



**CHENMKO ENTERPRISE CO.,LTD**

*Halogens free devices*

**SURFACE MOUNT ZENER**  
**SILICON PLANAR POWER ZENER DIODES**  
**VOLTAGE RANGE 2.4V TO 91V**

**MMSZ5221SGP**

**THRU**

**MMSZ5270SGP**

**FEATURE**

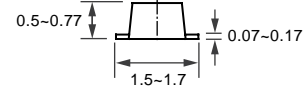
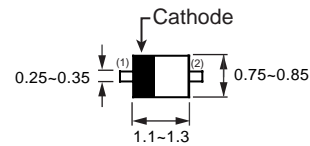
- \* Small surface mounting type. (SC-79/SOD-523)
- \* High temperature soldering type.
- \* ESD rating of class 3(>16 kV) per human body model.
- \* Silicon planar zener diodes.
- \* Silicon-oxide passivated junction.
- \* Low temperature coefficient voltage
- \* 500 mW Rating on FR-4 or FR-5 Board

**MECHANICAL**

- \* SC-79/SOD-523 Packaging.
- \* Cathode indicated by polarity band.
- \* Mounting position: Any.



**SC-79/SOD-523**



Dimensions in millimeters

**SC-79/SOD-523**

**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	$R_{\theta JA}$	-	-	556	$^\circ\text{C/W}$
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

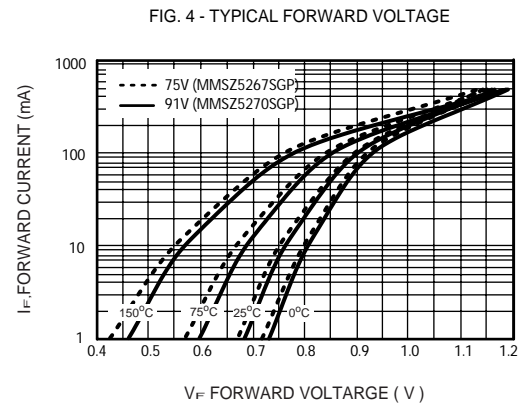
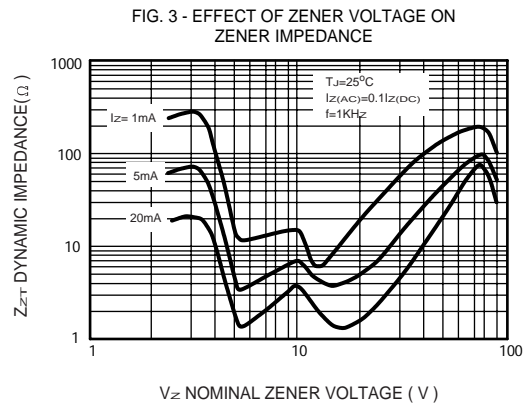
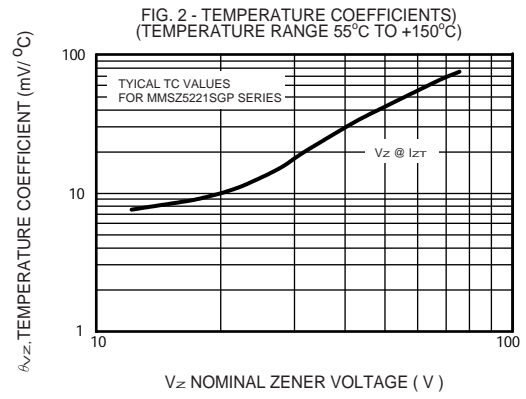
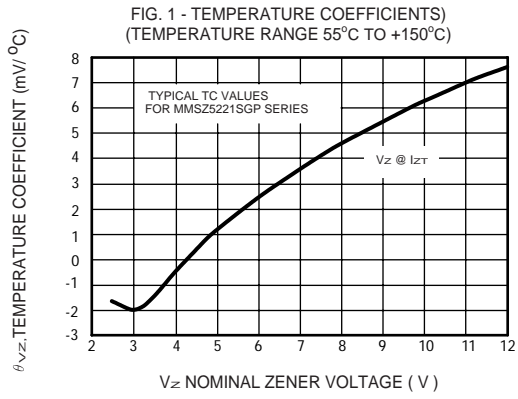
## ELECTRICAL CHARACTERISTICS ( MMSZ5221SGP THRU MMSZ5270SGP )

TYPE	Zener voltage V <sub>Z</sub> (V) @ I <sub>ZT</sub>			Test current  I <sub>ZT</sub> (mA)	Maximum Zener impedance			Maximum reverse leakage current		Type temperature coefficient at T <sub>A</sub> = 25°C θ <sub>VZ</sub> (%/°C)	Maximum regulator current at T <sub>A</sub> = 50°C I <sub>ZM</sub> (mA)
	Min	Nom	Max		Z <sub>ZT</sub> at I <sub>ZT</sub> (Ω)	Z <sub>ZK</sub> (Ω)	at I <sub>ZK</sub> (mA)	I <sub>R</sub> (μA)	at V <sub>R</sub> (V)		
	Volts	Volts	Volts								
MMSZ5221SGP	2.352	2.4	2.448	5	100	1800	0.25	100	1	-0.085	85
MMSZ5222SGP	2.450	2.5	2.550	5	100	1800	0.25	100	1	-0.085	82
MMSZ5223SGP	2.646	2.7	2.754	5	100	1900	0.25	75	1	-0.080	76
MMSZ5224SGP	2.774	2.8	2.856	5	100	1900	0.25	75	1	-0.080	73
MMSZ5225SGP	2.940	3.0	3.060	5	95	2000	0.25	50	1	-0.075	68
MMSZ5226SGP	3.234	3.3	3.366	5	95	2200	0.25	25	1	-0.070	62
MMSZ5227SGP	3.528	3.6	3.762	5	90	2300	0.25	15	1	-0.065	57
MMSZ5228SGP	3.822	3.9	3.987	5	90	2400	0.25	10	1	-0.060	52
MMSZ5229SGP	4.214	4.3	4.386	5	88	2500	0.25	5	1	-0.055	48
MMSZ5230SGP	4.606	4.7	4.794	5	70	2200	0.25	3	1.5	+0.030	44
MMSZ5231SGP	4.998	5.1	5.202	5	50	2050	0.25	2	2	+0.030	40
MMSZ5232SGP	5.488	5.6	5.712	5	25	1800	0.25	5	3	+0.038	36
MMSZ5233SGP	5.880	6.0	6.120	5	25	1800	0.25	5	3	+0.038	34
MMSZ5234SGP	6.070	6.2	6.324	5	10	1300	0.25	1	4	+0.045	33
MMSZ5235SGP	6.664	6.8	6.936	5	8	750	0.25	1	5.2	+0.050	30
MMSZ5236SGP	7.350	7.5	7.650	5	7	600	0.25	0.5	6	+0.058	27
MMSZ5237SGP	8.036	8.2	8.364	5	7	600	0.25	0.5	6.5	+0.062	25
MMSZ5238SGP	8.526	8.7	8.874	5	7	600	0.25	0.5	6.5	+0.065	23
MMSZ5239SGP	8.918	9.1	9.282	5	10	600	0.25	0.1	7	+0.068	22
MMSZ5240SGP	9.800	10	10.20	5	15	600	0.25	0.1	8	+0.075	20
MMSZ5241SGP	10.78	11	11.22	5	18	600	0.25	0.1	8.4	+0.076	18
MMSZ5242SGP	11.76	12	12.24	5	22	600	0.25	0.1	9.1	+0.077	17
MMSZ5243SGP	12.74	13	13.26	5	25	600	0.25	0.1	9.9	+0.079	16
MMSZ5244SGP	13.72	14	14.28	5	25	600	0.25	0.1	10	+0.082	14
MMSZ5245SGP	14.70	15	15.30	5	32	600	0.25	0.1	11	+0.082	13
MMSZ5246SGP	15.68	16	16.32	5	36	600	0.25	0.1	12	+0.083	12.5
MMSZ5247SGP	16.66	17	17.34	5	36	600	0.25	0.1	13	+0.084	12.1
MMSZ5248SGP	17.64	18	18.36	5	42	600	0.25	0.1	14	+0.085	11.2
MMSZ5249SGP	18.62	19	19.38	5	42	600	0.25	0.1	14	+0.086	10.8
MMSZ5250SGP	19.60	20	20.40	5	48	600	0.25	0.1	16	+0.086	10.3
MMSZ5251SGP	21.56	22	22.44	5	55	600	0.25	0.1	17	+0.087	9.4
MMSZ5252SGP	23.52	24	24.48	5	62	600	0.25	0.1	18	+0.088	8.6
MMSZ5253SGP	24.50	25	25.50	5	62	600	0.25	0.1	19	+0.089	7.6
MMSZ5254SGP	26.46	27	27.54	5	70	600	0.25	0.1	21	+0.090	7.5
MMSZ5255SGP	27.44	28	28.56	5	44	600	0.25	0.1	21	+0.091	7.3
MMSZ5256SGP	29.40	30	30.60	5	78	600	0.25	0.1	23	+0.091	6.8
MMSZ5257SGP	32.34	33	33.66	5	88	700	0.25	0.1	25	+0.092	6.2

## ELECTRICAL CHARACTERISTICS ( MMSZ5221SGP THRU MMSZ5270SGP )

TYPE	Zener voltage V <sub>Z</sub> (V) @ I <sub>ZT</sub>			Test current  I <sub>ZT</sub> (mA)	Maximum Zener impedance			Maximum reverse leakage current		Type temperature coefficient at T <sub>A</sub> = 25°C θ <sub>VZ</sub> (%/°C)	Maximum regulator current at T <sub>A</sub> = 50°C I <sub>ZM</sub> (mA)
	Min	Nom	Max		Z <sub>ZT</sub> at I <sub>ZT</sub> (Ω)	Z <sub>ZK</sub> (Ω)	at I <sub>ZK</sub> (mA)	I <sub>R</sub> (μA)	at V <sub>R</sub> (V)		
	Volts	Volts	Volts								
MMSZ5258SGP	35.28	36	36.72	5	95	700	0.25	0.1	27	+0.093	5.8
MMSZ5259SGP	38.22	39	39.78	5	130	800	0.25	0.1	30	+0.094	5.4
MMSZ5260SGP	42.14	43	43.86	3.0	93	900	0.25	0.1	33	+0.095	4.9
MMSZ5261SGP	46.06	47	47.94	2.7	105	1000	0.25	0.1	36	+0.095	4.5
MMSZ5262SGP	49.98	51	52.02	2.5	125	1100	0.25	0.1	36	+0.096	4.2
MMSZ5263SGP	54.88	56	57.12	2.2	150	1300	0.25	0.1	39	+0.096	3.8
MMSZ5264SGP	58.80	60	61.20	2.1	170	1400	0.25	0.1	43	+0.097	3.5
MMSZ5265SGP	60.76	62	63.24	2.0	185	1400	0.25	0.1	46	+0.097	-
MMSZ5266SGP	66.64	68	69.36	1.8	230	1600	0.25	0.1	52	+0.097	-
MMSZ5267SGP	73.50	75	76.50	1.7	270	1700	0.25	0.1	56	+0.098	-
MMSZ5268SGP	80.36	82	83.64	1.5	330	2000	0.25	0.1	62	+0.098	-
MMSZ5269SGP	85.26	87	88.74	1.4	370	2000	0.25	0.1	68	+0.099	-
MMSZ5270SGP	89.18	91	92.82	1.4	400	2300	0.25	0.1	69	+0.099	-

## RATING CHARACTERISTIC CURVES ( MMSZ5221SGP THRU MMSZ5270SGP )



## RATING CHARACTERISTIC CURVES ( MMSZ5221SGP THRU MMSZ5270SGP )

FIG. 5 - TYPICAL CAPACITANCE

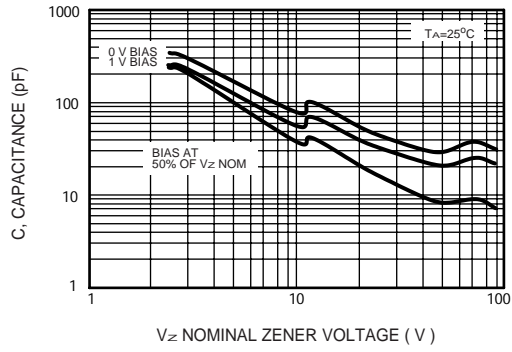


FIG. 6 - TYPICAL LEAKAGE CURRENT

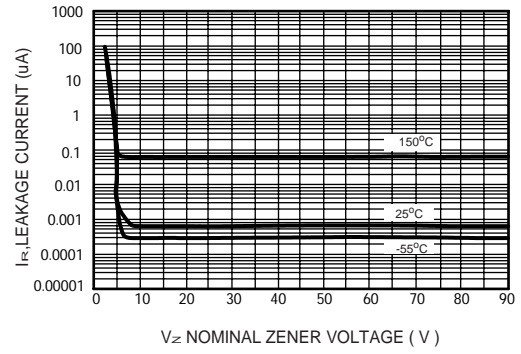


FIG. 7 - ZENER VOLTAGE VERSUS ZENER CURRENT ( $V_z$  UP TO 12V)

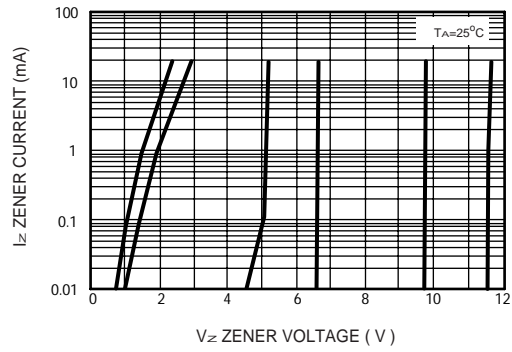


FIG. 8 - ZENER VOLTAGE VERSUS ZENER CURRENT (12V TO 91V)

