



CHENMKO ENTERPRISE CO.,LTD

SURFACE MOUNT ZENER

SILICON PLANAR POWER ZENER DIODES
VOLTAGE RANGE 2.4V TO 91V

MMCZ5221BPT

THRU

MMCZ5270BPT

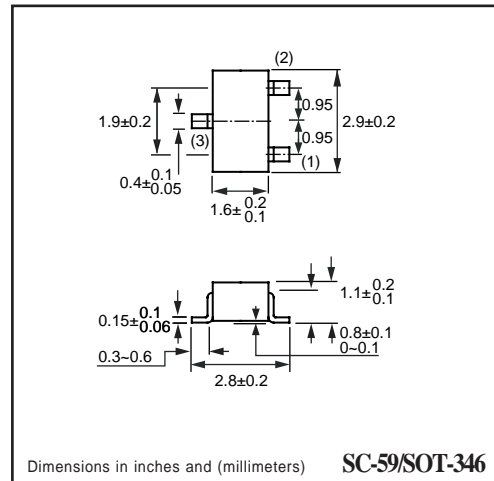
Lead free devices

FEATURE

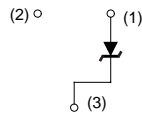
- * Small surface mounting type. (SC-59/SOT-346)
- * High temperature soldering type.
- * ESD rating of class 3(>16 kV) per human body model.
- * Silicon planar zener diodes.
- * Silicon-oxide passivated junction.
- * Low temperature coefficient voltage
- * 225 mW Rating on FR-4 or FR-5 Board

MECHANICAL

- * SC-59/SOT-346 Packaging.
- * Mounting position: Any.



CIRCUIT



MAXIMUM RATINGS (At $T_A = 25^{\circ}\text{C}$ unless otherwise noted)

| RATINGS | SYMBOL | VALUE | UNITS |
|--|-----------|-------------|--------------------|
| Zener Current (see Table "Characteristics") | - | - | - |
| Max. Steady State Power Dissipation @ $T_A=25^{\circ}\text{C}$ | P_D | 225 | mW |
| Max. Operating Temperature Range | T_J | -65 to +150 | $^{\circ}\text{C}$ |
| Storage Temperature Range | T_{STG} | -65 to +150 | $^{\circ}\text{C}$ |

ELECTRICAL CHARACTERISTICS (At $T_A = 25^{\circ}\text{C}$ unless otherwise noted)

| CHARACTERISTICS | SYMBOL | MIN. | TYP. | MAX. | UNITS |
|---|-----------------|------|------|------|----------------------|
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | - | - | 500 | $^{\circ}\text{C/W}$ |
| Max. Instantaneous Forward Voltage at $I_F=10\text{mA}$ | V_F | - | - | 0.9 | Volts |

- NOTES :
1. The JEDEC type numbers listed have a standard tolerance on the normal zener voltage of $\pm 10\%$, Suffix B= $\pm 5\%$, Suffix S= $\pm 2\%$
 2. The zener impedance is derived from 1KHz AC voltage, which results when an AC current having an RMS value equal to 10% of DC zener current (I_{ZT} or I_{ZK}) is superimposed on I_{ZT} or I_{ZK} . Zener impedance is measured at two points to insure a sharp knee on the breakdown curve to eliminate unstable units.
 3. Valid provided that electrodes at distance of 10mm from case are kept ambient temperature.
 4. Measured under thermal equilibrium and DC test conditions.
 5. The rating listed in the electrical characteristics table is maximum peak, non-repetitive, reverse surge current of 1/2 square wave or equivalent sine wave pulse of 1/120 second duration superimposed on the test current, I_{ZT} , per JEDEC registration.

2003-01

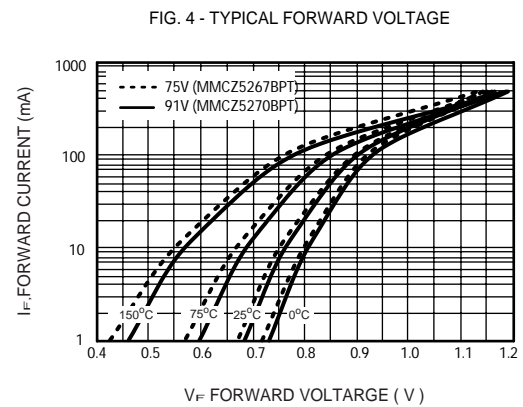
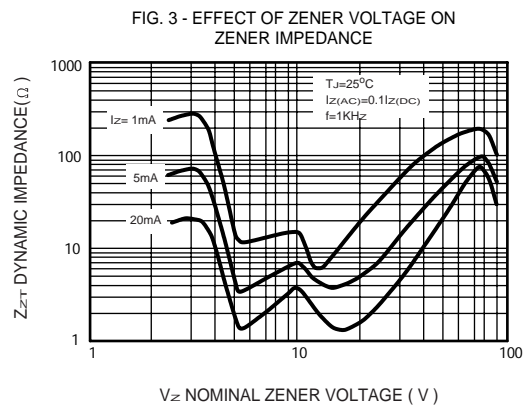
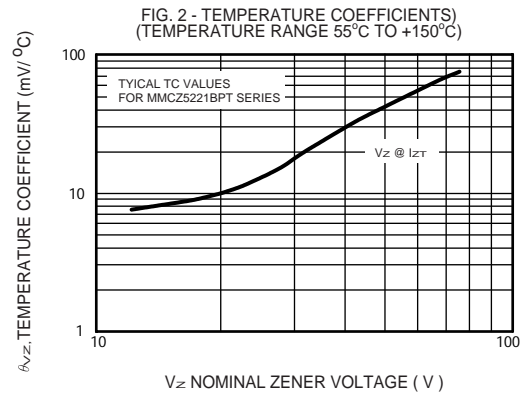
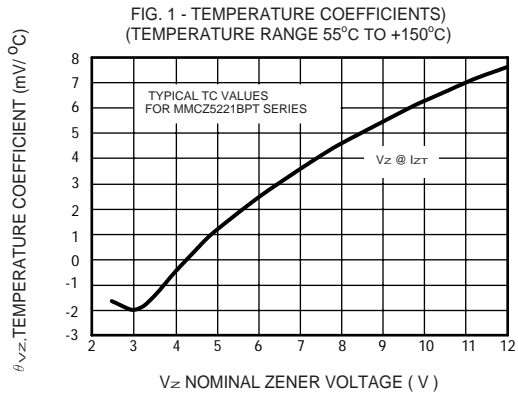
ELECTRICAL CHARACTERISTICS (MMCZ5221BPT THRU MMCZ5270BPT)

| TYPE | Zener voltage V _Z (V) @ I _{ZT} | | | Test current I _{ZT} (mA) | Maximum Zener impedance | | | Maximum reverse leakage current | | Type temperature coefficient at T _A = 25°C θ _{VZ} (%/°C) | Maximum regulator current at T _A = 50°C I _{ZM} (mA) |
|-------------|---|-------|-------|---|--|------------------------|-------------------------------|------------------------------------|--------------------------|---|--|
| | Min | Nom | Max | | Z _{ZT} at I _{ZT} (Ω) | Z _{ZK} (Ω) | at I _{ZK} (mA) | I _R (μA) | at V _R (V) | | |
| | Volts | Volts | Volts | | | | | | | | |
| MMCZ5221BPT | 2.280 | 2.4 | 2.520 | 5 | 100 | 1800 | 0.25 | 100 | 1 | -0.085 | 190 |
| MMCZ5222BPT | 2.375 | 2.5 | 2.625 | 5 | 100 | 1800 | 0.25 | 100 | 1 | -0.085 | 182 |
| MMCZ5223BPT | 2.565 | 2.7 | 2.835 | 5 | 100 | 1900 | 0.25 | 75 | 1 | -0.080 | 168 |
| MMCZ5224BPT | 2.660 | 2.8 | 2.940 | 5 | 100 | 1900 | 0.25 | 75 | 1 | -0.080 | 162 |
| MMCZ5225BPT | 2.850 | 3.0 | 3.150 | 5 | 95 | 2000 | 0.25 | 50 | 1 | -0.075 | 152 |
| MMCZ5226BPT | 3.135 | 3.3 | 3.465 | 5 | 95 | 2200 | 0.25 | 25 | 1 | -0.070 | 138 |
| MMCZ5227BPT | 3.420 | 3.6 | 3.780 | 5 | 90 | 2300 | 0.25 | 15 | 1 | -0.065 | 126 |
| MMCZ5228BPT | 3.705 | 3.9 | 4.095 | 5 | 90 | 2400 | 0.25 | 10 | 1 | -0.060 | 115 |
| MMCZ5229BPT | 4.085 | 4.3 | 4.515 | 5 | 88 | 2500 | 0.25 | 5 | 1 | -0.055 | 106 |
| MMCZ5230BPT | 4.465 | 4.7 | 4.935 | 5 | 70 | 2200 | 0.25 | 3 | 1.5 | +0.030 | 97 |
| MMCZ5231BPT | 4.845 | 5.1 | 5.355 | 5 | 50 | 2050 | 0.25 | 2 | 2 | +0.030 | 89 |
| MMCZ5232BPT | 5.320 | 5.6 | 5.880 | 5 | 25 | 1800 | 0.25 | 5 | 3 | +0.038 | 81 |
| MMCZ5233BPT | 5.700 | 6.0 | 6.300 | 5 | 25 | 1800 | 0.25 | 5 | 3 | +0.038 | 76 |
| MMCZ5234BPT | 5.890 | 6.2 | 6.510 | 5 | 10 | 1300 | 0.25 | 1 | 4 | +0.045 | 73 |
| MMCZ5235BPT | 6.460 | 6.8 | 7.140 | 5 | 8 | 750 | 0.25 | 1 | 5.2 | +0.050 | 67 |
| MMCZ5236BPT | 7.125 | 7.5 | 7.875 | 5 | 7 | 600 | 0.25 | 0.5 | 6 | +0.058 | 61 |
| MMCZ5237BPT | 7.790 | 8.2 | 8.610 | 5 | 7 | 600 | 0.25 | 0.5 | 6.5 | +0.062 | 55 |
| MMCZ5238BPT | 8.265 | 8.7 | 9.135 | 5 | 7 | 600 | 0.25 | 0.5 | 6.5 | +0.065 | 52 |
| MMCZ5239BPT | 8.645 | 9.1 | 9.555 | 5 | 10 | 600 | 0.25 | 0.1 | 7 | +0.068 | 50 |
| MMCZ5240BPT | 9.500 | 10 | 10.50 | 5 | 15 | 600 | 0.25 | 0.1 | 8 | +0.075 | 45 |
| MMCZ5241BPT | 10.45 | 11 | 11.55 | 5 | 18 | 600 | 0.25 | 0.1 | 8.4 | +0.076 | 41 |
| MMCZ5242BPT | 11.40 | 12 | 12.60 | 5 | 22 | 600 | 0.25 | 0.1 | 9.1 | +0.077 | 38 |
| MMCZ5243BPT | 12.35 | 13 | 13.65 | 5 | 25 | 600 | 0.25 | 0.1 | 9.9 | +0.079 | 35 |
| MMCZ5244BPT | 13.30 | 14 | 14.70 | 5 | 25 | 600 | 0.25 | 0.1 | 10 | +0.082 | 32 |
| MMCZ5245BPT | 14.25 | 15 | 15.75 | 5 | 32 | 600 | 0.25 | 0.1 | 11 | +0.082 | 30 |
| MMCZ5246BPT | 15.20 | 16 | 16.80 | 5 | 36 | 600 | 0.25 | 0.1 | 12 | +0.083 | 28 |
| MMCZ5247BPT | 16.15 | 17 | 17.85 | 5 | 36 | 600 | 0.25 | 0.1 | 13 | +0.084 | 27 |
| MMCZ5248BPT | 17.10 | 18 | 18.90 | 5 | 42 | 600 | 0.25 | 0.1 | 14 | +0.085 | 25 |
| MMCZ5249BPT | 18.05 | 19 | 19.95 | 5 | 42 | 600 | 0.25 | 0.1 | 14 | +0.086 | 24 |
| MMCZ5250BPT | 19.00 | 20 | 21.00 | 5 | 48 | 600 | 0.25 | 0.1 | 16 | +0.086 | 23 |
| MMCZ5251BPT | 20.90 | 22 | 23.10 | 5 | 55 | 600 | 0.25 | 0.1 | 17 | +0.087 | 21 |
| MMCZ5252BPT | 22.80 | 24 | 25.20 | 5 | 62 | 600 | 0.25 | 0.1 | 18 | +0.088 | 19.1 |
| MMCZ5253BPT | 23.75 | 25 | 26.25 | 5 | 62 | 600 | 0.25 | 0.1 | 19 | +0.089 | 18.2 |
| MMCZ5254BPT | 25.65 | 27 | 28.35 | 5 | 70 | 600 | 0.25 | 0.1 | 21 | +0.090 | 16.8 |
| MMCZ5255BPT | 26.60 | 28 | 29.40 | 5 | 44 | 600 | 0.25 | 0.1 | 21 | +0.091 | 16.2 |
| MMCZ5256BPT | 28.50 | 30 | 31.50 | 5 | 78 | 600 | 0.25 | 0.1 | 23 | +0.091 | 15.1 |
| MMCZ5257BPT | 31.35 | 33 | 34.65 | 5 | 88 | 700 | 0.25 | 0.1 | 25 | +0.092 | 13.8 |

ELECTRICAL CHARACTERISTICS (MMCZ5221BPT THRU MMCZ5270BPT)

| TYPE | Zener voltage V _Z (V) @ I _{ZT} | | | Test current | Maximum Zener impedance | | | Maximum reverse leakage current | | Type temperature coefficient at T _A = 25°C θ _{VZ} (%/°C) | Maximum regulator current at T _A = 50°C I _{ZM} (mA) |
|-------------|---|-------|-------|----------------------|--|------------------------|-------------------------------|------------------------------------|--------------------------|---|--|
| | Min | Nom | Max | | Z _{ZT} at I _{ZT} (Ω) | Z _{ZK} (Ω) | at I _{ZK} (mA) | I _R (μA) | at V _R (V) | | |
| | Volts | Volts | Volts | I _{ZT} (mA) | | | | | | | |
| MMCZ5258BPT | 34.20 | 36 | 37.80 | 5 | 95 | 700 | 0.25 | 0.1 | 27 | +0.093 | 13.8 |
| MMCZ5259BPT | 37.05 | 39 | 40.95 | 5 | 130 | 800 | 0.25 | 0.1 | 30 | +0.094 | 12.6 |
| MMCZ5260BPT | 40.85 | 43 | 45.15 | 3.0 | 93 | 900 | 0.25 | 0.1 | 33 | +0.095 | 11.6 |
| MMCZ5261BPT | 44.65 | 47 | 49.35 | 2.7 | 105 | 1000 | 0.25 | 0.1 | 36 | +0.095 | 10.6 |
| MMCZ5262BPT | 48.45 | 51 | 53.55 | 2.5 | 125 | 1100 | 0.25 | 0.1 | 39 | +0.096 | 9.7 |
| MMCZ5263BPT | 53.20 | 56 | 58.80 | 2.2 | 150 | 1300 | 0.25 | 0.1 | 43 | +0.096 | 8.9 |
| MMCZ5264BPT | 57.00 | 60 | 63.00 | 2.1 | 170 | 1400 | 0.25 | 0.1 | 46 | +0.097 | 11.6 |
| MMCZ5265BPT | 58.90 | 62 | 65.10 | 2.0 | 185 | 1400 | 0.25 | 0.1 | 47 | +0.097 | - |
| MMCZ5266BPT | 64.60 | 68 | 71.40 | 1.8 | 230 | 1600 | 0.25 | 0.1 | 52 | +0.097 | - |
| MMCZ5267BPT | 71.25 | 75 | 78.75 | 1.7 | 270 | 1700 | 0.25 | 0.1 | 56 | +0.098 | - |
| MMCZ5268BPT | 77.90 | 82 | 86.10 | 1.5 | 330 | 2000 | 0.25 | 0.1 | 62 | +0.098 | - |
| MMCZ5269BPT | 82.65 | 87 | 91.35 | 1.4 | 370 | 2200 | 0.25 | 0.1 | 68 | +0.099 | - |
| MMCZ5270BPT | 86.45 | 91 | 95.55 | 1.4 | 400 | 2300 | 0.25 | 0.1 | 69 | +0.099 | - |

RATING CHARACTERISTIC CURVES (MMCZ5221BPT THRU MMCZ5270BPT)



RATING CHARACTERISTIC CURVES (MMCZ5221BPT THRU MMCZ5270BPT)

FIG. 5 - TYPICAL CAPACITANCE

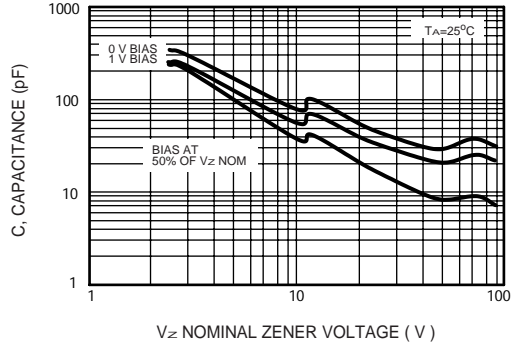


FIG. 6 - TYPICAL LEAKAGE CURRENT

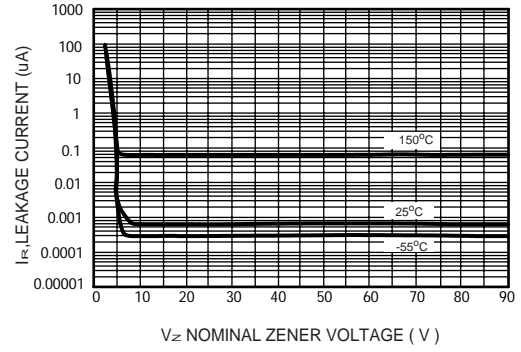


FIG. 7 - ZENER VOLTAGE VERSUS ZENER CURRENT (V_z UP TO 12V)

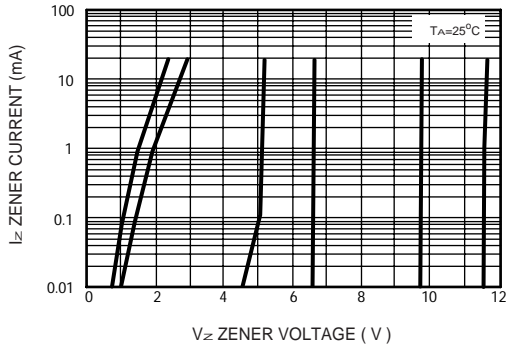


FIG. 8 - ZENER VOLTAGE VERSUS ZENER CURRENT (12V TO 91V)

