

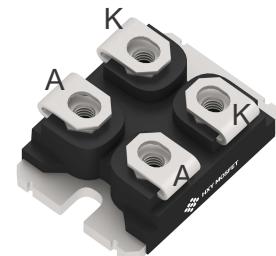


## General Description

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

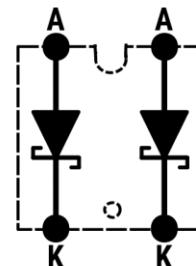
- Low conduction loss due to low  $V_F$
- Extremely low switching loss by tiny  $Q_C$
- Highly rugged due to better surge current
- Industrial standard quality and reliability



SOT-227

## Applications

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



## Ordering Information

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

## 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	$T_c=25^\circ\text{C}, t_p = 10 \text{ ms, Half Sine Wave}$ $T_c=110^\circ\text{C}, t_p = 10 \text{ ms, Half Sine Wave}$
$I_{FSM}$	Non-Repetitive Peak Forward Surge Current	225 180	A	$T_c=25^\circ\text{C}, t_p = 10 \text{ ms, Half Sine Wave}$ $T_c=110^\circ\text{C}, t_p = 10 \text{ ms, Half Sine Wave}$
$\int i^2 dt$	$i^2 dt$ value	253 162	$\text{A}^2\text{s}$	$T_c = 25^\circ\text{C}, t_p=10\text{ms},\text{Half Sine Pulse}$ $T_c = 110^\circ\text{C}, t_p=10\text{ms},\text{Half Sine Pulse}$
$P_{tot}$	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	1.8	V	$I_F=25A$
		-	2.2	-		$T_j=25^\circ C$ $T_j=175^\circ C$
Reverse Current	$I_R$	-	2	100	$\mu A$	$V_R=1700V$
		-	16	-		$T_j=25^\circ C$ $T_j=175^\circ C$
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	-	$pF$	$T_j=25^\circ C$ , $f=1MHz$
		-	107	-		$V_R=0V$
		-	102	-		$V_R=800V$ $V_R=1700V$

### Thermal Resistance

Parameter	Symbol	Test Conditions	Value	Unit
Thermal resistance, junction – case.	$R_{thJC}$	per leg	0.43	°C/W
Isolation Breakdown Voltage	$V_{isol}$	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

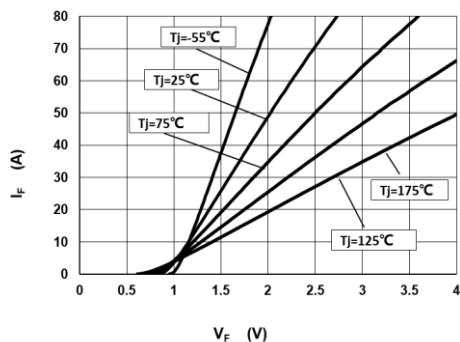


Fig 3: Current Derating

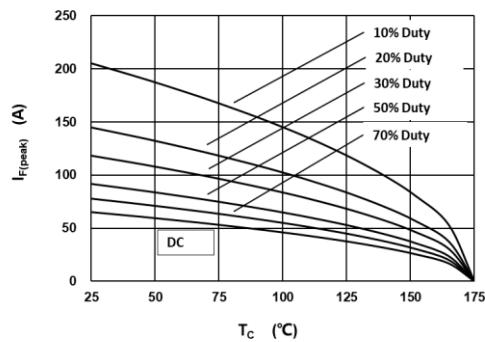


Fig 5: Capacitance vs. Reverse Voltage

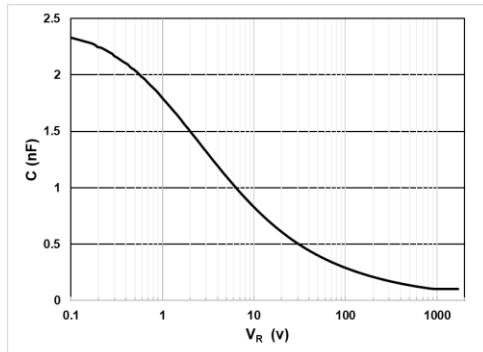


Fig 7: Typical Capacitance Stored Energy

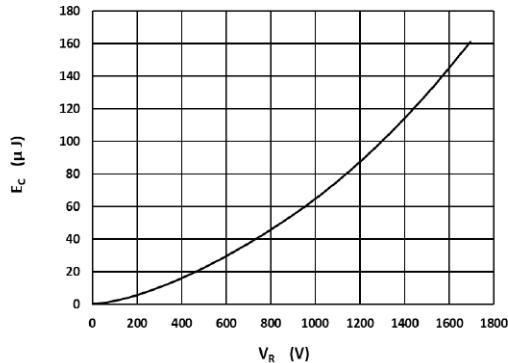


Fig 2: Reverse Characteristics

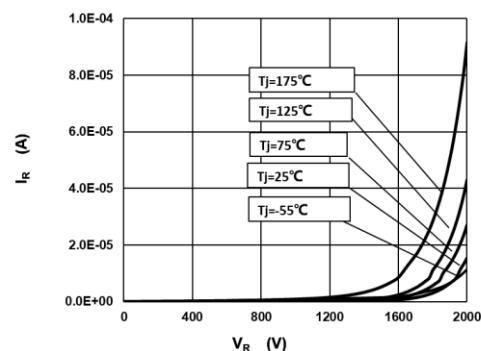


Fig 4: Power Derating

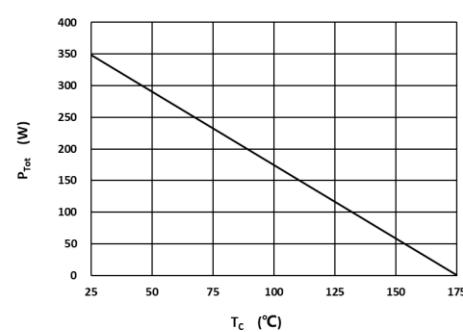


Fig 6: Reverse Charge vs. Reverse Voltage

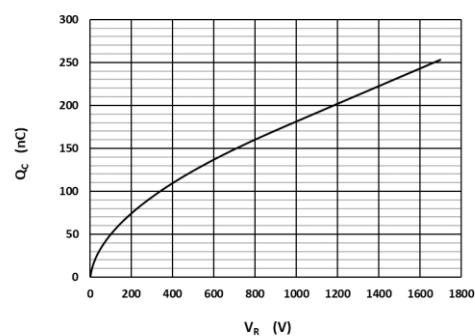
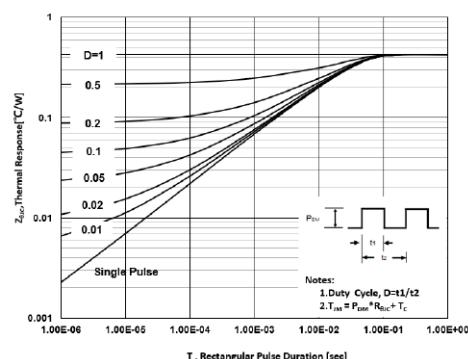
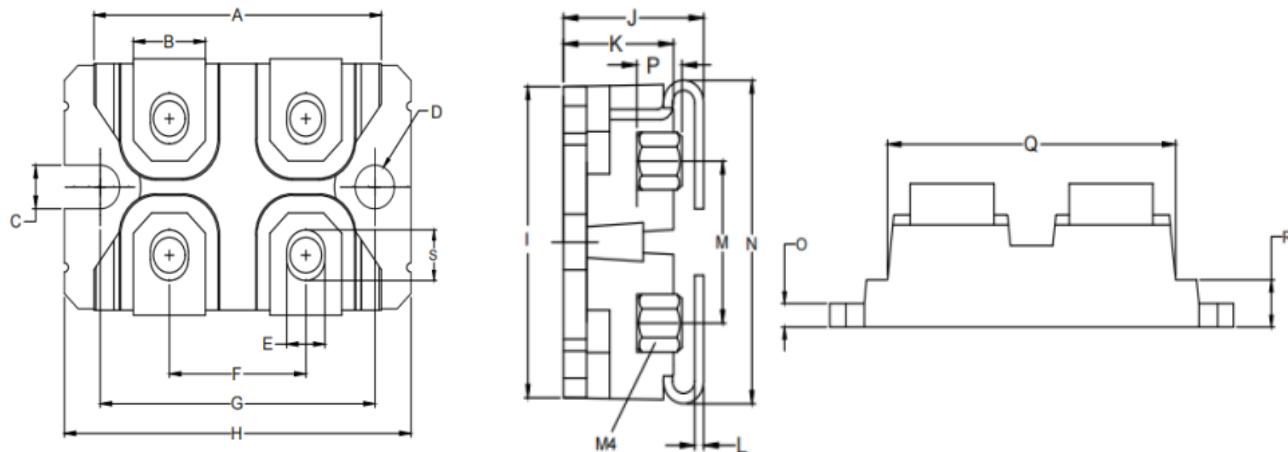


Fig 8: Transient Thermal Impedance





## 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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