

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-263AC/TO-252AC
- 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

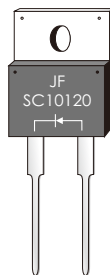
- General Purpose
- SMPS, Solar inverter, UPS
- Power Switching Circuits

KEY PERFORMANCE AND PACKAGE PARAMETERS

| Type | V _{DC} | I _F | Qc | T _{J,max} | Package |
|-----------|-----------------|----------------|------|--------------------|-----------|
| Sc10120 | 1200V | 10A | 30nC | 175°C | TO-220AC |
| SC10120F | 1200V | 10A | 30nC | 175°C | ITO-220AC |
| SC10120D2 | 1200V | 10A | 30nC | 175°C | TO-263AC |
| SC10120M2 | 1200V | 10A | 30nC | 175°C | TO-252AC |

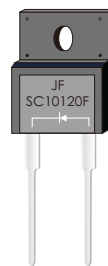
TO-220AC

Sc10120



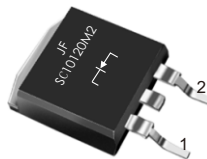
ITO-220AC

SC10120F



TO-252

SC10120M2



TO-263AC

SC10120D2



RATINGS AND CHARACTERISTIC OF SC10120XX

MAXIMUM RATINGS

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

| Parameter | Symbol | Value | Unit |
|--------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------|------------------|
| Maximum repetitive peak reverse voltage | V_{RRM} | 1200 | V |
| Continuous Forward Current for $R_{th(j-c)}$ | I_F | 10 ($T_c \leq 145^\circ\text{C}$ TO-220/TO-263) 10 ($T_c \leq 110^\circ\text{C}$ TO-252/ITO-220) | A |
| Non-Repetitive Forward Surge Current (Half-Sine Pulse, $t_p=8.3\text{ms}$) | $I_{F,SM}$ | 95 (25°C) 85 (150°C) | A |
| I^2t value | $\int i^2t$ | 37 (25°C) 30 (150°C) | A ² S |
| Diode dv/dt ruggedness(VR=0...650V) | dv/dt | 80 | V/ns |
| Power dissipation for $R_{th(j-c,max)}$ ($T_c=25^\circ\text{C}$) | P_{tot} | 125(TO-220/TO-263) 60(TO-252/ITO-220) | W |
| Operating junction temperature range | T_j | -55...175 | °C |
| Storage temperature range | T_{stg} | -55...175 | °C |

THERMAL CHARACTERISTICS (TA=25°C Unless otherwise noted)

| Parameter | Symbol | ITO-220AC | TO-220AC | TO-263AC | TO-252AC | Unit |
|-------------------------------------------|---------------|-----------|----------|----------|----------|------|
| Diode thermal resistance junction-case | $R_{th(j-c)}$ | 2.5 | 1.2 | 1.2 | 2.5 | K/W |

RATINGS AND CHARACTERISTIC OF SC10120XX

ELECTRICAL CHARACTERISTICS (T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Conditions | Value | | | Unit |
|-----------------------|-----------------|------------------------------------------------------------|-------|-------------------|-------------------|------|
| | | | min | typ | max | |
| DC blocking voltage | V _{DC} | T _j =25...175°C | 1200 | | | V |
| Diode forward voltage | V _F | IF=10A Tj=25°C IF=10A Tj=125°C IF=10A Tj=175°C | | 1.7 2.3 2.8 | 1.9 2.5 3.2 | V |
| Reverse current | I _R | VR=1200V Tj=25°C VR=1200V Tj=125°C VR=1200V Tj=175°C | | | 20 100 200 | uA |

DYNAMIC CHARACTERISTICS(at T_j=25°C, unless otherwise specified)

| Parameter | Symbol | conditions | Value | | | Unit |
|-------------------------|----------------|-------------------------------------------------------------------------------------------------------|-------|-----------------|-----|------|
| | | | min | typ | max | |
| Total capacitive charge | Q _c | VR=1200V, IF=5A di/dt=200A/uS Tj=25°C | | 30 | | nC |
| Total capacitance | C | V _R =0V, f=1MHz V _R =400V, f=1MHz V _R =800V, f=1MHz Tj=25°C | | 650 49 40 | | pF |

RATINGS AND CHARACTERISTIC OF SC10120XX

FIG.1-FORWARD CURRENT DERATING CURVE

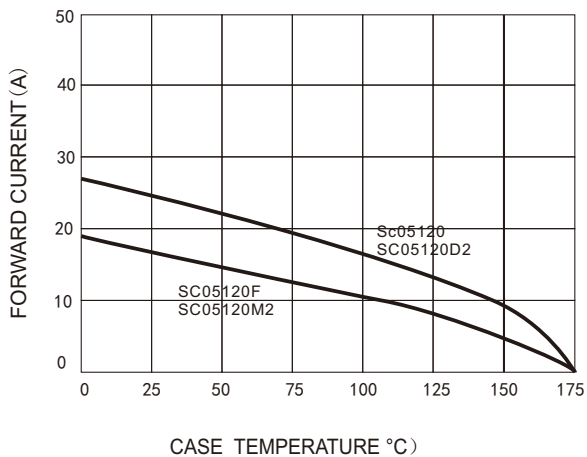


FIG.2-TYPICAL JUNCTION CAPACITANCE

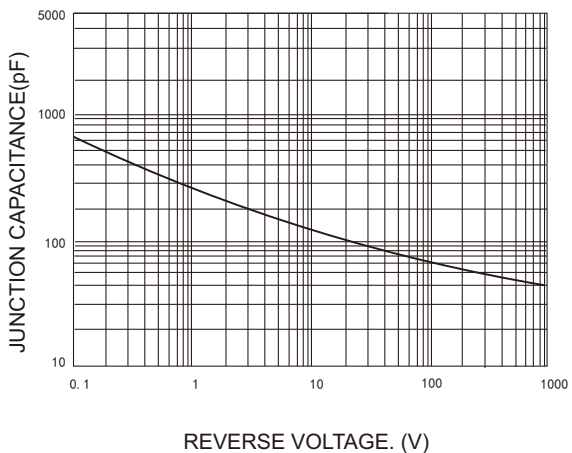


FIG.3-FORWARD CURRENT DERATING CURVE

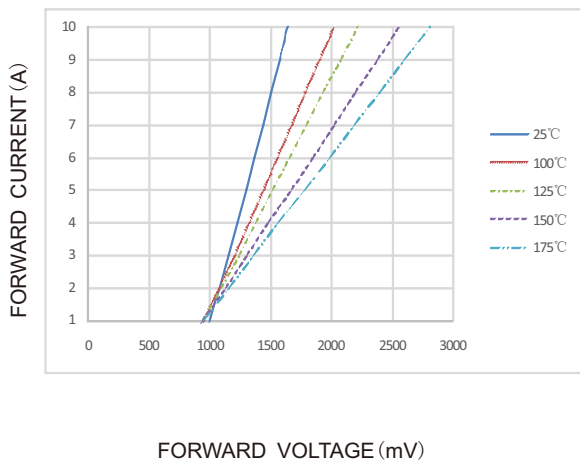
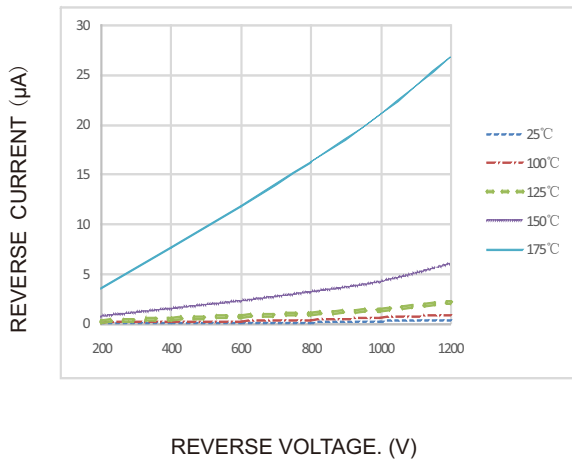
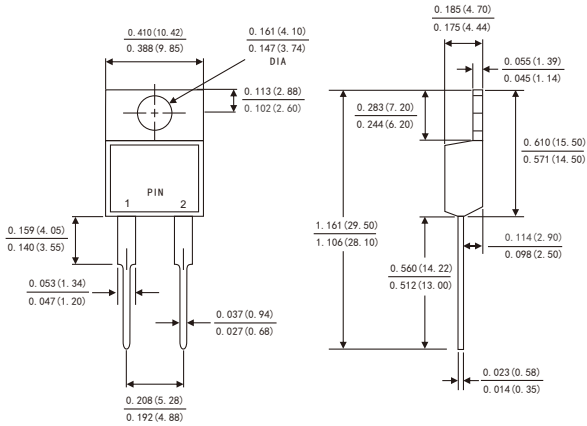


FIG.4-REVERSE CHARACTERISTICS



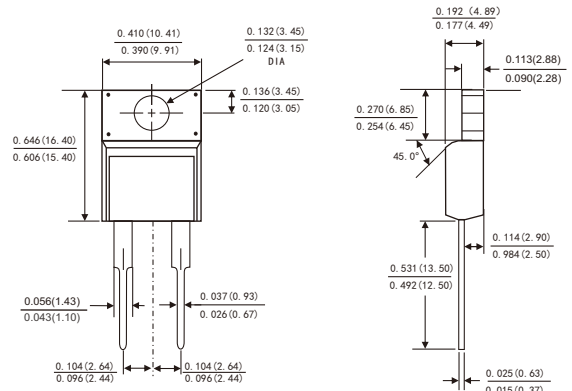
PACKAGE OUTLINE DIMENSIONS

TO-220AC



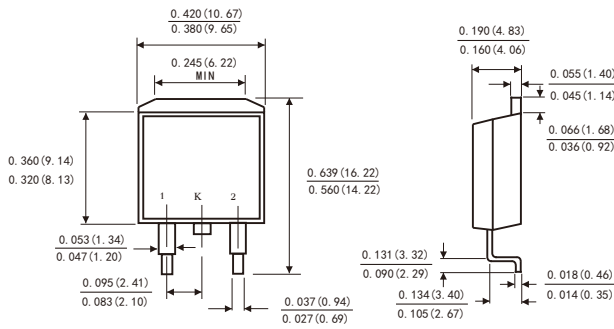
Dimensions in inches and (millimeters)

ITO-220AC



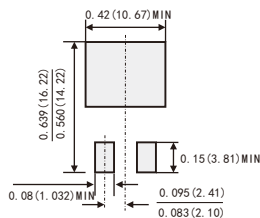
Dimensions in inches and (millimeters)

TO-263

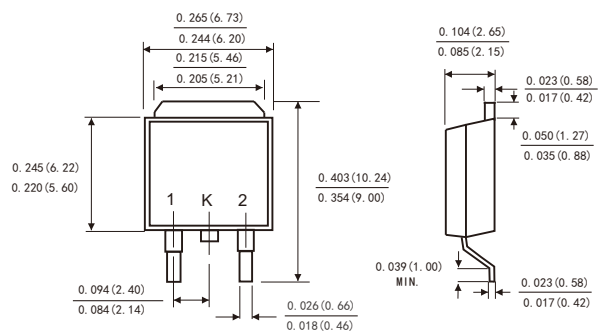


Suggested Pad Layout

(TO-263)

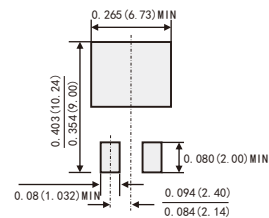


TO-252



Suggested Pad Layout

(TO-252)



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