



POWER MODULES

IRK.570 SERIES

High Voltage Thyristor/Diode and Thyristor/Thyristor

FEATURES

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

DESCRIPTION

These IRK series of Power Modules use power thyristors/diodes in four 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 or as AC-switches when modules are connected in anti-parallel.

These modules are intended for general purpose applications such as battery chargers, welders and plating equipment.

MAJOR RATINGS & CHARACTERISTICS

Parameters	IRK.570	Units
$I_{T(AV)}$ @ 85°C	570	A
$I_{T(RMS)}$	85	A
I_{TSM} @ 50 Hz	15500	A
I^2t @ 50 Hz	1201	kA ² s
$V_{DRM} - V_{RRM}$	Up to 1800	V
T_J	-40 to 130	°C

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ELECTRICAL SPECIFICATION VOLTAGE RATINGS

Type Number	Voltage Code	V_{RRM} / V_{DRM} max. repetitive peak reverse and off-state voltage blocking voltage V	V_{RSM} max. non-rep. peak reverse voltage V	I_{DRM} / I_{RRM} max. @ 130°C mA
	04	400	500	200
	06	600	700	200
IRK. 570	08	800	900	200
	10	1000	1100	200
	12	1200	1300	200
	14	1400	1500	200
	16	1600	1700	200
	18	1800	1900	200

ON-STATE CONDUCTION

Parameters	IRK. 570	Units	Conditions
$I_{T(AV)}$ Max. average on-state current @ Case temperature	570 85	A °C	180° conduction, half sine wave
$I_{T(RMS)}$ Max. RMS on-state current	895	A	as AC switch
I_{TSM} Max. peak, one cycle on-state, non-repetitive surge current	15500	A	t = 10ms Sinusoidal half wave, Initial $T_J = T_J$ max.
I^2t Maximum I^2t for fusing	1201	kA ² s	t = 10ms Sinusoidal half wave, Initial $T_J = T_J$ max.
$V_{T(TO)}$ Threshold voltage	0.78	V	$T_J = T_J$ max.
r_t On-state slope resistance	0.20	mΩ	$T_J = T_J$ max.
V_{TM} Max. on-state voltage drop	1.44	V	$I_t = 1700A$, 25°C
I_H Maximum holding current	500 max.	mA	
I_L Max. latching current	2000 max.	mA	$T_J = 25°C$ RG=33Ω

SWITCHING

t_d Delay Time	1.0	μs	$T_J = 25°C$ Gate current = 1A $dI_g/dt = 1A/μs$
t_r Rise Time	2.0	μs	$T_J = 25°C$ $V_d = 0.67\% V_{DRM}$
t_q Turn-Off Time	100 - 200	μs	$T_J = T_J$ max.

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BLOCKING

	Parameter	570		Units	Conditions
dv/dt	Maximum critical rate of rise of off-state voltage	500	V/μs		T _J = 130°C, exponential to 67% rated V _{DRM}
I _{RRM} I _{DRM}	Max. peak reverse and off-state leakage current	200	mA		T _J = 130°C, rated V _{DRM} /V _{RRM} applied
V _{INS}	RMS isolation voltage	3500	V		50Hz, Circuit to base, all terminal shorted, 25°C, 1sec

TRIGGERING

	Parameter	570	Units	Conditions
I _{GT}	DC gate current required to trigger	200	mA	T _J = 25°C Max. required gate trigger/current / voltage are the lowest value which will trigger all units 12V anode-to-cathode applied.
V _{GT}	DC gate voltage required to trigger	3.0	V	
V _{GD}	DC gate voltage not to trigger	0.25 max	V	T _J = 130°C Max. gate current / voltage not to trigger the max. value which will not trigger any unit with rated V _{DRM} anode-to-cathode applied
I _{GD}	DC gate current not to trigger	10.0 max	mA	
di/dt	Maximum critical rate of rise of turned-on current	100	A/μs	T _J = 130°C,

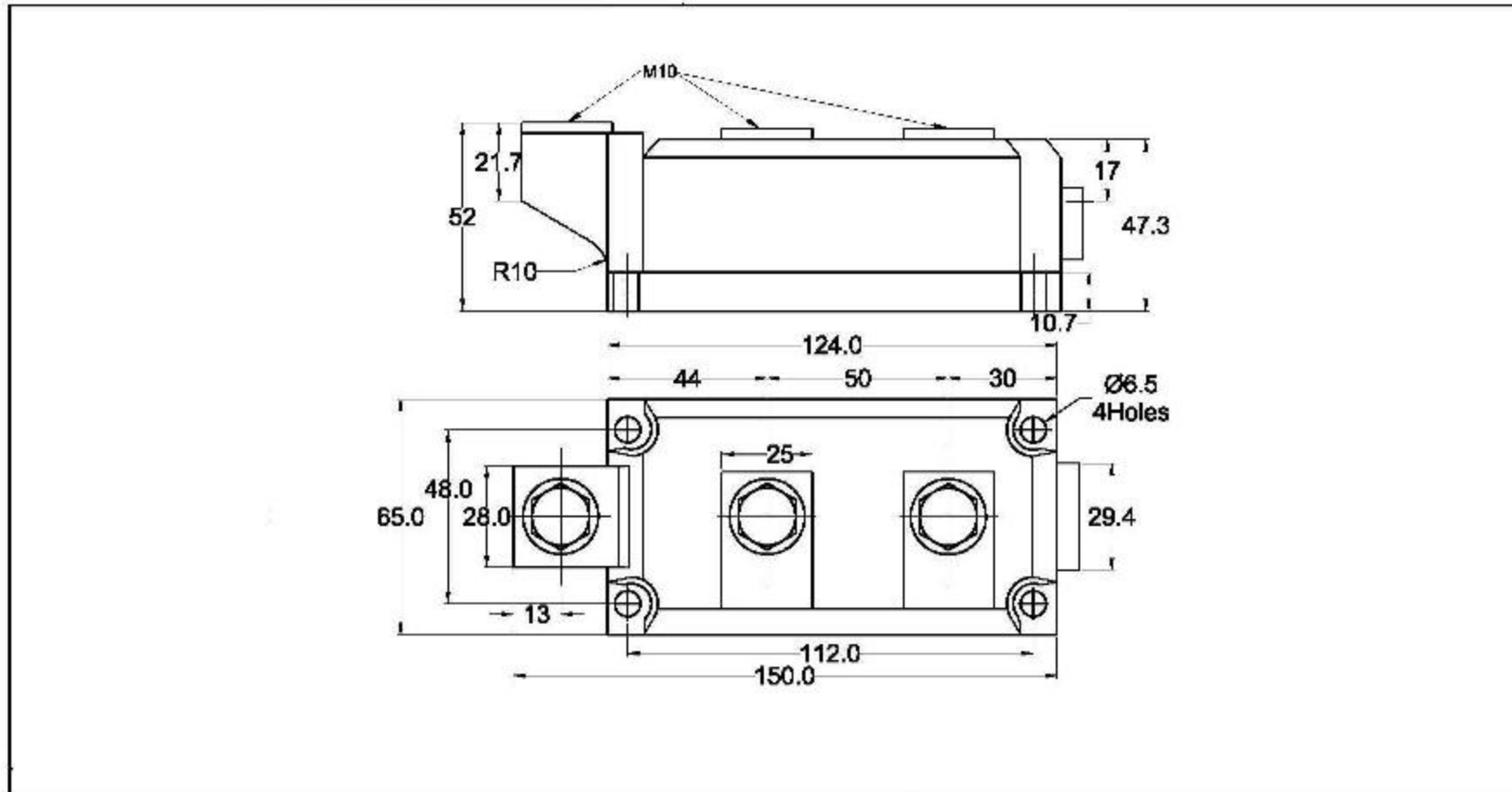
THERMAL AND MECHANICAL SPECIFICATION

	Parameter	570	Units	Conditions
T _J	Max. operating temperature range	-40 to 125	°C	
T _{stg}	Max. storage temperature range	-40 to 130		
R _{thJC}	Max. thermal resistance, junction to case	0.069	K/W	Per thyristor / per module
R _{thJC}	Max. thermal resistance, junction to heatsink	0.02	K/W	Per thyristor / per module
T	Mounting torque, ±15%	5(12)	Nm	to heatsink & to terminals

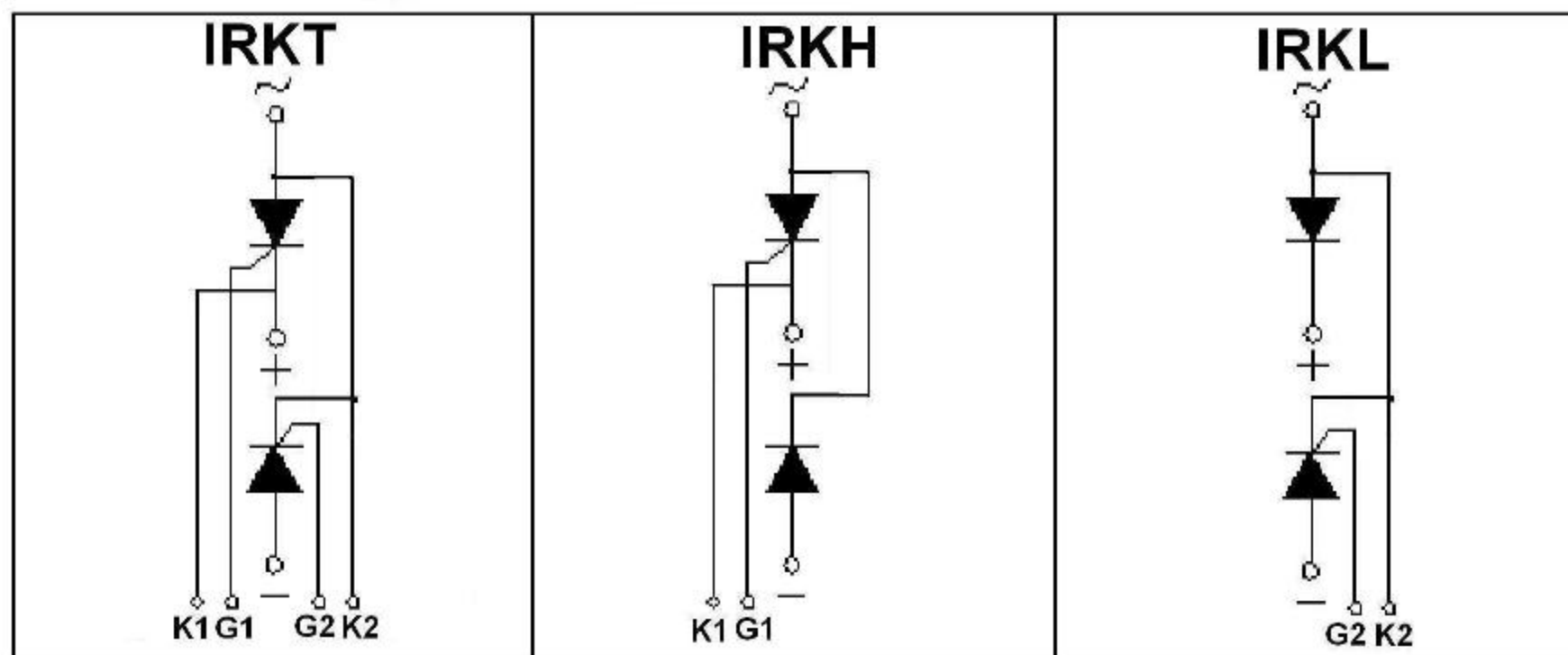
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OUTLINE DIAGRAM



Circuit Configuration Table



Ordering Information Table

