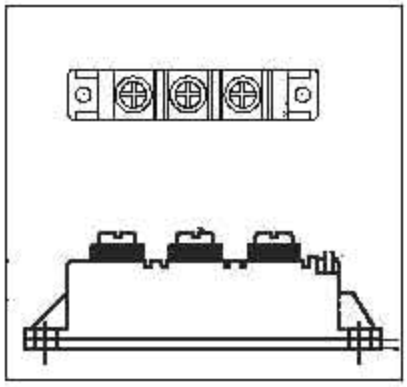
IRK.56, .71, .91 SERIES
High Voltage Diode/Diode

FEATURES



- *Electrically isolated base plate.*
- *2500 V_{RMS} isolating voltage.*
- *Simplified mechanical designs, rapid assembly.*
- *High surge capability.*
- *Large creepage distances.*
- *Aluminum Nitride*

DESCRIPTION

These IRK series of Power Modules use 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.56	IRK.71	IRK.91	Units
$I_{F(AV)}$	T_C = 100°C	55	70	90	A
$I_{F(RMS)}$		86	110	141	A
I_{FSM}	@ 50 Hz	1600	1790	2020	A
I^2t	@ 50 Hz	12890	15900	20430	A^2s
I^2t		128000	159000	204300	A^2s
V_{RRM}	range	400 to **1600**			V
T_J	range	-40 to **135**			°C

ELECTRICAL SPECIFICATION

VOLTAGE RATINGS

Type Number	Voltage Code	V_{RRM}, max. repetitive peak reverse voltage V	V_{RSM}, max. non-repetitive peak reverse voltage V	I_{RRM} max. mA Tj=Tj max
	04	400	500	10
IRK.56	06	600	700	10
IRK.71	08	800	900	10
IRK.91	10	1000	1100	10
	12	1200	1300	10
	14	1400	1500	10
	16	1600	1700	10

FORWARD CONDUCTION

	Parameters	IRK.56	IRK.71	IRK.91	Units	Conditions
$I_{F(AV)}$	Max. average forward current	55	70	90	A	180^0C conduction, half sine wave
	@ case temperature	100	100	100	^{0}C	
$I_{F(RMS)}$	Max. RMS forward current	86	110	141	A	
I_{FSM}	Max. peak, one cycle forward non-repetitive surge current	1600	1790	2020	A	t = 10ms
I^2t	Maximum I^2t for fusing	12890	15900	20430	A^2s	t = 10ms
I^2t	Maximum I^2t for fusing	128900	159000	204300	A^2s	t = 0.1 to 10ms. No voltage reapplied.
$V_{F(TO)}$	Threshold voltage	0.71	0.61	0.66	V	$T_J = T_J$ max.
r_t	Forward slope resistance	3.76	2.80	1.81	mΩ	$T_J = T_J$ max.
V_{FM}	Max. forward voltage drop	1.35	1.30	1.30	V	$I_{FM} = \pi \times I_{F(AV)}$, $T_J = 25^0$C, $t_p = 400\mu$s squarewave AV. power = $V_{F(TO)} \times I_{F(AV)} + r_1 \times (I_{F(RMS)})^2$

IRK.56, .71, .91 SERIES

THERMAL AND MECHANICAL SPECIFICATIONS

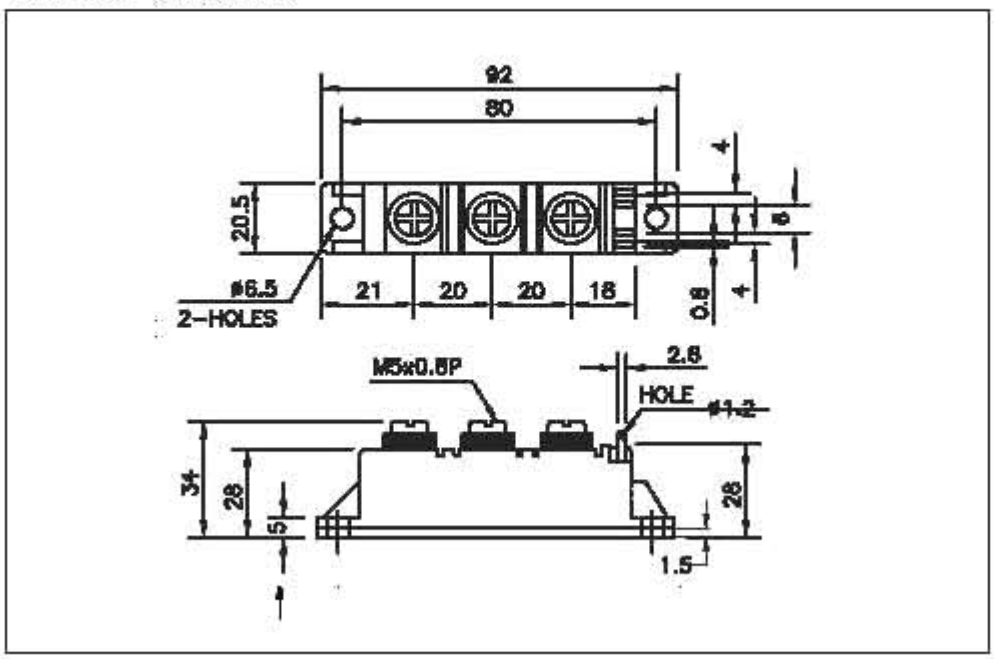
	Parameter		IRK.56	IRK.71	IRK.91	Units	Conditions	
T_J	Junction operating temperature range		-40 to 135			°C		
T_{stg}	Storage temperature range		-40 to 150			°C		
R_{thJ-C}	Max. internal thermal resistance, junction to case		0.325	0.285	0.22	K/W	IRKD../IRKJ../IRKC..	Per module, DC operation
R_{thC-S}	Thermal resistance, case to heatsink		0.1	0.1	0.1	K/W	Mounting surface flat, smooth and greased	
T	Mounting torque ±10%	Module to heatsink	5			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	3			Nm		
Wt	Approximate weight		115			g		

BLOCKING

	Parameters	IRK.56	IRK.71	IRK.91	Units	Conditions
I_{RRM}	Max. peak reverse leakage current	10	10	10	mA	T_J = 135 °C
V_{INS}	RMS isolation voltage	2500	2500	2500	V	50 Hz circuit to base, all terminals shorted, 1min

POWER MODULES

OUTLINE DIAGRAM



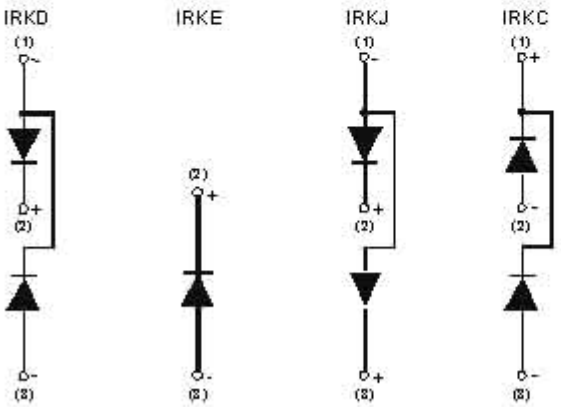
Ordering Information Table

Device Code

IRK	D	71	/	16
①	②	③		④

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

Circuit Configurations Table



D = 2 diodes in series
E = Single diode
J = 2 diodes/common anode
C = 2 diodes/common cathode