SBRT3U40P1

3A TRENCH SBR
TRENCH SUPER BARRIER RECTIFIER
PowerDI123

Product Summary (@T_A = +25°C)

V_{RRM} (V)	I_O (A)	$V_{F\ Max}$ (V)	$I_{R\ Max}$ (µA)
40	3	0.49	180

Description

Packaged in the compact thermally efficient PowerDI®123, the SBRT3U40P1 provides very low V_F and excellent reverse leakage stability at high temperatures. It is ideally suited to use as a rectifier diode in MR16 bridge rectifier applications.

Application

- Bridge diodes
- Blocking diodes
- Reverse protection diodes

Features and Benefits

- Reduced ultra-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.
- <1.1mm package profile – ideal for thin applications.
- Patented Super Barrier Rectifier SBR® Technology
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The SBRT3U40P1Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Package: PowerDI123
- Package 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: 0.01 grams (Approximate)

PowerDI123

Top View

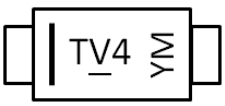
Device Symbol

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SBRT3U40P1-7	PowerDI123	3,000	Tape & Reel
SBRT3U40P1Q-7	PowerDI123	3,000	Tape & Reel

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/.

Marking Information



TV4 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: L = 2024)
M = Month (ex: 9 = September)

Date Code Key

Year	2013	…	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	A	…	L	M	N	P	R	S	T	U	V	W

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{RM}	40	V
Average Rectified Output Current	I_O	3	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load	I_{FSM}	75	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	138	°C/W
Typical Thermal Resistance Junction to Case (Note 5)	$R_{\theta JC}$	35	°C/W
Operating and Storage Temperature Range (Note 7)	T_J, T_{STG}	-65 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	— — — —	0.34 0.25 0.42 0.37	0.39 — 0.49 —	V	I_F = 1A, T_J = +25°C I_F = 1A, T_J = +125°C I_F = 3A, T_J = +25°C I_F = 3A, T_J = +125°C
Leakage Current (Note 6)	I_R	— —	30 7	180 40	μA mA	V_R = 40V, T_J = +25°C V_R = 40V, T_J = +125°C
Typical Total Capacitance	C_T	—	150	—	pF	V_R = 4V, f = 1MHz
Reverse-Recovery Time	t_{RR}	—	14	—	ns	I_F = 0.5A, I_R = 1A, I_{RR} = 0.25A

Notes: 5. Device mounted on 1inch FR-4.
6. Short duration pulse test used to minimize self-heating effect.
7. The heat generated must be less than thermal conductivity from junction-to-ambient: $dP_D / dT_J < 1 / R_{\theta JA}$.

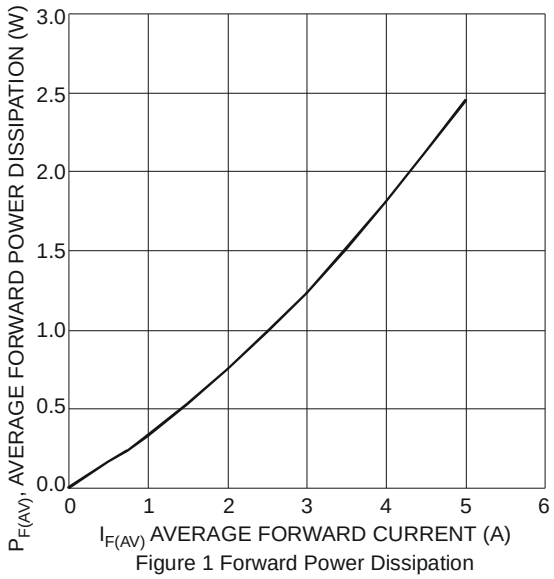


Figure 1 Forward Power Dissipation

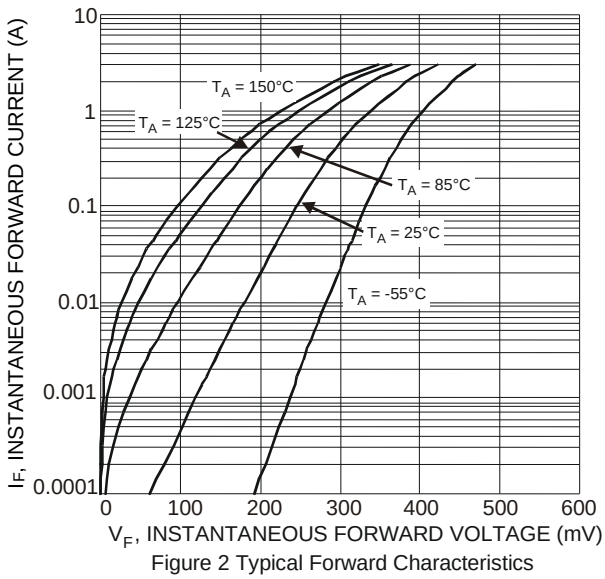


Figure 2 Typical Forward Characteristics

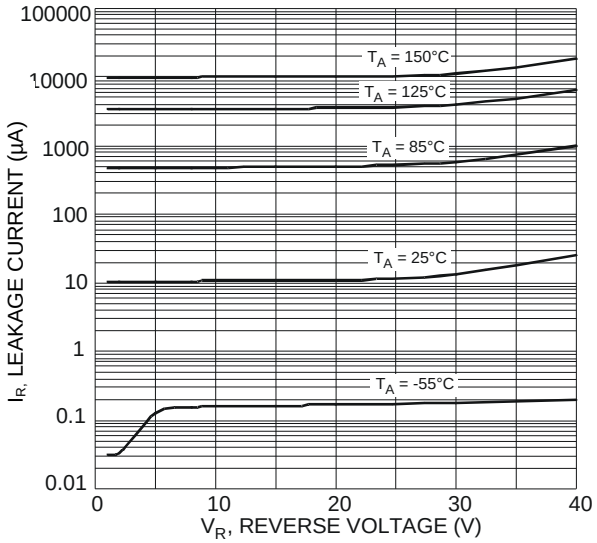


Figure 3 Typical Reverse Characteristics

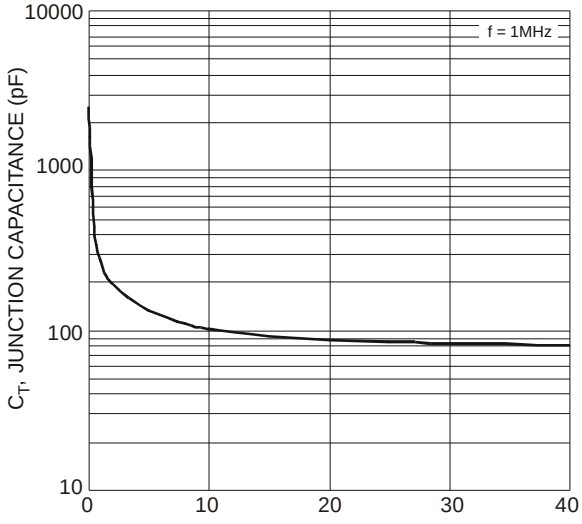


Figure 4 Typical Junction Capacitance

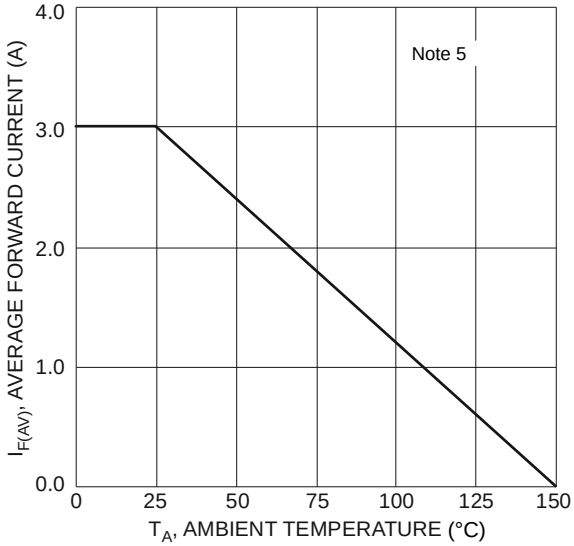


Figure 5 Forward Current Derating Curve

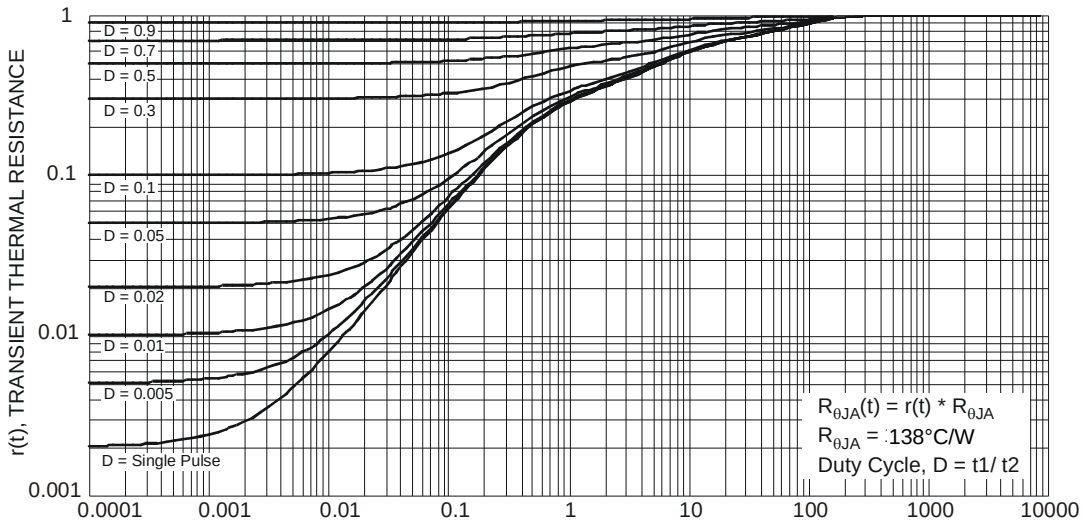
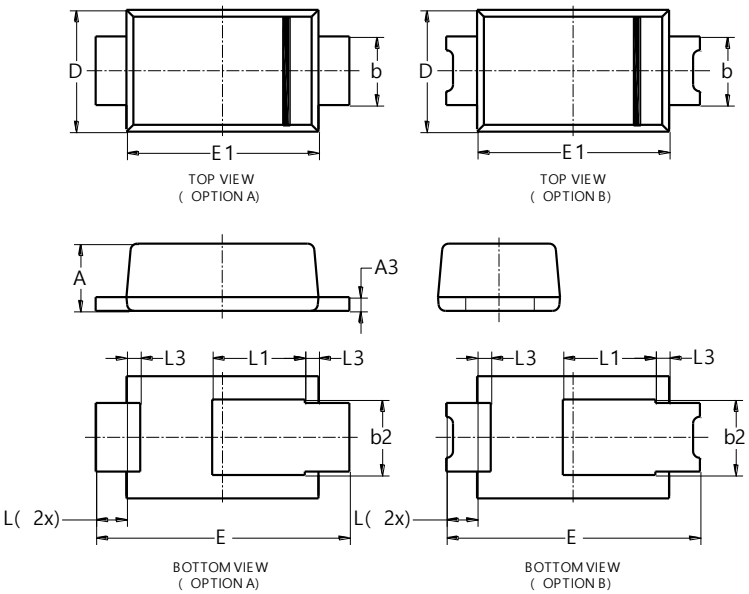


Figure 6 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI123

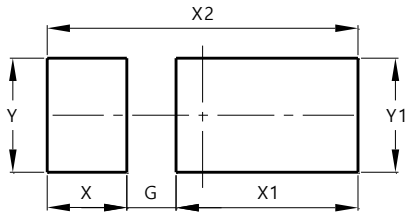


PowerDI123			
Dim	**Min**	**Max**	**Typ**
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI123



Dimensions	Value (in mm)
G	0.65
X	1.05
X1	2.40
X2	4.10
Y	1.50
Y1	1.50

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