CHENMKO ENTERPRISE CO.,LTD

SURFACE MOUNT ZENER

SILICON PLANAR POWER ZENER DIODES

VOLTAGE RANGE 2.4V TO 91V

MMCZ5221SPT

THRU

MMCZ5270SPT

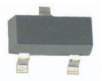
Lead free devices

FEATURE

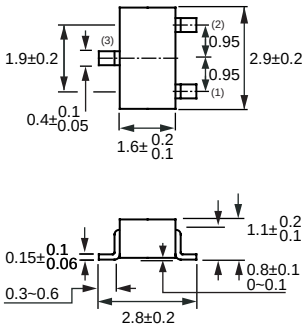
* Small surface mounting type. (SC-59/SOT-346)
* High temperature soldering type.
* ESD rating of class 3(>16 kV) per human body model.
* Silicon planar zener diodes.
* Silcon-oxide passivated junction.
* Low temperature coefficient voltage
* 225 mW Rating on FR-4 or FR-5 Board

MECHANICAL

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



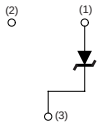
SC-59/SOT-346



Dimensions in inches and (millimeters)

SC-59/SOT-346

CIRCUIT



MAXIMUM RATINGES (At T_A = 25°C unless otherwise noted)

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

ELECTRICAL CHARACTERISTICS (At T_A = 25°C unless otherwise noted)

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

2003-01

NOTES :
1. The JEDEC type numbers listd have a standaerd tolerance on the normal zener voltage of ±10%, Suffix B=±5%.Suffix S=±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 listd 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.

ELECTRICAL CHARACTERISTICS (MMCZ5221SPT THRU MMCZ5270SPT)

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}	Z_{ZK}	at I_{ZK}	I_R	at V_R		
	Volts	Volts	Volts	I_{ZT} (mA)	(Ω)	(Ω)	(mA)	(uA)	(V)		
MMCZ5221SPT	2.352	2.4	2.448	20	30	1200	0.25	100	1	-0.085	190
MMCZ5222SPT	2.450	2.5	2.550	20	30	1250	0.25	100	1	-0.085	182
MMCZ5223SPT	2.646	2.7	2.754	20	30	1300	0.25	75	1	-0.080	168
MMCZ5224SPT	2.774	2.8	2.856	20	30	1400	0.25	75	1	-0.080	162
MMCZ5225SPT	2.940	3.0	3.060	20	29	1600	0.25	50	1	-0.075	152
MMCZ5226SPT	3.234	3.3	3.366	20	28	1600	0.25	25	1	-0.070	138
MMCZ5227SPT	3.528	3.6	3.762	20	24	1700	0.25	15	1	-0.065	126
MMCZ5228SPT	3.822	3.9	3.987	20	23	1900	0.25	10	1	-0.060	115
MMCZ5229SPT	4.214	4.3	4.386	20	22	2000	0.25	5	1	-0.055	106
MMCZ5230SPT	4.606	4.7	4.794	20	19	1900	0.25	5	2	+0.030	97
MMCZ5231SPT	4.998	5.1	5.202	20	17	1600	0.25	5	2	+0.030	89
MMCZ5232SPT	5.488	5.6	5.712	20	11	1600	0.25	5	3	+0.038	81
MMCZ5233SPT	5.880	6.0	6.120	20	7	1600	0.25	5	3.5	+0.038	76
MMCZ5234SPT	6.070	6.2	6.324	20	7	1000	0.25	5	4	+0.045	73
MMCZ5235SPT	6.664	6.8	6.936	20	5	750	0.25	3	5	+0.050	67
MMCZ5236SPT	7.350	7.5	7.650	20	6	500	0.25	3	6	+0.058	61
MMCZ5237SPT	8.036	8.2	8.364	20	8	500	0.25	3	6.5	+0.062	55
MMCZ5238SPT	8.526	8.7	8.874	20	8	600	0.25	3	6.5	+0.065	52
MMCZ5239SPT	8.918	9.1	9.282	20	10	600	0.25	3	7	+0.068	50
MMCZ5240SPT	9.800	10	10.20	20	17	600	0.25	3	8	+0.075	45
MMCZ5241SPT	10.78	11	11.22	20	22	600	0.25	2	8.4	+0.076	41
MMCZ5242SPT	11.76	12	12.24	20	30	600	0.25	1	9.1	+0.077	38
MMCZ5243SPT	12.74	13	13.26	9.5	13	600	0.25	0.5	9.9	+0.079	35
MMCZ5244SPT	13.72	14	14.28	9.0	15	600	0.25	0.1	10	+0.082	32
MMCZ5245SPT	14.70	15	15.30	8.5	16	600	0.25	0.1	11	+0.082	30
MMCZ5246SPT	15.68	16	16.32	7.8	17	600	0.25	0.1	12	+0.083	28
MMCZ5247SPT	16.66	17	17.34	7.4	19	600	0.25	0.1	13	+0.084	27
MMCZ5248SPT	17.64	18	18.36	7.0	21	600	0.25	0.1	14	+0.085	25
MMCZ5249SPT	18.62	19	19.38	6.6	23	600	0.25	0.1	14	+0.086	24
MMCZ5250SPT	19.60	20	20.40	6.2	25	600	0.25	0.1	16	+0.086	23
MMCZ5251SPT	21.56	22	22.44	5.6	29	600	0.25	0.1	17	+0.087	21
MMCZ5252SPT	23.52	24	24.48	5.2	33	600	0.25	0.1	18	+0.088	19.1
MMCZ5253SPT	24.50	25	25.50	5.0	35	600	0.25	0.1	19	+0.089	18.2
MMCZ5254SPT	26.46	27	27.54	4.6	41	600	0.25	0.1	21	+0.090	16.8
MMCZ5255SPT	27.44	28	28.56	4.5	44	600	0.25	0.1	21	+0.091	16.2
MMCZ5256SPT	29.40	30	30.60	4.2	49	600	0.25	0.1	23	+0.091	15.1
MMCZ5257SPT	32.34	33	33.66	3.8	58	700	0.25	0.1	25	+0.092	13.8

ELECTRICAL CHARACTERISTICS (MMCZ5221SPT THRU MMCZ5270SPT)

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 (uA)	at V_R (V)		
	Volts	Volts	Volts	I_{ZT} (mA)							
MMCZ5258SPT	35.28	36	36.72	3.4	70	700	0.25	0.1	27	+0.093	13.8
MMCZ5259SPT	38.22	39	39.78	3.2	80	800	0.25	0.1	30	+0.094	12.6
MMCZ5260SPT	42.14	43	43.86	3.0	93	900	0.25	0.1	33	+0.095	11.6
MMCZ5261SPT	46.06	47	47.94	2.7	105	1000	0.25	0.1	36	+0.095	10.6
MMCZ5262SPT	49.98	51	52.02	2.5	125	1100	0.25	0.1	36	+0.096	9.7
MMCZ5263SPT	54.88	56	57.12	2.2	150	1300	0.25	0.1	39	+0.096	8.9
MMCZ5264SPT	58.80	60	61.20	2.1	170	1400	0.25	0.1	43	+0.097	11.6
MMCZ5265SPT	60.76	62	63.24	2.0	185	1400	0.25	0.1	46	+0.097	-
MMCZ5266SPT	66.64	68	69.36	1.8	230	1600	0.25	0.1	52	+0.097	-
MMCZ5267SPT	73.50	75	76.50	1.7	270	1700	0.25	0.1	56	+0.098	-
MMCZ5268SPT	80.36	82	83.64	1.5	330	2000	0.25	0.1	62	+0.098	-
MMCZ5269SPT	85.26	87	88.74	1.4	370	2000	0.25	0.1	68	+0.099	-
MMCZ5270SPT	89.18	91	92.82	1.4	400	2300	0.25	0.1	69	+0.099	-

(RATING CHARACTERISTIC CURVES (MMCZ5221SPT THRU MMCZ5270SPT)

FIG. 1 - TEMPERATURE COEFFICIENTS)
(TEMPERATURE RANGE 55°C TO +150°C)

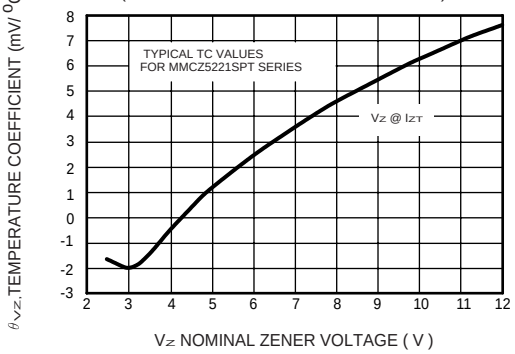


FIG. 2 - TEMPERATURE COEFFICIENTS)
(TEMPERATURE RANGE 55°C TO +150°C)

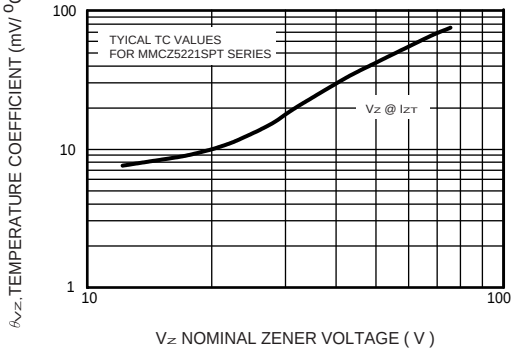


FIG. 3 - EFFECT OF ZENER VOLTAGE ON
ZENER IMPEDANCE

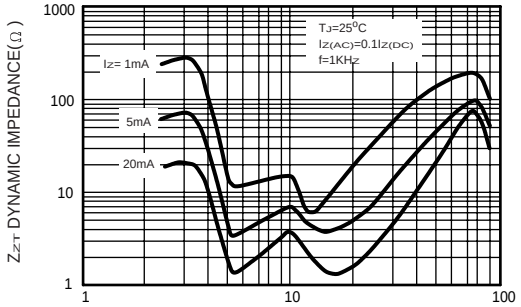
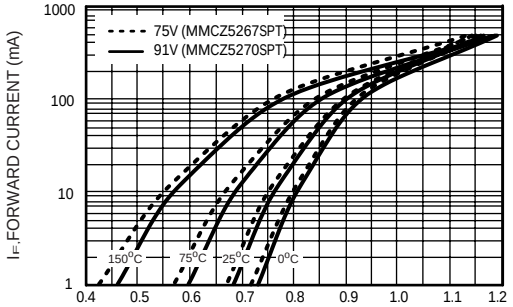


FIG. 4 - TYPICAL FORWARD VOLTAGE



RATING CHARACTERISTIC CURVES (MMCZ5221SPT THRU MMCZ5270SPT)

FIG. 5 - TYPICAL CAPACITANCE

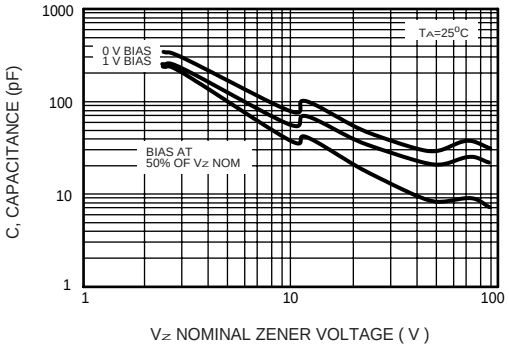


FIG. 6 - TYPICAL LEAKAGE CURRENT

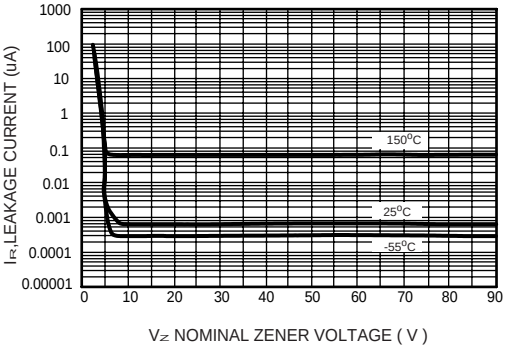


FIG. 7 - ZENER VOLTAGE VERSUS ZENER CURRENT (VZ UP TO 12V)

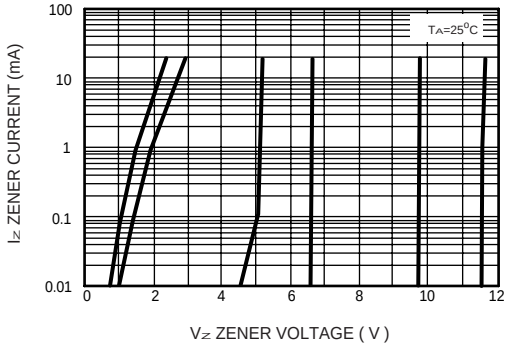
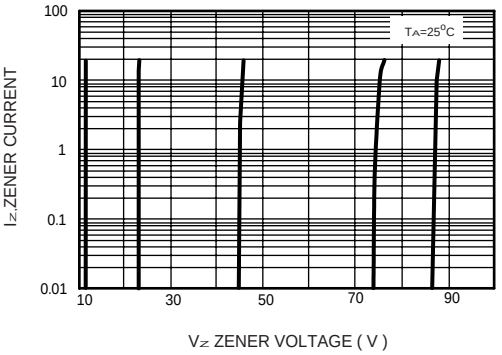



FIG. 8 - ZENER VOLTAGE VERSUS ZENER CURRENT (12V TO 91V)