

Thermo-variable Chip Attenuators

■ P*V Series

Features

- Simple solution for compensation for the temperature drift of GaAs amplifier
- Resistive construction allows operation in wide frequency range
- Ten different attenuation x 8 or 9 temperature characteristics: over 80 different offerings to meet any amplifier characteristics.

Applications

- Cell phone base station
- Wireless remote controller



*Except for Chinese RoHS

◆ Part numbering system

PXV 1220S - 6dB N1 - T

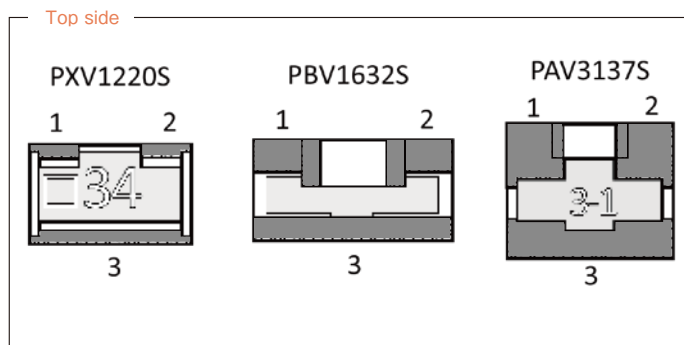
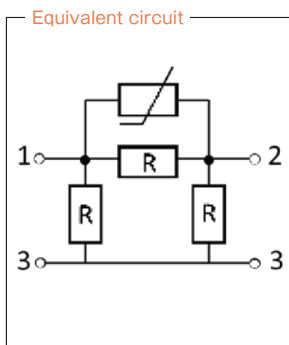
| | | | |
|---------------------------------------|--|--|--|
| Series code | | | Packing quantity: T=Tape(T02, T1), B=Bulk |
| Size : PXV1220S, PBV1632S PAV3137S | | | Sensitive characteristic: N1~N9 |
| | | | Attenuation : 2 digit |

◆ Electrical Specification

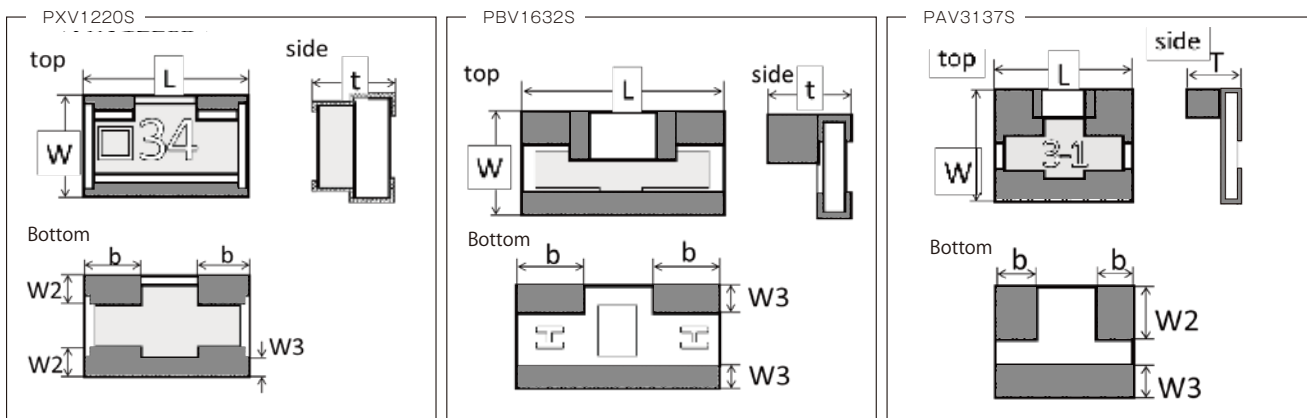
| Type | PXV1220S | PBV1632S | PAV3137S |
|--------------------------------|---|---|---|
| Attenuation | 1 ~ 10dB (1dB Step) | 1 ~ 10dB, 16dB (1dB Step) | 1 ~ 10dB (1dB Step) |
| Attenuation tolerance | ±0.5dB(@25°C, no load) | | |
| Impedance | 50Ω | | |
| VSWR | <1.3 | | |
| Termo Sensitive characteristic | N1 ~ N9 (1db ~ 3dB) N1 ~ N8 (4db ~ 10dB) | N1 ~ N9 (1db ~ 3dB) N1 ~ N8 (4db ~ 16dB) | N1 ~ N9 (1db ~ 3dB) N1 ~ N8 (4db ~ 10dB) |
| Operating frequency | DC ~ 3GHz | | DC ~ 6GHz |
| Rated power | 63mW | 100mW | 2W |
| Operating temperature | -40°C~+100°C | | -40°C~+125°C |
| Packaging quantity | 100pcs/bag(B) 200pcs/reel (T02) 1000pcs/reel (T1) | 20pcs/bag (B) 1,000pcs/reel (T1) | |

High frequency surface mount components
P*V series

◆ Equivalent Circuit and pin arrangement



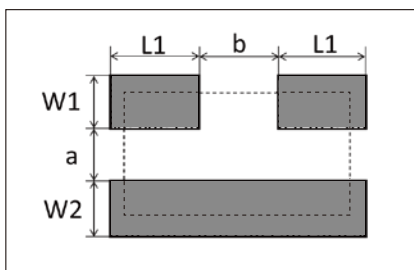
◆ Dimensions



| Type | Size (inch) | L | W | t | b | W2 | W3 |
|----------|-------------|-----------|-----------|--------|-----------|-----------|-----------|
| PXV1220S | 0805 | 2.00±0.20 | 1.25±0.20 | 1.1max | 0.65±0.20 | 0.38±0.20 | 0.25±0.35 |
| PBV1632S | 1206 | 3.20±0.20 | 1.60±0.20 | 1.5max | 1.00±0.20 | — | 0.40±0.35 |
| PAV3137S | 1512 | 3.70±0.20 | 3.10±0.20 | 1.5max | 1.00±0.20 | 1.50±0.20 | 0.85±0.20 |

(unit : mm)

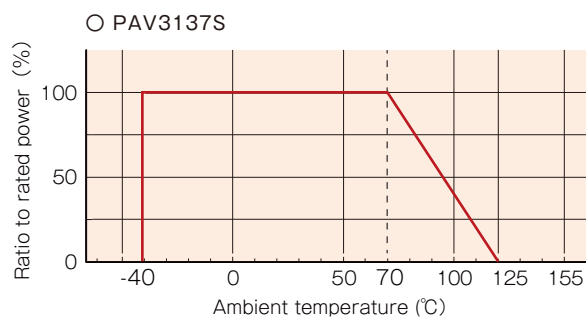
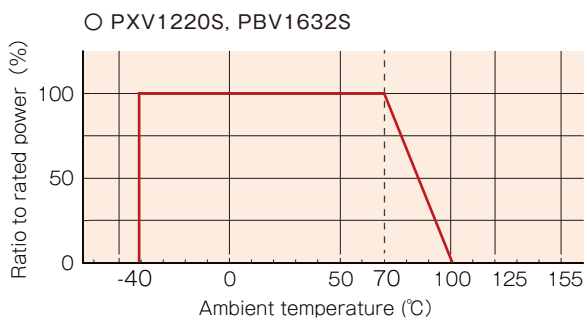
◆ Recommended land patterns(soldering footprints)



| Type | W1 | W2 | a | L1 | b |
|----------|------|------|------|------|------|
| PXV1220S | 0.70 | 0.70 | 0.50 | 0.80 | 0.70 |
| PBV1632S | 0.80 | 0.80 | 0.70 | 1.20 | 1.00 |
| PAV3137S | 1.55 | 1.15 | 0.60 | 1.25 | 1.50 |

(unit : mm)

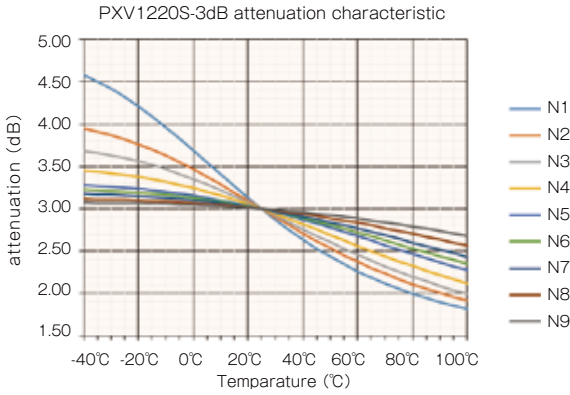
◆ Derating Curve



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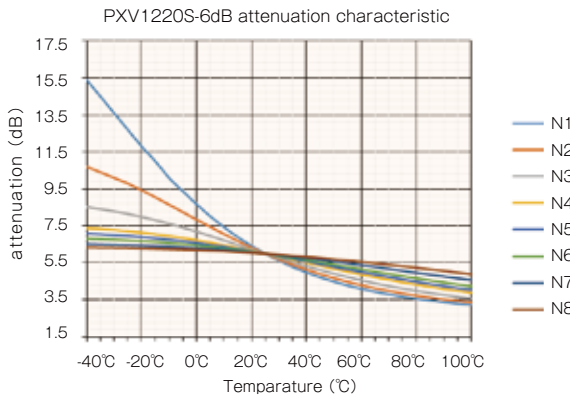
◆ Attenuation amount temperature characteristic



PXV1220S-3dB-N*

| Temperature | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 | N9 |
|--------------------------------|----------|---------|---------|----------|----------|----------|----------|----------|----------|
| -40 ~ +25°C | -0.0243 | -0.0146 | -0.0105 | -0.00693 | -0.00433 | -0.0035 | -0.00273 | -0.0018 | -0.00117 |
| +25 ~ +100°C | -0.0158 | -0.0145 | -0.0133 | -0.0117 | -0.00963 | -0.00867 | -0.00754 | -0.00578 | -0.00423 |
| -40 ~ +100°C | -0.0197 | -0.0145 | -0.012 | -0.00949 | -0.00717 | -0.00627 | -0.0053 | -0.00393 | -0.00281 |
| Temp. characteristic tolerance | max ±10% | | | | | | | max ±15% | |

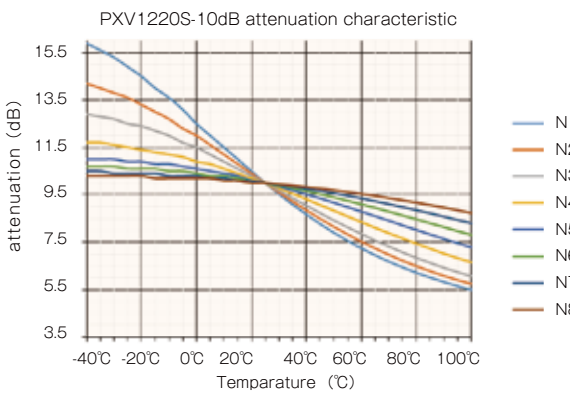
(unit : dB/°C)



PXV1220S-6dB-N*

| Temperature | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 |
|--------------------------------|----------|---------|---------|---------|---------|---------|----------|----------|
| -40 ~ +25°C | -0.145 | -0.0725 | -0.0388 | -0.0213 | -0.0166 | -0.0125 | -0.00794 | -0.00504 |
| +25 ~ +100°C | -0.037 | -0.0351 | -0.0323 | -0.0282 | -0.0261 | -0.0235 | -0.0191 | -0.0148 |
| -40 ~ +100°C | -0.0873 | -0.0525 | -0.0353 | -0.025 | -0.0217 | -0.0184 | -0.0139 | -0.0102 |
| Temp. characteristic tolerance | max ±10% | | | | | | | max ±15% |

(unit : dB/°C)

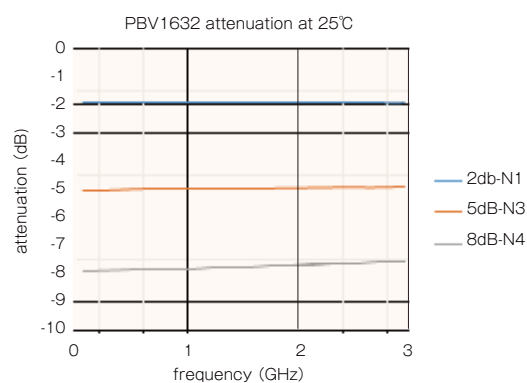
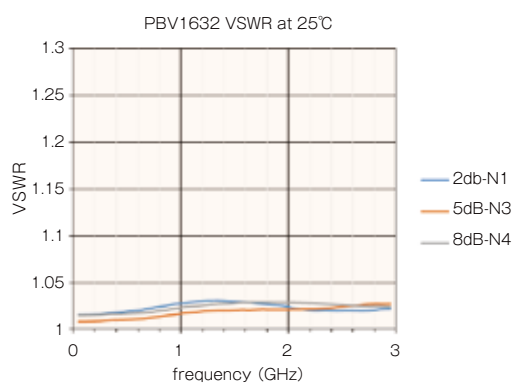
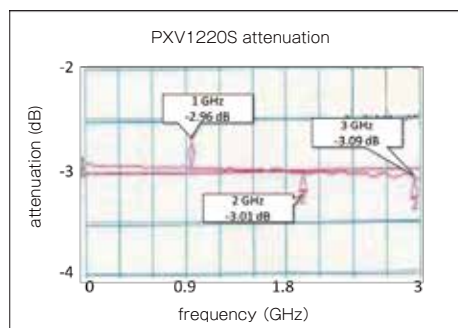
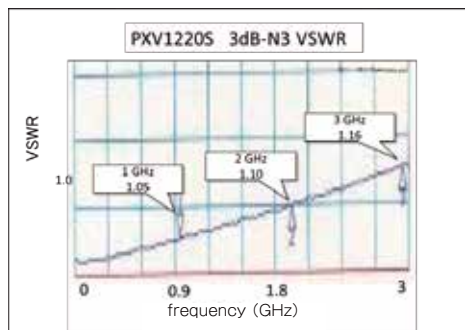


PXV1220S-10dB-N*

| Temperature | N1 | N2 | N3 | N4 | N5 | N6 | N7 | N8 |
|--------------------------------|----------|---------|---------|---------|---------|---------|----------|----------|
| -40 ~ +25°C | -0.0908 | -0.0643 | -0.0449 | -0.0264 | -0.0161 | -0.0107 | -0.00716 | -0.00475 |
| +25 ~ +100°C | -0.0601 | -0.0568 | -0.0525 | -0.0447 | -0.0362 | -0.0292 | -0.0227 | -0.0169 |
| -40 ~ +100°C | -0.0743 | -0.0603 | -0.049 | -0.0362 | -0.0269 | -0.0206 | -0.0155 | -0.0113 |
| Temp. characteristic tolerance | max ±10% | | | | | | max ±15% | |

(unit : dB/°C)

◆ High frequency characteristics (measured value)



◆ Example of use

- High frequency GaAs transistor amplifiers' gain decreases as temperature increases.
- Integrating this attenuator into amplifier circuit compensates the gain loss and keep the gain constant in the circuit. (figure below)
- Replaces complex feedback circuits.

