

STANDARD DIODES

SUPER MAGN-A-pak™ Power Modules

Features

- High current capability
- 3000 V_{RMS} isolating voltage with non-toxic substrate
- High surge capability
- High voltage ratings up to 2000V
- Industrial standard package
- UL E78996 approved 

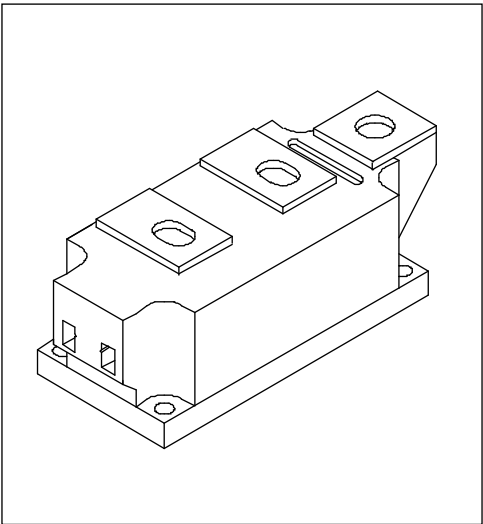
600 A

Typical Applications

- Rectifying bridge for large motor drives
- Rectifying bridge for large UPS

Major Ratings and Characteristics

Parameters	IRKD600..	Units
$I_{F(AV)}$	600	A
@ T_C	100	°C
$I_{F(RMS)}$	942	A
@ T_C	100	°C
I_{FSM}	@ 50Hz	19.0 KA
	@ 60Hz	20.1 KA
I^2t	@ 50Hz	1805 KA ² s
	@ 60Hz	1683 KA ² s
$I^2\sqrt{t}$		18050 KA ² √s
V_{RRM} range	800 to 2000	V
T_{STG} range	- 40 to 150	°C
T_J range	- 40 to 150	°C



IRKD600.. Series

Bulletin I27402 rev. A 09/97

International
IR Rectifier

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. @ T_J max. mA
IRKD600..	08	800	900	50
	12	1200	1300	
	16	1600	1700	
	20	2000	2100	

Forward Conduction

Parameter		IRKD600..	Units	Conditions			
I _{F(AV)}	Maximum average forward current @ Case temperature	600	A	180° conduction, half sine wave			
		100	°C				
I _{F(RMS)}	Maximum RMS forward current	942	A	180° conduction, half sine wave @ T _C = 100°C			
I _{FSM}	Maximum peak, one-cycle forward, non-repetitive surge current	19.0	KA	t = 10ms	No voltage	Sinusoidal half wave, Initial T _J = T _J max.	
		t = 8.3ms		reapplied			
		t = 10ms		100% V _{RRM}			
		t = 8.3ms		reapplied			
I ² t	Maximum I ² t for fusing	1805	KA ² s	t = 10ms	No voltage		Initial T _J = T _J max.
		1683		t = 8.3ms	reapplied		
		1319		t = 10ms	100% V _{RRM}		
		1230		t = 8.3ms	reapplied		
I ² √t	Maximum I ² √t for fusing	18050	KA ² √s	t = 0.1 to 10ms, no voltage reapplied			
V _{F(TO)1}	Low level value of threshold voltage	0.70	V	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.			
V _{F(TO)2}	High level value of threshold voltage	0.77		(I > π × I _{F(AV)}), T _J = T _J max.			
r _{f1}	Low level value of forward slope resistance	0.28	mΩ	(16.7% × π × I _{F(AV)} < I < π × I _{F(AV)}), T _J = T _J max.			
r _{f2}	High level value of forward slope resistance	0.25		(I > π × I _{F(AV)}), T _J = T _J max.			
V _{FM}	Maximum forward voltage drop	1.24	V	I _{pk} = 1800A, T _J = 25°C, t _p = 10ms sine pulse			

Blocking

Parameter	IRKD600..	Units	Conditions
V_{INS} RMS isolation voltage	3000	V	t = 1 s
I_{RRM} Maximum peak reverse and off-state leakage current	50	mA	$T_J = T_J$ max., rated V_{RRM} applied

Thermal and Mechanical Specifications

Parameter	IRKD600..	Units	Conditions
T_J Max. junction operating temperature range	- 40 to 150	°C	
T_{stg} Max. storage temperature range	- 40 to 150		
R_{thJC} Max. thermal resistance, junction to case	0.065	K/W	Per junction, DC operation
R_{thC-hs} Max. thermal resistance, case to heatsink	0.02	K/W	
T Mounting torque $\pm 10\%$ SMAP to heatsink busbar to SMAP	6 - 8	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
	12 - 15		
wt Approximate weight	1500	g	
Case style	SUPER MAGN-A-pak		See outline table

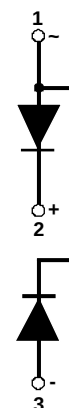
ΔR_{thJC} Conduction

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

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.009	0.006	K/W	$T_J = T_J \text{ max.}$
120°	0.011	0.011		
90°	0.014	0.015		
60°	0.021	0.022		
30°	0.037	0.038		

Ordering Information Table

Device Code				
1	2	3	4	
IRK	D	600	-	20
(1)	(2)	(3)	(4)	
1 - Module type				
2 - Circuit configuration D = 2 diodes in series				
3 - Current rating				
4 - Voltage code: Code x 100 = V_{RRM} (See Voltage Ratings Table)				



IRKD600.. Series

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Outline Table

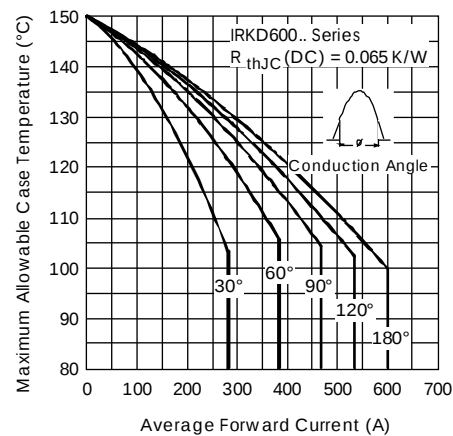
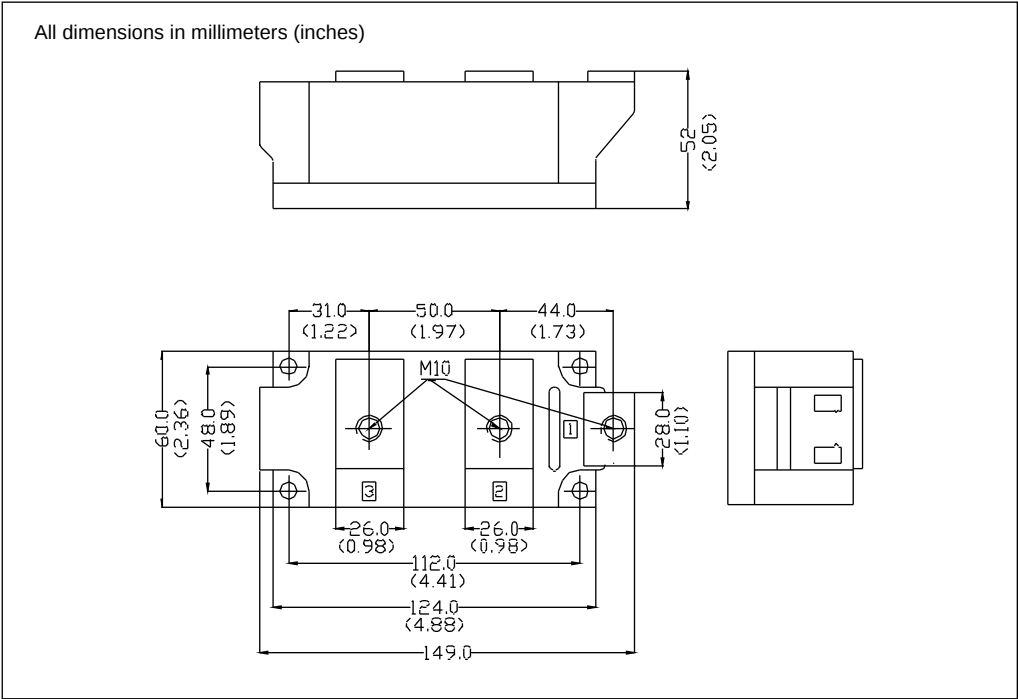


Fig. 1 - Current Ratings Characteristics

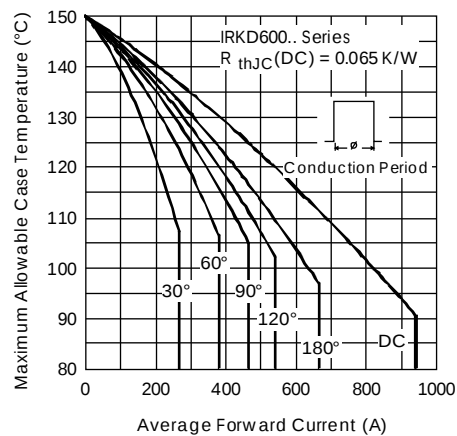


Fig. 2 - Current Ratings Characteristics

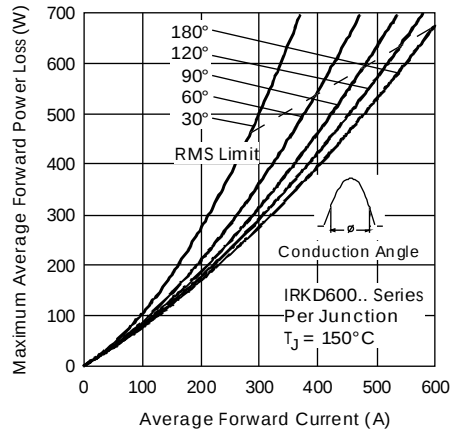


Fig. 3 - Forward Power Loss Characteristics

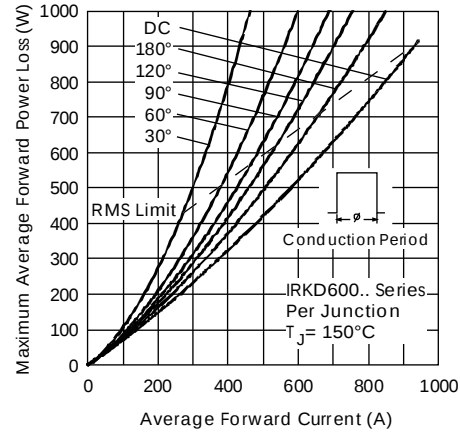


Fig. 4 - Forward Power Loss Characteristics

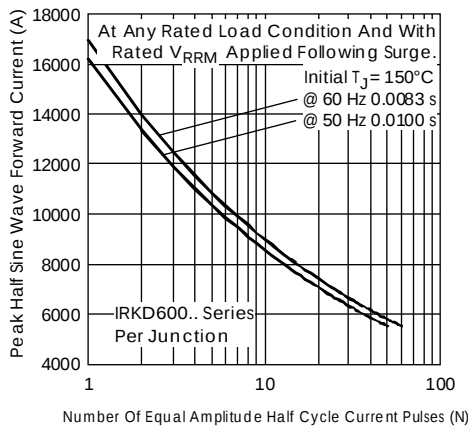


Fig. 5 - Maximum Non-Repetitive Surge Current

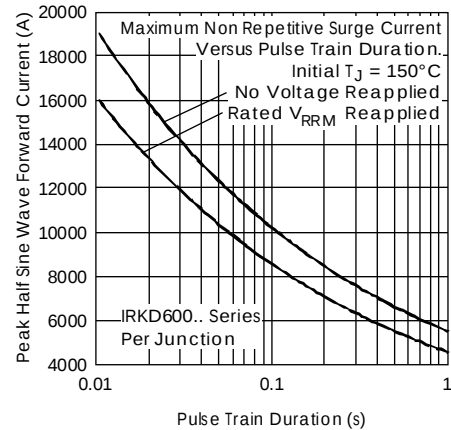


Fig. 6 - Maximum Non-Repetitive Surge Current

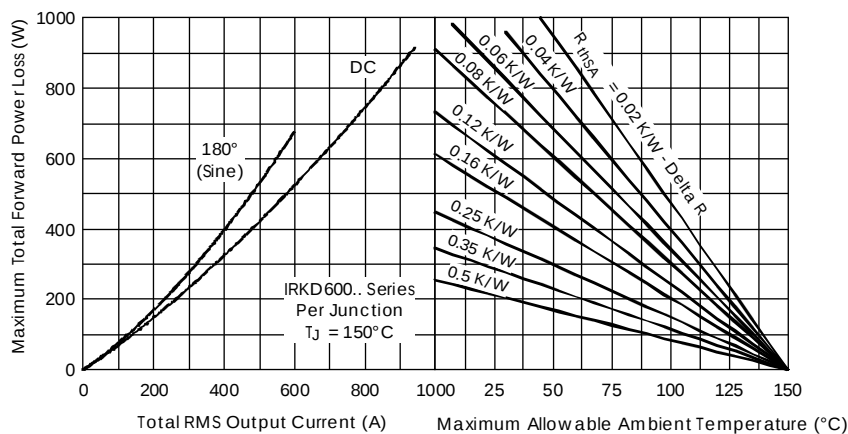


Fig. 7 - Forward Power Loss Characteristics

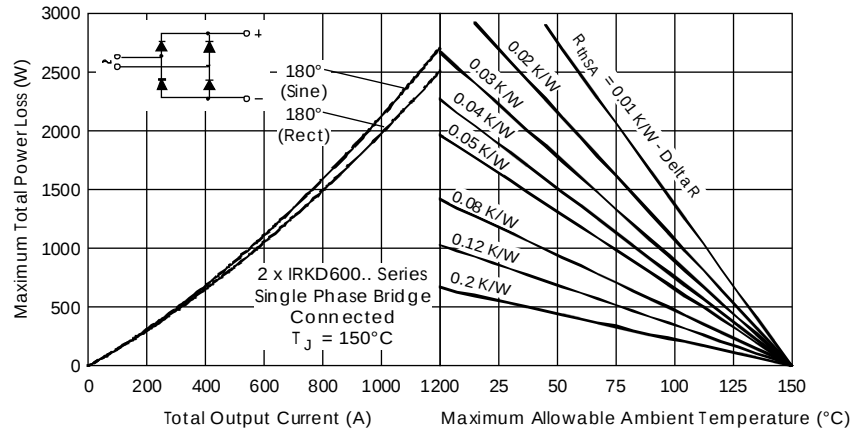


Fig. 8 - Forward Power Loss Characteristics

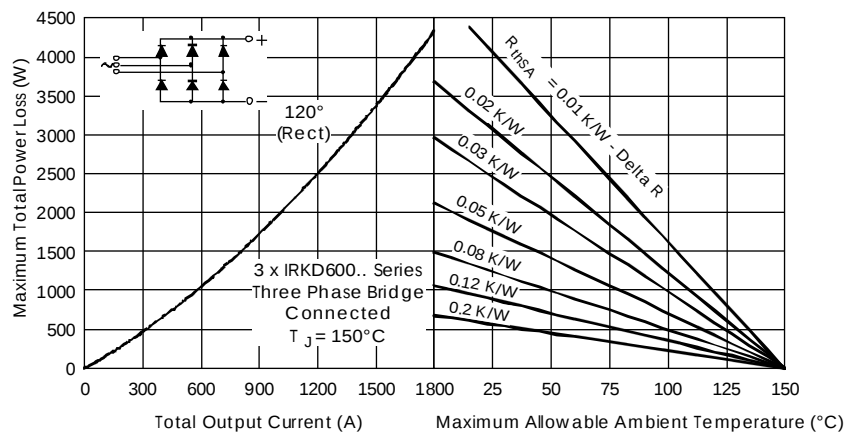


Fig. 9 - Forward Power Loss Characteristics

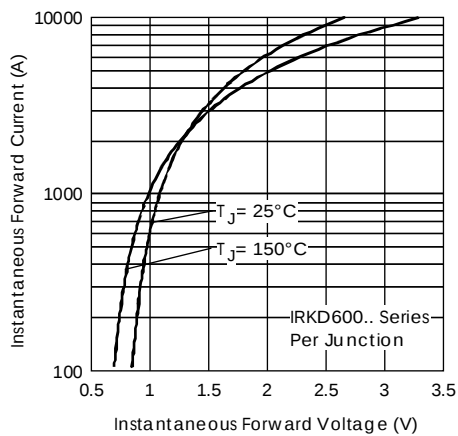


Fig. 10 - Forward Voltage Drop Characteristics

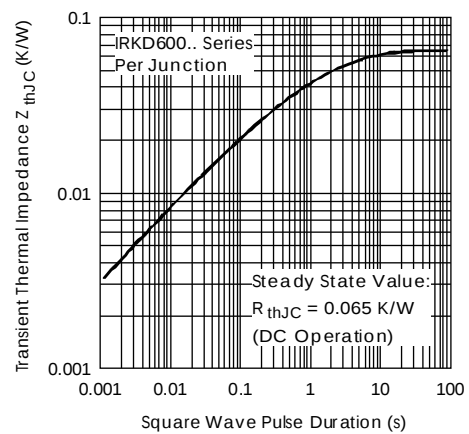


Fig. 11 - Thermal Impedance Z_{thJC} Characteristic