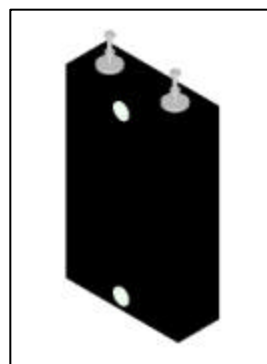


TECHNICAL DATA
DATA SHEET 560, REV. -

60KS200C



Transient Voltage Suppressor, Bi-directional

FEATURES:

- ◆ Equivalent Industry Standard Part Number – 60KS200C
- ◆ 200 Volt Bidirectional
- ◆ Exceeds MIL-STD-1399 Requirements
- ◆ Can be screened to JAN/JANTX level

These devices are bidirectional Transient Suppressors for shipboard equipment and power servicing equipment where large voltage transients endanger voltage sensitive components. The screening would consist of 100% TX level environmental testing per MIL-PRF-19500/507A.

MAXIMUM RATINGS

Rating	Condition	Minimum	Maximum	Units
Peak Pulse Power Dissipation	@ 25°	-	60,000	Watts
Steady State Power Dissipation	-	-	10	Watts
t_{clamping}	0 Volts to $V_{\text{(BR)}}$	-	$< 1 \times 10^{-8}$	Seconds
Operating & Storage Temp.	-	-65	+ 150	°C
Capacitance	@ 0 Volts (Typ.)		170	pF

ELECTRICAL CHARACTERISTICS @ 25° (Test Both Polarities)

Part Number	Reverse Stand-Off Voltage V_{WM} Volts	Maximum Reverse Leakage @ V_{wm} I_{D} μA	Breakdown Voltage @ 1 mA $V_{\text{(BR)}}$ Volts Min. Max.	Maximum Clamping Voltage @ I_{PP2} V_{c} Volts	Peak Pulse Current I_{PP} Amps
60KS200C	180	10	200 225	335	180

TECHNICAL DATA
DATA SHEET 560, REV. -

MECHANICAL CHARACTERISTICS

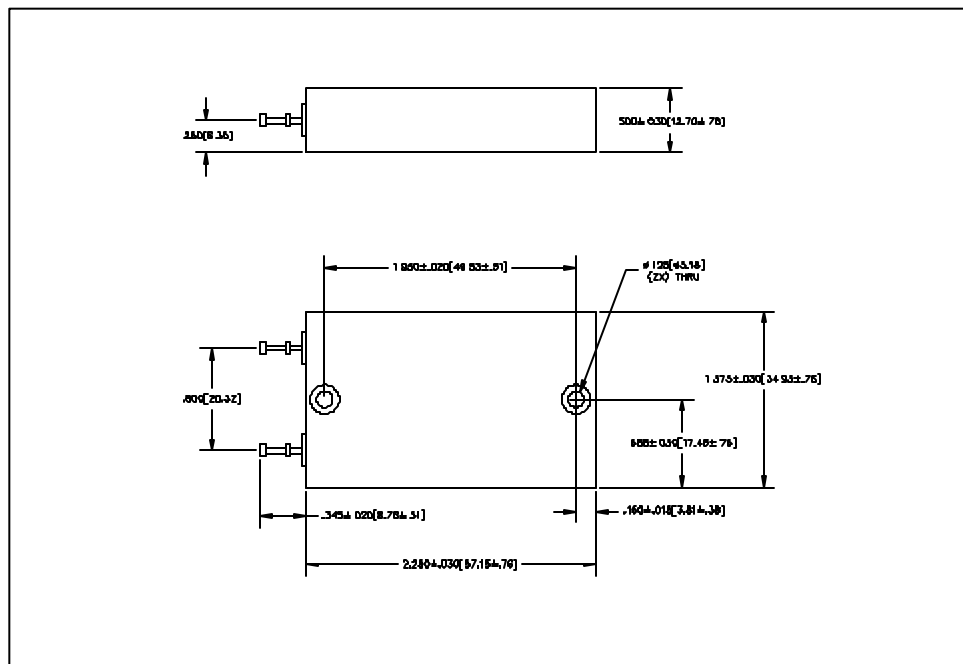
CASE: Molded case.

TERMINAL: Hot solder dipped

POLARITY: Bidirectional

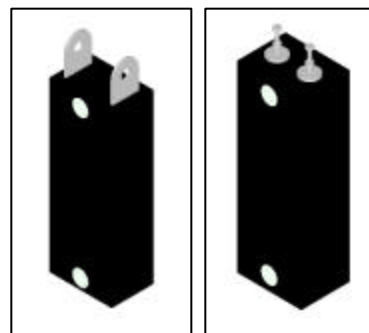
WEIGHT: 50 grams (Appx.)

MECHANICAL DIMENSIONS: In Inches / mm



TECHNICAL DATA
DATA SHEET 561, REV. -

704-15K36
704-15K36T



Transient Voltage Suppressor, Unidirectional

704-15K36 704-15K36T

FEATURES:

- ◆ Equivalent Industry Standard Part Numbers – 704-15K36 & 704-15K36T
- ◆ Designed For MIL-STD-704
- ◆ 28 Volt Power Supply Protection
- ◆ Can be supplied with JAN/JANTX parts

This series is primarily for use in avionics equipment. It meets all applicable environmental requirements of MIL-S-19500. These 15kW assemblies are designed typically to operate with a minimum source impedance of .25 Ohms for transients.

MAXIMUM RATINGS

Rating	Condition	Minimum	Maximum	Units
Peak Pulse Power Dissipation	@ 25°, 1ms	-	15,000	Watts
Steady State Power Dissipation	-	-	10	Watts
t_{clamping}	0 Volts to $V_{\text{(BR)}}$	-	$< 1 \times 10^{-12}$	Seconds
Operating & Storage Temp.	-	-65	+ 150	°C
Forward Surge Current	1/120 sec. @ 25°C	-	300	Amps
Duty Cycle	-	-	0.01	%

ELECTRICAL CHARACTERISTICS @ 25° (Test Both Polarities)

Part Number	Reverse Stand-Off Voltage (Note 1) V_{WM} Volts	Maximum Reverse Leakage @ V_{WM} I_{D} μA	Minimum Breakdown Voltage @ 10 mA $V_{\text{(BR)}}$ Volts	Maximum Clamping Voltage @ I_{PP} V_{C} Volts	Maximum Peak Pulse Current (Fig. 2) I_{PP} Amps	Maximum Forward Voltage V_{F} @ 8.3 msec. 100A Volts DC
704-15K36	31.5	100	36	51	300	3.0
704-15K36T	31.5	100	36	51	300	3.0

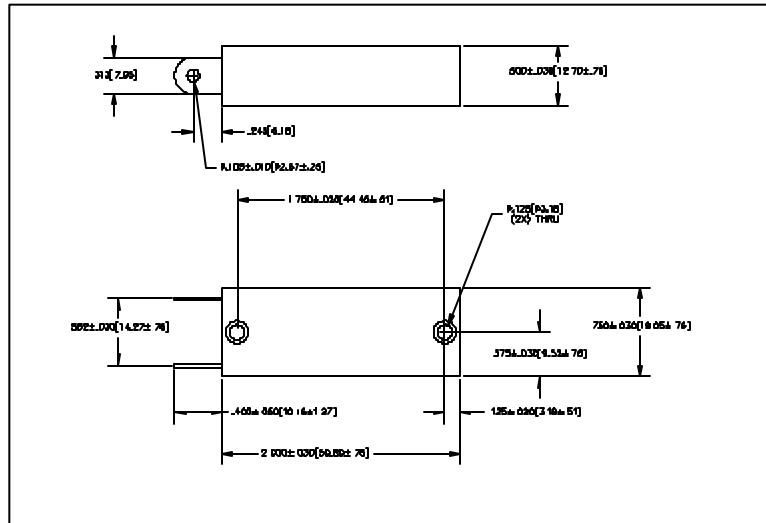
Note 1: A device is normally selected according to the reverse “Stand Off Voltage” (V_{WM}) which should be equal to or greater than the DC or continuous peak operating voltage level. Special Voltages available from the factory.

TECHNICAL DATA
DATA SHEET 561, REV. -

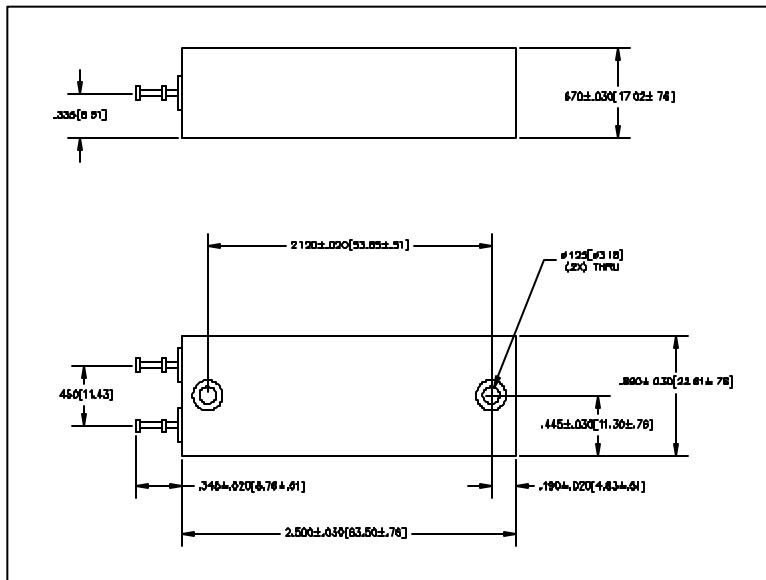
MECHANICAL CHARACTERISTICS

CASE: Molded Case
TERMINAL: Silver Plated Brass
POLARITY: Cathode terminal marked with a dot
WEIGHT: 38 grams
MOUNTING POSITION: Any

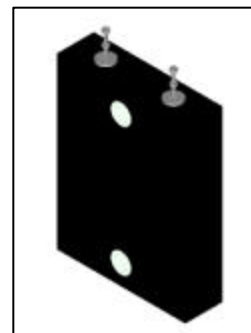
MECHANICAL DIMENSIONS: In Inches / mm



Flat Leads



Turret Leads

TECHNICAL DATA
DATA SHEET 562, REV. -
90KS200C
90KS200
Transient Voltage Suppressor, Bi-directional

FEATURES:

- ◆ Equivalent Industry Standard Part Number – 90KS200/C
- ◆ 200 Volt Bidirectional
- ◆ Exceeds MIL-STD-1399 Requirements
- ◆ Can be screened to JAN/JANTX level

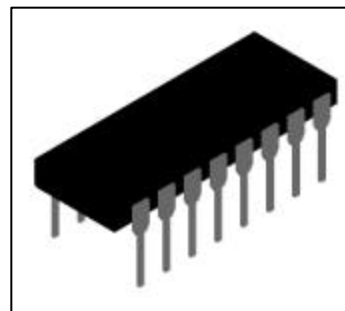
These devices are bidirectional Transient Suppressors for shipboard equipment and power servicing equipment where large voltage transients endanger voltage sensitive components. The screening would consist of 100% TX level environmental testing per MIL-S-19500/507A.

MAXIMUM RATINGS

Rating	Condition	Minimum	Maximum	Units
Peak Pulse Power Dissipation	@ 25°	-	90,000	Watts
Steady State Power Dissipation	-	-	10	Watts
t _{clamping}	0 Volts to V _(BR)	-	< 1x 10 ⁻⁸	Seconds
Operating & Storage Temp.	-	-65	+ 150	°C
Capacitance	@ 0 Volts (Typ.)		170	pF

ELECTRICAL CHARACTERISTICS @ 25° (Test Both Polarities)

Part Number	Reverse Stand-Off Voltage V _{WM} Volts	Maximum Reverse Leakage @ V _{wm} I _D μA	Breakdown Voltage @ 1 mA V _(BR) Volts		Maximum Clamping Voltage @ I _{PP2} V _c Volts	Peak Pulse Current I _{pp} Amps
			Min.	Max.		
90KS200C	180	0.5	200	225	280	180
90KS200	180	0.5	200	225	335	270

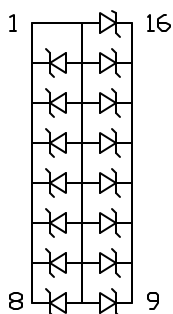
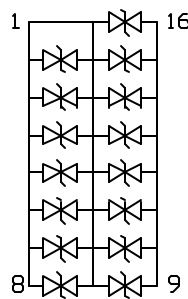
TECHNICAL DATA
DATA SHEET 563, REV. -
DLZ5 ~ DLZ30A UNI-DIRECTIONAL &
DLZ8C ~ DLZ30CA BI-DIRECTIONAL
Transient Voltage Suppressor

FEATURES:

This series of TVS devices is packaged in a ceramic, dual in-line, hermetically sealed package. These components offer 15 protective devices; unidirectional or bidirectional, common buss connections, per package. The dual in-line is designed specifically for data line protection, at the P.C. board level. TTL and MOS voltages are available for protection of input/output data circuits.

- ◆ Equivalent Industry Standard Part Numbers – DLZ5 – DLZ30A & DLZ8C – DLZ30CA
- ◆ Unidirectional or Bidirectional
- ◆ Multiple TVS Array
- ◆ Dual In-Line, 16 PIN Hermetic Package
- ◆ Low Capacitance
- ◆ μP / mP Compatible Package
- ◆ Voltage Range of 5V to 100V Available
- ◆ Common Buss Configuration
- ◆ Military Environment Capability

MAXIMUM RATINGS

Rating	Condition	Minimum	Maximum	Units
Peak Pulse Power Dissipation	@ 25°, (8x20 μs)	-	500	Watts
t_{clamping}	0 Volts to $V_{(\text{BR})}$ - Unidirectional - Bi-directional	-	$< 1 \times 10^{-12}$ $< 5 \times 10^{-9}$	Seconds
Operating & Storage Temp.	-	-55	+ 150	°C
Forward Surge Current	1/120 sec. @ 25°C (unidirectional)	-	10	Amps
Duty Cycle	-	-	0.01	%

**TYPICAL UNI-DIRECTIONAL
SCHEMATIC**

**TYPICAL BI-DIRECTIONAL
SCHEMATIC**


TECHNICAL DATA
DATA SHEET 563, REV. –

MECHANICAL CHARACTERISTICS

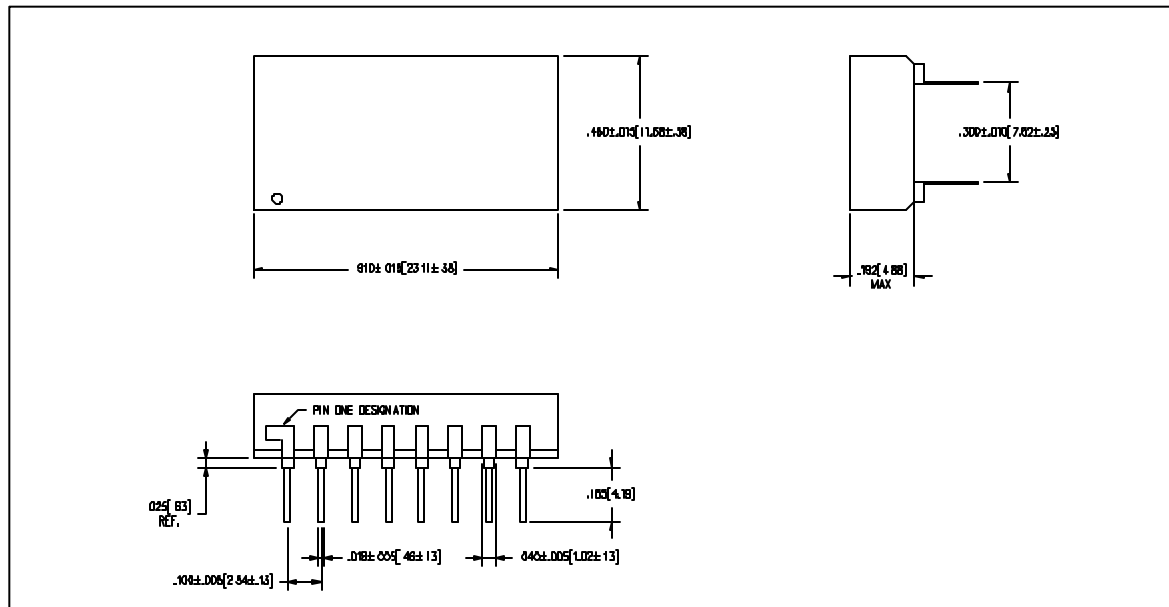
CASE: Ceramic, 16 pin dual in-line (.300" row spacing)

POLARITY: Pin No. 1 marked with a flag on lead and a dot on top of package. Body marked with type number.

WEIGHT: 3.5 grams (approx.)

Part Number	Reverse Stand-Off Voltage V_{WM} Volts	Minimum Breakdown Voltage @ 1 mA $V_{(BR)}$ Volts	Maximum Clamping Voltage @ $I_{PP2} = 1A$ (8x20 μ s) V_{c1} Volts	Maximum Clamping Voltage @ $I_{PP2} = 10A$ (8x20 μ s) V_{c2} Volts	Maximum Reverse Leakage @ V_{WM} I_D μA	Maximum Capacitance @ 0V 1MHz C pF	Maximum Voltage Temperature Variation of $V_{(BR)}$ MV/C
Unidirectional							
DLZ5	5.0	6.0	10.2	12.5	200	880	5.0
DLZ5A	5.0	6.0	9.5	10.6	200	880	5.0
DLZ12	12	13.3	21.1	26.0	2.0	440	18
DLZ12A	12	13.3	19.1	23.5	2.0	440	18
DLZ17	17	19.2	30.4	37.4	2.0	330	20
DLZ17A	17	19.2	27.5	33.9	2.0	330	20
DLZ24	24	26.7	42.3	52.1	2.0	275	31
DLZ24A	24	26.7	38.3	47.2	2.0	275	31
DLZ30	30	33.3	52.8	65.0	2.0	220	39
DLZ30A	30	33.3	47.8	58.8	2.0	220	39
Bi-directional							
DLZ8C	8.0	8.5	13.4	16.6	10	440	9.0
DLZ8CA	8.0	8.5	12.2	15.0	10	440	9.0
DLZ13C	13	14.4	22.8	28.1	4.0	385	18
DLZ13CA	13	14.4	20.6	25.4	4.0	385	18
DLZ19C	19	21.6	34.2	42.1	4.0	275	24
DLZ19CA	19	21.6	31.0	38.1	4.0	275	24
DLZ30C	30	33.3	52.8	65.0	4.0	165	39
DLZ30CA	30	33.3	47.8	58.8	4.0	165	39

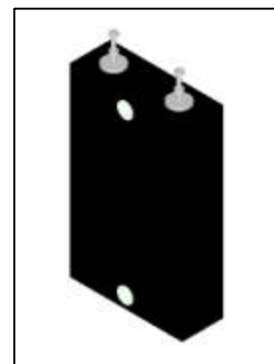
MECHANICAL DIMENSIONS: In Inches / mm



TECHNICAL DATA
DATA SHEET 564, REV. -

PHP8.4 ~ PHP500 & PIP8.4 ~ PIP500

Transient Voltage Suppressor, Unidirectional



FEATURES:

- ◆ Equivalent Industry Standard Part Numbers – PHP8.4 ~ PHP500 & PIP8.4 ~ PIP500
- ◆ 7,500 and 15,000 Watts Peak Pulse Power Dissipation
- ◆ Available in ranges from 8.4 to 500 Volts
- ◆ Each device is 100% tested
- ◆ Designed for Military (PHP Series) and Commercial (PIP Series)

PHP / PIP is designed for applications requiring “across the line” AC power protection. These TVS modules are used in applications where extreme voltage transients can permanently damage voltage sensitive systems or components.

MAXIMUM RATINGS

Rating	Condition	Minimum	Maximum	Units
Peak Pulse Power Dissipation	@ 25°, 1ms	-	7,500 & 15,000	Watts
Average Steady State Power Dissipation	@ 50°C	-	7.5	Watts
t_{clamping}	0 Volts to $V_{\text{(BR)}}$	-	$< 1 \times 10^{-8}$	Seconds
Operating & Storage Temp.	-	-65	+ 150	°C

TECHNICAL DATA**DATA SHEET 564, REV. -**

Part Number	Average RMS Voltage Volts AC	Reverse Stand-Off Voltage (note 1) V_{WM} Volts DC	Minimum Breakdown Voltage $V_{(BR)}$ @ I_t Volts mA	Maximum Reverse Leakage @ V_{wm} I_D @ V_{WM} μA	Maximum Clamping Voltage V_c @ I_{PP} Volts dc	Maximum Peak Pulse Current I_{PP} Amps	Maximum Peak Pulse Power (1 msec) P_P Kilowatts
PHP8.4	8.4	12.0	14 10	250	22	341	7.5
PHP24	24.0	34.0	40 10	250	67	112	7.5
PHP30	30.0	24.5	50 1.0	250	84	90	7.5
PHP60	60.0	85.0	100 1.0	250	167	90	15.0
PHP120	120.0	170.0	200 1.0	250	319	47	15.0
PHP206	208.0	295.0	347 1.0	250	536	28	15.0
PHP250	250.0	354.0	418 1.0	250	652	23	15.0
PHP440	440.0	623.0	735 1.0	250	1138	13.2	15.0
PHP500	500.0	708.0	835 1.0	250	1292	11.6	15.0
PIP8.4	8.4	12.0	14 10	250	22	341	7.5
PIP24	24.0	34.0	40 10	250	67	112	7.5
PIP30	30.0	24.5	50 1.0	250	84	90	7.5
PIP60	60.0	85.0	100 1.0	250	167	90	15.0
PIP120	120.0	170.0	200 1.0	250	319	47	15.0
PIP206	208.0	295.0	347 1.0	250	536	28	15.0
PIP250	250.0	354.0	418 1.0	250	652	23	15.0
PIP440	440.0	623.0	735 1.0	250	1138	13.2	15.0
PIP500	500.0	708.0	835 1.0	250	1292	11.6	15.0

Special Voltages available from the factory.

Note 1: A device is normally selected according to the reverse "Stand Off Voltage" (V_{WM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

MECHANICAL CHARACTERISTICS

CASE: Molded case.

TERMINAL: Hot solder dipped

POLARITY: Bidirectional

WEIGHT: 50 grams (Appx.)

MOUNTING POSITION: Any

MILITARY APPLICATIONS

PHP series sub-assemblies are packaged in a hermetically sealed glass-to-metal package, available with design consistency to MIL-PRF-19500/507

COMMERCIAL APPLICATIONS

PIP series sub-assemblies are packaged in a molded epoxy case

MECHANICAL DIMENSIONS: In Inches / mm