



Features

- 1.2kV Schottky Rectifier
- Zero Reverse Recovery Current
- High-Frequency Operation
- Temperature-Independent Switching
- Extremely Fast Switching
- Positive Temperature Coefficient on V_F

Benefits

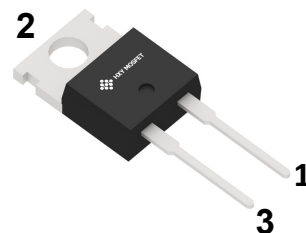
- Replace Bipolar with Unipolar Rectifiers
- Essentially No Switching Losses
- Higher Efficiency
- Reduction of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway

Applications

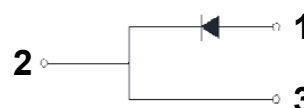
- Switch Mode Power Supplies (SMPS)
- Boost diodes in PFC or DC/DC stages
- Free Wheeling Diodes in Inverter stages
- AC/DC converters



Part Number	Package	Qty(PCS)
MSC015SDA120K	TO-220C-2L	50



TO-220C-2L



Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit	Test Conditions	Notes
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V		
DC Blocking Voltage	V_{DC}	1200			
Continuous Forward Current	I_F	43.5	A	$T_J = 25^{\circ}\text{C}$	Fig. 3
		21		$T_J = 135^{\circ}\text{C}$	
		15		$T_J = 152.5^{\circ}\text{C}$	
Repetitive Peak Forward Surge Current	I_{FRM}	68		$T_C = 25^{\circ}\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	
		44		$T_C = 110^{\circ}\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	
Non-Repetitive Forward Surge Current	I_{FSM}	100		$T_C = 25^{\circ}\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	Fig. 8
		85		$T_C = 110^{\circ}\text{C}$, $t_p = 10\text{ ms}$, Half Sine Wave	
Non-Repetitive Peak Forward Surge Current	$I_{F,Max}$	900		$T_C = 25^{\circ}\text{C}$, $t_p = 10\text{ }\mu\text{s}$, Pulse	
		750		$T_C = 110^{\circ}\text{C}$, $t_p = 10\text{ }\mu\text{s}$, Pulse	
Power Dissipation	P_{tot}	214	W	$T_J = 25^{\circ}\text{C}$	Fig. 4
		93		$T_J = 110^{\circ}\text{C}$	
i^2t Value	j^2t	50	A^2s	$T_C = 25^{\circ}\text{C}$, $t_p = 10\text{ ms}$	
		36		$T_C = 110^{\circ}\text{C}$, $t_p = 10\text{ ms}$	



Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Notes
Forward Voltage	V_F	1.6	1.8	V	$I_F = 15\text{ A}, T_j = 25\text{ }^\circ\text{C}$	Fig. 1
		2.2	3		$I_F = 15\text{ A}, T_j = 175\text{ }^\circ\text{C}$	
Reverse Current	I_R	35	200	μA	$V_R = 1200\text{ V}, T_j = 25\text{ }^\circ\text{C}$	Fig. 2
		120	300		$V_R = 1200\text{ V}, T_j = 175\text{ }^\circ\text{C}$	
Total Capacitive Charge	Q_C	77.5		nC	$V_R = 800\text{ V}, T_j = 25\text{ }^\circ\text{C}$	Fig. 5
Total Capacitance	C	1200		pF	$V_R = 0\text{ V}, T_j = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	Fig. 6
		70			$V_R = 400\text{ V}, T_j = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	
		50			$V_R = 800\text{ V}, T_j = 25\text{ }^\circ\text{C}, f = 1\text{ MHz}$	
Capacitance Stored Energy	E_C	22		μJ	$V_R = 800\text{ V}$	Fig. 7

Notes:

SiC Schottky Diodes are majority carrier devices, so there is no reverse recovery charge.

Thermal & Mechanical Characteristics

Parameter	Symbol	Value	Unit	Notes
Thermal Resistance, Junction to Case (Typical)	$R_{\theta, JC(TYP)}$	0.7	$^\circ\text{C} / \text{W}$	
Junction Temperature	T_j	-55 to +175	$^\circ\text{C}$	
Case & Storage Temperature	T_c	-55 to +175		
TO-220-2L Mounting Torque	-	1	Nm	M3 Screw
		8.8	lbf-in	6-32 Screw

Electrostatic Discharge (ESD) Classifications

Parameter	Symbol	Notes
Human Body Model	HBM	Class 3B ($\geq 8000\text{ V}$)
Charge Device Model	CDM	Class C3 ($\geq 1000\text{ V}$)



Typical Performance

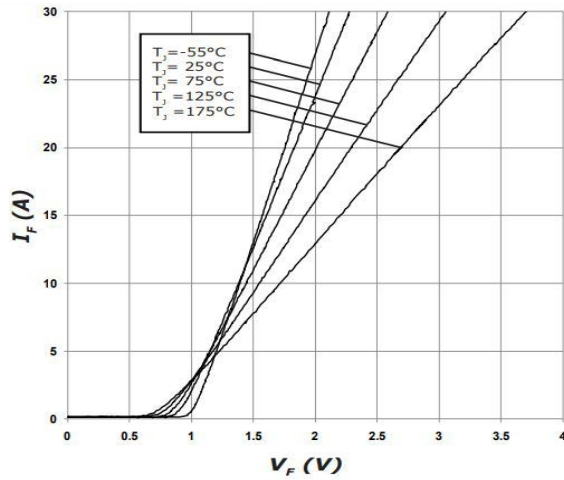


Figure 1

Forward Characteristics

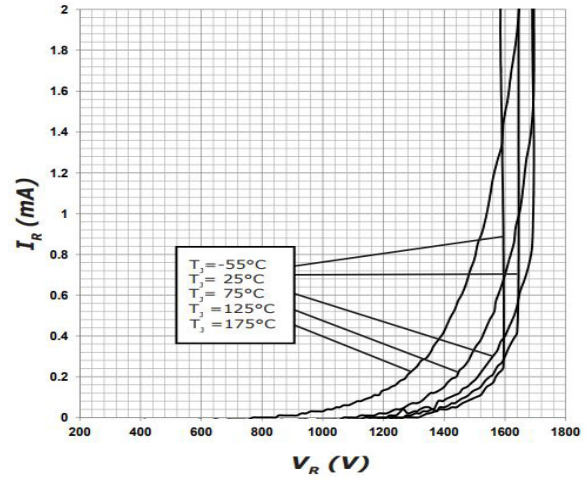


Figure 2

Reverse Characteristics

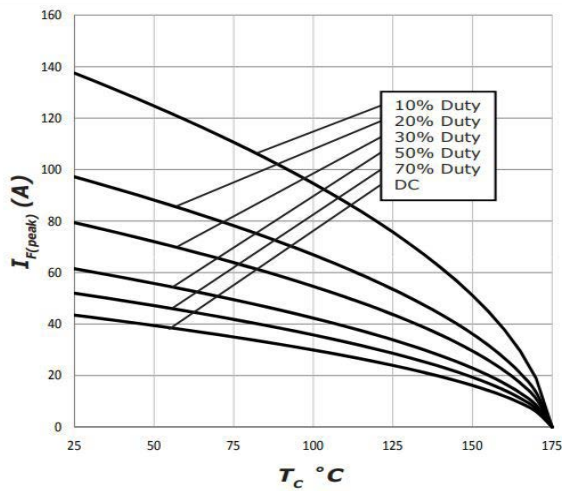


Figure 3

Current Derating

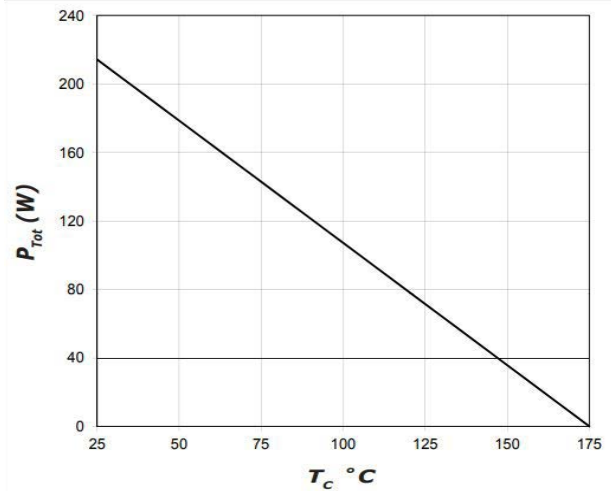


Figure 4

Power Derating

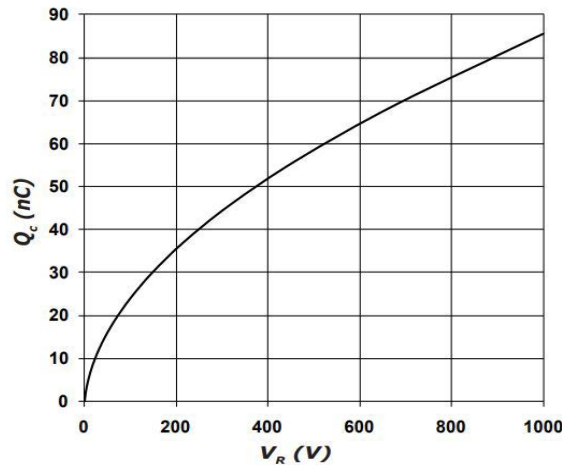


Figure 5

Total Capacitance vs. Reverse Voltage

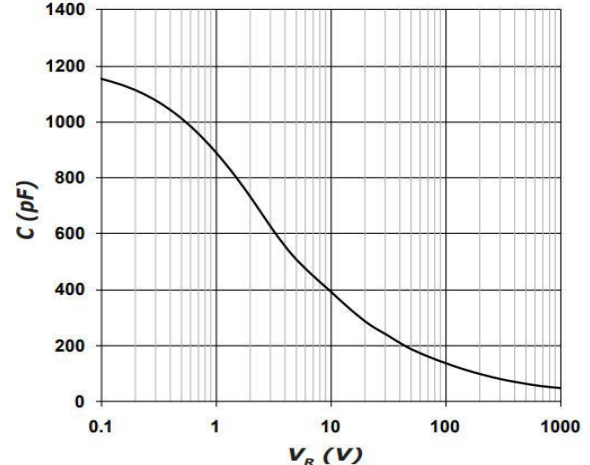


Figure 6

Capacitance vs. Reverse Voltage



Typical Performance

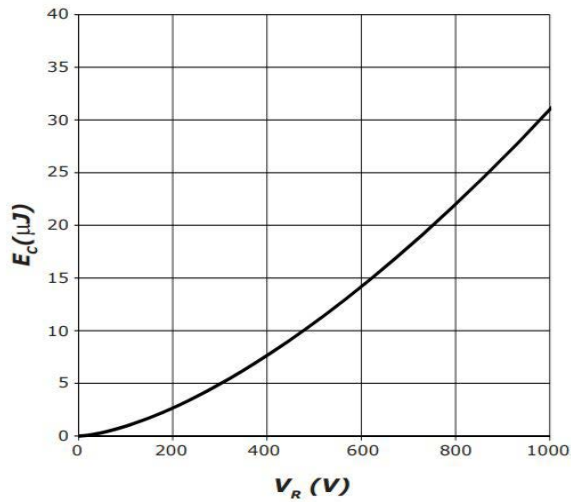


Figure 7

Capacitance Stored Energy

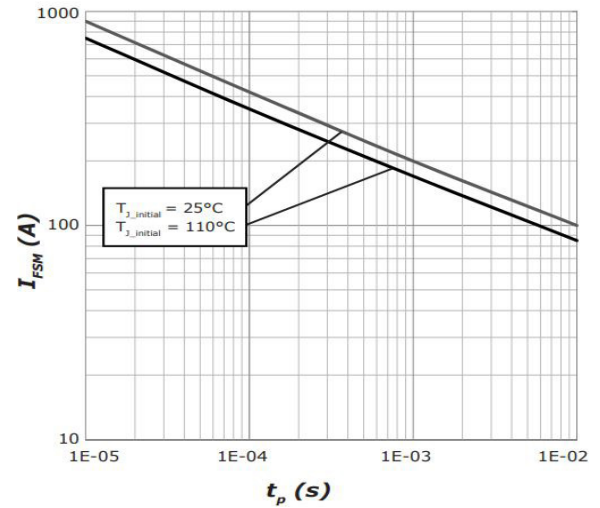


Figure 8

Non-Repetitive Peak Forward Surge Current
versus Pulse Duration (sinusoidal waveform)

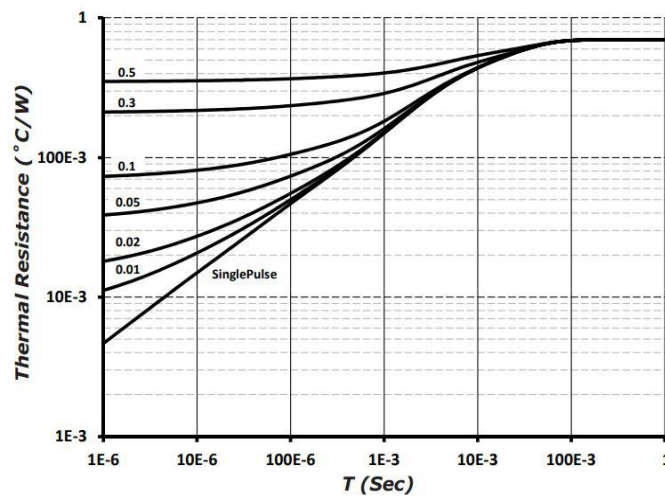
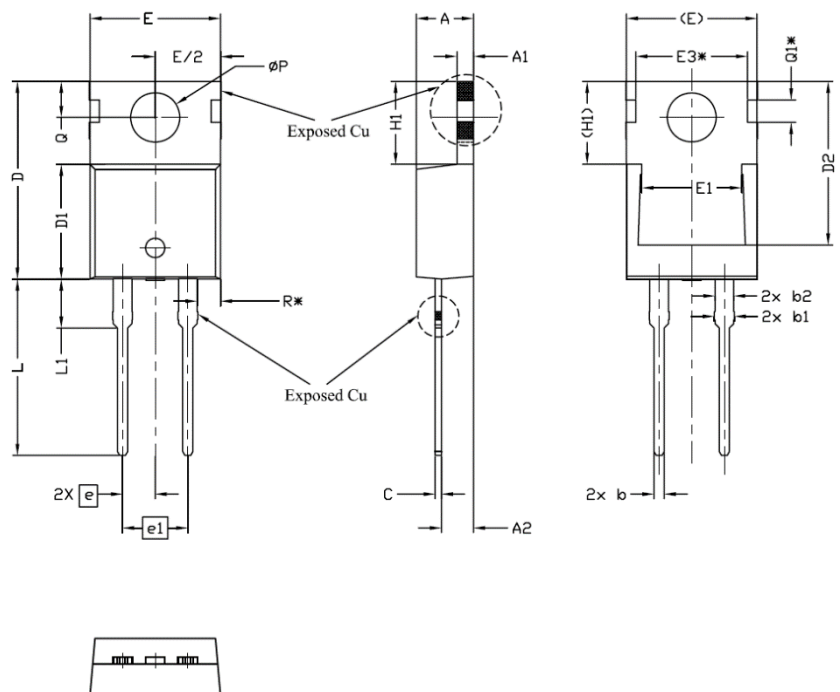


Figure 9

Transient Thermal Impedance

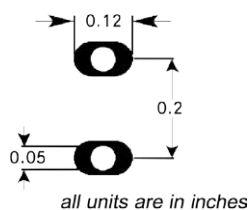


Package Information TO-220C-2L



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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