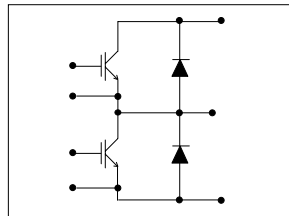


Features

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



$$V_{CES} = 600V$$

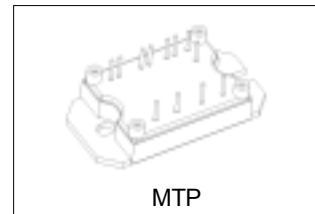
$$V_{CE(on) typ.} = 2.3V @$$

$$V_{GE} = 15V, I_C = 50A$$

$$T_C = 25^{\circ}C$$

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	@ $T_C = 25^{\circ}C$	A
		@ $T_C = 100^{\circ}C$	
I_{CM}	Pulsed Collector Current	350	
I_{LM}	Peak Switching Current	350	
I_F	Diode Continuous Forward Current	@ $T_C = 100^{\circ}C$	
I_{FM}	Peak Diode Forward Current	200	
V_{GE}	Gate-to-Emitter Voltage	± 20	V
V_{ISOL}	RMS Isolation Voltage, Any Terminal to Case, $t = 1$ min	2500	
P_D	Maximum Power Dissipation	@ $T_C = 25^{\circ}C$	W
		@ $T_C = 100^{\circ}C$	

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
$V_{(BR)CES}$ Collector-to-Emitter Breakdown Voltage	600			V	$V_{GE} = 0V, I_C = 250\mu A$
$V_{CE(on)}$ Collector-to-Emitter Voltage		1.93			$V_{GE} = 15V, I_C = 50A$
		2.25			$V_{GE} = 15V, I_C = 110A$
		1.71			$V_{GE} = 15V, I_C = 50A, T_J = 150^\circ\text{C}$
$V_{GE(th)}$ Gate Threshold Voltage	3		6		$I_C = 0.5mA$
$\Delta V_{GE(th)}/\Delta T_J$ Temperature Coeff. of Threshold Voltage		- 11		mV/ $^\circ\text{C}$	$V_{CE} = V_{GE}, I_C = 500\mu A$
g_{fe} Forward Transconductance		66		S	$V_{CE} = 25V, I_C = 75A$
I_{CES} Collector-to-Emitter Leaking Current			0.5	mA	$V_{GE} = 0V, V_{CE} = 600V$
			10		$V_{GE} = 0V, V_{CE} = 600V, T_J = 150^\circ\text{C}$
V_{FM} Diode Forward Voltage Drop		1.95		V	$I_F = 50A, V_{GE} = 0V$
		1.9			$I_F = 50A, V_{GE} = 0V, T_J = 150^\circ\text{C}$
I_{GES} Gate-to-Emitter Leakage Current			± 200	nA	$V_{GE} = \pm 20V$

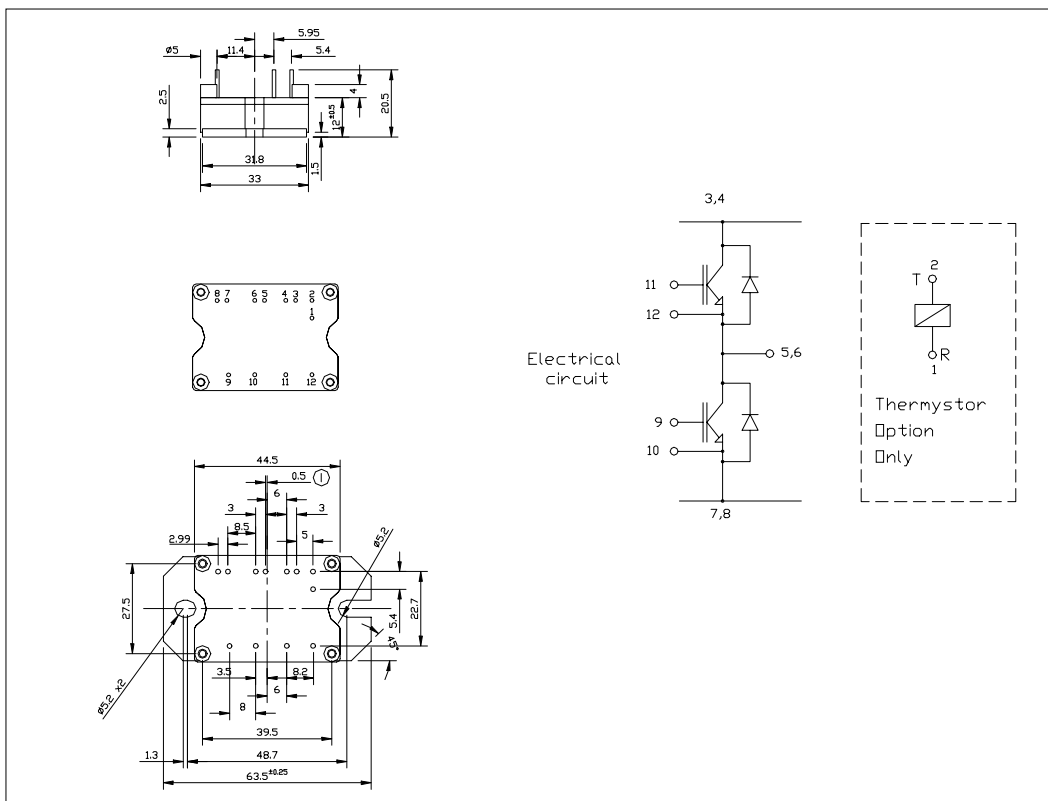
Switching Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
Q_g Total Gate Charge (turn-on)		360		nC	$I_C = 50A$ $V_{CC} = 400V$ $V_{GE} = 15V$
Q_{ge} Gate-Emitter Charge (turn-on)		50			
Q_{gc} Gate-Collector Charge (turn-on)		130			
E_{on} Turn-On Switching Loss		2		mJ	$R_{g1} = R_{g2} = 10\Omega$ (internal resistors) $I_C = 50A, V_{CC} = 480V, V_{GE} = 15V$ Energy losses include tail and diode reverse recovery
$E_{off(1)}$ Turn-Off Switching Loss		1			
$E_{ts(1)}$ Total Switching Loss		3			
C_{ies} Input Capacitance		7100		pF	$V_{GE} = 0V$ $V_{CC} = 30V$ $f = 1.0\text{ MHz}$
C_{oes} Output Capacitance		510			
C_{res} Reverse Transfer Capacitance		140			
t_{rr} Diode Reverse Recovery Time		50		ns	$V_{CC} = 200V, I_C = 25A$ $di/dt = 200A/\mu s$
I_{rr} Diode Peak Reverse Current		4.5		A	
Q_{rr} Diode Recovery Charge		112		nC	
$di_{(rec)}/dt$ Diode Peak Rate of Fall of Recovery During t_b		250		A/ μs	

Thermal- Mechanical Specifications

Parameters	Min	Typ	Max	Units
T_J Operating Junction Temperature Range	- 40		150	$^\circ\text{C}$
T_{STG} Storage Temperature Range	- 40		125	
R_{thJC} Junction-to-Case	IGBT		0.45	$^\circ\text{C}/W$
	Diode		0.7	
R_{thCS} Case-to-Sink (Heatsink Compound Thermal Conductivity = 1 W/mK)	Module	0.06		
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.

International
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