



# High Precision Chip Attenuators

## ■ PAT series

### Features

- One chip attenuator covers wide frequency range.
- Wrap around terminal similar to regular chip resistors makes it easy to mount.
- Sizes from 1005 to 3042 are offered, which contribute to miniaturization of devices.

### Applications

- Cell phone base stations
- Wireless communication modules
- Wide band measurement instrumentation



## ◆ Part numbering system

**PAT 1632 - C - 3dB - T1**

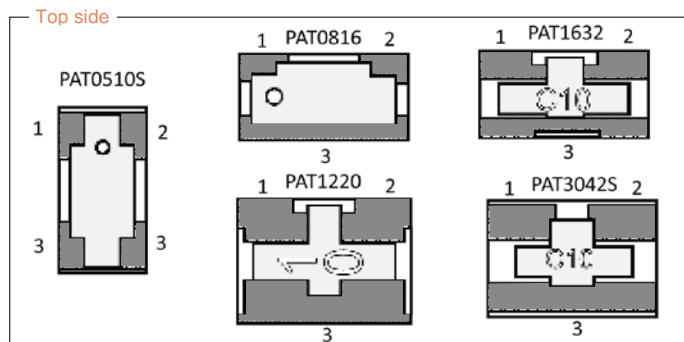
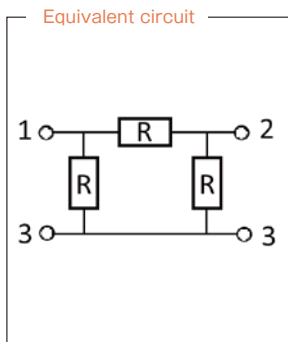
Series code Size : PAT0510S, PAT0816 PAT1220, PAT1632, PAT3042S	Impedance: C=50Ω D=75Ω	Packing quantity: T=Tape (T10/T1/T2/T5), B=Bulk Attenuation : 2 digit
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## ◆ Electrical Specification

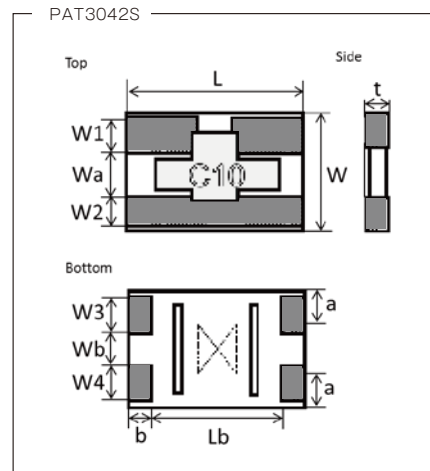
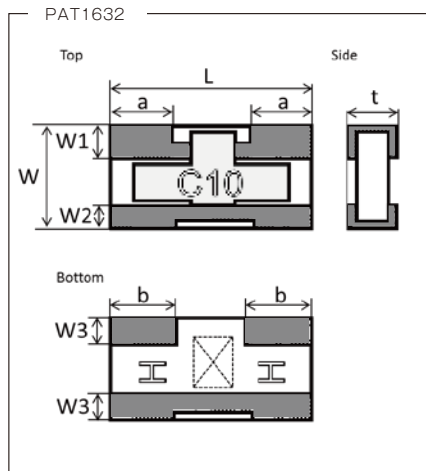
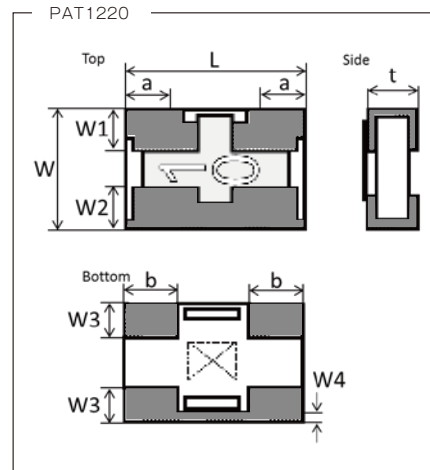
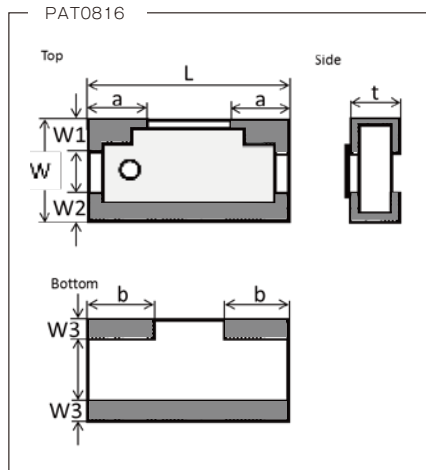
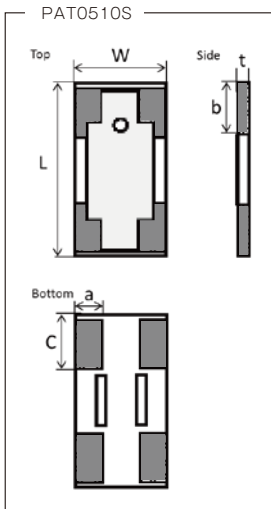
Type	PAT0510S			PAT0816			PAT1220	PAT1632		PAT3042S	
<b>Attenuation</b>	0 ~ 3dB (1dB step)	4 ~ 7dB (1dB step)	8 ~ 10dB (1dB step)	0 ~ 3dB (1dB step)	4 ~ 7dB (1dB step)	8 ~ 10dB (1dB step)	0 ~ 10dB (1dB step)	0 ~ 10dB (1dB step)	16dB	0 ~ 10dB (1dB step)	16,20dB
<b>Attenuation tolerance</b>	±0.3dB	±0.5dB	±0.7dB	±0.3dB	±0.5dB	±0.7dB	±0.3dB	±0.3dB	±0.5dB	±0.3dB	±0.5dB
<b>Impedance</b>	50Ω(C)			50Ω(C)				50Ω(C)		50Ω(C), 75Ω(D)	
<b>VSWR</b>	<1.3			<1.3(~6GHz), <1.5(6~10GHz)			<1.3	<1.3		<1.2(50Ω), <1.3(75Ω)	
<b>Operating frequency</b>	DC ~ 10GHz			DC ~ 10GHz				DC ~ 3GHz		50Ω: DC ~ 3GHz 75Ω: DC ~ 2GHz	
<b>Rated power</b>	32mW			64mW			100mW	125mW		250mW	
<b>Rated operating temperature</b>	70°C										
<b>Operating temperature</b>	-55°C~+125°C										
<b>Packaging quantity</b>	10,000pcs/reel (T10)							100pcs/Bag (B) 1,000pcs/reel (T1) 5,000pcs/reel (T5)		50pcs/Bag (B) 1,000pcs/reel (T1) 2,000pcs/reel (T2)	

High frequency surface mount components  
PAT series

## ◆ Equivalent Circuit and pin arrangement



◆ Dimensions



Type	Size (inch)	L	W	t	a	c	b
PAT0510S	0402	1.00±0.05	0.50±0.05	0.34±0.05	0.12±0.04	0.27±0.05	0.25±0.05

(unit : mm)

Type	Size (inch)	L	W	t	a	b	W1	W2	W3	W4
PAT0816	0603	1.60±0.10	0.80±0.10	0.40±0.10	0.50±0.15	0.50±0.10	0.25±0.10	0.15±0.10	0.20±0.10	—
PAT1220	0805	2.00±0.10	1.25±0.10	0.40±0.10	0.50±0.20	0.60±0.20	0.40±0.20	0.40±0.20	0.35±0.20	< 0.25
PAT1632	1206	3.20±0.20	1.60±0.20	0.40±0.10	1.00±0.25	1.00±0.25	0.55±0.25	0.40±0.25	0.40±0.20	—

(unit : mm)

Type	Size (inch)	L	W	t	a	b	Lb
PAT3042S 50Ω(C)	1612	4.20±0.20	3.00±0.20	0.80±0.15	0.80±0.20	0.50±0.20	3.10±0.20
PAT3042S 75Ω(D)	1612	4.20±0.20	3.00±0.20	0.80±0.15	0.80±0.20	0.30±0.20	3.50±0.20

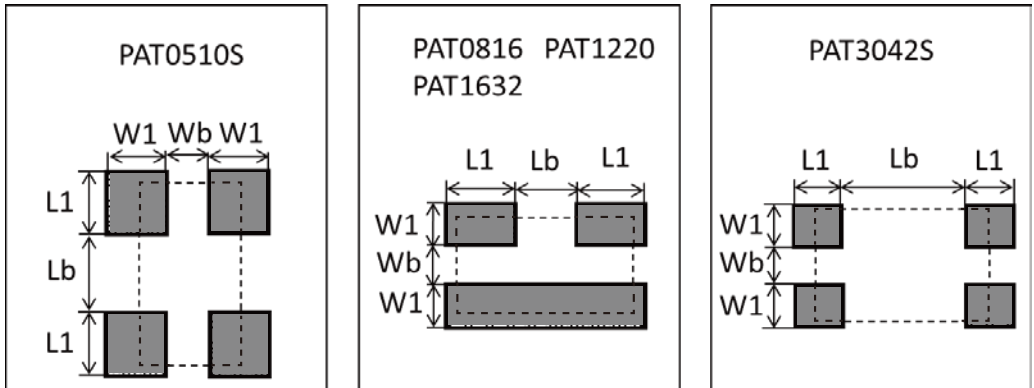
Type	W1	W2	Wa	W3	W4	Wb
PAT3042S 50Ω(C)	0.95±0.20	0.80±0.20	1.05±0.20	0.95±0.20	0.95±0.20	0.95±0.20
PAT3042S 75Ω(D)	0.55±0.20	0.60±0.20	1.55±0.20	0.55±0.20	0.60±0.20	1.55±0.20

(unit : mm)

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### ◆ Recommended land patterns(soldering footprints)



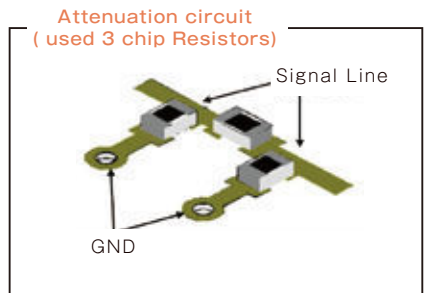
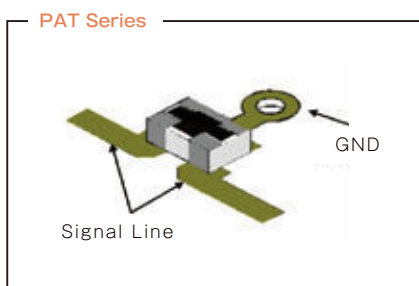
Size	W1	Wb	L1	Lb
PAT0510S	0.30	0.20	0.35	0.37
PAT0816	0.40	0.30	0.60	0.50
PAT1220	0.70	0.50	0.80	0.70
PAT1632	0.80	0.65	1.20	1.00
PAT3042S (50Ω)	1.10	0.90	1.20	2.90
PAT3042S (75Ω)	1.00	1.10	1.00	3.30

(unit : mm)

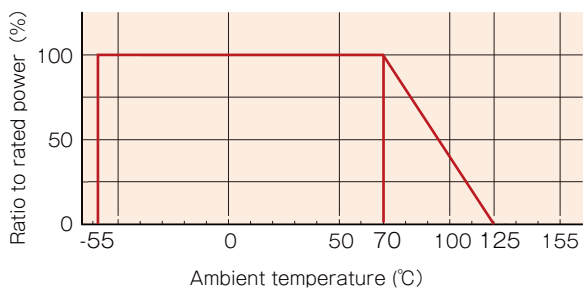
### ◆ Benefits of PAT series

Three resistive elements are integrated inside of this chip attenuator. If you use discrete resistors to construct an attenuator, 3 resistors are needed. The merits of one attenuator displacing 3 resistors are:

- 1) Three precision resistors are integrated as an attenuator. Therefore, precision attenuation can be easily achieved with this attenuator.
- 2) Because 3 elements are integrated in a small area, parasitic capacitance and inductance are minimized and desired attenuation can be easily attained.
- 3) One attenuator can replace 3 discrete resistors, which contributes miniaturizing the circuit and makes the circuit more reliable



### ◆ Derating Curve



◆ High frequency characteristics

