



# **Additional Information**



### **Agency Approvals**

Agency	Agency File Number
<b>71</b> °	E230531

#### **Maximum Ratings and Thermal Characteristics** (T<sub>4</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation by 10/1000µs Test Waveform (Fig.2)(Note 1)	P <sub>PPM</sub>	5	kW
Steady State Power Dissipation on Infinite Heat Sink at $T_1 = 75^{\circ}C$	P <sub>D</sub>	8.0	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave Unidirectional Only (Note 2)	I <sub>FSM</sub>	400	А
Maximum Instantaneous Forward Voltage at 100A for Unidirectional Only (Note 3)	$V_{\rm F}$	3.5/5.0	V
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 to 175	°C
Typical Thermal Resistance Junction to Lead	R <sub>eJL</sub>	8.0	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{_{\theta JA}}$	40	°C/W

#### Notes:

Non-repetitive current pulse , per Fig. 4 and derated above T<sub>j</sub> (initial) =25°C per Fig. 3.
Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 per minute maximum.

3.  $V_{\rm F}$  < 3.5V for single die parts and  $V_{\rm F}$ < 5.0V for stacked-die parts.

# **Description**

The 5KP Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

### **Features and Benefits**

- 5 kW peak pulse capability at 10/1000µs waveform, repetition rate (duty cycles):0.01%
- Glass passivated chip junction in P600 package
- Fast response time: typically less than 1.0ps from 0 Volts to BV min
- Excellent clamping capability
- Typical failure mode is short from over-specified voltage or current
- Whisker test is conducted based on JEDEC JESD201A per its table 4a and 4c
- IEC 61000-4-2 ESD 30kV(Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Low incremental surge resistance

#### Typical IR less than 2µA when VBR min>12V

- High temperature to reflow soldering guaranteed: 260°C/40sec / 0.375", (9.5mm) lead length, 5 lbs., (2.3kg) tension
- VBR @ TJ= VBR@25°C x  $(1+\alpha T)$ x (TJ - 25))(aT:Temperature Coefficient, typical value is 0.1%)
- UL Recognized compound meeting flammability rating V-0
- Matte tin lead-free plated
- Halogen free and RoHS compliant
- Pb-free E3 indicates that 2nd level interconnect is Pb-free and the terminal finish material is tin(Sn) (IPC/JEDEC J-STD-609A.01)

### **Applications**

TVS componants are ideal for the protection of I/O interfaces, VCC bus and other vulnerable circuits used in telecom, computer, industrial and consumer electronic applications.

### **Functional Diagram**



Electrical Characteristics (T <sub>4</sub> =25°C unless otherwise noted)	Electrical	Characteristics	(T.=25°C	unless	otherwise noted)
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SKP5.0.4     SKP5.0.4     SKP5.0.4     SKP5.0.4     SKP5.0.4     SKP5.0.4     SKP6.6.5     SC00     X       SKP6.0.4     SKP6.6.6.6.5     722     798     50     11.2     455.4     2000     X       SKP6.6.7     SKP6.70.4     SKP7.70.4     SKP7.70.4     SKP7.70.4     77.8     8.60     50     11.2     425.0     100.0     X       SKP7.50.4     SKP7.50.4     SKP7.50.4     SKP.85.6     8.33     9.21     5     12.9     395.3     250     X       SKP8.0.4     SKP8.0.6     8.5     9.44     10.40     5     14.4     354.2     50     X       SKP10.0.4     SKP10.0.10.0     11.10     12.30     5     16.4     331.2     20     X       SKP111.4     SKP112.4     13.0     14.40     15.30     5     21.5     237.2     2     X       SKP13.4     SKP14.7     15.0     16.70     18.50     5     24.4     200.0     2     X       SKP13.4     SKP16.7 <th>Part Number (Uni)</th> <th>Part Number (Bi)</th> <th>Reverse Stand off Voltage V<sub>R</sub></th> <th></th> <th>down ge V<sub>BR</sub> s) @ I<sub>T</sub></th> <th>Test Current I<sub>T</sub></th> <th>Maximum Clamping Voltage V<sub>c</sub> @ I<sub>PP</sub></th> <th>Maximum Peak Pulse Current</th> <th>Maximum Reverse Leakage I<sub>R</sub> @ V<sub>R</sub></th> <th>Agency Approval</th>	Part Number (Uni)	Part Number (Bi)	Reverse Stand off Voltage V <sub>R</sub>		down ge V <sub>BR</sub> s) @ I <sub>T</sub>	Test Current I <sub>T</sub>	Maximum Clamping Voltage V <sub>c</sub> @ I <sub>PP</sub>	Maximum Peak Pulse Current	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub>	Agency Approval
SKPE DA     SKPE DCA     6.0     6.67     7.37     50     10.3     495.1     5000     X       SKPE DA     SKPE BCA     6.6     7.22     7.98     6.0     12.0     425.0     1000     X       SKPE BA     SKP2 BCA     7.5     8.33     9.21     5     12.9     395.3     250     X       SKPE BA     SKP8 BCA     8.6     8.44     10.40     5     14.4     354.2     50     X       SKP10A     SKP8 DCA     9.0     10.00     11.10     5     15.4     331.2     20     X       SKP10A     SKP10CA     13.0     14.40     15.00     5     12.0     300.0     15     X       SKP13A     SKP15CA     15.0     16.70     18.50     5     21.5     237.2     2     X       SKP13A     SKP16CA     15.0     16.70     18.50     5     24.4     20.00     2     X       SKP13A     SKP16CA     15.0     16.70     18.50	(2,	()	(Volts)	Min	Max	(mA)	(V)	I <sub>PP</sub> (A)	, (μ Α)	<b>9</b> Ľ
SKPB0A     SKPB5CA     6.0     6.67     7.37     500     10.3     495.1     5000     X       SKPC0A     SKPB5CA     700     778     8.60     500     11.2     455.4     2000     X       SKP75A     SKP25CA     700     778     8.60     50     12.0     425.0     1000     X       SKP75A     SKP26CA     8.0     8.33     9.21     5     12.6     395.3     250     X       SKP80A     SKP80CA     8.6     9.44     10.40     5     14.4     354.2     200     X       SKP10A     SKP10CA     10.0     11.10     12.30     5     17.0     300.0     15     X       SKP13A     SKP14CA     14.0     15.00     5     21.5     237.2     2     X       SKP15A     SKP16CA     15.0     16.70     1720     5     23.2     218.8     2     X       SKP13A     SKP16CA     15.0     16.70     1720     5     23.5<	5KP5.0A	5KP5.0CA	5.0	6.40	7.00	50	9.2	554.3		Х
SKPE     SKP20A     SKP20A <td>5KP6.0A</td> <td>5KP6.0CA</td> <td>6.0</td> <td>6.67</td> <td>7.37</td> <td>50</td> <td>10.3</td> <td></td> <td></td> <td></td>	5KP6.0A	5KP6.0CA	6.0	6.67	7.37	50	10.3			
5KP7DA     5KP7DA<		5KP6.5CA	6.5			50	11.2		2000	Х
5KP75A     5KP80A     35KP1A     35L2     200     X       5KP10A     5KP11A     5KP1A	5KP7.0A	5KP7.0CA	7.0	7.78		50	12.0	425.0	1000	
5KP8.0A     5KP8.6A     8.0     8.89     9.83     5     13.6     375.0     150     X       5KP8.6A     8KP8.5CA     8.5     9.44     10.40     5     14.4     354.2     50     X       5KP10A     5KP10A     10.00     11.10     12.30     5     170     300.0     15     X       5KP12A     5KP12A     13.0     14.40     15.0     5     12.5     237.2     2     X       5KP13A     5KP12A     5KP12A     15.0     16.70     11.60     5     21.5     237.2     2     X       5KP15A     5KP15CA     115.0     16.70     11.80     5     24.4     203.0     2     X       5KP16A     5KP16CA     116.0     17.80     19.70     5     26.0     19.44     2     X       5KP16A     5KP16CA     116.0     20.90     5     35.5     114.7     2     X       5KP26A     5KP26CA     26.0     23.90     5     35.5	5KP7.5A	5KP7.5CA	7.5			5	12.9	395.3	250	
SKP8 BA     SKP8 DA     BK 5     9.44     10.40     5     14.4     364.2     500       SKP10A     SKP10CA     10.0     11.10     12.30     5     170     300.0     15     X       SKP11A     SKP11A     SKP11CA     12.0     13.50     5     19.2     286.2     2     X       SKP1A     SKP1AA     SKP1AA     14.40     15.90     5     21.5     237.2     2     X       SKP15A     SKP16A     SKP16A     16.0     16.70     16.50     5     24.4     203.0     2     X       SKP16A     SKP16A     16.0     17.80     19.70     5     26.0     196.2     2     X       SKP16A     SKP16CA     18.0     20.00     22.1     14.7     2     X       SKP20A     SKP26A     28.0     31.10     24.40     5     34.1     121.1     2     X       SKP26A     SKP26A     28.0     33.10     34.40     5     46.4	5KP8.0A	5KP8.0CA	8.0			5	13.6	375.0	150	
5KP00A     5KP10A     5KP12A     110     12.20     13.50     5     18.2     280.2     2     X       5KP13A     5KP12A     13.0     14.40     15.60     17.20     5     23.2     21.8     2     X       5KP15A     5KP15A     15.0     17.0     18.00     20.90     5     27.6     184.8     2     X       5KP16A     5KP12A     18.0     20.00     22.10     5     23.2     174.7     2     X       5KP2AA     5KP2CA     22.0     24.00     26.90     5     35.5     143.7     2     X       5KP2AA     5KP2CA     28.0     23.190     5     42.1     12.1     2     X       5KP2AA     5KP2AC     28.0     23.190<		5KP8.5CA				5	14.4		50	Х
SKP10A     SKP110A     SKP110A     SKP110A     SKP110A     SKP112A     SKP112A     SKP112A     SKP112A     SKP112A     SKP112A     SKP12A     SKP2A     SKP2A </td <td>5KP9.0A</td> <td>5KP9.0CA</td> <td></td> <td>10.00</td> <td>11.10</td> <td>5</td> <td>15.4</td> <td>331.2</td> <td>20</td> <td></td>	5KP9.0A	5KP9.0CA		10.00	11.10	5	15.4	331.2	20	
SKP11A     SKP12A     SKP12A     SKP12A     SKP12A     10.0     11.20     13.30     14.70     5     19.9     266.3     2     X       SKP13A     SKP13CA     13.0     14.40     15.90     5     21.5     237.2     2     X       SKP14A     SKP16A     14.0     15.60     1720     5     22.2     21.8     2     X       SKP16A     SKP16CA     16.0     1720     5     22.4     20.0     2     X       SKP16A     SKP17A     170     18.90     20.90     5     27.6     184.8     2     X       SKP2AA     SKP2CA     22.0     24.60     5     35.5     143.7     2     X       SKP2AA     SKP2CA     28.0     28.90     31.90     5     42.1     121.1     2     X       SKP2AA     SKP3CA     38.0     36.80     5     48.4     105.4     2     X       SKP3AA     SKP30CA     30.0     33.30     36.80			10.0			5	17.0	300.0	15	
SKP12A     SKP12A     12.0     13.30     14.70     5     19.9     266.3     2     X       SKP13A     SKP14CA     14.0     15.60     1720     5     23.2     237.2     2     X       SKP15A     SKP16A     SKP16A     16.0     18.50     5     24.4     209.0     2     X       SKP16A     SKP16A     16.0     1780     18.50     5     24.4     209.0     2     X       SKP17A     SKP16A     18.0     20.00     22.10     5     29.2     174.7     2     X       SKP20A     SKP2CA     22.00     24.00     26.90     5     35.5     13.17     2     X       SKP20A     SKP2CA     28.0     31.10     34.40     5     45.4     112.1     2     X       SKP30A     SKP30CA     30.0     33.30     36.80     5     48.4     105.4     2     X       SKP30A     SKP30CA     33.0     36.70     40.60     5										
5KP13A     5KP13CA     13.0     14.40     15.90     5     215     2372     2     X       5KP14A     5KP15CA     15.0     16.70     16.50     5     23.2     219.8     2     X       5KP15A     5KP15CA     15.0     16.70     16.50     5     23.4     20.9.0     2     X       5KP16A     5KP17CA     7.0     18.90     20.90     5     27.6     184.8     2     X       5KP12A     5KP2CA     22.0     24.50     5     35.5     143.7     2     X       5KP2A     5KP2CA     22.0     24.00     26.90     5     35.5     143.7     2     X       5KP2A     5KP2CA     28.0     31.10     34.40     5     42.1     121.1     2     X       5KP3A     5KP3CA     28.0     31.0     34.40     5     58.1     87.8     X       5KP3A     5KP3CA     33.0     36.70     40.60     5     53.1     87.8	5KP12A	5KP12CA				5			2	
SKP14A     5KP14A     14.0     15.60     17.20     5     23.2     219.8     2     X       SKP15A     SKP16A     15.0     16.70     18.50     5     24.4     209.0     2     X       SKP16A     SKP16A     16.0     17.80     19.70     5     26.0     196.2     2     X       SKP18A     SKP16A     18.0     20.00     22.10     5     23.2     174.7     2     X       SKP20A     SKP2CA     20.0     22.00     24.50     5     32.4     157.4     2     X       SKP20A     SKP2CA     24.0     26.70     29.50     5     38.9     131.1     2     X       SKP26A     SKP26A     26.0     28.90     31.90     5     42.1     121.1     2     X       SKP30A     SKP30CA     33.0     36.80     5     48.4     105.4     2     X       SKP30A     SKP30CA     33.0     36.80     5     48.4     10.2										
SKP15A     SKP15CA     15.0     16.70     18.50     5     24.4     20.00     2     X       SKP16A     SKP16CA     16.0     1780     19.70     5     26.0     196.2     2     X       SKP17A     SKP17A     17.0     18.90     20.90     5     27.6     184.8     2     X       SKP20A     SKP20CA     20.00     22.20     24.50     5     32.4     157.4     2     X       SKP22A     SKP2CA     24.00     26.90     5     35.5     143.7     2     X       SKP26A     SKP2CA     24.00     26.90     5     35.5     143.7     2     X       SKP26A     SKP26A     28.00     31.90     5     42.1     121.1     2     X       SKP30A     SKP30CA     30.0     33.30     36.80     5     48.4     105.4     2     X       SKP30A     SKP30CA     40.00     44.40     5     5     58.1     87.7     X <										
SKP16A     SKP16CA     16.0     1780     19.70     5     26.0     196.2     2     X       SKP17A     SKP17CA     1700     18.90     20.90     5     27.6     184.8     2     X       SKP18A     SKP18A     18.0     20.00     22.10     5     29.2     174.7     2     X       SKP22A     SKP2CA     22.0     24.50     5     35.5     143.7     2     X       SKP2AA     SKP2CAA     24.0     26.70     29.50     5     38.9     131.1     2     X       SKP2BA     SKP2BCA     28.0     31.10     34.40     5     45.4     112.3     2     X       SKP3DA     SKP3CA     30.0     33.30     36.70     40.60     5     53.3     95.7     2     X       SKP3BA     SKP3CA     43.0     47.80     52.80     5     69.4     73.5     2     X       SKP4BA     SKP4AA     45.0     53.00     5     77.7										
SKP17A     SKP17CA     17.0     18.90     20.90     5     27.6     184.8     2     X       SKP18A     SKP18CA     18.0     20.00     22.10     5     29.2     174.7     2     X       SKP2AA     SKP2CA     20.0     22.20     24.50     5     33.5     143.7     2     X       SKP2AA     SKP2CA     24.0     26.70     29.50     5     33.9     131.1     2     X       SKP2BA     SKP2CA     26.0     28.90     31.90     5     42.1     112.1     2     X       SKP3BA     SKP3CA     33.0     36.70     40.60     5     53.3     95.7     2     X       SKP40A     SKP40CA     40.0     44.40     49.10     5     64.5     79.1     2     X       SKP43A     SKP40CA     43.0     47.00     55.30     5     7.7     70.2     2     X       SKP44A     SKP4ACA     45.0     50.00     55.30     5										
SKP1BA     SKP18CA     18.0     20.00     22.10     5     29.2     174.7     2     X       SKP20A     SKP2CA     22.0     24.00     26.90     5     33.5     143.7     2     X       SKP24A     SKP2CA     22.0     24.00     26.90     5     33.5     143.7     2     X       SKP26A     SKP26A     26.0     28.90     31.90     5     42.1     121.1     2     X       SKP26A     SKP26A     28.0     31.10     34.40     5     44.4     105.4     2     X       SKP30A     SKP30CA     30.0     36.70     40.60     5     53.3     95.7     2     X       SKP30A     SKP30CA     40.0     44.40     49.10     5     64.5     79.1     2     X       SKP43A     SKP43CA     43.0     4780     55.30     5     77.7     70.2     2     X       SKP44A     SKP4ACA     48.0     50.30     5     77.4										
5KP20A     5KP20CA     22.0     24.50     5     32.4     157.4     2     X       5KP22A     5KP22CA     22.0     24.00     26.90     5     35.5     143.7     2     X       5KP24A     5KP2CA     22.0     26.0     28.90     31.90     5     42.1     121.1     2     X       5KP26A     5KP26A     28.0     31.10     34.40     5     45.4     112.3     2     X       5KP30A     5KP26A     28.0     31.10     34.40     5     45.4     112.3     2     X       5KP30A     5KP30CA     30.0     33.30     36.80     5     48.4     105.4     2     X       5KP30A     5KP30CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP40A     5KP40CA     45.0     60.00     65.30     5     72.7     70.2     2     X       5KP45A     5KP46CA     48.0     53.30     58.90     5										
5KP22A     5KP22CA     22.0     24.00     26.90     5     35.5     143.7     2     X       5KP24A     5KP26CA     26.0     28.90     31.90     5     42.1     121.1     2     X       5KP28A     5KP28CA     28.0     31.10     34.40     5     45.4     112.3     2     X       5KP30CA     30.0     33.30     36.80     5     48.4     105.4     2     X       5KP30CA     30.0     33.30     36.70     40.60     5     53.3     95.7     2     X       5KP30CA     36.0     40.00     44.40     9.10     5     64.5     79.1     2     X       5KP43A     5KP43CA     45.0     50.00     55.30     5     77.4     65.9     2     X       5KP43A     5KP43CA     44.0     53.30     58.90     5     77.4     65.9     2     X       5KP44A     5KP54CA     54.0     60.00     66.30     5     87.1										
5KP24A     5KP24CA     24.0     26.70     29.50     5     38.9     131.1     2     X       5KP26A     5KP26CA     28.0     31.10     34.40     5     45.4     112.3     2     X       5KP30A     5KP30CA     30.0     33.30     36.80     5     48.4     105.4     2     X       5KP30A     5KP30CA     33.0     36.70     40.60     5     53.3     95.7     2     X       5KP30A     5KP30CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP40A     5KP40CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP4A     5KP4CA     45.0     50.00     55.30     5     72.7     70.2     2     X       5KP5A     5KP5A     5KP5A     48.0     53.30     58.90     5     71.4     65.9     2     X       5KP5A     5KP5ACA     54.0     60.00     66.30										
5KP26A     5KP26A     26.0     28.90     31.90     5     42.1     12.11     2     X       5KP28A     5KP28CA     28.0     31.10     34.40     5     45.4     112.3     2     X       5KP30A     5KP30CA     33.0     36.70     40.60     5     58.1     87.8     2     X       5KP30A     5KP30CA     36.0     40.00     44.20     5     58.1     87.8     2     X       5KP40A     5KP40CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP43A     5KP43CA     43.0     47.80     52.80     5     64.5     79.1     2     X       5KP44A     5KP42CA     44.0     53.30     58.90     5     77.4     65.9     2     X       5KP4A     5KP54CA     54.0     60.00     66.30     5     87.1     58.6     2     X       5KP54CA     54.0     60.00     66.70     73.70     5										
5KP28A     5KP28A     2KP28A     3KP30A     5KP30A     3KP30CA     33.0     36.80     5     48.4     112.3     2     X       5KP30A     5KP30CA     33.0     36.70     40.60     5     53.3     95.7     2     X       5KP36A     5KP36CA     36.0     40.00     44.20     5     58.1     87.8     2     X       5KP43A     5KP40CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP43A     5KP43CA     43.0     47.80     52.80     5     69.4     73.5     2     X       5KP45A     5KP51CA     61.0     56.70     62.70     5     82.4     61.9     2     X       5KP54A     5KP54A     5KP54A     5KP64A     54.0     60.00     66.70     73.70     5     93.6     54.5     2     X       5KP64A     5KP60CA     60.0     66.70     73.70     5     96.8     52.7     2     X										
5KP30A     5KP30CA     30.0     33.30     36.80     5     48.4     105.4     2     X       5KP33A     5KP33CA     33.0     36.70     40.60     5     53.3     95.7     2     X       5KP36A     5KP36CA     40.00     44.40     49.10     5     58.1     87.8     2     X       5KP43A     5KP43CA     43.0     47.80     52.80     5     69.4     73.5     2     X       5KP43A     5KP45CA     44.0     53.30     5     77.7     70.2     2     X       5KP43A     5KP45CA     48.0     53.30     58.90     5     77.4     65.9     2     X       5KP54A     5KP54A     56.00     66.00     5     87.1     58.6     2     X       5KP54A     5KP54A     58.0     64.40     71.20     5     93.6     54.5     2     X       5KP54A     5KP64A     58.0     66.00     5     103.0     49.5     2										
5KP33A     5KP33CA     33.0     36.70     40.60     5     53.3     95.7     2     X       5KP30A     5KP36CA     36.0     40.00     44.20     5     58.1     87.8     2     X       5KP40A     5KP40CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP43A     5KP43CA     45.0     50.00     55.30     5     72.7     70.2     2     X       5KP48A     5KP48CA     48.0     53.30     5     77.4     65.9     2     X       5KP54A     5KP54CA     54.0     60.00     66.30     5     87.1     58.6     2     X       5KP54A     5KP64A     58.0     64.40     71.20     5     93.6     54.5     2     X       5KP60A     5KP60CA     60.0     66.70     73.70     5     96.8     52.7     2     X       5KP75A     5KP76CA     75.0     83.30     92.10     5     121.0										
5KP36A     5KP36A     36.0     40.00     44.20     5     58.1     87.8     2     X       5KP40A     5KP40CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP43A     5KP43CA     43.0     4780     52.80     5     69.4     73.5     2     X       5KP43A     5KP43CA     45.0     50.00     55.30     5     72.7     70.2     2     X       5KP51A     5KP51CA     51.0     56.70     62.70     5     82.4     61.9     2     X       5KP51A     5KP51CA     51.0     66.70     73.70     5     93.6     54.5     2     X       5KP60A     5KP60CA     60.0     66.70     73.70     5     96.8     52.7     2     X       5KP64A     5KP60CA     64.0     71.10     78.60     5     103.0     49.5     2     X       5KP75A     5KP35CA     75.0     83.30     92.10     5										
5KP40A     5KP40CA     40.0     44.40     49.10     5     64.5     79.1     2     X       5KP43A     5KP43CA     43.0     47.80     52.80     5     69.4     73.5     2     X       5KP43A     5KP48CA     45.0     50.00     55.30     5     72.7     70.2     2     X       5KP48A     5KP48CA     48.0     53.30     58.90     5     77.4     65.9     2     X       5KP51A     5KP51CA     51.0     66.70     62.70     5     82.4     61.9     2     X       5KP58A     5KP56CA     58.0     64.40     71.20     5     93.6     54.5     2     X       5KP60A     5KP6CA     64.0     71.10     78.60     5     103.0     49.5     2     X       5KP75A     5KP75CA     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP75A     5KP75CA     75.0     83.30     92.10     5										
5KP43A     5KP43CA     43.0     47.80     52.80     5     69.4     73.5     2     X       5KP43A     5KP43CA     45.0     50.00     55.30     5     72.7     70.2     2     X       5KP48A     5KP48CA     48.0     53.30     58.90     5     77.4     65.9     2     X       5KP51A     5KP51CA     51.0     56.70     62.70     5     82.4     61.9     2     X       5KP54A     5KP54CA     54.0     60.00     66.30     5     87.1     58.6     2     X       5KP64A     5KP66CA     60.0     66.70     73.70     5     96.8     52.7     2     X       5KP6AA     5KP6CA     64.0     71.10     78.60     5     103.0     49.51     2     X       5KP7AA     5KP7CA     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP7AA     5KP7BCA     78.0     86.70     95.80     5										
5KP45A     5KP45CA     45.0     50.00     55.30     5     72.7     70.2     2     X       5KP48A     5KP48CA     48.0     53.30     58.90     5     77.4     65.9     2     X       5KP51A     5KP51CA     51.0     56.70     62.70     5     82.4     61.9     2     X       5KP54A     5KP54CA     58.0     64.40     71.20     5     93.6     54.5     2     X       5KP64A     5KP64CA     66.0     66.70     73.70     5     96.8     52.7     2     X       5KP64A     5KP64CA     66.0     71.10     78.60     5     103.0     49.5     2     X       5KP75A     5KP75CA     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP75A     5KP75CA     78.0     86.70     95.80     5     126.0     40.5     2     X       5KP75A     5KP75CA     78.0     86.70     95.80     5										
5KP48A     5KP48CA     48.0     53.30     58.90     5     77.4     65.9     2     X       5KP51A     5KP51CA     51.0     56.70     62.70     5     82.4     61.9     2     X       5KP54A     5KP58CA     54.0     60.00     66.30     5     87.1     58.6     2     X       5KP58A     5KP58CA     68.0     64.40     71.20     5     93.6     54.5     2     X       5KP64A     5KP64CA     64.0     71.10     78.60     5     103.0     49.5     2     X       5KP75A     5KP76CA     70.0     77.80     86.00     5     113.0     45.1     2     X       5KP75A     5KP76CA     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP78A     5KP78CA     78.0     86.70     95.80     5     126.0     40.5     2     X       5KP10A     5KP80CA     80.0     1010.00     111.00     5 </td <td></td>										
5KP51A     5KP51A     5L0     56.70     62.70     5     82.4     61.9     2     X       5KP54A     5KP54CA     54.0     60.00     66.30     5     87.1     58.6     2     X       5KP58A     5KP60A     5K.0     64.40     71.20     5     93.6     54.5     2     X       5KP60A     5KP60CA     60.0     66.70     73.70     5     96.8     52.7     2     X       5KP60A     5KP60CA     64.0     71.10     78.60     5     103.0     49.5     2     X       5KP75A     5KP75CA     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP78A     5KP78CA     78.0     86.70     95.80     5     126.0     40.5     2     X       5KP80A     5KP80CA     85.0     94.40     104.00     5     137.0     37.2     2     X       5KP10A     5KP10CA     100.0     110.00     123.00     5 <td></td>										
5KP54A     5KP54CA     54.0     60.00     66.30     5     87.1     58.6     2     X       5KP58A     5KP58CA     58.0     64.40     71.20     5     93.6     54.5     2     X       5KP6AA     5KP6ACA     60.0     66.70     73.70     5     96.8     52.7     2     X       5KP6AA     5KP70CA     70.0     77.80     86.00     5     113.0     49.5     2     X       5KP75A     5KP76A     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP78A     5KP78CA     78.0     86.70     95.80     5     126.0     40.5     2     X       5KP8A     5KP8CA     85.0     94.40     104.00     5     137.0     37.2     2     X       5KP10A     5KP10CA     100.0     110.00     123.00     5     162.0     31.5     2     X       5KP10A     5KP10CA     100.0     110.00     123.00     5										
5KP58A     5KP58CA     58.0     64.40     71.20     5     93.6     54.5     2     X       5KP60A     5KP60CA     60.0     66.70     73.70     5     96.8     52.7     2     X       5KP60A     5KP64CA     64.0     71.10     78.60     5     103.0     49.5     2     X       5KP70A     5KP70CA     70.0     77.80     86.00     5     113.0     45.1     2     X       5KP75A     5KP75CA     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP78A     5KP78CA     78.0     86.70     95.80     5     126.0     40.5     2     X       5KP8A     5KP9CA     90.0     100.00     111.00     5     146.0     34.9     2     X       5KP10A     5KP10CA     100.0     112.00     135.00     5     162.0     31.5     2     X       5KP10A     5KP10CA     100.0     123.00     5     193										
5KP60A     5KP60CA     60.0     66.70     73.70     5     96.8     52.7     2     X       5KP64A     5KP64CA     64.0     71.10     78.60     5     103.0     49.5     2     X       5KP70A     5KP70CA     70.0     77.80     86.00     5     113.0     45.1     2     X       5KP75A     5KP75CA     75.0     83.30     92.10     5     121.0     42.1     2     X       5KP78A     5KP78CA     78.0     86.70     95.80     5     126.0     40.5     2     X       5KP85A     5KP85CA     85.0     94.40     104.00     5     137.0     37.2     2     X       5KP90A     5KP10CA     100.0     110.00     123.00     5     162.0     31.5     2     X       5KP10A     5KP10CA     120.0     133.00     147.00     5     193.0     26.4     2     X       5KP130A     5KP130CA     130.0     146.00     159.00										
5KP64A5KP64CA64.071.1078.605103.049.52X5KP70A5KP70CA70.077.8086.005113.045.12X5KP75A5KP75CA75.083.3092.105121.042.12X5KP78A5KP78CA78.086.7095.805126.040.52X5KP85A5KP85CA85.094.40104.005137.037.22X5KP90A5KP90CA90.0100.00111.005146.034.92X5KP10A5KP10CA100.0110.00123.005162.031.52X5KP10A5KP10CA100.0110.00123.005177.028.82X5KP120A5KP130CA130.0147.005193.026.42X5KP130A5KP130CA150.0167.00185.005279.024.42X5KP150A5KP160CA150.0167.00185.005275.018.52X5KP150A5KP160CA160.0178.00197.005292.017.52X5KP180A5KP180CA180.0200.00221.005275.018.52X5KP180A5KP190CA190.0211.00233.005310.016.52-5KP180A5KP210CA210.0223.00253										
5KP70A5KP70CA70.077.8086.005113.045.12X5KP75A5KP75CA75.083.3092.105121.042.12X5KP78A5KP78CA78.086.7095.805126.040.52X5KP85A5KP85CA85.094.40104.005137.037.22X5KP90A5KP90CA90.0100.00111.005146.034.92X5KP100A5KP10CA100.0110.00123.005162.031.52X5KP10A5KP10CA110.0122.00135.005177.028.82X5KP120A5KP130CA130.0144.00159.005209.024.42X5KP150A5KP160CA160.0178.00197.005259.019.72X5KP160A5KP160CA160.0178.00197.005292.017.52X5KP180A5KP180CA180.0200.00221.005275.018.52X5KP190A5KP200CA200.0223.0025310.016.52-5KP20A5KP210CA210.0233.0025349.514.62-5KP20A5KP20CA220.0244.00270.005349.514.62-5KP20A5KP20CA220.0244.00270.005 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>										
5KP75A5KP75CA75.083.3092.105121.042.12X5KP78A5KP78CA78.086.7095.805126.040.52X5KP85A5KP85CA85.094.40104.005137.037.22X5KP90A5KP90CA90.0100.00111.005146.034.92X5KP10A5KP10CA100.0110.00123.005162.031.52X5KP10A5KP10CA100.0110.00123.005177.028.82X5KP10A5KP10CA110.0122.00135.005193.026.42X5KP120A5KP130CA130.0144.00159.005209.024.42X5KP150A5KP150CA150.0167.00185.005243.021.02X5KP160A5KP160CA160.0178.00197.005259.019.72X5KP180A5KP130CA180.0200.00221.005275.018.52X5KP190A5KP190CA190.0211.00233.005310.016.52-5KP190A5KP200CA200.0222.00246.005329.215.52X5KP190A5KP200CA200.0222.00246.005349.514.62-5KP20A5KP20CA20.0222.00<										
5KP78A5KP78CA78.086.7095.805126.040.52X5KP85A5KP85CA85.094.40104.005137.037.22X5KP90A5KP90CA90.0100.00111.005146.034.92X5KP10A5KP10CA100.0110.00123.005162.031.52X5KP10A5KP10CA110.0122.00135.005177.028.82X5KP120A5KP120CA120.0133.00147.005193.026.42X5KP130A5KP130CA130.0144.00159.005209.024.42X5KP150A5KP160CA150.0167.00185.005243.021.02X5KP160A5KP160CA160.0178.00197.005259.019.72X5KP180A5KP180CA180.0209.00221.005275.018.52X5KP190A5KP180CA190.0211.00233.005310.016.52-5KP200A5KP200CA200.0222.00246.005329.215.52X5KP190A5KP200CA200.0223.00258.005349.514.62-5KP20A5KP20CA20.0244.00270.005371.113.72X5KP20A5KP20CA20.022.										
5KP85A5KP85CA85.094.40104.005137.037.22X5KP90A5KP90CA90.0100.00111.005146.034.92X5KP10A5KP100CA100.0110.00123.005162.031.52X5KP10A5KP10CA110.0122.00135.005177.028.82X5KP12A5KP120CA120.0133.00147.005193.026.42X5KP130A5KP130CA130.0144.00159.005209.024.42X5KP150A5KP160CA150.0167.00185.005243.021.02X5KP160A5KP160CA160.0178.00197.005259.019.72X5KP170A5KP170CA170.0189.00209.005275.018.52X5KP180A5KP180CA180.0200.0021.005310.016.52-5KP190A5KP190CA190.0211.00233.005310.016.52-5KP20A5KP210CA200.0222.00246.005329.215.52X5KP20A5KP20CA200.0223.00258.005349.514.62-5KP20A5KP20CA20.0244.00270.005371.113.72X5KP20A5KP20CA220.02										
5KP90A5KP90CA90.0100.00111.005146.034.92X5KP100A5KP100CA100.0110.00123.005162.031.52X5KP10A5KP10CA110.0122.00135.005177.028.82X5KP120A5KP120CA120.0133.00147.005193.026.42X5KP130A5KP130CA130.0144.00159.005209.024.42X5KP150A5KP150CA150.0167.00185.005243.021.02X5KP160A5KP160CA160.0178.00197.005259.019.72X5KP170A5KP170CA170.0189.00209.005275.018.52X5KP180A5KP180CA180.0200.00221.005310.016.52-5KP190A5KP200CA200.0211.00233.005310.016.52-5KP20A5KP210CA210.0233.00258.005349.514.62-5KP20A5KP20CA220.0244.00270.005371.113.72X5KP20A5KP250CA250.0277.00306.005329.215.52X5KP20A5KP250CA250.0277.00306.005371.113.72X5KP300A5KP300CA300.0										
5KP100A5KP100CA100.0110.00123.005162.031.52X5KP110A5KP110CA110.0122.00135.005177.028.82X5KP120A5KP120CA120.0133.00147.005193.026.42X5KP130A5KP130CA130.0144.00159.005209.024.42X5KP150A5KP150CA150.0167.00185.005243.021.02X5KP160A5KP160CA160.0178.00197.005259.019.72X5KP170A5KP170CA170.0189.00209.005275.018.52X5KP180A5KP180CA180.0200.00221.005292.017.52X5KP190A5KP190CA190.0211.00233.005310.016.52-5KP200A5KP200CA200.0222.00246.005329.215.52X5KP20A5KP20CA200.0223.005349.514.62-5KP20A5KP20CA220.0244.00270.005371.113.72X5KP20A5KP20CA220.0244.00270.005371.113.72X5KP20A5KP250CA250.0277.00306.005425.012.02X5KP300A5KP300CA300.0335										
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5KP160A5KP160CA160.0178.00197.005259.019.72X5KP170A5KP170CA170.0189.00209.005275.018.52X5KP180A5KP180CA180.0200.00221.005292.017.52X5KP190A5KP190CA190.0211.00233.005310.016.52-5KP200A5KP200CA200.0222.00246.005329.215.52X5KP210A5KP210CA210.0233.00258.005349.514.62-5KP220A5KP220CA220.0244.00270.005371.113.72X5KP250A5KP250CA250.0277.00306.005425.012.02X5KP300A5KP300CA300.0335.00373.005503.010.22-										
5KP170A5KP170CA170.0189.00209.005275.018.52X5KP180A5KP180CA180.0200.00221.005292.017.52X5KP190A5KP190CA190.0211.00233.005310.016.52-5KP200A5KP200CA200.0222.00246.005329.215.52X5KP210A5KP210CA210.0233.00258.005349.514.62-5KP220A5KP220CA220.0244.00270.005371.113.72X5KP250A5KP250CA250.0277.00306.005425.012.02X5KP300A5KP300CA300.0335.00373.005503.010.22-										
5KP180A     5KP180CA     180.0     200.00     221.00     5     292.0     17.5     2     X       5KP190A     5KP190CA     190.0     211.00     233.00     5     310.0     16.5     2     -       5KP200A     5KP200CA     200.0     222.00     246.00     5     329.2     15.5     2     X       5KP210A     5KP210CA     210.0     233.00     258.00     5     349.5     14.6     2     -       5KP220A     5KP220CA     220.0     244.00     270.00     5     371.1     13.7     2     X       5KP250A     5KP250CA     250.0     277.00     306.00     5     425.0     12.0     2     X       5KP300A     5KP300CA     300.0     335.00     373.00     5     503.0     10.2     2     -										
5KP190A     5KP190CA     190.0     211.00     233.00     5     310.0     16.5     2     -       5KP200A     5KP200CA     200.0     222.00     246.00     5     329.2     15.5     2     X       5KP210A     5KP210CA     210.0     233.00     258.00     5     349.5     14.6     2     -       5KP220A     5KP220CA     220.0     244.00     270.00     5     371.1     13.7     2     X       5KP250A     5KP250CA     250.0     277.00     306.00     5     425.0     12.0     2     X       5KP300A     5KP300CA     300.0     335.00     373.00     5     503.0     10.2     2     -										
5KP200A     5KP200CA     200.0     222.00     246.00     5     329.2     15.5     2     X       5KP210A     5KP210CA     210.0     233.00     258.00     5     349.5     14.6     2     -       5KP220A     5KP220CA     220.0     244.00     270.00     5     371.1     13.7     2     X       5KP250A     5KP250CA     250.0     277.00     306.00     5     425.0     12.0     2     X       5KP300A     5KP300CA     300.0     335.00     373.00     5     503.0     10.2     2     -										
5KP210A     5KP210CA     210.0     233.00     258.00     5     349.5     14.6     2     -       5KP220A     5KP220CA     220.0     244.00     270.00     5     371.1     13.7     2     X       5KP250A     5KP250CA     250.0     277.00     306.00     5     425.0     12.0     2     X       5KP300A     5KP300CA     300.0     335.00     373.00     5     503.0     10.2     2     -										
5KP220A     5KP220CA     220.0     244.00     270.00     5     371.1     13.7     2     X       5KP250A     5KP250CA     250.0     277.00     306.00     5     425.0     12.0     2     X       5KP300A     5KP300CA     300.0     335.00     373.00     5     503.0     10.2     2     -										
5KP250A     5KP250CA     250.0     277.00     306.00     5     425.0     12.0     2     X       5KP300A     5KP300CA     300.0     335.00     373.00     5     503.0     10.2     2     -										
5KP300A 5KP300CA 300.0 335.00 373.00 5 503.0 10.2 2 -										
5KP350A 5KP350CA 350.0 391.00 433.00 5 585.0 8.7 2 -										

For bidirectional type having V<sub>g</sub> of 10 volts and less, the I<sub>g</sub> limit is double. For parts without A , the V<sub>es</sub> is ± 10% and V<sub>c</sub> is 5% higher than with A parts, the parts without A are currently available, but not recommended for new designs. The parts with A are preferred.



# **I-V Curve Characteristics**





- Stand-off Voltage -- Maximum voltage that can be applied to the TVS without operation
- Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current  $(I_{\tau})$
- V<sub>BR</sub> V<sub>c</sub> Clamping Voltage -- Peak voltage measured across the TVS at a specified lppm (peak impulse current)
- Reverse Leakage Current -- Current measured at V.
- I V<sub>F</sub> Forward Voltage Drop for Uni-directional

# Ratings and Characteristic Curves (T<sub>A</sub>=25°C unless otherwise noted)



Figure 2 - Peak Pulse Power Rating Curve



# Ratings and Characteristic Curves (T<sub>A</sub>=25°C unless otherwise noted) (Continued)



Figure 3 - Peak Pulse Power Derating Curve



Figure 5 - Typical Junction Capacitance



- REVERSE BREAKDOWN VOLTAGE (V)

100

1000

10

VRR



Figure 4 - Pulse Waveform



### Figure 6 - Typical Transient Thermal Impedance



Figure 8 - Peak Forward Voltage Drop vs Peak Forward Current (Typical Values)



10

1

### TVS Diodes Datasheet

### **Soldering Parameters**

Reflow Conc	lition	Lead-free assembly		
	- Temperature Min (T <sub>s(min)</sub> )	150°C		
Pre Heat	- Temperature Max (T <sub>s(max)</sub> )	200°C		
	-Time (min to max) (t <sub>s</sub> )	60 - 180 secs		
Average ram peak	p up rate (Liquidus Temp (T <sub>A</sub> ) to	3°C/second max		
$T_{S(max)}$ to $T_A$ -	Ramp-up Rate	3°C/second max		
Reflow	- Temperature (T <sub>A</sub> ) (Liquidus)	217°C		
nenow	-Time (min to max) (t <sub>s</sub> )	60 – 150 seconds		
Peak Temper	ature (T <sub>P</sub> )	260 <sup>+0/-5</sup> °C		
Time within	5°C of actual peak Temperature (t <sub>p</sub> )	20 – 40 seconds		
Ramp-down	Rate	6°C/second max		
Time 25°C to	peak Temperature (T <sub>P</sub> )	8 minutes Max.		
Do not exce	ed	260°C		



### Flow/Wave Soldering (Solder Dipping)

Peak Temperature :	265°C
Dipping Time :	10 seconds
Soldering :	1 time

### **Physical Specifications**

Weight	0.07oz., 2.1g
Case	P600 molded plastic body over passivated junction.
Polarity	Color band denotes the cathode except Bipolar.
Terminal	Matte Tin axial leads, solderable per JESD22-B102.

### **Environmental Specifications**

High Temp. Storage	JESD22-A103
HTRB	JESD22-A108
Temperature Cycling	JESD22-A104
H3TRB	JESD22-A101
RSH	JESD22-B106

# Dimensions



Dimensions	Inc	hes	Millimeters		
	Min	Max	Min	Max	
Α	1.000	-	25.40	-	
В	0.340	0.360	8.60	9.10	
С	0.048	0.054	1.22	1.36	
D	0.340	0.360	8.60	9.10	

#### **Part Numbering System**







#### **Packing Options**

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
5KPxxxXX	P600	800	Tape & Reel	EIA STD RS-296
5KPxxxXX-B	P600	100	BULK	Littelfuse Spec.

#### **Tape and Reel Specification**



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