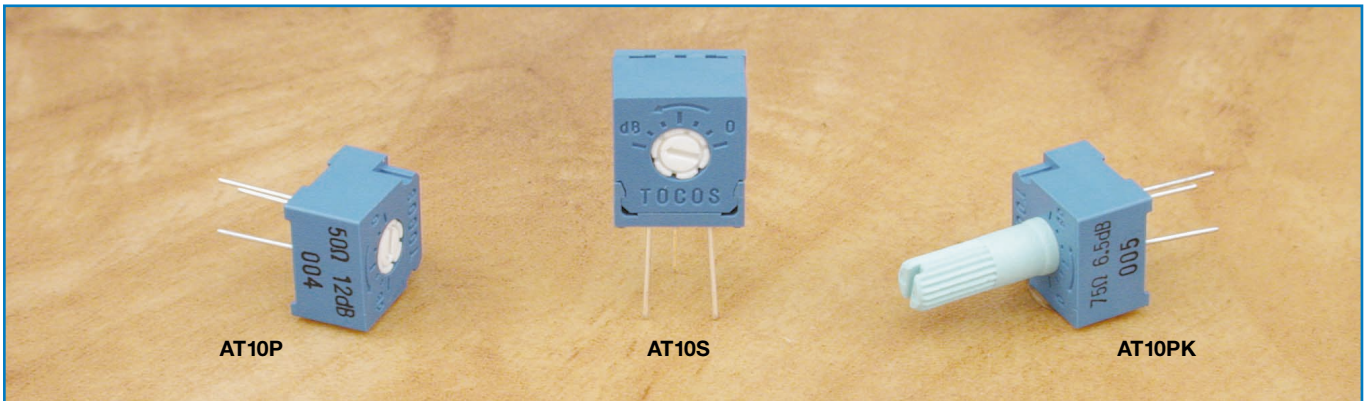


# AT10 Series

**TOCOS**<sup>®</sup>  
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

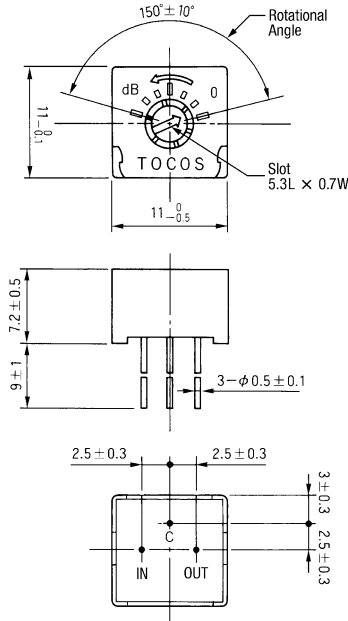
\* A = Attenuation

# AT10 Series

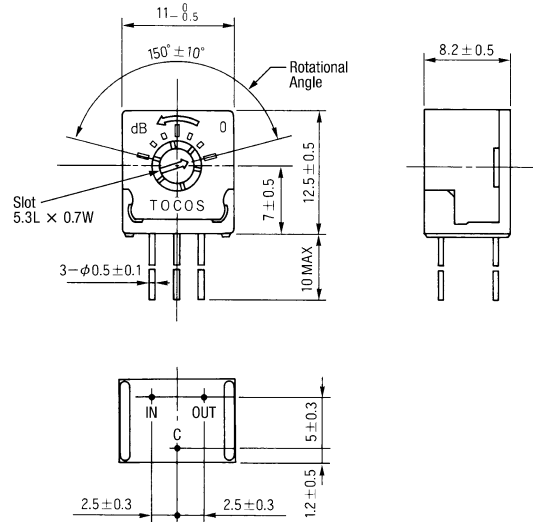
# Dimensions

Unit: mm

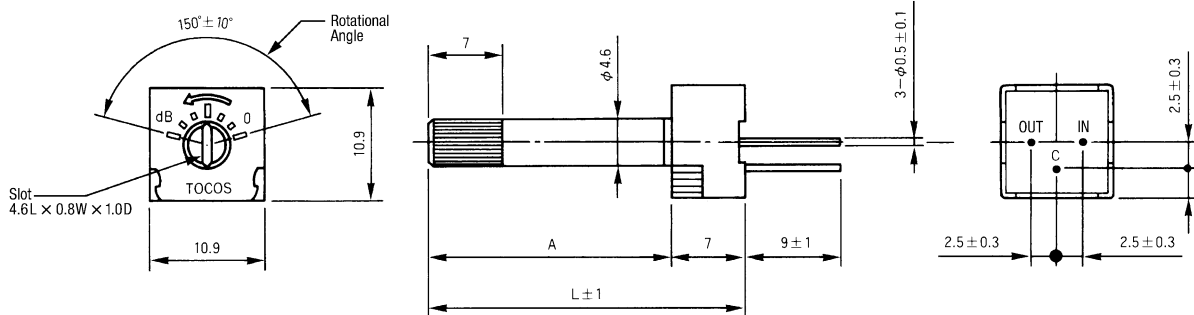
## AT10P No Shaft, Flush Single-Slot, Top Adjust P Terminal Style



## 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



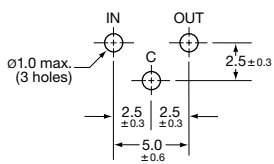
### AT10PK Shaft Codes and Dimensions

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

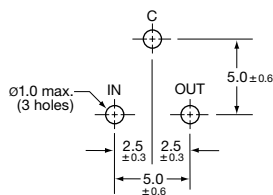
## Recommended PCB Layouts

## Electrical Schematic

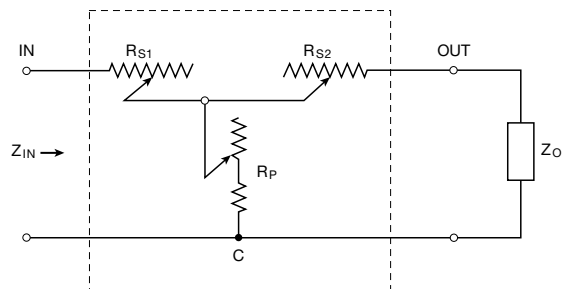
### P & PK Pin-Out



### S Pin-Out

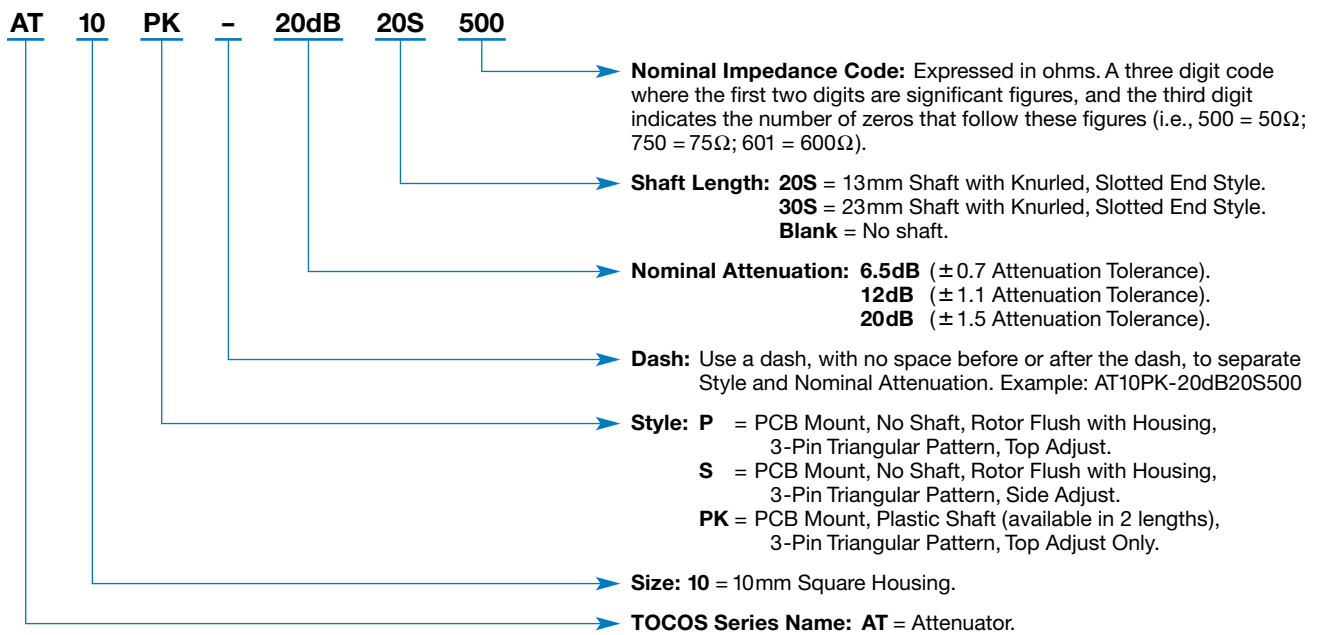


Unit: mm



## 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.