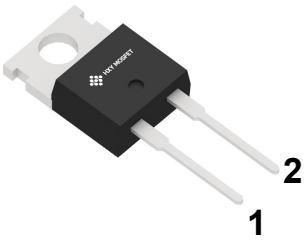
MSC010SDA120K

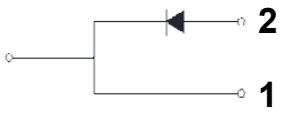
Silicon Carbide Schottky Diode

Features

- 1200-Volt Schottky Rectifier
- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- High-Frequency Operation
- Temperature-Independent Switching Behavior
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F



TO-220C-2L



Benefits

- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drives

Part Number	Package	Qty(PCS)
MSC010SDA120K	TO-220C-2L	50

Maximum Ratings (T_C = 25 ˚C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions
V_{RRM}	Repetitive Peak Reverse Voltage	1200	V	
V_{RSM}	Surge Peak Reverse Voltage	1200	V	
I_F	Continuous Forward Current	33 15.7 10	A	T_C=25˚C T_C=135˚C T_C=156˚C
I_{FRM}	Repetitive Peak Forward Surge Current	60	A	T_C=25˚C, t_P = 10 ms, Half Sine Wave
I_{FSM}	Non-Repetitive Peak Forward Surge Current	120	A	T_C=25˚C, t_p = 10 ms, Half Sine Wave
P_{tot}	Power Dissipation	150 65	W	T_C=25˚C T_C=110˚C
T_J , T_{stg}	Operating Junction and Storage Temperature	-55 to +175	˚C	
	TO-220 Mounting Torque	1	Nm	M3 Screw
$\int i^2dt$	i²dt value	72	A^2s	T_C=25˚C, t_p = 10 ms, Half Sine Wave

Electrical Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
V_{DC}	DC Blocking Voltage	1200			V	
V_F	Forward Voltage		1.39 1.89	1.7 2.5	V	I_F = 10 A T_J=25°C I_F = 10 A T_J=175°C
I_R	Reverse Current		4 25	50 100	μA	V_R = 1200 V T_J=25°C V_R = 1200 V T_J=175°C
Q_C	Total Capacitive Charge		55		nC	V_R = 800 V T_J = 25°C
C	Total Capacitance		834 51 43.8		pF	V_R = 0 V, T_J = 25°C, f = 1 MHz V_R = 400 V, T_J = 25°C, f = 1 MHz V_R = 800 V, T_J = 25°C, f = 1 MHz
E_C	Capacitance Stored Energy		28		μJ	V_R = 800 V

Thermal Characteristics

Symbol	Parameter	Typ.	Unit
$R_{\theta JC}$	Thermal Resistance from Junction to Case	1	°C/W

Typical Performance

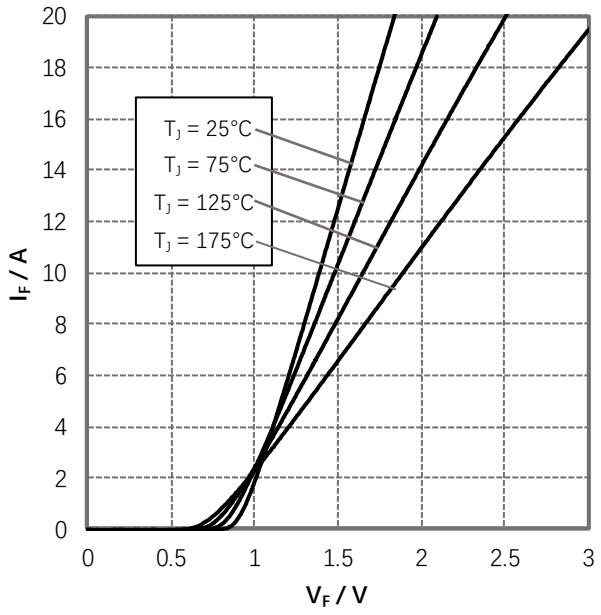


Figure 1. Forward Characteristics

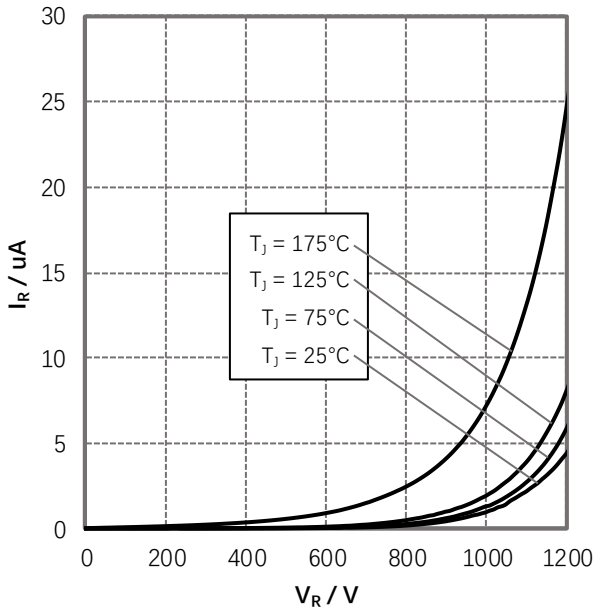


Figure 2. Reverse Characteristics

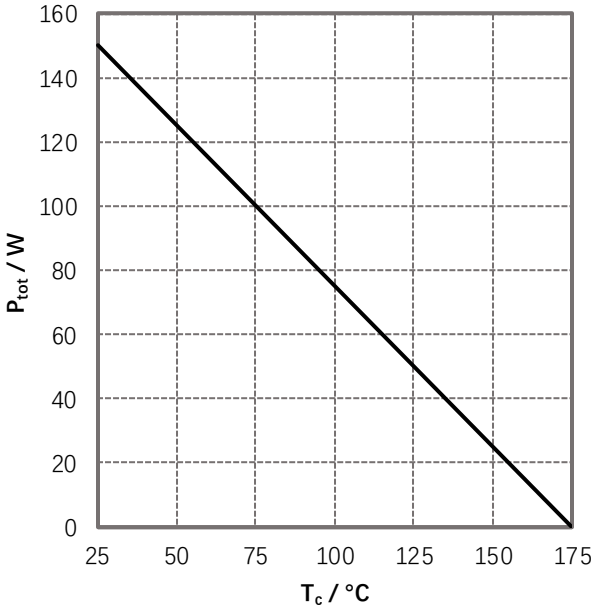


Figure 3. Power Derating

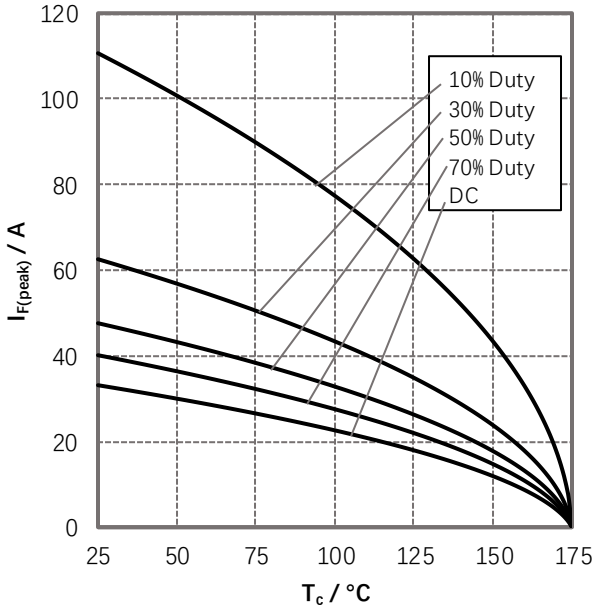


Figure 4. Current Derating

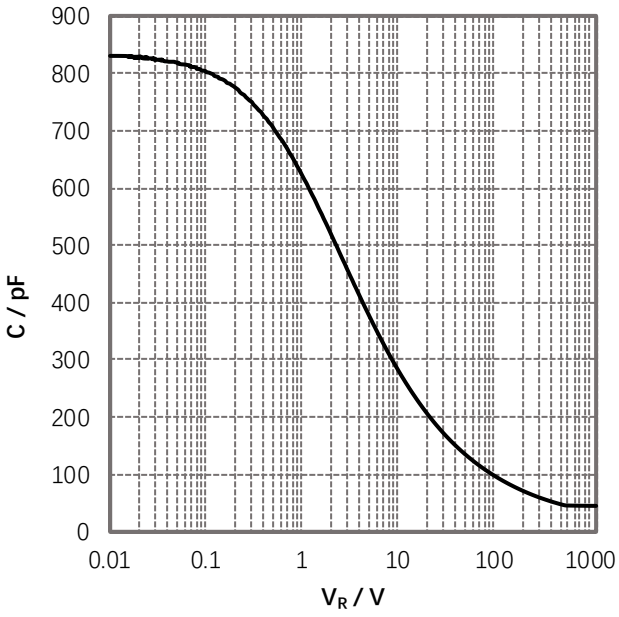


Figure 5. Capacitance vs. Reverse Voltage

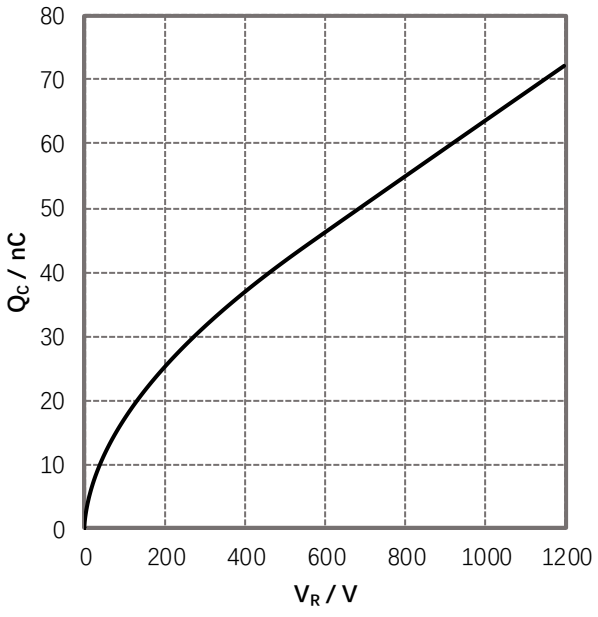


Figure 6. Total Capacitance Charge vs. Reverse Voltage

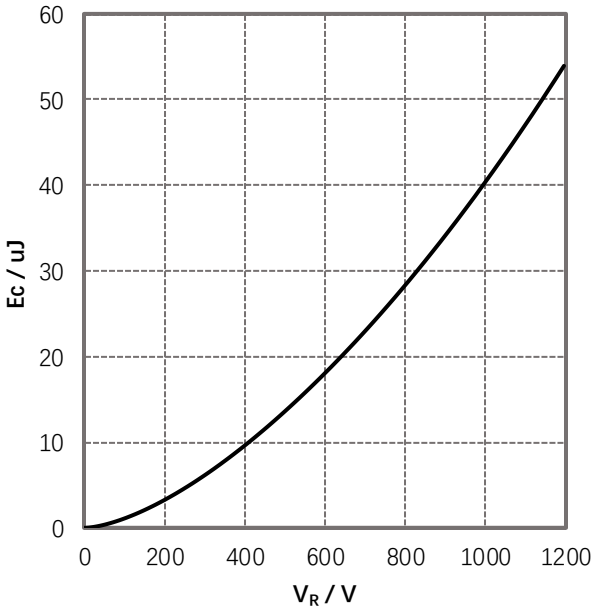


Figure 7. Capacitance Stored Energy

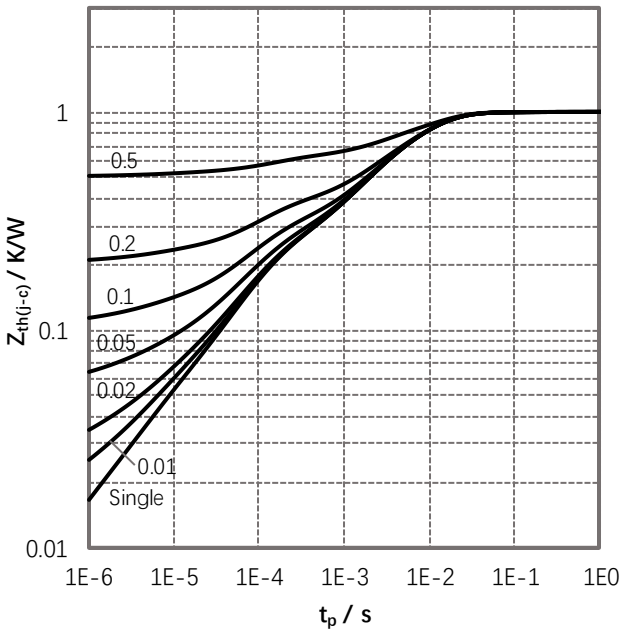
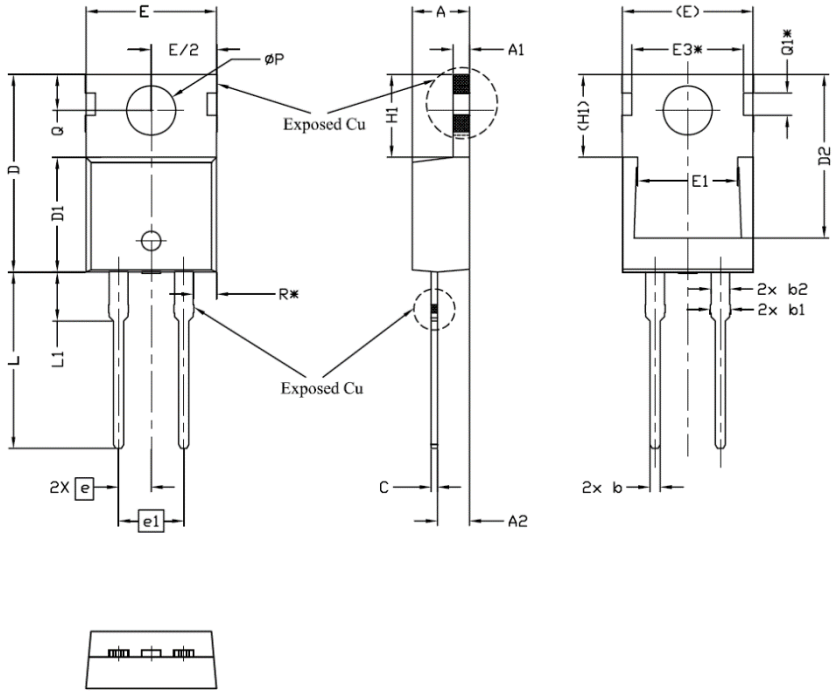


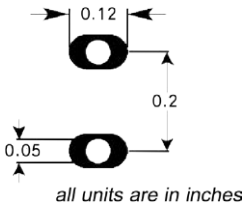
Figure 8. Transient Thermal Impedance

Package Information
TO-220C-2L



SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.24	4.44	4.64	
A1	1.15	1.27	1.40	
A2	2.30	2.48	2.70	
b	0.70	0.80	0.90	
b1	1.20	1.55	1.75	
b2	1.20	1.45	1.70	
c	0.40	0.50	0.60	
D	14.70	15.37	16.00	4
D1	8.82	8.92	9.02	
D2	12.43	12.73	12.83	5
E	9.96	10.16	10.36	4,5
E1	6.86	7.77	8.89	5
E3*	8.70REF.			
e	2.54BSC			
e1	5.08BSC			
H1	6.30	6.45	6.60	5,6
L	13.47	13.72	13.97	
L1	3.60	3.80	4.00	
ØP	3.75	3.84	3.93	
Q	2.60	2.80	3.00	
Q1*	1.73REF.			
R*	1.82REF.			

Recommended Solder Pad Layout



TO-220C-2L

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HXY MOSFET:

AZ4836-01L ESD5L5.0C-HXY HAZ4007-01H HSEN3611D3 HSTS521050B331 PESDNC2XD5VBF RLSD32A121V PJSD24CW_R1 HRCLAMP3371ZCTFT PESDNC2XD5VBL PESDSC2FD5VU AQ15C-01FTG HSD15C.TCT PJEC5V0M1FN2 TPSMB28A-VR HLY323BC1524L HPTVSUC3D5VB PESDLC2FD3V3BH 60N06 AZ4007-01H HACPDQC5V0-HF HESD36VD3B BV05C-H HCEZ36V,L3F HESDSLC3V3D3B HSG3D15B3.3MA ESD5LM5.0C-HXY HSEN2411D3 LM393DR-HXY TPSMB100CA-VR