MBRA120LT3

Surface Mount Schottky Power Rectifier

SMA Power Surface Mount Package

    . . . employing the Schottky Barrier principle in a metal–to–silicon power rectifier. Features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies; free wheeling diodes and polarity protection diodes.

- Compact Package with J–Bend Leads Ideal for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guardring for Over–Voltage Protection
- Optimized for Low Leakage Current

Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL94, V_O at 1/8″
- Weight: 70 mg (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Polarity: Polarity Band Indicates Cathode Lead
- Available in 12 mm Tape, 5000 Units per 13 inch Reel
- ESD Protection: Human Body Model > 4000 V (Class 3)
                          Machine Model > 400 V (Class C)
- Marking: B1L2

ON Semiconductor®

http://onsemi.com

SCHOTTKY BARRIER RECTIFIER
1 AMPERE
20 VOLTS

MARKING DIAGRAM

SMA
CASE 403D
PLASTIC

B1L2

B1L2 = Device Code

ORDERING INFORMATION

Device	Package	Shipping
MBRA120LT3	SMA	5000/Tape & Reel

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	20	V
Average Rectified Forward Current (At Rated V_R, T_L = 110°C)	I_O	1.0	A
Non–Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	40	A
Storage/Operating Case Temperature Operating Junction Temperature	T_{stg}, T_C T_J	–55 to +125	°C
Voltage Rate of Change (Rated V_R, T_J = 25°C)	dv/dt	10,000	V/µs

1

Publication Order Number:

MBRA120LT3

THERMAL CHARACTERISTICS

Characteristic	Symbol	5 mm x 5 mm (Note 2)	1 Inch x 1/2 inch (Note 3)	Unit
Thermal Resistance – Junction–to–Lead	Psi$_{JL}$ (Note 4)	34	20	°C/W
Thermal Resistance – Junction–to–Ambient	R$_{\theta JA}$	138	77	

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 1), See Figure 2	V$_F$	**T$_J$ = 25°C**	**T$_J$ = 125°C**	V
(I$_F$ = 0.1 A) (I$_F$ = 1.0 A) (I$_F$ = 2.0 A)		0.300 0.395 0.445	0.15 0.30 0.40	
Maximum Instantaneous Reverse Current, See Figure 4	I$_R$	**T$_J$ = 25°C**	**T$_J$ = 100°C**	mA
(V$_R$ = 20 V) (V$_R$ = 10 V)		0.2 0.1	6.0 4.0	

1. Pulse Test: Pulse Width ≤ 250 μs, Duty Cycle ≤ 2%.
2. Mounted on a Pad Size of 5 mm x 5 mm, PC Board FR4 (2 pads).
3. Mounted on a Pad Size of 1 inch x 1/2 inch, PC Board FR4 (2 pads).
4. In compliance with JEDEC 51, these values (historically represented by R$_{\theta JL}$) are now referenced as Psi$_{JL}$.
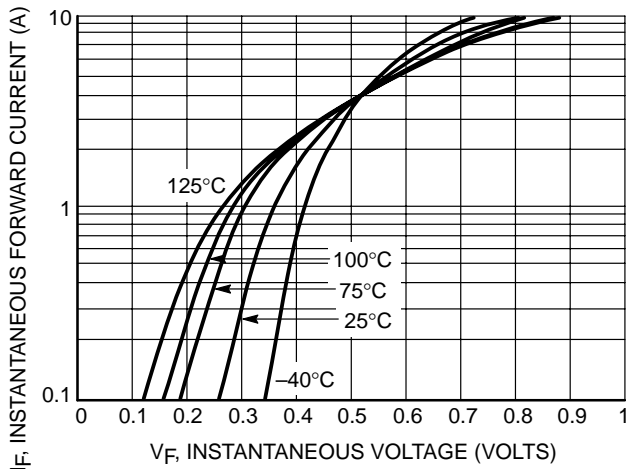
Figure 1. Typical Forward Voltage
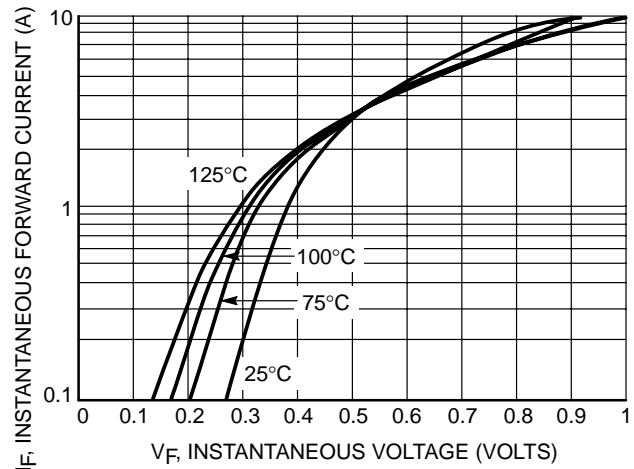
Figure 2. Maximum Forward Voltage
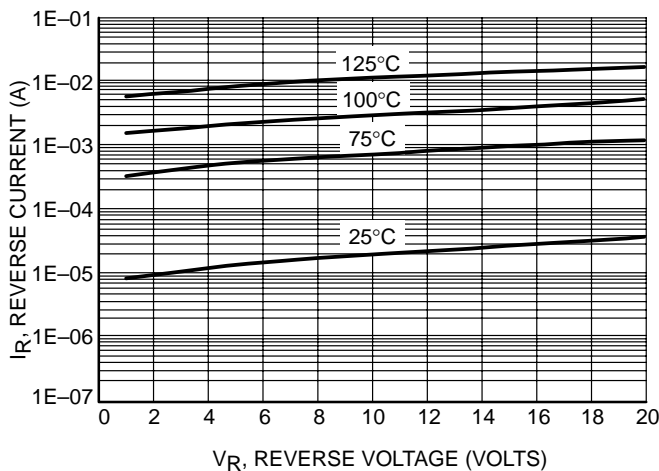
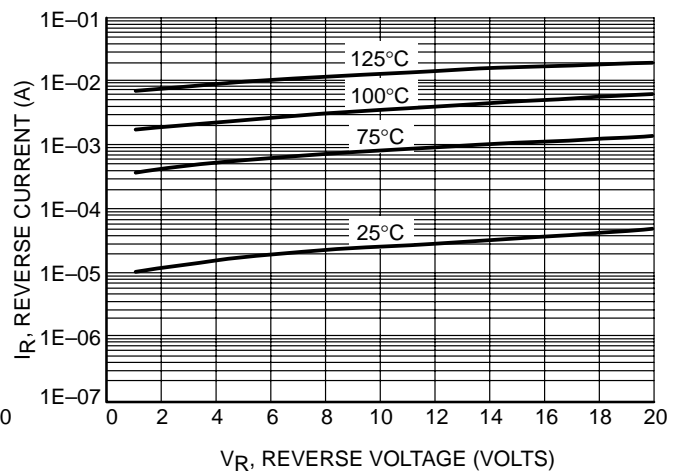**Figure 3. Typical Reverse Current**

Figure 4. Maximum Reverse Current

MBRA120LT3
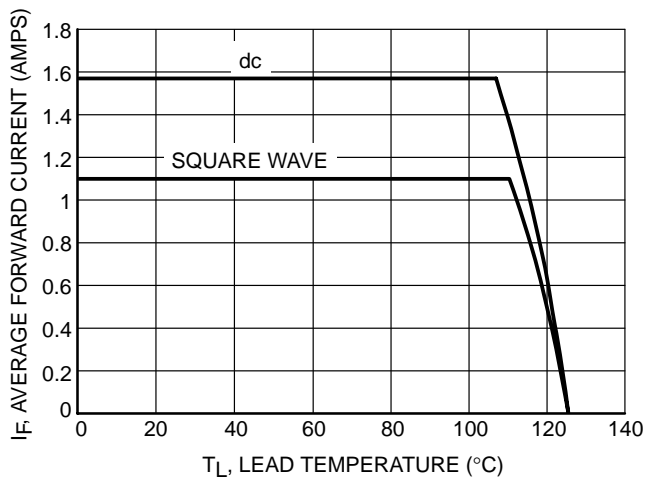
Figure 5. Current Derating – Lead

Y-axis: I_F, AVERAGE FORWARD CURRENT (AMPS)
X-axis: T_L, LEAD TEMPERATURE (°C)

Labels: dc, SQUARE WAVE
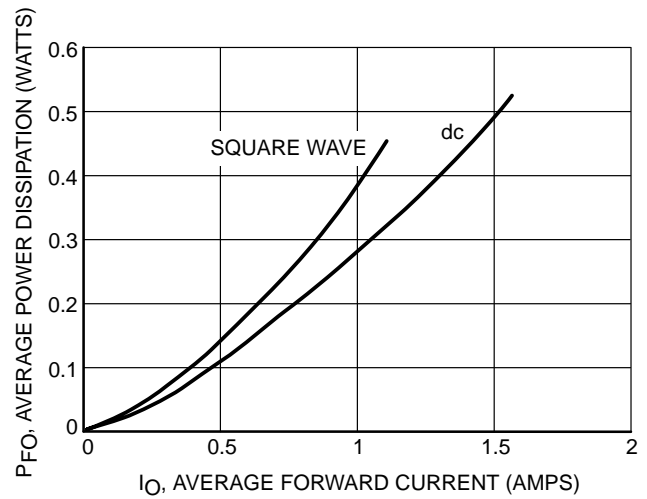
Figure 6. Forward Power Dissipation

Y-axis: P_{FO}, AVERAGE POWER DISSIPATION (WATTS)
X-axis: I_O, AVERAGE FORWARD CURRENT (AMPS)

Labels: SQUARE WAVE, dc
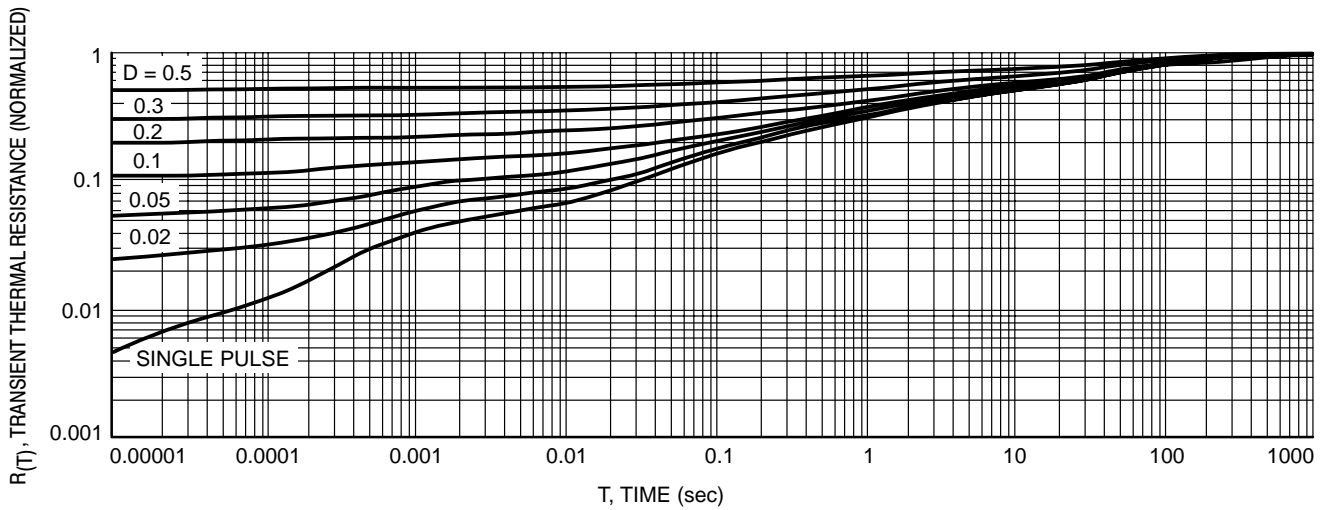
Figure 7. Thermal Resistance

Y-axis: $R_{(T)}$, TRANSIENT THERMAL RESISTANCE (NORMALIZED)
X-axis: T, TIME (sec)

Labels: D = 0.5, 0.3, 0.2, 0.1, 0.05, 0.02, SINGLE PULSE
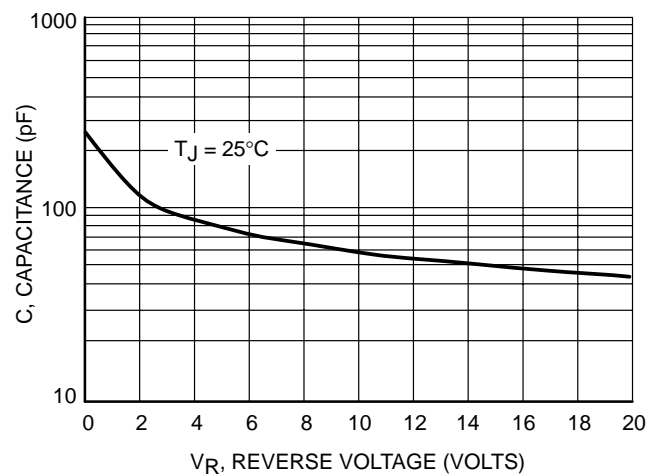
Figure 8. Typical Junction Capacitance

Y-axis: C, CAPACITANCE (pF)
X-axis: V_R, REVERSE VOLTAGE (VOLTS)

Label: $T_J = 25$°C

MBRA120LT3

PACKAGE DIMENSIONS

SMA
CASE 403D–02
ISSUE A

POLARITY INDICATOR OPTIONAL AS NEEDED
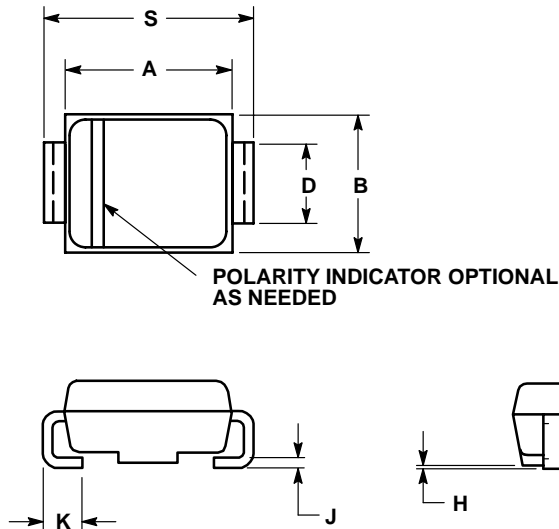
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 403D–01 OBSOLETE, NEW STANDARD IS 403D–02.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.090	0.115	2.29	2.92
C	0.075	0.095	1.91	2.41
D	0.050	0.064	1.27	1.63
H	0.002	0.006	0.05	0.15
J	0.006	0.016	0.15	0.41
K	0.030	0.060	0.76	1.52
S	0.190	0.220	4.83	5.59

SMA FOOTPRINT

$$\frac{0.157}{4.0}$$

$$\frac{0.0787}{2.0}$$

$$\frac{0.0787}{2.0}$$

$$\left(\frac{\text{inches}}{\text{mm}}\right)$$