1PMT5920B Series

3.2 Watt Plastic Surface Mount POWERMITE® 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 μA
- 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^2
- Supplied in 12 mm Tape and Reel
- Lead Orientation in Tape: Cathode (Short) Lead to Sprocket Holes
- POWERMITE is JEDEC Registered as DO−216AA
- Cathode Indicated by Polarity Band
- These Devices are Pb−Free and are RoHS Compliant

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®

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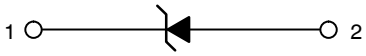
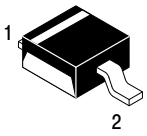
PLASTIC SURFACE MOUNT 3.2 WATT ZENER DIODES 6.2 – 47 VOLTS

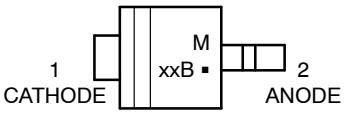


1: CATHODE
2: ANODE



POWERMITE
CASE 457

MARKING DIAGRAM



M = Date Code
xxB = Specific Device Code (See Table on Page 2)
▪ = Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping†
1PMT59xxBT1G	POWERMITE (Pb−Free)	3000 / Tape & Reel

†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.

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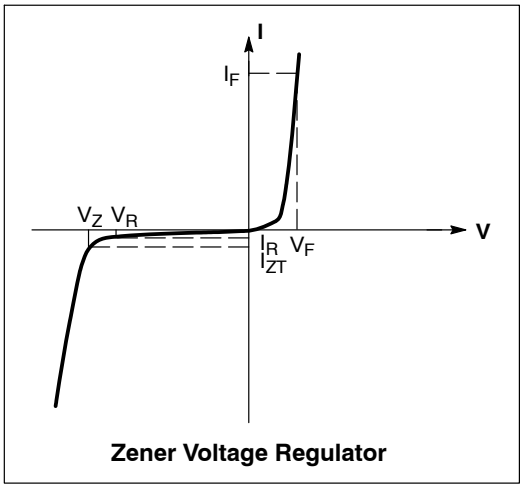
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Power Dissipation @ T_A = 25°C (Note 1) Derate above 25°C Thermal Resistance, Junction−to−Ambient	P_D $R_{\theta JA}$	500 4.0 248	mW mW/°C °C/W
Thermal Resistance, Junction−to−Lead (Anode)	$R_{\theta Janode}$	35	°C/W
Maximum DC Power Dissipation (Note 2) Thermal Resistance from Junction−to−Tab (Cathode)	P_D $R_{\theta Jcathode}$	3.2 23	W °C/W
Operating and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, 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°C

ELECTRICAL CHARACTERISTICS (T_L = 25°C unless otherwise noted, V_F = 1.5 V Max. @ I_F = 200 mAdc for all types)

Symbol	Parameter
V_Z	Reverse Zener Voltage @ I_{ZT}
I_{ZT}	Reverse Current
Z_{ZT}	Maximum Zener Impedance @ I_{ZT}
I_{ZK}	Reverse Current
Z_{ZK}	Maximum Zener Impedance @ I_{ZK}
I_R	Reverse Leakage Current @ V_R
V_R	Reverse Voltage
I_F	Forward Current
V_F	Forward Voltage @ I_F



Zener Voltage Regulator

ELECTRICAL CHARACTERISTICS (T_L = 30°C unless otherwise noted, V_F = 1.25 Volts @ 200 mA)

Device*	Device Marking	Zener Voltage (Note 3) V_Z @ I_{ZT} (Volts) Min	Nom	Max	I_{ZT} (mA)	I_R @ V_R (μA)	V_R (V)	Z_{ZT} @ I_{ZT} (Note 4) (Ω)	Z_{ZK} @ I_{ZK} (Note 4) (Ω)	I_{ZK} (mA)
1PMT5920BT1G	20B	5.89	6.2	6.51	60.5	5.0	4.0	2.0	200	1.0
1PMT5921BT1G	21B	6.46	6.8	7.14	55.1	5.0	5.2	2.5	200	1.0
1PMT5924BT1G	24B	8.64	9.1	9.56	41.2	5.0	7.0	4.0	500	0.5
1PMT5927BT1G	27B	11.4	12	12.6	31.2	1.0	9.1	6.5	550	0.25
1PMT5929BT1G	29B	14.25	15	15.75	25	1.0	11.4	9.0	600	0.25
1PMT5933BT1G	33B	20.9	22	23.1	17	1.0	16.7	17.5	650	0.25
1PMT5934BT1G	34B	22.8	24	25.2	15.6	1.0	18.2	19	700	0.25
1PMT5935BT1G	35B	25.65	27	28.35	13.9	1.0	20.6	23	700	0.25
1PMT5941BT1G	41B	44.65	47	49.35	8.0	1.0	35.8	67	1000	0.25

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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.

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TYPICAL CHARACTERISTICS

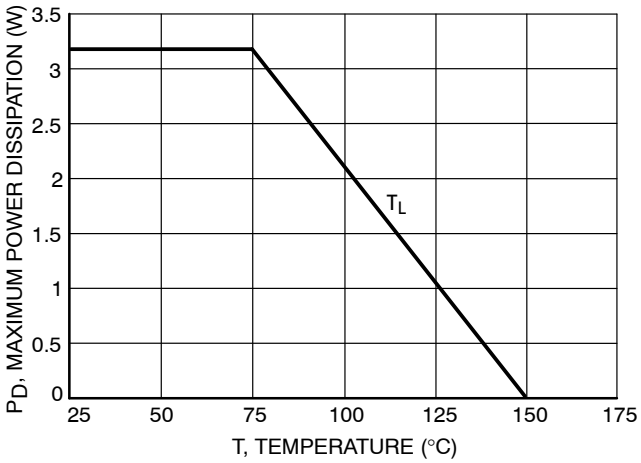

Figure 1. Steady State Power Derating

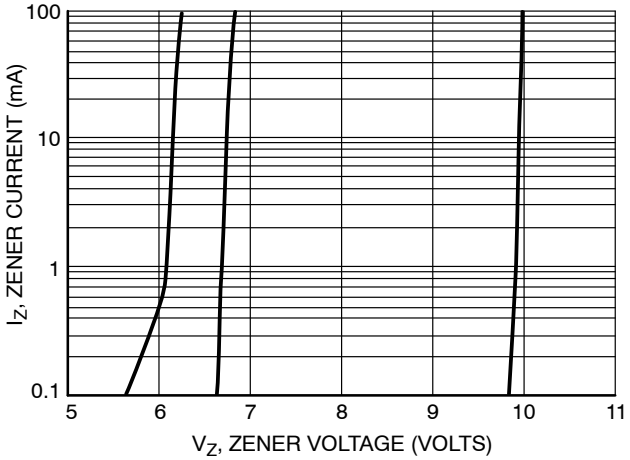

Figure 2. V_Z to 10 Volts

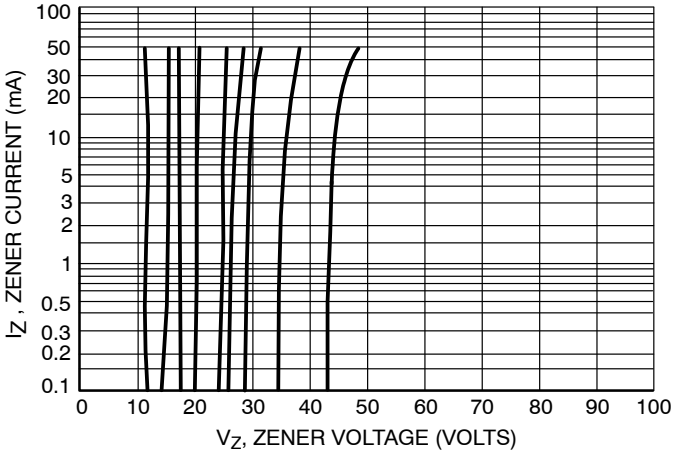

Figure 3. V_Z = 12 thru 47 Volts

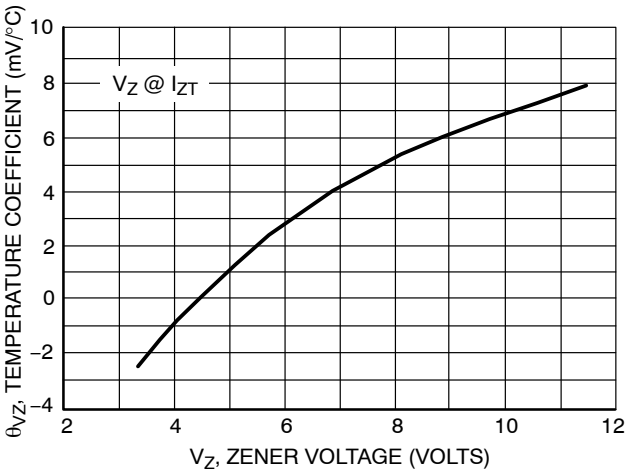

Figure 4. Zener Voltage – To 12 Volts

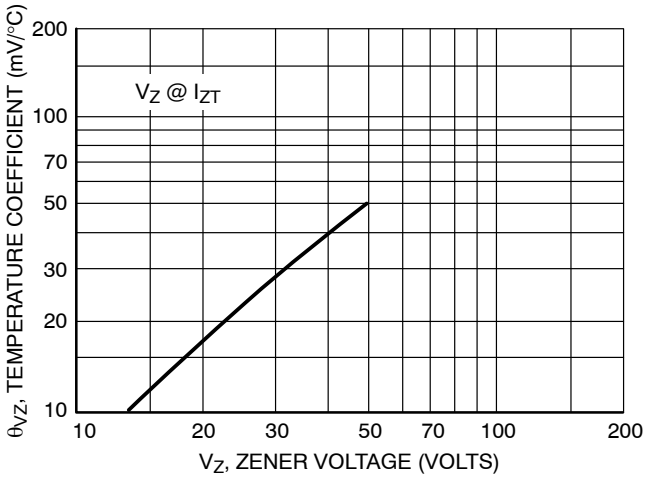

Figure 5. Zener Voltage – 14 To 47 Volts

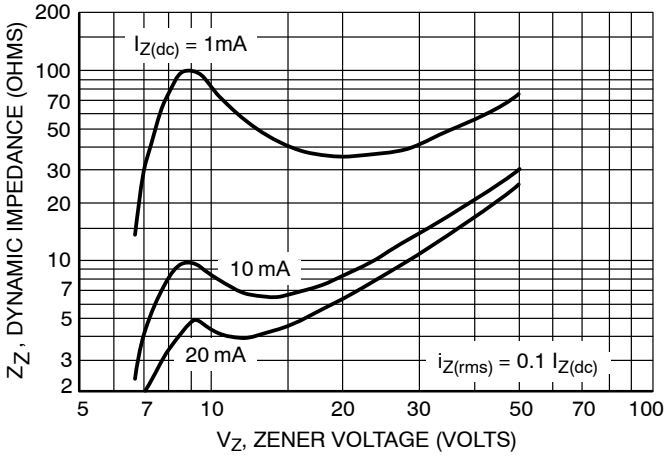

Figure 6. Effect of Zener Voltage

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TYPICAL CHARACTERISTICS

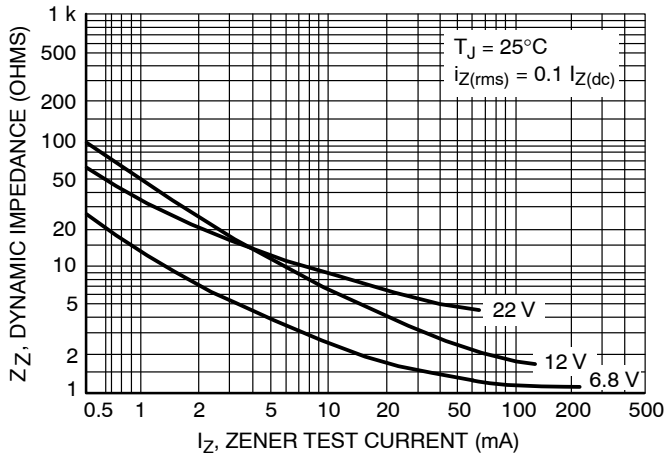

Figure 7. Effect of Zener Current

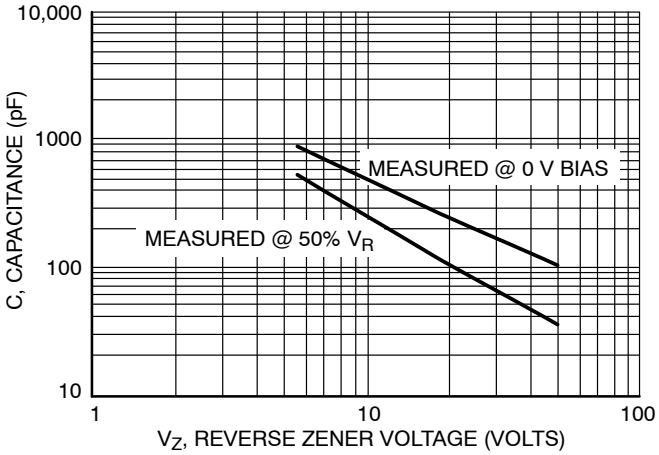

Figure 8. Capacitance versus Reverse Zener Voltage

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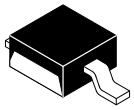
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

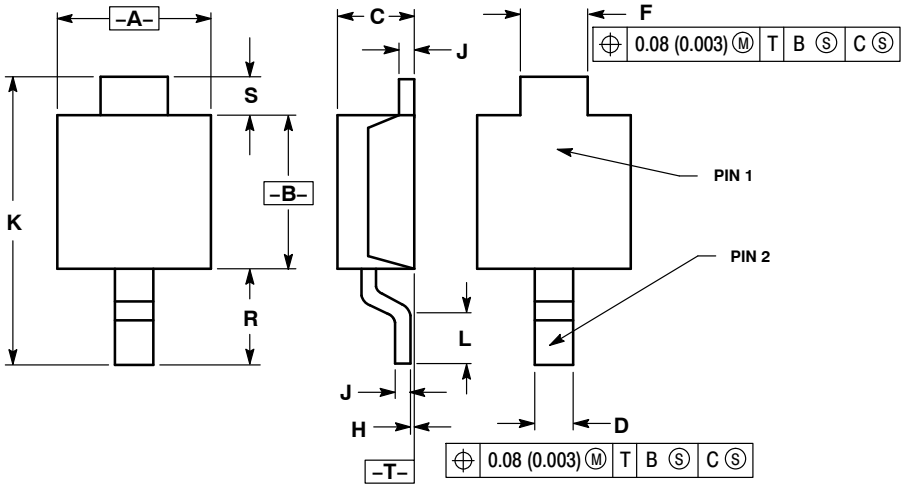
ON Semiconductor®



SCALE 4:1

POWERMITE
CASE 457−04
ISSUE F

DATE 14 MAY 2013



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

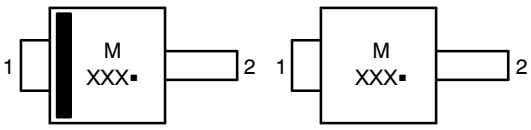
	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	1.75	2.05	0.069	0.081
B	1.75	2.18	0.069	0.086
C	0.85	1.15	0.033	0.045
D	0.40	0.69	0.016	0.027
F	0.70	1.00	0.028	0.039
H	−0.05	+0.10	−0.002	+0.004
J	0.10	0.25	0.004	0.010
K	3.60	3.90	0.142	0.154
L	0.50	0.80	0.020	0.031
R	1.20	1.50	0.047	0.059
S	0.50 REF		0.019 REF	

STYLE 1:
PIN 1. CATHODE
2. ANODE

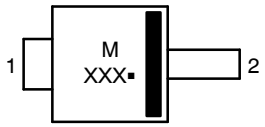
STYLE 2:
PIN 1. ANODE OR CATHODE
2. CATHODE OR ANODE
(BI−DIRECTIONAL)

STYLE 3:
PIN 1. ANODE
2. CATHODE

GENERIC MARKING DIAGRAMS*



STYLE 1 STYLE 2

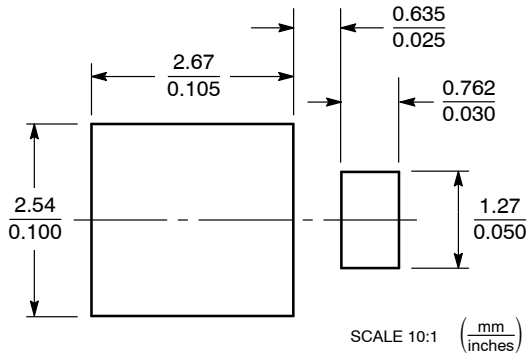


STYLE 3

XXX = Specific Device Code
M = Date Code
▪ = Pb−Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present.

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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DESCRIPTION:	POWERMITE		PAGE 1 OF 1

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