

## Small Signal Zener Diodes



### FEATURES

- Very sharp reverse characteristic
- Low reverse current level
- Available with tighter tolerances
- Very high stability
- Low noise
- $V_Z$  - tolerance  $\pm 5\%$
- AEC-Q101 qualified
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**RoHS**  
COMPLIANT

PRIMARY CHARACTERISTICS		
PARAMETER	VALUE	UNIT
$V_Z$ range nom.	2.4 to 75	V
Test current $I_{ZT}$	1.7 to 20	mA
$V_Z$ specification	Thermal equilibrium	
Int. construction	Single	

### APPLICATIONS

- Voltage stabilization

ORDERING INFORMATION			
DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
TZQ5221B to TZQ5267B	TZQ5221B to TZQ5267-series-GS18	10 000 (per 13" reel)	10 000/box
TZQ5221B to TZQ5267B	TZQ5221B to TZQ5267B-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, maximum		$T_j$	175	°C
Storage temperature range		$T_{stg}$	- 65 to + 175	°C
Forward voltage (max.)	$I_F = 200\text{ mA}$	$V_F$	1.5	V



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)								
PART NUMBER	ZENER VOLTAGE RANGE	TEST CURRENT		REVERSE LAEKAGE CURRENT		DYNAMIC RESISTANCE		TEMPERATURE COEFFICIENT
	$V_z$ at $I_{ZT1}$	$I_{ZT1}$	$I_{ZT2}$	$I_R$ at $V_R$		$Z_z$ at $I_{ZT1}$	$Z_{ZK}$ at $I_{ZT2}$	TKVz
	V	mA		$\mu\text{A}$	V	$\Omega$		%/K
	NOM.							
TZQ5221B	2.4	20	0.25	< 100	1	< 30	< 1200	< - 0.085
TZQ5222B	2.5	20	0.25	< 100	1	< 30	< 1250	< - 0.085
TZQ5223B	2.7	20	0.25	< 75	1	< 30	< 1300	< - 0.080
TZQ5224B	2.8	20	0.25	< 75	1	< 30	< 1400	< - 0.080
TZQ5225B	3	20	0.25	< 50	1	< 29	< 1600	< - 0.075
TZQ5226B	3.3	20	0.25	< 25	1	< 28	< 1600	< - 0.070
TZQ5227B	3.6	20	0.25	< 15	1	< 24	< 1700	< - 0.065
TZQ5228B	3.9	20	0.25	< 10	1	< 23	< 1900	< - 0.060
TZQ5229B	4.3	20	0.25	< 5	1	< 22	< 2000	< $\pm$ 0.055
TZQ5230B	4.7	20	0.25	< 5	2	< 19	< 1900	< $\pm$ 0.030
TZQ5231B	5.1	20	0.25	< 5	2	< 17	< 1600	< $\pm$ 0.030
TZQ5232B	5.6	20	0.25	< 5	3	< 11	< 1600	< + 0.038
TZQ5233B	6	20	0.25	< 5	3.5	< 7	< 1600	< + 0.038
TZQ5234B	6.2	20	0.25	< 5	4	< 7	< 1000	< + 0.045
TZQ5235B	6.8	20	0.25	< 3	5	< 5	< 750	< + 0.050
TZQ5236B	7.5	20	0.25	< 3	6	< 6	< 500	< + 0.058
TZQ5237B	8.2	20	0.25	< 3	6.5	< 8	< 500	< + 0.062
TZQ5238B	8.7	20	0.25	< 3	6.5	< 8	< 600	< + 0.065
TZQ5239B	9.1	20	0.25	< 3	7	< 10	< 600	< + 0.068
TZQ5240B	10	20	0.25	< 3	8	< 17	< 600	< + 0.075
TZQ5241B	11	20	0.25	< 2	8.4	< 22	< 600	< + 0.076
TZQ5242B	12	20	0.25	< 1	9.1	< 30	< 600	< + 0.077
TZQ5243B	13	9.5	0.25	< 0.5	9.9	< 13	< 600	< + 0.079
TZQ5244B	14	9	0.25	< 0.1	10	< 15	< 600	< + 0.082
TZQ5245B	15	8.5	0.25	< 0.1	11	< 16	< 600	< + 0.082
TZQ5246B	16	7.8	0.25	< 0.1	12	< 17	< 600	< + 0.083
TZQ5247B	17	7.4	0.25	< 0.1	13	< 19	< 600	< + 0.084
TZQ5248B	18	7	0.25	< 0.1	14	< 21	< 600	< + 0.085
TZQ5249B	19	6.6	0.25	< 0.1	14	< 23	< 600	< + 0.086
TZQ5250B	20	6.2	0.25	< 0.1	15	< 25	< 600	< + 0.086
TZQ5251B	22	5.6	0.25	< 0.1	17	< 29	< 600	< + 0.087
TZQ5252B	24	5.2	0.25	< 0.1	18	< 33	< 600	< + 0.088
TZQ5253B	25	5	0.25	< 0.1	19	< 35	< 600	< + 0.089
TZQ5254B	27	4.6	0.25	< 0.1	21	< 41	< 600	< + 0.090
TZQ5255B	28	4.5	0.25	< 0.1	21	< 44	< 600	< + 0.091
TZQ5256B	30	4.2	0.25	< 0.1	23	< 49	< 600	< + 0.091
TZQ5257B	33	3.8	0.25	< 0.1	25	< 58	< 700	< + 0.092
TZQ5258B	36	3.4	0.25	< 0.1	27	< 70	< 700	< + 0.093
TZQ5259B	39	3.2	0.25	< 0.1	30	< 80	< 800	< + 0.094
TZQ5260B	43	3	0.25	< 0.1	33	< 93	< 900	< + 0.095
TZQ5261B	47	2.7	0.25	< 0.1	36	< 105	< 1000	< + 0.095
TZQ5262B	51	2.5	0.25	< 0.1	39	< 125	< 1100	< + 0.096
TZQ5263B	56	2.2	0.25	< 0.1	43	< 150	< 1300	< + 0.096
TZQ5264B	60	2.1	0.25	< 0.1	46	< 170	< 1400	< + 0.097
TZQ5265B	62	2	0.25	< 0.1	47	< 185	< 1400	< + 0.097
TZQ5266B	68	1.8	0.25	< 0.1	52	< 230	< 1600	< + 0.097
TZQ5267B	75	1.7	0.25	< 0.1	56	< 270	< 1700	< + 0.098

Note

- Based on DC measurement at thermal equilibrium; case temperature maintained at  $30\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$

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

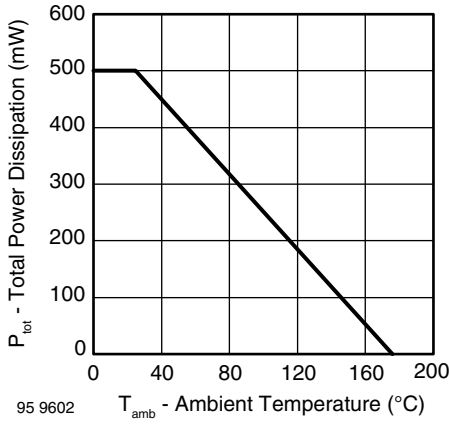


Fig. 1 - Total Power Dissipation vs. Ambient Temperature

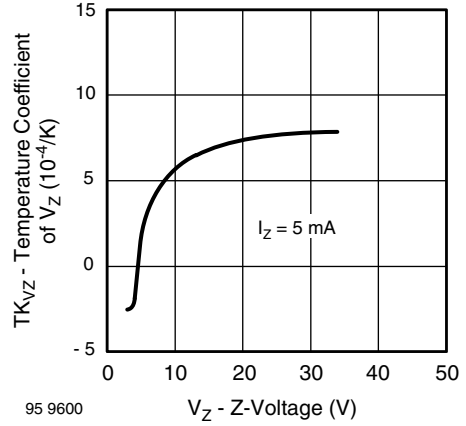


Fig. 4 - Temperature Coefficient of  $V_Z$  vs. Z-Voltage

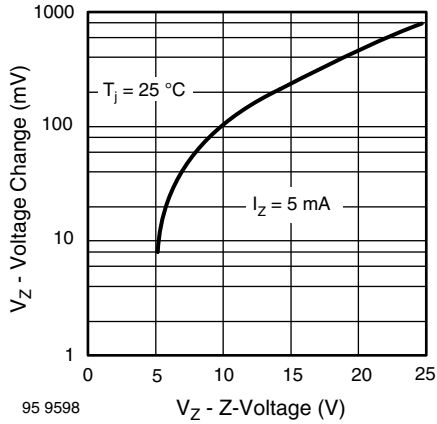


Fig. 2 - Typical Change of Working Voltage under Operating Conditions at  $T_{amb} = 25\text{ }^{\circ}\text{C}$

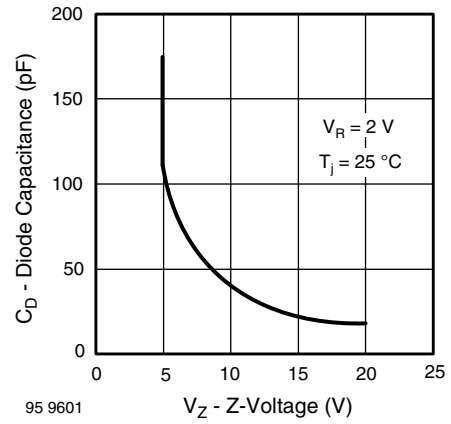


Fig. 5 - Diode Capacitance vs. Z-Voltage

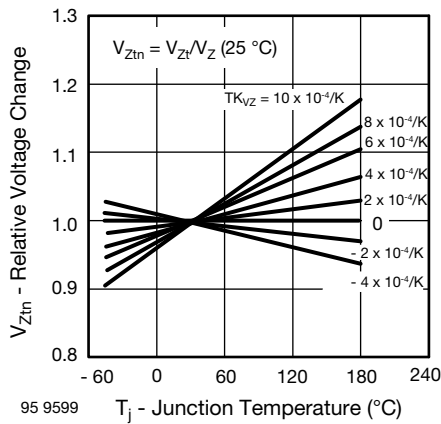


Fig. 3 - Typical Change of Working Voltage vs. Junction Temperature

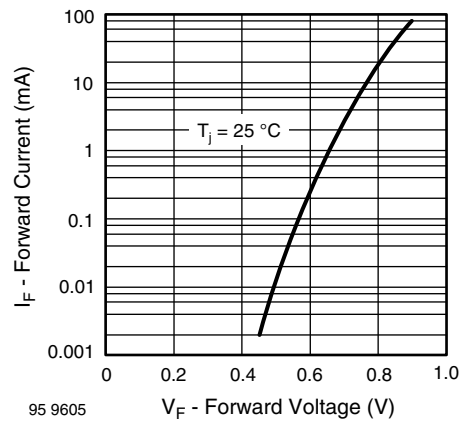


Fig. 6 - Forward Current vs. Forward Voltage



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



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

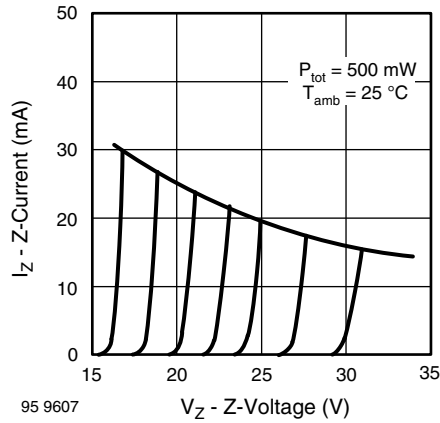


Fig. 8 - Z-Current vs. Z-Voltage

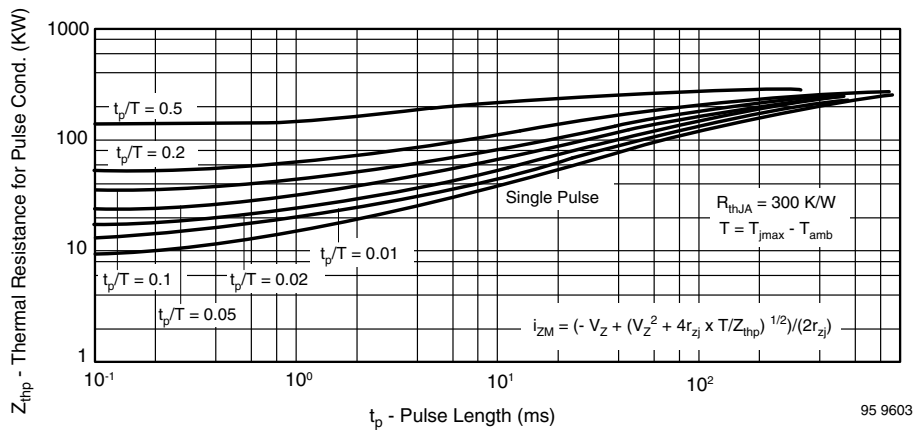
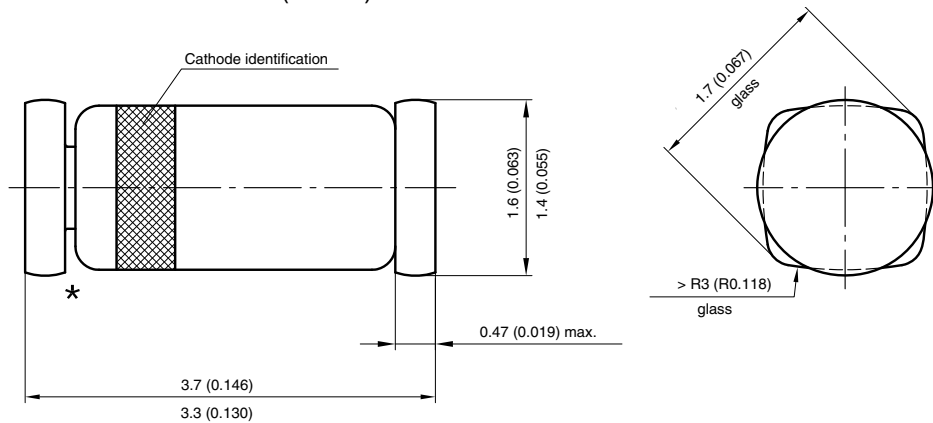
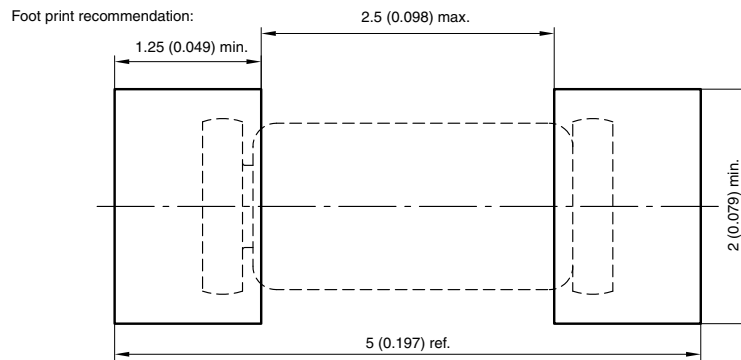


Fig. 10 - Thermal Response

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



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



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



## Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

## Material Category Policy

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.