

## YDS Thin Film Components List

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# Thermo Variable Attenuator



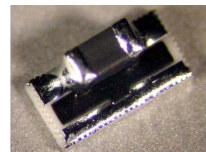
Using a very simple scheme, this component corrects temperature characteristics of circuits and is usable in the high



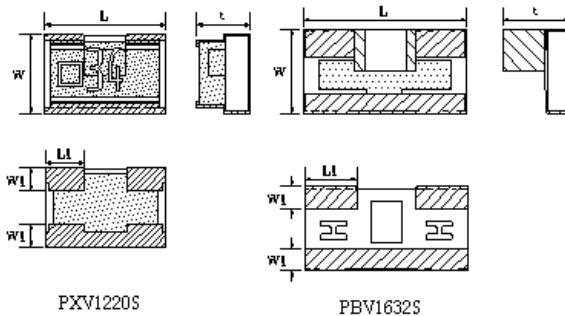
## <Specification>

Type	PXV1220S	PBV1632S
Size	2.0 × 1.25 × 0.9mm (0805)	3.2 × 1.6 × 1.5mm (1206)
Rated input power	63mW	100mW
Attenuation	1~10dB(1dB step)	1~10(1dB step)·16dB
Impedance	50 Ω	
Attenuation tolerance	±0.5dB(@25°C)	
VSWR	<1.3(@25°C)	
Thermo sensitive characteristic	N1 to N8 ex.: 6dB 1 to 3dB: N1:0.0119dB/dB*°C N2:0.0088dB/dB*°C N3:0.0062dB/dB*°C N1 to N9 N4:0.0047dB/dB*°C N5:0.0041dB/dB*°C N6:0.0035dB/dB*°C N7:0.0026dB/dB*°C N8:0.0019dB/dB*°C	
Frequency range	DC to 3GHz	
Operating Temperature range	-40°C~+100°C	
Package	100pcs/B 1,000pcs/reel	min.20pcs/B 1,000pcs/reel

Detail specifications for individual part-number showing temperature characteristics of the attenuation are available. Contact us!



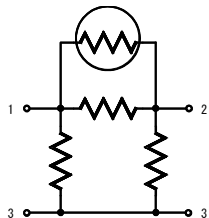
## <Dimensions>



Type	PXV1220S	PBV1632S
L	2.0 ± 0.2	3.2 ± 0.2
W	1.25 ± 0.2	1.6 ± 0.2
L1	0.65 ± 0.35	1.0 ± 0.25
W1	0.35 ± 0.2	0.55 ± 0.2
t	0.9 ± 0.2	1.5max.

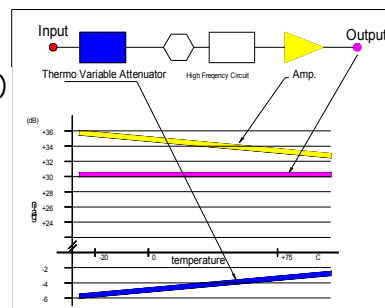
(mm)

## <Equivalent circuit>



## <Characteristics>

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.



## <Part number>

**PXV 1220S - 3dB - N1 - T1(T5)**

**Device**      **Size**      **Attenuation**      **Thermo sensitive characteristic (N1~N8·N9)**      **Packaging form**  
 T1: Taping (1,000pcs/reel)  
 T5: Taping (5,000pcs/reel)  
 B: Bulk

< Not for shipment to or sale in the United States. >



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# Thin Film Attenuator

DC to 10GHz , 0402 (32mW) to 1612 (250mW) High Performance



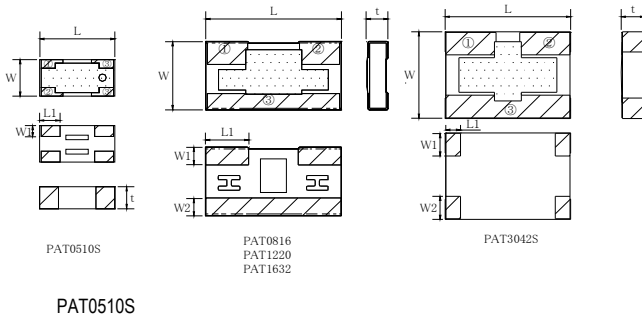
## <Specification>

Type	PAT0510S	PAT0816	PAT1220	PAT1632	PAT3042S
Size	1.0 × 0.5 × 0.3mm (0402)	1.6 × 0.8 × 0.4mm (0603)	2.0 × 1.25 × 0.4mm (0805)	3.2 × 1.6 × 0.4mm (1206)	4.2 × 3.0 × 0.8mm (1612)
Rated input power	32mW	64mW	100mW	125mW	250mW
Frequency range	DC-10GHz	DC-10GHz	DC-10GHz	DC-3GHz	DC-3GHz
Attenuation	0~10dB	0~10dB	0~10dB	0~10 16dB	0~10 16-20dB
Attenuation 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 (DC-6GHz) 1.5 (6.1-10GHz) 1.5 (6-10GHz)	1.3 (DC-6GHz) 1.5 (6.1-10GHz) 1.5 (6-10GHz)	1.3 (DC-6GHz) 1.5 (6.1-10GHz) 1.5 (6-10GHz)	1.3	1.2
Operating Temperature range	-55°C~+125°C				

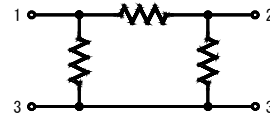


If you require attenuation, frequency range, or tolerance out side of the product specifications, please contact us!

## <Dimensions>



## <Equivalent circuit>



Type	PAT0510S	PAT0816	PAT1220	PAT1632	PAT3042S
L	1.0±0.05	1.6±0.1	2.0±0.2	3.2±0.2	4.2±0.2
W	0.5±0.05	0.8±0.1	1.25±0.2	1.6±0.2	3.0±0.2
L1	0.29±0.05	0.5±0.15	0.6±0.2	1.0±0.2	0.5±0.2
W1	-	0.25±0.1	0.4±0.2	0.55±0.25	0.95±0.2
W2	-	0.15±0.1	0.4±0.2	0.4±0.25	0.95±0.2
W3	0.17±0.04	0.20±0.1	0.35±0.2	0.4±0.25	0.8±0.2
t	0.3±0.05	0.4±0.1	0.4±0.1	0.4±0.1	0.8±0.15

(mm)

## <Characteristics>

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.

## <Part number>

**PAT 1632 - C - 3dB - T1(T5)**

Device Size Impedance Attenuation Packaging form  
T1 : Taping (1,000pcs/reel)  
T5 : Taping (5,000pcs/reel)



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# Thin Film Attenuator <W-Type>



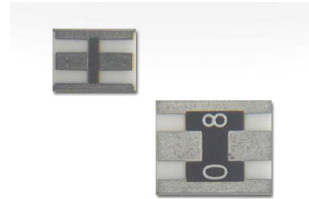
DC to 10GHz , High performance, high power application



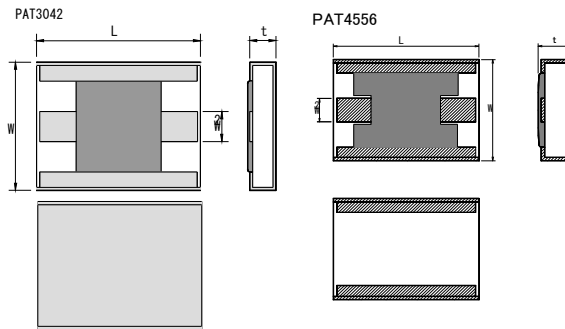
## <Specification>

Type	PAT3042	PAT4556
Attenuation (dB)	0~10, 16, 20	
Rated input power	250mW	500mW
Impedance	50 Ω (C)	
Frequency range	DC~10GHz	
VSWR	<1.1 (DC~2GHz)	
	<1.2 (2~5GHz)	
	<1.3 (5~10GHz)	
Operating Temperature range	-55~+125°C	
Rated ambient temperature	70°C	
Packaging form	1,000pcs/reel 50pcs/B	

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

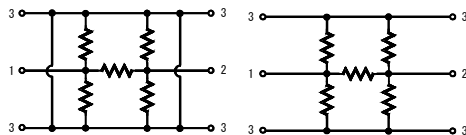


## <Dimensions>



Symbol	Size(mm)	
	PAT3042	PAT4556
L	4.2±0.2	5.6±0.2
W	3.0±0.2	4.5±0.2
W2	(0.9±0.1)	(1.39±0.1)
t	0.8±0.15	0.8±0.15

## <Equivalent circuit>



## <Characteristics>

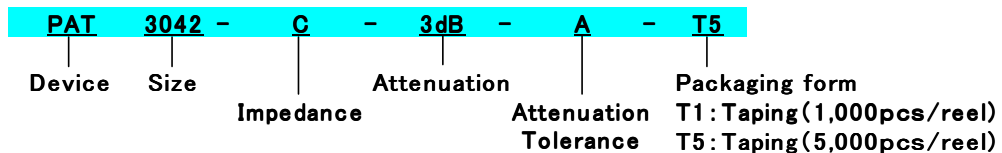
You can obtain highly accurate attenuation with one attenuator.

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

## <Part number>



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# Thin Film Impedance Converter



High frequency, wide frequency range. Eliminates impedance mismatching between circuits. Custom parts available.

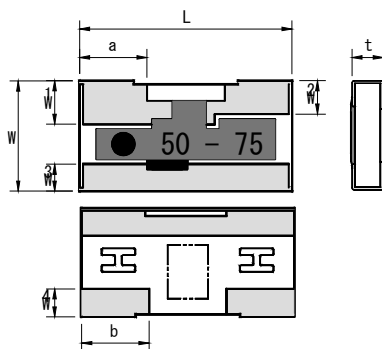
## <Specification>

Type	PCH1632
Size	3.2×1.6×0.5mm (1206)
Conversion impedance	50Ω/75Ω
Insertion loss	6±0.3dB
Rated power	125mW
Frequency range	DC~1.5GHz
Rated ambient temperature	70°C
Operating temperature range	-55~+125°C



Other impedance conversions and ATT for matching possible. Contact us!

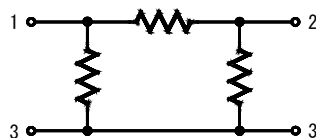
## <Dimensions>



Symbol	Size
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

(mm)

## <Equivalent circuit>



## <Characteristics>

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.

## <Part number>

<b>PCH</b>	<b>1632</b>	<b>-</b>	<b>50/75</b>	<b>-</b>	<b>T5</b>
Device	Size		Impedance		Packaging form
					T1 : Taping (1,000pcs/reel)
					T5 : Taping (5,000pcs/reel)



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# Thin Film Chip Terminator



< co-planer type >

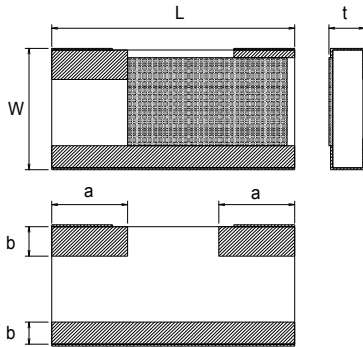


0816(0603) , 1220(0805) , 1632(1206) , 3042(1216) , DC to 10GHz

<Specification>

Type	PCS0816S	PCS1220S	PCS1632S		PCS3042S	
Size	0.8 x 1.6 x 0.4mm (0603)	1.25 x 2.0 x 0.4mm (0805)	1.6 x 3.2 x 0.4mm (1206)		3.0 x 4.2 x 0.4mm (1612)	
Power	<b>63mW</b>	<b>100mW</b>	<b>125mW</b>		<b>250mW</b>	
Impedance	<b>50Ω</b>	<b>50Ω</b>	<b>50Ω</b>	<b>75Ω</b>	<b>50Ω</b>	<b>75Ω</b>
VSWR	DC ~ 2GHz	1.2	1.2	1.2	1.3	1.2
	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 Range	-40°C ~ +125°C					
Rated ambient temperature	+70°C					

<Dimensions>



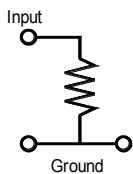
<Characteristics>

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

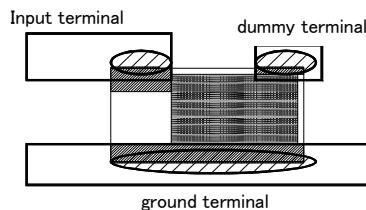
Type	PCS0816S	PCS1220S	PCS1632S	PCS3264S
L	1.6±0.15	2.0±0.15	3.2±0.2	4.2±0.2
W	0.8±0.15	1.25±0.15	1.6±0.2	3.0±0.2
a	0.4±0.15	0.4±0.15	0.55±0.25	1.2±0.2
b	0.2±0.15	0.3±0.15	0.4±0.2	0.4±0.2
t	0.4±0.1	0.4±0.1	0.4±0.1	0.4±0.1

(mm)

<Equivalent circuit>



<Mounting example>



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.

<Part number>

**PCS 1632S - 50Ω - B**

Device      Size      Impedance      Packaging form  
B: Bulk



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# Thin Film Power Chip

1005(0402) : 200mW to 6432(2412) : 10W DC to 10GHz

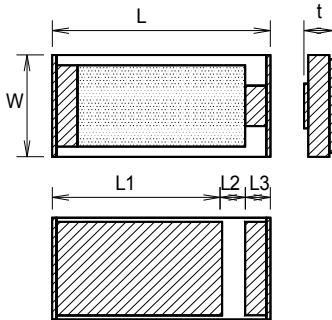
**RoHS**  
compliance

## <Specification>

Type	PCS1005	PCS1608	PCS2012	PCS3216	PCS5025	PCS6432
Size	1.0 × 0.5 × 0.3mm (0402)	1.6 × 0.8 × 0.4mm (0603)	2.0 × 1.25 × 0.4mm (0805)	3.2 × 1.6 × 0.4mm (1206)	5.0 × 2.5 × 0.4mm (2010)	6.4 × 3.2 × 0.4mm (2412)
Power	<b>200mW</b>	<b>500mW</b>	<b>1W</b>	<b>2W</b>	<b>5W</b>	<b>10W</b>
VSWR	DC ~ 3GHz	1.2	1.2	1.2	1.2	1.3
	3.1 ~ 5GHz	1.2	1.2	1.3	1.3	1.5
	5.1 ~ 7.5GHz	1.3	1.3	1.3	1.4	---
	7.6 ~ 10GHz	1.3	1.3	1.4	1.5	---
	10.1 ~ 12.5GHz	1.4	1.4	1.5	---	---
12.6 ~ 15GHz	1.5	1.5	---	---	---	
Operating Temperature Range	-40°C ~ +125°C					
Rated ambient temperature	+70°C					

Notes: While this component is fully powered, make sure the soldered surface temperature does not exceed 80°C

## <Dimensions>



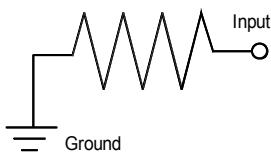
## <Characteristics>

High power small thin film chip terminator  
Thin film elements and special patterning offer small size, high power and excellent high frequency performance.  
Wrap-around terminals offer easy mounting and high reliability  
New terminator designed for better heat dissipation and reflection characteristics.

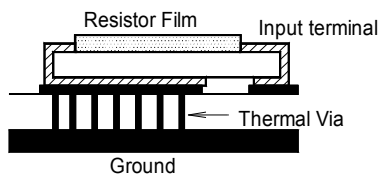
Type	PCS1005	PCS1608	PCS2012	PCS3216	PCS5025	PCS6432
L	1.0 ± 0.1	1.6 ± 0.15	2.0 ± 0.15	3.2 ± 0.2	5.0 ± 0.2	6.4 ± 0.2
W	0.5 ± 0.1	0.8 ± 0.15	1.25 ± 0.15	1.6 ± 0.2	2.5 ± 0.2	3.2 ± 0.2
L1	0.65 ± 0.1	1.1 ± 0.15	1.5 ± 0.15	2.7 ± 0.2	4.3 ± 0.2	5.7 ± 0.2
L2	0.2 ± 0.1	0.3 ± 0.15	0.3 ± 0.15	0.3 ± 0.15	0.4 ± 0.15	0.4 ± 0.15
L3	0.15 ± 0.1	0.2 ± 0.15	0.2 ± 0.15	0.2 ± 0.15	0.3 ± 0.15	0.3 ± 0.15
t	0.3 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.4 ± 0.1

(mm)

## <Equivalent circuit>



## <Mounting example>



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.

## <Part number>

**PCS 3216 - 50Ω - T1(T5)**

Device      Size      Impedance      Packaging form  
T1: Taping (1,000pcs/reel)  
T5: Taping (5,000pcs/reel)



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# Terminator of ECL Logic



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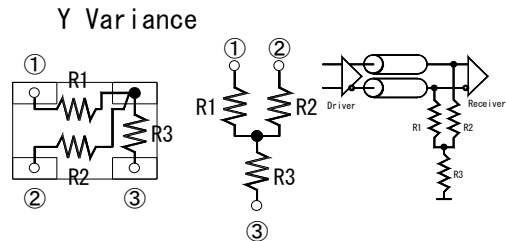
Three elements in one package. Small size (0603), good performance, contributes to simplifying circuits and improving density



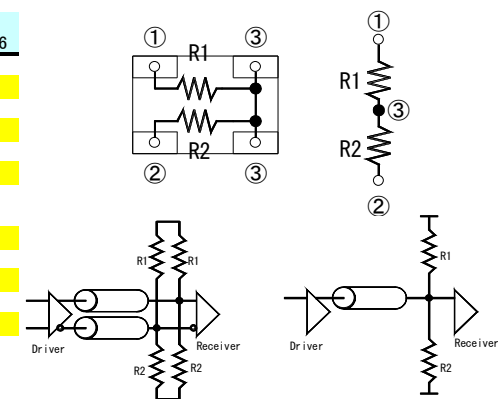
## <Specification>

Size	1608	2012	3216
	1.6X0.8X0.4mm (0603)	2.0X1.25X0.4mm (0805)	3.2X1.6X0.4mm (1206)
Rated power	64mW	100mW	125mW
Resistance tolerance	±1%		
Tracking Resistance	±0.1%		
TCR	±50ppm/°C		
Tracking TCR	±10ppm/°C		
Operating Temperature range	-55°C ~ +125°C		
Rated ambient temperature	+70°C		

## <Schematics>

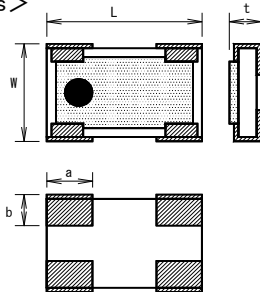


## Thevenin



type	Ecc	impe- dance	circuit	resistance value (OHM)			package		
				R1	R2	R3	1608	2125	3216
Y25V50Z	2.5V	50 Ω	Y Variance	50	50	21.2	0	0	--
Y25V75Z	2.5V	75 Ω	Y Variance	75	75	31.8	0	0	--
Y33V50Z	3.3V	50 Ω	Y Variance	50	50	46	0	0	0
Y33V75Z	3.3V	75 Ω	Y Variance	75	75	68	--	0	0
Y50V50Z	5.0V	50 Ω	Y Variance	50	50	112	--	--	0
Y50V75Z	5.0V	75 Ω	Y Variance	75	75	166	--	--	0
T25V50Z	2.5V	50 Ω	Thevenin	250	62.5	---	0	0	0
T25V75Z	2.5V	75 Ω	Thevenin	375	93.8	---	0	0	0
T33V50Z	3.3V	50 Ω	Thevenin	127	83	---	0	0	0
T33V75Z	3.3V	75 Ω	Thevenin	190	123	---	0	0	0
T50V50Z	5.0V	50 Ω	Thevenin	83	125	---	0	0	0
T50V75Z	5.0V	75 Ω	Thevenin	125	188	---	0	0	0

## <Dimensions>



Type	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

(mm)

## <Characteristics>

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.

## <Part number>

ELT	1608	-	Y25V50Z	-	T1(T5)
Device	Size		Type		Packaging form

T1 : Taping (1,000pcs/reel)  
T5 : Taping (5,000pcs/reel)



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# Thin Film Power Splitter



< DC to 20GHz Super wide frequency range 100m to 500mW >

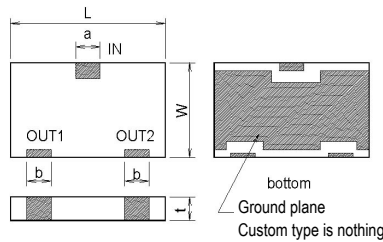


## <Specification>

Type	PS1005	PS1608	PS2012	PS3216	PS5025
Size	1.0 × 0.5 × 0.3mm (0402)	1.6 × 0.8 × 0.4mm (0603)	2.0 × 1.25 × 0.4mm (0805)	3.2 × 1.6 × 0.4mm (1206)	5.0 × 2.5 × 0.8mm (2010)
Frequency range	DC - 20GHz	DC - 20GHz	DC - 17.5GHz	DC - 15GHz	DC - 10GHz
Rated input power	100mW	100mW	125mW	250mW	500mW
Insertion loss	6 ± 0.5dB (B)	6 ± 0.5dB (B)	6 ± 0.5dB (A)	6 ± 0.5dB (A)	6 ± 0.5dB (A)
	6 ± 1.0dB (D)	6 ± 1.0dB (D)	6 ± 1.0dB (C)	6 ± 1.0dB (C)	6 ± 1.0dB (B)
	6 ± 2.0dB (F)	6 ± 2.0dB (F)	6 ± 2.0dB (F)	6 ± 2.0dB (F)	6 ± 2.0dB (F)
Balance	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	1.3 (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)
Operation Temperature range: -40°C ~ +125°C					

Frequency range A: DC-5.0GHz、B: -7.5GHz、C: -10GHz、D: -15GHz、F: -MAX

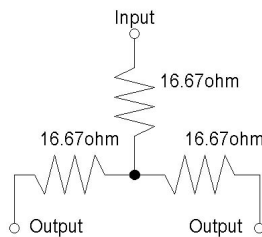
## <Dimensions>



symbol	PS1005	PS1608	PS2012	PS3216	PS5025
L	1.0 ± 0.1	1.6 ± 0.15	2.0 ± 0.15	3.2 ± 0.2	5.0 ± 0.2
W	0.5 ± 0.1	0.8 ± 0.15	1.25 ± 0.15	1.6 ± 0.2	2.5 ± 0.2
a	0.40 ± 0.1	0.45 ± 0.1	0.45 ± 0.1	2.7 ± 0.2	4.3 ± 0.2
b	0.2 ± 0.1	0.3 ± 0.15	0.3 ± 0.15	0.3 ± 0.15	0.4 ± 0.15
t	0.3 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.4 ± 0.1	0.4 ± 0.25

(mm)

## <Schematics>



## <Characteristics>

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.

## <Part number>

PS	1608	G	T2	R50	T1(T5)
Device	Size	Type	Number of	Impedance	Packaging
		G:standard Nx:custom	output terminals		T1:Taping(1,000pcs/reel) T5:Taping(5,000pcs/reel)



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# Terminator of ECL Logic



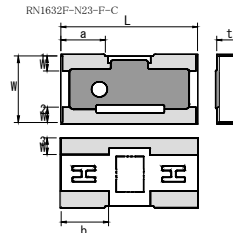
YOKOHAMA DENSHI SEIKO Co., Ltd.

Y branched PECL output terminating element (conventional type)

## <Specification>

Parameter	Specification
Resistance	R1=50Ω, R2=46.4Ω, R3=50Ω
Resistance tolerance	±1% (F)
TCR	±50ppm/°C (C)
Rated power	42mW/element, 125mW/network
Operating Temperature Range	-55~+125°C
Rated ambient temperature	70°C
Packaging	5,000pcs/reel

## <Dimensions>

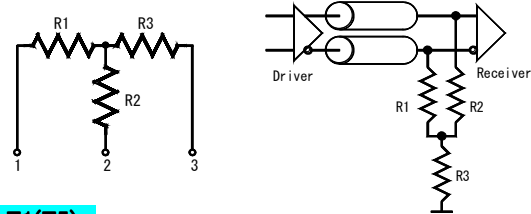


Symbol	Size (mm)
L	3.2±0.2
W	1.6±0.2
t	0.4±0.1
a	1.0±0.25
b	1.0±0.2
W1	0.55±0.25
W2	0.4±0.25
W3	0.4±0.2

## <Characteristics>

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.

## <Schematics>



## <Part number>

**RN1632F - N23 - B - T1(T5)**

Device Type

Resistance

TCR

Packaging form

T1: Taping (1,000pcs/reel)

T5: Taping (5,000pcs/reel)

# Chip Power Splitter



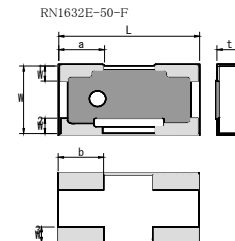
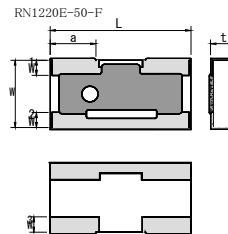
YOKOHAMA DENSHI SEIKO Co., Ltd.

Low frequency two-way power splitter from DC to 2GHz (conventional type)

## <Specification>

Parameter	RN1220E	RN1632E
Insertion loss	6±0.3dB	
VSWR	<1.3	
Frequency range	DC~2GHz	
Rated power	100mW	125mW
Resistance tolerance	±1% (F)	
Rated ambient temperature	70°C	
Operating Temperature Range	-55~+125°C	
Packaging	1,000・5,000pcs/reel	

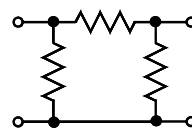
## <Dimensions>



## <Characteristics>

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.

## <Schematics>



Symbol	Size (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

## <Part number>

**RN1632E - 50 - F - T1(T5)**

Device Type

Resistance

Resistance T1: Taping (1,000pcs/reel)

Tolerance T5: Taping (5,000pcs/reel)



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# Thin Film Resistor



YOKOHAMA DENSHI SEIKO Co., Ltd.

+/-0.05% +/-5ppm Low noise and High Precision, High

Reliability

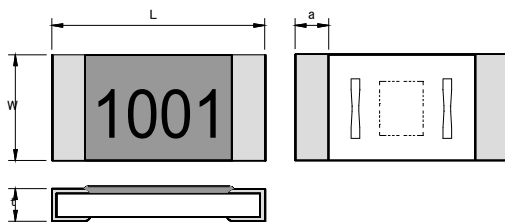


## <Specification>

Type	RN73 2X		RR1632				RR2632			
Size	2.0 × 1.25 × 0.4mm (0805)		3.2 × 1.6 × 0.4mm (1206)				3.2 × 2.6 × 0.4mm (1210)			
Rated power	1/10W		1/8W				1/4W			
Resistance tolerance	±0.1% (B) ±0.5% (D)									
Resistance Value Range (Ω)	511~100k	100~100k	100~200k	100~200k	51~1M	10~49.9	100~330k	100~330k	51~2M	10~49.9
TCR (ppm/°C)	±5 (V)	±10 (N)	±5 (V)	±10 (N)	±25 (P)	±50 (Q)	±5 (V)	±10 (N)	±25 (P)	±50 (Q)
Resistance Value series	E-24/E-96		E-24/E-96				E-24/E-96			
Voltage max	100V		150V				200V			
Packaging	1,000 · 5,000 · pcs/reel									

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

## <Dimensions>



Type	Size (mm)		
	RN73*2X	RR1632	RR2632
L	2.0±0.2	3.2±0.2	3.2±0.2
W	1.25±0.2	1.6±0.2	2.6±0.2
a	0.4±0.2	0.5±0.2	0.5±0.2
t	0.4±0.1	0.4±0.1	0.4±0.1



## <Schematics>



## <Characteristics>

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.

## <Part number>

**RR 1632 V - 1001 - B - T1(T5)**

Device Type

Size

TCR

Resistance

Resistance Tolerance

Packaging form

T1: Taping (1,000 pcs/reel)

T5: Taping (5,000 pcs/reel)



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# Low Resistance Value Chip Resistor



< 0.01 OHM to 4.7 OHM >

Standard size 1632(1206) , 2550(2010) , 3264(2412)



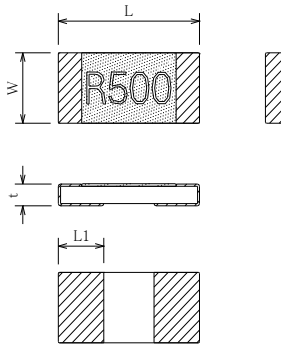
<Specification>

Type	RL1632	RL2550	RL3264
Size	3.2×1.6×0.5mm (1206)	5.0×2.5×0.5mm (2010)	6.4×3.2×0.5mm (2412)
Rated power	0.5W	0.75W	1.0W
Resistance Value Range	10mΩ ~ 4.7Ω		
Resistance Value series	E-24	E-12	E-12
Resistance tolerance	±2% (G)		
	±1% (F)		
	±0.5% (D)		
TCR	10~15mΩ ( 0~+500ppm/°C ) : T		
	18~27mΩ ( 0~+350ppm/°C ) : T		
	33~47mΩ ( 0~+200ppm/°C ) : S		
	56mΩ~4.7Ω ( ±100ppm/°C ) : R		
Operating Temperature Range	-40°C ~ +125°C		
Rated ambient temperature	70°C		



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

<Dimensions>



<Characteristics>

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.

Size	RL1632	RL2550	RL3264
L	3.2±0.2	5.0±0.2	6.4±0.2
W	1.6±0.2	2.5±0.2	3.2±0.2
L1	1.0±0.15	1.7±0.15	2.0±0.15
t	0.5±0.15	0.5±0.15	0.5±0.15

<Schematics>



<Part number>

RL	1632	R	-	R050	-	F	-	T1(T5)
Device Type	Size	TCR		Resistance example 10mΩ:R010 47mΩ:R047		Resistance Tolerance		Packaging form T1:Taping(1,000pcs/reel) T5:Taping(5,000pcs/reel)



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# Low Resistance Value Chip Resistor PRL YOKOHAMA DENSHI SEIKO Co., Ltd.

< Small & High Power >

0816(0603) 330mW ,,, 1220(0805) 660mW ,,, 1632(1206) 1W ,,, 3264(2412)2W ,,,



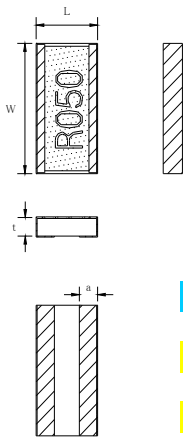
<Specification>

Type	PRL0816	PRL1220	PRL1632	PRL3264
Size	1.6×0.8×0.5mm (0603)	2.0×1.25×0.5mm (0805)	3.2×1.6×0.5mm (1206)	6.4×3.2×0.5mm (2412)
Rated power	330 mW	660 mW	1.0 W	2.0 W
Resistance Value Range	10 to 100mΩ	7 to 100mΩ	5 to 100mΩ	3 to 100mΩ
Resistance Value series	E-24 (10mΩ under : 1mΩ step)			
Resistance Tolerance	±5% ±2% ±1% ±0.5%	---	---	3 to 4mΩ 5 to 9mΩ 10 to 100mΩ 47 to 100mΩ
TCR (ppm/°C)	0to350 0to200 ±100 ±50	10 to 15mΩ 18 to 27mΩ 33 to 68mΩ 75 to 100mΩ	7 to 9mΩ 10 to 18mΩ 20 to 51mΩ 56 to 100mΩ	5 to 9mΩ 10 to 18mΩ 20 to 51mΩ 56 to 100mΩ
Rated ambient temperature	70°C			
Operating Temperature Range	-40°C to +125°C			



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

<Dimensions>



<Characteristics>

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.

TYPE	PRL0816	PRL1220	PRL1632	PRL3264
W	1.6±0.2	2.0±0.2	3.2±0.2	6.4±0.2
L	0.8±0.2	1.25±0.2	1.6±0.2	3.2±0.2
a	0.2±0.1	0.35±0.15	0.45±0.15	0.9±0.15
t	0.4±0.1	0.5±0.1	0.5±0.1	0.5±0.1

(mm)

<Schematics>



<Part number>

PRL	1632	-	R050	-	F	-	T1(T5)
Device Type	Size		Resistance example 10mΩ:R010 47mΩ:R047		Resistance Tolerance		Packaging form T1: Taping (1,000pcs/reel) T5: Taping (5,000pcs/reel)



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# 4 terminals High Precision Current

< 1m to 500mOHM , ±0.5% , ±50ppm/°C >

RoHS compliance

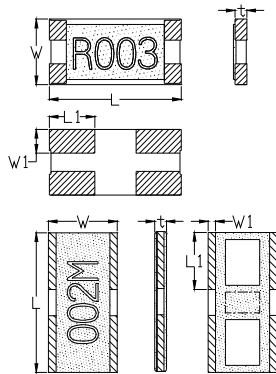
<Specification>

Type	RL1632L4	RL2550L4	RL3264L4	RL3264SW4
Size	3.2 × 1.6 × 0.5mm (1206)	5.0 × 2.5 × 0.5mm (2010)	6.4 × 3.2 × 0.5mm (2412)	3.2 × 6.4 × 0.5mm (1224)
Rated power	0.5W	0.75W	1.0W	2.0W
Resistance Value Range	10~500mΩ			1~10mΩ
Resistance tolerance	±0.5%(D) , ±1%(F)			
TCR (ppm/°C)	±50			±300 (1mΩ) ±200 (2~4mΩ) ±100 (5~10mΩ)
Operating Temperature Range	E-24 (50,500mΩ)			1,2,3,4,5,6,7,8,9,10mΩ
Rated ambient temperature	-40°C~+125°C			
Rated ambient temperature	70°C			



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

<Dimensions>



<Characteristics>

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.

Type	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	0.5±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

(mm)

<Schematics>



V = sensing terminal (voltage)  
I = current terminal

<Part number>

RL	1632	L4	-	R050	-	F	-	T1(T5)
Device Type	Size	terminal		Resistance example	Resistance Tolerance			Packaging form
				10mΩ:R010				T1: Taping(1,000pcs/reel)
				47mΩ:R047				T5: Taping(5,000pcs/reel)



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# KRL series Small & High Power Current Sensing Low R Value Resistor

## Metal Foil Low Resistance Value Resistor

### <KRL Short Terminal Series>



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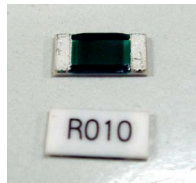
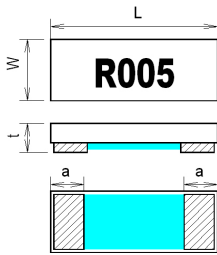
0510 (100mW) ~ 3264 (1.0W) Low TCR High Precision Low Inductance

#### <Specification>

Type	KRL0510	KRL0816	KRL1220	KRL1632	KRL2550	KRL3264
Size	0.5 × 1.0 × 0.5mm	0.8 × 1.6 × 0.5mm	1.25 × 2.0 × 0.5mm	1.6 × 3.2 × 0.5mm	2.5 × 5.0 × 0.5mm	3.2 × 6.4 × 0.5mm
	(0402)	(0603)	(0805)	(1206)	(2010)	(2512)
Rated Power	0.1W	0.2W	0.25W	0.5W	0.75W	1.0W
Resistance Value Range	20mΩ ~ 100mΩ	10mΩ ~ 100mΩ	5mΩ ~ 500mΩ			
Resistance Value Series	E-6	E-6	E-12	E-12	E-6	E-12
Resistance Tolerance	±2% (G)	5 ~ 9mΩ				
	±1% (F)	10mΩ ~				
TCR	5 ~ 9mΩ : ±100ppm/°C					
	10mΩ ~ : ±50ppm/°C					
Operating Temperature Range	Low-heat EMF type: -55 ~ +155°C (Code: M)			Low-heat EMF type: -55 ~ +155°C (Code: M)		
				High heat-safe type: -55 ~ +170°C (Code: C)		
Rated Ambient Temperature	70°C					

Consult us for further information

#### <Dimensions>



Type	Size(mm.)			
	L	W	t	a
KRL0510	1.0 ± 0.2	0.5 ± 0.2	0.5 ± 0.2	0.3 ± 0.2
KRL0816	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.2	0.3 ± 0.2
KRL1220	2.0 ± 0.2	1.25 ± 0.2	0.5 ± 0.2	0.4 ± 0.2
KRL1632	3.2 ± 0.2	1.6 ± 0.2	0.5 ± 0.2	0.4 ± 0.2 (9mΩ ~) 1.1 ± 0.2 (5 ~ 8mΩ ~)
KRL2550	5.0 ± 0.2	2.5 ± 0.2	0.5 ± 0.2	0.6 ± 0.2 (8mΩ ~) 1.4 ± 0.2 (5 ~ 7mΩ ~)
KRL3264	6.3 ± 0.2	3.1 ± 0.2	0.5 ± 0.2	1.0 ± 0.2 (9mΩ ~) 1.9 ± 0.2 (5 ~ 8mΩ ~)

#### <Features>

- 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 against short and pulse power allowing almost no waveform or impedance change.
- RoHS compliance and Halogen free.

#### <Schematics>



#### <Part Number>

<b>KRL</b>	<b>1632</b>	<b>-</b>	<b>M</b>	<b>-</b>	<b>R005</b>	<b>-</b>	<b>F</b>	<b>-</b>	<b>T1(T5)</b>
Device Type	Size		Operating Temperature Range		Resistance		Resistance Tolerance		Packaging Form
			M: Low-heat EMF type C: High heat-safe type		Ex. 10mΩ: R010				T1: Taping (1,000pcs/reel) T5: Taping (5,000pcs/reel)



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KRL series Small & High Power Current Sensing Low R Value Resistor



YOKOHAMA DENSHI SEIKO Co., Ltd.

# Metal Foil Low Resistance Value Resistor

## <KRL Long Terminal Series>

0510 (100mW) ~ 3264 (1.0W) Low TCR High Precision Low Inductance

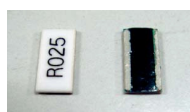
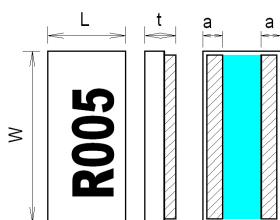
**RoHS Compliance**

### <Specification>

Type	KRL2012	KRL3216	KRL6432	KRL7638	KRL9045	KRL11050
Size	2.0 × 1.25 × 0.5mm (0805)	3.2 × 1.6 × 0.5mm (1206)	6.4 × 3.2 × 0.5mm (2512)	7.6 × 3.8 × 0.5mm (3015)	9.0 × 4.5 × 0.5mm (3518)	11.0 × 5.0 × 0.5mm (4320)
Rated Power	0.66W	1.0W	2.0W	3.0W	4.0W	5.0W
Resistance Value Range	1mΩ ~ 500mΩ					
Resistance Value Series	E-6	E-6	E-6	E-6	E-6	E-6
Resistance Tolerance	±5% (G)					
	±2% (G)					
	±1% (F)					
TCR	1 ~ 2mΩ : ±200ppm/°C					
	3 ~ 4mΩ : ±100ppm/°C					
	5mΩ ~ : ±50ppm/°C					
Operating Temperature Range	Low-heat EMF type: -55 ~ +155°C (Code: M)		Low-heat EMF type: -55 ~ +155°C (Code: M) High heat-safe type: -55 ~ +170°C (Code: C)			
Rated Ambient Temperature	70°C					

Consult us for further information

### <Dimensions>



Type	Size (mm.)				
	L	W	t	a	
KRL2012	1.25 ± 0.2	2.0 ± 0.2	0.5 ± 0.2	0.3 ± 0.2	(2mΩ ~)
				0.55 ± 0.2	(1mΩ)
KRL3216	1.6 ± 0.2	3.2 ± 0.2	0.5 ± 0.2	0.3 ± 0.2	(2mΩ ~)
				0.55 ± 0.2	(1mΩ)
KRL6432	3.1 ± 0.2	6.3 ± 0.2	0.5 ± 0.2	0.5 ± 0.2	(2mΩ ~)
				1.20 ± 0.2	(1mΩ)
KRL7638	3.8 ± 0.2	7.6 ± 0.2	0.5 ± 0.2	0.6 ± 0.2	(2mΩ ~)
				1.35 ± 0.2	(1mΩ)
KRL9045	4.5 ± 0.2	9.0 ± 0.2	0.5 ± 0.2	0.7 ± 0.2	(2mΩ ~)
				1.60 ± 0.2	(1mΩ)
KRL11050	5.0 ± 0.2	11.0 ± 0.2	0.5 ± 0.2	0.8 ± 0.2	(2mΩ ~)
				1.60 ± 0.2	(1mΩ)

### <Features>

- Flip-chip structure (no side edge electrode) minimizes mounting area.
- 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 against short and pulse power allowing almost no waveform or impedance change.
- RoHS compliance and Halogen free.

### <Schematics>



### <Part Number>

<b>KRL</b>	<b>3216</b>	<b>-</b>	<b>M</b>	<b>-</b>	<b>R005</b>	<b>-</b>	<b>F</b>	<b>-</b>	<b>T1(T5)</b>
Device Type	Size		Operating Temperature Range		Resistance		Resistance Tolerance		Packaging Form
			M: Low-heat EMF type C: High heat-safe type	Ex.	10mΩ: R010				T1: Taping (1,000pcs/reel) T5: Taping (5,000pcs/reel)



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ERL series Small & High Power Current Sensing Low R Value Resistor

# Metal Foil Low Resistance Value Resistor

## <ERL Short Terminal Series>



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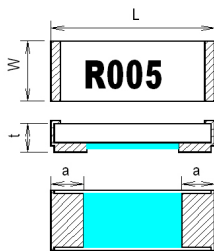
0510 (100mW) ~ 3264 (1.0W) Low TCR High Precision Low Inductance

<Specification>

Type	ERL0510	ERL0816	ERL1220	ERL1632	ERL2550	ERL3264
Size	0.5 × 1.0 × 0.5mm (0402)	0.8 × 1.6 × 0.5mm (0603)	1.25 × 2.0 × 0.5mm (0805)	1.6 × 3.2 × 0.5mm (1206)	2.5 × 5.0 × 0.5mm (2010)	3.2 × 6.4 × 0.5mm (2512)
Rated Power	0.1W	0.2W	0.25W	0.5W	0.75W	1.0W
Resistance Value Range	20mΩ ~ 100mΩ	10mΩ ~ 100mΩ	5mΩ ~ 500mΩ			
Resistance Value Series	E-6	E-6	E-12	E-12	E-6	E-12
Resistance Tolerance	±2% (G)		5~9mΩ			
	±1% (F)		10mΩ ~			
TCR	5~9mΩ : ±100ppm/°C					
	10mΩ ~ : ±50ppm/°C					
Operating Temperature Range	Low-heat EMF type : -55 ~ +155°C (Code: M)			Low-heat EMF type : -55 ~ +155°C (Code: M)		
				High heat-safe type : -55 ~ +170°C (Code: C)		
Rated Ambient Temperature	70°C					

Consult us for further information

<Dimensions>



Type	Size(mm.)			
	L	W	t	a
ERL0510	1.0 ±0.2	0.5 ±0.2	0.5 ±0.2	0.3 ±0.2
ERL0816	1.6 ±0.2	0.8 ±0.2	0.5 ±0.2	0.3 ±0.2
ERL1220	2.0 ±0.2	1.25 ±0.2	0.5 ±0.2	0.4 ±0.2
ERL1632	3.2 ±0.2	1.6 ±0.2	0.5 ±0.2	0.4 ±0.2 (9mΩ ~)
				1.1 ±0.2 (5~8mΩ ~)
ERL2550	5.0 ±0.2	2.5 ±0.2	0.5 ±0.2	0.6 ±0.2 (8mΩ ~)
				1.4 ±0.2 (5~7mΩ ~)
ERL3264	6.3 ±0.2	3.1 ±0.2	0.5 ±0.2	1.0 ±0.2 (9mΩ ~)
				1.9 ±0.2 (5~8mΩ ~)

<Features>

- 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 against short and pulse power allowing almost no waveform or impedance change.
- RoHS compliance and Halogen free.

<Schematics>



<Part Number>

ERL	1632	-	M	-	R005	-	F	-	T1(T5)
Device Type	Size		Operating Temperature Range		Resistance		Resistance Tolerance		Packaging Form
			M: Low-heat EMF type C: High heat-safe type		Ex. 10mΩ: R010				T1: Taping (1,000pcs/reel) T5: Taping (5,000pcs/reel)



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ERL series Small & High Power Current Sensing Low R Value Resistor  
**Metal Foil Low Resistance Value Resistor**  
**<ERL Long Terminal Series>**



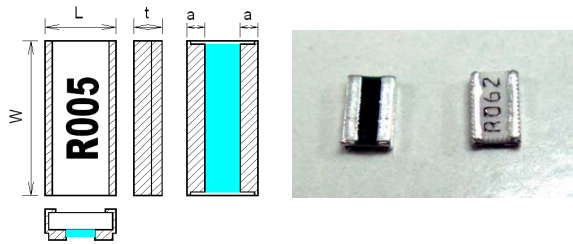
0510 (100mW) ~ 3264 (1.0W) Low TCR High Precision Low Inductance

<Specification>

Type	ERL2012	ERL3216	ERL6432	ERL7638	ERL9045	ERL11050
Size	2.0 × 1.25 × 0.5mm (0805)	3.2 × 1.6 × 0.5mm (1206)	6.4 × 3.2 × 0.5mm (2512)	7.6 × 3.8 × 0.5mm (3015)	9.0 × 4.5 × 0.5mm (3518)	11.0 × 5.0 × 0.5mm (4320)
Rated Power	0.66W	1.0W	2.0W	3.0W	4.0W	5.0W
Resistance Value Range	1mΩ ~ 500mΩ					
Resistance Value Series	E-6					
Resistance Tolerance	±5% (G) 1mΩ					
	±2% (G) 2mΩ					
	±1% (F) 3mΩ ~					
TCR	1~2mΩ : ±200ppm/°C					
	3~4mΩ : ±100ppm/°C					
	5mΩ ~ : ±50ppm/°C					
Operating Temperature Range	Low-heat EMF type: -55~+155°C (Code: M)		Low-heat EMF type: -55~+155°C (Code: M) High heat-safe type: -55~+170°C (Code: C)			
Rated Ambient Temperature	70°C					

Consult us for further information

<Dimensions>



Type	Size(mm.)			
	L	W	t	a
ERL2012	1.25 ± 0.2	2.0 ± 0.2	0.5 ± 0.2	0.3 ± 0.2 (2mΩ ~)
				0.55 ± 0.2 (1mΩ)
ERL3216	1.6 ± 0.2	3.2 ± 0.2	0.5 ± 0.2	0.3 ± 0.2 (2mΩ ~)
				0.55 ± 0.2 (1mΩ)
ERL6432	3.1 ± 0.2	6.3 ± 0.2	0.5 ± 0.2	0.5 ± 0.2 (2mΩ ~)
				1.20 ± 0.2 (1mΩ)
ERL7638	3.8 ± 0.2	7.6 ± 0.2	0.5 ± 0.2	0.6 ± 0.2 (2mΩ ~)
				1.35 ± 0.2 (1mΩ)
ERL9045	4.5 ± 0.2	9.0 ± 0.2	0.5 ± 0.2	0.7 ± 0.2 (2mΩ ~)
				1.60 ± 0.2 (1mΩ)
ERL11050	5.0 ± 0.2	11.0 ± 0.2	0.5 ± 0.2	0.8 ± 0.2 (2mΩ ~)
				1.60 ± 0.2 (1mΩ)

<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 against short and pulse power allowing almost no waveform or impedance change.
- RoHS compliance and Halogen free.

<Schematics>



<Part Number>

<b>ERL</b>	<b>3216</b>	<b>-</b>	<b>M</b>	<b>-</b>	<b>R005</b>	<b>-</b>	<b>F</b>	<b>-</b>	<b>T1(T5)</b>
Device Type	Size		Operating Temperature Range		Resistance		Resistance Tolerance		Packaging Form
			M: Low-heat EMF type C: High heat-safe type		Ex. 10mΩ: R010				T1: Taping (1,000pcs/reel) T5: Taping (5,000pcs/reel)



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# Pair Chip

Excellent Tracking performance



YOKOHAMA DENSHI SEIKO Co., Ltd.

Guaranteed matching performance: 0.1% absolute resistance, 5ppm/°C TCR. Small



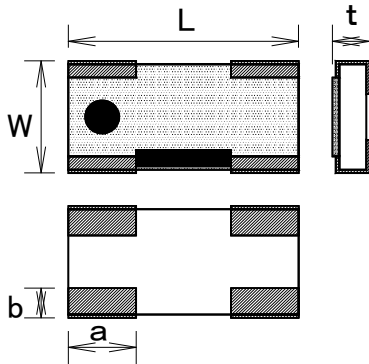
<Specification>

Type	RN0816	RN1220	RN1632
Size	1.6 x 0.8 x 0.4mm (0603)	2.0 x 1.25 x 0.4mm (0805)	3.2 x 1.6 x 0.4mm (1206)
Rated power	32mW/ element	50mW/ element	64mW/ element
Resistance Value Range	50Ω~15KΩ	50Ω~100KΩ	50Ω~200KΩ
Resistance tolerance	±0.5%(D) , ±0.1%(B)		
Tracking Resistance Tolerance	±0.2%(C) , ±0.1%(B)		
TCR	±25ppm/°C		
Tracking TCR	±10ppm/°C (N) , ±5ppm/°C (V)		
Operating Temperature Range	-55~+125°C		
Rated ambient temperature	+70°C		

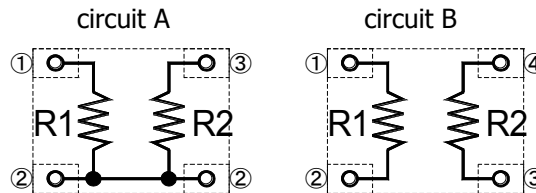


Contact us if you do not find what you need (resistance value, tolerance etc.) in our standard series resistors. Matching resistance +/-0.05% possible.

<Dimensions>



<Schematics>



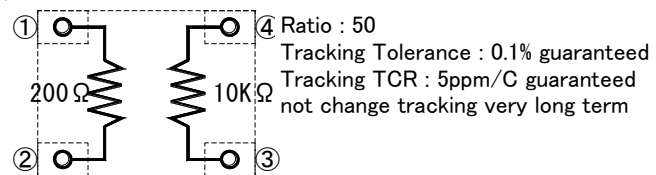
<Characteristics>

Two thin film paired resistors are formed on the same ceramic substrate at the same time and exhibits extraordinarily matching characteristics.

In addition to initial resistance value and TCR, excellent matching is maintained with environmental fluctuations and aging, offering a very long term matching performance.

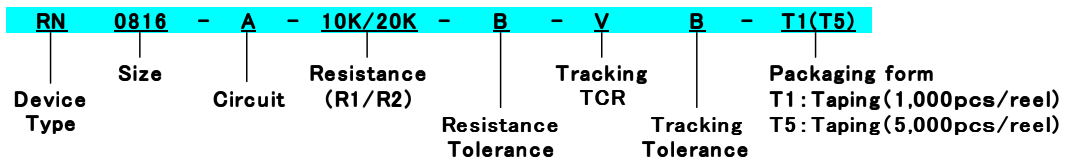
Thin film design offers low noise and high reliability. Wrap-around terminals offer easy and reliable mounting on PC boards.

Example



Type	RN0816	RN1220	RN1632
L	1.6±0.1	2.0±0.1	3.2±0.2
W	0.8±0.1	1.25±0.1	1.6±0.2
a	0.4±0.15	0.6±0.2	1.0±0.2
b	0.2±0.15	0.35±0.2	0.4±0.2
t	0.4±0.1	0.4±0.1	0.4±0.1 (mm)

<Part number>



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# Network Chip Resistor *Excellent Tracking performance*



YOKOHAMA DENSHI SEIKO Co., Ltd.

Guaranteed matching performance: 0.1% absolute resistance, 5ppm/CTCR offering good performance for complicated circuit.

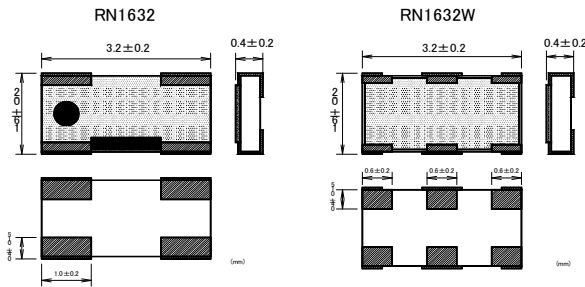


<Specification>

Type	RN1632		RN1632W			
Size	3.2 × 1.6 × 0.4mm (1206)		3.2 × 1.6 × 0.4mm (1206)			
Circuit	C	D	A	B	C	F
Number of terminal	4	4	6	6	6	6
Number of resistor	3	3	5	3	5	custom
Rated Power	42mW/element	42mW/element	25mW/element	42mW/element	25mW/element	custom
Resistance Range	50Ω ~ 110KΩ	50Ω ~ 110KΩ	150Ω ~ 33KΩ	50Ω ~ 110KΩ	150Ω ~ 33KΩ	custom
Resistance Tolerance	±0.5% (D), ±0.1% (B)		±0.5% (D), ±0.1% (B)			
Tracking Resistance Tolerance	±0.2% (C), ±0.1% (B)		±0.2% (C), ±0.1% (B)			
TCR	±25ppm/°C		±25ppm/°C			
Tracking TCR	±10ppm/°C (N), ±5ppm/°C (V)		±10ppm/°C (N), ±5ppm/°C (V)			
Operating Temperature Range	-55 ~ +125°C		-55 ~ +125°C			
Rated ambient temperature	+70°C		+70°C			

Contact us if you do not find what you need (resistance value, different circuits etc.) in our standard series resistors. Matching resistance +/-0.05% possible

<Dimensions>



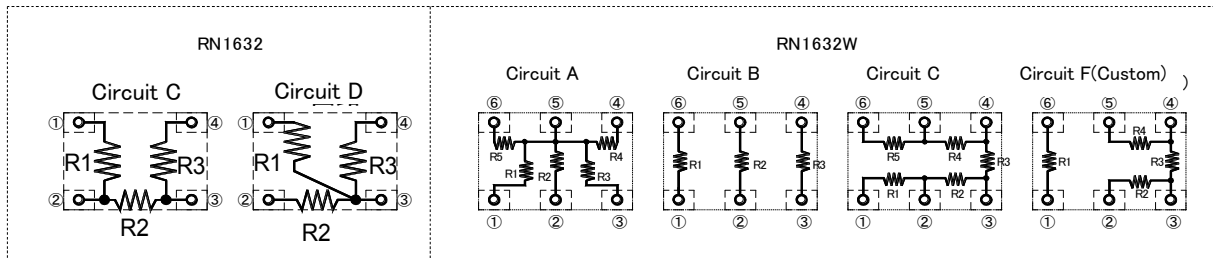
<Characteristics>

All thin film resistors are formed on the same ceramic substrate at the same time and demonstrates extraordinarily matching characteristics.

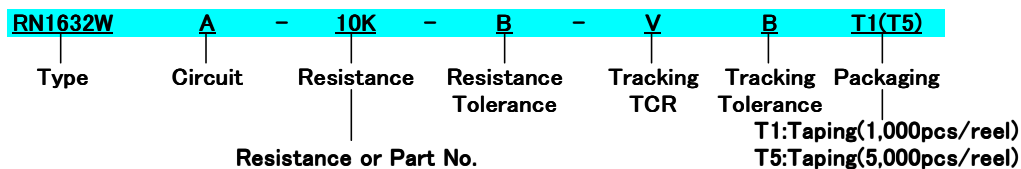
In addition to initial resistance value and TCR, excellent matching is maintained with environmental fluctuations and aging, offering a very long-term matching performance.

Thin film design offers low noise and high reliability. Wrap around terminals offer easy and reliable mounting on PC boards.

<Schematics>



<Part number>



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# Network Chip Resistor *Excellent Tracking performance*



YOKOHAMA DENSHI SEIKO Co., Ltd.

< Custom >



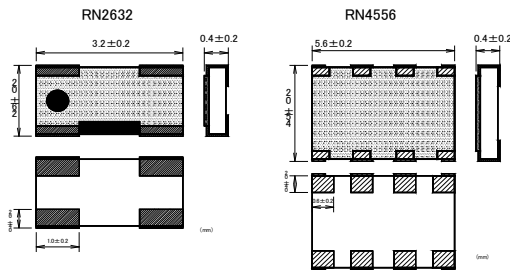
Fit for various applications. Guaranteed matching performance: 0.1% absolute resistance, 5ppm/C TCR offering a good performance for complicated circuits.

< Specification >

Type	RN2632				RN4556			
Size	3.2 × 2.6 × 0.4mm (1210)				5.6 × 4.5 × 0.4mm (1206)			
Circuit	A	B	C	D	A	B	C	F
Number of terminal	3	4	4	4	8	8	8	8
Number of resistor	2	2	3	3	6	4	7	custom
Rated Power	250mW/package				500mW/package			
Resistance Range	50 Ω ~ Total Resistance max1M Ω /package				50 Ω ~ Total Resistance max2M Ω /package			
Resistance Tolerance	±0.5%(D) , ±0.1%(B)				±0.5%(D) , ±0.1%(B)			
Tracking Resistance Tolerance	±0.2%(C) , ±0.1%(B)				±0.2%(C) , ±0.1%(B)			
TCR	±25ppm/°C				±25ppm/°C			
Tracking TCR	±10ppm/°C(N) , ±5ppm/°C(V)				±10ppm/°C(N) , ±5ppm/°C(V)			
Operating Temperature Range	-55 ~ +125°C				-55 ~ +125°C			
Rated ambient temperature	+70°C				+70°C			

Contact us if you do not find what you need (resistance value, different circuits etc.) in our standard series resistors. Matching resistance +/-0.05% possible

< Dimensions >



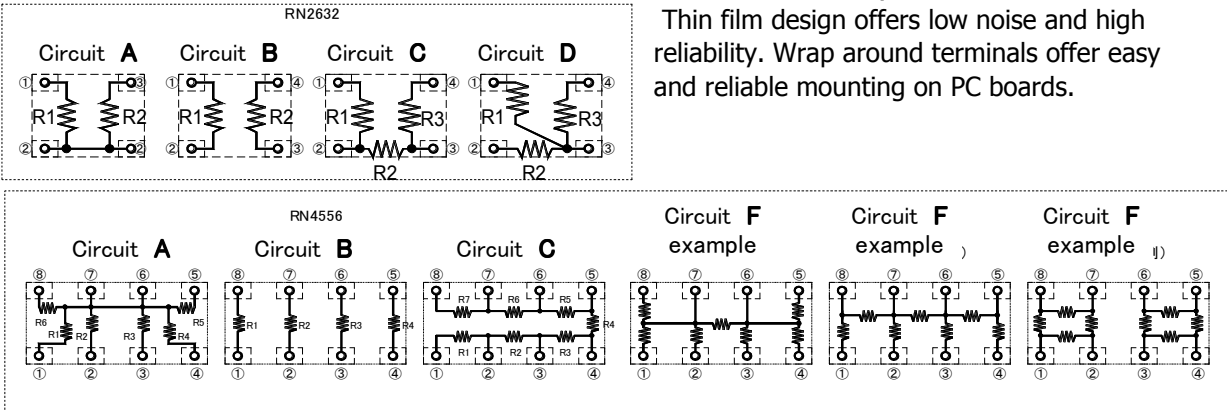
< Characteristics >

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

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.

< Schematics >



< Part number >

**RN2632 A - 10K - B - V B T1(T5)**

Type    Circuit    Resistance    Resistance Tolerance    Tracking TCR    Tracking Tolerance    Packaging

Resistance or Part No.

T1 : Taping (1,000pcs/reel)  
T5 : Taping (5,000pcs/reel)



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# Network Chip Resistor *Excellent Tracking performance*



## < RA series >

High density multi-resistive element network with gold-plated embossed terminal offering a high precision, high reliability

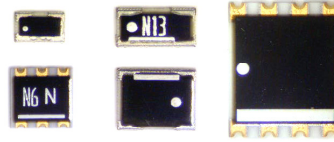
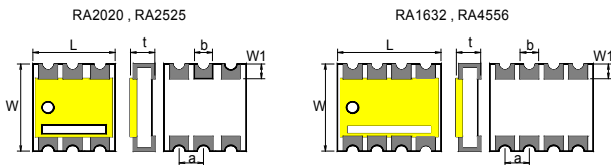


## < Specification >

type	RA1632	RA2020	RA2525	RA4556
Size	3.2×1.6×0.5mm (1206)	2.0×2.0×0.4mm (0808)	2.5×2.5×0.4mm (1010)	5.6×4.5×0.8mm (2218)
Number of terminal	8	6	6	8
Number of resistor	4	3	3	4
Resistance Range	50~100 kΩ	100~120 kΩ	100~180 kΩ	50~500kΩ
Rated Power	30mW/element	42mW/element		50mW/element
Resistance Tolerance	±0.1% (B) , ±0.5% (D)			
Tracking Resistance Tolerance	±0.1%(B) , ±0.2% (C)			
TCR	±25ppm/°C			
Tracking TCR	±5ppm/°C (V) , ±10ppm/°C (N)			
Operating Temperature Range	-55°C ~ +125°C			
Rated ambient temperature	+70°C			

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

## < Dimensions >



Type	RA2020	RA2525	RA4556	RA1632
L	2.0±0.2	2.54±0.2	5.6±0.2	3.2±0.1
W	2.0±0.2	2.54±0.2	4.5±0.2	1.6±0.1
t	0.4±0.1	0.4±0.1	0.5±0.2	0.4±0.1
b	0.36±0.1	0.43+0.1/-0.05	1.1±0.1	0.6±0.2
a	0.72±0.1	0.86±0.25	1.4±0.1	0.8±0.1
W1	0.4±0.25	0.5±0.2	1.0±0.2	0.4±0.2

(mm)

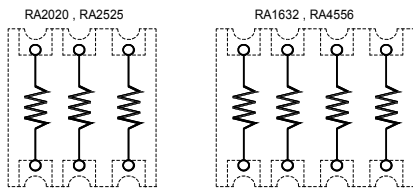
## < Characteristics >

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 changing solder composition. It is more reliable and can be stored longer than tin finished products offering less post-soldering terminal problems.

This film design offers low noise and high reliability.

## < Schematics >



## < Part number >

RA	1632	-	10K	-	B	-	V	B	-	T1(T5)
Device Type	Size	Resistance	Resistance Tolerance	Tracking TCR	Tracking Resistance	Packaging form				
						T1: Taping (1,000pcs/reel)	T5: Taping (5,000pcs/reel)			



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< Foot Print >



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# Recommended land patterns <1/2>

Recommended land patterns for the products in this catalogue are shown here. These patterns are for typical substrates and circuits. Please give consideration to your substrate characteristics and other conditions when designing land patterns. Please contact us with any questions you might have.

Type	Page	Figure	Dimensions (mm)						Figure
			A	B	C	D	E	F	
PXV1220S	2	1	0.6	0.8	0.3	0.3	2	0.2 to 0.5	Figure -1 
PBV1632	2	1	1	1.2	0.4	0.8	3.2	0.2 to 0.5	
PAT0510	3	1	0.2 to 0.4	0.3	0.25	0.5	0.7 to 1.1	0 to 0.3	
PAT0816	3	1	0.4	0.8	0.2	0.4	1.6	0.2 to 0.4	
PAT1220	3	1	0.6	0.8	0.3	0.3	2	0.2 to 0.5	
PAT1632	3	1	1	1.2	0.4	0.8	3.2	0.2 to 0.5	
PAT3042S	3	1	0.5	3.2	0.9	1.2	4.2	0.2 to 0.5	Figure -2 
PCH1632	5	1	1	1.2	0.4	0.8	3.2	0.2 to 0.5	
RN1632F-N23	10	1	1	1.2	0.4	0.8	3.2	0.2 to 0.5	
RN1220E	10	1	0.6	0.8	0.3	0.3	2	0.2 to 0.5	
RN1632E	10	1	1	1.2	0.4	0.8	3.2	0.2 to 0.5	
PCS0816S	6	2	0.4	0.8	0.2	0.4	1.6	0.2 to 0.4	
PCS1220S	6	2	0.6	0.8	0.3	0.3	2	0.2 to 0.5	
PCS1632S	6	2	1	1.2	0.4	0.8	3.2	0.2 to 0.5	
PCS3042S	6	2	0.5	3.2	0.9	1.2	4.2	0.2 to 0.5	
PCS1005	7	3	0.65	0.2	0.15	0.5			
PCS1608	7	3	1.1	0.3	0.2	0.8			
PCS2012	7	3	1.5	0.3	0.2	2			Figure -4 
PCS3216	7	3	2.7	0.3	0.2	1.6			
PCS5025	7	3	4.3	0.4	0.3	2.5			
PCS6432	7	3	5.7	0.4	0.3	3.2			
ELT1608	8	4	0.5	0.8	0.4	0.4			
ELT2012	8	4	0.8	0.7	0.7	0.5			
ELT3216	8	4	1.1	1.2	0.7	0.8			Figure -5 
RN0816	15	4	0.5	0.8	0.4	0.4			
RN1220	15	4	0.8	0.7	0.7	0.5			
RN1632	15 16	4	1.1	1.2	0.7	0.8			
RN2632	17	4	1.1	1.2	0.7	1.8			
RN1632W	16	5	0.5	0.85	0.7	0.8			
RN4556	17	6	0.6	1	0.8	3.5			



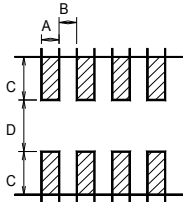
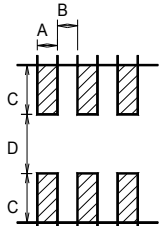
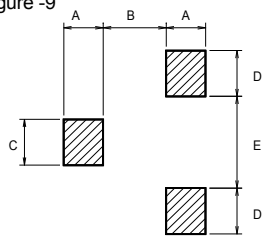
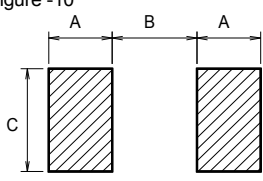
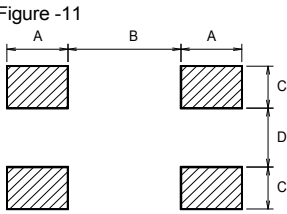
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# Recommended land patterns <2/2>

Recommended land patterns for the products in this catalogue are shown here. These patterns are for typical substrates and circuits. Please give consideration to your substrate characteristics and other conditions when designing land patterns. Please contact us with any questions you might have.

Type	Page	Figure	Dimensions (mm)						Figure
			A	B	C	D	E	F	
RA1632	18	7	0.25 to 0.3	0.5 to 0.55	0.9	0.6			Figure -7 
RA4556	18	7	0.8 to 0.9	0.5 to 0.6	1.8	2.5			
RA2020	18	8	0.4	0.32	0.8	0.8			Figure -8 
RA2525	18	8	0.5	0.36	0.8	1.5			
PS1005	9	9	0.3	0.2	0.4	0.35	0.35		Figure -9 
PS1608	9	9	0.3	0.5	0.45	0.55	0.55		
PS2012	9	9	0.4	0.85	0.45	0.4	1.3		
PS3216	9	9	0.4	1.2	0.7	0.8	0.52		
PS5025	9	9	0.4	2.1	0.7	0.7	1		
RN73 2X	11	10	0.6	1.2	1.2				Figure -10 
RR1632	11	10	0.6	2.4	1.6				
RR2632	11	10	0.6	2.4	2.6				
RL1632	12	10	1.6	1.2	2				Figure -11 
RL2550	12	10	2.7	1.6	3				
RL3264	12	10	3	2.4	4				
PRL0816	13	10	1	0.4	2				
PRL1220	13	10	1.2	0.55	2.5				
PRL1632	13	10	1.4	0.7	4				
PRL3264	13	10	2	1.6	7.5				
RL1632L4	14	11	1	2.2	1.1	0.5			
RL2550L4	14	11	3.4	2.6	1.8	0.7			
RL3264L4	14	11	4.2	2.2	2.4	0.8			
RL3264SW4	14	11	5.4	1	2.4	2.2			

