Target Data 05/01

International
IOR Rectifier

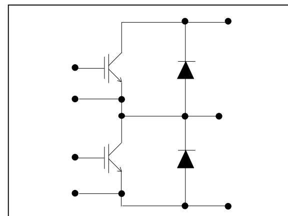
40MT120UH

"HALF-BRIDGE" IGBT MTP

UltraFast NPT IGBT

Features

- UltraFast Non Punch Through (NPT) Technology
- Positive $V_{CE(ON)}$ Temperature Coefficient
- 10µs Short Circuit Capability
- HEXFRED™ Antiparallel Diodes with UltraSoft Reverse Recovery
- Low Diode V_F
- Square RBSOA
- Aluminum Nitride DBC
- Optional SMT Thermystor Inside
- Very Low Stray Inductance Design for High Speed Operation

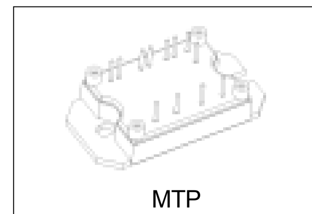


V_{CES} = 1200V

$V_{CE(on)\ typ.}$ = 3.1V @

V_{GE} = 15V, I_C = 40A

T_C = 25°C



MTP

Benefits

- Optimized for Welding, UPS and SMPS Applications
- Rugged with UltraFast Performance
- Benchmark Efficiency above 20KHz
- Outstanding ZVS and Hard Switching Operation
- Low EMI, requires Less Snubbing
- Excellent Current Sharing in Parallel Operation
- 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		1200	V
I_C	Continuos Collector Current	@ T_C = 25°C	80	A
		@ T_C = 100°C	40	
I_{CM}	Pulsed Collector Current		200	
I_{LM}	Peak Switching Current		200	
I_F	Diode Continuous Forward Current	@ T_C = 100°C	20	
I_{FM}	Peak Diode Forward Current		120	
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°C	800	W
		@ T_C = 100°C	330	

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameters	Min	Typ	Max	Units	Test Conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	1200			V	V_{GE} = 0V, I_C = 250μA
$V_{CE(on)}$	Collector-to-Emitter Voltage		3.1			V_{GE} = 15V, I_C = 40A
			3.9			V_{GE} = 15V, I_C = 40A, T_J = 125°C
$V_{GE(th)}$	Gate Threshold Voltage	4.4		6		I_C = 0.5mA
$\Delta V_{GE(th)}/\Delta T_J$	Temperature Coeff. of Threshold Voltage		-		mV/°C	
g_{fe}	Forward Transconductance		-		S	
I_{CES}	Collector-to-Emitter Leaking Current			250	μA	V_{GE} = 0V, V_{CE} = 1200V
V_{FM}	Diode Forward Voltage Drop		2.0		V	I_F = 40A, V_{GE} = 0V
			2.35			I_F = 40A, V_{GE} = 0V, T_J = 125°C
I_{GES}	Gate-to-Emitter Leakage Current			±200	nA	V_{GE} = ± 20V

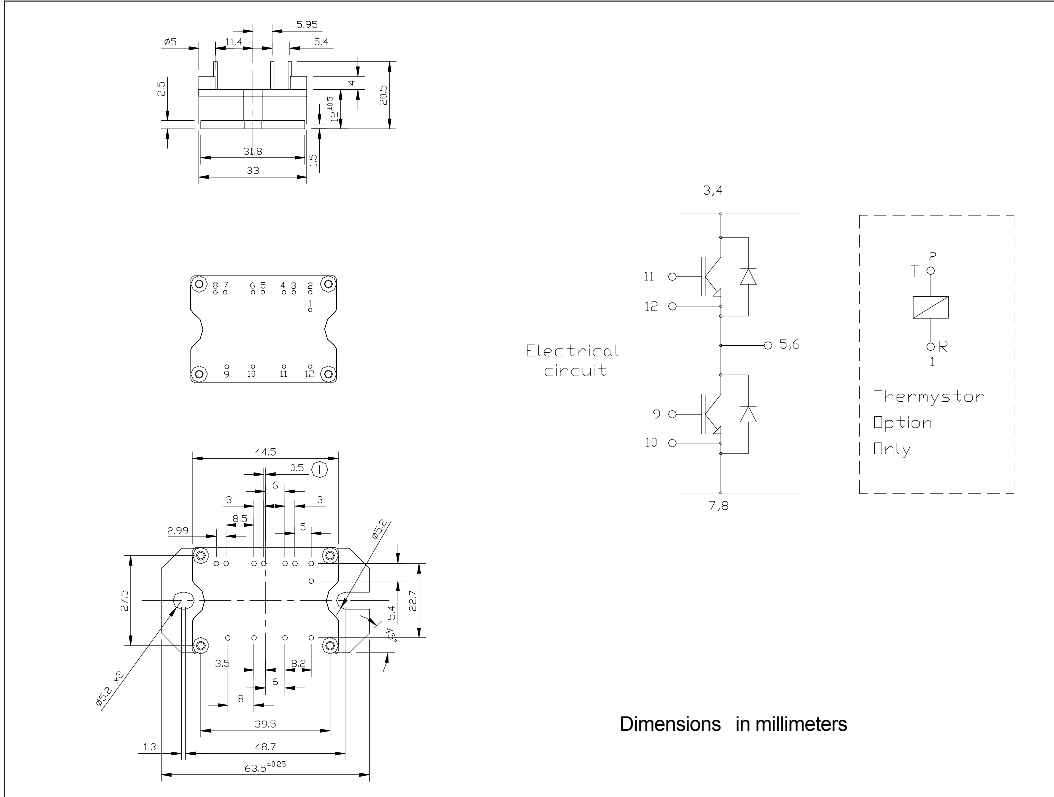
Switching Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameters	Min	Typ	Max	Units	Test Conditions
Q_g	Total Gate Charge (turn-on)		395		nC	I_C = 40A
Q_{ge}	Gate-Emitter Charge (turn-on)		56			V_{CC} = 600V
Q_{gc}	Gate-Collector Charge (turn-on)		190			V_{GE} = 15V
E_{on}	Turn-On Switching Loss		1500		μJ	T_J = 125°C
E_{off}	Turn-Off Switching Loss		1220			Energy losses include tail and diode reverse
E_{tot}	Total Switching Loss		2720			recovery
E_{on}	Turn-On Switching Loss		950			T_J = 25°C
E_{off}	Turn-Off Switching Loss		850			Energy losses include tail and diode reverse
E_{tot}	Total Switching Loss		1800			recovery
C_{ies}	Input Capacitance		5100		pF	V_{GE} = 0V
C_{oes}	Output Capacitance		490			V_{CC} = 30V
C_{res}	Reverse Transfer Capacitance		200			f = 1.0 MHz
E_{rec}	Reverse Recovery Energy of the Diode		1600		μJ	T_J = 125°C
trr	Diode Reverse Recovery Time		300		ns	V_{CC} = 600V, I_C = 40A
Irr	Peak Reverse Recovery Current		32		A	V_{GE} = 15V, R_g = 5Ω, L = 200μH

Thermal- Mechanical Specifications

	Parameters		Min	Typ	Max	Units
T_J	Operating Junction Temperature Range		- 40		150	°C
T_{STG}	Storage Temperature Range		- 40		125	
R_{thJC}	Junction-to-Case	IGBT			0.35	°C/ W
		Diode			0.9	
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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