Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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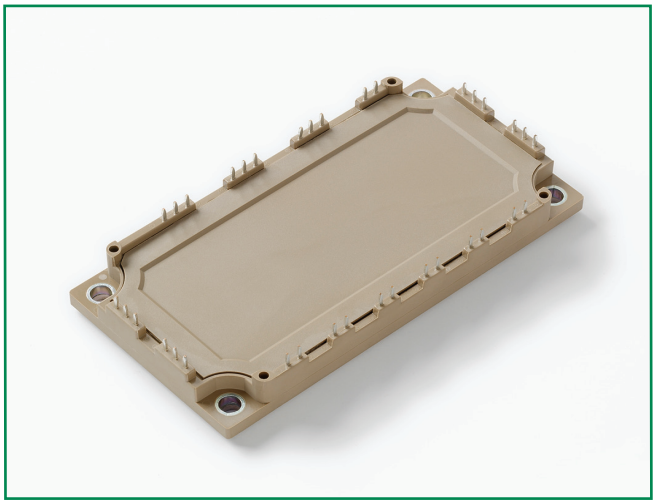
Littelfuse
Expertise Applied | Answers Delivered

Power Module
1200V 100A IGBT Module

MG12100W-XN2MM

RoHS



Features

- High level of integration
- IGBT^3 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				300		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	140	A
		T_C=80°C	100	A
I_{CM}	Repetitive Peak Collector Current	t_p=1ms	200	A
P_{tot}	Power Dissipation Per IGBT		450	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	T_J=25°C	1200	V
$I_{F(AV)}$	Average Forward Current	T_C=25°C	140	A
		T_C=80°C	100	A
I_{FRM}	Repetitive Peak Forward Current	t_p=1ms	200	A
I^2t		T_J =125°C, t=10ms, V_R=0V	1850	A^2s

Revised:12/04/14

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=4.0mA		5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	I_C=100A, V_{GE}=15V, T_J=25°C			1.7		V
		I_C=100A, 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				1	mA
		V_{CE}=1200V, V_{GE}=0V, T_J=125°C				10	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±15V, T_J=125°C		-400		400	nA
R_{Gint}	Integrated Gate Resistor				7.5		Ω
Q_{ge}	Gate Charge	V_{CE}=600V, I_C=100A , V_{GE}=±15V			0.9		μC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz			7.1		nF
C_{RES}	Reverse Transfer Capacitance				0.3		nF
$t_{d(on)}$	Turn - on Delay Time	V_{CC}=600V I_C=100A R_G =3.9Ω V_{GE}=±15V Inductive Load	T_J=25°C		260		ns
			T_J=125°C		290		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		7.8		mJ
			T_J=125°C		10		mJ
E_{off}	Turn - off Energy		T_J=25°C		8		mJ
			T_J=125°C		10		mJ
I_{SC}	Short Circuit Current	t_{psc}≤10μS , V_{GE}=15V; T_J=125°C , V_{CC}=900V			400		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)					0.28	K/W
Diode							
V_F	Forward Voltage	I_F=100A, V_{GE}=0V, T_J =25°C			1.65		V
		I_F=100A, V_{GE}=0V, T_J =125°C			1.65		V
t_{RR}	Reverse Recovery Time	I_F=100A, V_R=600V di_F/dt=2400A/μs T_J=125°C			320		ns
I_{RRM}	Max. Reverse Recovery Current				105		A
E_{rec}	Reverse Recovery Energy				9.5		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)					0.5	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

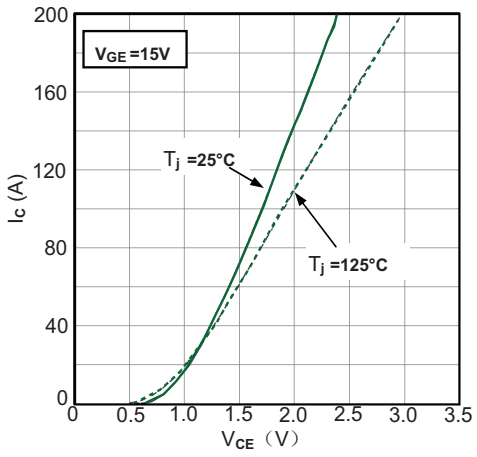


Figure 2: Typical Output Characteristics for IGBT Inverter

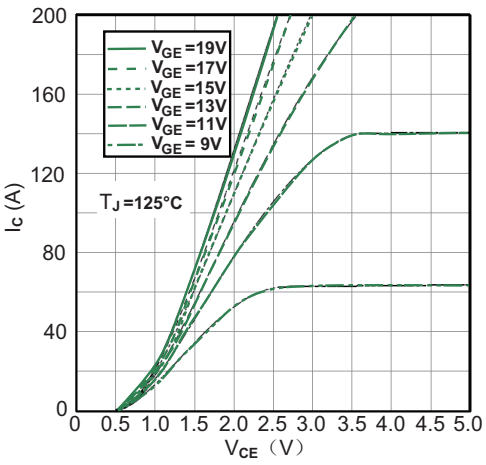


Figure 3: Typical Transfer Characteristics for IGBT Inverter

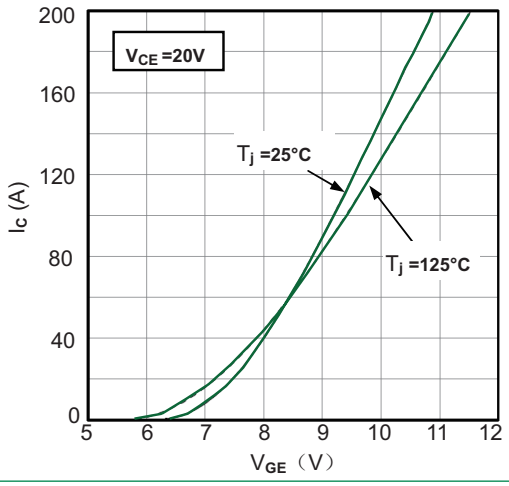


Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter

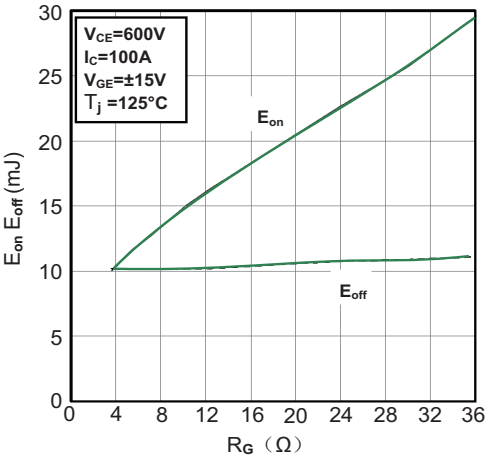


Figure 5: Switching Energy vs. Collector Current for IGBT Inverter

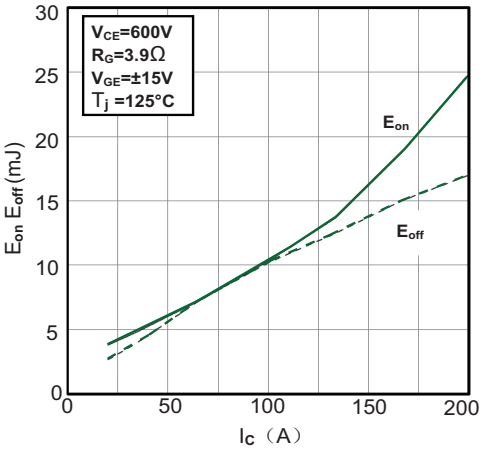


Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter

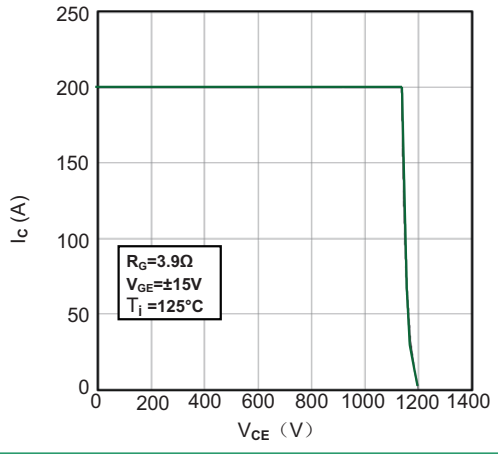


Figure 7: Diode Forward Characteristics for Diode Inverter

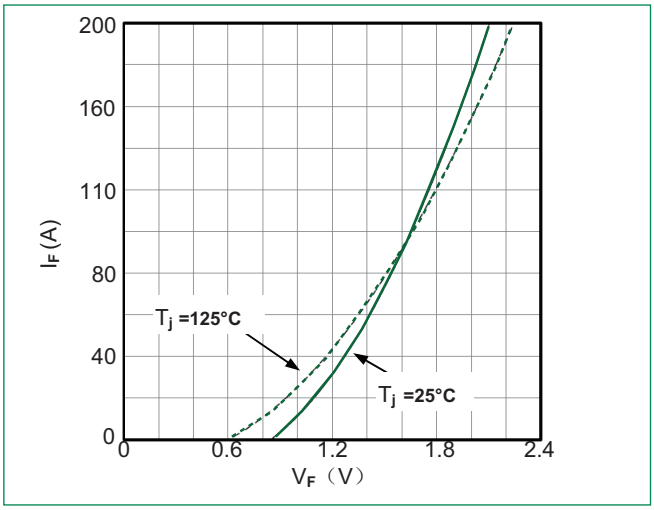


Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter

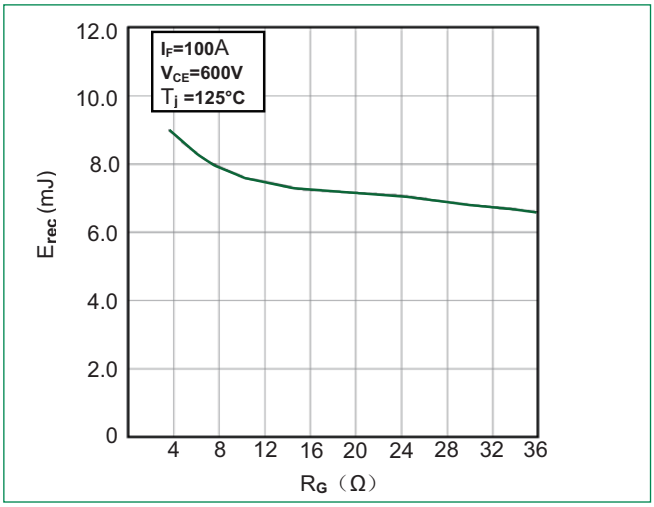


Figure 9: Switching Energy vs. Forward Current for Diode Inverter

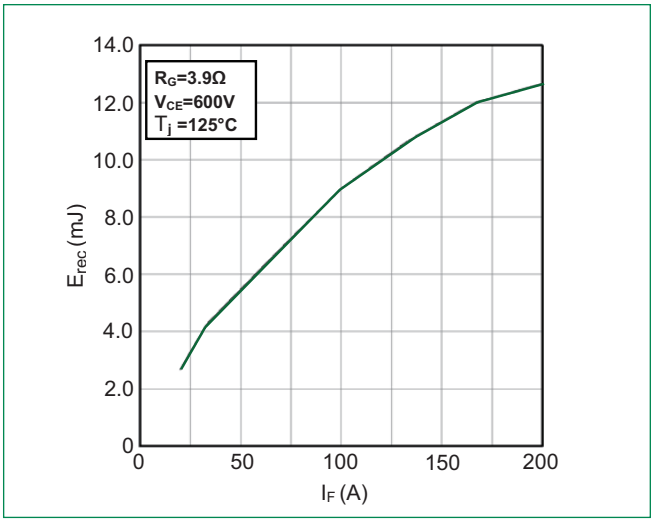


Figure 10: Transient Thermal Impedance of Diode and IGBT Inverter

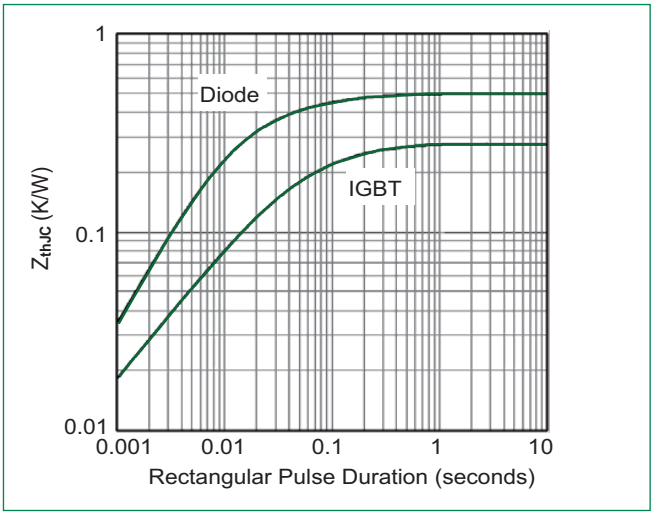
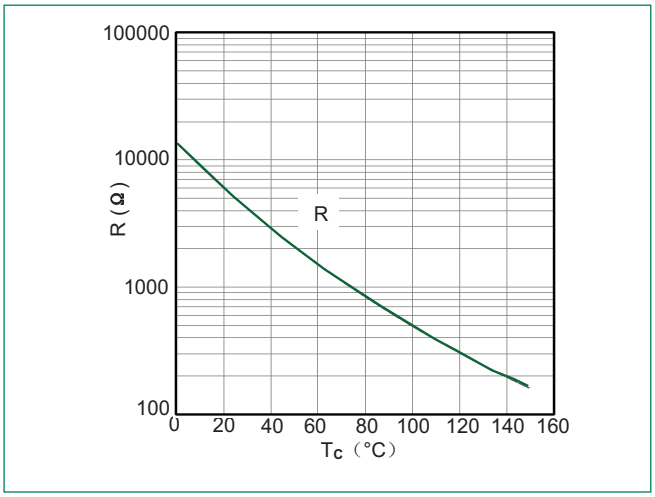
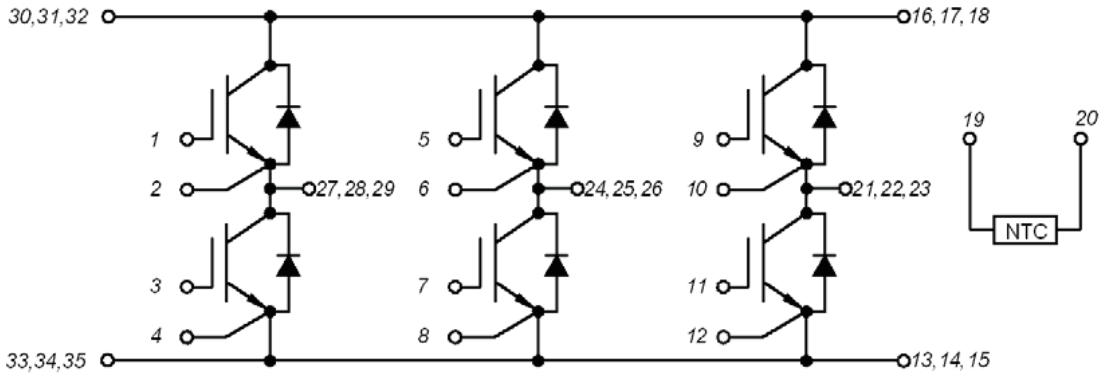


Figure 11: NTC Characteristics



Power Module
1200V 100A IGBT Module

Circuit Diagram

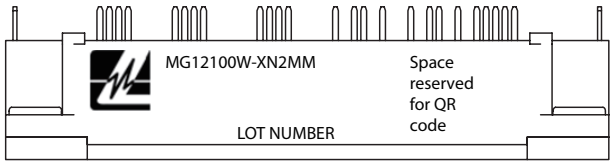


Part Numbering System

MG12100W-XN2MM

- **PRODUCT TYPE** M: Power Module
- **MODULE TYPE** G: IGBT
- **VOLTAGE RATING** 12: 1200V
- **CURRENT RATING** 100: 100A
- **ASSEMBLY SITE**
- **WAFER TYPE**
- **CIRCUIT TYPE** X: X
- **PACKAGE TYPE** W: Package W

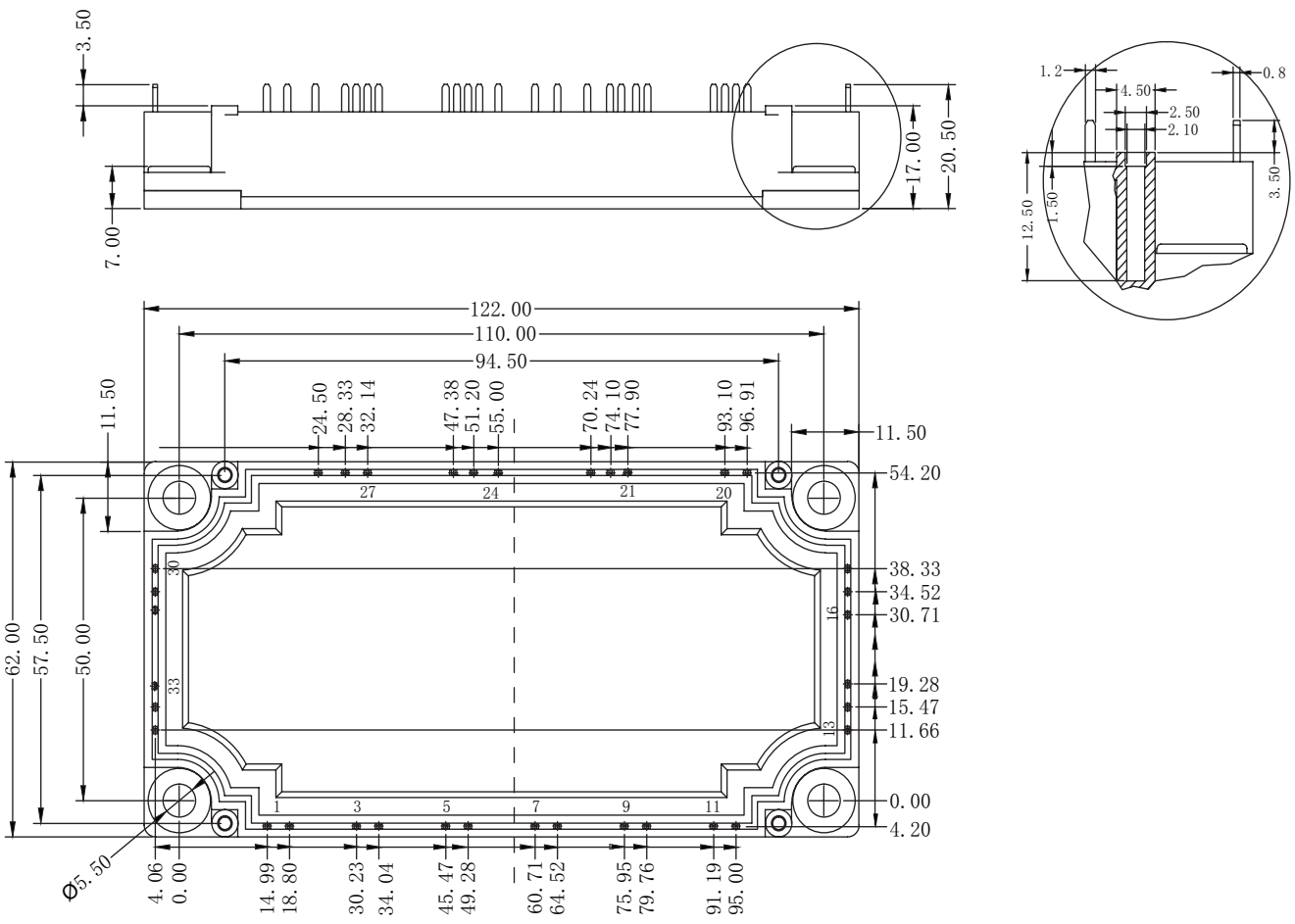
Part Marking System



Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG12100W-XN2MM	MG12100W-XN2MM	300g	Bulk Pack	20

Dimensions-Package W



Dimensions (mm)