

International IOR Rectifier

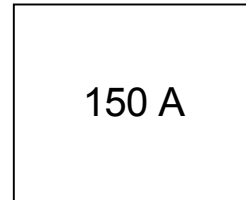
IRKT152/04

THYRISTOR/ THYRISTOR

INT-A-pak™ Power Module

Features

- Electrically Isolated by DBC Ceramic (Al₂O₃)
- 3500 V_{RMS} Isolating Voltage
- Industrial Standard Package
- High Surge Capability
- Glass Passivated Chips
- Simple Mounting
- UL E78996 approved 



Applications

- Battery Charges
- Welders
- Power Converters

Major Ratings and Characteristics

Parameters	IRKT152/04	Units
I _{T(AV)}	150	A
@ T _C	85	°C
I _{T(RMS)}	330	A
I _{TSM} @ 50Hz	4000	KA ² s
@ 60Hz	4200	
i ² t @ 50Hz	80	KA ² /s
@ 60Hz	73	
i ² √t	800	KA ² /√s
V _{RRM}	400	V
T _{STG} range	-40 to 150	°C
T _J range	-40 to 125	

CASE STYLE NEW INT-A-PAK



ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	V_{RRM}/V_{DRM} , Maximum repetitive peak reverse voltage V	V_{RSM}/V_{DSM} , Maximum non-repetitive peak reverse voltage V	I_{RRM}/I_{DRM} @ 125°C mA
IRKT152/04	400	500	50

On-state Conduction

Parameter	IRKT152/04	Units	Conditions
$I_{T(AV)}$ Max. average on-state current @ Case temperature	150	A	180° conduction half sine wave
	85	°C	
$I_{T(RMS)}$ Maximum RMS on-state current	330	A	as AC switch
I_{TSM} Maximum peak, one-cycle on-state, non-repetitive surge current	4000	A	t = 10ms No voltage
	4200		t = 8.3ms reapplied
	3350		t = 10ms 100% V_{RRM}
	3500		t = 8.3ms reapplied
I^2t Maximum I^2t for fusing	80	KA ² s	t = 10ms No voltage
	73		t = 8.3ms reapplied
	56		t = 10ms 100% V_{RRM}
	51		t = 8.3ms reapplied
$I^2\sqrt{t}$ Maximum $I^2\sqrt{t}$ for fusing	800	KA ² √s	t = 0.1 to 10ms, no voltage reapplied
$V_{T(TO)}$ Value of threshold voltage	0.82	V	@ T_J max.
r_t On-state slope resistance	1.44	mΩ	
V_{TM} Maximum on-state voltage drop	1.44	V	$I_{pk} = 470A$, $T_J = 25^\circ C$
I_H Maximum Holding Current	200	mA	$T_J = 25^\circ C$, anode supply = 6V, resistive load, gate open circuit
I_L Maximum Latching Current	400		$T_J = 25^\circ C$, anode supply = 6V, resistive load

Switching

Parameter	Value	Units	Conditions
t_{gd} Typical delay time	1	μs	$T_J = 25^\circ C$ Gate Current=1A $di/dt=1A/\mu s$
t_{gr} Typical rise time	2		$T_J = 25^\circ C$ $V_d=0,67\% V_{DRM}$
t_q Typical turn-off time	50 - 200		$I_{TM} = 300 A$; $-di/dt = 15 A/\mu s$; $T_J = T_J \text{ max}$ $V_f = 50 V$; $dV/dt = 20 V/\mu s$; Gate 0 V, 100Ω

Blocking

Parameter	Value	Units	Conditions
I_{RRM} Maximum peak reverse and off-state leakage current	50	mA	$T_J = 125^\circ C$
I_{DRM}			
V_{INS} RMS isolation voltage	3500	V	50Hz, circuit to base, all terminals shorted, t = 1s
dV/dt critical rate of rise of off-state voltage	1000	V/μs	$T_J = T_J \text{ max.}$, exponential to 67% rated V_{DRM}

Triggering

Parameter	IRKT152/04	Units	Conditions
P_{GM} Max. peak gate power	12	W	$t_p \leq 5ms, T_J = T_{Jmax}$.
$P_{G(AV)}$ Max. average gate power	3	W	$f=50Hz, T_J = T_{Jmax}$.
I_{GM} Max. peak gate current	3	A	$t_p \leq 5ms, T_J = T_{Jmax}$.
$-V_{GT}$ Max. peak negative gate voltage	10	V	
V_{GT} Max. required DC gate voltage to trigger	4	V	$T_J = -40^\circ C$ $T_J = 25^\circ C$ $T_J = T_{Jmax}$. Anode supply = 6V, resistive load; $R_a = 1\Omega$
	2.5		
	1.7		
I_{GT} Max. required DC gate current to trigger	270	mA	$T_J = -40^\circ C$ $T_J = 25^\circ C$ $T_J = T_{Jmax}$. Anode supply = 6V, resistive load; $R_a = 1\Omega$
	150		
	80		
V_{GD} Max. gate voltage that will not trigger	0.3	V	@ $T_J = T_{Jmax}$., rated V_{DRM} applied
I_{GD} Max. gate current that will not trigger	10	mA	
di/dt Max. rate of rise of turned-on current	300	A/ μs	@ $T_J = T_{Jmax}$., $I_{TM} = 400A$ rated V_{DRM} applied

Thermal and Mechanical Specifications

Parameter	IRKT152/04	Units	Conditions
T_J Max. junction operating temperature range	-40 to 125	$^\circ C$	
T_{stg} Max. storage temperature range	-40 to 150	$^\circ C$	
R_{thJC} Max. thermal resistance, junction to case	0.18	K/W	DC operation, per junction
R_{thCS} Max. thermal resistance, case to heatsink	0.05	K/W	Mounting surface smooth, flat and greased Per module
T Mounting torque $\pm 10\%$	IAP to heatsink 4 to 6 busbar to IAP 4 to 6	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. Lubricated threads.
wt Approximate weight	200 (7.1)		
Case Style	New Int-A-Pak		

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	Sinusoidal conduction @ T_J max.					Rectangular conduction @ T_J max.					Units
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
IRKT152/04	0.007	0.010	0.013	0.016	0.017	0.009	0.012	0.014	0.016	0.017	K/W

IRKT152/04

Bulletin I27122 rev. C 04/02

Ordering Information Table

Device Code				
IRK	T	152	/	04
①	②	③		④
1	- Module Type			
2	- Circuit Configuration			
3	- Current Rating: $I_{T(AV)}$			
4	- Voltage Code: Code x 100 = V_{RRM}			

Outline Table

Technical drawing showing the outline of the IRKT152/04 module. The drawing includes a top view, a side view, and a detail view of the terminal block. Dimensions are provided in millimeters and inches.

Top View Dimensions:

- Total width: 94 [3.70"]
- Distance between screw centers: 66 [2.60"]
- Distance from left edge to first screw center: 17 [0.67"]
- Distance between screw centers: 23 [0.91"]
- Distance between screw centers: 23 [0.91"]
- Distance from last screw center to right edge: 5 [0.20"]
- Distance from left edge to terminal block center: 35 [1.38"]
- Terminal block width: 14.5 [0.57"]
- Terminal block height: 2.8x0.8 [0.11x0.03"]

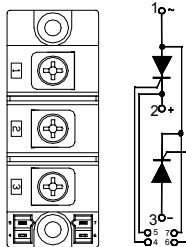
Side View Dimensions:

- Total height: 30 [1.18"]
- Distance from top surface to terminal block top: 9 [0.33"]
- Terminal block height: 7 [0.28"]
- Distance from terminal block top to bottom surface: 28 [1.10"]
- Distance from terminal block top to bottom surface: 29 [1.15"]
- Terminal block diameter: $\phi 6.5$ [0.25" DIA]
- Terminal block length: 80 [3.15"]

Detail View Dimensions:

- Terminal block width: 37 [1.44"]

All dimensions are in millimeters



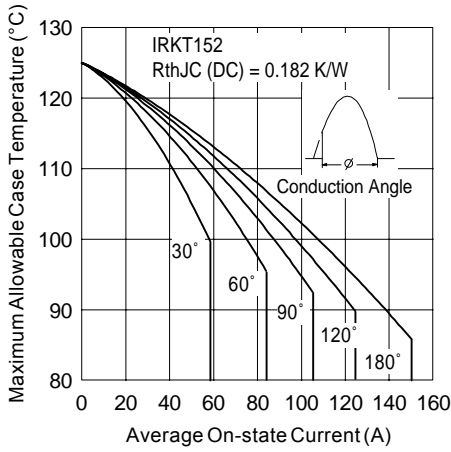


Fig. 1 - Current Ratings Characteristics

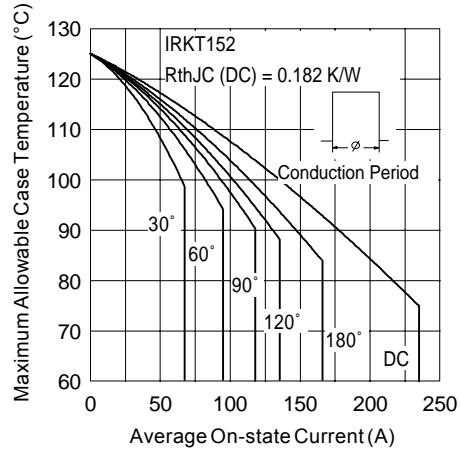


Fig. 2 - Current Ratings Characteristics

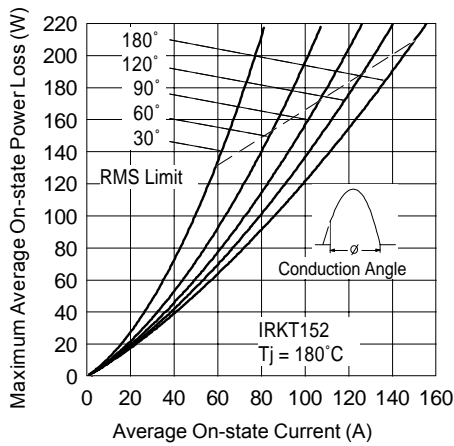


Fig. 3 - Forward Power Loss Characteristics

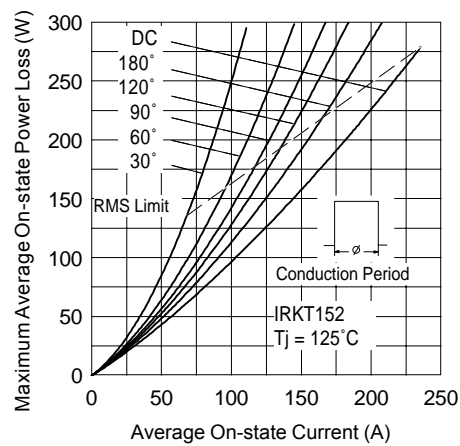


Fig. 4 - Forward Power Loss Characteristics

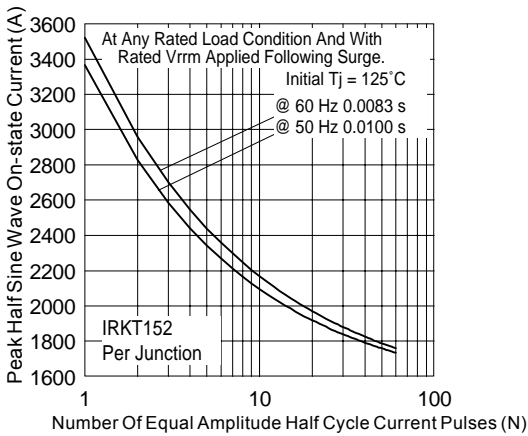


Fig. 5 - Maximum Non-Repetitive Surge Current

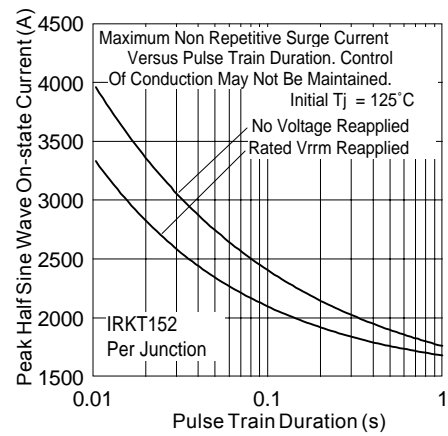


Fig. 6 - Maximum Non-Repetitive Surge Current

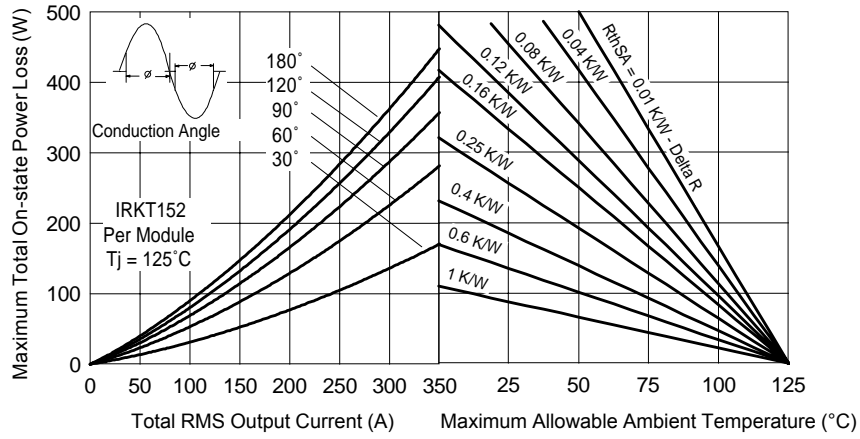


Fig.7 - On State Power Loss Characteristics

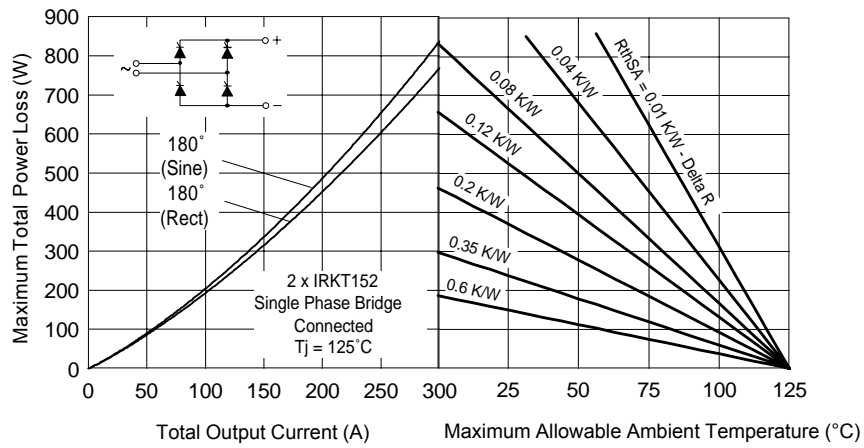


Fig.8 - On State Power Loss Characteristics

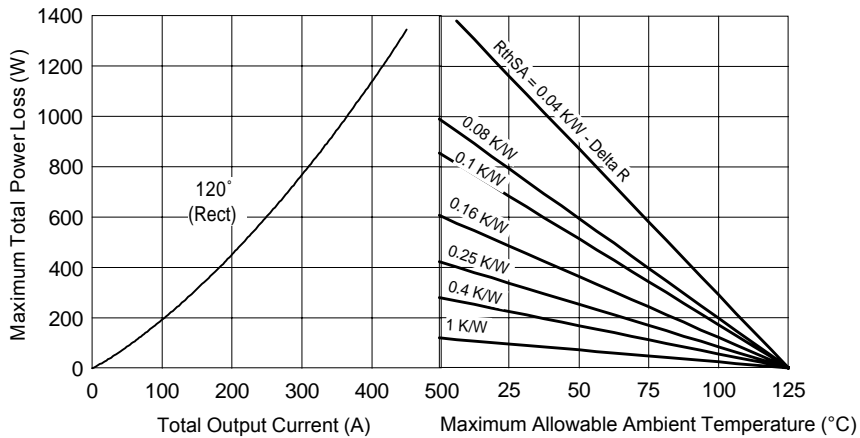


Fig.9 - On State Power Loss Characteristics

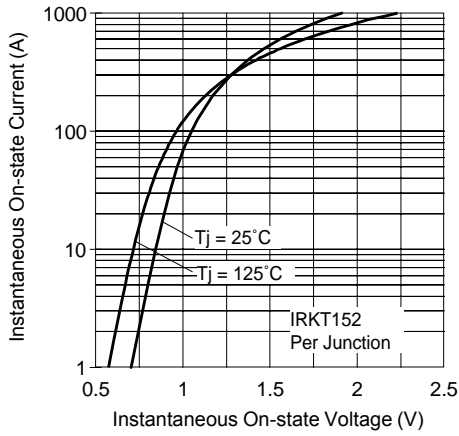


Fig. 10 - On-State Voltage Drop Characteristics

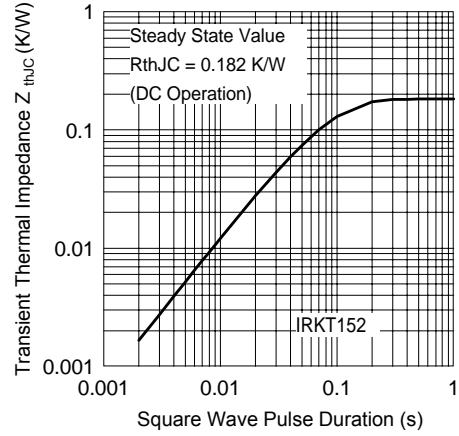


Fig. 11 - Thermal Impedance ZthJC Characteristics

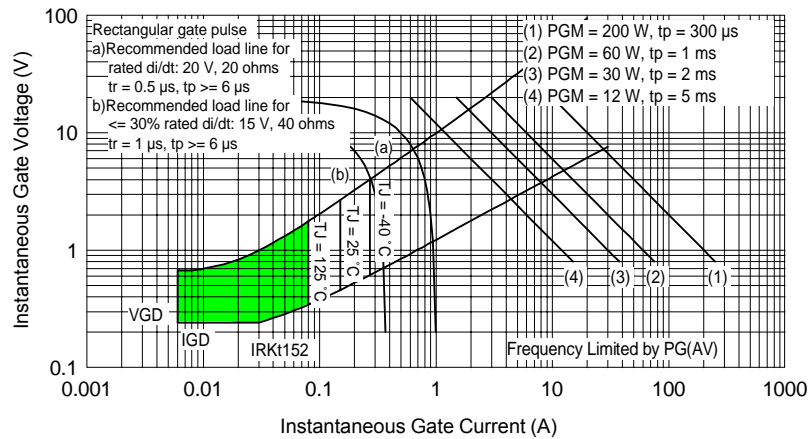


Fig. 12 - Gate Characteristics

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

This datasheet has been download from:

www.datasheetcatalog.com

Datasheets for electronics components.