

Target Data 05/01

# International IOR Rectifier

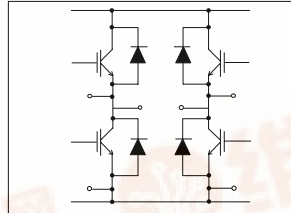
## 25MT060WF

"FULL-BRIDGE" IGBT MTP

Warp Speed IGBT

### Features

- Gen. 4 Warp Speed IGBT Technology
- HEXFRED™ Antiparallel Diodes with UltraSoft Reverse Recovery
- Very Low Conduction and Switching Losses
- Optional SMT Thermystor Inside
- Aluminum Nitride DBC
- Very Low Stray Inductance Design for High Speed Operation



$V_{CES} = 600V$   
 $V_{CE(on) typ.} = 2.2V @$   
 $V_{GE} = 15V, I_C = 25A$   
 $T_C = 25^\circ C$

### Benefits

- Optimized for Welding, UPS and SMPS Applications
- Operating Frequencies > 20 kHz Hard Switching, >200 kHz Resonant Mode
- Low EMI, requires Less Snubbing
- Direct Mounting to Heatsink
- PCB Solderable Terminals
- Very Low Junction-to-Case Thermal Resistance

### Absolute Maximum Ratings

Parameters	Max	Units
$V_{CES}$ Collector-to-Emitter Voltage	600	V
$I_C$ Continuous Collector Current	@ $T_C = 25^\circ C$	50
	@ $T_C = 100^\circ C$	25
$I_{CM}$ Pulsed Collector Current	200	
$I_{LM}$ Peak Switching Current	200	
$I_F$ Diode Continuous Forward Current	@ $T_C = 100^\circ C$	25
$I_{FM}$ Peak Diode Forward Current	200	
$V_{GE}$ Gate-to-Emitter Voltage	$\pm 20$	V
$V_{ISOL}$ RMS Isolation Voltage, Any Terminal to Case, t = 1 min	2500	
$P_D$ Maximum Power Dissipation	@ $T_C = 25^\circ C$	900
	@ $T_C = 100^\circ C$	400

**Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

Parameters	Min	Typ	Max	Units	Test Conditions
V <sub>(BR)CES</sub> Collector-to-Emitter Breakdown Voltage	600			V	V <sub>GE</sub> = 0V, I <sub>C</sub> = 250μA
V <sub>CE(on)</sub> Collector-to-Emitter Voltage		1.85			V <sub>GE</sub> = 15V, I <sub>C</sub> = 25A
		1.7			V <sub>GE</sub> = 15V, I <sub>C</sub> = 25A, T <sub>J</sub> = 150°C
V <sub>GE(th)</sub> Gate Threshold Voltage	3		6		I <sub>C</sub> = 250μA
ΔV <sub>GE(th)</sub> /ΔT <sub>J</sub> Temperature Coeff. of Threshold Voltage		-		mV/°C	V <sub>GE</sub> = V <sub>CE</sub> , I <sub>C</sub> = 500μA
g <sub>fe</sub> Forward Transconductance		40		S	V <sub>CE</sub> = 100V, I <sub>C</sub> = 25A
I <sub>CES</sub> Collector-to-Emitter Leaking Current			250	μA	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 600V
			5000		V <sub>GE</sub> = 0V, V <sub>CE</sub> = 600V, T <sub>J</sub> = 150°C
V <sub>FM</sub> Diode Forward Voltage Drop		1.3		V	I <sub>F</sub> = 25A, V <sub>GE</sub> = 0V
		1.2			I <sub>F</sub> = 25A, V <sub>GE</sub> = 0V, T <sub>J</sub> = 150°C
I <sub>GES</sub> Gate-to-Emitter Leakage Current			± 100	nA	V <sub>GE</sub> = ± 20V

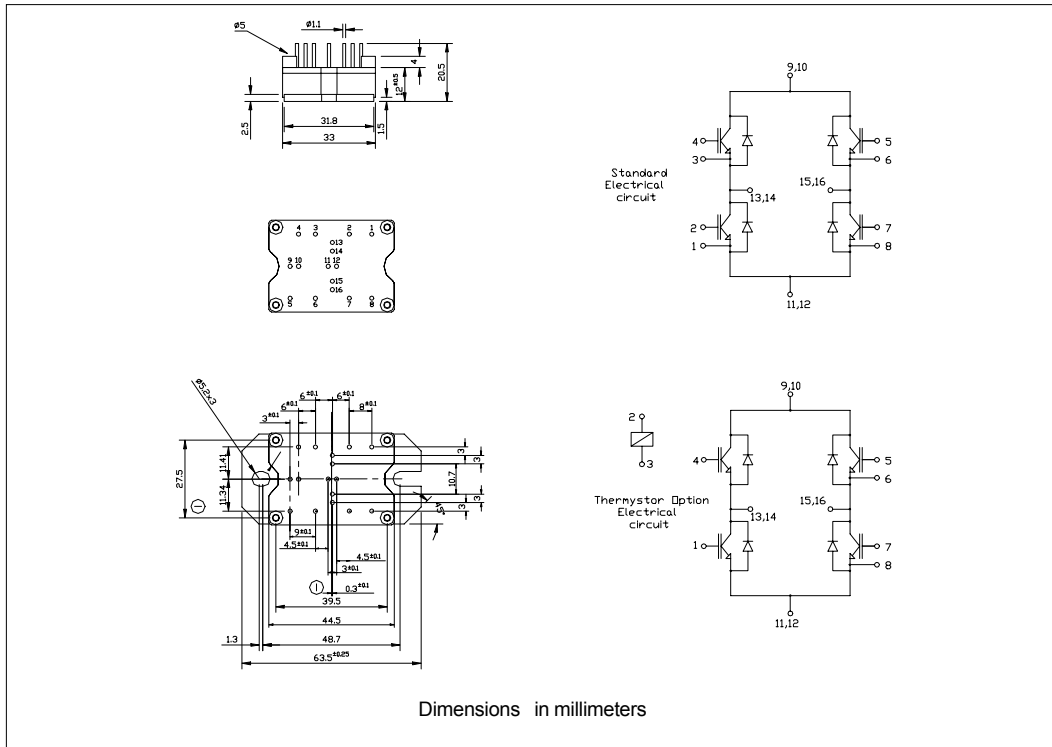
**Switching Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

Parameters	Min	Typ	Max	Units	Test Conditions
Q <sub>g</sub> Total Gate Charge (turn-on)		180		nC	I <sub>C</sub> = 25A
Q <sub>ge</sub> Gate-Emitter Charge (turn-on)		25			V <sub>CC</sub> = 400V
Q <sub>gc</sub> Gate-Collector Charge (turn-on)		63			V <sub>GE</sub> = 15V
E <sub>on</sub> Turn-On Switching Loss		950		μJ	R <sub>g1</sub> = R <sub>g2</sub> = 5Ω, I <sub>C</sub> = 25A
E <sub>off(1)</sub> Turn-Off Switching Loss		320			V <sub>CC</sub> = 480V
E <sub>ts(1)</sub> Total Switching Loss		1270			V <sub>GE</sub> = ±15V
C <sub>ies</sub> Input Capacitance		4000		pF	V <sub>GE</sub> = 0V
C <sub>oes</sub> Output Capacitance		260			V <sub>CC</sub> = 30V
C <sub>res</sub> Reverse Transfer Capacitance		68			f = 1.0 MHz
t <sub>rr</sub> Diode Reverse Recovery Time		50		ns	V <sub>R</sub> = 200V, I <sub>C</sub> = 25A
I <sub>rr</sub> Diode Peak Reverse Current		4.5		A	di/dt = 200A/μs
Q <sub>rr</sub> Diode Recovery Charge		112		nC	
di <sub>(rec)</sub> /dt During t <sub>b</sub> Diode Peak Rate of Fall of Recovery		250		A/μs	

**Thermal- Mechanical Specifications**

Parameters	Min	Typ	Max	Units
T <sub>J</sub> Operating Junction Temperature Range	- 40		150	°C
T <sub>STG</sub> Storage Temperature Range	- 40		125	
R <sub>thJC</sub> Junction-to-Case	IGBT		0.7	°C/ W
	Diode		0.9	
R <sub>thCS</sub> Case-to-Sink	Module	0.06		
(Heatsink Compound Thermal Conductivity = 1 W/mK)				
Weight		66		g

**Outline Table**



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