

STANDARD DIODES

ADD-A-pak™ GEN V Power Modules

Features

- High Voltage
- Industrial Standard Package
- Thick Al metal die and double stick bonding
- Thick copper baseplate
- UL approval pending
- 3500V_{RMS} isolating voltage

Benefits

- Full compatible TO-240AA
- High Surge capability
- Easy Mounting on heatsink
- Al₂O₃ DBC insulator
- Heatsink grounded

60 A

Mechanical Description

The Generation V of Add-A-pak module combine the excellent thermal performance obtained by the usage of Direct Bonded Copper substrate with superior mechanical ruggedness, thanks to the insertion of a solid Copper baseplate at the bottom side of the device.

The Cu baseplate allow an easier mounting on the majority of heatsink with increased tolerance of surface roughness and improve thermal spread.

The Generation V of AAP module is manufactured without hard mold, eliminating in this way any possible direct stress on the leads.

The electrical terminals are secured against axial pull-out: they are fixed to the module housing via a click-stop feature already tested and proved as reliable on other IR modules.

Electrical Description

These modules are intended for general purpose high voltage applications such as high voltage regulated power supplies, lighting circuits, temperature and motor speed control circuits, UPS and battery charger.

Major Ratings and Characteristics

Parameters	IRKJ60	Units
$I_{F(AV)}$ @ 100°C	60	A
$I_{F(RMS)}$	94	A
I_{FSM} @ 50Hz	1000	A
@ 60Hz	1047	A
V_{RRM}	400	V
T_J	-40 to 150	°C
T_{STG}	-40 to 150	°C



ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	I_{RRM} max. @ 150°C mA
IRKJ60/04A	04	400	500	10

Forward Conduction

Parameter	IRKJ60	Units	Conditions
$I_{F(AV)}$ Max. average forward current @ Case temperature	60	A	180° conduction, half sine wave
	100	°C	
$I_{F(AV)}$ Max. average forward current @ Case temperature	55	A	180° conduction, half sine wave
	105	°C	
$I_{F(RMS)}$ Max. RMS forward current	94	A	DC @ 92°C case temperature
I_{FSM} Max. peak, one-cycle forward, non-repetitive surge current	1000	A	t = 10ms No voltage
	1047		t = 8.3ms reapplied
	950		t = 10ms 100% V_{RRM}
	995		t = 8.3ms reapplied
I^2t Maximum I^2t for fusing	5000	A ² s	t = 10ms No voltage
	4564		t = 8.3ms reapplied
	4500		t = 10ms 100% V_{RRM}
	4100		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	70.7	KA ² /s	t = 0.1 to 10ms, no voltage reapplied
$V_{F(TO)}$ Threshold voltage	0.642	V	
r_f Forward slope resistance	5.7	mΩ	
V_{FM} Max. forward voltage drop	1.51	V	$I_{FM} = 190A, T_J = 25°C, t_p = 400\mu s$ square wave

Blocking

Parameter	IRKJ60	Units	Conditions
I_{RRM} Max. peak reverse leakage current	10	mA	$T_J = 150°C$
V_{INS} RMS isolation voltage	3500 (1 sec)	V	50 Hz, circuit to base, all terminals shorted

Thermal and Mechanical Specifications

Parameter	IRKJ60	Units	Conditions
T_J Junction temperature range	-40 to 150	°C	
T_{stg} Storage temperature range	-40 to 150	°C	
R_{thJC} Max. thermal resistance, junction to case	0.5	K/W	Per junction, DC operation
R_{thCS} Typical thermal resistance, case to heatsink	0.1	K/W	Mounting surface flat, smooth and greased
T Mounting torque ±10% to heatsink busbar	5	Nm	A mounting compound is recommended and the torque should be rechecked after a period of 3 hours to allow for the spread of the compound
	4		
wt Approximate weight	110 (4)	gr (oz)	
Case style	TO-240AA		JEDEC

ΔR Conduction (per Junction)

(The following table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC)

Devices	Sine half wave conduction					Rect. wave conduction					Units
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
IRKJ60	0.11	0.13	0.16	0.22	0.32	0.09	0.14	0.17	0.23	0.32	°C/W

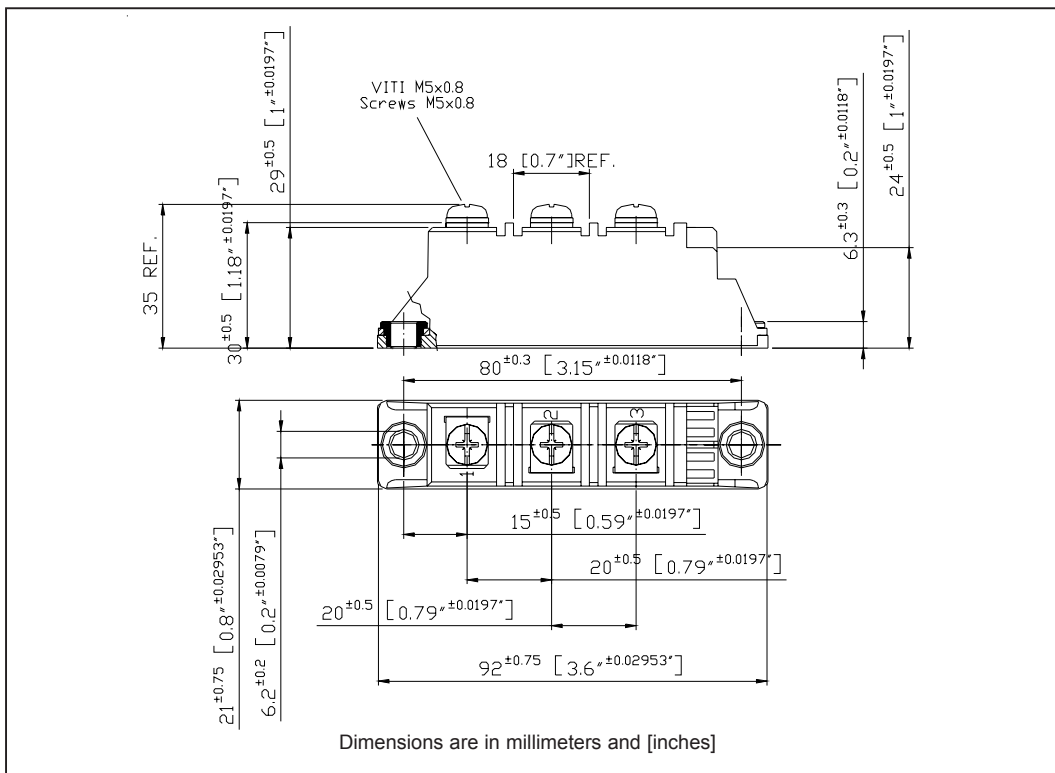
Ordering Information Table

Device Code

IRK	J	60	/	04	A
①	②	③		④	⑤

- 1** - Module type
- 2** - Circuit configuration (2 diodes/common anode)
- 3** - Current code (60 = 60A)
- 4** - Voltage rating (04 = 400V)
- 5** - A = Gen V

Outline Table



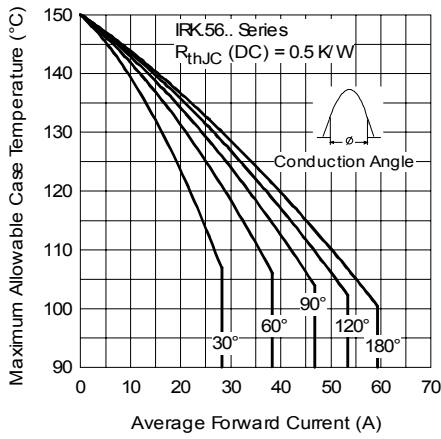


Fig. 1 - Current Ratings Characteristics

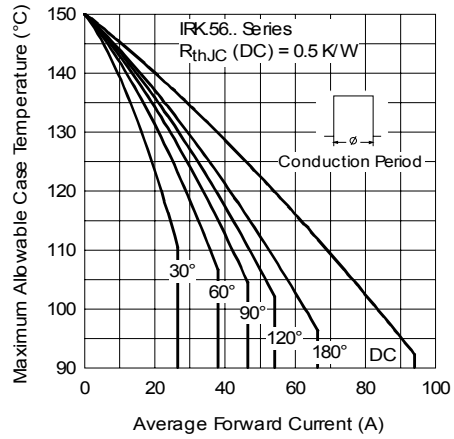


Fig. 2 - Current Ratings Characteristics

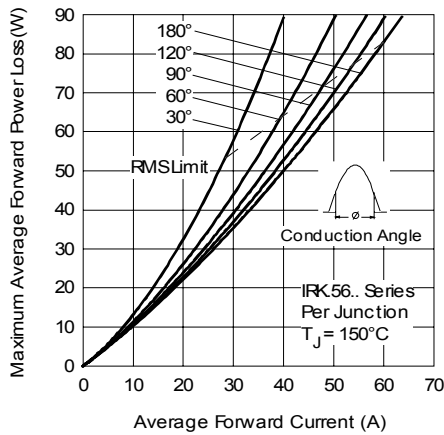


Fig. 3 - Forward Power Loss Characteristics

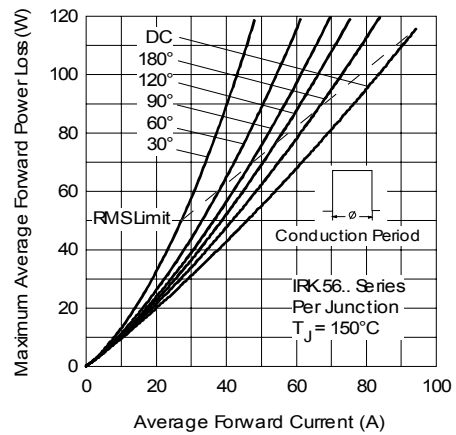


Fig. 4 - Forward Power Loss Characteristics

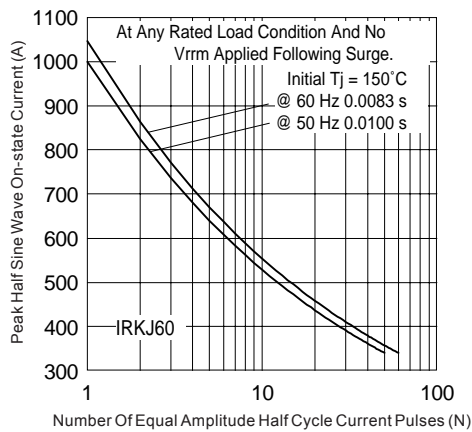


Fig. 5 - Maximum Non-Repetitive Surge Current

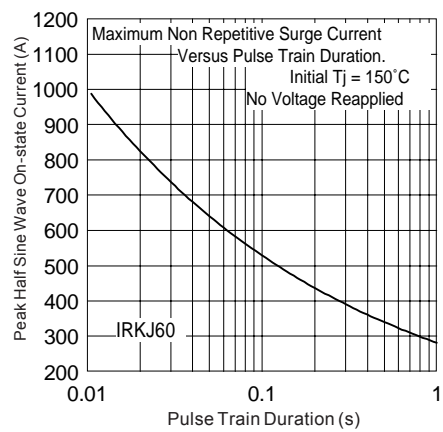


Fig. 6 - Maximum Non-Repetitive Surge Current

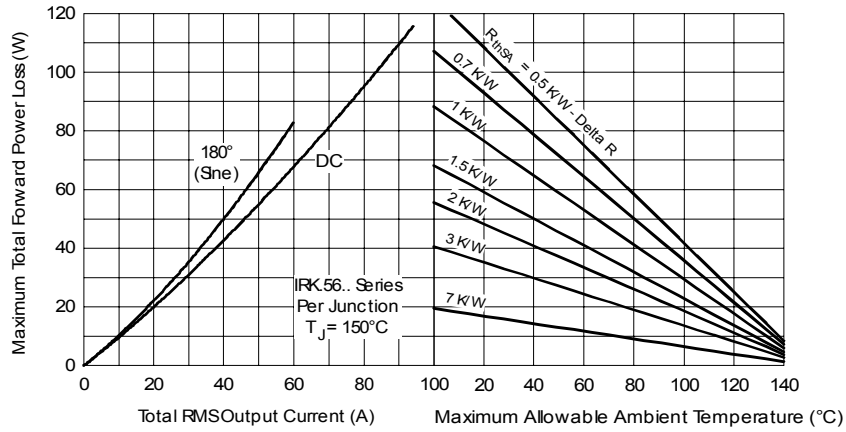


Fig. 7 - Forward Power Loss Characteristics

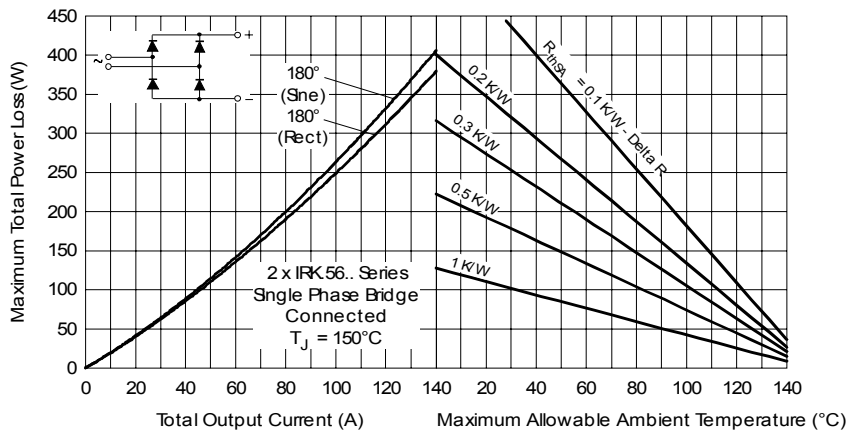


Fig. 8 - Forward Power Loss Characteristics

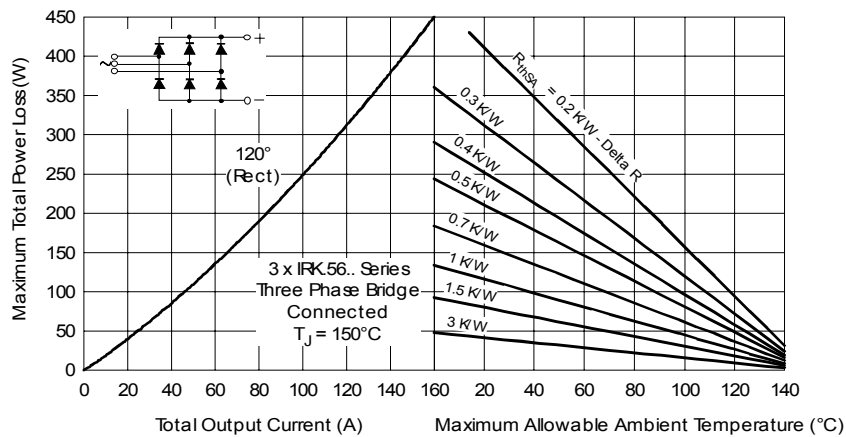


Fig. 9 - Forward Power Loss Characteristics

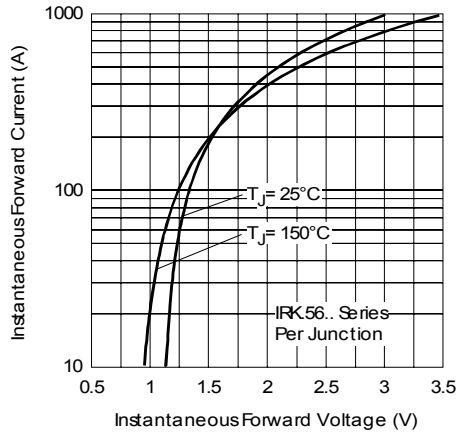


Fig. 10 - Forward Voltage Drop Characteristics

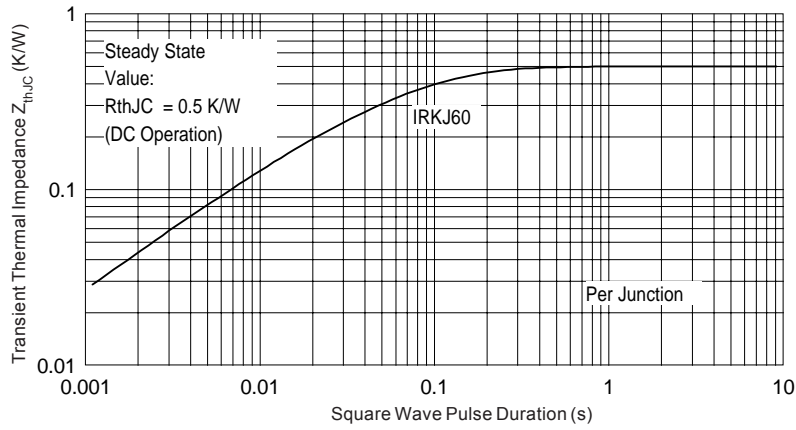


Fig. 11 - Thermal Impedance Z_{thJC} Characteristic

Data and specifications subject to change without notice.
 This product has been designed and qualified for Industrial Level.
 Qualification Standards can be found on IR's Web site.