

# 600w Transient Voltage Suppressor



## P6KE Series

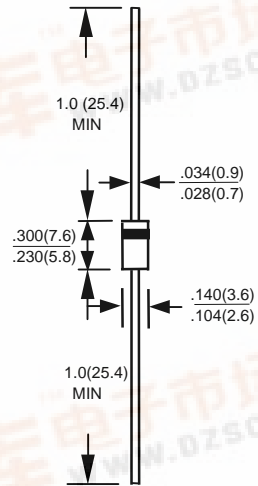
### Features

- plastic package has underwriters laboratory flammability classification 94v-0
- 600w surge capability at 1ms
- Excellent clamping capability
- Low zener impedance
- Fast response time: typically less than 1.0 ps from 0 volts to bv min
- High temperature soldering guaranteed: 260 °C/10s
- .375" (9.5mm) lead length/5lbs., (2.3kg) tension
- Typical  $T_R$  less than 1µa above 10V

### Mechanical Data

- Case: Molded plastic
- Terminals: Axial leads solderable per MIL-STD-202, Method 208
- Polarity :color band denoted cathode except
- Weight: 0.014 oz., 0.4 g

DO15



Dimensions in inches and (mm)

### Maximum Ratings and Electrical Characteristics @ TA = 25 °C unless otherwise specified

| RATINGS  | SYMBOL         | VALUE         | UNITS |
|--|----------------|---------------|-------|
| PEAK POWER DISSIPATION AT TA=25 °C, TP=1ms(NOTE 1)   | $P_{PK}$       | 600           | WATTS |
| STEADY STATE POWER DISSIPATION AT TL=75 °C<br>LEAD LENGTHS .375"(9.5mm) (NOTE 2)                           | PD             | 5.0           | WATTS |
| PEAK FORWARD SURGE CURRENT, 8.3ms SINGLE HALF SINE-WAVE SUPERIMPOSED ON RATED LOAD (JEDEC METHOD) (NOTE 3) | $I_{FSM}$      | 100           | Amps  |
| OPERATING AND STORAGE TEMPERATURE RANGE  | $T_J, T_{STG}$ | - 55 TO + 175 | °C    |

NOTE :

1. NON-REPETITIVE CURRENT PULSE, PER FIG.3 AND DERATED ABOVE TA=25 °C PER FIG.2.
2. MOUNTED ON COPPER LEAT AREA OF 1.57 IN<sup>2</sup> (40mm<sup>2</sup>)
3. 8.3ms SINGLE HALF SINE-WAVE, DUTY CYCLE=4 PULSES PER MINUTES MAXIMUM
4. FOR BIDIRECTIONAL USE C SUFFIX FOR 10% TOLERANCE, CA SUFFIX FOR 5% TOLERANCE



# 600w Transient Voltage Suppressor



| DEVICE      | BREAKDOWN VOLTAGE       |       |             | WORKING<br>PEAK<br>REVERSE<br>VOLTAGE<br>V <sub>RWM</sub> (VOLTS) | MAXIMUM<br>REVERSE<br>LEAKAGE<br>AT V <sub>RWM</sub><br>IR(μA) | MAXIMUM<br>REVERSE<br>CURRENT<br>I <sub>RSM</sub><br>(AMPS) | MAX<br>CLAMPING<br>VOLTAGE<br>V <sub>RWM</sub><br>(VOLTS) | MAXIMUM<br>TEMPERATURE<br>COEFFICIENT<br>OF V <sub>BR</sub><br>(%C) |
|-------------|-------------------------|-------|-------------|---|--|---|---|---|
|             | B <sub>BR</sub> (VOLTS) |       | @IT<br>(mA) |   |  |   |   |   |
|             | MIN                     | MAX   |             |   |  |   |   |   |
| P6KE6.8(C)  | 6.12                    | 7.48  | 10          | 5.50  | 1000   | 56  | 10.8  | 0.057   |
| P6KE6.8(C)A | 6.45                    | 7.14  | 10          | 5.80  | 1000   | 57  | 10.5  | 0.057   |
| P6KE7.5(C)  | 6.75                    | 8.25  | 10          | 6.05  | 500  | 51  | 11.7  | 0.061   |
| P6KE7.5(C)A | 7.13                    | 7.88  | 10          | 6.40  | 500  | 53  | 11.3  | 0.061   |
| P6KE8.2(C)  | 7.38                    | 9.02  | 10          | 6.63  | 200  | 48  | 12.5  | 0.065   |
| P6KE8.2(C)A | 7.79                    | 8.61  | 10          | 7.02  | 200  | 50  | 12.1  | 0.065   |
| P6KE9.1(C)  | 8.19                    | 10.0  | 1.0         | 7.37  | 50   | 44  | 13.8  | 0.068   |
| P6KE9.1(C)A | 8.65                    | 9.55  | 1.0         | 7.78  | 50   | 45  | 13.4  | 0.068   |
| P6KE10(C)   | 9.00                    | 11.0  | 1.0         | 8.10  | 10   | 40  | 15.0  | 0.073   |
| P6KE10(C)A  | 9.50                    | 10.5  | 1.0         | 8.55  | 10   | 41  | 14.5  | 0.073   |
| P6KE11(C)   | 9.90                    | 12.1  | 1.0         | 8.92  | 5.0  | 37  | 16.2  | 0.075   |
| P6KE11(C)A  | 10.5                    | 11.6  | 1.0         | 9.40  | 5.0  | 38  | 15.6  | 0.075   |
| P6KE12(C)   | 10.8                    | 13.2  | 1.0         | 9.72  | 5.0  | 35  | 17.3  | 0.078   |
| P6KE12(C)A  | 11.4                    | 12.6  | 1.0         | 10.2  | 5.0  | 36  | 16.7  | 0.078   |
| P6KE13(C)   | 11.7                    | 14.3  | 1.0         | 10.5  | 5.0  | 32  | 19.0  | 0.081   |
| P6KE13(C)A  | 12.4                    | 13.7  | 1.0         | 11.1  | 5.0  | 33  | 18.2  | 0.081   |
| P6KE15(C)   | 13.5                    | 16.5  | 1.0         | 12.1  | 5.0  | 27  | 22.0  | 0.084   |
| P6KE15(C)A  | 14.3                    | 15.8  | 1.0         | 12.8  | 5.0  | 28  | 21.2  | 0.084   |
| P6KE16(C)   | 14.4                    | 17.6  | 1.0         | 12.9  | 5.0  | 26  | 23.5  | 0.086   |
| P6KE16(C)A  | 15.2                    | 16.8  | 1.0         | 13.6  | 5.0  | 27  | 22.5  | 0.086   |
| P6KE18(C)   | 16.2                    | 19.8  | 1.0         | 14.5  | 5.0  | 23  | 26.5  | 0.088   |
| P6KE18(C)A  | 17.1                    | 18.9  | 1.0         | 15.3  | 5.0  | 24  | 25.2  | 0.088   |
| P6KE20(C)   | 18.0                    | 22.0  | 1.0         | 16.2  | 5.0  | 21  | 29.1  | 0.090   |
| P6KE20(C)A  | 19.0                    | 21.0  | 1.0         | 17.1  | 5.0  | 22  | 27.7  | 0.090   |
| P6KE22(C)   | 19.8                    | 24.2  | 1.0         | 17.8  | 5.0  | 19  | 31.9  | 0.092   |
| P6KE22(C)A  | 20.9                    | 23.1  | 1.0         | 18.8  | 5.0  | 20  | 30.6  | 0.092   |
| P6KE24(C)   | 21.6                    | 26.4  | 1.0         | 19.4  | 5.0  | 17  | 34.7  | 0.094   |
| P6KE24(C)A  | 22.8                    | 25.2  | 1.0         | 20.5  | 5.0  | 18  | 33.2  | 0.094   |
| P6KE27(C)   | 24.3                    | 29.7  | 1.0         | 21.8  | 5.0  | 15  | 39.1  | 0.096   |
| P6KE27(C)A  | 25.7                    | 28.4  | 1.0         | 23.1  | 5.0  | 16  | 37.5  | 0.096   |
| P6KE30(C)   | 27.0                    | 33.0  | 1.0         | 24.3  | 5.0  | 14  | 43.5  | 0.097   |
| P6KE30(C)A  | 28.5                    | 31.5  | 1.0         | 25.6  | 5.0  | 14.4  | 41.4  | 0.097   |
| P6KE33(C)   | 29.7                    | 36.3  | 1.0         | 26.8  | 5.0  | 12.6  | 47.7  | 0.098   |
| P6KE33(C)A  | 31.4                    | 34.7  | 1.0         | 28.2  | 5.0  | 13.2  | 45.7  | 0.098   |
| P6KE36(C)   | 32.4                    | 39.6  | 1.0         | 29.1  | 5.0  | 11.6  | 52.0  | 0.099   |
| P6KE36(C)A  | 34.2                    | 37.8  | 1.0         | 30.8  | 5.0  | 12.0  | 49.9  | 0.099   |
| P6KE39(C)   | 35.1                    | 42.9  | 1.0         | 31.6  | 5.0  | 10.6  | 56.4  | 0.100   |
| P6KE39(C)A  | 37.1                    | 41.0  | 1.0         | 33.3  | 5.0  | 11.2  | 53.9  | 0.100   |
| P6KE43(C)   | 38.7                    | 47.3  | 1.0         | 34.8  | 5.0  | 9.6   | 61.9  | 0.101   |
| P6KE43(C)A  | 40.9                    | 45.2  | 1.0         | 36.8  | 5.0  | 10.1  | 59.3  | 0.101   |
| P6KE47(C)   | 42.3                    | 51.7  | 1.0         | 38.1  | 5.0  | 8.9   | 67.8  | 0.101   |
| P6KE47(C)A  | 44.7                    | 49.4  | 1.0         | 40.2  | 5.0  | 9.3   | 64.8  | 0.101   |
| P6KE51(C)   | 45.9                    | 56.1  | 1.0         | 41.3  | 5.0  | 8.2   | 73.5  | 0.102   |
| P6KE51(C)A  | 48.5                    | 53.6  | 1.0         | 43.6  | 5.0  | 8.6   | 70.1  | 0.102   |
| P6KE56(C)   | 50.4                    | 61.6  | 1.0         | 45.4  | 5.0  | 7.4   | 80.5  | 0.103   |
| P6KE56(C)A  | 53.2                    | 58.8  | 1.0         | 47.8  | 5.0  | 7.8   | 77.0  | 0.103   |
| P6KE62(C)   | 55.8                    | 68.2  | 1.0         | 50.2  | 5.0  | 6.8   | 89.0  | 0.104   |
| P6KE62(C)A  | 58.9                    | 65.1  | 1.0         | 53.0  | 5.0  | 7.1   | 85.0  | 0.104   |
| P6KE68(C)   | 61.2                    | 74.8  | 1.0         | 55.1  | 5.0  | 6.1   | 98.0  | 0.104   |
| P6KE68(C)A  | 64.6                    | 71.4  | 1.0         | 58.1  | 5.0  | 6.5   | 92.0  | 0.104   |
| P6KE75(C)   | 67.5                    | 82.5  | 1.0         | 60.7  | 5.0  | 5.5   | 108.0   | 0.105   |
| P6KE75(C)A  | 71.3                    | 78.8  | 1.0         | 64.1  | 5.0  | 5.8   | 103.0   | 0.105   |
| P6KE82(C)   | 73.8                    | 90.2  | 1.0         | 66.4  | 5.0  | 5.1   | 118.0   | 0.105   |
| P6KE82(C)A  | 77.9                    | 86.1  | 1.0         | 70.1  | 5.0  | 5.3   | 113.0   | 0.105   |
| P6KE91(C)   | 81.9                    | 100.0 | 1.0         | 73.7  | 5.0  | 4.5   | 131.8   | 0.106   |
| P6KE91(C)A  | 86.5                    | 95.50 | 1.0         | 77.8  | 5.0  | 4.8   | 125.0   | 0.106   |
| P6KE100(C)  | 90.0                    | 110.0 | 1.0         | 81.0  | 5.0  | 4.2   | 144.0   | 0.106   |
| P6KE100(C)A | 95.0                    | 105.0 | 1.0         | 85.5  | 5.0  | 4.4   | 137.0   | 0.106   |

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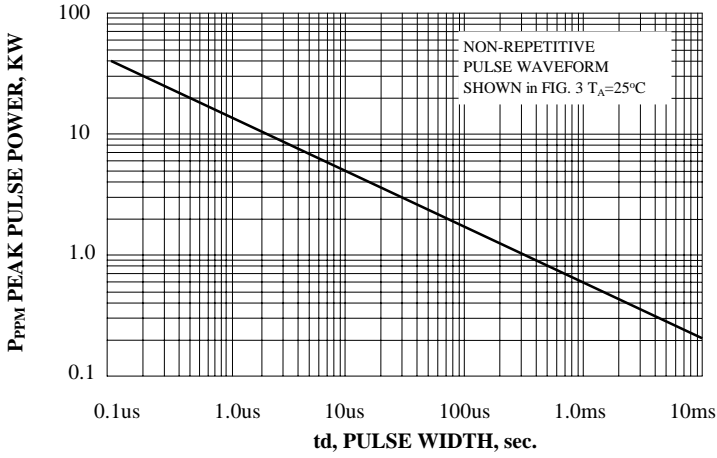
| DEVICE      | BREAKDOWN VOLTAGE       |       | @IT<br>(mA) | WORKING<br>PEAK<br>REVERSE<br>VOLTAGE<br>V <sub>RWM</sub> (VOLTS) | MAXIMUM<br>REVERSE<br>LEAKAGE<br>AT V <sub>RWM</sub><br>IR(μA) | MAXIMUM<br>REVERSE<br>CURRENT<br>I <sub>RSM</sub><br>(AMPS) | MAX<br>CLAMPING<br>VOLTAGE<br>V <sub>RWM</sub><br>(VOLTS) | MAXIMUM<br>TEMPERATURE<br>COEFFICIENT<br>OF V <sub>RR</sub><br>(%C) |
|-------------|-------------------------|-------|-------------|---|--|---|---|---|
|             | B <sub>BR</sub> (VOLTS) |       |             |   |  |   |   |   |
|             | MIN                     | MAX   |             |   |  |   |   |   |
| P6KE110(C)  | 99.0                    | 121.0 | 1.0         | 89.2  | 5.0  | 3.8   | 158.0   | 0.107   |
| P6KE110(C)A | 105.0                   | 116.0 | 1.0         | 94.0  | 5.0  | 4.0   | 152.0   | 0.107   |
| P6KE120(C)  | 108.0                   | 132.0 | 1.0         | 97.2  | 5.0  | 3.5   | 173.0   | 0.107   |
| P6KE120(C)A | 114.0                   | 126.0 | 1.0         | 102.0   | 5.0  | 3.6   | 165.0   | 0.107   |
| P6KE130(C)  | 117.0                   | 143.0 | 1.0         | 105.0   | 5.0  | 3.2   | 187.0   | 0.107   |
| P6KE130(C)A | 124.0                   | 137.0 | 1.0         | 111.0   | 5.0  | 3.3   | 179.0   | 0.107   |
| P6KE150(C)  | 135.0                   | 165.0 | 1.0         | 121.0   | 5.0  | 2.8   | 215.0   | 0.108   |
| P6KE150(C)A | 143.0                   | 158.0 | 1.0         | 128.0   | 5.0  | 2.9   | 207.0   | 0.108   |
| P6KE160(C)  | 144.0                   | 176.0 | 1.0         | 130.0   | 5.0  | 2.6   | 230.0   | 0.108   |
| P6KE160(C)A | 152.0                   | 168.0 | 1.0         | 136.0   | 5.0  | 2.7   | 219.0   | 0.108   |
| P6KE170(C)  | 153.0                   | 187.0 | 1.0         | 138.0   | 5.0  | 2.5   | 244.0   | 0.108   |
| P6KE170(C)A | 162.0                   | 179.0 | 1.0         | 145.0   | 5.0  | 2.6   | 234.0   | 0.108   |
| P6KE180(C)  | 162.0                   | 198.0 | 1.0         | 146.0   | 5.0  | 2.3   | 258.0   | 0.108   |
| P6KE180(C)A | 171.0                   | 189.0 | 1.0         | 154.0   | 5.0  | 2.4   | 246.0   | 0.108   |
| P6KE200(C)  | 180.0                   | 220.0 | 1.0         | 162.0   | 5.0  | 2.1   | 287.0   | 0.108   |
| P6KE200(C)A | 190.0                   | 210.0 | 1.0         | 171.0   | 5.0  | 2.2   | 274.0   | 0.108   |
| P6KE220(C)  | 198.0                   | 242.0 | 1.0         | 175.0   | 5.0  | 1.75  | 344.0   | 0.108   |
| P6KE220(C)A | 209.0                   | 231.0 | 1.0         | 185.0   | 5.0  | 1.83  | 328.0   | 0.108   |
| P6KE250(C)  | 225.0                   | 275.0 | 1.0         | 202.0   | 5.0  | 1.67  | 360.0   | 0.110   |
| P6KE250(C)A | 237.0                   | 263.0 | 1.0         | 214.0   | 5.0  | 1.75  | 344.0   | 0.110   |
| P6KE300(C)  | 270.0                   | 330.0 | 1.0         | 243.0   | 5.0  | 1.4   | 430.0   | 0.110   |
| P6KE300(C)A | 285.0                   | 315.0 | 1.0         | 256.0   | 5.0  | 1.45  | 414.0   | 0.110   |
| P6KE350(C)  | 315.0                   | 385.0 | 1.0         | 284.0   | 5.0  | 1.2   | 504.0   | 0.110   |
| P6KE350(C)A | 332.0                   | 368.0 | 1.0         | 300.0   | 5.0  | 1.25  | 482.0   | 0.110   |
| P6KE400(C)  | 360.0                   | 440.0 | 1.0         | 324.0   | 5.0  | 1.05  | 574.0   | 0.110   |
| P6KE400(C)A | 380.0                   | 420.0 | 1.0         | 342.0   | 5.0  | 1.1   | 548.0   | 0.110   |
| P6KE440(C)  | 396.0                   | 484.0 | 1.0         | 356.0   | 5.0  | 0.95  | 630.0   | 0.113   |
| P6KE440(C)A | 418.0                   | 462.0 | 1.0         | 376.0   | 5.0  | 1.00  | 600.0   | 0.113   |

NOTES :

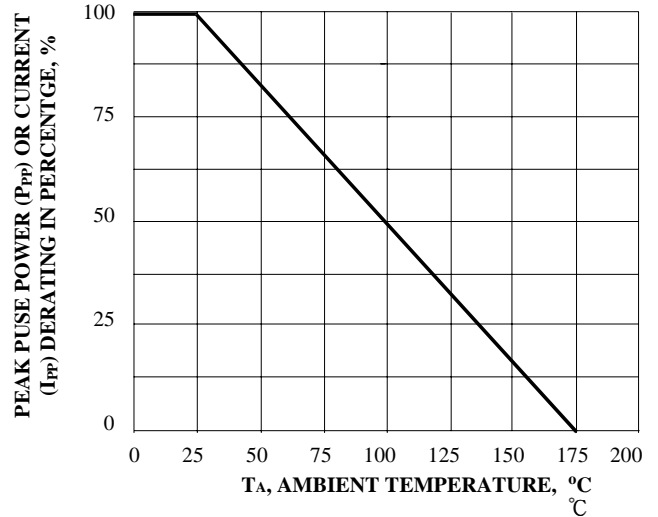
- V<sub>BR</sub> MEASURED AFTER I<sub>T</sub> APPLIED FOR 300 μS, I<sub>T</sub>=SQUARE WAVE PULSE OR EQUIVALENT
- SURGE CURRENT WAVEFORM PER FIGURE 3 AND DERATED PER FIGUE 2.
- V<sub>F</sub>=3.5V AT I<sub>F</sub>=50A (P6KE6.8 THRU P6KE91A)  
V<sub>F</sub>=5.0V AT I<sub>F</sub>=50A (P6KE100 THRU P6KE440A) ON 1/2 SQUARE OR EQUIVALENT SINE WAVE.  
PW=8.3ms, DUTY CYCLE=4 PULSES PER MINUTE MXIMUM
- FOR BIPOLAR TYPES HAVING V<sub>RWM</sub> OF 10 VOLTS AND UNDER, THE I<sub>R</sub> LIMIT IS DOUBLED

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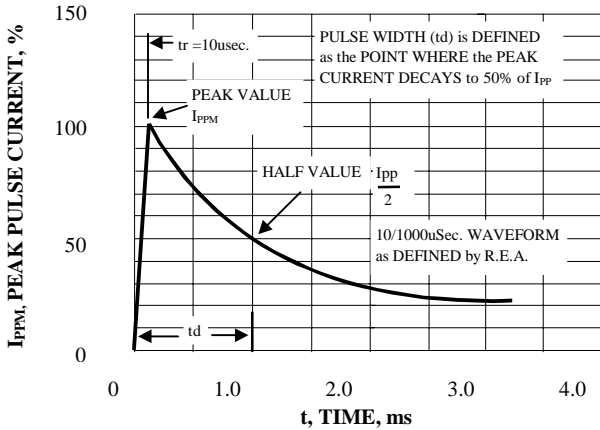
**FIG. 1 - PEAK PULSE POWER RATING CURVE**



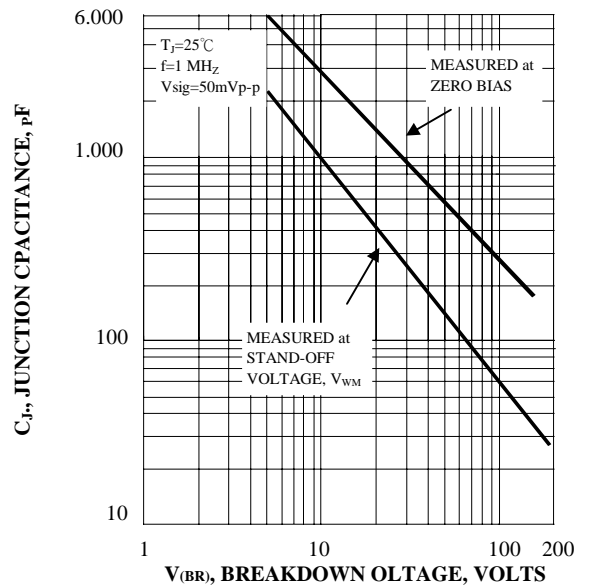
**FIG. 2 - PULSE DERATING CURVE**



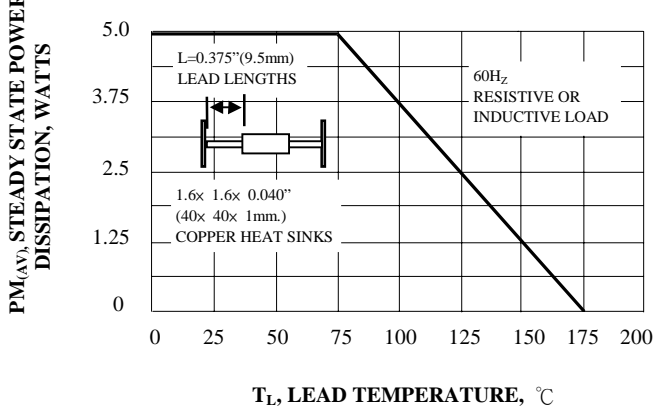
**FIG. 3 - PULSE WAVEFORM**



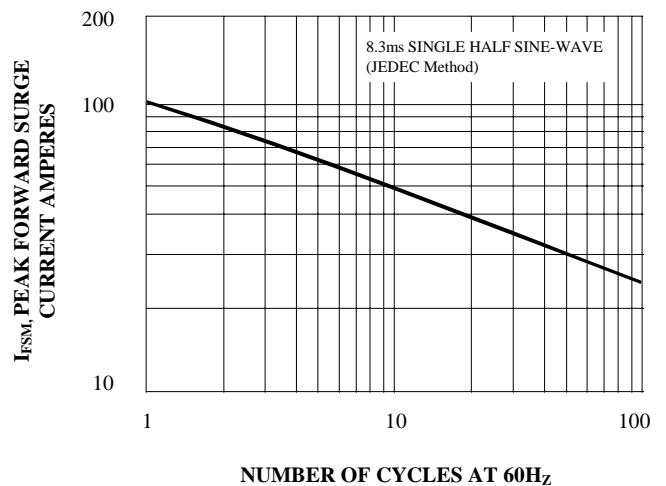
**FIG. 4 - TYPICAL JUNCTION CAPACITANCE UNIDIRECTIONAL**



**FIG. 5 - STEADY STATE POWER DERATING CURVE**



**FIG. 6 - MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL**



**FIG. 7 - TYPICAL REVERSE LEAKAGE CHARACTERISTICS**

