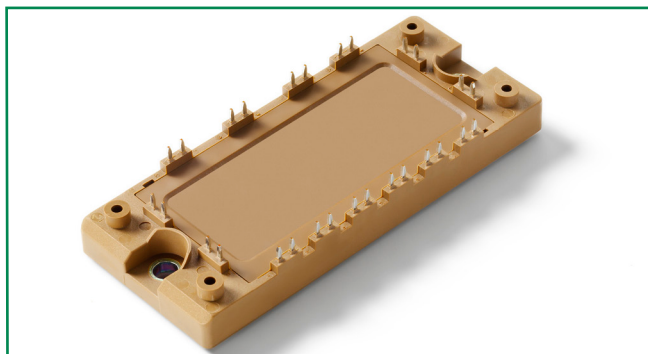


MG1225H-XN2MM

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

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
$T_{J\max}$	Max. Junction Temperature				150	$^\circ\text{C}$
$T_{J\text{op}}$	Operating Temperature		-40		125	$^\circ\text{C}$
T_{stg}	Storage Temperature		-40		125	$^\circ\text{C}$
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 ($T_J = 25^\circ\text{C}$, unless otherwise specified)

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

Power Module

1200V 25A IGBT Module

Electrical and Thermal Specifications ($T_J = 25^\circ\text{C}$, 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	I _C =25A, V _{GE} =15V, T _J =25°C		1.7		V
	Saturation Voltage	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 ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
R_{25}	Resistance	$T_c=25^\circ\text{C}$		5		K Ω
$B_{25/50}$				3375		K

Figure 1: Typical Output Characteristics for IGBT Inverter

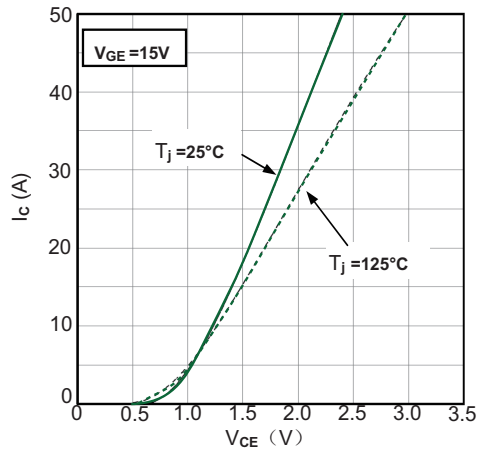


Figure 2: Typical Output Characteristics for IGBT Inverter

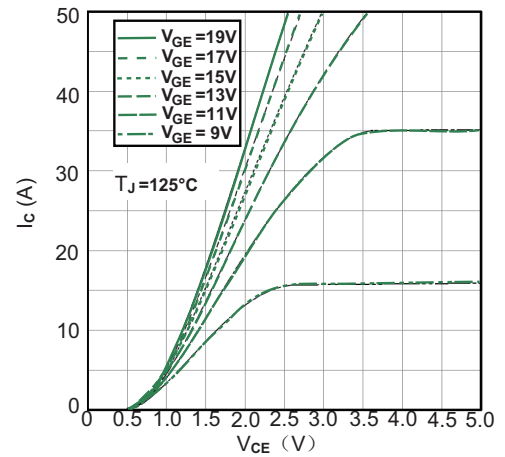


Figure 3: Typical Transfer Characteristics for IGBT Inverter

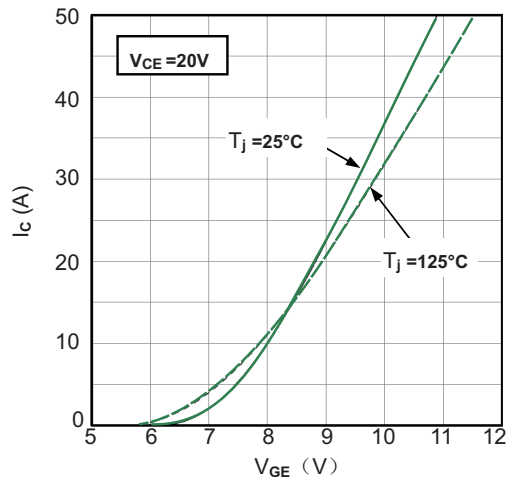


Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter

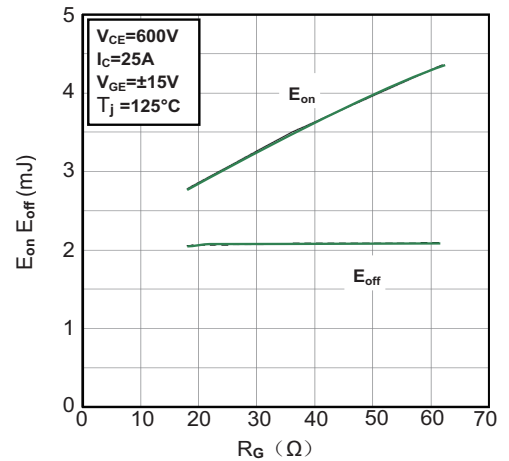


Figure 5: Switching Energy vs. Collector Current for IGBT Inverter

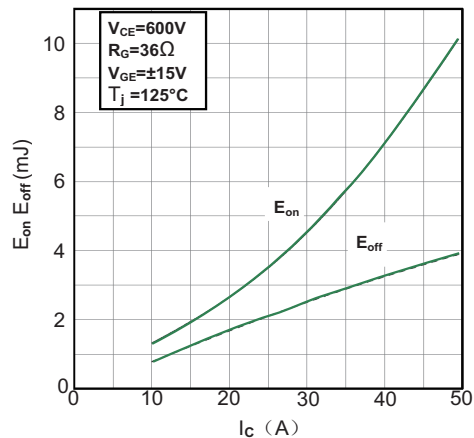


Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter

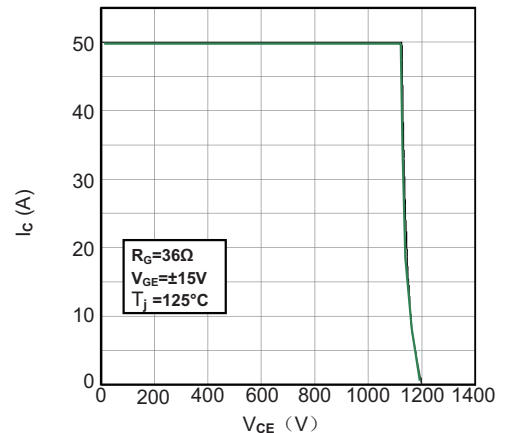


Figure 7: Diode Forward Characteristics for Diode Inverter

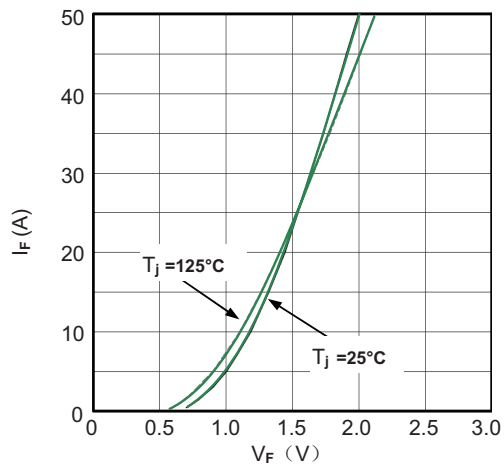


Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter

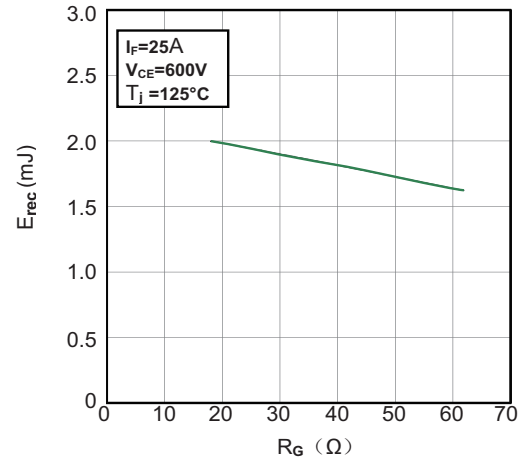


Figure 9: Switching Energy vs. Forward Current Diode-inverter

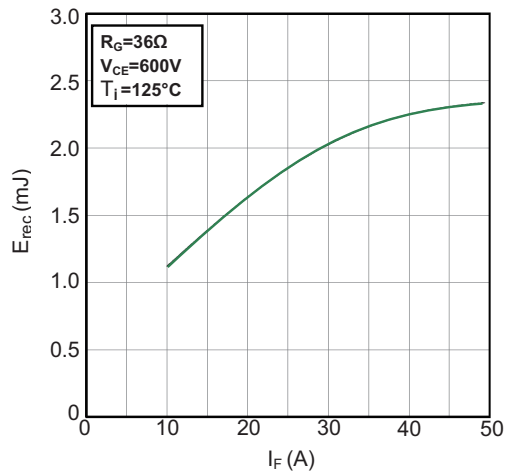


Figure 10: Transient Thermal Impedance of Diode and IGBT-inverter

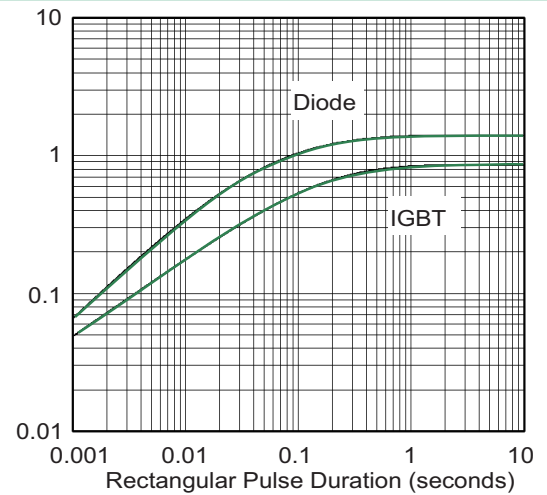
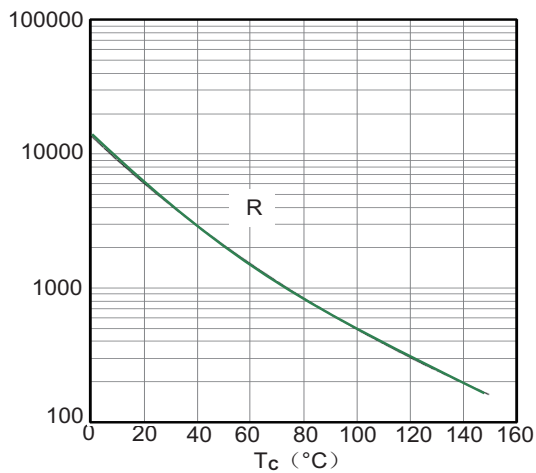


Figure 11: NTC Characteristics



Technical drawing of the 100-pin connector showing top, side, and detail views with dimensions in mm.

Top View Dimensions:

- Overall width: 20.5 ± 1
- Overall height: 17 ± 0.5
- Pin pitch: 3.5 ± 0.5
- Pin 1 location: 19.83
- Pin 20 location: 23.64
- Pin 40 location: 38.88
- Pin 60 location: 42.89
- Pin 80 location: 57.93
- Pin 100 location: 61.74
- Pin 101 location: 73.17
- Pin 102 location: 76.98

Side View Dimensions:

- Overall height: 45 ± 1
- Pin height: 11.09
- Pin 1 location: 16.02
- Pin 20 location: 19.83
- Pin 40 location: 27.45
- Pin 60 location: 31.26
- Pin 80 location: 38.88
- Pin 100 location: 50.31
- Pin 101 location: 54.12
- Pin 102 location: 61.74
- Pin 103 location: 65.55
- Pin 104 location: 73.17
- Pin 105 location: 76.98

Detail View Dimensions (X 2.1):

- Pin diameter: 2.60 ± 0.1
- Pin height: 2.25 ± 0.1
- Pin 1 location: 11.43
- Pin 20 location: 7.62
- Pin 40 location: 7.62
- Pin 60 location: 11.43

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

The diagram illustrates the structure of the part number MG12 25 H-XN2 MM. It is divided into eight fields, each with a specific meaning:

- PRODUCT TYPE**: M: Power Module
- MODULE TYPE**: G: IGBT
- VOLTAGE RATING**: 12: 1200V
- CURRENT RATING**: 25: 25A
- ASSEMBLY SITE**
- WAFER TYPE**
- CIRCUIT TYPE**
- PACKAGE TYPE**

Diagram illustrating the pin configuration and labeling for the MG1225H-XN2MM connector. The diagram shows a top view of the connector with pins numbered 1 through 25. The pins are arranged in a single row. The labels are as follows:

- MG1225H-XN2MM**: The model number, centered below the pins.
- Space reserved for QR code**: A label indicating the area reserved for a QR code, located to the right of the model number.
- LOT NUMBER**: A label indicating the lot number, located below the model number.

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