# **3.2 Watt Plastic Surface Mount POWERMITE<sup>®</sup> Package**

This complete new line of 3.2 Watt Zener Diodes are offered in highly efficient micro miniature, space saving surface mount with its unique heat sink design. The POWERMITE package has the same thermal performance as the SMA while being 50% smaller in footprint area and delivering one of the lowest height profiles (1.1 mm) in the industry. Because of its small size, it is ideal for use in cellular phones, portable devices, business machines and many other industrial/consumer applications.

### Features

- Zener Breakdown Voltage: 6.2 47 V
- DC Power Dissipation: 3.2 W with Tab 1 (Cathode) @ 75°C
- Low Leakage  $< 5 \mu A$
- ESD Rating of Class 3 (> 16 kV) per Human Body Model
- Low Profile Maximum Height of 1.1 mm
- Integral Heat Sink/Locking Tabs
- Full Metallic Bottom Eliminates Flux Entrapment
- Small Footprint Footprint Area of 8.45 mm<sup>2</sup>
- Supplied in 12 mm Tape and Reel
  - T1 = 3,000 Units per Reel T3 = 12,000 Units per Reel
- Lead Orientation in Tape: Cathode (Short) Lead to Sprocket Holes
- POWERMITE is JEDEC Registered as DO-216AA
- Cathode Indicated by Polarity Band
- Pb–Free Packages are Available

#### **Mechanical Characteristics**

CASE: Void-free, transfer-molded, thermosetting plastic

**FINISH:** All external surfaces are corrosion resistant and leads are readily solderable

**MOUNTING POSITION:** Any

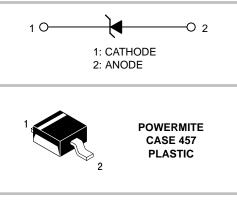
MAXIMUM CASE TEMPERATURE FOR SOLDERING PURPOSES: 260°C for 10 Seconds



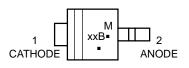
## **ON Semiconductor®**

http://onsemi.com

## PLASTIC SURFACE MOUNT 3.2 WATT ZENER DIODES 6.2 – 47 VOLTS



#### MARKING DIAGRAM





- (See Table on Page 2)
- = Pb–Free Package

#### **ORDERING INFORMATION**

Device	Package	Shipping <sup>†</sup>		
1PMT59xxBT1	POWERMITE	3,000/Tape&Reel		
1PMT59xxBT1G	POWERMITE (Pb-Free)	3,000/Tape&Reel		
1PMT59xxBT3	POWERMITE	12,000/Tape&Reel		
1PMT59xxBT3G	POWERMITE (Pb-Free)	12,000/Tape&Reel		

Individual devices are listed on page 2 of this data sheet.

+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

#### **MAXIMUM RATINGS**

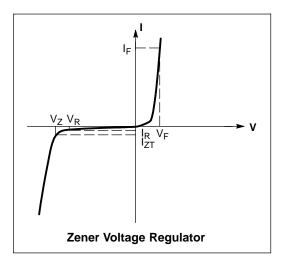
Rating	Symbol	Value	Unit
DC Power Dissipation @ T <sub>A</sub> = 25°C (Note 1) Derate above 25°C Thermal Resistance, Junction–to–Ambient	Ρ <sub>D</sub> R <sub>θJA</sub>	500 4.0 248	mW mW/°C °C/W
Thermal Resistance, Junction-to-Lead (Anode)	$R_{ heta Janode}$	35	°C/W
Maximum DC Power Dissipation (Note 2) Thermal Resistance from Junction-to-Tab (Cathode)	P <sub>D</sub> R <sub>θJcathode</sub>	3.2 23	W ∘C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	-55 to +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Mounted with recommended minimum pad size, PC board FR-4. 2. At Tab (Cathode) temperature,  $T_{tab} = 75^{\circ}C$ 

**ELECTRICAL CHARACTERISTICS** ( $T_L = 25^{\circ}C$  unless

otherwise noted, $V_F = 1.5 \text{ V}$ Max. @ $I_F = 200 \text{ mAdc for all types}$ )					
Symbol	Parameter				
VZ	Reverse Zener Voltage @ I <sub>ZT</sub>				
I <sub>ZT</sub>	Reverse Current				
Z <sub>ZT</sub>	Maximum Zener Impedance @ IZT				
I <sub>ZK</sub>	Reverse Current				
Z <sub>ZK</sub>	Maximum Zener Impedance @ I <sub>ZK</sub>				
I <sub>R</sub>	Reverse Leakage Current @ V <sub>R</sub>				
V <sub>R</sub>	Reverse Voltage				
١ <sub>F</sub>	Forward Current				
V <sub>F</sub>	Forward Voltage @ I <sub>F</sub>				



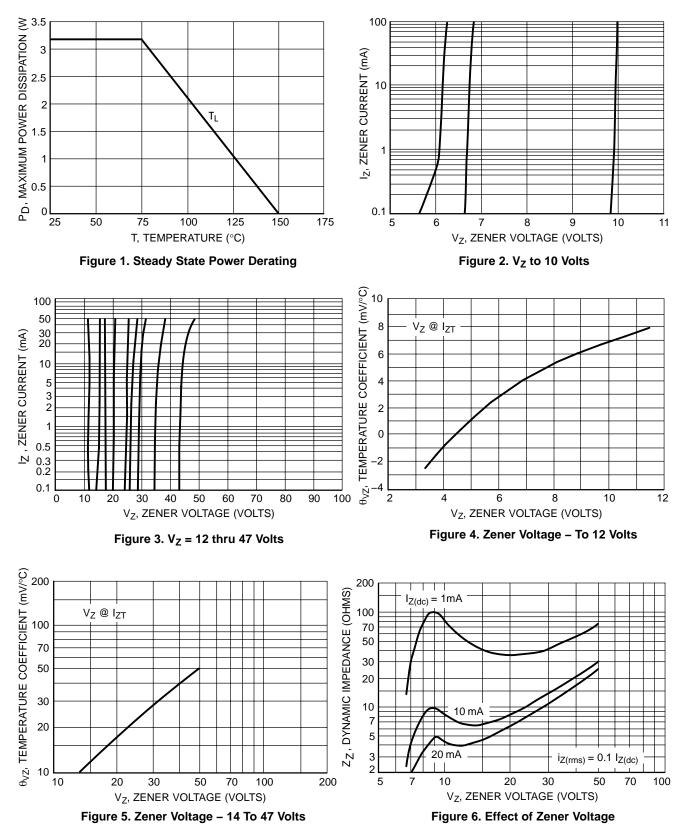
#### ELECTRICAL CHARACTERISTICS (T<sub>L</sub> = 30°C unless otherwise noted, V<sub>F</sub> = 1.25 Volts @ 200 mA)

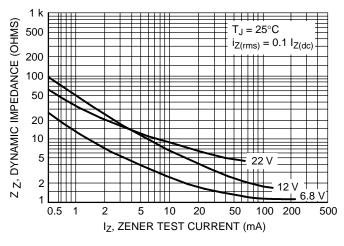
			Zener Voltage (Note 3)					Z <sub>ZT</sub> @ I <sub>ZT</sub>	Z <sub>ZK</sub> @ I <sub>ZK</sub>	
	Device	V <sub>Z</sub> @ I <sub>ZT</sub> (Volts)		I <sub>ZT</sub>	I <sub>ZT</sub> I <sub>R</sub> @ V <sub>R</sub>		(Note 4)	(Note 4)	I <sub>ZK</sub>	
Device*	Marking	Min	Nom	Max	(mA)	(μΑ)	(V)	(Ω)	(Ω)	(mA)
1PMT5920BT1, T3,G	20B	5.89	6.2	6.51	60.5	5.0	4.0	2.0	200	1.0
1PMT5921BT1, T3,G	21B	6.46	6.8	7.14	55.1	5.0	5.2	2.5	200	1.0
1PMT5922BT1, T3,G	22B	7.12	7.5	7.88	50	5.0	6.0	3.0	400	0.5
1PMT5923BT1, T3,G	23B	7.79	8.2	8.61	45.7	5.0	6.5	3.5	400	0.5
1PMT5924BT1, T3,G	24B	8.64	9.1	9.56	41.2	5.0	7.0	4.0	500	0.5
1PMT5925BT1, T3,G	25B	9.5	10	10.5	37.5	5.0	8.0	4.5	500	0.25
1PMT5927BT1, T3,G	27B	11.4	12	12.6	31.2	1.0	9.1	6.5	550	0.25
1PMT5929BT1, T3,G	29B	14.25	15	15.75	25	1.0	11.4	9.0	600	0.25
1PMT5930BT1, T3,G	30B	15.2	16	16.8	23.4	1.0	12.2	10	600	0.25
1PMT5931BT1, T3,G	31B	17.1	18	18.9	20.8	1.0	13.7	12	650	0.25
1PMT5933BT1, T3,G	33B	20.9	22	23.1	17	1.0	16.7	17.5	650	0.25
1PMT5934BT1, T3,G	34B	22.8	24	25.2	15.6	1.0	18.2	19	700	0.25
1PMT5935BT1, T3,G	35B	25.65	27	28.35	13.9	1.0	20.6	23	700	0.25
1PMT5936BT1, T3,G	36B	28.5	30	31.5	12.5	1.0	22.8	28	750	0.25
1PMT5939BT1, T3,G	39B	37.05	39	40.95	9.6	1.0	29.7	45	900	0.25
1PMT5941BT1, T3,G	41B	44.65	47	49.35	8.0	1.0	35.8	67	1000	0.25

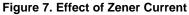
3. Zener voltage is measured with the device junction in thermal equilibrium with an ambient temperature of 25°C.

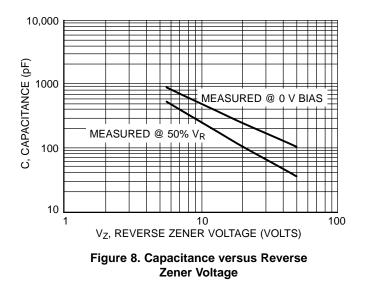
4. Zener Impedance Derivation  $Z_{ZT}$  and  $Z_{ZK}$  are measured by dividing the AC voltage drop across the device by the AC current applied. The specified limits are for  $I_Z(ac) = 0.1 I_Z(dc)$  with the ac frequency = 60 Hz. \* The "G" suffix indicates Pb–Free package available.

## **TYPICAL CHARACTERISTICS**



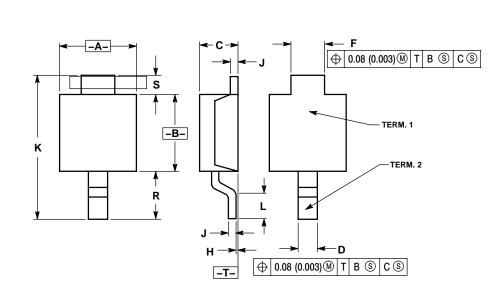






#### **OUTLINE DIMENSIONS**

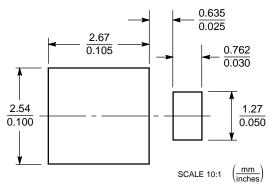
**POWERMITE**® CASE 457-04 ISSUE D



- NOTES: 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 2. CONTROLLING DIMENSION: MILLIMETER. 3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 (0.000 PER SIDE EXCEED 0.15 (0.006) PER SIDE.

	MILLIN	IETERS	INCHES		
DIM	MIN	MIN MAX		MAX	
Α	1.75	2.05	0.069	0.081	
В	1.75	2.18	0.069	0.086	
С	0.85	0.85 1.15 0.03		0.045	
D	0.40	0.69	0.016	0.027	
F	0.70	1.00	0.028	0.039	
Н	-0.05	+0.10	-0.002	+0.004	
J	0.10	0.25	0.004	0.010	
K	3.60	3.90	0.142	0.154	
L	0.50	0.80	0.020	0.031	
R	1.20	1.50	0.047	0.059	
S	0.50	REF	0.019 REF		

**SOLDERING FOOTPRINT\*** 



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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