

High Precision Chip Attenuators

■PAT series

Lead free　Halogen free　RoHS Compliance

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

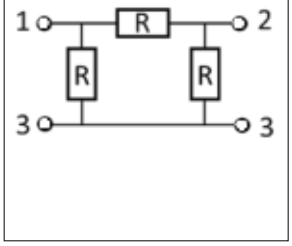
- PAT — Series code
- 1632 — Size : PAT0510S, PAT0816, PAT1220, PAT1632, PAT3042S
- C — Impedance: C=50Ω D=75Ω
- 3dB — Attenuation : 2 digit
- T1 — Packing quantity: T=Tape (T10/T1/T2/T5), B=Bulk

◆Electrical Specification

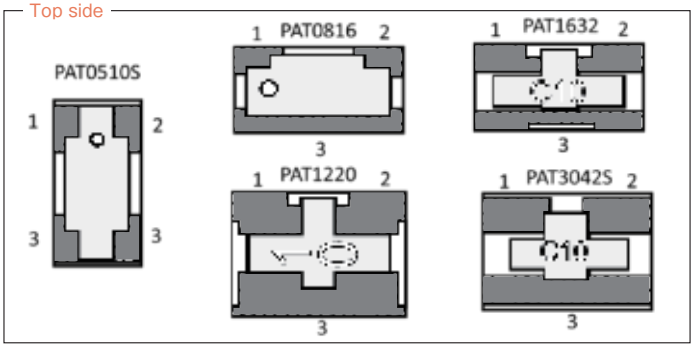
Type	PAT0510S			PAT0816			PAT1220	PAT1632		PAT3042S	
Attenuation	0～3dB (1dB step)	4～7dB (1dB step)	8～10dB (1dB step)	0～3dB (1dB step)	4～7dB (1dB step)	8～10dB (1dB step)	0～10dB (1dB step)	0～10dB (1dB step)	16dB	0～10dB (1dB step)	16,20dB
Attenuation tolerance	±0.3dB	±0.5dB	±0.7dB	±0.3dB	±0.5dB	±0.7dB	±0.3dB	±0.3dB	±0.5dB	±0.3dB	±0.5dB
Impedance	50Ω(C)			50Ω(C)				50Ω(C)		50Ω(C), 75Ω(D)	
VSWR	<1.3			<1.3(～6GHz), <1.5(6～10GHz)			<1.3	<1.3		<1.2(50Ω), <1.3(75Ω)	
Operating frequency	DC～10GHz			DC～10GHz				DC～3GHz		50Ω: DC～3GHz 75Ω: DC～2GHz	
Rated power	32mW			64mW			100mW	125mW		250mW	
Rated operating temperature	70℃										
Operating temperature	−55℃~+125℃										
Packaging quantity	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)	

◆Equivalent Circuit and pin arrangement

Equivalent circuit

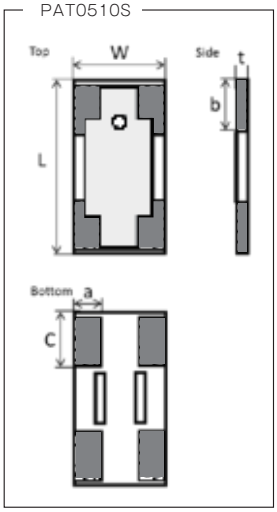


Top side

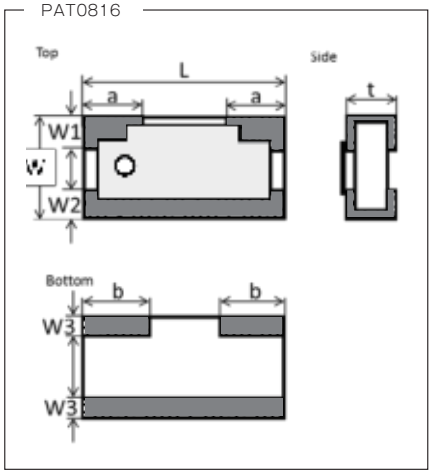


◆Dimensions

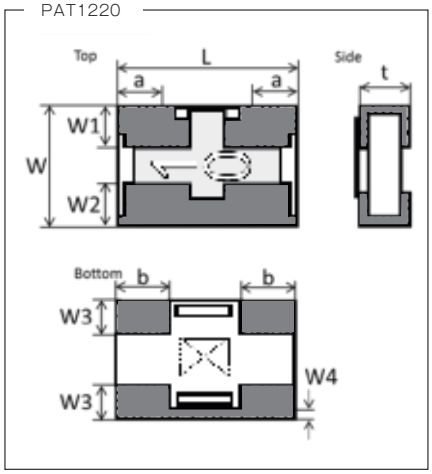
PAT0510S



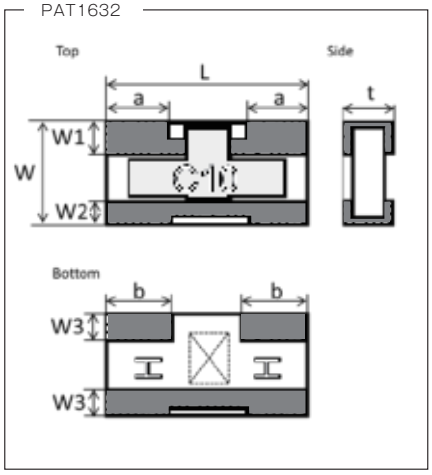
PAT0816



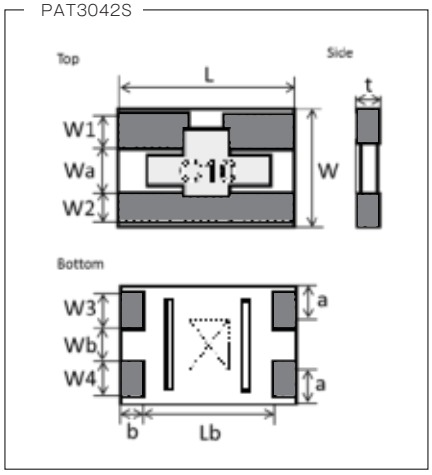
PAT1220



PAT1632



PAT3042S



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

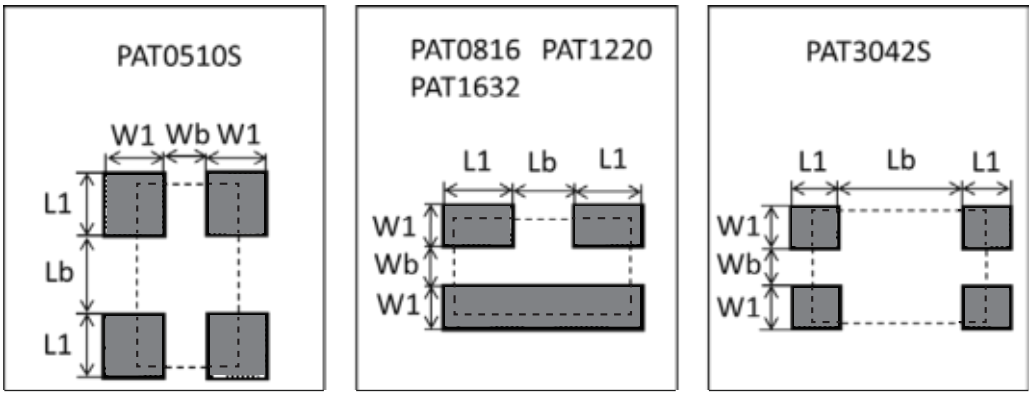
Type	W1	W2	Wa	W3	W4	Wb
PAT3042S 50Ω(C)	0.95±0.20	0.80±0.20	1.05±0.20	0.95±0.20	0.95±0.20	0.95±0.20
PAT3042S 75Ω(D)	0.55±0.20	0.60±0.20	1.55±0.20	0.55±0.20	0.60±0.20	1.55±0.20

(unit : mm)

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◆Recommended land patterns(soldering footprints)



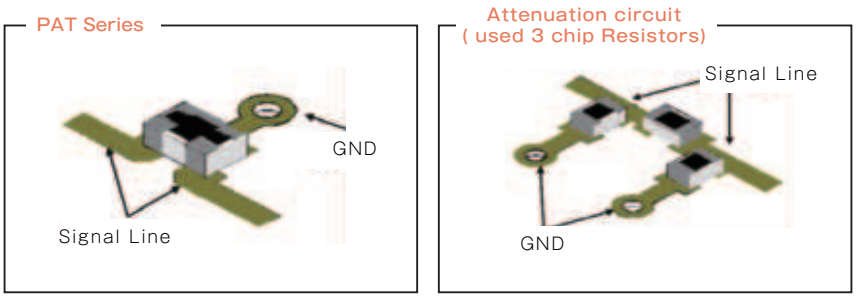
Size	W1	Wb	L1	Lb
PAT0510S	0.30	0.20	0.35	0.37
PAT0816	0.40	0.30	0.60	0.50
PAT1220	0.70	0.50	0.80	0.70
PAT1632	0.80	0.65	1.20	1.00
PAT3042S (50Ω)	1.10	0.90	1.20	2.90
PAT3042S (75Ω)	1.00	1.10	1.00	3.30

(unit : mm)

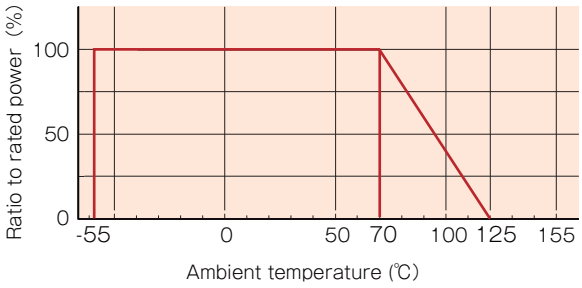
◆Benefits of PAT series

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

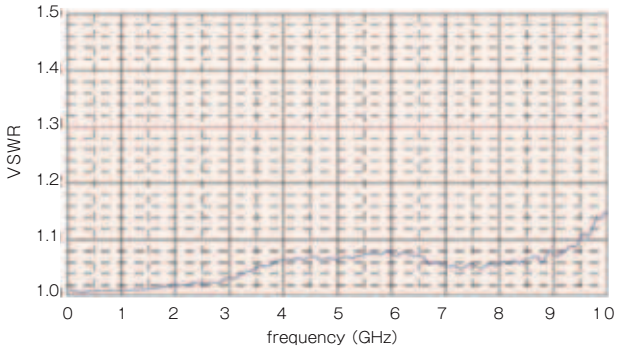


◆Derating Curve

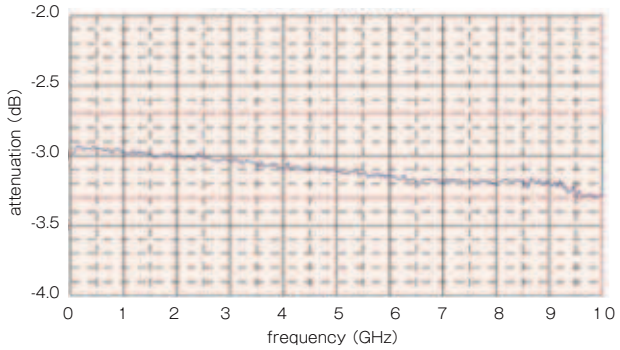


◆High frequency characteristics

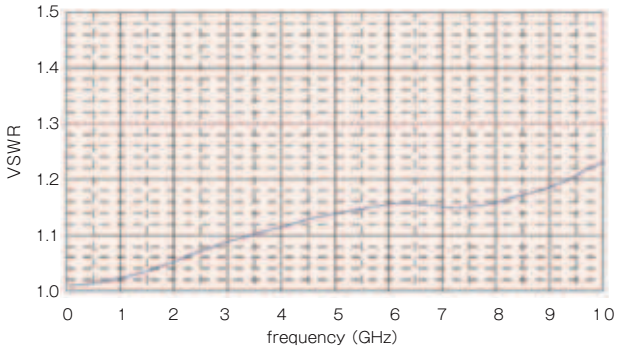
PAT0816 3dB VSWR



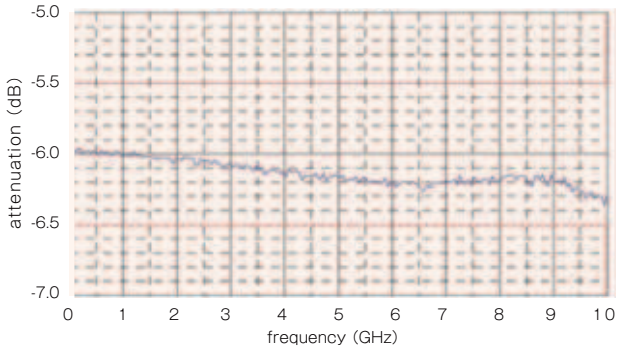
PAT0816 3dB attenuation



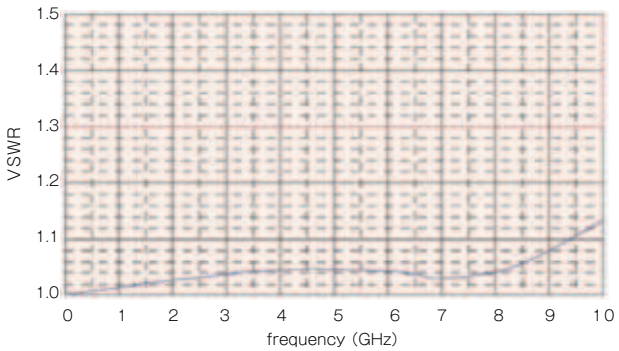
PAT0816 6dB VSWR



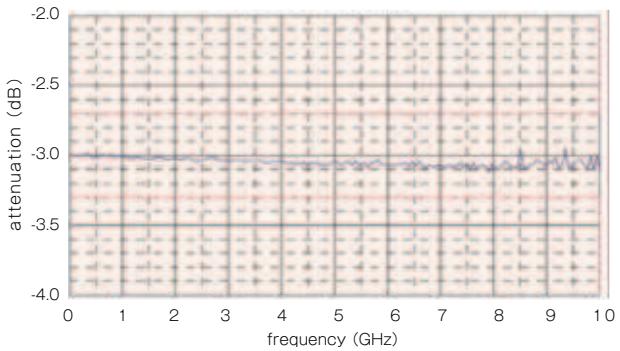
PAT0816 6dB attenuation



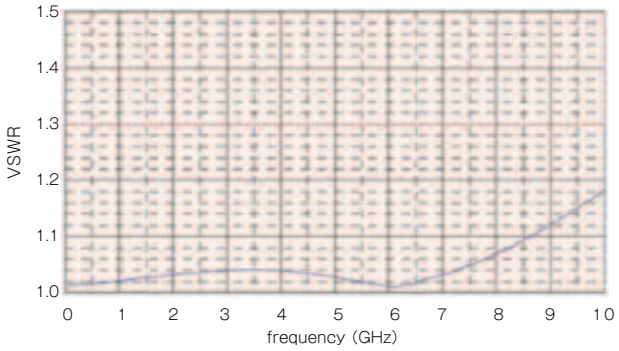
PAT1220 3dB VSWR



PAT1220 3dB attenuation



PAT1220 6dB VSWR



PAT1220 6dB attenuation

