Target Data 05/01

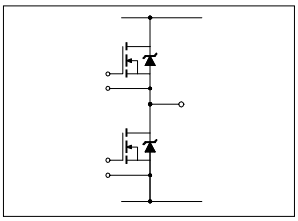
International
IOR Rectifier

29MT050XH

"HALF-BRIDGE" FREDFET MTP HEXFET® Power MOSFET

Features

- Low On-Resistance
- High Performance Optimised Built-in Fast Recovery Diodes
- Fully Characterized Capacitance and Avalanche Voltage and Current
- Optional SMT Thermystor Inside
- Aluminum Nitride DBC
- Very Low Stray Inductance Design for High Speed Operation



V_{DSS} = 500V

$R_{DS(on)\ typ.}$ = 0.087Ω

I_D = 46A

@ T_C = 25°C

MTP

Benefits

- Low Gate Charge Qg results in Simple Drive Requirement
- Improved Gate, Avalanche and Dynamic dv/dt Ruggedness
- Low Trr and Soft Diode Reverse Recovery
- Optimized for Welding, UPS and SMPS Applications
- Outstanding ZVS and High Frequency Operation
- Direct Mounting to Heatsink
- PCB Solderable Terminals
- Very Low Junction-to-Case Thermal Resistance

Absolute Maximum Ratings

	Parameters		Max	Units
I_D	Continuos Drain Current @ V_{GS} = 10V	@ T_C = 25°C	46	A
		@ T_C = 100°C	29	
I_{DM}	Pulsed Drain Current (1)		180	
P_D	Maximum Power Dissipation	@ T_C = 25°C	800	W
		@ T_C = 100°C	320	
V_{GS}	Gate-to-Source Voltage		± 30	V
V_{ISOL}	RMS Isolation Voltage, Any Terminal to Case, t = 1 min		2500	
dv/dt	Peak Diode Recovery dv/dt (3)		25	V/ ns

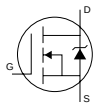
Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameters	Min	Typ	Max	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	500			V	V_{GS} = 0V, I_C = 250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Temperature Coeff. of Breakdown Voltage		0.6		V/°C	I_D = 1mA, reference to T_J = 25°C
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance		0.087		Ω	V_{GS} = 15V, I_D = 28A (4)
$V_{GS(th)}$	Gate Threshold Voltage	3		5	V	V_{DS} = V_{GS}, I_D = 250µA
I_{DSS}	Drain-to-Source Leakage Current			50	µA	V_{DS} = 500V, V_{GS} = 0V
				2	mA	V_{DS} = 400V, V_{GS} = 0V, T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage			100	nA	V_{GS} = 30V
	Gate-to-Source Reverse Leakage			-100		V_{GS} = - 30V

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

	Parameters	Min	Typ	Max	Units	Test Conditions
g_{fs}	Forward Transconductance	21			S	V_{DS} = 50V, I_D = 46A
Q_g	Total Gate Charge			380	nC	I_D = 46A
Q_{gs}	Gate-to-Source Charge			80		V_{DS} = 400V
Q_{gd}	Gate-to-Drain ("Miller") Charge			190		V_{GS} = 10V (4)
C_{iss}	Input Capacitance		8110		pF	V_{GS} = 0V
C_{oss}	Output Capacitance		960			V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance		130			f = 1.0 MHz
C_{oss}	Output Capacitance		11200			V_{GS} = 0V, V_{DS} = 1.0V, f = 1.0 MHz
C_{oss}	Output Capacitance		240			V_{GS} = 0V, V_{DS} = 400V, f = 1.0 MHz
C_{oss} eff.	Effective Output Capacitance		420			V_{GS} = 0V, V_{DS} = 0V to 400V (5)

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

	Parameters	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)			46	A	MOSFET symbol showing the integral reverse p-n junction diode 
I_{SM}	Pulsed Source Current (Body Diode) (1)			180		
V_{SD}	Diode Forward Voltage			1.5	V	T_J = 25°C, I_S = 46A, V_{GS} = 0V (4)
t_{rr}	Reverse Recovery Time		170		ns	T_J = 25°C, I_F = 46A
Q_{rr}	Reverse Recovery Charge		0.8		µC	di/dt = 100A/µs (4)
I_{RRM}	Reverse Recovery Current		8.4		A	

Notes:

(1) Repetitive rating; pulse width limited by max. junction temperature

(2) Starting T_J = 25°C, L = 0.86mH, R_G = 25Ω I_{AS} = 46A

(3) I_{SD} ≤ 46A, di/dt ≤ 367A/µs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

(4) Pulse width ≤ 400µs; duty cycle ≤ 2%

(5) C_{oss} eff. is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 to 80% V_{DSS}

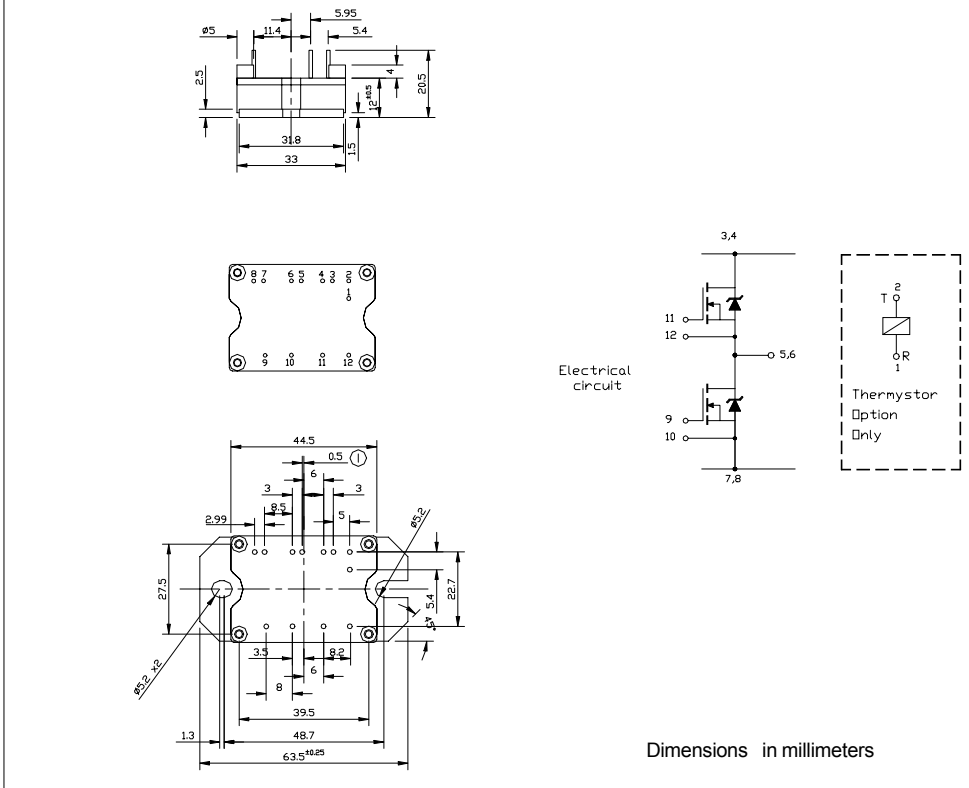
Thermal- Mechanical Specifications

	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			0.35	°C/ W
R_{thCS}	Case-to-Sink (Heatsink Compound Thermal Conductivity = 1 W/mK)		0.06		
	Weight		66		g

Avalanche Characteristics

	Parameters		Min	Typ	Max	Units
E_{AS}	Single Pulse Avalanche Energy	(2)			920	mJ
I_{AR}	Avalanche Current	(1)			46	A
E_{AR}	Repetitive Avalanche Energy	(1)			54	mJ

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
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 05/01