Ruttonsha International Rectifier Ltd.

POWER MODULES (FAST RECOVERY)

IRK. 196. SERIES

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.196	Units
$I_{F(AV)}$	@ $T_C = 100^0C$	195	A
$I_{F(RMS)}$		305	A
I_{FSM}	@ 50 Hz	4750	A
I^2t	@ 50 Hz	113	kA^2s
$I^2\sqrt{t}$		1130	$kA^2\sqrt{s}$
V_{RRM} range		600	V
T_J		-40 to 125	^0C

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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
	04	400	500	30
IRK.196	06	600	700	30

FORWARD CONDUCTION

	Parameters	IRK.196	Units	Conditions	
$I_{F(AV)}$	Max. average forward current	195	A	180°C conduction, half sine wave	
	@ case temperature	100	°C		
$I_{F(RMS)}$	Max. RMS forward current	305	A	as AC switch	
I_{FSM}	Max. peak, one cycle forward non-repetitive surge current	4750	A	t = 10ms	Sinusoidal half wave, Initial $T_J = T_J$ max.
I^2t	Maximum I^2t for fusing	113	kA^2s	t = 10ms	
$I^2\sqrt{t}$	Maximum $I^2\sqrt{t}$ for fusing	1130	$kA^2\sqrt{s}$	t = 0.1 to 10ms. No voltage reapplied.	
$V_{F(TO)}$	Threshold voltage	0.75	V	$T_J = T_J$ max.	
r_t	Forward slope resistance	0.92	mΩ	$T_J = T_J$ max.	
V_{FM}	Max. forward voltage drop	1.65	V	$I_{FM} = \pi \times I_{F(AV)}$, $T_J = T_J$ max., 180° conduction AV. power = $V_{F(TO)} \times I_{F(AV)} + r_1 \times (I_{F(RMS)})^2$	
t_{rr}	Maximum reverse recovery time	500	ns	Tj= 25°C, -diF/dt = 25A/µs $I_{FM} = \pi \times I_F(AV)$	

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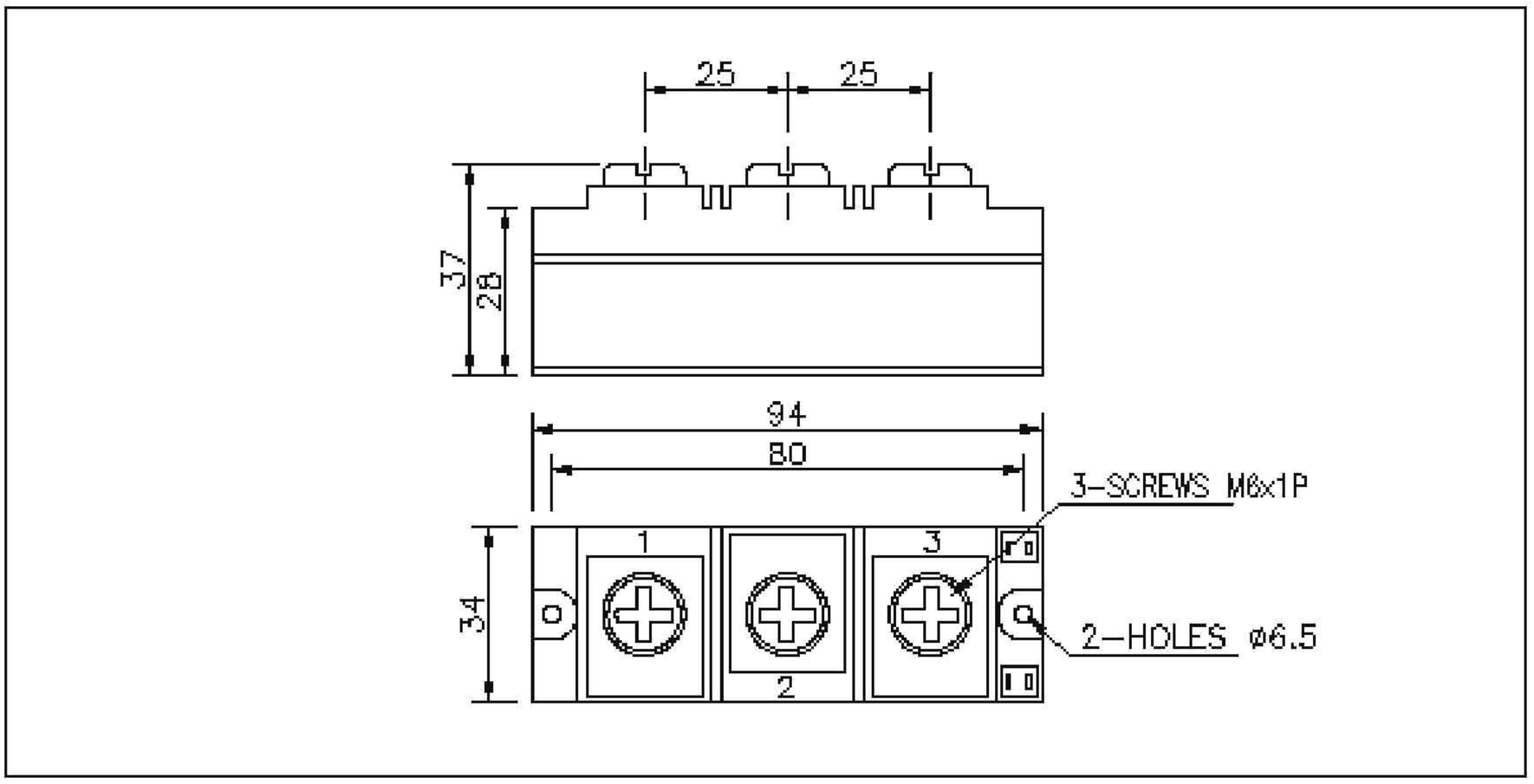
THERMAL AND MECHANICAL SPECIFICATIONS

	Parameters		IRK.196	Units	Conditions	
T_J	Junction operating temperature		-40 to 125	^{0}C		
T_{stg}	Storage temperature range		-40 to 150	^{0}C		
R_{thj-c}	Max. internal thermal resistance, junction to case		0.20	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	4 to 6	Nm		
Wt	Approximate weight		350	g		

BLOCKING

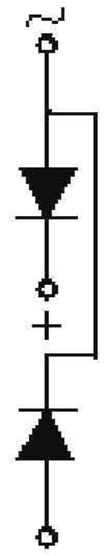
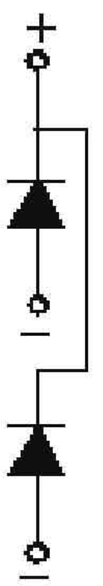
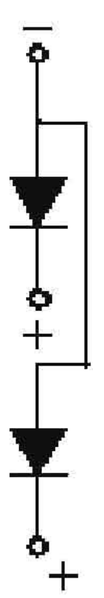
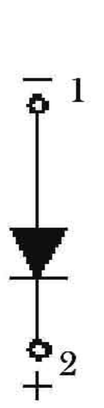
	Parameter	IRK.196	Units	Conditions
I_{RRM}	Max. peak reverse leakage current	50	mA	T_J = 150^{0}C
V_{INS}	RMS isolation voltage	3000	V	50 Hz, circuit to base, all terminals shorted, t=1sec

OUTLINE DIAGRAM

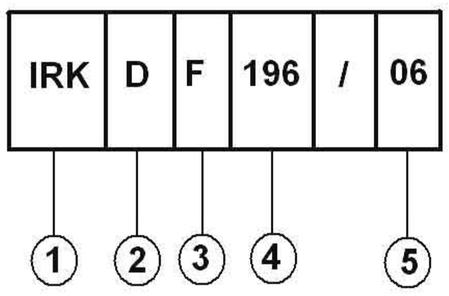


IRK.196. Series

Circuit Configuration Table

IRKD	IRKC	IRKJ	IRKE
			

Ordering Information Table



① - Module type

② - Circuit configuration (See Circuit Configuration table)

③ - F For fast recovery

④ - Current Code

⑤ - Voltage Code (See Voltage Ratings table)