1.0A SCHOTTKY BARRIER RECTIFIER

Product Summary

B120AE/B130AE/B140AE
B120BE/B130BE/B140BE

V_{RRM} (V)	I_O (A)	$V_{F(MAX)}$ (V) @ +25°C	$I_{R(MAX)}$ (mA) @ +25°C
20	1	0.5	0.1
30	1	0.5	0.1
40	1	0.5	0.2

Features and Benefits

- Reduced Low Forward Voltage Drop (V_F); Better Efficiency and Cooler Operation
- Reduced High-Temperature Reverse Leakage; Increased Reliability against Thermal Runaway Failure in High Temperature Operation
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative.**
  https://www.diodes.com/quality/product-definitions/

Description and Applications

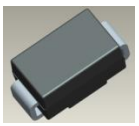
The Schottky rectifier providing low V_F and excellent reverse leakage stability at high temperatures, this device is ideal for use in general rectification applications such as:

- Boost Diode
- Blocking Diode
- Recirculating Diode

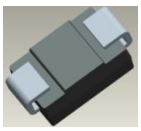
Mechanical Data

- Case: SMA, SMB
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Polarity: Cathode Band
- Weight: SMA-0.063 grams (Approximate)
  SMB-0.093 grams (Approximate)

SMA/SMB



Top View



Bottom View

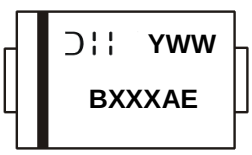
Ordering Information (Notes 4, 5)

Part Number	Case	Packaging	Status	Replacement
B120AE-13	SMA	5,000/Tape & Reel	NRND	B120-13-F
B120BE-13	SMB	3,000/Tape & Reel	NRND	B120B-13-F
B130AE-13	SMA	5,000/Tape & Reel	NRND	B130-13-F
B130BE-13	SMB	3,000/Tape & Reel	NRND	B130B-13-F
B140AE-13	SMA	5,000/Tape & Reel	Active	—
B140BE-13	SMB	3,000/Tape & Reel	NRND	B140B-13-F

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.
5. NRND: Not recommended for new design.

Marking Information

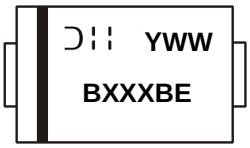
SMA



BXXXAE = Product Type Marking Code, ex: B120AE (SMA Package)
= Manufacturers' Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 0 for 2020)
WW = Week Code (01 to 53)

Marking Information (continued)

SMB



BXXXBE = Product Type Marking Code, ex: B120BE (SMB Package)
= Manufacturers' Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 0 for 2020)
WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

Characteristic	Symbol	B120AE B120BE	B130AE B130BE	B140AE B140BE	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{RM}	20	30	40	V
Average Rectified Output Current	I_O	1			A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	30			A

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 6)	SMA SMB	$R_{\theta JA}$	95 90	°C/W
Typical Thermal Resistance Junction to Case (Note 6)	SMA SMB	$R_{\theta JC}$	45 40	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop		V_F	— —	0.45 0.40	0.50 —	V	I_F = 1A, T_J = +25°C I_F = 1A, T_J = +125°C
Leakage Current (Note 7)	B120AE/B120BE B130AE/B130BE B140AE/B140BE	I_R	— — — —	— — — 6.1	0.1 0.1 0.2 —	mA	V_R = 20V, T_J = +25°C V_R = 30V, T_J = +25°C V_R = 40V, T_J = +25°C V_R = 40V, T_J = +125°C
Typical Capacitance		C_T	—	50	—	pF	V_R = 4.0V, f = 1MHz

Notes: 6. Device mounted on FR-4 substrate, 0.4" × 0.5", 2oz, single-sided, PC boards with 0.2" × 0.25" copper pad.
7. Short duration pulse test used to minimize self-heating effect.

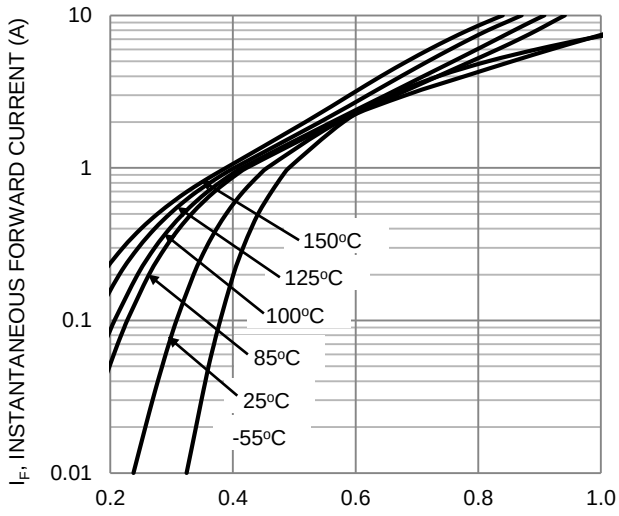


Figure 1. Typical Forward Characteristics

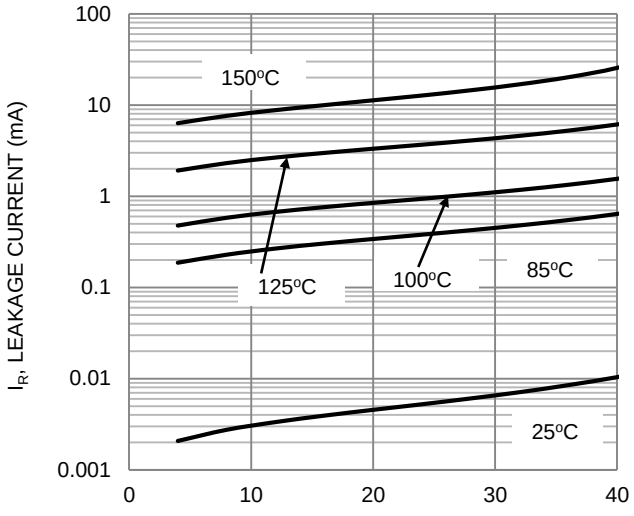


Figure 2. Typical Reverse Characteristics

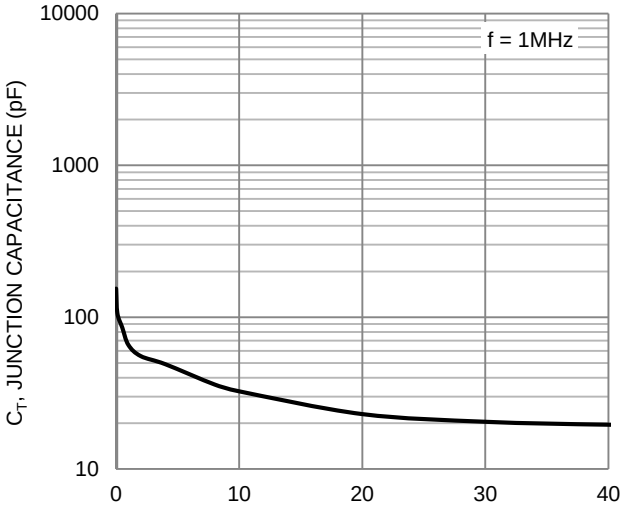


Figure 3. Typical Junction Capacitance

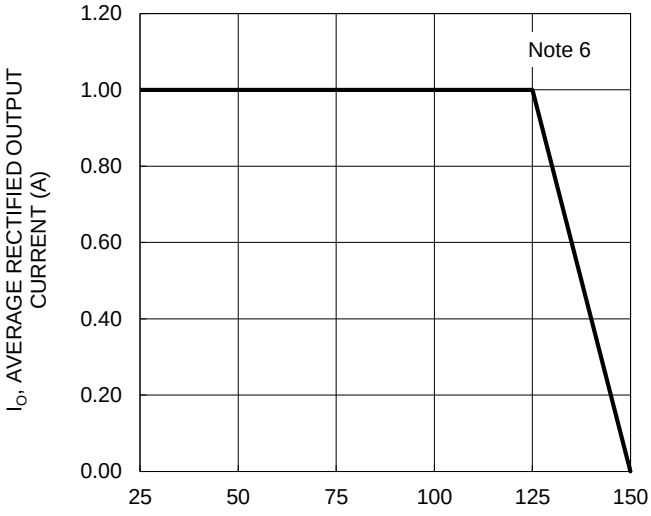
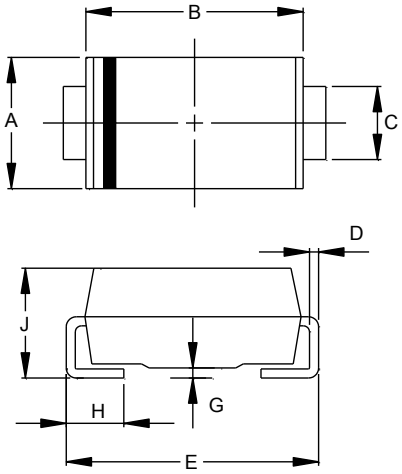


Figure 4. DC Forward Current Derating

Package Outline Dimensions

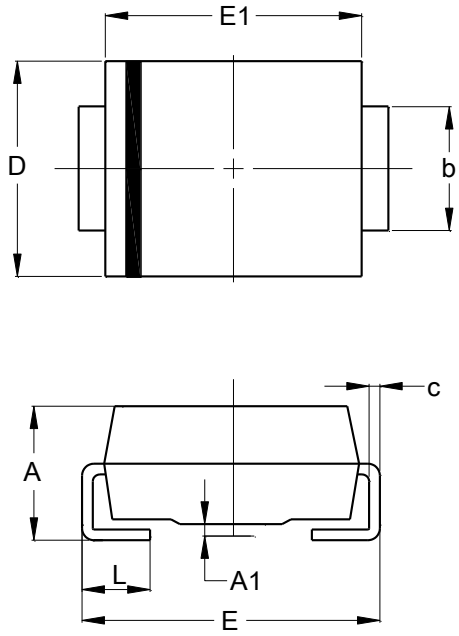
Please see http://www.diodes.com/package-outlines.html for the latest version.

(1) Package Type: SMA



SMA		
Dim	**Min**	**Max**
A	2.29	2.92
B	4.00	4.60
C	1.27	1.63
D	0.15	0.31
E	4.80	5.59
G	0.05	0.20
H	0.76	1.52
J	1.96	2.40
All Dimensions in mm		

(2) Package Type: SMB

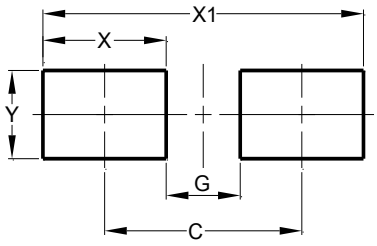


SMB		
Dim	**Min**	**Max**
A	2.00	2.50
A1	0.05	0.20
b	1.96	2.21
c	0.15	0.31
D	3.30	3.94
E	5.00	5.59
E1	4.06	4.57
L	0.76	1.52
All Dimensions in mm		

Suggested Pad Layout

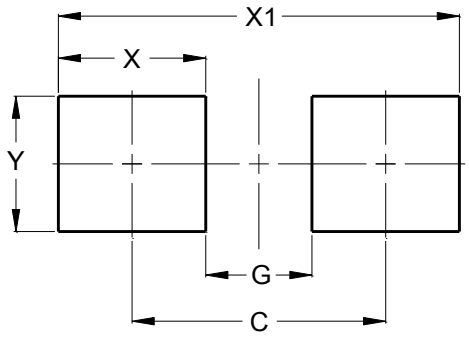
Please see http://www.diodes.com/package-outlines.html for the latest version.

(1) Package Type: SMA



Dimensions	Value (in mm)
C	4.00
G	1.50
X	2.50
X1	6.50
Y	1.70

(2) Package Type: SMB



Dimensions	Value (in mm)
C	4.30
G	1.80
X	2.50
X1	6.80
Y	2.30

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