	○	○	○	○	○	○	○
Absolute T.C.R ppm/℃	±25	○	○	○	○	○	○	○	○	○
Tracking T.C.R ppm/℃	±5(V)	○	○	○	○	○	○	○	○	○
	±10(N)	○	○	○	○	○	○	○	○	○
Operating Temperature		-55 to +125℃			-55 to +125℃		-55 to +125℃			
Rated Ambient Temperature		+70℃			+70℃		+70℃			

Combination of different resistance values or different circuitry possibl
Resistance matching +/-0.05% possible. Please contact us
範囲外の抵抗値、また相対抵抗値許容差±0.05%も製作可能です。ご相談ください

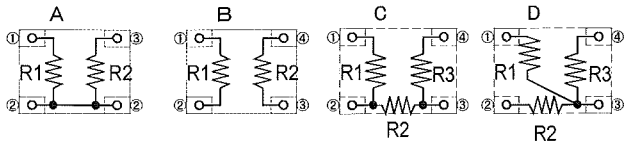
YOKOHAMA DENSHI SEIKO Co., Ltd.

外形寸法 Dimensions & 等価回路 Circuit Diagram

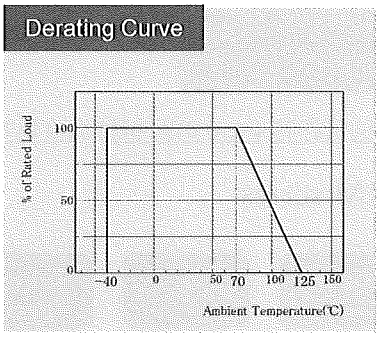
■RN0816, 1220, 1632, 2632



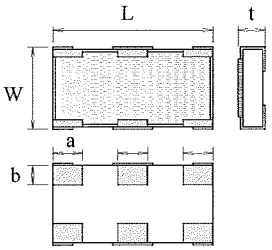
Dimension (mm)	RN1608	RN1220	RN1632	RN2632
L	1.6±0.1	2.0±0.1	3.2±0.2	3.2±0.2
W	0.8±0.1	1.25±0.1	1.6±0.2	2.6±0.2
a	0.4±0.15	0.6±0.2	1.0±0.2	1.0±0.2
b	0.2±0.15	0.35±0.2	0.4±0.2	0.4±0.2
t	0.4±0.1	0.4±0.1	0.4±0.2	0.4±0.2
(Size in inch)	0603	0805	1206	1210



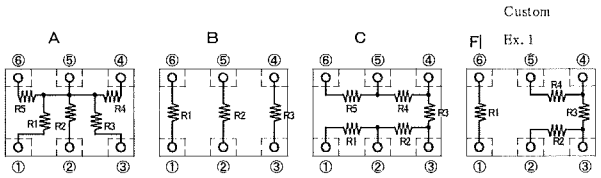
Derating Curve



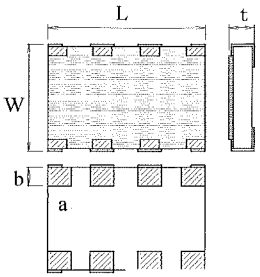
■RN1632W



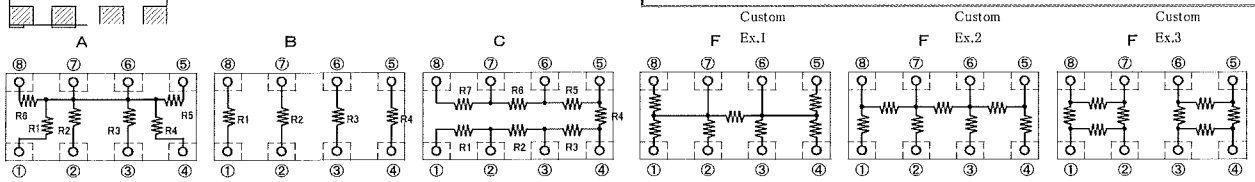
Dimension (mm)	RN1632W
L	3.2±0.2
W	1.6±0.2
a	0.6±0.2
b	0.4±0.2
t	0.4±0.2



■RN4556



Dimension (mm)	RN4556
L	5.6±0.2
W	4.5±0.2
a	0.6±0.2
b	0.4±0.2
t	0.4±0.2



電気特性 Electrical characteristics

Series		RN2632				RN4556			
Circuit		A	B	C	D	A	B	C	F
Rated Power	/ Element	64mW	64mW	42mW	42mW	25mW	42mW	25mW	custom
	/ Package	250mW				500mW			
Size in mm		3226				5645			
(inch)		(1210)				(2218)			
Terminal Number		4	4	4	4	8	8	8	8
Resistor Number		2	2	3	3	6	4	7	custom
Resistance Range		Total R-value / package = 50Ω to 1MΩ Max				Total R-value / package = 50Ω to 2MΩ Max			
Absolute Tolerance %	±0.1(B)	○	○	○	○	○	○	○	○
	±0.2(C)	○	○	○	○	○	○	○	○
	±0.5(D)	○	○	○	○	○	○	○	○
Tracking Tolerance %	±0.1(B)	○	○	○	○	○	○	○	○
	±0.2(C)	○	○	○	○	○	○	○	○
	±0.5(D)	○	○	○	○	○	○	○	○
Absolute T.C.R ppm/℃	±25	○	○	○	○	○	○	○	○
Tracking T.C.R ppm/℃	±5(V)	○	○	○	○	○	○	○	○
	±10(N)	○	○	○	○	○	○	○	○
Operating Temperature		-55 to +125℃				-55 to +125℃			
Rated Ambient Temperature		+70℃				+70℃			

Combination of different resistance values or different circuitry possibl
Resistance matching +/-0.05% possible. Please contact us
範囲外の抵抗値、また相対抵抗値許容差±0.05%も製作可能です。ご相談ください

Thin Film
Chip Network Resistors (1/2)

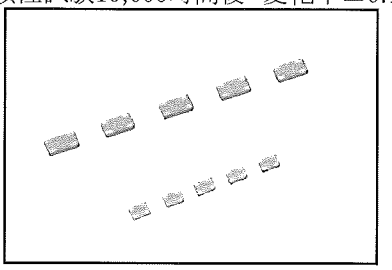
YOKOHAMA DENSHI SEIKO Co.,Ltd.

超精密級 薄膜チップネットワーク抵抗器（高信頼）

AEC-Q200 Compliance

※信頼性試験10,000時間後　変化率±0.1%以下

抵抗値許容差±0.01%, 抵抗温度係数±1ppm/℃



RM series

RoHS Compliance　Pb Free　Halogen Free

特徴

相対抵抗値許容差±0.01%、相対抵抗温度係数±1ppm/℃の超高精度を実現。
85℃/85%RH 高温高湿負荷　10,000時間で抵抗値変化量±0.1%以下、155℃耐熱性　10,000時間で抵抗値変化量±0.1%以下の高信頼を実現
相対抵抗比やTCRを生かした分圧回路や差動AMP回路のゲイン設定に最適です。

Features

Ultra accuracy : Tracking resistance tolerance +/-0.01%, Tracking TCR+/-1ppm/℃.Ultra reliability : 10,000hours of 85℃/85RH test or 10,000 hours of 155℃ high temperature exposure test causes less than +/-0.1% resistance drift
Applications that require a precise tracking resistance ratio such as voltage dividers, and gain-setting circuits for amplifires

型名構成 Part Number

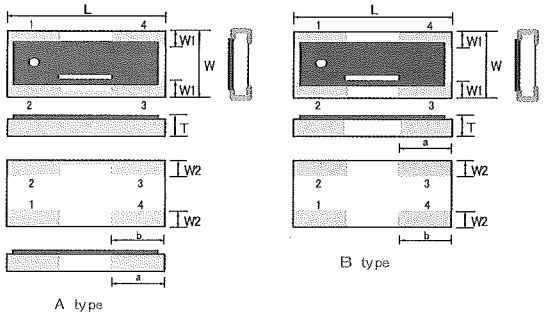
抵抗値および組み合わせ、素子数、チップサイズ、回路、その他のカスタム対応もご相談ください

RM 1632 A – ＊＊＊/＊＊＊ – P W X L 10

Series	Size in mm	Circuit	Resistance	Absolute TCR	Absolute Tolerance	Tracking TCR	Tracking Tolerance	Taping reel
RM	2012 3216	A,B,C,D or F	(R1 / R2)	N: ±10ppm/℃ P: ±25ppm/℃	W: ±0.05% B: ±0.1% D: ±0.5%	X: ±1ppm/℃ V: ±2ppm/℃ W: ±5ppm/℃	L: ±0.01% P: ±0.02% W: ±0.05%	10: 1,000pcs 50: 5,000pcs

※other configurations
& other circuits availabe

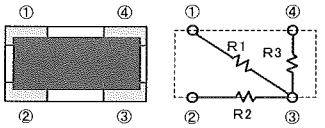
外形寸法 Dimensions



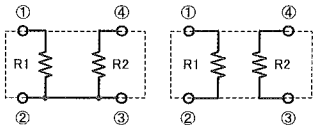
Dimension (mm)	RM2012	RM3216
L	2.00±0.20	3.20±0.20
W	1.25±0.20	1.60±0.20
W1	0.40±0.20	0.40±0.25
W2	0.35±0.20	0.40±0.20
a	0.50±0.20	1.00±0.25
b	0.60±0.20	1.00±0.20
T	0.40±0.10	0.40±0.10
(Size in inch)	0805	1206

等価回路 Circuit Diagram

2012 / 3216 Size

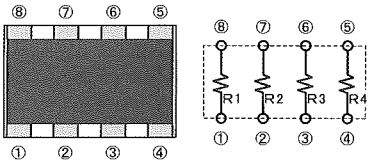


Outside appearance　Circuit diagram: 3 element type



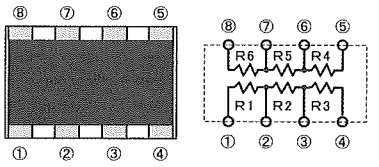
Circuit diagram: A type　Circuit diagram: B type

3216Size 4 element type
(array,network with different resistance values)



Outside appearance　Circuit diagram

3216Size 6 element type



Outside appearance　Circuit diagram

電気特性 Electrical characteristics

Series		RM2012		RM3216	
Rated Power	High Power Application	0.05W/element、0.1WPackage		0.063W/element、0.125WPackage	
Size	mm (inch)	2012 (0805)		3216 (1206)	
Resistance Range (Ω)		100 to <300	300 to 100kΩ	100 to <300	300 to 330kΩ
Absolute TCR (ppm/℃)	±10 (N)	—	○	—	○
	±25 (P)	○	○	○	○
Absolute Tolerance (%)	±0.05 (W)	—	○	—	○
	±0.1 (B)	○	○	○	○
	±0.5 (D)	○	○	○	○
Tracking TCR (ppm/℃)	±1 (X)	Resistance Ratio = 1		Resistance Ratio = 1	
	±2 (W)	1<Resistance Ratio≦3		1<Resistance Ratio≦3	
	±5 (V)	Resistance Ratio>3		Resistance Ratio>3	
Tracking Tolerance (%)	±0.01 (L)	Resistance Ratio =1		Resistance Ratio =1	
	±0.02 (P)	Resistance Ratio≦10		Resistance Ratio≦10	
	±0.05 (W)	Resistance Ratio≦100		Resistance Ratio≦100	
Maximum voltage		25V		50V	
Operating Temperature		-55℃ to 155℃		-55℃ to 155℃	
Packaging	1,000pcs	Code10		Code10	
	5,000pcs	Code50		Code50	

* Tracking resistance tolerance is defind as the ratio of the actual R2 / R1 against the specified R2 / R1 as expressed :

$$\left(\frac{\text{actual R2 / R1}}{\text{specified R2 / R1}} - 1\right) \times 100$$

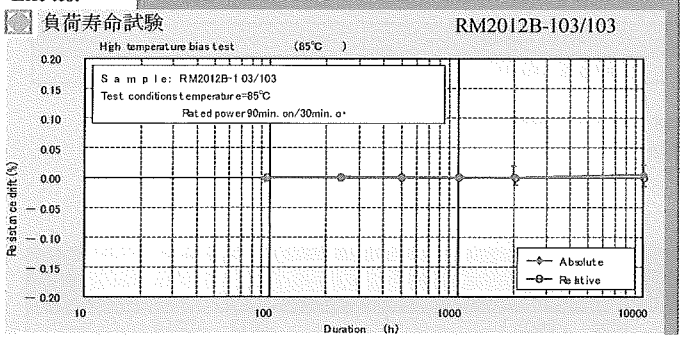
Standard resistance value pairings

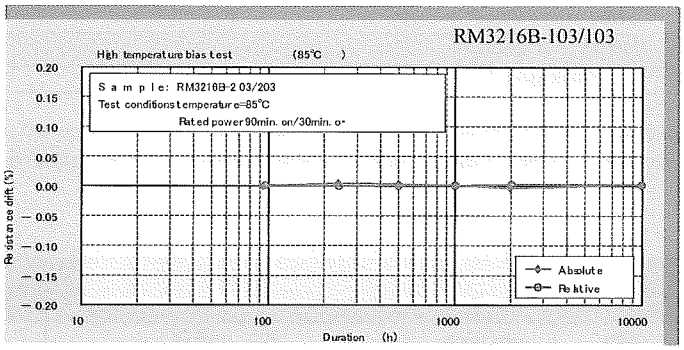
Ration	R1(Ω)	R2(Ω)	Ratio	R1(Ω)	R2(Ω)	Ratio	R1(Ω)	R2(Ω)	Ratio	R1(Ω)	R2(Ω)	Ratio	R1(Ω)	R2(Ω)	Ratio	R1(Ω)	R2(Ω)
1:1	1k	1k	1:3	1k	3k	1:5	1k	5k	1:9	1k	9k	1:20	1k	20k	1:50	1K	50k
	10k	10k		10k	30k		2k	10k		10k	90k		2k	40k		2K	100k
	100k	100k		100k	300k		10k	50k	1:10	1k	10k		5k	100k	1:100	1K	100k
1:2	1k	2k	1:4	1k	4k	1:6	1k	6k		2k	20k	1:25	1k	25k		2K	200k
	10k	20k		10k	40k		10k	60k		10k	100k		2k	50k			
	100k	200k															

10,000 hour reliability test data 信頼性試験

Life test

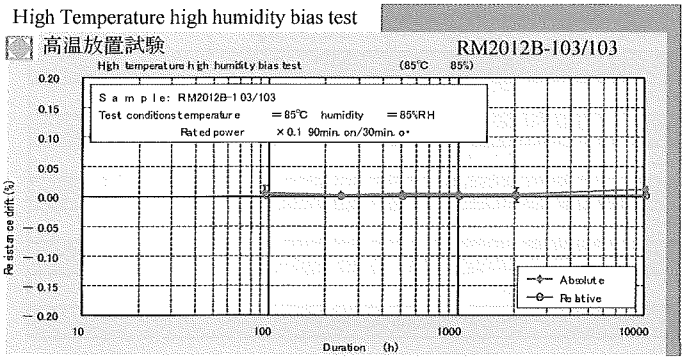
負荷寿命試験

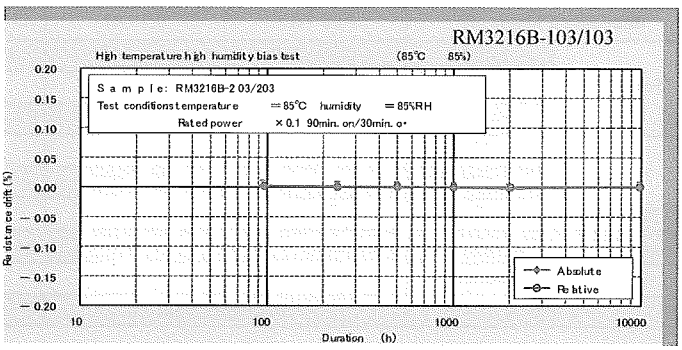




High Temperature high humidity bias test

高温放置試験





Thin Film
Low Resistance Valure Chip Resistors (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

電流検出低抵抗（短辺電極タイプ）

RL series

RoHS Compliance | Pb Free | Halogen Free

特徴

・セラミックベース上に抵抗体を皮膜で形成した優れた放熱性能によりホットスポットできにくく、また皮膜構造により大きな過負荷により溶断するなど安全性に優れます。
・抵抗皮膜には耐腐食性合金を使用しており、環境に対する耐性が高く信頼性に優れます。
・リアクタンス値が小さく、瞬間的な負荷またはパルス状の負荷に対し波形変形やインピーダンス変化が起こりにくくなっています。
・一般チップ抵抗器と同等の電極形状及び構造を持ち、寸法精度に優れることから実装性が良好で高信頼です。

Features

This film resistor on a ceramic base provides excellent heat dissipation with less tendency to create hot spots and offers safety by becoming completely open with overload.
The resistive material is an anti-corrosion metal alloy offering strong environmental protection and high reliability
Small reactance decreases the risk of causing impedance change or wave form distortion against rush loads or pulse loads.
The same electrode structure as regular chip resistors and offers size consistency which allows easy and reliable mounting on PC boards.

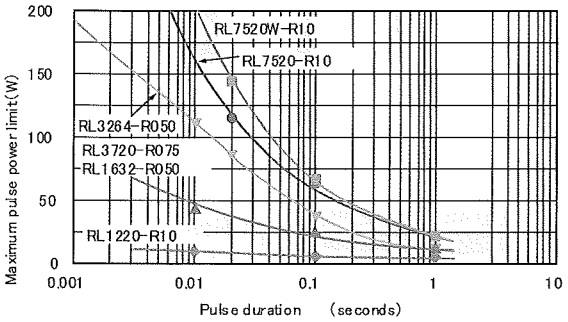
電気特性 Electrical characteristics

Series		RL1632	RL2550	RL3264
Rated Power (W)		1/2W	3/4W	1W
Size	mm (inch)	3216 (1206)	2550 (2010)	3264 (2512)
E-series		E-24	E-24	E-24
Resistance Range (Ω)		0.01 - 4.7	0.01 - 4.7	0.01 - 4.7
Tolerance (%)	±0.5(D)	0.5 - 4.7	0.5 - 4.7	0.5 - 4.7
	±1.0(F)	0.027 - 4.7	0.027 - 4.7	0.027 - 4.7
	±2.0(G)	0.010 - 4.7	0.010 - 4.7	0.010 - 4.7
T.C.R. ppm/°C)	0 to +100'(R)	0.056 - 4.7	0.056 - 4.7	0.056 - 4.7
	0 to +200(S)	0.033 - 4.7	0.033 - 4.7	0.033 - 4.7
	0 to +350(T)	0.018 - 4.7	0.018 - 4.7	0.018 - 4.7
	0 to +500(T)	0.010 - 4.7	0.010 - 4.7	0.010 - 4.7
Maximum Voltage		$\sqrt{(P \cdot R)}$		
Operating Temperature		-55 to 125°C		
Packaging		5,000pcs / reel		

contacu us if you do not find what you need (resistance value, tolerance, etd.,) in our standard resistors
シリーズ外及び範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせください。

Series		RL0510		RL0816		RL1220	
Rated Power (W)		1/8W	1/6W	1/4W	1/5W	1/4W	1/3W
Size	mm (inch)	1005 (0402)		1608 (0603)		2012 (0805)	
E-series		E-24		E-24		E-24	
Resistance Range (Ω)		0.05 - 0.1	0.1 - 47	0.01 - 0.1	0.1 - 68	0.01 - 0.091	0.1 - 100
Tolerance (%)	±1.0(F)	0.05 - 0.1	0.1 - 47	0.01 - 0.1	0.1 - 68	0.01 - 0.091	0.1 - 100
	±2.0(G)	0.05 - 0.1	0.1 - 47	0.01 - 0.1	7.5 - 68	0.01 - 0.091	0.1 - 100
	±5.0(J)	—	5.1 - 47	0.01 - 0.1	7.5 - 68	0.01 - 0.091	0.1 - 100
T.C.R. ppm/°C)	0 to +100'(R)	—	—	—	0.1 - 6.8	—	0.1 - 10
	0 to +200(S)	---	0.1 - 47	0.01 - 0.1	0.1 - 68	0.043 - 0.091	0.1 - 100
	0 to +350(T)	0.05 - 0.1	—	0.01 - 0.1	—	0.01 - 0.091	—
Maximum Voltage		$\sqrt{(P \cdot R)}$					
Operating Temperature		-55 to +125°C					
Packaging		10,000pcs/reel		5,000pcs/reel			

Resistance to power pulse



試験方法

供試抵抗器にパルス電圧を1回印加し、抵抗値の変化率を測定する。
抵抗値変化率が±0.5%を超えるまで印加電圧を上げ、抵抗値変化率が±0.5%以下である上限の電力(印加電圧)をパルス限界電力とする。

Test procedure

Voltage pulse is applied to the test samples mounted on the test board.
After each pulse, resistance drift is measured. Pulse voltage s increased until the drift exceeds +/-0.5%. The power at that voltage is defined as the maximum pulse power.

型名構成 Part Number

RL — 1632 — R — R010: 10mΩ — J — T1

Series
RL

Size in mm
0510
0816
1220
1632
2550
3264

T.C.R
0～+100(R)
0～+200(S)
0～+350(T)※
0～+500(T)※

※RL1632, 2550,3264

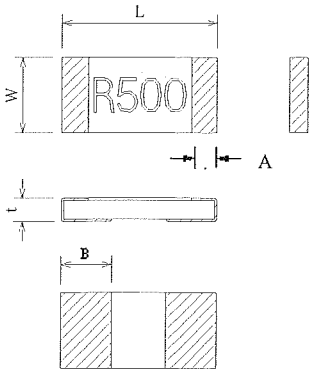
Resistance
R010: 10mΩ

Tolerance
D: ±0.5%
F: ±1%
G: ±2%
J: ±5%

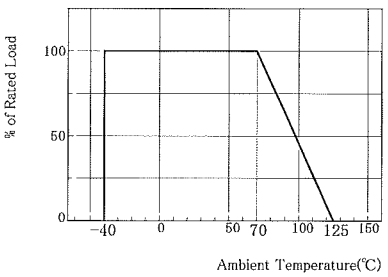
Packaging
T1: 1Kpcs / reel
T5: 5Kpcs / reel

外形寸法 Dimensions

Dimension (mm)	RL0510		RL0816		RL1220		RL1632	RL3264
	R≦0.2Ω	R>0.2Ω	R≦0.082Ω	R>0.091Ω	R≦0.068Ω	R>0.075Ω		
L	1.00±0.05		1.60±0.20		2.00±0.20		3.2±0.20	6.4±0.20
W	0.50±0.05		0.80±0.20		1.25±0.20		1.6±0.20	3.2±0.20
A	0.15±0.10		0.20±0.15		0.40±0.20		---	---
B	0.25±0.10	0.15±0.10	0.25±0.20	0.20±0.15	0.40±0.20		1.00±0.15	2.00±0.15
T	0.35+0.15/? 0.10	0.35±0.10	0.45+0.15/? 0.10	0.45±0.10	0.5±0.20	0.4±0.10	0.5±0.15	0.5±0.15
(Size in inch)	0402		0603		0805		1206	2512



Derating Curve



Thin Film Low Resistance Value Chip Resistors －Long Terminal (1/2)

YOKOHAMA DENSHI SEIKO Co.,Ltd.

電流検出低抵抗（長辺電極タイプ）

PRL series
RL-W series

RoHS Compliance | Pb Free | Halogen Free

特徴

・優れた放熱性により、小型化を実現しています。(当社比較で同一電力品を最大25%まで小型化)
・セラミック基板上に抵抗体を皮膜で形成している構造からホットスポットができにくく、また過負荷時には溶断するなど安全性に優れています。
・熱起電力が小さく、電流検出の精度に影響しにくくなっています。
・リアクタンス値が小さく、瞬間的な負荷またはパルス状の負荷に対し波形変形やインピーダンス変化が起こりにくくなっています。

Features

Exceptional heat dissipation - smaller size for the rated power (maximum 25% smaller than our own conventional products)
This film resistor on a ceramic base provides excellent heat dissipation with less tendency to create hot spots and offers safety by becoming completely open with overload.
Low thermal emf allows accurate measurement of the current.
Small reactance decreases the risk of causing impedance change or wave form distortion against rush loads or pulse loads.

型名構成 Part Number

PRL 1632 — R — R010: 10mΩ — J — T1

Series	Size in mm
PRL	0816 1632 1220 3264
RL	3720W 7520W

T.C.R
0～+50(Q)
0～+100(R)
0～+200(S)
0～+350(T)
0～+420(T)※
0～+800(T)※

※RL3720W, RL7520W

Resistance
R010: 10mΩ

Tolerance
D: ±0.5%
F: ±1%
G: ±2%
J: ±5%

Packaging
T1: 1,000pcs/ reel※
T5: 5,000pcs/ reel

※PRL series only

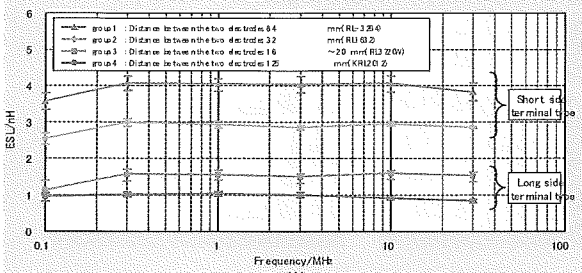
電気特性 Electrical characteristics

Series		PRL0816	PRL1220	PRL1632	PRL3264	RL3720W	RL7520W
Rated Power (W)		1/3W	2/3W	1W	2W	1W	2W
Size in mm		1608	2012	3216	6432	3720	7520
(inch)		0603	0805	1206	2512	1508	3008
E-series		E-24 (under 10mΩ : 1mΩ step)				E-24 (under 10mΩ: 1mΩstep)	
Resistance Range (Ω)		0.01 ～ 0.1	0.007 - 0.1	0.005 - 0.1	0.003 - 0.1	0.001 - 0.091	0.001 - 0.47
Tolerance (%)	±5.0%(J)	—	—	—	0003 ～ 0004	---	0.001 - 0.009
	±2.0%(G)	---	0007 ～ 0009	0005 ～ 0009	0005 ～ 0009	0.001 - 0.091	0.001 - 0.47
	±1.0%(F)	0.01 ～ 0.1	0.01 ～ 0.1	0.01 ～ 0.1	0.01 ～ 0.1	0.001 - 0.091	0.001 - 0.47
	±0.5%(D)	0.047 ～ 0.1	0.047 ～ 0.1	0.047 ～ 0.1	0.047 ～ 0.1	—	—
T.C,R (ppm/°C)	0 to +800(T)	—	—	—	—	—	0.001 - 0.004
	0 to +420(T)	—	—	—	—	—	0.005 - 0.009
	0 to +350	0.001 ～ 0.015	0.007 ～ 0.009	0.005 ～ 0.009	0.003 ～ 0.009	0.001 - 0.091	0.01 - 0.009
	0 to +200	to 0.027	to 0.018	to 0.018	to 0.018	0.005 - 0.091	0.1 - 0.47
	0 to +100	to 0.068	to 0.051	to 0.051	to 0.051	—	0.01 - 0.47
	0 to +50	to 0.1	to 0.1	to 0.1	to 0.1	—	0.1 - 0.47
Maximum Voltage		√(P・R)				√(P・R)	
Operating Temperature		-55°C to 125°C				-55°C to 125°C	
Rated Ambient Temperature		+70°C				+70°C	+30°C
Packaging		5000pcs / reel				4,000pcs / reel	

contacu us if you do not find what you need (resistance value, tolerance, etd.,) in our standard resistors
シリーズ外及び範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせください。

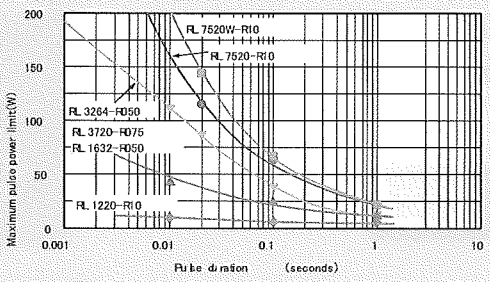
Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

ESL



※Low ESL controls the noise.

Resistance to Power Pulse



試験方法

供試抵抗器にパルス電圧を1回印加し、抵抗値の変化率を測定する。
抵抗値変化率が±0.5%を超えるまで印加電圧を上げ、抵抗値変化率が
±0.5%以下である上限の電力(印加電圧)を

Test procedure

oltage pulse is applied to the test samples mounted on the test board.
ter each pulse, resistance drift measured. Pulse voltage is creased until the drift exceeds -0.5%. The power at that voltage defined as the maximum pulse power.

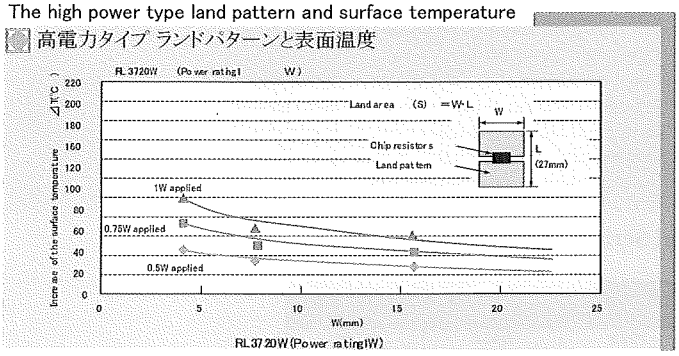
Surface Temperature

高電力低抵抗チップ抵抗器は、抵抗体で発熱する熱を基板ランド(銅配線)より効率よく放熱できる設計になっております。抵抗器の温度上昇は基板ランドに依存します。

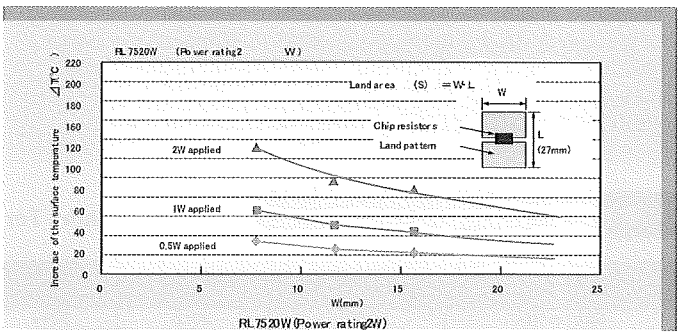
These high-power low resistance chip resistors are designed to dissipate heat efficiently through the land patterns on circuit boards. The actual temperature of the surface of the resistor is dependent upon the dimensions and the shape of the land patterns.

The high power type land pattern and surface temperature

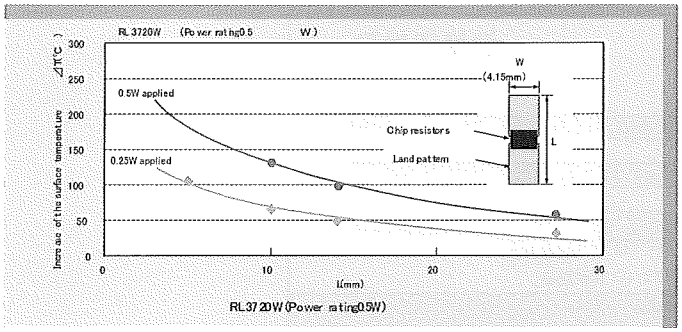
高電力タイプ ランドパターンと表面温度



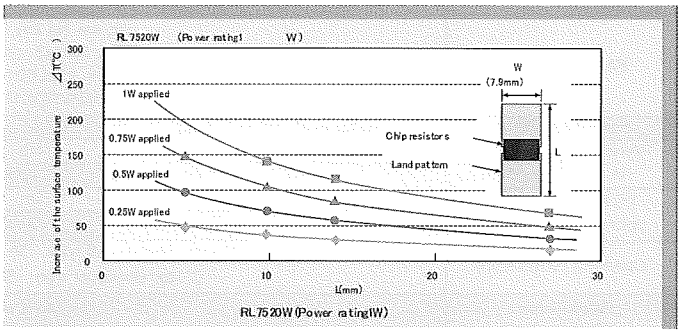
RL3720W (Power rating1W)



RL7520W (Power rating2W)

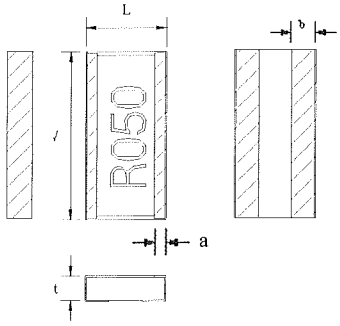


RL3720W (Power rating0.5W)



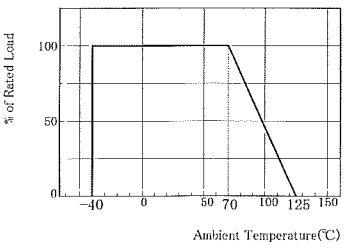
RL7520W (Power rating1W)

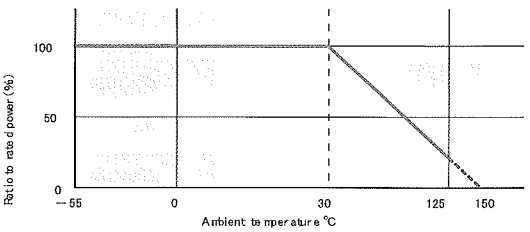
外形寸法 Dimensions



Dimension (mm)	PRL0816	PRL1220	PRL1632	PRL3264	RL3720W	RL7520W
L	0.8±0.2	1.25±0.2	1.6±0.2	3.2±0.2	2.00±0.20	2.00±0.20
W	1.6±0.2	2.0±0.2	3.2±0.2	6.4±0.2	3.75±0.30	7.50±0.30
a	—	—	—	—	0.40±0.20	0.40±0.20
b	0.2±0.1	0.35±0.15	0.45±0.15	0.9±0.15	0.40±0.20	0.40±0.20
t	0.4±0.1	0.5±0.1	0.5±0.1	0.5±0.1	0.5±0.2	0.5±0.2
(Size in inch)	0603	0805	1206	2512	1508	3008

Derating Curve





RL7520W

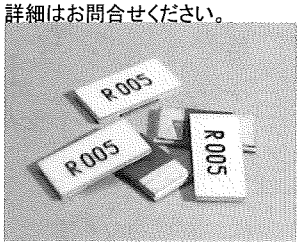
Metal Foil
Low Resistance Value Resistors　Flip Chip (1/2)

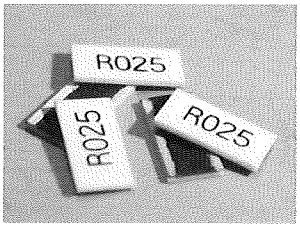
YOKOHAMA DENSHI SEIKO Co.,Ltd.

金属箔低抵抗　SMD 0.2W to 10W

AEC-Q200 Compliance

※極めて温度サイクル(半田クラック)耐性に優れたシリーズです。
詳細はお問合せください。





KRL －Short Terminal Series

RoHS Compliance　Pb Free　Halogen Free

特徴

- 端面電極のないフリップチップ構造で実装面積を極少化。
- 極めて放熱性に優れ、抵抗体表面温度を低く抑える構造。
- 金属箔特有の低TCR、低熱起電力
- 定格負荷印加時でも精度が保たれます。(定格電力係数が小さい)
- 熱起電力が小さく、電流検出の精度に影響しにくい低抵抗です。
- 低インダクタンスでインダクタンス値のばらつきが小さいため、電圧検出時の補正が容易で高精度化が可能。また瞬間的な負荷またはパルス状の負荷に対し波形変形やインピーダンス変化が起こりにくくなっています。
- RoHs指令及びハロゲンフリーに対応。

※極めて温度サイクル(半田クラック)耐性に優れたシリーズです。

Features

- Flip-chip structure (no side edge electrode)minimizes mounting area.
- 0510 size of metal foil chip register available.
- Good heat dissipation, high power despite the small size. Temperature on the surfaces is relatively low.
- Low TCR, unique characteristics of metal foil. Low-heat EMF and high precision when rated power being applied. (Low power rating factor)
- Low-heat EMF makes little influence on the accuracy of current sensing.
- Low inductance and small variability makes adjustment of current sensing and high fidelity easier. Strong agaist short and pulse power allowing almost no waveform or impedance change.
- RoHs compliance and Halogen free.

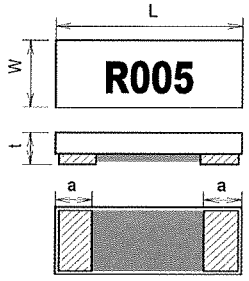
電気特性 Electrical characteristics

KRL －Short Terminal Series

Series		KRL0816	KRL1220	KRL1632	KRL2550	KRL3264	KRL50110
Rated Power		0.3W	0.5W	0.75W	1.0W	2.0W	5.0W
Size in mm		1608	2012	3216	5025	6432	11050
(inch)		(0603)	(0805)	(1206)	(2010)	(2512)	(4320)
Resistance Range		5m, 6m, 7m, 8m, 9m, 10m - 500mΩ (※1) 20m, 25m, 50m, 200m,500m Ω				5m, 6m, 7m, 8m, 9m, 10m － 500mΩ (※1) 20m, 25m, 50m, 200m,1000m Ω	
Resistance Series		E-12	E-12	E-12	E-6	E-12	E-6
Tolerance %	±2 (G)	5m - 9mΩ					
	±1 (F)	10mΩ ≦					
T.C.R ppm/°C	±100	5m - 9mΩ					
	±50	10mΩ ≦					
Operating Temperature		M: Low-Thermo EMF type; -55 to +155°C (M: 低熱起電力品) C: High Heatproof type; -55 to +175°C (C: 高耐熱品)					
Rated Ambient Temperature		C : 120°C at terminals M : 100°C at terminals					
Packaging / reel		1,000pcs, or 5,000pcs					1,000pcs

Contact us if you do not find w hat you need (resistance value, tolerance , etc....) in our standard resistors
(※1) 1220series, under 10mΩ developing, please contact us.
(※2) 2550, 3264 series, 1mΩ≦ developing, please contact us.
シリーズ外 及び 範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合せください。
(※1) 1220シリーズ、10mΩ未満を開発しております。ご相談ください。
(※2) 2550, 3264 シリーズ 1mΩ≦を開発しております。ご相談ください。

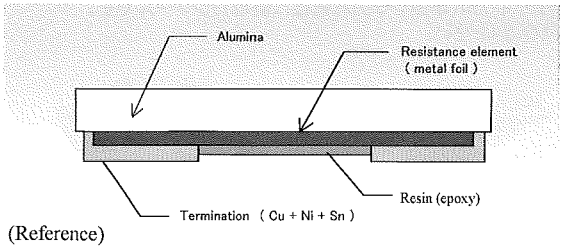
外形寸法 Dimensions



Dimension(mm)	L	W	t		(Size in inch)
KRL0816	1.6 ±0.2	0.8 ±0.2	0.5 ±0.2	0.7 ±0.2 10～18mΩ 0.5 ±0.2 29～39mΩ 0.3 ±0.2 43～500mΩ	0603
KRL1220	2.0 ±0.2	1.25 ±0.2	0.5 ±0.2	0.4 ±0.2 5～500mΩ	0805
KRL1632	3.2 ±0.2	1.6 ±0.2	0.5 ±0.2	1.1 ±0.2 (5～8mΩ) 0.5 ±0.2 (9mΩ～500mΩ)	1206
KRL2550	5.0 ±0.2	2.5 ±0.2	0.5 ±0.2	1.4 ±0.2 (5～8mΩ) 0.6 ±0.2 (9mΩ～500mΩ)	2010
KRL3264	6.3 ±0.2	3.1 ±0.2	0.5 ±0.2	1.9 ±0.2 (5～8mΩ) 1.0 ±0.2 (9mΩ～1Ω)	2512
KRL50110	11.0 ±0.2	5.0 ±0.2	0.65 ±0.2	3.6 ±0.2 (5～7mΩ) 2.36 ±0.2 (8mΩ～1Ω)	4320

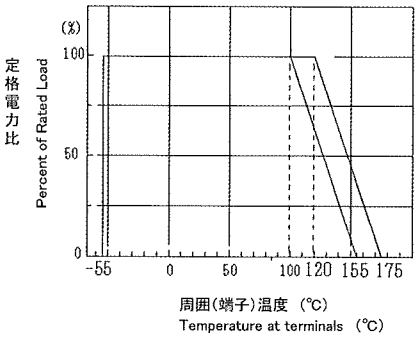
Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp　e-mail: info@yds.co.jp

構造図 Structure



(Reference)

Derating Curve



型名構成 Part Number

KRL — 1632 — M — R010 — F — T1

Series	Size in mm	Operating Temperature	Resistance	Tolerance	Packaging
	Short Teminal 16 32	C: High Heatproof Type	R010: 10mΩ	F: ±1%	T1: 1,000pcs / reel
	Long Terminal 32 16	M: Low Thermo EMS Type		G: ±2%	T5: 5,000pcs / reel
				J: ±5%	
				K: ±10%	

電気特性 Electrical characteristics

KRL —Long Terminal Series

Series		KRL1608	KRL2012	KRL3216	KRL5025	KRL6432	KRL7638	KRL9045	KRL11050	KRL15075
Rated Power		0.5W	1.0W	1.5W	2.0W	3.0W	4.0W	5.0W	6.0W	10.0W
Size in mm (inch)		1608 (0603)	2012 (0805)	3216 (1206)	5025 (2010)	6432 (2512)	7638 (3015)	9045 (3518)	11050 (4320)	15075 (5930)
Resistance Range		5m,6m,7m,8m,9mΩ 10m - 100mΩ 20m,25m,50m, 200m, 500mΩ	1m,2m,3m,4m,5m,6m,7m,8m,9mΩ 10m - 500mΩ 20m,25m,50m,200m ,500mΩ							0.5 - 500mΩ (※1)
Resistance Series		E-6								
Tolerance (%)	±10 (K)	—	—							0.5mΩ (※1)
	±5 (J)	—	1mΩ							
	±2 (G)	5 - 9mΩ	2mΩ							
	±1 (F)	10mΩ ≦	3mΩ≦ (1mΩ ≦(※2))							
T.C.R (ppm/℃)	±150	—	1mΩ							0.5m - 2mΩ(※1)
	±100	5 - 9mΩ	2mΩ							3 - 9mΩ
	±50	10mΩ ≦	3mΩ ≦ (1mΩ ≦(※2))							10mΩ ≦
Operating Temperature Range		M: Low -Thermo EMF type: -55 to +155℃ (M: 低熱起電力品) C: High Heatproof type: -55 to +175℃ (C: 高耐熱品)								
Rated ambient Temperature		C : 120℃ at terminals M : 100℃ at terminals								
Packaging / reel		5,000pcs	1,000pcs, or 5,000pcs						1,000pcs	500 or 1,000pcs

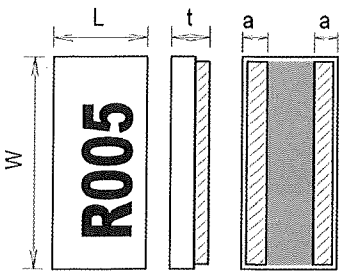
Contact us if you do not find w hat you need (resistance value, tolerance ...etc) in our standard resistors

(※1) 15075 series, 0.5mohm developing, please contact us. (※2) 2012～11050 series, 1mΩ≦±1%, ±50ppm/℃ developing , please contact us.

シリーズ外、及び、範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせ下さい。

(※1) 15075シリーズ 0.5mΩ品を開発しております。お問い合わせ下さい。 (※2) 2012～11050シリーズ, 1mΩ≦±1%, ±50ppm/℃ を開発しております。お問い合せ下さい。

外形寸法 Dimensions



Dimension (mm)	L	W	t	a	(Size in inch)
KRL1608	0.80 ±0.2	1.6 ±0.2	0.5 ±0.2	0.25 ±0.2 (5mΩ≦)	0603
KRL2012	1.25 ±0.2	2.0 ±0.2	0.5 ±0.2	0.55 ±0.2 (1mΩ) 0.3 ±0.2 (2mΩ≦)	0805
KRL3216	1.6 ±0.2	3.2 ±0.2	0.5 ±0.2	0.55 ±0.2 (1mΩ) 0.3 ±0.2 (2mΩ≦)	1206
KRL5025	2.5 ±0.2	5.0 ±0.2	0.5 ±0.2	0.55 ±0.2 (1mΩ) 0.9 ±0.2 (2mΩ≦)	2010
KRL6432	3.1 ±0.2	6.3 ±0.2	0.5 ±0.2	1.20 ±0.2 (1mΩ) 0.5 ±0.2 (2mΩ≦)	2512
KRL7638	3.8 ±0.2	7.6 ±0.2	0.5 ±0.2	1.35 ±0.2 (1mΩ) 0.6 ±0.2 (2mΩ≦)	3015
KRL9045	4.5 ±0.2	9.0 ±0.2	0.5 ±0.2	1.35 ±0.2 (1mΩ) 0.7 ±0.2 (2mΩ≦)	3518
KRL11050	5.0 ±0.2	11.0 ±0.2	0.5 ±0.2	1.60 ±0.2 (1mΩ) 0.8 ±0.2 (2mΩ≦)	4320
KRL15075	7.5 ±0.2	15.0 ±0.2	0.65 ±0.2	2.75 ±0.2 (0.5mΩ≦) 1.10 ±0.2 (1.0mΩ≦)	5930

Metal Foil
Low Resistance Value Resistors　Wrap Around (1/2)

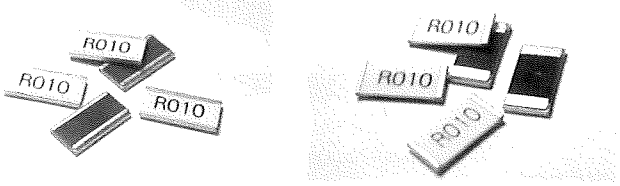
YOKOHAMA DENSHI SEIKO Co.,Ltd.

金属箔低抵抗　SMD 0.2W to 10W

AEC-Q200 Compliance

※極めて温度サイクル(半田クラック)耐性に優れたシリーズです。
詳細はお問合せください。

ERL －Short Terminal Series



RoHS Compliance　Pb Free　Halogen Free

特徴

・極めて放熱性に優れ、抵抗体表面温度を低く抑える構造。
・コの字電極で実装が容易です。
・金属箔特有の低TCR、低熱起電力
・定格負荷印加時でも精度が保たれます。(定格電力係数が小さい)
・熱起電力が小さく、電流検出の精度に影響しにくい低抵抗です。
・低インダクタンスでインダクタンス値のばらつきが小さいため、電圧検出時の補正が容易で高精度化が可能。また瞬間的な負荷またはパルス状の負荷に対し波形変形やインピーダンス変化が起こりにくくなっています。
・RoHs指令及びハロゲンフリーに対応。
※極めて温度サイクル(半田クラック)耐性に優れたシリーズです。

Features

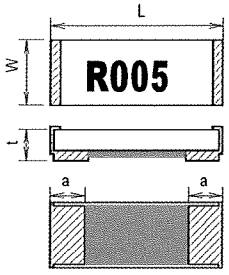
・Good heat dissipation, high power despite the small size.
Temperature on the surfaces is relatively low.
・Low TCR, unique characteristics of metal foil.
Low-heat EMF and high precision when rated power being applied.
(Low power rating factor)
・Low-heat EMF makes little influence on the accuracy of current sensing.
・Low inductance and small variability makes adjustment of current sensing and high fidelity easier. Strong agaist short and pulse power allowing almost no waveform or impedance change.
・RoHs compliance and Halogen free.

電気特性 Electrical characteristics　ERL －Short Terminal Series

Series		ERL0510	ERL0816	ERL1220	ERL1632	ERL2550	ERL3264	ERL50110
Rated Power		0.2W	0.25W	0.5W	0.75W	1.0W	2.0W	5.0W
Size in mm		1005	1608	2012	3216	5025	6432	11050
(inch)		(0402)	(0603)	(0805)	(1206)	(2010)	(2512)	(4320)
Resistance Range		50m - 100mΩ	5m, 6m, 7m, 8m, 9m, 10m - 500mΩ (※1) 20m, 25m, 50m, 200m,500m Ω				5m, 6m, 7m, 8m, 9m, 10m － 500m Ω (※1) 20m, 25m, 50m, 200m,1000m Ω	
Resistance Series		E-6	E-12	E-12	E-12	E-6	E-12	E-6
Tolerance %	±2 (G)	50mΩ ≦	5m, 6m, 7m, 8m, 9mΩ					
	±1 (F)	50mΩ ≦	10mΩ ≦					
T.C.R ppm/℃	±100	50mΩ ≦	5m, 6m, 7m, 8m, 9mΩ					
	±50	50mΩ ≦	10mΩ ≦					
Operating Temperature		M: Low-Thermo EMF type: -55 to +155℃ (M: 低熱起電力品) C: High Heatproof type: -55 to +175℃ (C: 高耐熱品)						
Rated Ambient Temperature		C : 120℃ at terminals M : 100℃ at terminals						
Packaging / reel		10,000pcs	1,000pcs, or 5,000pcs					1,000pcs

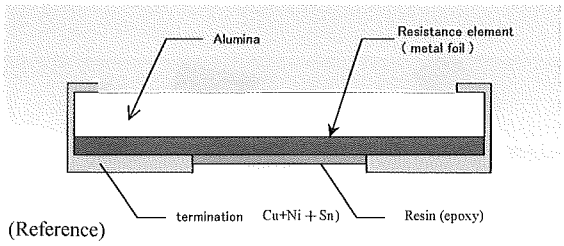
Contact us if you do not find what you need (resistance value, tolerance , etc...,) in our standard resistors
(※1) 1220series, under 10mΩ developing, please contact us.
(※2) 2550, 3264 series, 1mΩ≦ developing, please contact us.
シリーズ外 及び 範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合せください。
(※1) 1220シリーズ、10mΩ未満を開発しております。ご相談ください。
(※2) 2550, 3264 シリーズ 1mΩ≦を開発しております。ご相談ください。

外形寸法 Dimensions



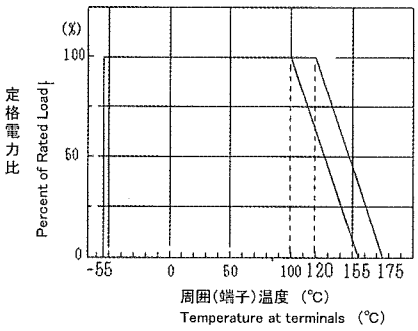
Dimension (mm)	L	W	t	a	(Size in inch)
ERL0510	1 ±0.2	0.5 ±0.2	0.4 ±0.2	0.3 ±0.2	0402
ERL0816	1.6 ±0.2	0.8 ±0.2	0.5 ±0.2	0.7 ±0.2 10～18mΩ 0.5 ±0.2 29～39mΩ 0.3 ±0.2 43～500mΩ	0603
ERL1220	2.0 ±0.2	1.25 ±0.2	0.5 ±0.2	0.4 ±0.2 5～500mΩ	0805
ERL1632	3.2 ±0.2	1.6 ±0.2	0.5 ±0.2	1.1 ±0.2 (5～8mΩ) 0.5 ±0.2 (9mΩ～500mΩ)	1206
ERL2550	5.0 ±0.2	2.5 ±0.2	0.5 ±0.2	1.4 ±0.2 (5～8mΩ) 0.6 ±0.2 (9mΩ～500mΩ)	2010
ERL3264	6.3 ±0.2	3.1 ±0.2	0.5 ±0.2	1.9 ±0.2 (5～8mΩ) 1.0 ±0.2 (9mΩ～1Ω)	2512
ERL50110	11.0 ±0.2	5.0 ±0.2	0.65 ±0.2	3.6 ±0.2 (5～7mΩ) 2.36 ±0.2 (8mΩ～1Ω)	4320

構造図 Structure



(Reference)

Derating Curve



型名構成 Part Number

ERL — 1632 — M — R010 — F — T1

Series	Size in mm	Operating Temperature	Resistance	Tolerance	Packaging
	Short Teminal 16 32	C: High Heatproof Type	R010: 10mΩ	F: ±1%	T1: 1,000pcs / reel
	Long Terminal 32 16	M: Low Thermo EMS Type		G: ±2%	T5: 5,000pcs / reel
				J: ±5%	
				K: ±10%	

電気特性 Electrical characteristics

ERL —Long Terminal Series

Series		ERL2012	ERL3216	ERL5025	ERL6432	ERL7638	ERL9045	ERL11050	ERL15075
Rated Power		1.0W	1.5W	2.0W	3.0W	4.0W	5.0W	6.0W	10.0W
Size in mm (inch)		2012 (0805)	3216 (1206)	5025 (2010)	6432 (2512)	7638 (3015)	9045 (3518)	11050 (4320)	15075 (5930)
Resistance Range		1m,2m,3m,4m,5m,6m,7m,8m,9mΩ 10m - 500mΩ 20m,25m,50m,200m ,500mΩ							(※1) 0.5 - 500mΩ
Resistance Series		E-6							
Tolerance (%)	±10 (K)	—							0.5mΩ (※1)
	±5 (J)	1mΩ							
	±2 (G)	2mΩ							
	±1 (F)	3mΩ≦ (1mΩ≦(※2))							
T.C.R (ppm/℃)	±150	1mΩ							0.5m - 2mΩ(※1)
	±100	2mΩ							3 - 9mΩ
	±50	3mΩ≦ (1mΩ≦(※2))							10mΩ ≦
Operating Temperature		M: Low-Thermo EMF type: -55 to +155℃ (M: 低熱起電力品) C: High Heatproof type: -55 to +175℃ (C: 高耐熱品)							
Rated ambient Temperature		C : 120℃ at terminals M : 100℃ at terminals							
Packaging / reel		1,000pcs, or 5,000pcs						1,000pcs	500 or 1,000pcs

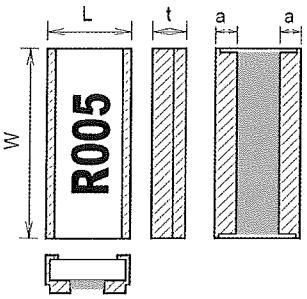
Contact us if you do not find w hat you need (resistance value, tolerance ...etc) in our standard resistors

(※1) 15075 series, 0.5mohm developing, please contact us. (※2) 2012～11050 series, 1mΩ≦±1%, ±50ppm/℃ developing , please contact us.

シリーズ外、及び、範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせ下さい。

(※1) 15075シリーズ 0.5mΩ品を開発しております。お問い合わせ下さい。 (※2) 2012～11050シリーズ, 1mΩ≦±1%, ±50ppm/℃ を開発しております。お問い合せ下さい。

外形寸法 Dimensions



Dimension (mm)	L	W	t	a	(Size in Inch)
ERL2012	1.25 ±0.2	2.0 ±0.2	0.5 ±0.2	0.55 ±0.2 (1mΩ) 0.3 ±0.2 (2mΩ≦)	0805
ERL3216	1.6 ±0.2	3.2 ±0.2	0.5 ±0.2	0.55 ±0.2 (1mΩ) 0.3 ±0.2 (2mΩ≦)	1206
ERL5025	2.5 ±0.2	5.0 ±0.2	0.5 ±0.2	0.55 ±0.2 (1mΩ) 0.9 ±0.2 (2mΩ≦)	2010
ERL6432	3.1 ±0.2	6.3 ±0.2	0.5 ±0.2	1.20 ±0.2 (1mΩ) 0.5 ±0.2 (2mΩ≦)	2512
ERL7638	3.8 ±0.2	7.6 ±0.2	0.5 ±0.2	1.35 ±0.2 (1mΩ) 0.6 ±0.2 (2mΩ≦)	3015
ERL9045	4.5 ±0.2	9.0 ±0.2	0.5 ±0.2	1.35 ±0.2 (1mΩ) 0.7 ±0.2 (2mΩ≦)	3518
ERL11050	5.0 ±0.2	11.0 ±0.2	0.5 ±0.2	1.60 ±0.2 (1mΩ) 0.8 ±0.2 (2mΩ≦)	4320
ERL15075	7.5 ±0.2	15.0 ±0.2	0.65 ±0.2	2.75 ±0.2 (0.5mΩ≦) 1.10 ±0.2 (1.0mΩ≦)	5930

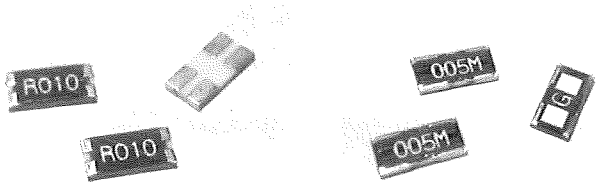
Thin Film
4 terminals High Precision Current Sensors

YOKOHAMA DENSHI SEIKO Co.,Ltd.

4端子電流検出素子

1m to 500mOHM , ±0.5% , ±50ppm/℃

RL****L4 Series



RoHS Compliance | Pb Free | Halogen Free

特徴

・電流検出用の電流端子と電圧端子が独立しており、高精度な電流検出が可能です。
・特に検出抵抗値が低い場合に問題となる測定と実装時の誤差、取り付け位置による誤差、電圧端子回路の引き回しによる誤差が起こりません。
・独自の技術により電流検出抵抗(出力電圧)の温度係数がコントロール可能で、極低抵抗域でも優れた温度特性を保証します。
・抵抗皮膜には耐腐食性合金を使用しており、環境に対する耐性が高く信頼

Features

Separating voltage terminals from current terminals makes it possible to measure current precisely. The error caused by the process of mounting, mounting position, and traces of voltage terminal circuit, especially when detecting resistance is low, are eliminated. Our proprietary technology allows to control TCR of current sensing resistors (output voltage) and to offer excellent TCR even for very low resistance ranges. The resistive material is an anti-corrosion metal alloy offering strong environmental protection and high reliability.

電気特性 Electrical characteristics

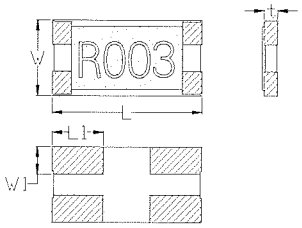
Series	RL1632L4	RL2550L4	RL3264L4	RL3264SW4
Rated Power (W)	0.5W	0.75W	1.0W	2.0W
Size in mm	3216	5025	6432	3264
(inch)	(1206)	(2010)	(2512)	(2512)
Resistance Range (Ω)	10～500mΩ			1～10mΩ
Tolerance (%)	±0.5%(D) , ±1%(F)			
TCR (ppm/℃)	±50			±300 (1mΩ) ±200 (2 to 4mΩ) ±100 (5 to 10mΩ)
E-series	E-12 (50,500mΩ)			1,2,3,4,5,6,7,8,9,10mΩ
Operating Temperature	-40°C to +125°C			
Rated Ambient Temperature	+70°C			

contacu us if you do not find what you need (resistance value, tolerance, etd.,) in our standard resistors
シリーズ外及び範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせください。

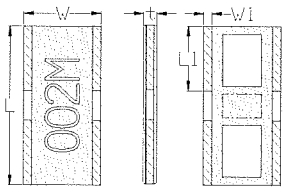
外形寸法 Dimensions

Dimension (mm)	RL1632L4	RL2550L4	RL3264L4	RL3264SW4
L	3.2±0.2	5.0±0.2	6.4±0.2	6.4±0.2
W	1.6±0.2	2.5±0.2	3.2±0.2	3.2±0.2
L1	1.0±0.2	1.7±0.2	2.1±0.2	2.7±0.2
W1	0.55±0.2	0.9±0.2	1.2±0.2	0.4±0.2
t	0.5±0.15	0.5±0.15	0.5±0.15	0.5±0.2
(Size in inch)	1206	2010	2512	2512

RL****L4



RL3264 SW4

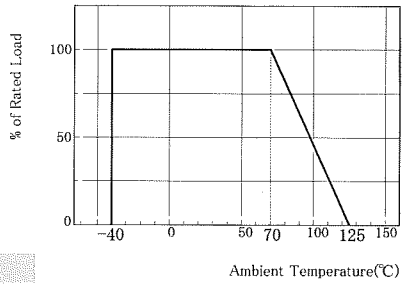


等価回路 Circuit Diagram

V = sensing terminal (voltage)
I = current terminal

V = 電圧端子
I = 電流端子

Derating Curve



型名構成 Part Number

RL — 1632 — L4 — R010 — D — T1

Series	Size in mm	Terminal	Resistance	Tolerance	Packaging
RL	1632 2550 3264	L4 *SW4 * 3264 only	R010: 10mΩ	D: ±0.5% F: ±1%	T1: 1,000pcs/ reel T5: 5,000pcs/ reel

Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

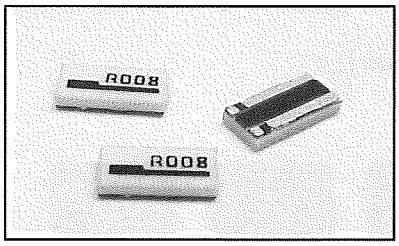
4 terminals
Metal Foil Low Resistance Value Resistors

YOKOHAMA DENSHI SEIKO Co.,Ltd.

4端子金属箔低抵抗

1m to 500mOHM 、1.5W to 10W

KRL****T4 Series



RoHS Compliance | Pb Free | Halogen Free

特徴

・端面電極のないフリップチップ構造で実装面積を極少化。
・極めて放熱性に優れ、抵抗体表面温度を低く抑える構造。
・電流検出用の電流端子と電圧端子が独立しており、高精度な電流検出が可能です。
・特に検出抵抗値が低い場合に問題となる測定と実装時の誤差、取り付け位置に よる誤差、電圧端子回路の引き回しによる誤差が起こりません。
・独自の技術により電流検出抵抗(出力電圧)の温度係数がコントロール

Features

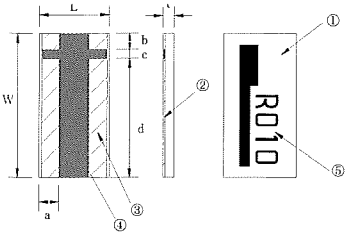
・Flip-chip structure (no side edge electrode)minimizes mounting area.
・Good heat dissipation, high power despite the small size.
・Separating voltage terminals from current terminals makes it possible to measure current precisely. The error caused by the process of mounting, mounting position, and traces of voltage terminal circuit, especially when detecting resistance is low, are eliminated.
・Our proprietary technology allows to control TCR of current sensing resistors (output voltage) and to offer excellent TCR even for very low resistance ranges.

電気特性 Electrical characteristics

Series		KRL3216T4	KRL6432T4	KRL7638T4	KRL9045T4	KRL11050T4	KRL15075T4
Rated Power		1W	2W	3W	4W	5W	8W
Size in mm		3216	6432	7638	9045	11050	15075
(inch)		(1206)	(2512)	(3015)	(3518)	(4320)	(5930)
Resistance Range		1 to 500mΩ					
Resistance Series		1 to 10mΩ: 1mΩSTEP 10mΩ to 100mΩ: E-6 over 100mΩ: 200m & 500mΩ					
Tolerance (%)	±5 (J)	1mΩ					
	±2 (G)	2mΩ					
	±1 (F)	3mΩ ≦					
TCR (ppm/℃)	±100	1 to 3mΩ					
	±50	4mΩ ≦					
Operating Temperature		Low-Thermo EMF type: -55 to +155℃(Code:M)					
Rated ambient Temperature		70℃					
Packaging / reel		1,000pcs, or 5,000pcs				1,000pcs	500 or 1,000pcs

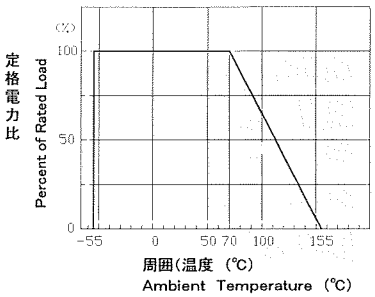
Contact us if you do not find what you need (resistance value, tolerance ...etc) in our standard resistors
シリーズ外、及び、範囲外の抵抗値、精度などご要望がありましたらお気軽にお問い合わせ下さい。

外形寸法 Dimensions



Dimension (mm)	KRL11050T4	KRL9045T4	KRL7638T4	KRL6432T4	KRL3216T4
W	5.00	4.50	3.80	3.20	1.60
L	11.00	9.00	7.60	6.40	3.20
a	0.70	0.60	0.55	0.50	0.35
b	1.40	1.00	0.80	0.70	0.35
c	1.10	0.70	0.60	0.50	0.20
d	8.50	7.30	6.20	5.20	2.60
t	0.50	0.50	0.50	0.50	0.50
(Size in inch)	(4320)	(3518)	(3015)	(2512)	(1206)

Derating Curve



等価回路 Circuit Diagram

V = sensing terminal (voltage)
I = current terminal

型名構成 Part Number

KRL — 3216 — T4 — M — R010 — F — T5

KRL	3216	T4	M	R010	F	T5
Series KRL	Size in mm 3216 to 15075	Terminal	Operating Temperature M: Low Thermo EMS Type	Resistance R010: 10mΩ	Tolerance F: ±1% G: ±2% J: ±5%	Packaging T1: 1,000pcs/ reel T5: 5,000pcs/ reel

Yokohama Denshi Seiko Co., Ltd.
web: www.yds.co.jp e-mail: info@yds.co.jp

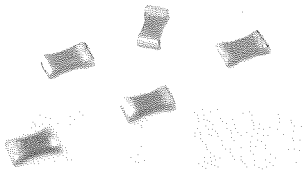
Micro ohm
High Current Chip Resistors

YOKOHAMA DENSHI SEIKO Co.,Ltd.

マイクロΩ 大電流チップ抵抗器

※20A at SMD 1608(0603) chip

YJP Series



RoHS Compliance | Pb Free | Halogen Free

特徴

- 導通抵抗値 Max 0.3mΩ
- 定格電流が大幅に改善された面実装型のジャンパーチップです。
- 当社標準条件における定格電流規格は10A
- より放熱性に優れたご使用条件では更なる高電流での使用もご検討頂けます
- 発熱が低く抑えられ、電圧ロスや電圧ドロップも低減

Features

Less cond. resistance: 0.3mΩ(Max)
Extended range of current rating on SMT chip
10A constant current
Sufficient safety margin for much higher current handling
Surpress thermal hike, lowering voltage drop and loss.

電気特性 Electrical characteristics

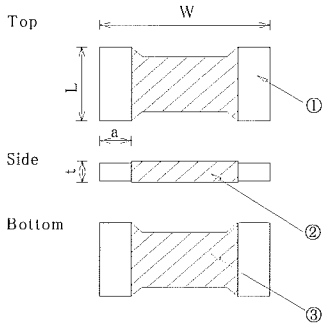
Series	YJP1608	YJP3216
Rated Maximum current	10A(ave) 16A(Max)	20A(ave) 32A(Max)
Size in mm (inch)	1608 (0603)	3216 (1206)
Resistance value	0.2 ±0.1mΩ	0.2 ±0.1mΩ
Rated ambient temperature	70℃	70℃
Operating temperature range	-40 to +125℃	-40 to +125℃

型名構成 Part Number

YJP — 1608 — R001 — T1

Series	Size in mm	Maximum Resistance Value	Packaging
YJP	1608		T1: 1,000pcs/ reel T5: 5,000pcs/ reel

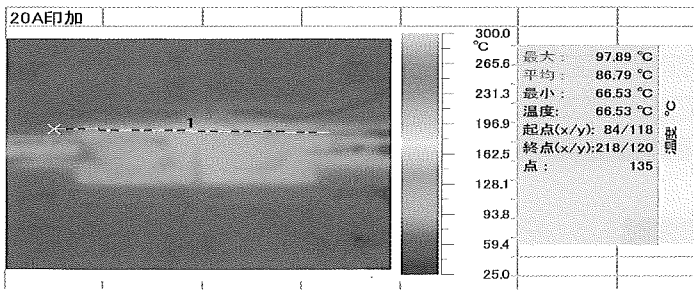
外形寸法 Dimensions

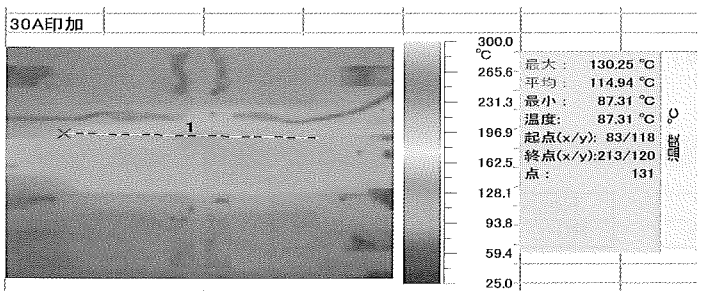


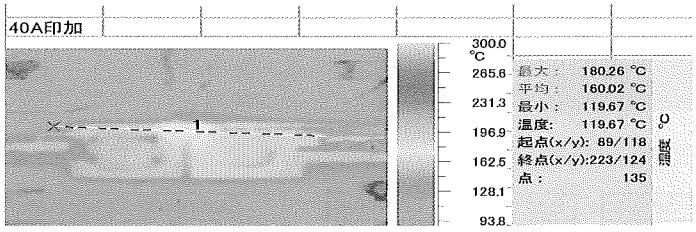
Dimension (mm)	YJP1608	YJP3216 (※1)
L	1.6±0.2	3.2±0.2
W	0.8±0.2	1.6±0.2
t	0.3±0.1	0.3±0.1
a	0.3±0.1	0.3±0.1

(※1) Reference only, please contact us for individual data sheet.

YJP1608 series Power Test Resuslt







Preferred Value E series Eシリーズ数列

Series	Significant Figures 数列
E−6	1.0 1.5 2.2 3.3 4.7 6.8
E−12	1.0 1.2 1.5 1.8 2.2 2.7 3.3 3.9 4.7 5.6 6.8 8.2
E−24	1.0 1.1 1.2 1.3 1.5 1.6 1.8 2.0 2.2 2.4 2.7 3.0 3.3 3.6 3.9 4.3 4.7
	5.1 5.6 6.2 6.8 7.5 8.2 9.1
E−96	1.00 1.02 1.05 1.07 1.10 1.13 1.15 1.18 1.21 1.24 1.27 1.30 1.33 1.37 1.40
	1.43 1.47 1.50 1.54 1.58 1.62 1.65 1.69 1.74 1.78 1.82 1.87 1.91 1.96 2.00
	2.05 2.10 2.15 2.21 2.26 2.32 2.37 2.43 2.49 2.55 2.61 2.67 2.74 2.80 2.87
	2.94 3.01 3.09 3.16 3.24 3.32 3.40 3.48 3.57 3.65 3.74 3.83 3.92 4.02 4.12
	4.22 4.32 4.42 4.53 4.64 4.75 4.87 4.99 5.11 5.23 5.36 5.49 5.62 5.76 5.90
	6.04 6.19 6.34 6.49 6.65 6.81 6.98 7.15 7.32 7.50 7.68 7.87 8.06 8.25 8.45
	8.66 8.87 9.09 9.31 9.53 9.76

注意事項

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- 本カタログに記載しております製品は、一般電子機器に使用されることを意図しております。原子力、宇宙、医療機械などで特別な品質、信頼性が要求される機器へのご使用は事前にご相談くださいますようお願いします。
- 本カタログの記載内容を当社の許可なく転載、複写しないようお願いします。
- 本カタログは2015年11月現在のものです。

http://www.yds.co.jp

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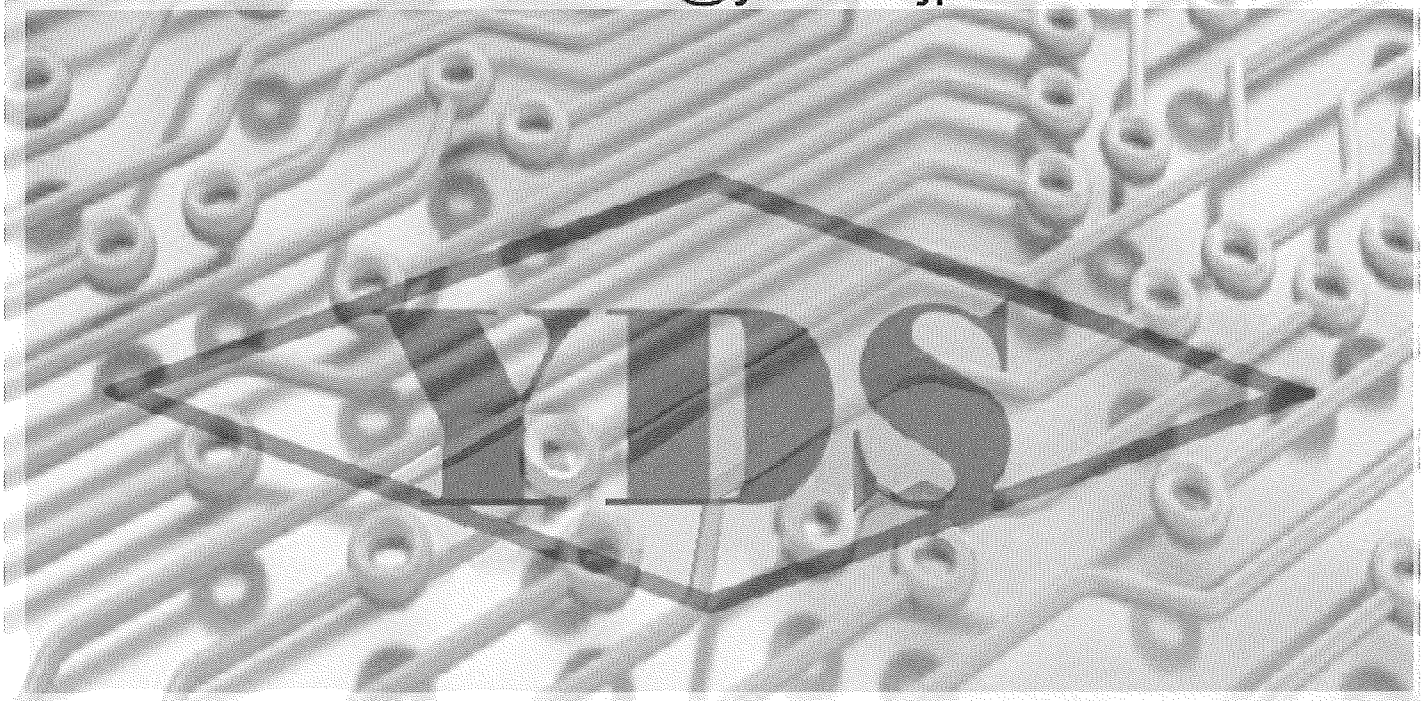

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