

SILICON CARBIDE SCHOTTKY DIODE

Features:

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

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.

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

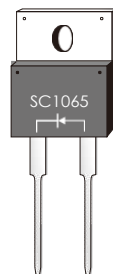
Typical Applications:

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

Reverse Voltage - 650 Volts Forward
Current - 10.0Amperes

TO-220AC

KWSC1065



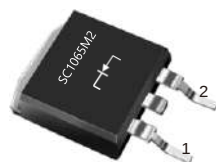
ITO-220AC

KWSC1065F



TO-252

KWSC1065M2



TO-263AC

KWSC1065D2



KEY PERFORMANCE AND PACKAGE PARAMETERS

Type	V _{DC}	I _F	Q _c	T _{J,max}	Package
KWSC1065	650V	10A	25nC	175°C	TO-220AC
KWSC1065F	650V	10A	25nC	175°C	ITO-220AC
KWSC1065D2	650V	10A	25nC	175°C	TO-263AC
KWSC1065M2	650V	10A	25nC	175°C	TO-252AC

MAXIMUM RATINGS

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

Parameter	Symbol	Value	Unit
Maximum repetitive peak reverse voltage	V_{RRM}	650	V
Continuous Forward Current for $R_{th(j-c)}$	I_F	10 ($T_c \leq 156^\circ\text{C}$ TO-220/TO-263) 10 ($T_c \leq 135^\circ\text{C}$ TO-252/ITO-220)	A
Non-Repetitive Forward Surge Current (Half-Sine Pulse, $t_p=8.3\text{ms}$)	$I_{F, SM}$	85(25°C) 75(150°C)	A
I^2t value	$\int i^2t$	30 (25°C) 23 (150°C)	A^2S
Diode dv/dt ruggedness($V_R=0\ldots 650\text{V}$)	dv/dt	80	V/nS
Power dissipation for $R_{th(j-c, max)}$ ($T_c=25^\circ\text{C}$)	P_{tot}	125(TO-220/TO-263) 60(TO-252/ITO-220)	W
Operating junction temperature range	T_j	-55...175	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55...175	$^\circ\text{C}$

THERMAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ 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

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	650			V
Diode forward voltage	V _F	IF= 10A T _j =25°C IF=10A T _j =125°C IF=10A T _j =175°C		1.5 1.6 1.8	1.8 1.9 2.1	V
Reverse current	I _R	VR=650V T _j =25°C VR= 650V T _j =125°C VR= 650V T _j =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=650V,IF=10A di/dt=200A/uS T _j =25°C		25		nC
Total capacitance	C	V _R =0V,f=1MHz V _R =200V,f=1MHz V _R =400V,f=1MHz T _j =25°C		440 57 46		pF

RATINGS AND CHARACTERISTIC OF KWSC1065XX

FIG.1-FORWARD CURRENT DERATING CURVE

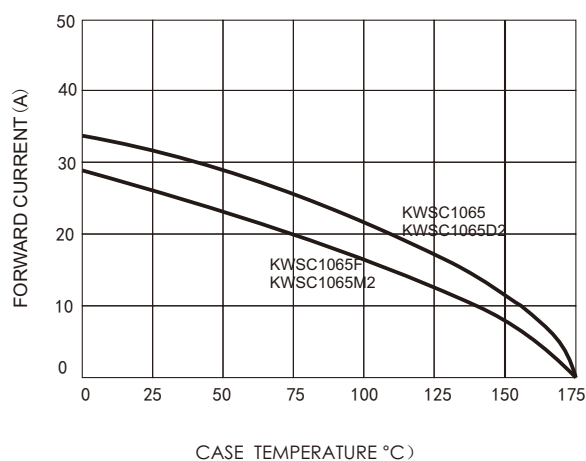


FIG.2-TYPICAL JUNCTION CAPACITANCE

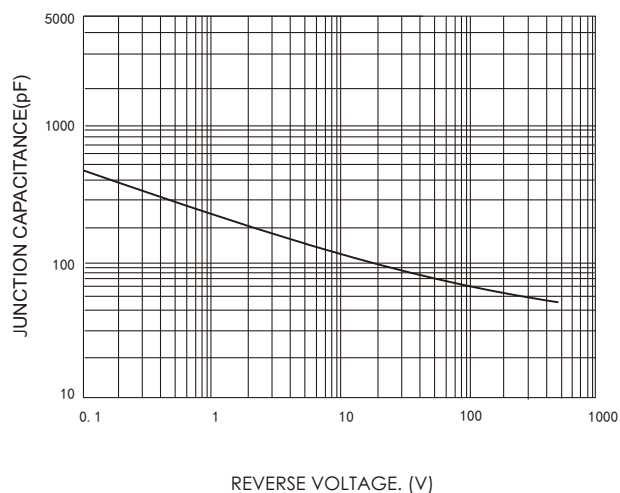


FIG.3-FORWARD CHARACTERISTICS

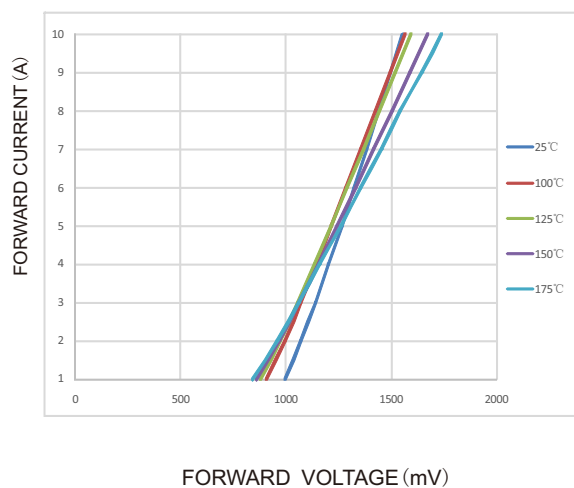
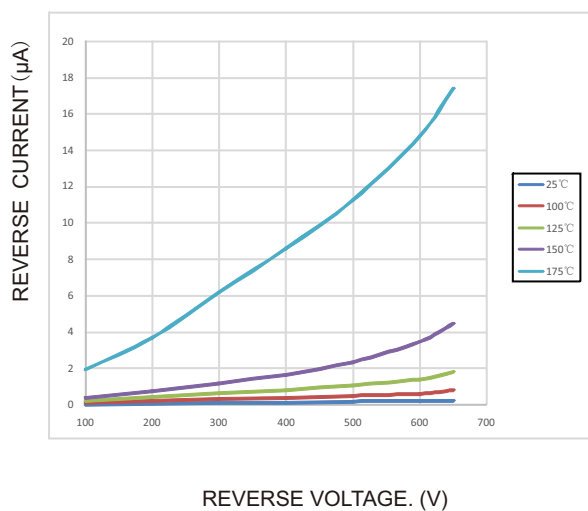
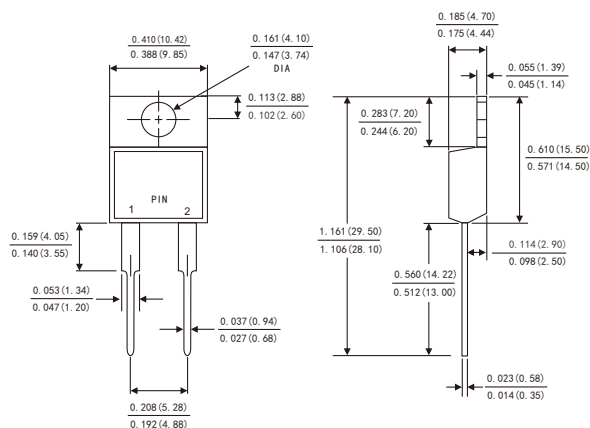


FIG.4-REVERSE CHARACTERISTICS

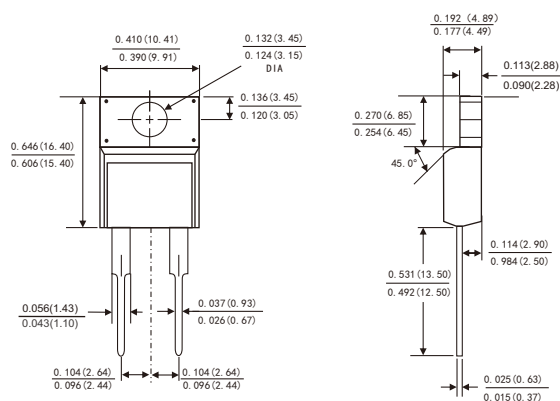


PACKAGE OUTLINE DIMENSIONS

TO-220AC



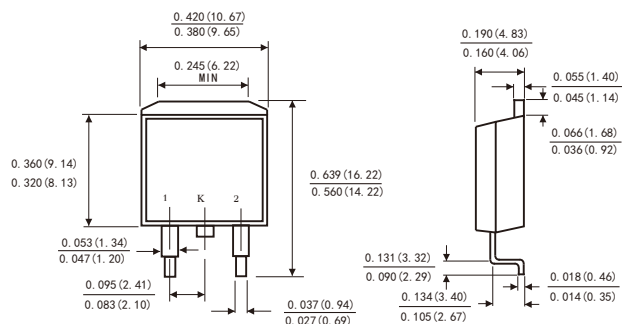
ITO-220AC



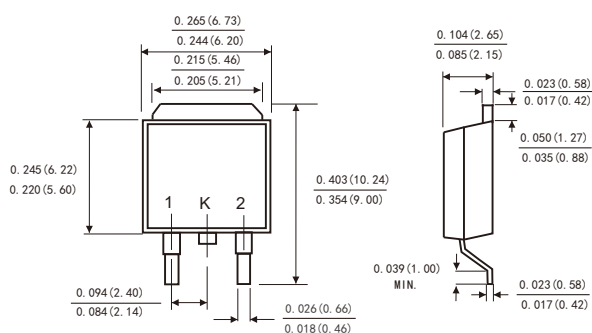
Dimensions in inches and (millimeters)

Dimensions in inches and (millimeters)

TO-263

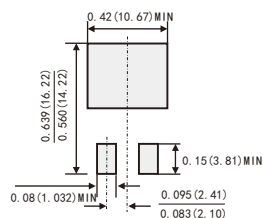


TO-252



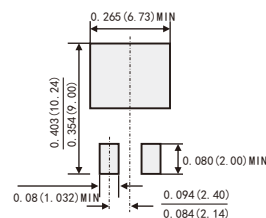
Suggested Pad Layout

(TO-263)



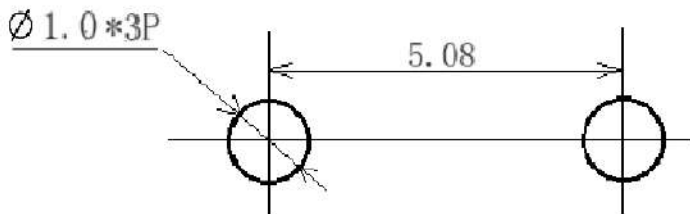
Suggested Pad Layout

(TO-252)



Packaging Specifications of Tube Pack for TO-220AC and ITO-220AC

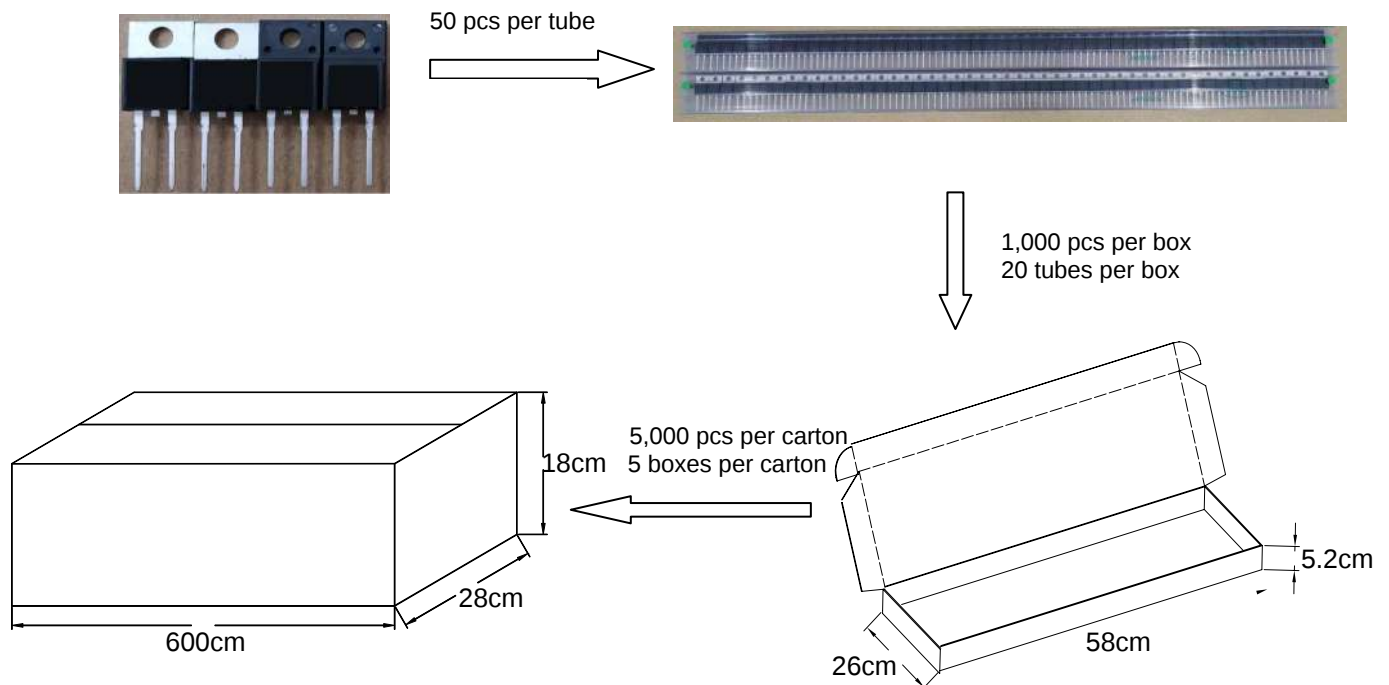
TO-220AC & ITO-220AC Suggested Pad Layout



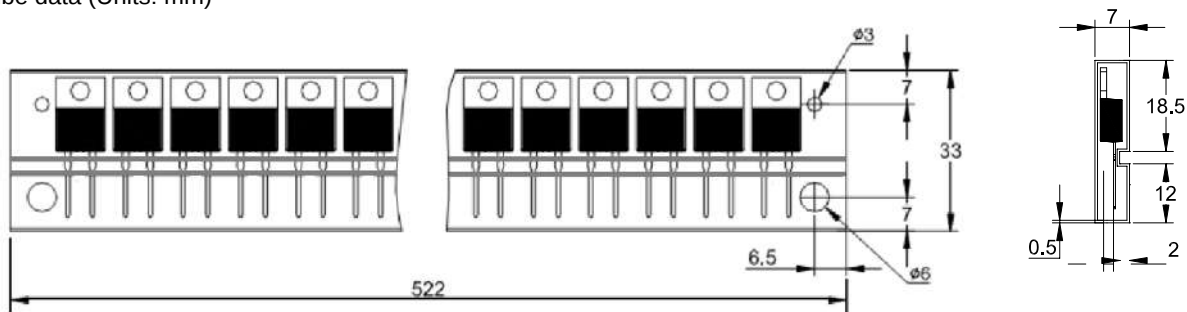
Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.

1. The method of packaging and dimension are shown as below figure. (Dimension in mm)



2. Tube data (Units: mm)



Storage

1 It is recommended to store the products in the following conditions:

Humidity: 75% R.H. Max.

Temperature : $0^{\circ}\text{C} \sim 35^{\circ}\text{C}$ ($32^{\circ}\text{F} \sim 95^{\circ}\text{F}$)

2 Shelf life : 12 month at $< 0^{\circ}\text{C} \sim 35^{\circ}\text{C}$ ($32^{\circ}\text{F} \sim 95^{\circ}\text{F}$) and $< 75\%$ R.H.