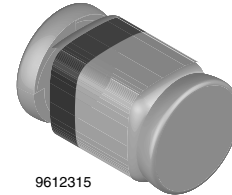


## Small Signal Zener Diodes

### Features

- Saving space
- Hermetic sealed parts
- Electrical data identical with the devices BZT55..Series/TZM..Series
- Fits onto SOD-323/SOD-110 footprints
- Very sharp reverse characteristic
- Low reverse current level
- Very high stability
- Low noise
- Available with tighter tolerances
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21 definition



9612315

### Applications

- Voltage stabilization

### Mechanical Data

**Case:** MicroMELF

**Weight:** approx. 12 mg

**Packaging codes/options:**

TR/2.5 k per 7" reel, 12.5 k/box

TR3/10 k per 13" reel, 10 k/box

### Absolute Maximum Ratings

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

Parameter	Test condition	Symbol	Value	Unit
Power dissipation	$R_{thJA} \leq 300\text{ K/W}$	$P_V$	500	mW
Z-current		$I_Z$	$P_V/V_Z$	mA
Junction temperature		$T_j$	175	$^{\circ}\text{C}$
Storage temperature range		$T_{stg}$	- 65 to + 175	$^{\circ}\text{C}$

### Thermal Characteristics

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

Parameter	Test condition	Symbol	Value	Unit
Junction to ambient air	Mounted on epoxy-glass hard tissue, fig. 1	$R_{thJA}$	500	K/W
Junction tie point	35 $\mu\text{m}$ copper clad, 0.9 $\text{mm}^2$ copper area per electrode	$R_{thJL}$	300	K/W

### Electrical Characteristics

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

Parameter	Test condition	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	$I_F = 200\text{ mA}$	$V_F$			1.5	V

### Electrical Characteristics

#### BZM55C..

Part number	Zener voltage range <sup>1)</sup>		Dynamic resistance		Test current	Temperature coefficient		Test current	Reverse leakage current		
	V <sub>Z</sub> at I <sub>ZT</sub>		r <sub>zT</sub> at I <sub>ZT</sub> , f = 1kHz	r <sub>zJK</sub> at I <sub>ZK</sub> , f = 1kHz	I <sub>ZT</sub>	TK <sub>VZ</sub>		I <sub>ZK</sub>	I <sub>R</sub> at T <sub>amb</sub> = 25 °C	I <sub>R</sub> at T <sub>amb</sub> = 150 °C	at V <sub>R</sub>
	V		Ω		mA	%K		mA	μA		V
	min.	max.				min.	max.				
BZM55C2V4	2.28	2.56	< 85	< 600	5	- 0.09	- 0.06	1	< 50	< 100	1
BZM55C2V7	2.5	2.9	< 85	< 600	5	- 0.09	- 0.06	1	< 10	< 50	1
BZM55C3V0	2.8	3.2	< 90	< 600	5	- 0.08	- 0.05	1	< 4	< 40	1
BZM55C3V3	3.1	3.5	< 90	< 600	5	- 0.08	- 0.05	1	< 2	< 40	1
BZM55C3V6	3.4	3.8	< 90	< 600	5	- 0.08	- 0.05	1	< 2	< 40	1
BZM55C3V9	3.7	4.1	< 90	< 600	5	- 0.08	- 0.05	1	< 2	< 40	1
BZM55C4V3	4	4.6	< 90	< 600	5	- 0.06	- 0.03	1	< 1	< 20	1
BZM55C4V7	4.4	5	< 80	< 600	5	- 0.05	0.02	1	< 0.5	< 10	1
BZM55C5V1	4.8	5.4	< 60	< 550	5	- 0.02	0.02	1	< 0.1	< 2	1
BZM55C5V6	5.2	6	< 40	< 450	5	- 0.05	0.05	1	< 0.1	< 2	1
BZM55C6V2	5.8	6.6	< 10	< 200	5	0.03	0.06	1	< 0.1	< 2	2
BZM55C6V8	6.4	7.2	< 8	< 150	5	0.03	0.07	1	< 0.1	< 2	3
BZM55C7V5	7	7.9	< 7	< 50	5	0.03	0.07	1	< 0.1	< 2	5
BZM55C8V2	7.7	8.7	< 7	< 50	5	0.03	0.08	1	< 0.1	< 2	6.2
BZM55C9V1 *	8.5	9.6	< 10	< 50	5	0.03	0.09	1	< 0.1	< 2	6.8
BZM55C10 *	9.4	0.6	< 15	< 70	5	0.03	0.1	1	< 0.1	< 2	7.5
BZM55C11 *	10.4	11.6	< 20	< 70	5	0.03	0.11	1	< 0.1	< 2	8.2
BZM55C12 *	11.4	12.7	< 20	< 90	5	0.03	0.11	1	< 0.1	< 2	9.1
BZM55C13 *	12.4	14.1	< 26	< 110	5	0.03	0.11	1	< 0.1	< 2	10
BZM55C15 *	13.8	15.6	< 30	< 110	5	0.03	0.11	1	< 0.1	< 2	11
BZM55C16 *	15.3	17.1	< 40	< 170	5	0.03	0.11	1	< 0.1	< 2	12
BZM55C18 *	16.8	19.1	< 50	< 170	5	0.03	0.11	1	< 0.1	< 2	13
BZM55C20 *	18.8	21.2	< 55	< 220	5	0.03	0.11	1	< 0.1	< 2	15
BZM55C22 *	20.8	23.3	< 55	< 220	5	0.04	0.12	1	< 0.1	< 2	16
BZM55C24 *	22.8	25.6	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	18
BZM55C27 *	25.1	28.9	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	20
BZM55C30 *	28	32	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	22
BZM55C33 *	31	35	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	24
BZM55C36 *	34	38	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	27
BZM55C39 *	37	41	< 90	< 500	2.5	0.04	0.12	0.5	< 0.1	< 5	30
BZM55C43 *	40	46	< 90	< 600	2.5	0.04	0.12	0.5	< 0.1	< 5	33
BZM55C47 *	44	50	110	< 700	2.5	0.04	0.12	0.5	< 0.1	< 5	36
BZM55C51 *	48	54	125	< 700	2.5	0.04	0.12	0.5	< 0.1	< 10	39
BZM55C56 *	52	60	135	< 1000	2.5	0.04	0.12	0.5	< 0.1	< 10	43
BZM55C62 *	58	66	150	< 1000	2.5	0.04	0.12	0.5	< 0.1	< 10	47
BZM55C68 *	64	72	200	< 1000	2.5	0.04	0.12	0.5	< 0.1	< 10	51
BZM55C75 *	70	79	250	< 1500	2.5	0.04	0.12	0.5	< 0.1	< 10	56

Notes:

<sup>1)</sup> t<sub>p</sub> ≤ 10 ms, T/t<sub>p</sub> > 1000

<sup>\*)</sup> Additional measurement of voltage group 9V1 to 75 % at 95 % V<sub>zmin.</sub> ≤ 35 nA at T<sub>j</sub> 25 °C



## Electrical Characteristics

### BZM55B..

Part number	Zener voltage range <sup>1)</sup>		Dynamic resistance		Test current	Temperature coefficient		Test current	Reverse leakage current		
	$V_Z$ at $I_{ZT}$		$r_{zT}$ at $I_{ZT}$ , $f = 1\text{kHz}$	$r_{zK}$ at $I_{ZK}$ , $f = 1\text{kHz}$	$I_{ZT}$	TK <sub>VZ</sub>		$I_{ZK}$	$I_R$ at $T_{amb} = 25\text{ }^\circ\text{C}$	$I_R$ at $T_{amb} = 150\text{ }^\circ\text{C}$	at $V_R$
	V		$\Omega$		mA	%/K		mA	$\mu\text{A}$		V
	min.	max.				min.	max.				
BZM55B2V4	2.35	2.45	< 85	< 600	5	- 0.09	- 0.06	1	< 50	< 100	1
BZM55B2V7	2.64	2.76	< 85	< 600	5	- 0.09	- 0.06	1	< 10	< 50	1
BZM55B3V0	2.94	3.06	< 90	< 600	5	- 0.08	- 0.05	1	< 4	< 40	1
BZM55B3V3	3.24	3.36	< 90	< 600	5	- 0.08	- 0.05	1	< 2	< 40	1
BZM55B3V6	3.52	3.68	< 90	< 600	5	- 0.08	- 0.05	1	< 2	< 40	1
BZM55B3V9	3.82	3.98	< 90	< 600	5	- 0.08	- 0.05	1	< 2	< 40	1
BZM55B4V3	4.22	4.38	< 90	< 600	5	- 0.06	- 0.03	1	< 1	< 20	1
BZM55B4V7	4.6	4.80	< 80	< 600	5	- 0.05	0.02	1	< 0.5	< 10	1
BZM55B5V1	5	5.20	< 60	< 550	5	- 0.02	0.02	1	< 0.1	< 2	1
BZM55B5V6	5.48	5.72	< 40	< 450	5	- 0.05	0.05	1	< 0.1	< 2	1
BZM55B6V2	6.08	6.32	< 10	< 200	5	0.03	0.06	1	< 0.1	< 2	2
BZM55B6V8	6.66	6.94	< 8	< 150	5	0.03	0.07	1	< 0.1	< 2	3
BZM55B7V5	7.35	7.65	< 7	< 50	5	0.03	0.07	1	< 0.1	< 2	5
BZM55B8V2	8.04	8.36	< 7	< 50	5	0.03	0.08	1	< 0.1	< 2	6.2
BZM55B9V1 *	8.92	9.28	< 10	< 50	5	0.03	0.09	1	< 0.1	< 2	6.8
BZM55B10 *	9.8	10.20	< 15	< 70	5	0.03	0.1	1	< 0.1	< 2	7.5
BZM55B11 *	10.78	11.22	< 20	< 70	5	0.03	0.11	1	< 0.1	< 2	8.2
BZM55B12 *	11.76	12.24	< 20	< 90	5	0.03	0.11	1	< 0.1	< 2	9.1
BZM55B13 *	12.74	13.26	< 26	< 110	5	0.03	0.11	1	< 0.1	< 2	10
BZM55B15 *	14.7	15.30	< 30	< 110	5	0.03	0.11	1	< 0.1	< 2	11
BZM55B16 *	15.7	16.30	< 40	< 170	5	0.03	0.11	1	< 0.1	< 2	12
BZM55B18 *	17.64	18.36	< 50	< 170	5	0.03	0.11	1	< 0.1	< 2	13
BZM55B20 *	19.6	20.40	< 55	< 220	5	0.03	0.11	1	< 0.1	< 2	15
BZM55B22 *	21.55	22.45	< 55	< 220	5	0.04	0.12	1	< 0.1	< 2	16
BZM55B24 *	23.5	24.5	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	18
BZM55B27 *	26.4	27.6	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	20
BZM55B30 *	29.4	30.6	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	22
BZM55B33 *	32.4	33.6	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	24
BZM55B36 *	35.3	36.7	< 80	< 220	5	0.04	0.12	1	< 0.1	< 2	27
BZM55B39 *	38.2	39.8	< 90	< 500	2.5	0.04	0.12	1	< 0.1	< 5	30
BZM55B43 *	42.1	43.9	< 90	< 600	2.5	0.04	0.12	0.5	< 0.1	< 5	33
BZM55B47 *	46.1	47.9	< 110	< 700	2.5	0.04	0.12	0.5	< 0.1	< 5	36
BZM55B51 *	50	52.0	< 125	< 700	2.5	0.04	0.12	0.5	< 0.1	< 10	39
BZM55B56 *	54.9	57.1	< 135	< 1000	2.5	0.04	0.12	0.5	< 0.1	< 10	43
BZM55B62 *	60.8	63.2	< 150	< 1000	2.5	0.04	0.12	0.5	< 0.1	< 10	47
BZM55B68 *	66.6	69.4	< 200	< 1000	2.5	0.04	0.12	0.5	< 0.1	< 10	51
BZM55B75 *	73.5	76.5	< 250	< 1500	2.5	0.04	0.12	0.5	< 0.1	< 10	56

Notes:

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

<sup>\*)</sup> Additional measurement of voltage group 9V1 to 75 % at 95 %  $V_{zmin.} \leq 35\text{ nA}$  at  $T_j 25\text{ }^\circ\text{C}$

### Typical Characteristics

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

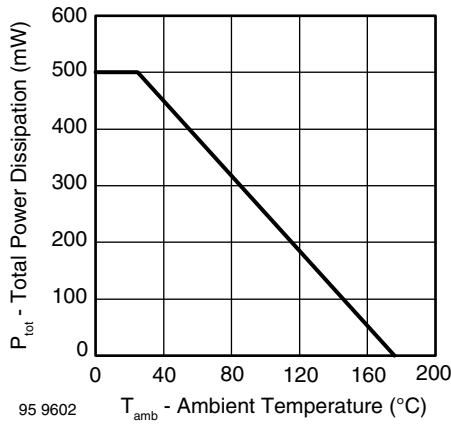


Figure 1. Total Power Dissipation vs. Ambient Temperature

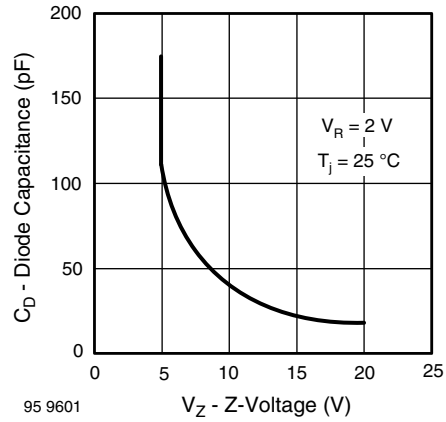


Figure 4. Diode Capacitance vs. Z-Voltage

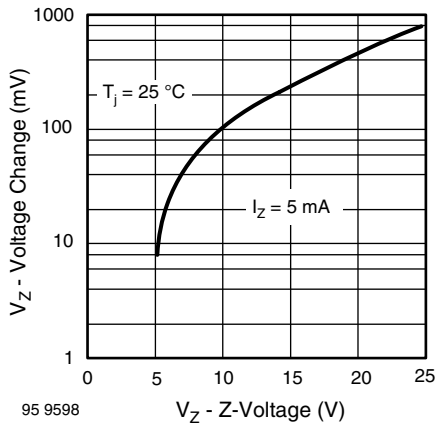


Figure 2. Typical Change of Working Voltage under Operating Conditions at  $T_{amb}=25^{\circ}\text{C}$

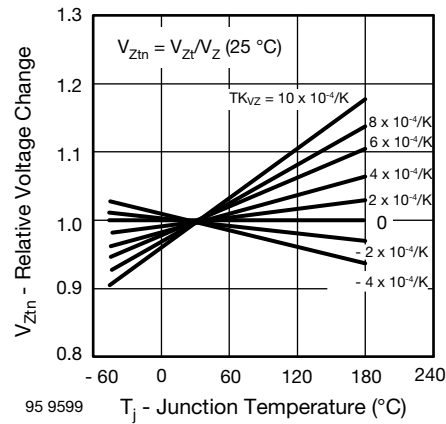


Figure 5. Typical Change of Working Voltage vs. Junction Temperature

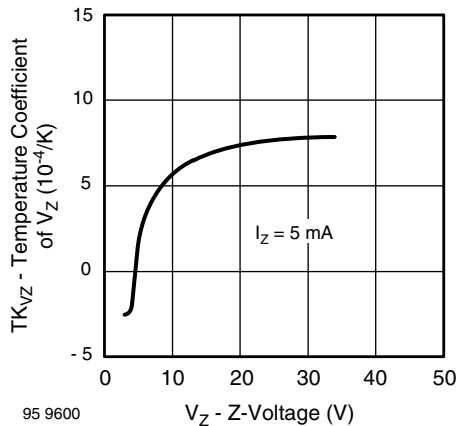


Figure 3. Temperature Coefficient of  $V_Z$  vs. Z-Voltage

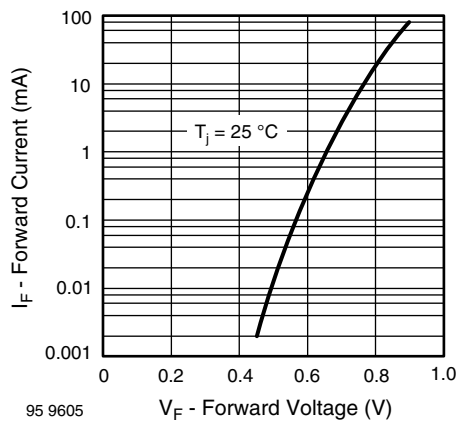


Figure 6. Forward Current vs. Forward Voltage

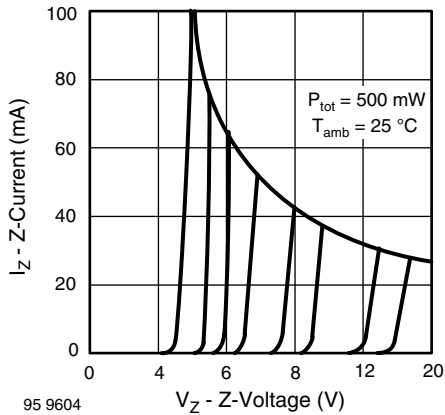


Figure 7. Z-Current vs. Z-Voltage

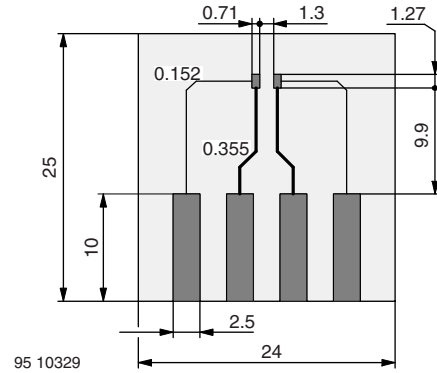


Figure 10. Board for  $R_{thJA}$  Definition (in mm)

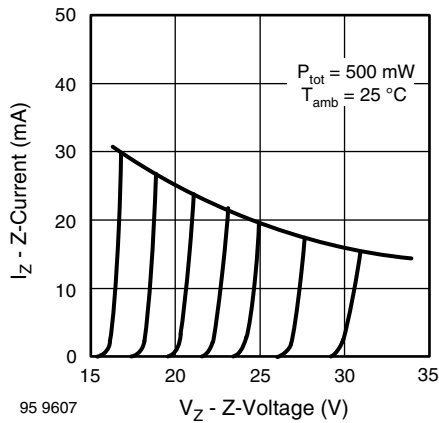


Figure 8. Z-Current vs. Z-Voltage

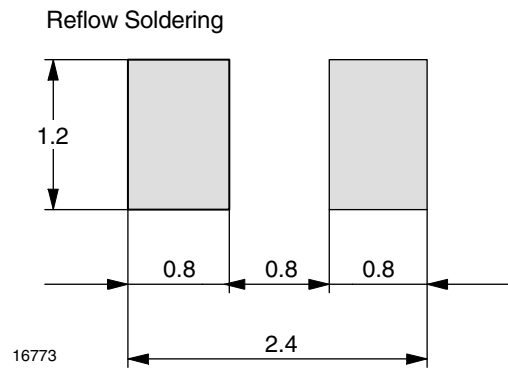


Figure 11. Recommended Foot Pads (in mm)

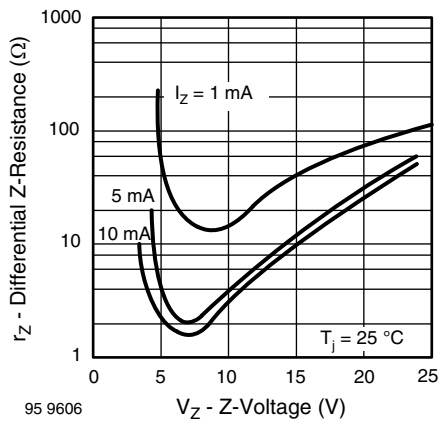


Figure 9. Differential Z-Resistance vs. Z-Voltage

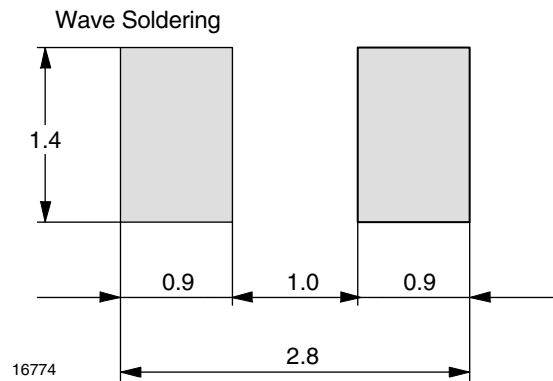


Figure 12. Recommended Foot Pads (in mm)

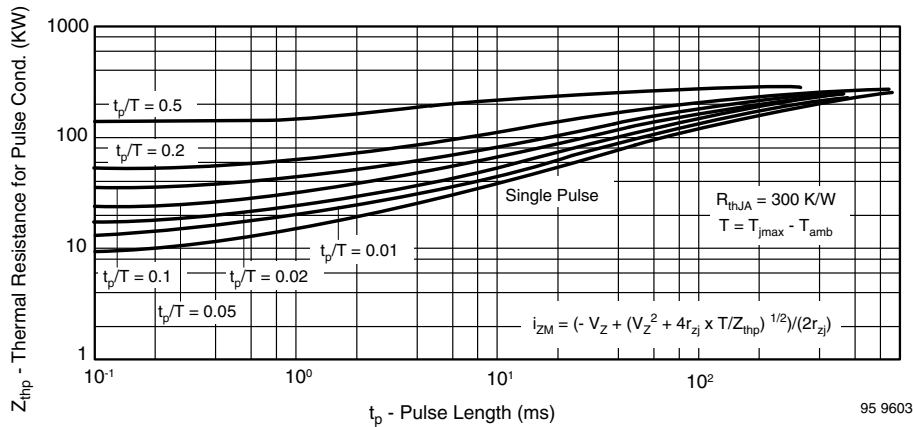
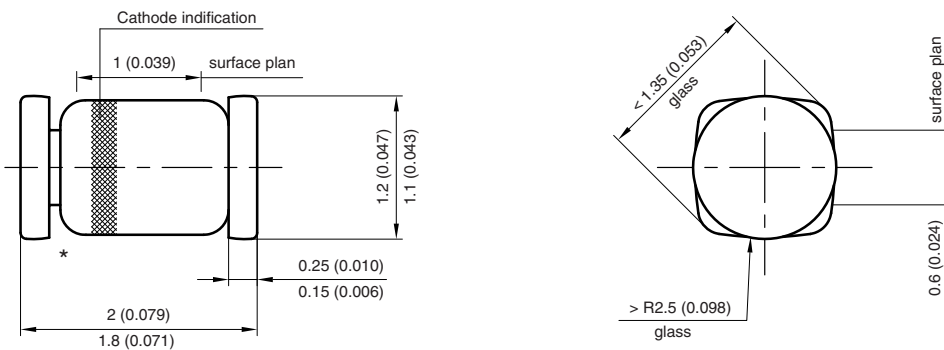


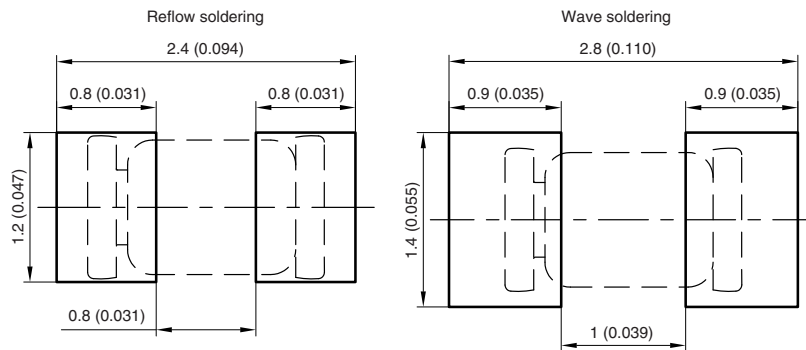
Figure 13. Thermal Response

## Package Dimensions in millimeters (inches): MicroMELF



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

Foot print recommendation:



Created - Date: 26.July.1996  
 Rev. 13 - Date: 07.June.2006  
 Document no.: 6.560-5007.01-4  
 96 12072



## 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 and agree to fully indemnify and hold Vishay and its distributors harmless from and against any and all claims, liabilities, expenses and damages arising or resulting in connection with such use or sale, including attorneys fees, even if such claim alleges that Vishay or its distributor was negligent regarding the design or manufacture of the part. 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.