Littelfuse
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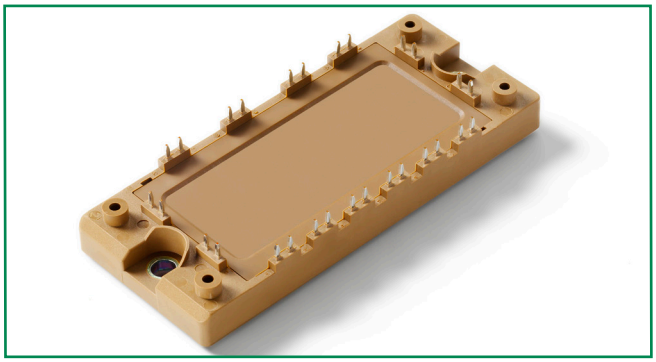
Power Module
1200V 25A IGBT Module

MG1225H-XN2MM

RoHS



Features

- High level of integration
- IGBT³ CHIP(Trench+Field Stop technology)
- Low saturation voltage and positive temperature coefficient
- Fast switching and short tail current
- Free wheeling diodes with fast and soft reverse recovery
- Solderable pins for PCB mounting
- Temperature sense included

Applications

- AC motor control
- Motion/servo control
- Inverter and power supplies

Module Characteristics (T_J = 25°C, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
$T_{J\,max}$	Max. Junction Temperature				150	°C
$T_{J\,op}$	Operating Temperature		-40		125	°C
T_{stg}	Storage Temperature		-40		125	°C
V_{isol}	Insulation Test Voltage	AC, t=1min		3000		V
CTI	Comparative Tracking Index		250			
M_d	Mounting Torque	Recommended (M5)	2.5		5	N·m
Weight				180		g

Absolute Maximum Ratings (T_J = 25°C, unless otherwise specified)

Symbol	Parameters	Test Conditions	Values	Unit
IGBT				
V_{CES}	Collector - Emitter Voltage	T_J=25°C	1200	V
V_{GES}	Gate - Emitter Voltage		±20	V
I_C	DC Collector Current	T_C=25°C	40	A
		T_C=80°C	25	A
I_{CM}	Repetitive Peak Collector Current	t_p=1ms	50	A
P_{tot}	Power Dissipation Per IGBT		147	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	T_J=25°C	1200	V
$I_{F(AV)}$	Average Forward Current	T_C=25°C	35	A
		T_C=80°C	25	A
I_{FRM}	Repetitive Peak Forward Current	t_p=1ms	50	A
I^2t		T_J =125°C, t=10ms, V_R=0V	200	A^2s

Electrical and Thermal Specifications (T_J = 25°C, unless otherwise specified)

Symbol	Parameters	Test Conditions		Min	Typ	Max	Unit
IGBT							
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	V_{CE}=V_{GE}, I_C=1mA		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	I_C=25A, V_{GE}=15V, T_J=25°C			1.7		V
		I_C=25A, V_{GE}=15V, T_J=125°C			1.9		V
I_{ICES}	Collector Leakage Current	V_{CE}=1200V, V_{GE}=0V, T_J=25°C				0.1	mA
		V_{CE}=1200V, V_{GE}=0V, T_J=125°C				1	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±15V, T_J=125°C		-400		400	nA
R_{Gint}	Integrated Gate Resistor				8.0		Ω
Q_{ge}	Gate Charge	V_{CE}=600V, I_C=25A , V_{GE}=±15V			0.24		μC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			1.81		nF
C_{res}	Reverse Transfer Capacitance				0.08		nF
$t_{d(on)}$	Turn - on Delay Time	V_{CC}=600V I_C=25A R_G =36Ω V_{GE}=±15V Inductive Load	T_J=25°C		90		ns
			T_J=125°C		90		ns
t_r	Rise Time		T_J=25°C		30		ns
			T_J=125°C		50		ns
$t_{d(off)}$	Turn - off Delay Time		T_J=25°C		420		ns
			T_J=125°C		520		ns
t_f	Fall Time		T_J=25°C		70		ns
			T_J=125°C		90		ns
E_{on}	Turn - on Energy		T_J=25°C		2.4		mJ
			T_J=125°C		3.5		mJ
E_{off}	Turn - off Energy		T_J=25°C		1.8		mJ
			T_J=125°C		2.1		mJ
I_{SC}	Short Circuit Current	t_{psc}≤10μS , V_{GE}=15V; T_J=125°C , V_{CC}=900V			100		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)					0.85	K/W
Diode							
V_F	Forward Voltage	I_F=25A, V_{GE}=0V, T_J =25°C			1.55		V
		I_F=25A, V_{GE}=0V, T_J =125°C			1.54		V
t_{RR}	Reverse Recovery Time	I_F=25A, V_R=600V di_F/dt=-400A/μs T_J=125°C			200		ns
I_{RRM}	Max. Reverse Recovery Current				20		A
E_{rec}	Reverse Recovery Energy				1.5		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)					1.4	K/W

NTC Characteristics (T_J = 25°C, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
R_{25}	Resistance	T_c=25°C		5		KΩ
$B_{25/50}$				3375		K

Figure 1: Typical Output Characteristics for IGBT Inverter

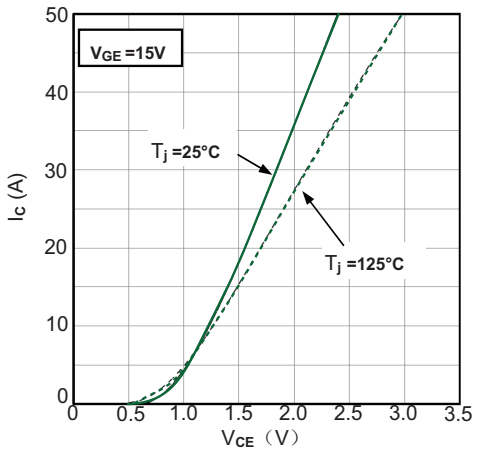


Figure 2: Typical Output Characteristics for IGBT Inverter

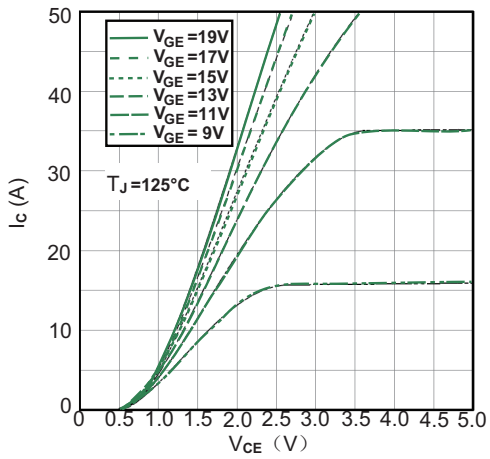


Figure 3: Typical Transfer Characteristics for IGBT Inverter

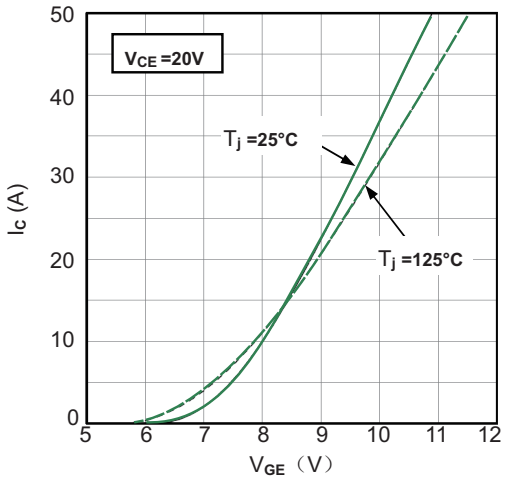


Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter

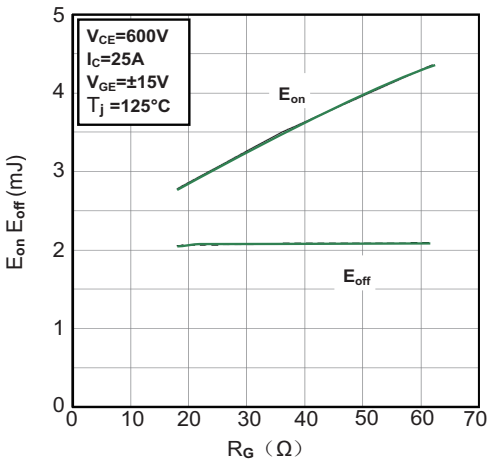


Figure 5: Switching Energy vs. Collector Current for IGBT Inverter

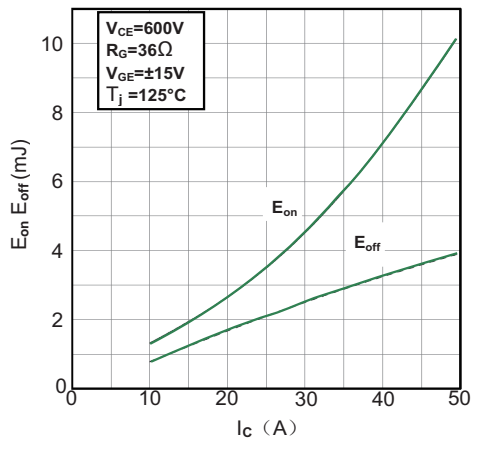


Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter

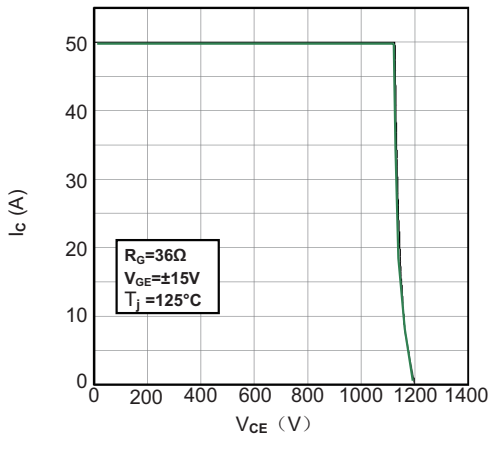


Figure 7: Diode Forward Characteristics for Diode Inverter

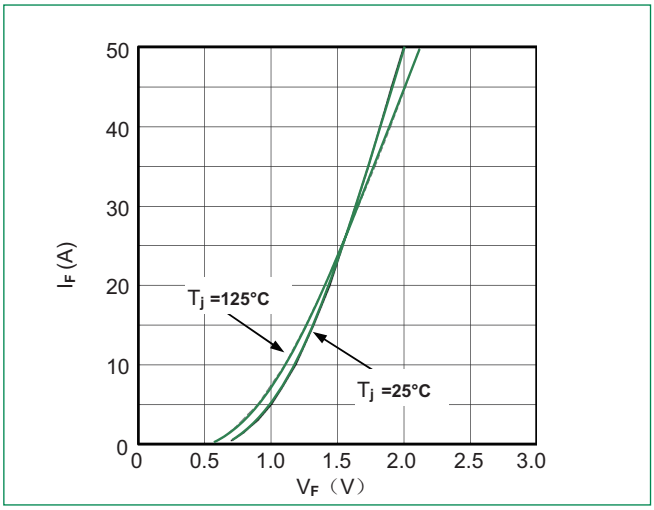


Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter

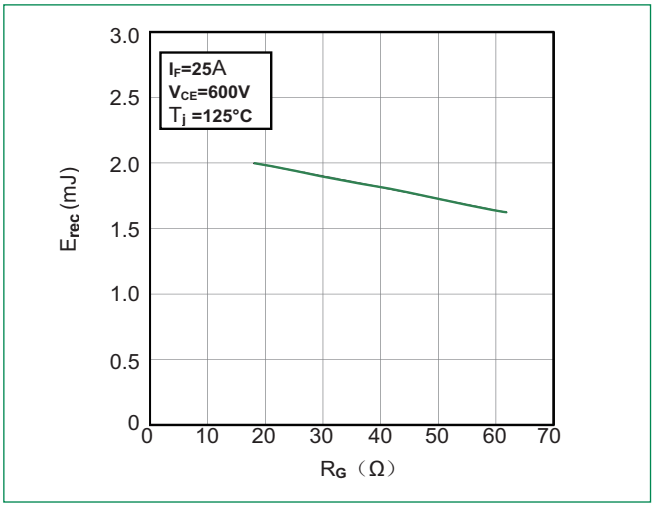


Figure 9: Switching Energy vs. Forward Current Diode-inverter

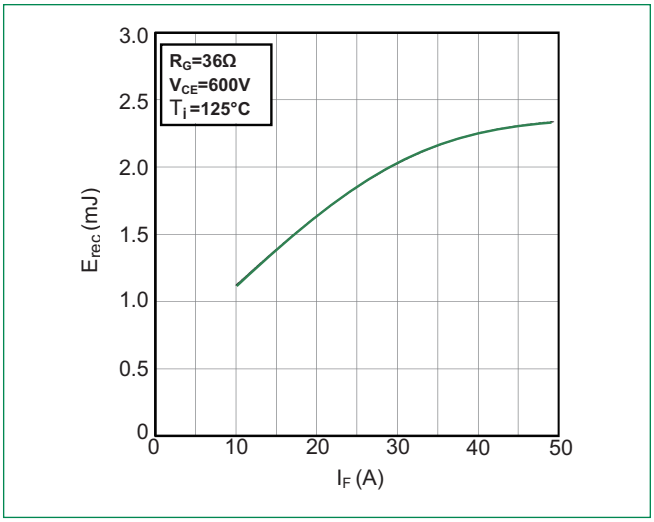


Figure 10: Transient Thermal Impedance of Diode and IGBT-inverter

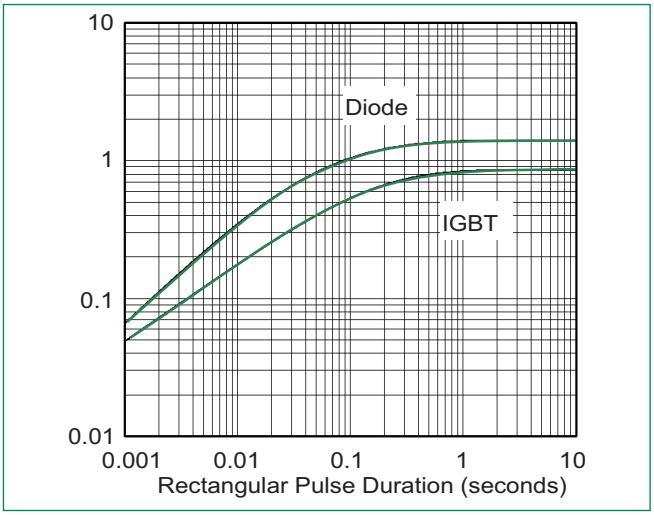
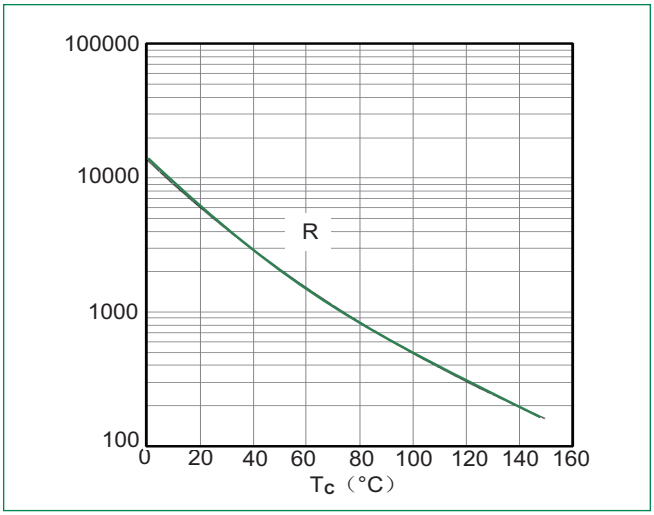
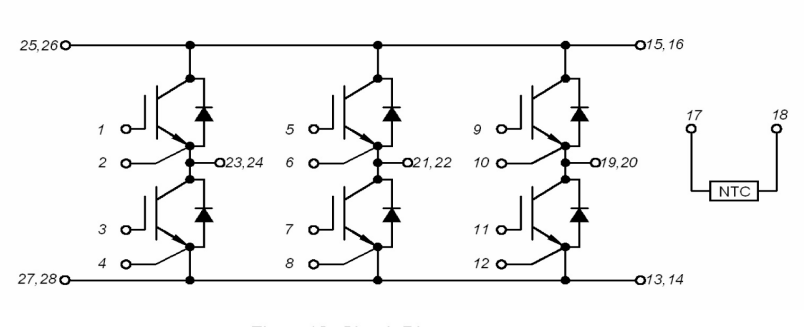


Figure 11: NTC Characteristics

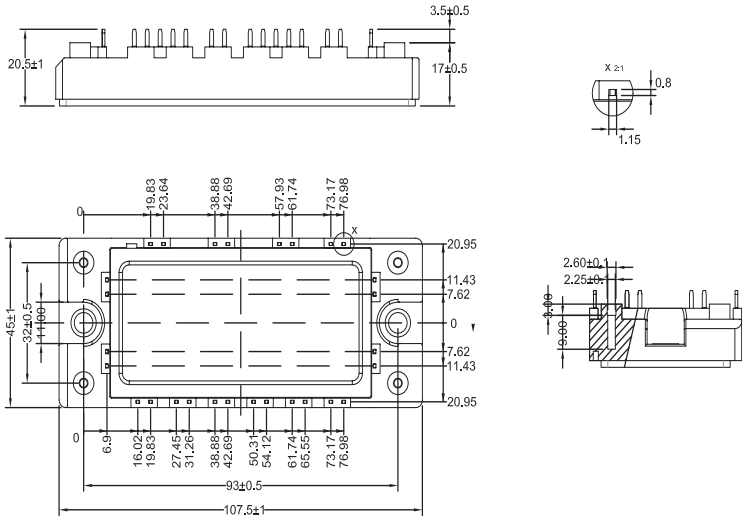


Power Module
1200V 25A IGBT Module

Circuit Diagram



Dimensions-Package H

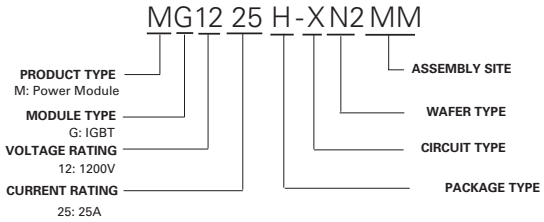


The foot pins are in gold / nickel coating

Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG1225H-XN2MM	MG1225H-XN2MM	180g	Bulk Pack	40

Part Numbering System



Part Marking System