S5KP SERIES

TRANSIENT VOLTAGE SUPPRESSOR

V_{BR} : 5.0 - 180 Volts
P_{PK} : 5000 Watts

FEATURES :

* 5000W Peak Pulse Power
* Excellent clamping capability
* Low incremental surge resistance
* Fast response time : typically less then 1.0 ps from 0 volt to $V_{BR(min.)}$
* Pb / RoHS Free

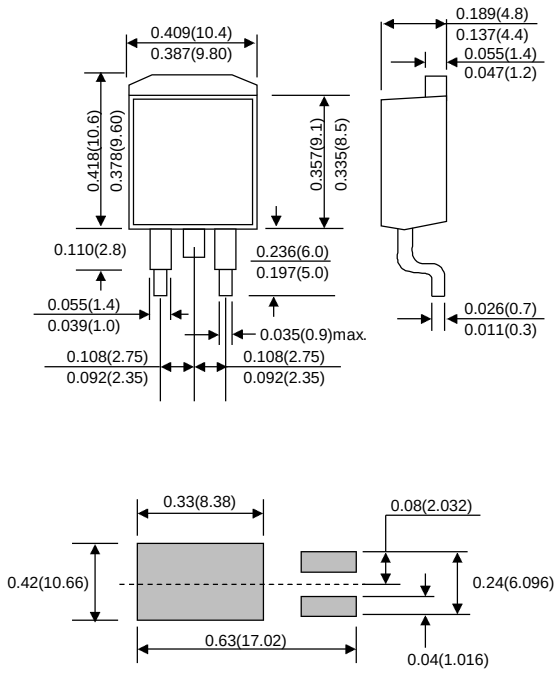
MECHANICAL DATA

* Case : D^2PAK(TO-263)
* Epoxy : UL94V-O rate flame retardant
* Lead : Axial lead solderable per MIL-STD-202, Method 208 guaranteed
* Polarity : Heatsink is Anode
* Mounting position : Any
* Weight : 1.7 grams (approximately)

DEVICES FOR BIPOLAR APPLICATIONS

For Bi-directional use C or CA Suffix
Electrical characteristics apply in both directions

D^2PAK



Dimensions in inches and (millimeters)

MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

Rating	Symbol	Value	Unit
Peak Pulse Power Dissipation at tp = 1ms (Note 1, Fig. 4)	P_{PK}	Minimum 5000	W
Steady State Power Dissipation	P_D	8.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note 2)	I_{FSM}	400	A
Operating and Storage Temperature Range	T_J, T_{STG}	- 55 to + 150	°C

Notes:

(1) Non-repetitive Current pulse, per Fig. 5 and derated above Ta = 25 °C per Fig. 1

(2) Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minutes maximum.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

TYPE	Breakdown Voltage @ I_T (Note 1)			Reverse Stand off Voltage	Maximum Reverse Leakage @ V_{RM}	Maximum Peak Pulse Current (Note2)	Maximum Clamping Voltage @ I_{PPM}	Maximum Temperature Coefficient of V_{BR}
	V_{BR} (V)		I_T	V_{RM}	I_R	I_{PPM}	V_C	
	Min.	Max.	(mA)	(V)	(μA)	(A)	(V)	(%/°C)
S5KP5.0	6.40	7.30	50	5.0	5000	520	9.60	0.057
S5KP5.0A	6.40	7.00	50	5.0	5000	543	9.20	0.057
S5KP6.0	6.67	8.15	50	6.0	5000	439	11.4	0.061
S5KP6.0A	6.67	7.37	50	6.0	5000	485	10.3	0.061
S5KP6.5	7.22	8.82	50	6.5	2000	407	12.3	0.065
S5KP6.5A	7.22	7.98	50	6.5	2000	447	11.2	0.065
S5KP7.0	7.78	9.51	5.0	7.0	1000	378	13.3	0.068
S5KP7.0A	7.78	8.60	5.0	7.0	1000	417	12.0	0.068
S5KP7.5	8.33	10.2	5.0	7.5	250	350	14.3	0.073
S5KP7.5A	8.33	9.21	5.0	7.5	250	388	12.9	0.073
S5KP8.0	8.89	10.9	5.0	8.0	150	333	15.0	0.075
S5KP8.0A	8.89	9.83	5.0	8.0	150	367	13.6	0.075
S5KP8.5	9.44	11.5	5.0	8.5	50	314	15.9	0.078
S5KP8.5A	9.44	10.4	5.0	8.5	50	347	14.4	0.078
S5KP9.0	10.0	12.2	5.0	9.0	20	295	16.9	0.081
S5KP9.0A	10.0	11.1	5.0	9.0	20	325	15.4	0.081
S5KP10	11.1	13.6	5.0	10	15	266	18.8	0.084
S5KP10A	11.1	12.3	5.0	10	15	294	17.0	0.084
S5KP11	12.2	14.9	5.0	11	10	249	20.1	0.086
S5KP11A	12.2	13.5	5.0	11	10	274	18.2	0.086
S5KP12	13.3	16.3	5.0	12	10	227	22.0	0.088
S5KP12A	13.3	14.7	5.0	12	10	251	19.9	0.088
S5KP13	14.4	17.6	5.0	13	10	210	23.8	0.090
S5KP13A	14.4	15.9	5.0	13	10	232	21.5	0.090
S5KP14	15.6	19.1	5.0	14	10	194	25.8	0.092
S5KP14A	15.6	17.2	5.0	14	10	215	23.2	0.092
S5KP15	16.7	20.4	5.0	15	10	188	26.9	0.094
S5KP15A	16.7	18.5	5.0	15	10	206	24.4	0.094
S5KP16	17.8	21.8	5.0	16	10	176	28.8	0.096
S5KP16A	17.8	19.7	5.0	16	10	192	26.0	0.096
S5KP17	18.9	23.1	5.0	17	10	164	30.5	0.097
S5KP17A	18.9	20.9	5.0	17	10	181	27.6	0.097
S5KP18	20.0	24.4	5.0	18	10	155	32.2	0.098
S5KP18A	20.0	22.1	5.0	18	10	172	29.2	0.098
S5KP20	22.2	27.1	5.0	20	10	139	35.8	0.099
S5KP20A	22.2	24.5	5.0	20	10	154	32.4	0.099
S5KP22	24.4	29.8	5.0	22	10	127	39.4	0.100
S5KP22A	24.4	26.9	5.0	22	10	141	35.5	0.100
S5KP24	26.7	32.6	5.0	24	10	116	43.0	0.101
S5KP24A	26.7	29.5	5.0	24	10	128	38.9	0.101
S5KP26	28.9	35.3	5.0	26	10	107	46.6	0.101
S5KP26A	28.9	31.9	5.0	26	10	119	42.1	0.101
S5KP28	31.1	38.0	5.0	28	10	99	50.1	0.102
S5KP28A	31.1	34.4	5.0	28	10	110	45.4	0.102
S5KP30	33.3	40.7	5.0	30	10	93	53.5	0.103
S5KP30A	33.3	36.8	5.0	30	10	103	48.4	0.103
S5KP33	36.7	44.9	5.0	33	10	85	59.0	0.104
S5KP33A	36.7	40.6	5.0	33	10	94	53.3	0.104
S5KP36	40	48.9	5.0	36	10	78	64.3	0.104
S5KP36A	40	44.2	5.0	36	10	86	58.1	0.104

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

TYPE	Breakdown Voltage @ I_T (Note 1)			Reverse Stand off Voltage	Maximum Reverse Leakage @ V_{RM}	Maximum Peak Pulse Current (Note2)	Maximum Clamping Voltage @ I_{PPM}	Maximum Temperature Coefficient of V_{BR}
	V_{BR} (V)		I_T	V_{RM}	I_R	I_{PPM}	V_C	
	Min.	Max.	(mA)	(V)	(µA)	(A)	(V)	(%/°C)
S5KP40	44.4	54.3	5.0	40	10	70	71.4	0.105
S5KP40A	44.4	49.1	5.0	40	10	78	64.5	0.105
S5KP43	47.8	58.4	5.0	43	10	65	76.7	0.105
S5KP43A	47.8	52.8	5.0	43	10	72	69.4	0.105
S5KP45	50.0	61.1	5.0	45	10	62	80.3	0.106
S5KP45A	50.0	55.3	5.0	45	10	69	72.7	0.106
S5KP48	53.3	65.2	5.0	48	10	58	85.5	0.106
S5KP48A	53.3	58.9	5.0	48	10	65	77.4	0.106
S5KP51	56.7	69.3	5.0	51	10	55	91.1	0.107
S5KP51A	56.7	62.7	5.0	51	10	61	82.4	0.107
S5KP54	60.0	73.3	5.0	54	10	52	96.3	0.107
S5KP54A	60.0	66.3	5.0	54	10	57	87.1	0.107
S5KP56	62.2	76.1	5.0	56	10	50	100	0.107
S5KP56A	62.2	68.8	5.0	56	10	55	91	0.107
S5KP58	64.4	78.7	5.0	58	10	49	103	0.107
S5KP58A	64.4	71.2	5.0	58	10	53	94	0.107
S5KP60	66.7	81.5	5.0	60	10	47	107	0.108
S5KP60A	66.7	73.7	5.0	60	10	52	97	0.108
S5KP64	71.1	96.9	5.0	64	10	44	114	0.108
S5KP64A	71.1	78.6	5.0	64	10	49	103	0.108
S5KP70	77.6	95.1	5.0	70	10	40	125	0.108
S5KP70A	77.6	86.0	5.0	70	10	44	113	0.108
S5KP75	83.3	102	5.0	75	10	37	134	0.108
S5KP75A	83.3	92.1	5.0	75	10	41	121	0.108
S5KP78	86.7	106	5.0	78	10	36	139	0.108
S5KP78A	86.7	95.8	5.0	78	10	40	126	0.108
S5KP85	94.4	115	5.0	85	10	33	151	0.108
S5KP85A	94.4	104	5.0	85	10	36	137	0.110
S5KP90	100	122	5.0	90	10	31	160	0.110
S5KP90A	100	111	5.0	90	10	34	146	0.110
S5KP100	111	136	5.0	100	10	28	179	0.110
S5KP100A	111	123	5.0	100	10	31	162	0.110
S5KP110	122	149	5.0	110	10	26	196	0.112
S5KP110A	122	135	5.0	110	10	28	177	0.112
S5KP120	133	163	5.0	120	10	24	211	0.112
S5KP120A	133	147	5.0	120	10	26	194	0.112
S5KP150	167	204	5.0	150	10	19	263	0.112
S5KP150A	167	184	5.0	150	10	21	242	0.112
S5KP160	178	217	5.0	160	10	18	281	0.114
S5KP160A	178	196	5.0	160	10	19	258	0.114
S5KP170	189	231	5.0	170	10	17	298	0.114
S5KP170A	189	209	5.0	170	10	18	274	0.114
S5KP180	200	244	5.0	180	10	16	316	0.114
S5KP180A	200	221	5.0	180	10	17	290	0.114

Notes:

(1) V_{BR} measured after I_T applied for 300 µs., I_T = square wave pulse or equivalent.

(2) Surge Current waveform per Fig. 3 and Derate per Fig. 2

(3) V_F = 3.5 Volts max. for devices of V_R < 100 V, and V_F = 5 Volts max. for devices of V_R > 100 V.

(4) For Bi-directional devices having V_R of 10 Volts and under the I_R limit is doubled.

(5) " S5K " will be omitted in marking on the diode.

RATING AND CHARACTERISTIC CURVES (S5KP SERIES)

FIG.1 - PULSE DERATING CURVE

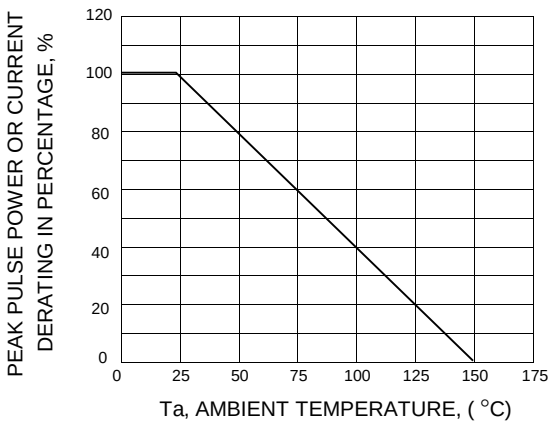


FIG.2 - MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

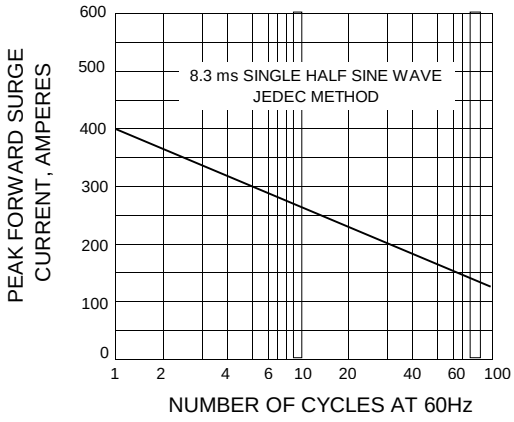


FIG.3 - STEADY STATE POWER DERATING

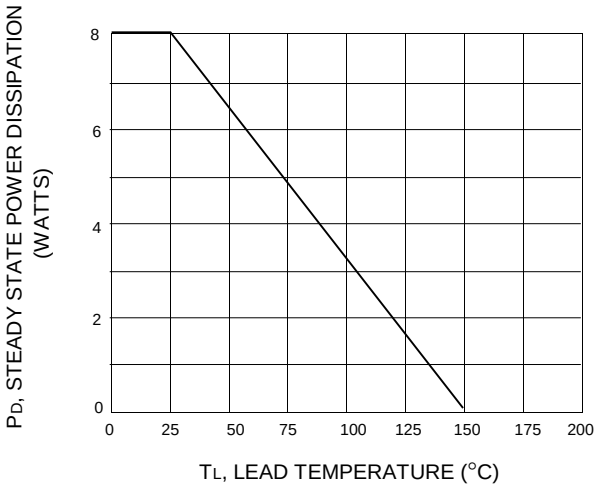


FIG.4 - PEAK PULSE POWER RATING CURVE

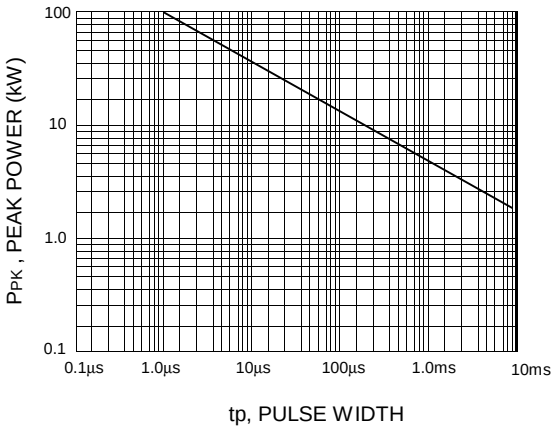


FIG.5 - PULSE WAVEFORM