



General Description

This product family offers state of the art performance. It is designed for high frequency applications where high efficiency and high reliability are required.

Features

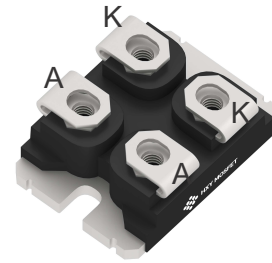
- Low conduction loss due to low V_F
- Extremely low switching loss by tiny Q_c
- Highly rugged due to better surge current
- Industrial standard quality and reliability

Applications

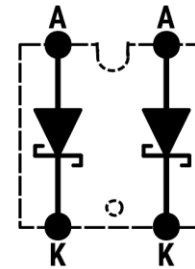
- Power factor Correction (PFC)
- Inverters/ConVerter
- High performance SMPS
- Motor controllers
- Snubber/clamp diode

Ordering Information

Part Number	Package	Qty(PCS)
MSC2X31SDA170J	SOT-227	120



SOT-227



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

Symbol	Parameter	Value	Unit	Test Conditions
V_{RRM}	Repetitive Peak Reverse Voltage	1700	V	
V_{RSM}	Surge Peak Reverse Voltage	1700	V	
V_R	DC Blocking Voltage	1700	V	
I_F	Continuous Forward Current	64 40 33	A	$T_C=25^\circ\text{C}$ $T_C=117^\circ\text{C}$ $T_C=135^\circ\text{C}$
I_{FRM}	Repetitive Peak Forward Surge Current	140 88	A	$T_C=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave $T_C=110^\circ\text{C}$, $t_p=10$ ms, Half Sine Wave
I_{FSM}	Non-Repetitive Peak Forward Surge Current	225 180	A	$T_C=25^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave $T_C=110^\circ\text{C}$, $t_p = 10$ ms, Half Sine Wave
$\int i^2 dt$	$i^2 dt$ value	253 162	A^2s	$T_C = 25^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse $T_C = 110^\circ\text{C}$, $t_p=10\text{ms}$, Half Sine Pulse
P_{tot}	Power Dissipation	348 151	W	$T_C=25^\circ\text{C}$ $T_C=110^\circ\text{C}$
T_{stg}	Storage temperature Range	-55 to +175	$^\circ\text{C}$	
T_J	Operating junction Range	-55 to +175	$^\circ\text{C}$	



Electrical Characteristics

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Forward Voltage	V_F	- -	1.45 2.2	1.8	V	$I_F=25A$ $T_j=25^{\circ}C$ $T_j=175^{\circ}C$
Reverse Current	I_R	- -	2 16	100 -	μA	$V_R=1700V$ $T_j=25^{\circ}C$ $T_j=175^{\circ}C$
Total Capacitive Charge	Q_C	-	201	-	nC	$V_R=1200V$ $T_j=25^{\circ}C$ $Q_C = \int_0^{V_R} C(V) dV$
Total Capacitance	C	- - -	2390 107 102	- - -	pF	$T_j=25^{\circ}C$, $f=1MHz$ $V_R=0V$ $V_R=800V$ $V_R=1700V$

Thermal Resistance

Parameter	Symbol	Test Conditions	Value	Unit
Thermal resistance, junction – case.	R_{thJC}	per leg	0.43	$^{\circ}C/W$
Isolation Breakdown Voltage	$Visol$	AC, 50Hz(R.M.S), $T=3s$	3600	V
Mounting Torque	M	Recommended (M4 screw)	1~1.5	Nm
Terminal Connection Torque		Recommended (M4 screw)	1~1.5	
Weight	W		29	g



Characteristics Curve

Fig 1: Forward Characteristics

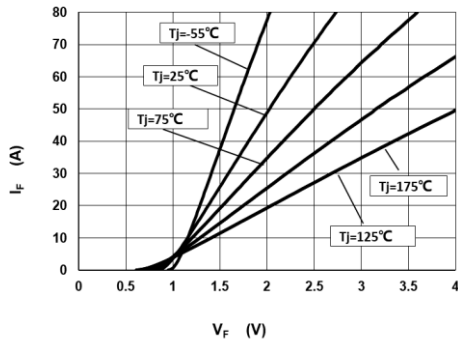


Fig 2: Reverse Characteristics

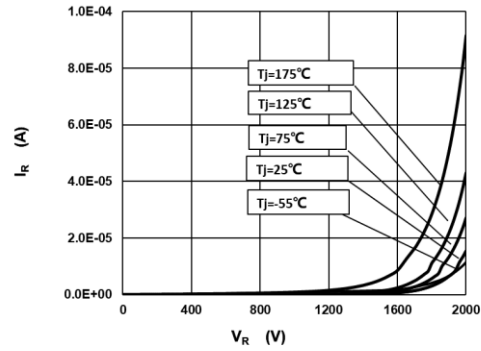


Fig 3: Current Derating

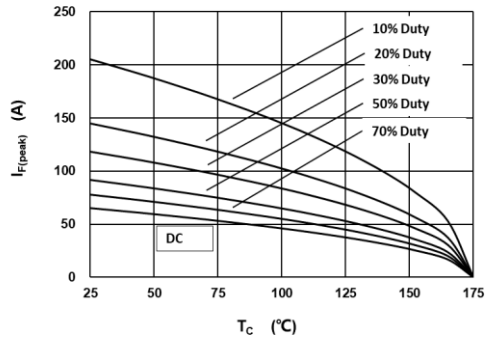


Fig 4: Power Derating

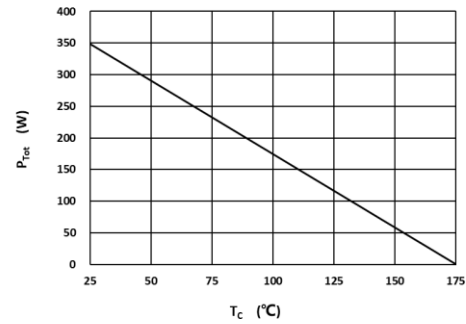


Fig 5: Capacitance vs. Reverse Voltage

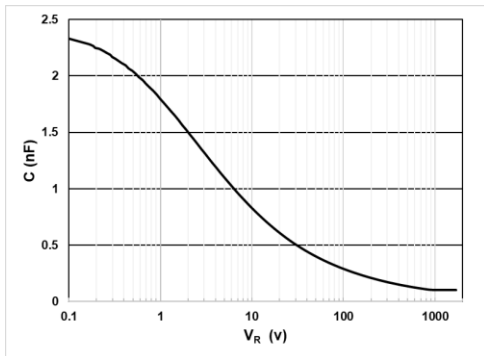


Fig 6: Reverse Charge vs. Reverse Voltage

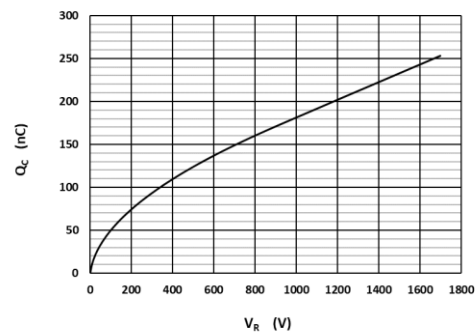


Fig 7: Typical Capacitance Stored Energy

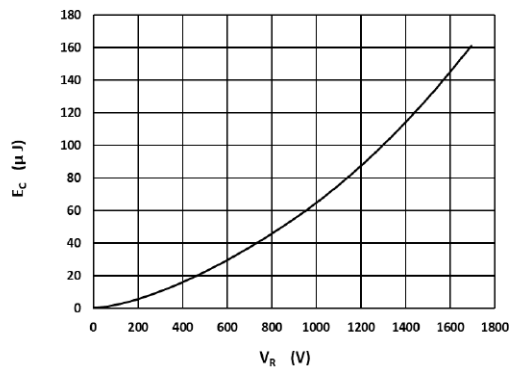
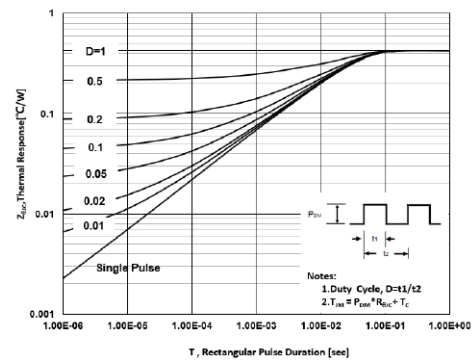
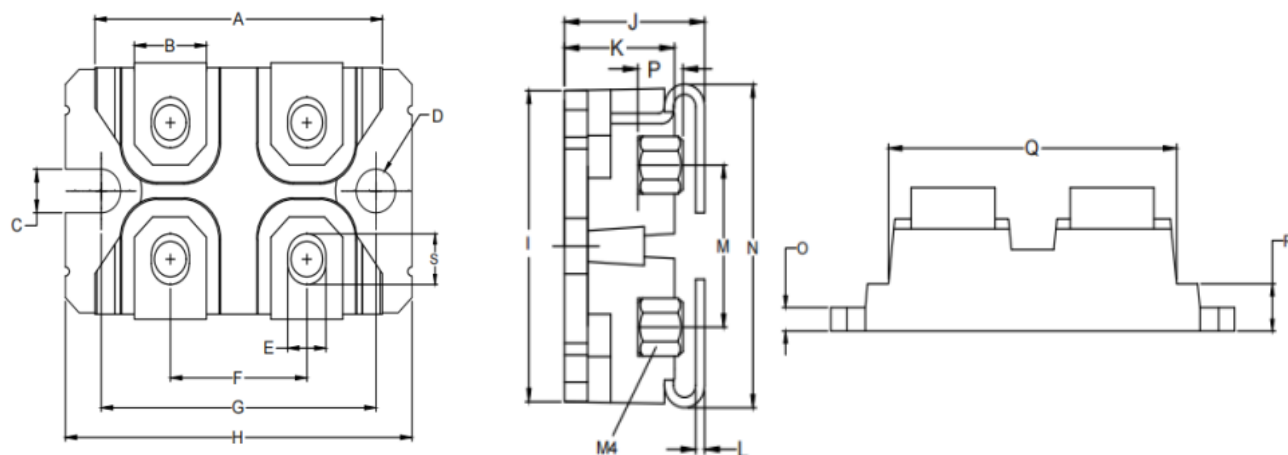


Fig 8: Transient Thermal Impedance





Package Information SOT-227



DiM	Millimeter	
	Min	Max
A	31.40	31.60
B	7.70	8.10
C	4.20	4.40
D	4.20	4.40
E	4.10	4.30
F	14.90	15.10
G	30.10	30.20
H	38.00	38.40
I	23.80	24.20
J	12.20	12.70
K	9.40	9.60
L	0.75	0.85
M	12.40	12.80
N	24.50	25.40
O	1.90	2.10
P	3.10	3.95
Q	26.60	27.00
R	3.80	4.20
S	5.10	5.40



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