



**14KESD5.0  
thru  
14KESD170A**

**Features**

1. Protects Sensitive Circuits From Short Duration Fast Rise Time Transients such as Electro-Static-Discharge (ESD) or Electrical Fast Transients (EFT).
2. Excellent Protection in Clamping Direct ESD Level Transients\* in Excess of 40,000 Volts.
3. Absorbs ESD Level Transients\* of 14,000 Watts or One Microsecond Transients\*\* up to 4000 Watts. See Figure #1 For Overall Transient Peak Pulse Power.
4. Clamps Transients in 1 Pico Second.
5. 1.5 Watt Continuous Power Dissipation.
6. Working (Stand-off) Voltage Range of 5V to 170V.
7. Hermetic DO-41 Package. Also Available in Surface Mount DO-213AB (MELF).
8. Low Inherent Capacitance for High Frequency Application (See Figure #3).

These devices feature the ability to clamp dangerous high voltage short term transients such as produced by directed or radiated electro-static-discharge phenomena before entering sensitive component regions of a circuit design. They are small economical transient voltage suppressors targeted primarily for short term transients below a few microseconds while still achieving significant peak-pulse-power capability as seen in Figure #1.

**Maximum Ratings**

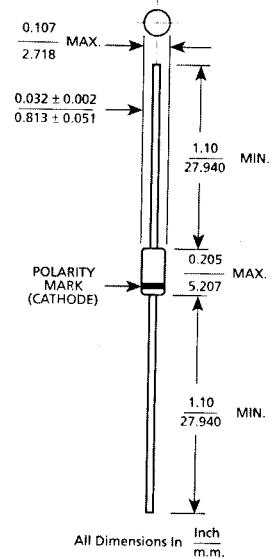
1. 4000 Watts for One Microsecond Square Wave or 14,000 Watts Per ESD Wave Form of MIL-STD-750, Method 1020.
2. See Surge Rating Curve in Figures #1 and 2.
3. Operating and Storage Temperature -65° to 200°C.
4. DC Power Dissipation 1500 mW at  $T_L = 75^\circ C$ , .375" From Body.
5. Derate at 22.8 W / °C Above 25°C For  $P_{PP}$  (1µs) and at 12 mW / °C Above 75°C for dc Power.
6. Forward Surge Current 500 amp for 1 µs at  $T_L = 25^\circ C$  (rise time  $\geq 100$  ns).

**Electrical Characteristics**

TYPE NUMBER	REVERSE STAND-OFF VOLTAGE	BREAK DOWN VOLTAGE VBR MINIMUM	TEST CURRENT	MAXIMUM REVERSE LEAKAGE	MAXIMUM CLAMPING VOLTAGE	PEAK PULSE CURRENT
	$V_{wm}$	$V_{(BR)}$	$I_T$	$I_D @ V_{wm}$	$V_C @ I_{pp}$	$I_{pp}^{**}$
	VOLTS	VOLTS	mA	µA	VOLTS	AMPS
14KESD5.0	5.0	6.40	10	600	17.1	233.6
14KESD5.0A	5.0	6.40	10	600	16.8	238.8
14KESD6.0	6.0	6.67	10	600	18.5	215.9
14KESD6.0A	6.0	6.67	10	600	17.6	227.9
14KESD6.5	6.5	7.22	10	400	20.1	199.5
14KESD6.5A	6.5	7.22	10	400	19.0	210.5
14KESD7.0	7.0	7.78	10	150	21.6	185.0
14KESD7.0A	7.0	7.78	10	150	20.5	195.4
14KESD7.5	7.5	8.33	1.0	50	23.2	172.6
14KESD7.5A	7.5	8.33	1.0	50	21.9	182.4
14KESD8.0	8.0	8.89	1.0	25	24.8	161.6
14KESD8.0A	8.0	8.89	1.0	25	23.4	170.9
14KESD8.5	8.5	9.44	1.0	5	26.2	152.8
14KESD8.5A	8.5	9.44	1.0	5	24.8	161.3
14KESD9.0	9.0	10.0	1.0	1.0	27.8	144.1

\* Pulse wave form of MIL-STD-750, Method 1020. (Approximately 150 ns exponential wave)  
\*\*At 4000 watts 1 µs square wave rating (See Figures 1 and 2).

**AXIAL LEAD**



**DO-41**

**Mechanical Characteristics**

**CASE:** Hermetically sealed glass case DO-41.

**FINISH:** All external surfaces are corrosion resistant and leads solderable.

**THERMAL RESISTANCE:** Less than 83°C / Watt junction to lead at 0.375 inches from body.

**POLARITY:** Banded end is cathode.

**WEIGHT:** 0.378 grams (typical).

# Electrical Characteristics

# 14KESD5.0 thru 14KESD170A

TYPE NUMBER	REVERSE STAND-OFF VOLTAGE	BREAK DOWN VOLTAGE VBR MINIMUM	TEST CURRENT	MAXIMUM REVERSE LEAKAGE	MAXIMUM CLAMPING VOLTAGE	PEAK PULSE CURRENT
	$V_{wm}$	$V_{(BR)}$	$I_T$	$I_0 @ V_{wm}$	$V_C @ I_{pp}$	$I_{pp}^{**}$
	VOLTS	VOLTS	mA	$\mu$ A	VOLTS	AMPS
14KESD9.0A	9.0	10.0	1.0	1.0	26.4	151.7
14KESD10	10	11.1	1.0	1.0	30.9	129.5
14KESD10A	10	11.1	1.0	1.0	29.3	136.8
14KESD11	11	12.2	1.0	1.0	33.9	118.0
14KESD11A	11	12.2	1.0	1.0	32.1	124.5
14KESD12	12	13.3	1.0	1.0	37.0	108.1
14KESD12A	12	13.3	1.0	1.0	35.0	114.3
14KESD13	13	14.4	1.0	1.0	40.0	100.0
14KESD13A	13	14.4	1.0	1.0	37.9	105.6
14KESD14	14	15.6	1.0	1.0	43.4	92.2
14KESD14A	14	15.6	1.0	1.0	41.0	97.6
14KESD15	15	16.7	1.0	1.0	46.4	86.2
14KESD15A	15	16.7	1.0	1.0	42.2	94.7
14KESD16	16	17.8	1.0	1.0	45.5	87.8
14KESD16A	16	17.8	1.0	1.0	41.3	97.0
14KESD17	17	18.9	1.0	1.0	41.8	95.7
14KESD17A	17	18.9	1.0	1.0	39.8	100.5
14KESD18	18	20.0	1.0	1.0	42.2	94.8
14KESD18A	18	20.0	1.0	1.0	37.9	105.6
14KESD20	20	22.2	1.0	1.0	41.9	95.4
14KESD20A	20	22.2	1.0	1.0	37.4	107.1
14KESD22	22	24.4	1.0	1.0	40.7	98.4
14KESD22A	22	24.4	1.0	1.0	38.5	103.9
14KESD24	24	26.7	1.0	1.0	44.5	89.9
14KESD24A	24	26.7	1.0	1.0	42.2	94.9
14KESD26	26	28.9	1.0	1.0	48.2	83.1
14KESD26A	26	28.9	1.0	1.0	45.6	87.7
14KESD28	28	31.1	1.0	1.0	51.8	77.2
14KESD28A	28	31.1	1.0	1.0	49.1	81.4
14KESD30	30	33.3	1.0	1.0	55.5	72.1
14KESD30A	30	33.3	1.0	1.0	52.6	76.1
14KESD33	33	36.7	1.0	1.0	61.2	65.4
14KESD33A	33	36.7	1.0	1.0	58.0	69.0
14KESD36	36	40.0	1.0	1.0	66.7	60.0
14KESD36A	36	40.0	1.0	1.0	63.2	63.3
14KESD40	40	44.4	1.0	1.0	74.0	54.0
14KESD40A	40	44.4	1.0	1.0	70.1	57.0
14KESD43	43	47.8	1.0	1.0	79.7	50.2
14KESD43A	43	47.8	1.0	1.0	75.5	53.0
14KESD45	45	50.0	1.0	1.0	83.3	48.0
14KESD45A	45	50.0	1.0	1.0	79.0	50.6
14KESD48	48	53.3	1.0	1.0	88.8	45.0
14KESD48A	48	53.3	1.0	1.0	84.2	47.5
14KESD51	51	56.7	1.0	1.0	94.5	42.3
14KESD51A	51	56.7	1.0	1.0	89.6	44.6
14KESD54	54	60.0	1.0	1.0	100.0	40.0
14KESD54A	54	60.0	1.0	1.0	94.7	42.2
14KESD58	58	64.4	1.0	1.0	107.4	37.2
14KESD58A	58	64.4	1.0	1.0	101.7	39.3
14KESD60	60	66.7	1.0	1.0	111.2	36.0
14KESD60A	60	66.7	1.0	1.0	105.3	38.0
14KESD64	64	71.1	1.0	1.0	118.5	33.7
14KESD64A	64	71.1	1.0	1.0	112.3	35.6
14KESD70	70	77.8	1.0	1.0	129.7	30.8
14KESD70A	70	77.8	1.0	1.0	122.9	32.5
14KESD75	75	83.3	1.0	1.0	139.0	28.8
14KESD75A	75	83.3	1.0	1.0	131.5	30.4
14KESD78	78	86.7	1.0	1.0	144.5	27.7
14KESD78A	78	86.7	1.0	1.0	136.9	29.2
14KESD85	85	94.4	1.0	1.0	157.1	25.4
14KESD85A	85	94.4	1.0	1.0	148.8	26.9
14KESD90	90	100.0	1.0	1.0	166.5	24.0
14KESD90A	90	100.0	1.0	1.0	158.3	25.3
14KESD100	100	111.0	1.0	1.0	185.3	21.6
14KESD100A	100	111.0	1.0	1.0	175.5	22.8
14KESD110	110	122.0	1.0	1.0	203.3	19.7
14KESD110A	110	122.0	1.0	1.0	192.8	20.7
14KESD120	120	133.0	1.0	1.0	222.0	18.0
14KESD120A	120	133.0	1.0	1.0	210.0	19.0
14KESD130	130	144.0	1.0	1.0	240.0	16.7
14KESD130A	130	144.0	1.0	1.0	227.3	17.6
14KESD150	150	167.0	1.0	1.0	278.3	14.4
14KESD150A	150	167.0	1.0	1.0	264.0	15.2
14KESD160	160	178.0	1.0	1.0	297.0	13.5
14KESD160A	160	178.0	1.0	1.0	281.2	14.2
14KESD170	170	189.0	1.0	1.0	315.0	12.7
14KESD170A	170	189.0	1.0	1.0	298.5	13.4

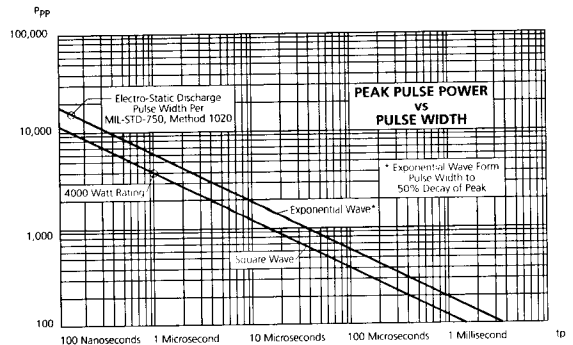


Figure 1

Clamping Factor vs Breakdown Voltage For Various Power Levels

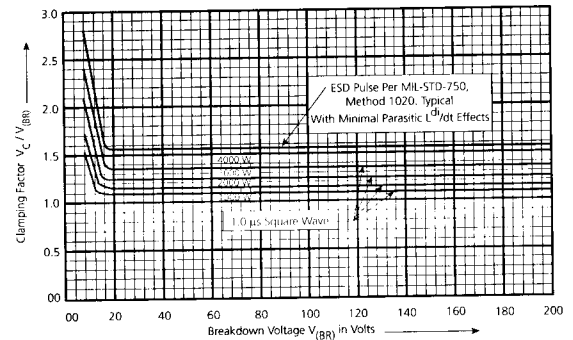


Figure 2

Capacitance vs. V(BR) Curve

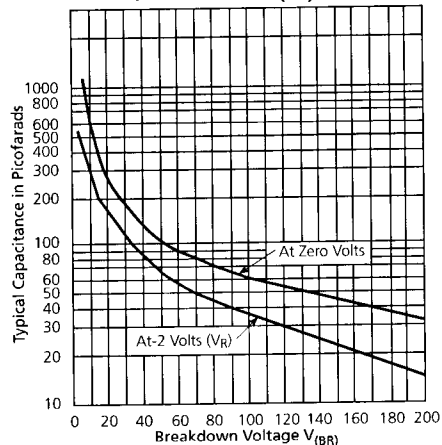


Figure 3