

Small Signal Zener Diodes



FEATURES

- Very sharp reverse characteristic
- Low reverse current level
- 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.	2.4 to 75	V
Test current I _{ZT}	2.5 to 5	mA
V _Z specification	Pulse current	
Int. construction	Single	

ORDERING INFORMATION

DEVICE NAME	ORDERING CODE	TAPED UNITS PER REEL	MINIMUM ORDER QUANTITY
BZT55-series	BZT55-series-GS18	10 000 per 13" reel	10 000/box
BZT55-series	BZT55-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 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Power dissipation	R _{thJA} ≤ 300 K/W	P _{tot}	500	mW
Zener current		I _Z	P _V /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 = 200 mA	V _F	1.5	V



ELECTRICAL CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)												
PART NUMBER	ZENER VOLTAGE RANGE ⁽¹⁾			TEST CURRENT		REVERSE LEAKAGE 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}	TK _{VZ}	
						T _{amb} = 25 °C	T _{amb} = 150 °C		f = 1 kHz			
	V			mA		μA		V	Ω		% / K	
	MIN.	NOM.	MAX.						MAX.	MAX.	MIN.	MAX.
BZT55C2V4	2.28	2.4	2.56	5	1	< 50	< 100	1	< 85	< 600	- 0.09	- 0.06
BZT55C2V7	2.5	2.7	2.9	5	1	< 10	< 50	1	< 85	< 600	- 0.09	- 0.06
BZT55C3V0	2.8	3.0	3.2	5	1	< 4	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55C3V3	3.1	3.3	3.5	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55C3V6	3.4	3.6	3.8	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55C3V9	3.7	3.9	4.1	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55C4V3	4	4.3	4.6	5	1	< 1	< 20	1	< 90	< 600	- 0.06	- 0.03
BZT55C4V7	4.4	4.7	5	5	1	< 0.5	< 10	1	< 80	< 600	- 0.05	0.02
BZT55C5V1	4.8	5.1	5.4	5	1	< 0.1	< 2	1	< 60	< 550	- 0.02	0.02
BZT55C5V6	5.2	5.6	6	5	1	< 0.1	< 2	1	< 40	< 450	- 0.05	0.05
BZT55C6V2	5.8	6.2	6.6	5	1	< 0.1	< 2	2	< 10	< 200	0.03	0.06
BZT55C6V8	6.4	6.8	7.2	5	1	< 0.1	< 2	3	< 8	< 150	0.03	0.07
BZT55C7V5	7	7.5	7.9	5	1	< 0.1	< 2	5	< 7	< 50	0.03	0.07
BZT55C8V2	7.7	8.2	8.7	5	1	< 0.1	< 2	6.2	< 7	< 50	0.03	0.08
BZT55C9V1	8.5	9.1	9.6	5	1	< 0.1	< 2	6.8	< 10	< 50	0.03	0.09
BZT55C10	9.4	10	10.6	5	1	< 0.1	< 2	7.5	< 15	< 70	0.03	0.1
BZT55C11	10.4	11	11.6	5	1	< 0.1	< 2	8.2	< 20	< 70	0.03	0.11
BZT55C12	11.4	12	12.7	5	1	< 0.1	< 2	9.1	< 20	< 90	0.03	0.11
BZT55C13	12.4	13	14.1	5	1	< 0.1	< 2	10	< 26	< 110	0.03	0.11
BZT55C15	13.8	15	15.6	5	1	< 0.1	< 2	11	< 30	< 110	0.03	0.11
BZT55C16	15.3	16	17.1	5	1	< 0.1	< 2	12	< 40	< 170	0.03	0.11
BZT55C18	16.8	18	19.1	5	1	< 0.1	< 2	13	< 50	< 170	0.03	0.11
BZT55C20	18.8	20	21.2	5	1	< 0.1	< 2	15	< 55	< 220	0.03	0.11
BZT55C22	20.8	22	23.3	5	1	< 0.1	< 2	16	< 55	< 220	0.04	0.12
BZT55C24	22.8	24	25.6	5	1	< 0.1	< 2	18	< 80	< 220	0.04	0.12
BZT55C27	25.1	27	28.9	5	1	< 0.1	< 2	20	< 80	< 220	0.04	0.12
BZT55C30	28	30	32	5	1	< 0.1	< 2	22	< 80	< 220	0.04	0.12
BZT55C33	31	33	35	5	1	< 0.1	< 2	24	< 80	< 220	0.04	0.12
BZT55C36	34	36	38	5	1	< 0.1	< 2	27	< 80	< 220	0.04	0.12
BZT55C39	37	39	41	2.5	0.5	< 0.1	< 5	30	< 90	< 500	0.04	0.12
BZT55C43	40	43	46	2.5	0.5	< 0.1	< 5	33	< 90	< 600	0.04	0.12
BZT55C47	44	47	50	2.5	0.5	< 0.1	< 5	36	< 110	< 700	0.04	0.12
BZT55C51	48	51	54	2.5	0.5	< 0.1	< 10	39	< 125	< 700	0.04	0.12
BZT55C56	52	56	60	2.5	0.5	< 0.1	< 10	43	< 135	< 1000	0.04	0.12
BZT55C62	58	62	66	2.5	0.5	< 0.1	< 10	47	< 150	< 1000	0.04	0.12
BZT55C68	64	68	72	2.5	0.5	< 0.1	< 10	51	< 200	< 1000	0.04	0.12
BZT55C75	70	75	79	2.5	0.5	< 0.1	< 10	56	< 250	< 1500	0.04	0.12

Notes

- Additional measurement of voltage group 9V1 to 75 at 95 % $V_{Zmin.} \leq 35\text{ nA}$ at $T_j 25\text{ }^{\circ}\text{C}$

⁽¹⁾ $t_p \leq 10\text{ ms}$, $T/t_p > 1000$



ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)												
PART NUMBER	ZENER VOLTAGE RANGE ⁽¹⁾			TEST CURRENT		REVERSE LEAKAGE 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}	TK_{VZ}	
	V			mA		$T_{amb} = 25\text{ }^{\circ}\text{C}$		$T_{amb} = 150\text{ }^{\circ}\text{C}$	$f = 1\text{ kHz}$			
	MIN.	NOM.	MAX.				μA	V	MAX.	MAX.	MIN.	MAX.
BZT55B2V4	2.35	2.4	2.45	5	1	< 50	< 100	1	< 85	< 600	- 0.09	- 0.06
BZT55B2V7	2.64	2.7	2.76	5	1	< 10	< 50	1	< 85	< 600	- 0.09	- 0.06
BZT55B3V0	2.94	3.0	3.06	5	1	< 4	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55B3V3	3.24	3.3	3.36	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55B3V6	3.52	3.6	3.68	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55B3V9	3.82	3.9	3.98	5	1	< 2	< 40	1	< 90	< 600	- 0.08	- 0.05
BZT55B4V3	4.22	4.3	4.38	5	1	< 1	< 20	1	< 90	< 600	- 0.06	- 0.03
BZT55B4V7	4.6	4.7	4.8	5	1	< 0.5	< 10	1	< 80	< 600	- 0.05	0.02
BZT55B5V1	5	5.1	5.2	5	1	< 0.1	< 2	1	< 60	< 550	- 0.02	0.02
BZT55B5V6	5.48	5.6	5.72	5	1	< 0.1	< 2	1	< 40	< 450	- 0.05	0.05
BZT55B6V2	6.08	6.2	6.32	5	1	< 0.1	< 2	2	< 10	< 200	0.03	0.06
BZT55B6V8	6.66	6.8	6.94	5	1	< 0.1	< 2	3	< 8	< 150	0.03	0.07
BZT55B7V5	7.35	7.5	7.65	5	1	< 0.1	< 2	5	< 7	< 50	0.03	0.07
BZT55B8V2	8.04	8.2	8.36	5	1	< 0.1	< 2	6.2	< 7	< 50	0.03	0.08
BZT55B9V1	8.92	9.1	9.28	5	1	< 0.1	< 2	6.8	< 10	< 50	0.03	0.09
BZT55B10	9.8	10	10.2	5	1	< 0.1	< 2	7.5	< 15	< 70	0.03	0.1
BZT55B11	10.78	11	11.22	5	1	< 0.1	< 2	8.2	< 20	< 70	0.03	0.11
BZT55B12	11.76	12	12.24	5	1	< 0.1	< 2	9.1	< 20	< 90	0.03	0.11
BZT55B13	12.74	13	13.26	5	1	< 0.1	< 2	10	< 26	< 110	0.03	0.11
BZT55B15	14.7	15	15.3	5	1	< 0.1	< 2	11	< 30	< 110	0.03	0.11
BZT55B16	15.7	16	16.3	5	1	< 0.1	< 2	12	< 40	< 170	0.03	0.11
BZT55B18	17.64	18	18.36	5	1	< 0.1	< 2	13	< 50	< 170	0.03	0.11
BZT55B20	19.6	20	20.4	5	1	< 0.1	< 2	15	< 55	< 220	0.03	0.11
BZT55B22	21.55	22	22.45	5	1	< 0.1	< 2	16	< 55	< 220	0.04	0.12
BZT55B24	23.5	24	24.5	5	1	< 0.1	< 2	18	< 80	< 220	0.04	0.12
BZT55B27	26.4	27	27.6	5	1	< 0.1	< 2	20	< 80	< 220	0.04	0.12
BZT55B30	29.4	30	30.6	5	1	< 0.1	< 2	22	< 80	< 220	0.04	0.12
BZT55B33	32.4	33	33.6	5	1	< 0.1	< 2	24	< 80	< 220	0.04	0.12
BZT55B36	35.3	36	36.7	5	1	< 0.1	< 2	27	< 80	< 220	0.04	0.12
BZT55B39	38.2	39	39.8	2.5	1	< 0.1	< 5	30	< 90	< 500	0.04	0.12
BZT55B43	42.1	43	43.9	2.5	0.5	< 0.1	< 5	33	< 90	< 600	0.04	0.12
BZT55B47	46.1	47	47.9	2.5	0.5	< 0.1	< 5	36	< 110	< 700	0.04	0.12
BZT55B51	50	51	52	2.5	0.5	< 0.1	< 10	39	< 125	< 700	0.04	0.12
BZT55B56	54.9	56	57.1	2.5	0.5	< 0.1	< 10	43	< 135	< 1000	0.04	0.12
BZT55B62	60.8	62	63.2	2.5	0.5	< 0.1	< 10	47	< 150	< 1000	0.04	0.12
BZT55B68	66.6	68	69.4	2.5	0.5	< 0.1	< 10	51	< 200	< 1000	0.04	0.12
BZT55B75	73.5	75	76.5	2.5	0.5	< 0.1	< 10	56	< 250	< 1500	0.04	0.12

Notes

- Additional measurement of voltage group 9V1 to 75 at 95 % $V_{Zmin.} \leq 35\text{ nA}$ at $T_j 25\text{ }^{\circ}\text{C}$

⁽¹⁾ $t_p \leq 10\text{ ms}$, $T/t_p > 1000$

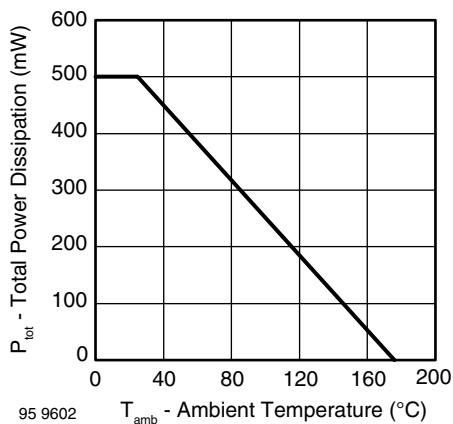
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Total Power Dissipation vs. Ambient Temperature

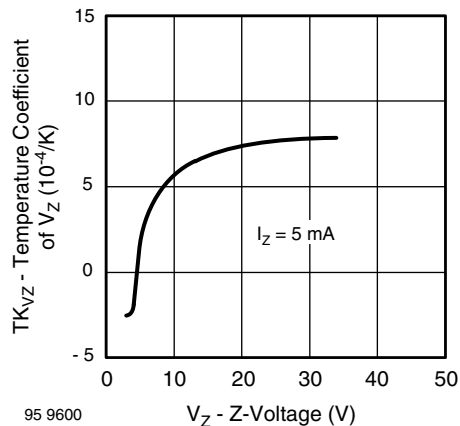
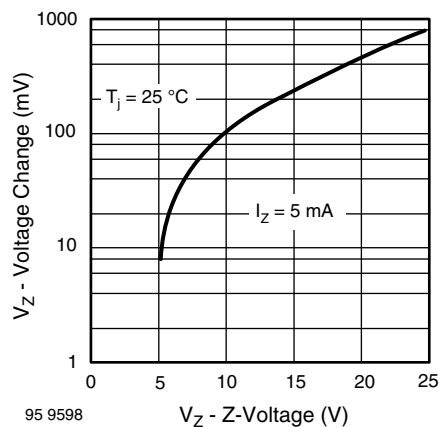
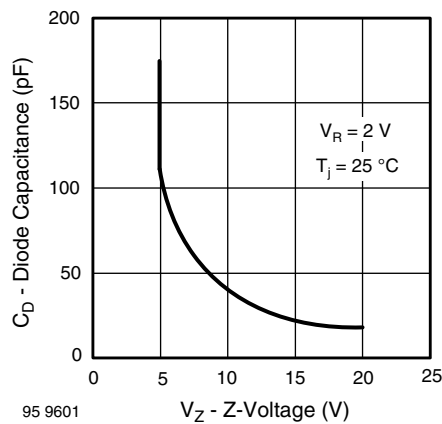

Fig. 4 - Temperature Coefficient of V_Z vs. Z-Voltage

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

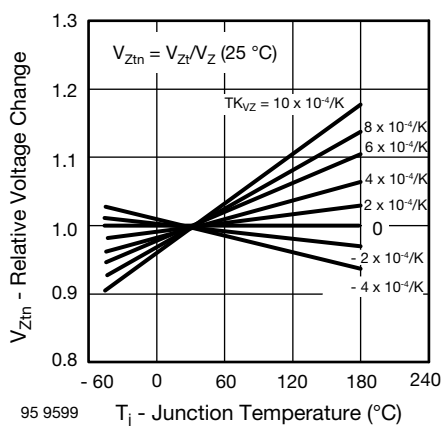


Fig. 3 - Typical Change of Working Voltage vs. Junction Temperature

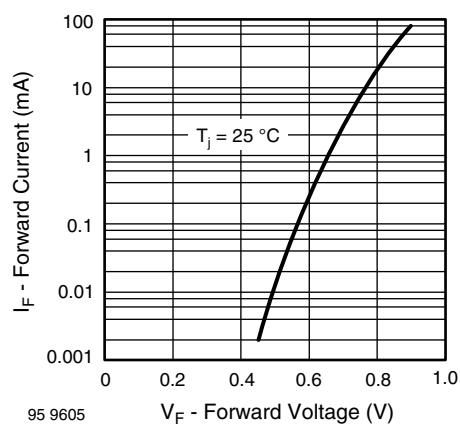


Fig. 6 - Forward Current vs. Forward Voltage

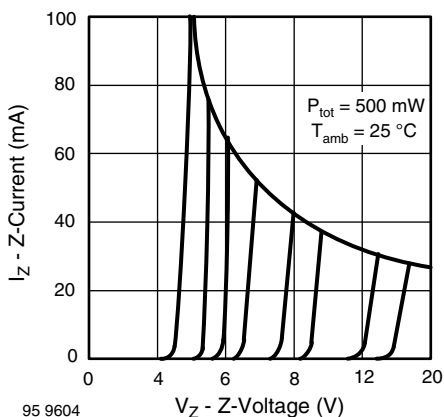


Fig. 7 - Z-Current vs. Z-Voltage

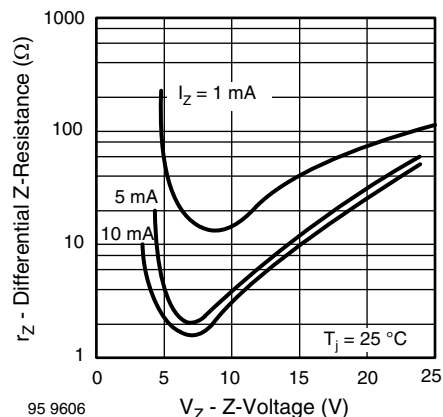


Fig. 9 - Differential Z-Resistance vs. Z-Voltage

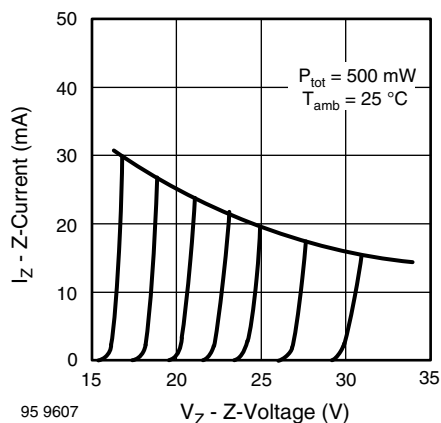


Fig. 8 - Z-Current vs. Z-Voltage

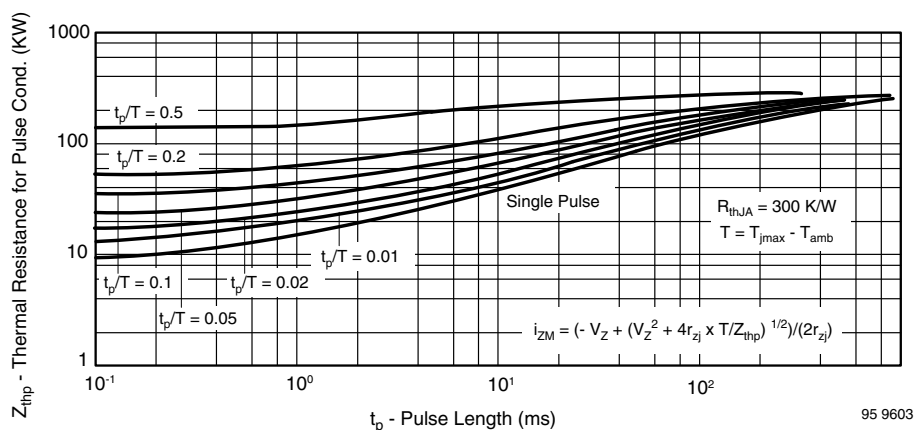
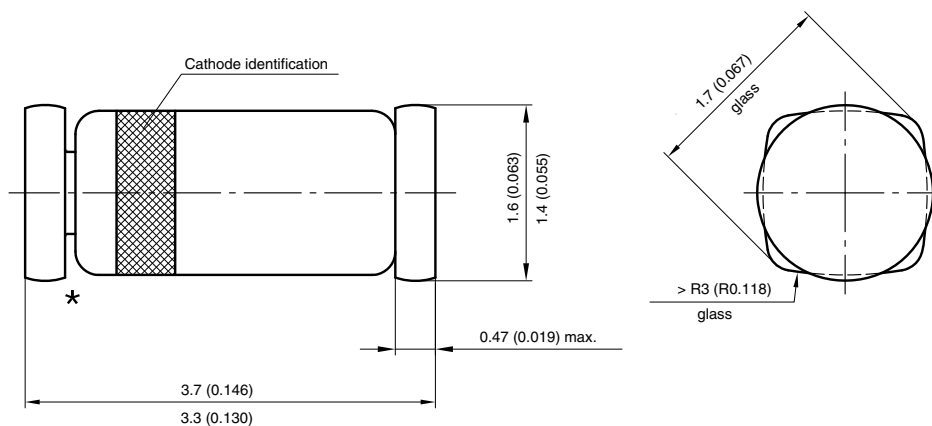


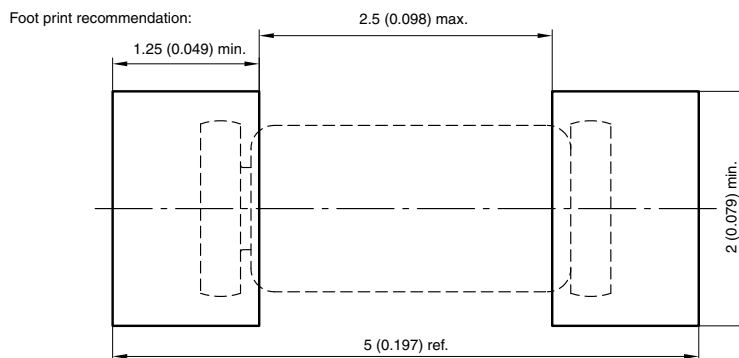
Fig. 10 - Thermal Response



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.