

## DESCRIPTION

SiC Schottky Diode has no switching loss, provides improved system efficiency against Si diodes by utilizing new semiconductor material-Silicon Carbide, enables higher operating frequency, and helps increasing power density and reduction of system size /cost. Its high reliability ensures robust operation during surge or over-voltage conditions.

## FEATURES

- Max Junction Temperature 175°C
- High Surge Current Capacity
- Positive Temperature Coefficient
- Ease of Paralleling
- No Reverse Recovery/No Forward Recovery

## MECHANICAL DATA

- Case: JEDEC TO-220AC/ITO-220AC/TO-263/TO-252
- Molding compound meets UL94V-0 flammability rating
- Terminals: Lead solderable per J-STD-002 and JESD22-B102
- Polarity: As marked
- Mounting Torque: 10 in-lbs maximum

## TYPICAL APPLICATIONS

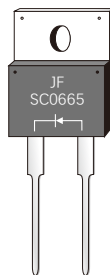
- General Purpose
- SMPS, Solar inverter, UPS
- Power Switching Circuits

## KEY PERFORMANCE AND PACKAGE PARAMETERS

Type	V <sub>DC</sub>	I <sub>F</sub>	Q <sub>c</sub>	T <sub>j,MAX</sub>	Package
SC0665	650V	6A	18nC	175°C	TO-220AC
SC0665F	650V	6A	18nC	175°C	ITO-220AC
SC0665D2	650V	6A	18nC	175°C	TO-263
SC0665M2	650V	6A	18nC	175°C	TO-252

### TO-220AC

SC0665



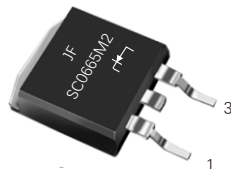
### ITO-220AC

SC0665F



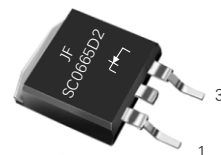
### TO-252

SC0665M2



### TO-263

SC0665D2



## MAXIMUM RATINGS

(Ratings at 25°C ambient temperature unless otherwise specified)

Parameters	Symbol	Value	Units
Maximum Repetitive Peak Reverse Voltage	$V_{RRM}$	650	V
Continuous Forward Current for $R_{th(j-c)}$	$I_F$	6 ( $T_c \leq 162^\circ\text{C}$ TO-220AC/TO-263) 6 ( $T_c \leq 149^\circ\text{C}$ TO-252/ITO-220AC) 11 ( $T_c \leq 135^\circ\text{C}$ TO-220AC/TO-263) 8 ( $T_c \leq 135^\circ\text{C}$ TO-252/ITO-220AC) 20 ( $T_c \leq 25^\circ\text{C}$ TO-220AC/TO-263) 16 ( $T_c \leq 25^\circ\text{C}$ TO-252/ITO-220AC)	A
Non-Repetitive Forward Surge Current (Half-Sine Pulse, $t_p=8.3\text{ms}$ )	$I_{FSM}$	60(25°C) 52(150°C)	A
$I^2t$ Value	$\int i^2t$	15(25°C) 11.2(150°C)	A <sup>2</sup> S
Diode dv/dt Ruggedness( $V_R=0\dots650\text{V}$ )	dv/dt	80	V/ns
Power Dissipation for $R_{th(j-c,max)}$ ( $T_c=25^\circ\text{C}$ )	$P_{tot}$	125 (TO-220AC/TO-263) 60(TO-252/ITO-220AC)	W
Operating Junction Temperature Range	$T_j$	-55...175	°C
Storage Temperature Range	$T_{stg}$	-55...175	°C

## THERMAL CHARACTERISTICS ( $T_A=25^\circ\text{C}$ Unless otherwise noted)

Parameters	Symbol	ITO-220AC (Typ)	TO-220AC (Typ)	TO-263 (Typ)	TO-252 (Typ)	Units
Diode Thermal Resistance Junction-case	$R_{th(j-c)}$	2.5	1.2	1.2	2.5	K/W

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Value			Unit
			Min	Typ	Max	
DC blocking voltage	V <sub>DC</sub>	T <sub>j</sub> =25...175°C	650			V
Diode forward voltage	V <sub>F</sub> <sup>1)</sup>	IF=6A T <sub>j</sub> =25°C IF=6A T <sub>j</sub> =125°C IF=6A T <sub>j</sub> =175°C		1.4 1.5 1.7	1.7 1.8 2.0	V
Reverse current	I <sub>r</sub> <sup>2)</sup>	VR=650V T <sub>j</sub> =25°C VR=650V T <sub>j</sub> =125°C VR=650V T <sub>j</sub> =175°C			20 70 100	uA

Notes: 1.Pulse Test:300μs pulse width,1% duty cycle

2.Pulse test:pulse width ≤40ms

## DYNAMIC CHARACTERISTICS(at T<sub>j</sub>=25°C,unless otherwise specified)

Parameter	Symbol	conditions	Value			Unit
			min	typ	max	
Total capacitive charge	Q <sub>c</sub>	VR=650V,IF=6A di/dt=200A/uS T <sub>j</sub> =25°C		18		nC
Total capacitance	C	V <sub>R</sub> =0V,f=1MHz V <sub>R</sub> =200V,f=1MHz V <sub>R</sub> =400V,f=1MHz T <sub>j</sub> =25°C		300 34 30		pF

FIG.1-FORWARD CURRENT DERATING CURVE

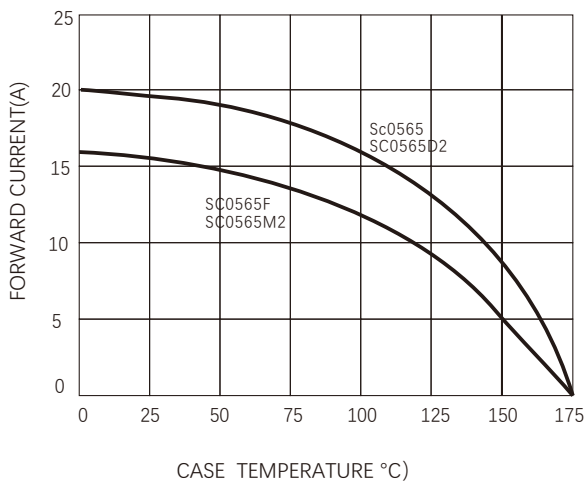


FIG.2-TYPICAL JUNCTION CAPACITANCE

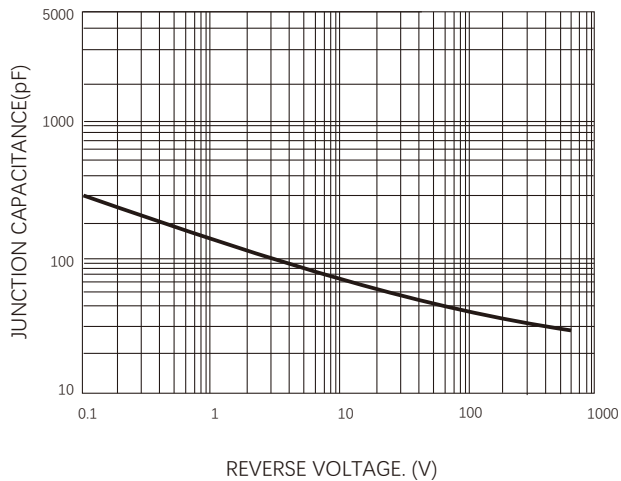


FIG.3-FORWARD CHARACTERISTICS

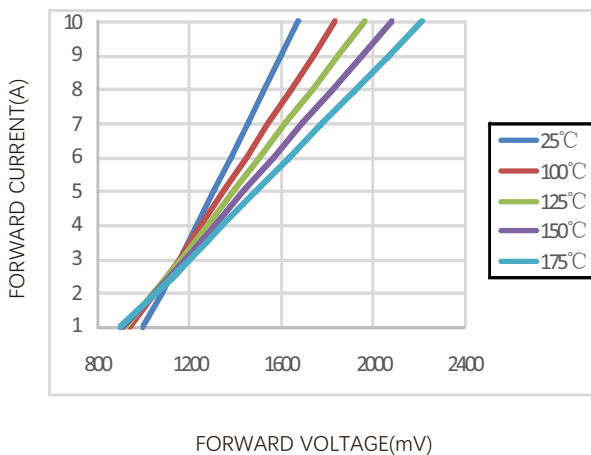


FIG.4-REVERSE CHARACTERISTICS

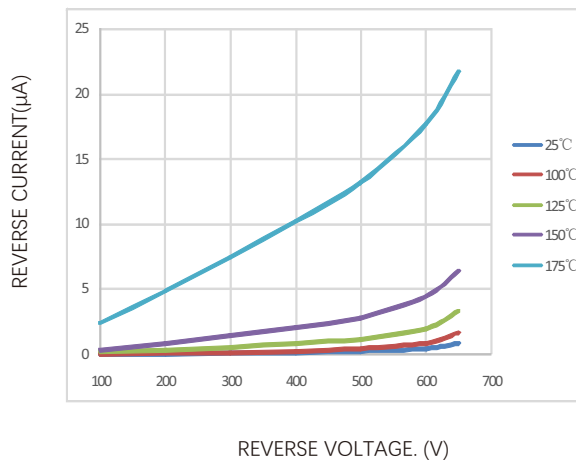
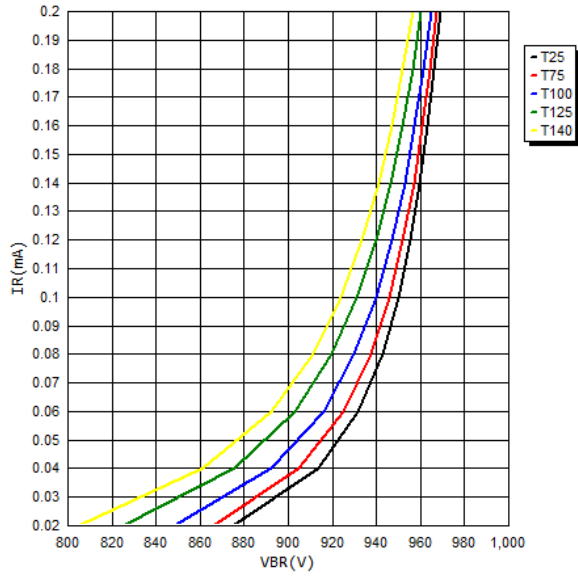
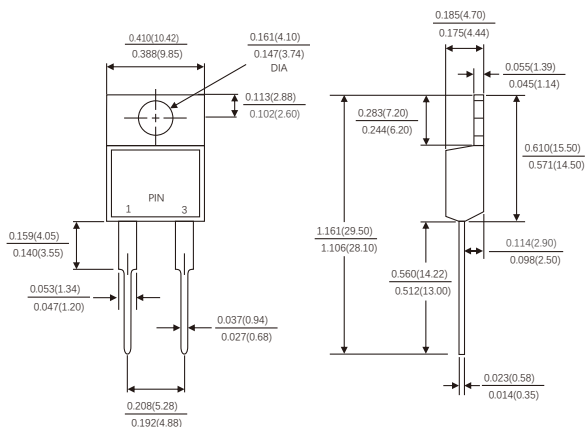


FIG.5-REVERSE CHARACTERISTICS

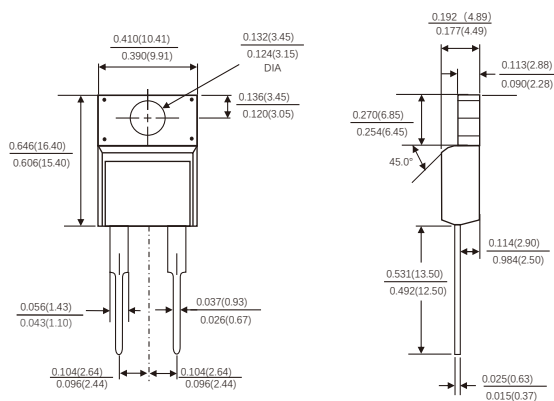


Dimensions in inches and (millimeters)

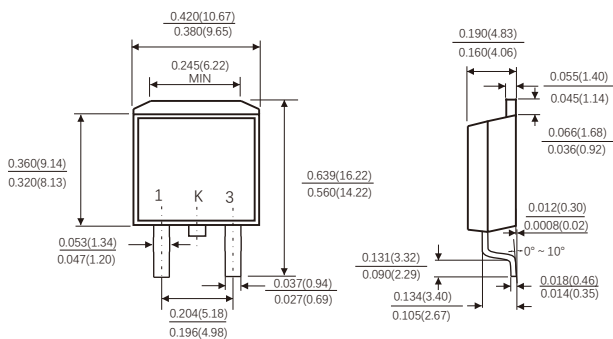
## TO-220AC



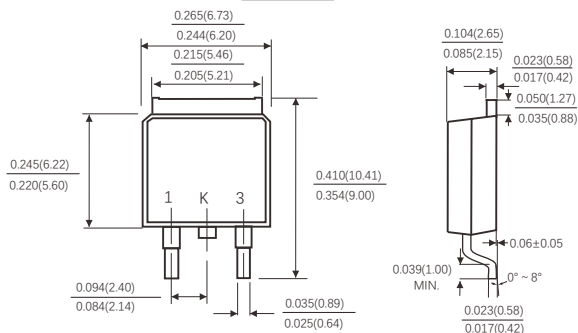
## ITO-220AC



## TO-263

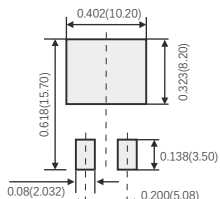


## TO-252



## Suggested Pad Layout

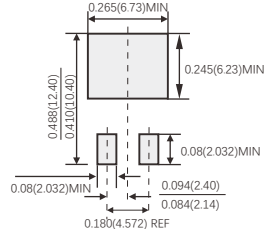
(TO-263)



(设计者可参考推荐值根据焊接工艺要求自行确定适合的焊盘尺寸)  
(Designers can refer to the recommended values according to the manufacturing process requirements to determine the appropriate pad size)

## Suggested Pad Layout

(TO-252)



(设计者可参考推荐值根据焊接工艺要求自行确定适合的焊盘尺寸)  
(Designers can refer to the recommended values according to the manufacturing process requirements to determine the appropriate pad size)

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