IRK. 231 SERIES
High Voltage Diode/Diode

FEATURES

- *High voltage.*
- *Electrically isolated base plate.*
- *3000 V_{RMS} isolating voltage.*
- *Industrial standard package.*
- *Simplified mechanical designs, rapid assembly.*
- *High surge capability.*
- *Large creepage distances.*
- *Aluminum Nitride*

DESCRIPTION

This IRK series of Power Modules uses power diodes in three basic configurations. The semiconductors are electrically isolated from the metal base, allowing common heatsinks and compact assemblies to be built. They can be interconnected to form single phase or three phase bridges. These modules are intended for general purpose applications such as battery chargers, welders and plating equipment.

MAJOR RATINGS & CHARACTERISTICS

Parameters		IRK.231	Units
$I_{F(AV)}$	@ T_C = 100°C	230	A
$I_{F(RMS)}$		363	A
I_{FSM}	@ 50 Hz	7015	A
I^2t	@ 50 Hz	246	kA^2s
$I^2\sqrt{t}$		2460	$kA^2\sqrt{s}$
V_{RRM} range		1400 to 2600	V
T_J		-40 to 150	°C

IRK.231 SERIES

ELECTRICAL SPECIFICATION

VOLTAGE RATINGS

Type Number	Voltage Code	V_{RRM}, max. repetitive peak reverse and off-state voltage blocking voltage V	V_{RSM}, max. non-repetitive peak reverse voltage V	I_{RRM} max. @ 150°C mA
IRK.231	14	1400	1500	60
	16	1600	1700	
	18	1800	1900	
	20	2000	2100	
	22	2200	2300	
	24	2400	2500	
	26	2600	2700	

FORWARD CONDUCTION

	Parameters	IRK.231	Units	Conditions
$I_{F(AV)}$	Max. average forward current	231	A	180°C conduction, half sine wave
	@ case temperature	100	°C	
$I_{F(RMS)}$	Max. RMS forward current	363	A	as AC switch
I_{FSM}	Max. peak, one cycle forward non-repetitive surge current	7015	A	Sinusoidal half wave, Initial $T_J = T_J$ max.
		5900	A	
I^2t	Maximum I^2t for fusing	246	kA^2s	
		174	kA^2s	
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	2460	$kA^2\sqrt{s}$	t = 0.1 to 10ms. No voltage reapplied.
$V_{F(TO)}$	Threshold voltage	0.79	V	$T_J = T_J$ max.
r_t	Forward slope resistance	0.63	mΩ	$T_J = T_J$ max.
V_{FM}	Max. forward voltage drop	1.29	V	$I_{FM} = \pi \times I_{F(AV)}$, $T_J = T_J$ max., 180° conduction AV. power = $V_{F(TO)} \times I_{F(AV)} + r_t \times (I_{F(RMS)})^2$

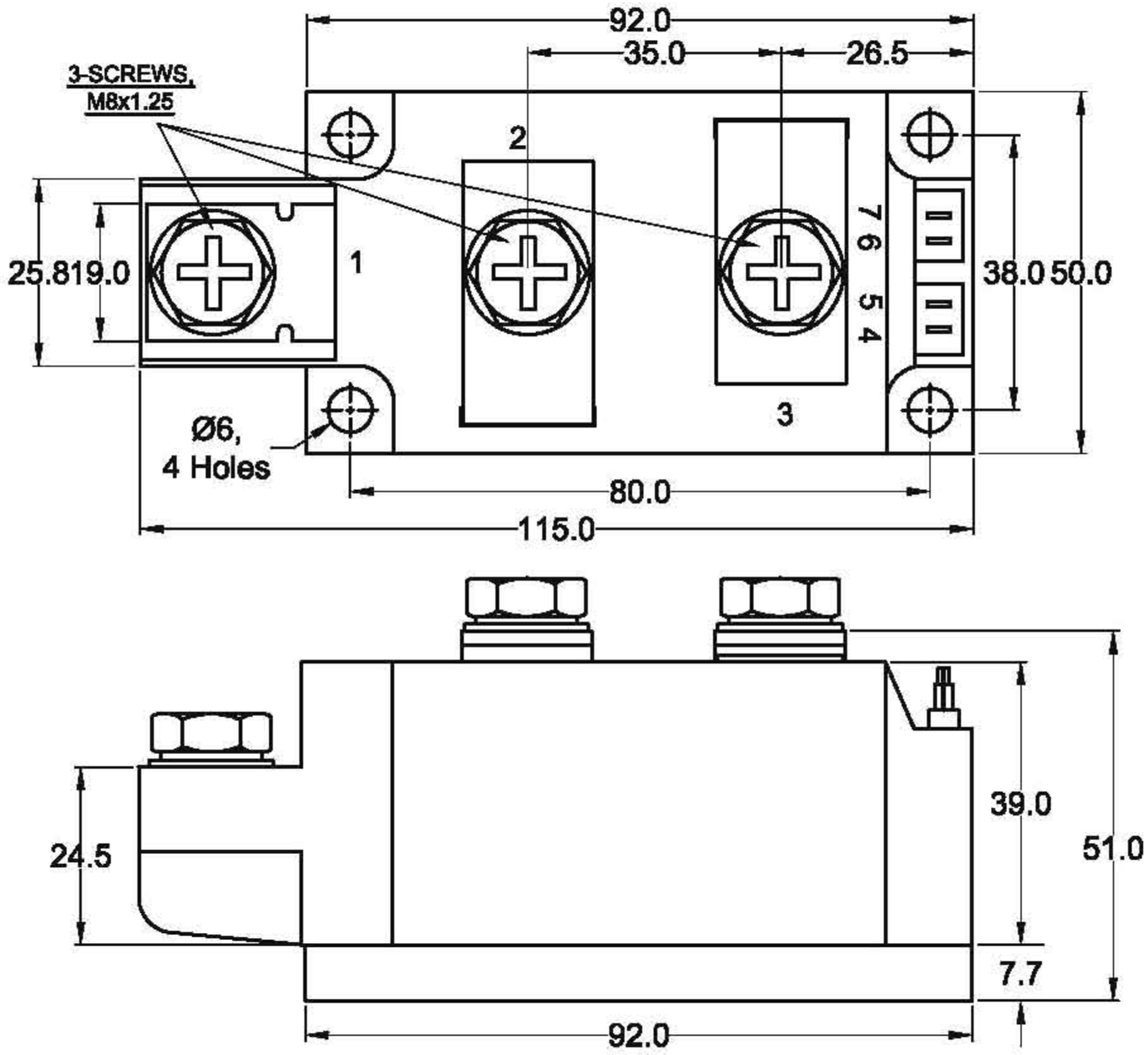
THERMAL AND MECHANICAL SPECIFICATIONS

	Parameters	IRK.231	Units	Conditions	
T_J	Junction operating temperature	-40 to 135	°C		
T_{stg}	Storage temperature range	-40 to150	°C		
R_{thj-c}	Max. internal thermal resistance, junction to case	0.16	K/W	IRKD../IRKJ../IRKC..	Per junction, DC operation
R_{thC-S}	Thermal resistance, case to heatsink	0.035	K/W	Mounting surface flat, smooth and greased	
T	Mounting torque ±10% — Module to heatsink	4 to 6	Nm	A mounting compound is recommended and the torque should be rechecked after a period of about 3 hours to allow for the spread of the compound.	
	Busbar to module	8 to 10	Nm		
Wt	Approximate weight	800	g		

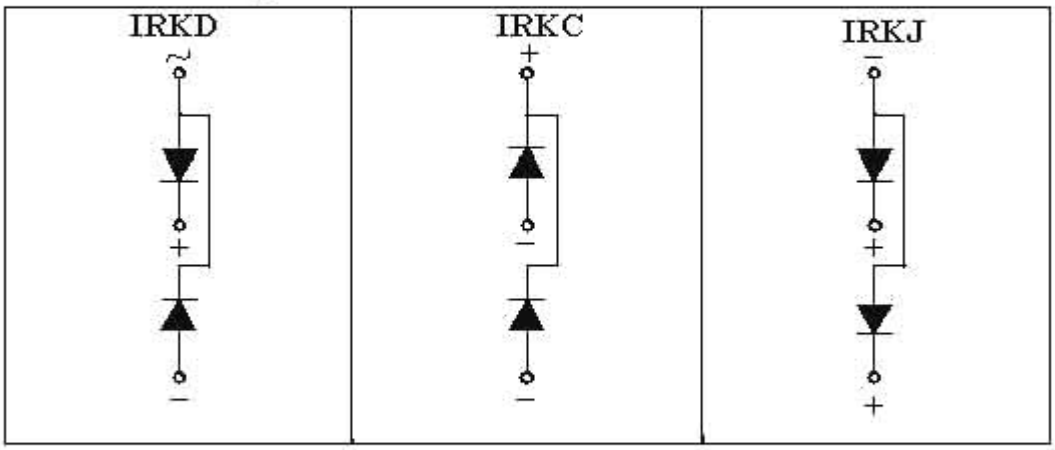
BLOCKING

	Parameter	IRK.231	Units	Conditions
I_{RRM}	Max. peak reverse leakage current	60	mA	T_J = 150°C
V_{INS}	RMS isolation voltage	3000	V	50 Hz,circuit to base,all terminals shorted, t=1sec

OUTLINE DIAGRAM



Circuit Configuration Table



Ordering Information Table

IRK	D	231	/	26
①	②	③		④

① - Module type
② - Circuit configuration (See Circuit Configuration table)
③ - Current Code
④ - Voltage Code (See Voltage Ratings table)