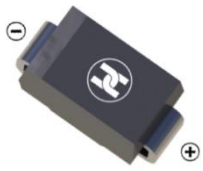
SCHOTTKY BARRIER DIODE

FEATURES

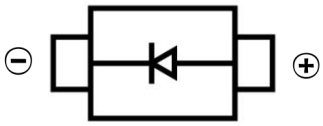
- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



SMB

Applications:

- **Disk Drives**
- **Switching power supply**
- **Redundant power subsystems**
- **Converters**
- **Free-Wheeling diodes**
- **Reverse battery protection**
- **Battery Charging**



MECHANICAL DATA

- Case: SMB(DO-214AA)
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.088 grams (approximate)
- Marking:10BQ040

Major Ratings and Characteristics

Characteristics	10BQ040	Units
$I_{F(AV)}$ Rectangular waveform	1.0	A
V_{RRM}	40	V
I_{FSM} @tp = 5 µs sine	430	A
V_F @1.0 Apk, T_J=125°C	0.49	V
T_J range	- 55 to 150	°C

Voltage Ratings

	Part number	10BQ040
V_R	Max. DC Reverse Voltage (V)	40
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	10BQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current	1.0	A	50% duty cycle @ T_L = 112 °C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current	430	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		45		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non- Repetitive Avalanche Energy	3.0	mJ	T_J = 25 °C, I_{AS} = 1A, L = 6mH	
I_{AR}	Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. Va = 1.5 x Vr typical	

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Electrical Specifications

Parameters		10BQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (1) * See Fig. 1	0.53	V	@ 1A	T_J = 25 °C
		0.70	V	@ 2A	
		0.49	V	@ 1A	T_J = 125 °C
		0.64	V	@ 2A	
I_{RM}	Max. Reverse Leakage Current (1) * See Fig. 2	0.1	mA	T_J = 25 °C	V_R = rated V_R
		4	mA	T_J = 125 °C	
C_T	Typical Junction Capacitance	80	pF	V_R = 5V_{DC}, (test signal range 100kHz to 1MHz) 25°C	
L_S	Typical Series Inductance	2.0	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Volatge Rate of Charge (Rated V_R)	10000	V/ µs		

(1) Pulse Width < 300µs, Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters		10BQ	Units	Conditions
T_J	Max. Junction Temperature Range (*)	-55 to 150	°C	
T_{stg}	Max. Storage Temperature Range	-55 to 150	°C	
R_{thJL}	Max. Thermal Resistance Junction to Lead (**)	36	°C/W	DC operation
R_{thJA}	Max. Thermal Resistance Junction to Ambient	80	°C/W	
wt	Approximate Weight	0.10 (0.003)	g (oz.)	
	Case Style	SMB		Similar DO-214AA

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

(**) Mounted 1 inch square PCB

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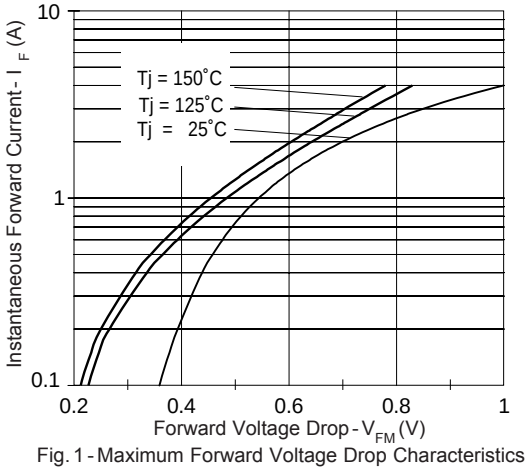


Fig. 1 - Maximum Forward Voltage Drop Characteristics

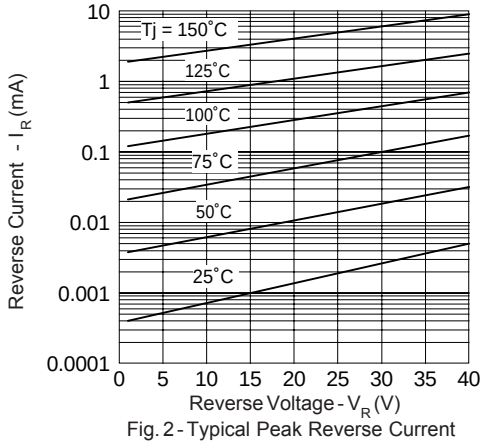


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

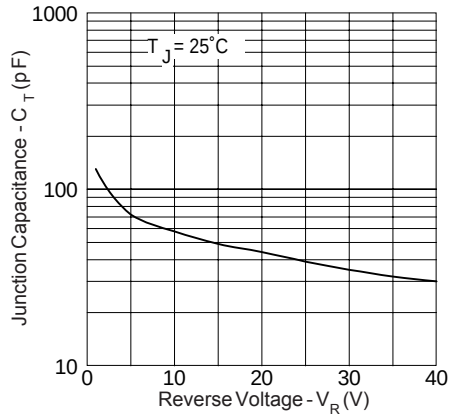


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

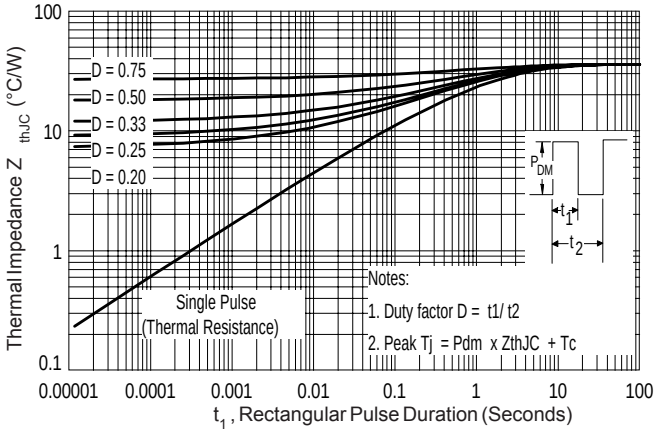


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

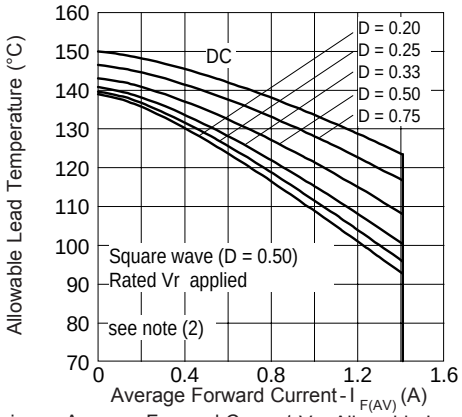


Fig. 5 - Maximum Average Forward Current Vs. Allowable Lead Temperature

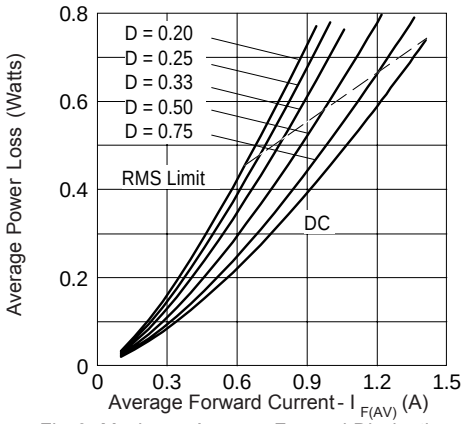


Fig. 6 - Maximum Average Forward Dissipation Vs. Average Forward Current

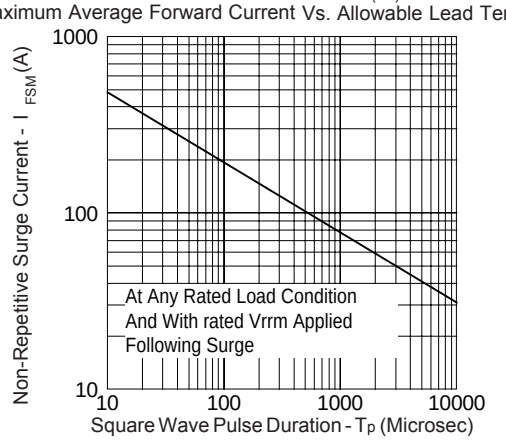


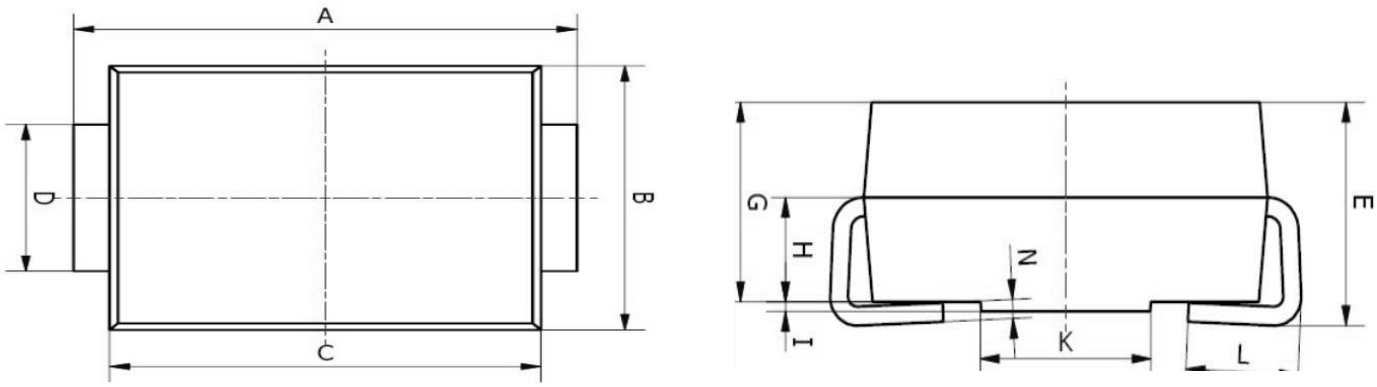
Fig. 7 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;

Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

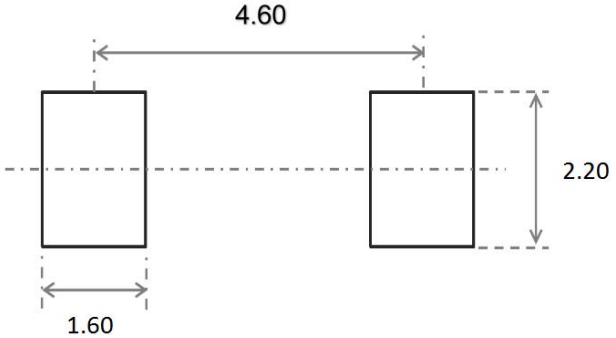
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

SMB Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	5.00	5.45	0.197	0.215
B	3.20	4.00	0.126	0.157
C	4.30	4.70	0.169	0.185
D	1.80	2.20	0.071	0.087
E	2.20	2.50	0.087	0.098
G	1.90	2.30	0.075	0.090
H	0.95	1.25	0.037	0.049
I	0.05	0.15	0.002	0.006
K	1.70	2.10	0.067	0.083
L	0.90	1.60	0.035	0.063
N	0.10	0.30	0.004	0.012

SMB Suggested Pad Layout



Note:

1.Controlling dimension: in millimeters

2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

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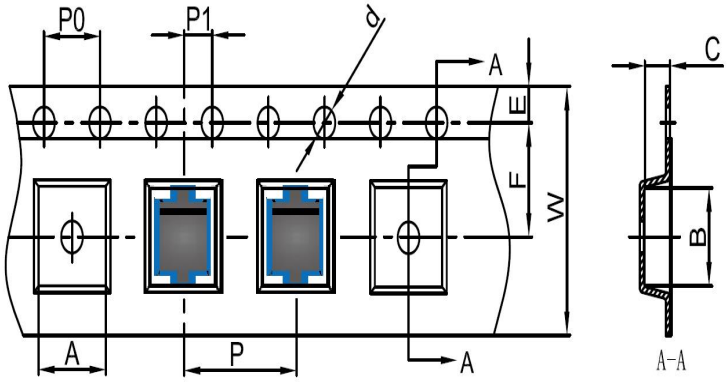
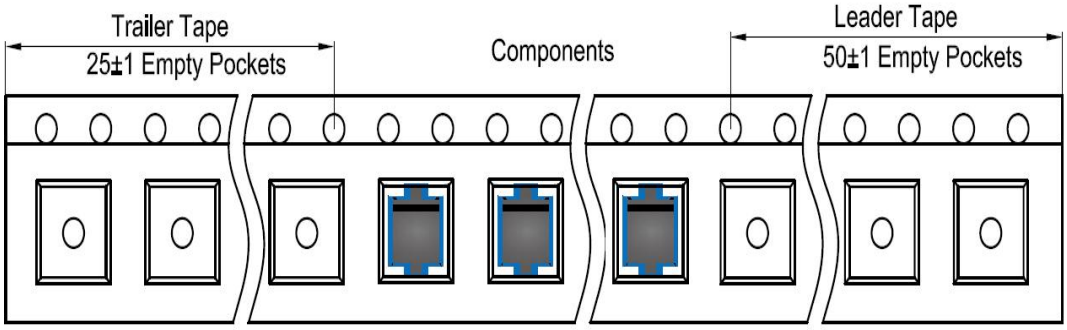
SMB Tape and Reel

SMB Embossed Carrier Tape

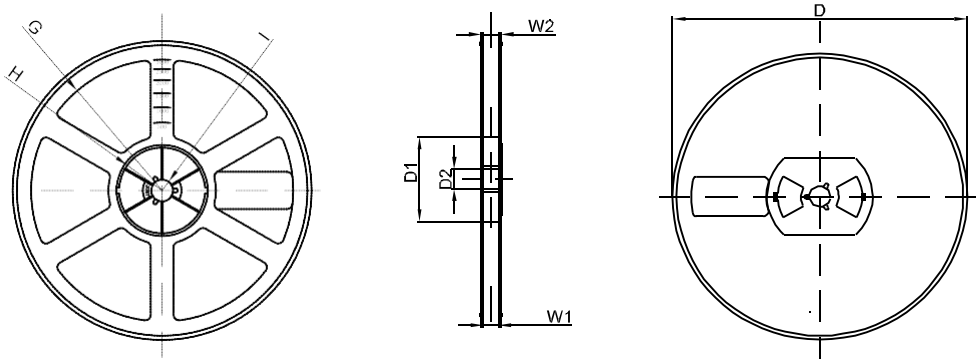


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SMB	4.10	5.50	2.58	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SMB Tape Leader and Trailer



SMB Reel



	DIMENSIONS ARE IN MILLIMETER							
REEL OPTION	D	D1	D2	G	H	I	W1	W2
13” DIA	Ø330	75.0	13.00	R165	R37.50	R6.50	12.40	17.60
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1