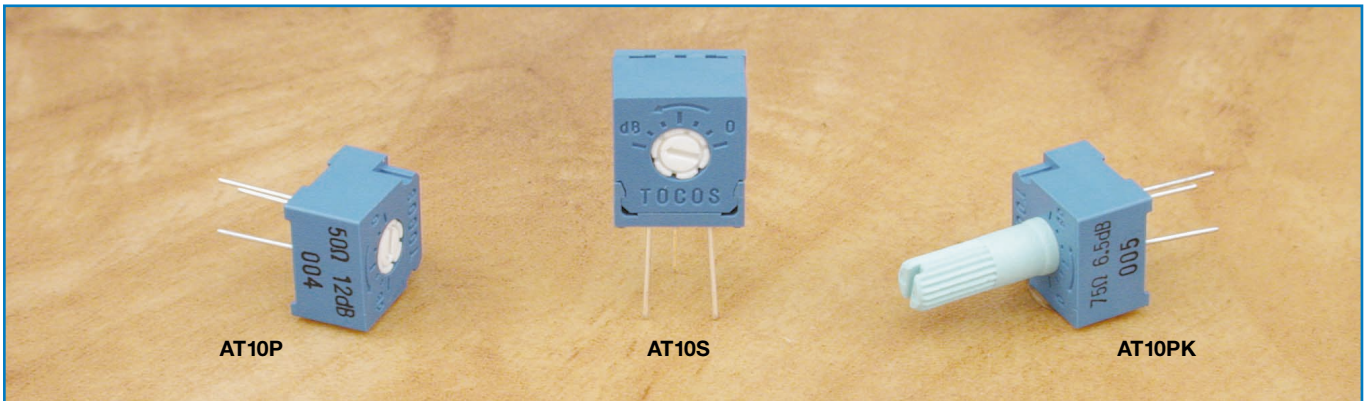


AT10 Series

TOCOS[®]
ATTENUATORS

10mm Square, Single-Turn, Through-Hole Sealed Cermet Attenuators



Features

- 10mm square, single-turn, through-hole, sealed attenuators
- Cermet element
- Top and side adjust styles available
- Flush single-slot rotor adjustment
- Optional 20mm or 30mm plastic shaft with knurled, slotted end style
- 50Ω, 75Ω or 600Ω nominal impedance
- 6.5dB, 12dB or 20dB nominal attenuation
- 3-pin triangular PCB patterns
- Meets UL 94V-0 flammability requirements
- Sealed to withstand immersion cleaning

Specifications

Electrical

Nominal Impedance 50Ω, 75Ω, 600Ω

Attenuation Range at DC

| | | | |
|-----------------------|------------|------------|------------|
| Nominal Attenuation | 6.5dB | 12dB | 20dB |
| Attenuation Tolerance | ±0.7dB | ±1.1dB | ±1.5dB |
| Minimum Attenuation | 0.4dB max. | 0.6dB max. | 1.2dB max. |

Power Rating 0.2 watt at +70°C, 0 watt at +100°C

Insulation Resistance 100MΩ minimum at 1,000VDC

Dielectric Strength 1,000VAC, 1 minute

Adjustment Travel 140° ±10°

Mechanical

Mechanical Travel 150° ±10°

Shaft Torque 25 to 200 gf•cm (0.35 to 2.77 oz•in)

Stop Strength 800 gf•cm (11.09 oz•in) max.

Flammability of Plastic Materials Meets UL 94V-0

Nominal Weight 1.4g (P); 1.7g (S)
1.7g (PK 20mm shaft length)
2.0g (PK 30mm shaft length)

Marking Impedance, attenuation, dial locators,
terminal identification, date code

Environmental

Temperature Range -55°C to +100°C

Load Life +70°C, 250 hours with rated load
ΔA ≤0.5dB, ΔI ≤5%

Moisture and Load Life +40°C, 90-95% RH
90 minutes on, 30 minutes off,
0.2 watt, 120 cycles
ΔA ≤0.5dB, ΔI ≤5%

Thermal Shock -55°C, +100°C,
30 minutes each, 5 cycles without load
ΔA ≤0.5dB, ΔI ≤5%

Shock 50G, 11ms, 6 directions, 3 times each
ΔA ≤0.5dB, ΔI ≤5%

Vibration 10-55Hz, 1.5mm amplitude,
3 directions, 2 hours each
ΔA ≤0.5dB, ΔI ≤5%

Soldering Heat Resistance 350°C, 3 seconds
ΔA ≤0.1dB, ΔI ≤1%

Seal Test +85°C, hot water for 1 minute

Rotational Life 50 cycles without load
ΔA ≤1dB, ΔI ≤10%

ΔA = Attenuation Change at DC; ΔI = Impedance Change Ratio

AT10 Series

Frequency Specifications

| Model | Nominal Impedance | Nominal Attenuation | Frequency Range | Attenuation Flatness | Return Loss | |
|----------------|---------------------|---------------------|---------------------|----------------------|-------------|-----------|
| | | | | dB max. | dB min. | VSWR max. |
| AT10P & AT10PK | 50Ω | 6.5dB | DC ~ 300MHz | 0.2 | 18 | 1.29 |
| | | | DC ~ 500MHz | 0.3 | 14 | 1.50 |
| | | 12dB | DC ~ 300MHz | 0.2 | 17 | 1.33 |
| | | | DC ~ 500MHz | 0.3 | 13 | 1.58 |
| | | 20dB | DC ~ 300MHz | A* = 0 ~ 10dB: 0.2 | 20 | 1.22 |
| | | | | A* = 10 ~ 20dB: 2.0 | | |
| | DC ~ 500MHz | | A* = 0 ~ 10dB: 0.3 | 16 | 1.38 | |
| | | | A* = 10 ~ 20dB: 4.5 | | | |
| | 75Ω | 6.5dB | DC ~ 300MHz | 0.2 | 23 | 1.15 |
| | | | DC ~ 500MHz | 0.3 | 17 | 1.33 |
| | | 12dB | DC ~ 300MHz | 0.2 | 20 | 1.22 |
| | | | DC ~ 500MHz | 0.3 | 16 | 1.38 |
| | | 20dB | DC ~ 300MHz | A* = 0 ~ 10dB: 0.2 | 20 | 1.15 |
| | | | | A* = 10 ~ 20dB: 2.0 | | |
| | DC ~ 500MHz | | A* = 0 ~ 10dB: 0.3 | 16 | 1.38 | |
| | | | A* = 10 ~ 20dB: 4.5 | | | |
| | 600Ω | 6.5dB | DC ~ 100kHz | 0.3 | 23 | 1.15 |
| | | 12dB | DC ~ 100kHz | 0.3 | 20.8 | 1.20 |
| 20dB | | DC ~ 100kHz | 0.3 | 20.8 | 1.20 | |
| AT10S | 50Ω | 6.5dB | DC ~ 300MHz | 0.15 | 23 | 1.15 |
| | | | DC ~ 500MHz | 0.4 | 14 | 1.50 |
| | | 12dB | DC ~ 300MHz | 0.15 | 21 | 1.20 |
| | | | DC ~ 500MHz | 0.4 | 13 | 1.58 |
| | | 20dB | DC ~ 300MHz | A* = 0 ~ 13dB: 0.15 | 19 | 1.25 |
| | | | | A* = 13 ~ 20dB: 0.7 | | |
| | DC ~ 500MHz | | A* = 0 ~ 13dB: 0.4 | 12 | 1.67 | |
| | | | A* = 13 ~ 20dB: 3.0 | | | |
| | 75Ω | 6.5dB | DC ~ 250MHz | 0.2 | 20 | 1.22 |
| | | 12dB | DC ~ 250MHz | 0.2 | 19 | 1.25 |
| | | 20dB | DC ~ 250MHz | A* = 0 ~ 14dB: 0.25 | 17 | 1.33 |
| | A* = 14 ~ 20dB: 1.3 | | | | | |
| | 600Ω | 6.5dB | DC ~ 100kHz | 0.3 | 23 | 1.15 |
| | | 12dB | DC ~ 100kHz | 0.3 | 20.8 | 1.20 |
| | | 20dB | DC ~ 100kHz | 0.3 | 20.8 | 1.20 |

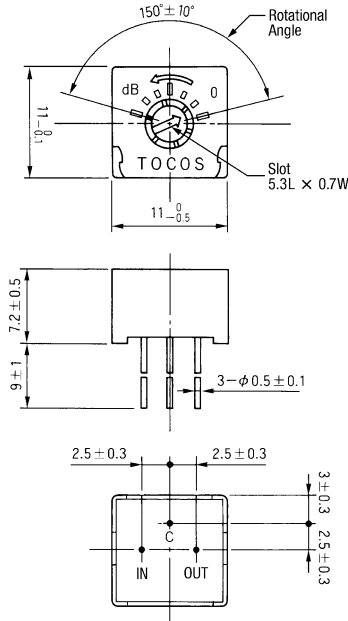
* A = Attenuation

AT10 Series

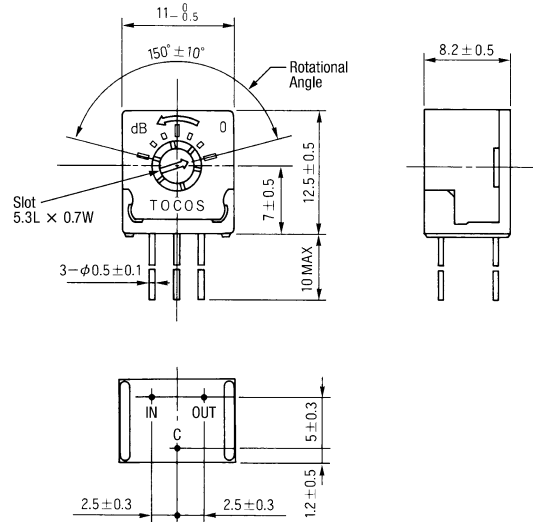
Dimensions

Unit: mm

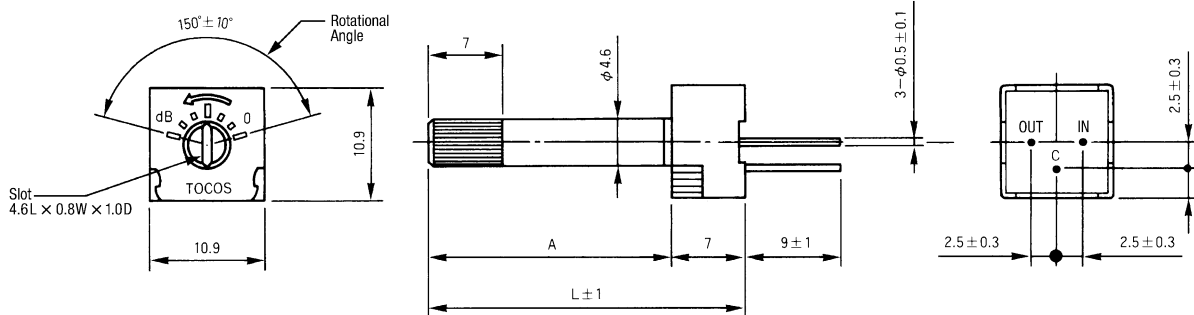
AT10P No Shaft, Flush Single-Slot, Top Adjust P Terminal Style



AT10S No Shaft, Flush Single-Slot, Side Adjust S Terminal Style



AT10PK 13mm or 23mm Plastic Shaft with Knurled, Slotted End Style, Top Adjust, PK Terminal Style



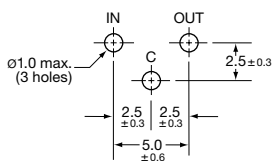
AT10PK Shaft Codes and Dimensions

| Shaft Code | L Shaft + Housing Length | A Actual Shaft Length |
|------------|-----------------------------|--------------------------|
| 20S | 20mm | 13mm |
| 30S | 30mm | 23mm |

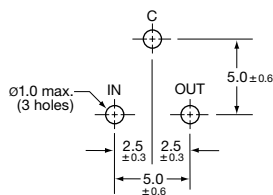
Recommended PCB Layouts

Electrical Schematic

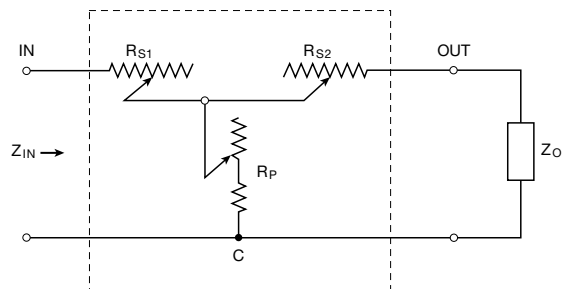
P & PK Pin-Out



S Pin-Out

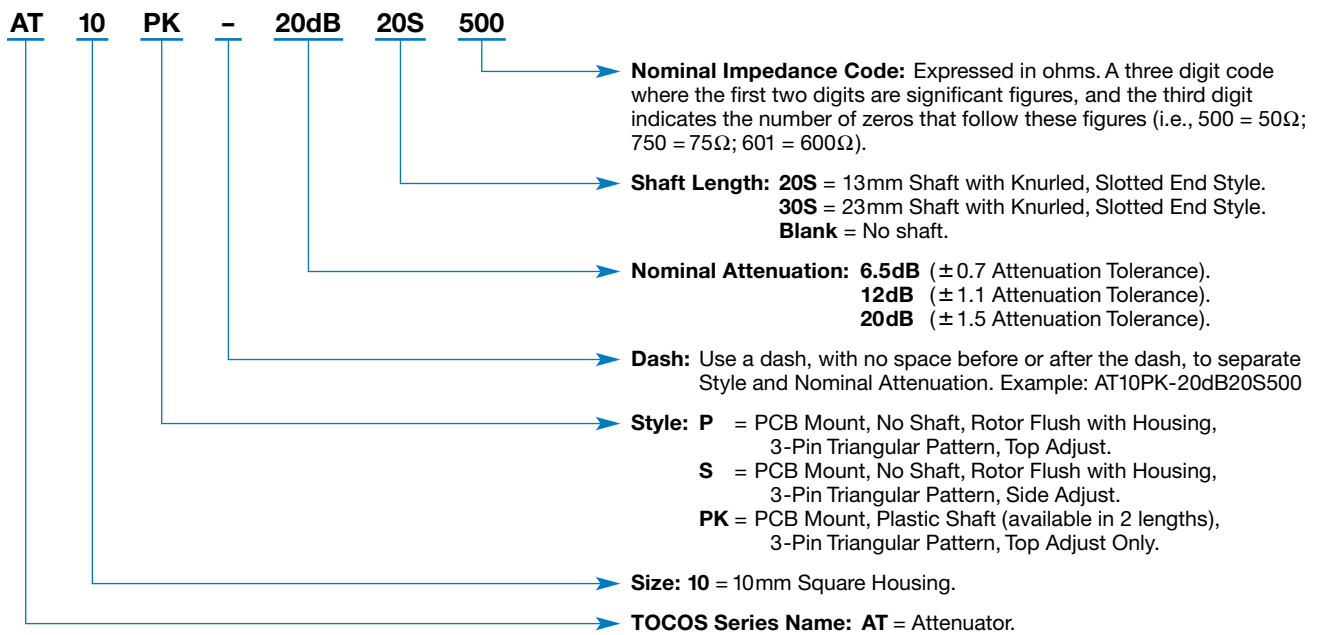


Unit: mm



AT10 Series

Part Numbering System



Packaging

Standard: **Bulk Packaging** **Quantity**
100 pieces per box.

Soldering and Cleaning Guidelines

For soldering, cleaning and other information, refer to the Guidelines and Precautions.