

## Small Signal Zener Diodes



### FEATURES

- Zener voltage specified at 50  $\mu$ A
- Maximum delta  $V_Z$  given from 10  $\mu$ A to 100  $\mu$ A
- Very high stability
- Low noise
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### APPLICATIONS

- Voltage stabilization

### PRIMARY CHARACTERISTICS

PARAMETER	VALUE	UNIT
$V_Z$ range nom.	1.8 to 43	V
Test current $I_{ZT}$	0.05	mA
$V_Z$ specification	Pulse current	
Int. construction	Single	

### ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
TZS4678 to TZS4717	TZS4678 to TZS4717-series-GS08	2500 (per 7" reel)	12 500/box

### PACKAGE

PACKAGE NAME	WEIGHT	MOLDING COMPOUND FLAMMABILITY RATING	MOISTURE SENSITIVITY LEVEL	SOLDERING CONDITIONS
QuadroMELF SOD-80	34 mg	UL 94 V-0	MSL level 1 (according J-STD-020)	260 °C/10 s at terminals

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ °C}$ , unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	$R_{thJA} \leq 300\text{ K/W}$	$P_{tot}$	500	mW
Zener current		$I_Z$	$P_{tot}/V_Z$	mA
Junction to ambient air	On PC board 50 mm x 50 mm x 1.6 mm	$R_{thJA}$	500	K/W
Junction temperature		$T_j$	175	°C
Storage temperature range		$T_{stg}$	- 65 to + 175	°C
Forward voltage (max.)	$I_F = 100\text{ mA}$	$V_F$	1.5	V



ELECTRICAL CHARACTERISTICS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)								
PART NUMBER	ZENER VOLTAGE RANGE			TEST CURRENT		REVERSE CURRENT <sup>(3)</sup>		VOLTAGE CHANGE <sup>(4)</sup>
	$V_Z$ at $I_{ZT1}$			$I_{ZT1}$	$I_{ZT2}$ <sup>(2)</sup>	$I_R$ at $V_R$		$\Delta V_Z$
	V			mA		$\mu\text{A}$	V	V
	MIN.	NOM. <sup>(1)</sup>	MAX.			MAX.		MAX.
TZS4678	1.71	1.8	1.89	0.05	120	7.5	1	0.7
TZS4679	1.9	2	2.1	0.05	110	5	1	0.7
TZS4680	2.09	2.2	2.31	0.05	100	4	1	0.75
TZS4681	2.28	2.4	2.52	0.05	95	2	1	0.8
TZS4682	2.565	2.7	2.835	0.05	90	1	1	0.85
TZS4683	2.85	3	3.15	0.05	85	0.8	1	0.9
TZS4684	3.135	3.3	3.465	0.05	80	7.5	1.5	0.95
TZS4685	3.42	3.6	3.78	0.05	75	7.5	2	0.95
TZS4686	3.705	3.9	4.095	0.05	70	5	2	0.97
TZS4687	4.085	4.3	4.515	0.05	65	4	2	0.99
TZS4688	4.465	4.7	4.935	0.05	60	10	3	0.99
TZS4689	4.845	5.1	5.355	0.05	55	10	3	0.97
TZS4690	5.32	5.6	5.88	0.05	50	10	4	0.96
TZS4691	5.89	6.2	6.51	0.05	45	10	5	0.95
TZS4692	6.46	6.8	7.14	0.05	35	10	5.1	0.9
TZS4693	7.125	7.5	7.875	0.05	31.8	10	5.7	0.75
TZS4694	7.79	8.2	8.61	0.05	29	1	6.2	0.5
TZS4695	8.265	8.7	9.135	0.05	27.4	1	6.6	0.1
TZS4696	8.645	9.1	9.555	0.05	26.2	1	6.9	0.08
TZS4697	9.5	10	10.5	0.05	24.8	1	7.6	0.1
TZS4698	10.45	11	11.55	0.05	21.6	0.05	8.4	0.11
TZS4699	11.4	12	12.6	0.05	20.4	0.05	9.1	0.12
TZS4700	12.35	13	13.65	0.05	19	0.05	9.8	0.13
TZS4701	13.3	14	14.7	0.05	17.5	0.05	10.6	0.14
TZS4702	14.25	15	15.75	0.05	16.3	0.05	11.4	0.15
TZS4703	15.2	16	16.8	0.05	15.4	0.05	12.1	0.16
TZS4704	16.15	17	17.85	0.05	14.5	0.05	12.9	0.17
TZS4705	17.1	18	18.9	0.05	13.2	0.05	13.6	0.18
TZS4706	18.05	19	19.95	0.05	12.5	0.05	14.4	0.19
TZS4707	19	20	21	0.05	11.9	0.01	15.2	0.2
TZS4708	20.9	22	23.1	0.05	10.8	0.01	16.7	0.22
TZS4709	22.8	24	25.2	0.05	9.9	0.01	18.2	0.24
TZS4710	23.75	25	26.25	0.05	9.5	0.01	19	0.25
TZS4711	25.65	27	28.35	0.05	8.8	0.01	20.4	0.27
TZS4712	26.6	28	29.4	0.05	8.5	0.01	21.2	0.28
TZS4713	28.5	30	31.5	0.05	7.9	0.01	22.8	0.3
TZS4714	31.35	33	34.65	0.05	7.2	0.01	25	0.33
TZS4715	34.2	36	37.8	0.05	6.6	0.01	27.3	0.36
TZS4716	37.05	39	40.95	0.05	6.1	0.01	29.6	0.39
TZS4717	40.85	43	45.15	0.05	5.5	0.01	32.6	0.43

**Notes**

- (1) Tolerancing and voltage designation ( $V_Z$ ). The type numbers shown have a standard tolerance of  $\pm 5\%$  on the nominal zener voltage.
- (2) Maximum zener current ratings ( $I_{ZM}$ ). Maximum zener current ratings are based on maximum zener voltage of the individual units
- (3) Reverse leakage current ( $I_R$ ). Reverse leakage currents are guaranteed and measured at  $V_R$  as shown on the table.
- (4) Maximum voltage change ( $\Delta V_Z$ ). Voltage change is equal to the difference between  $V_Z$  at 100  $\mu\text{A}$  and  $V_Z$  at 10  $\mu\text{A}$ .



**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

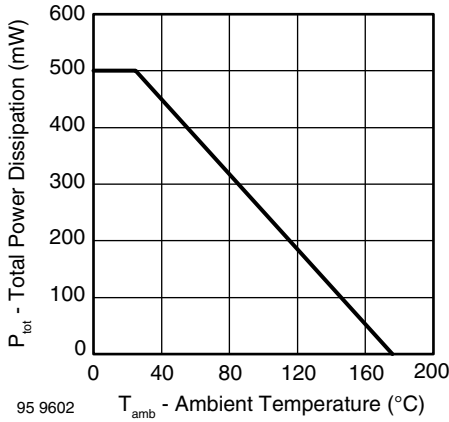


Fig. 1 - Total Power Dissipation vs. Ambient Temperature

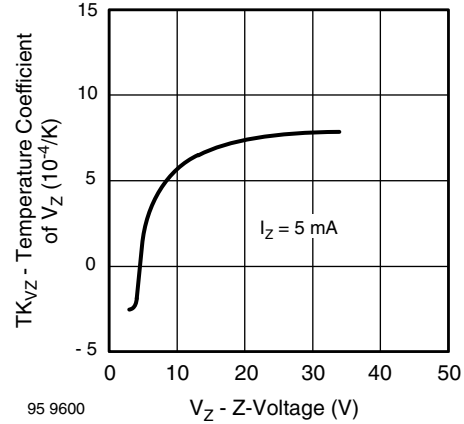


Fig. 4 - Temperature Coefficient of  $V_Z$  vs. Z-Voltage

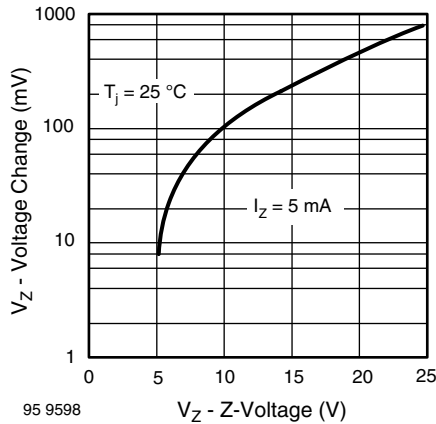


Fig. 2 - Typical Change of Working Voltage under Operating Conditions at  $T_{amb} = 25\text{ }^{\circ}\text{C}$

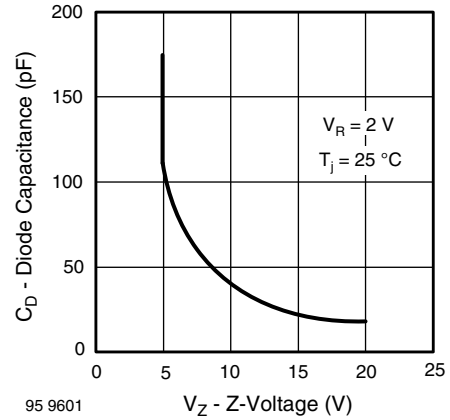


Fig. 5 - Diode Capacitance vs. Z-Voltage

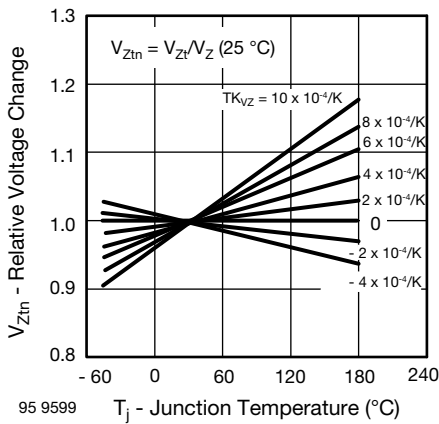


Fig. 3 - Typical Change of Working Voltage vs. Junction Temperature

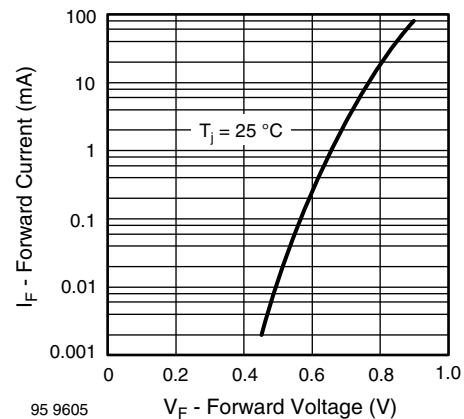


Fig. 6 - Forward Current vs. Forward Voltage



Fig. 7 - Z-Current vs. Z-Voltage



Fig. 9 - Differential Z-Resistance vs. Z-Voltage

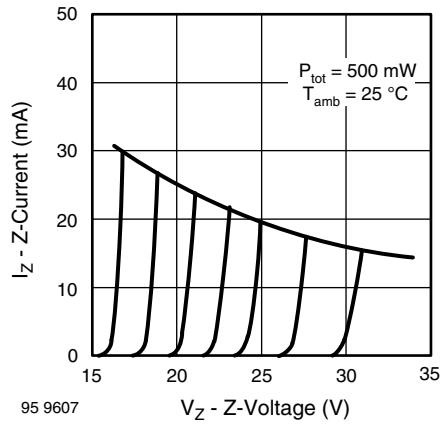


Fig. 8 - Z-Current vs. Z-Voltage

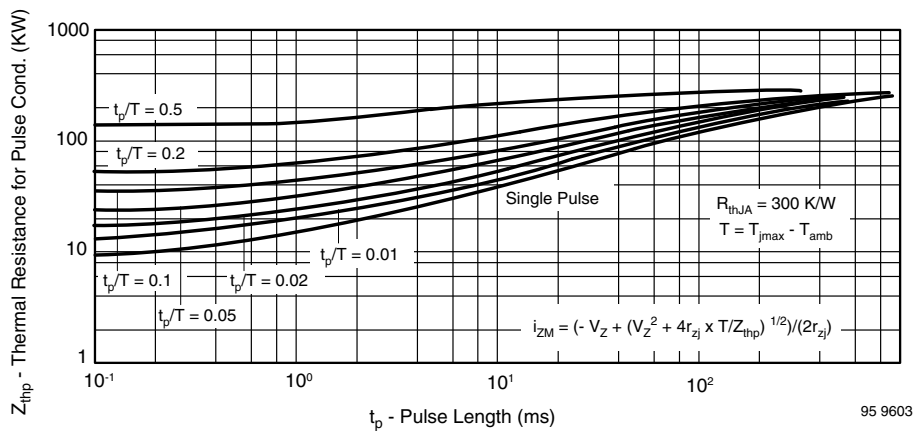
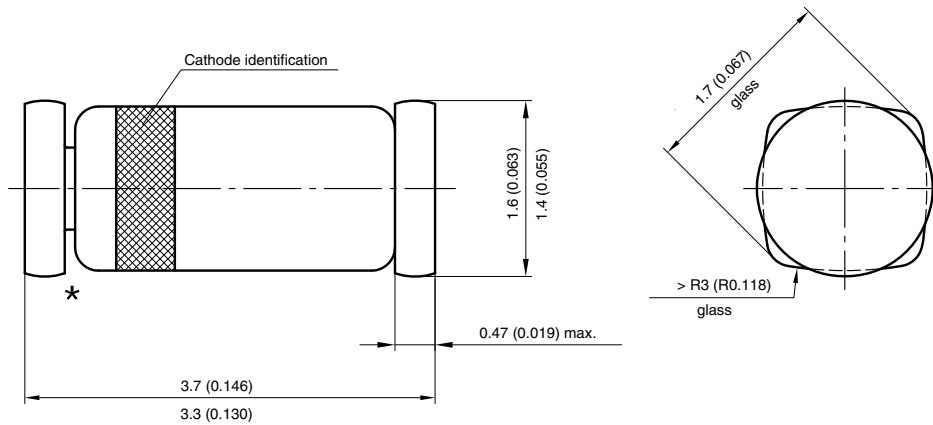


Fig. 10 - Thermal Response

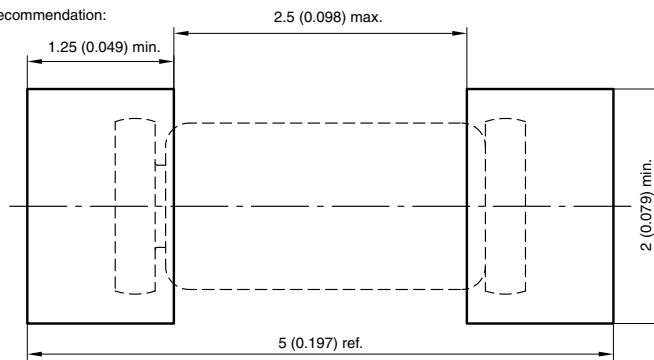


PACKAGE DIMENSIONS in millimeters (inches): **QuadroMELF SOD-80**



★ The gap between plug and glass can be either on cathode or anode side

Foot print recommendation:



Created - Date: 03.November.2003  
Rev. 11 - Date: 07.June 2006  
Document no.:6.560-5006.01-4  
96 12071



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