



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.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



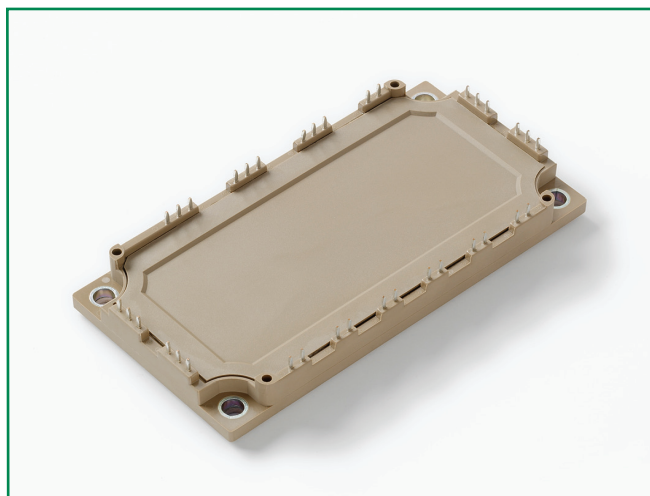
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Features

- 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	$^\circ\text{C}$
$T_{J(op)}$	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				300		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	$T_C=25^\circ\text{C}$	200	A
		$T_C=80^\circ\text{C}$	150	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	300	A
P_{tot}	Power Dissipation Per IGBT		625	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^\circ\text{C}$	200	A
		$T_C=80^\circ\text{C}$	150	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	300	A
I^2t		$T_J=125^\circ\text{C}$, t=10ms, $V_R=0\text{V}$	4350	A^2s

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	$V_{CE}=V_{GE}, I_C=6.0\text{mA}$	5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter	$I_C=150\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		1.7		V
	Saturation Voltage	$I_C=150\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		1.9		V
I_{ICES}	Collector Leakage Current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			1	mA
		$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$			10	mA
I_{GES}	Gate Leakage Current	$V_{CE}=0\text{V}, V_{GE}=\pm 15\text{V}, T_J=125^\circ\text{C}$	-400		400	nA
R_{Gint}	Integrated Gate Resistor			5.0		Ω
Q_{ge}	Gate Charge	$V_{CE}=600\text{V}, I_C=150\text{A}, V_{GE}=\pm 15\text{V}$		1.4		μC
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		10.5		nF
C_{RES}	Reverse Transfer Capacitance			0.4		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=600\text{V}$ $I_C=150\text{A}$ $R_G=2.4\Omega$ $V_{GE}=\pm 15\text{V}$ Inductive Load	$T_J=25^\circ\text{C}$	260		ns
			$T_J=125^\circ\text{C}$	290		ns
t_r	Rise Time		$T_J=25^\circ\text{C}$	30		ns
			$T_J=125^\circ\text{C}$	50		ns
$t_{d(off)}$	Turn - off Delay Time		$T_J=25^\circ\text{C}$	420		ns
			$T_J=125^\circ\text{C}$	520		ns
t_f	Fall Time		$T_J=25^\circ\text{C}$	70		ns
			$T_J=125^\circ\text{C}$	90		ns
E_{on}	Turn - on Energy		$T_J=25^\circ\text{C}$	12		mJ
			$T_J=125^\circ\text{C}$	16		mJ
E_{off}	Turn - off Energy	$T_J=25^\circ\text{C}$	11		mJ	
		$T_J=125^\circ\text{C}$	14.5		mJ	
I_{SC}	Short Circuit Current	$t_{psc} \leq 10\mu\text{s}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}, V_{CC}=900\text{V}$		600		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)				0.20	K/W
Diode						
V_F	Forward Voltage	$I_F=150\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.65		V
		$I_F=150\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.65		V
t_{RR}	Reverse Recovery Time	$I_F=150\text{A}, V_R=600\text{V}$ $di_p/dt=3600\text{A}/\mu\text{s}$ $T_J=125^\circ\text{C}$		350		ns
I_{RRM}	Max. Reverse Recovery Current			160		A
E_{rec}	Reverse Recovery Energy			13.5		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)				0.36	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

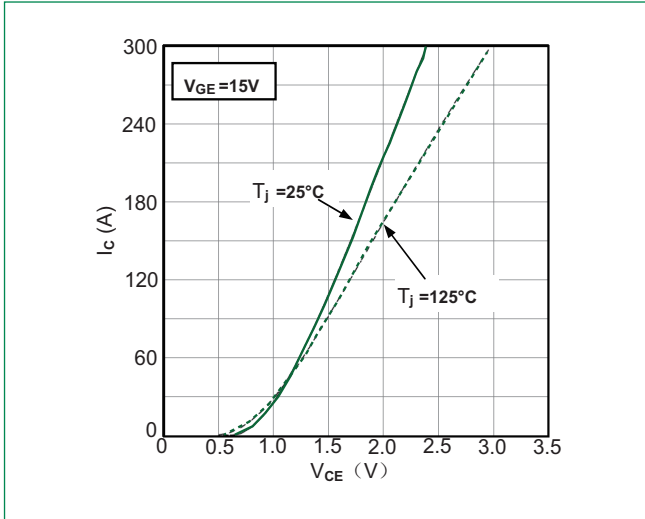


Figure 2: Typical Output Characteristics for IGBT Inverter

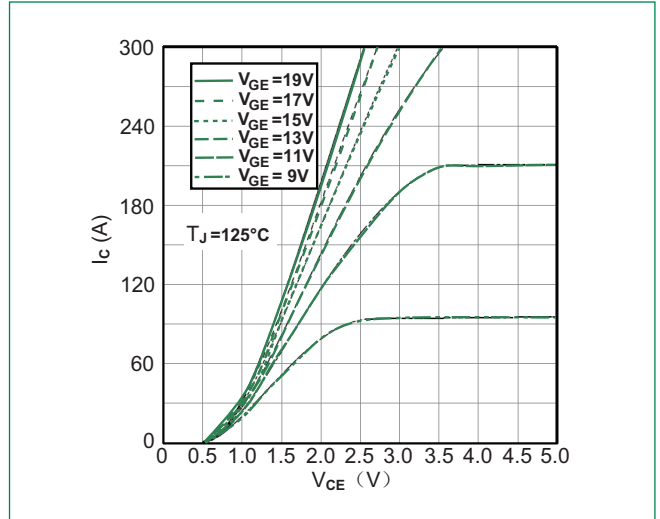


Figure 3: Typical Transfer Characteristics for IGBT Inverter

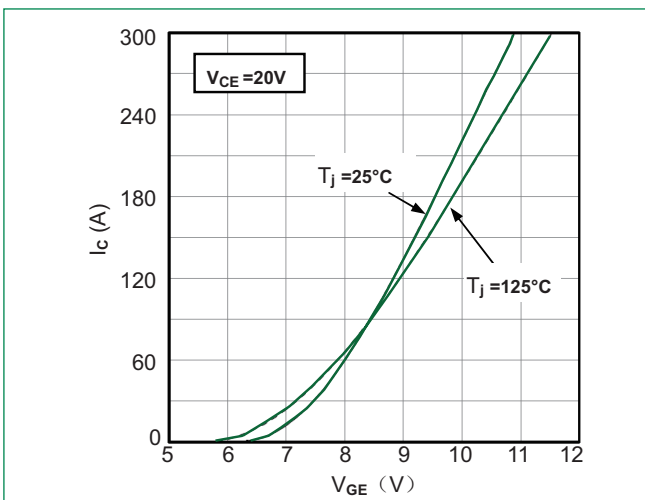


Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter

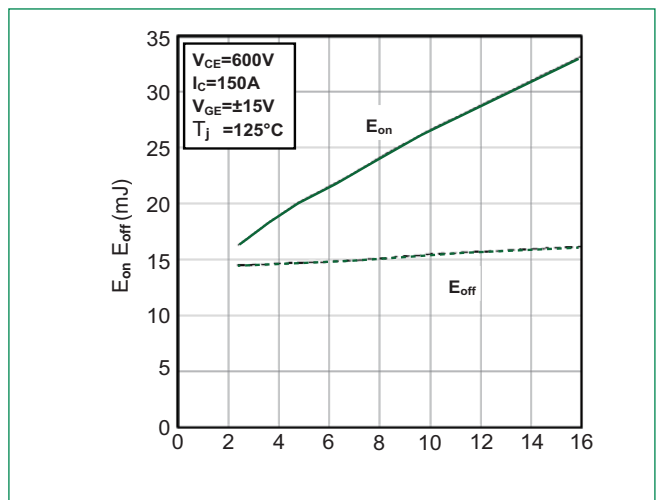


Figure 5: Switching Energy vs. Collector Current for IGBT Inverter

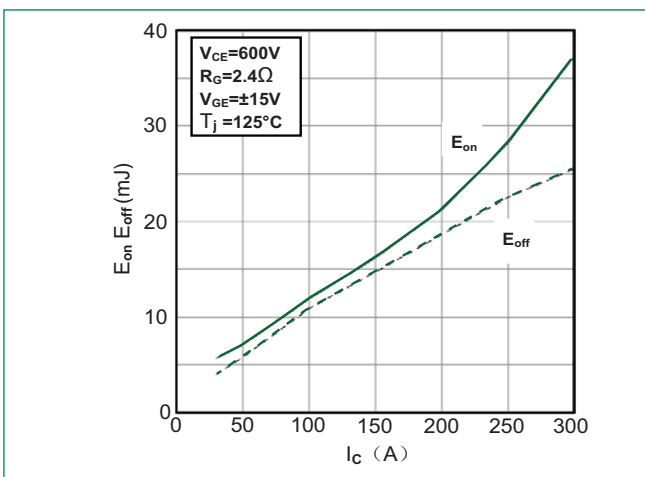


Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter

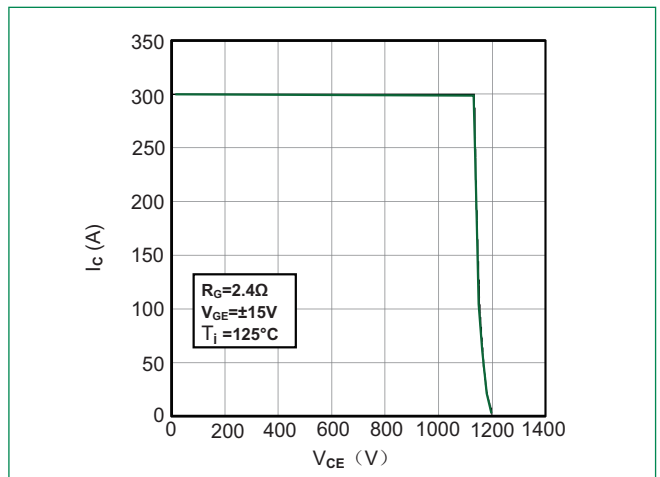


Figure 7: Diode Forward Characteristics for Diode Inverter

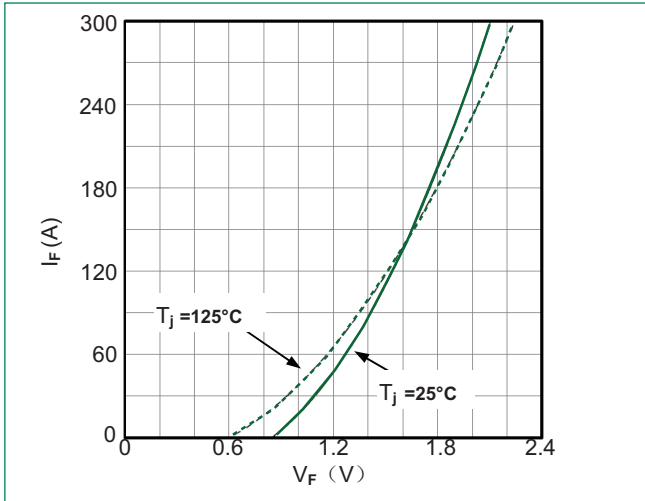


Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter

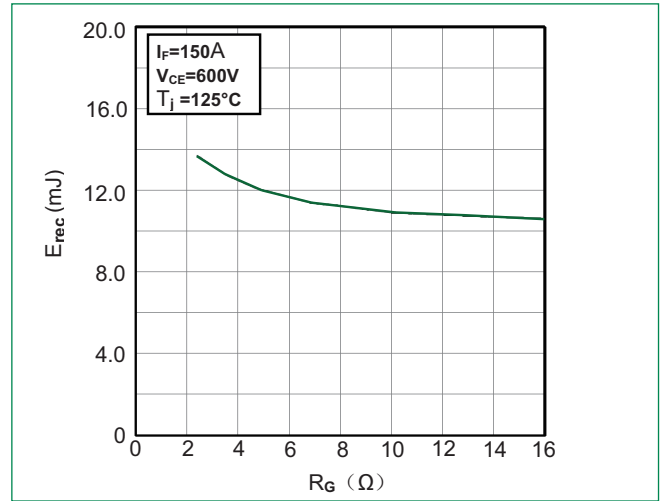


Figure 9: Switching Energy vs. Forward Current for Diode Inverter

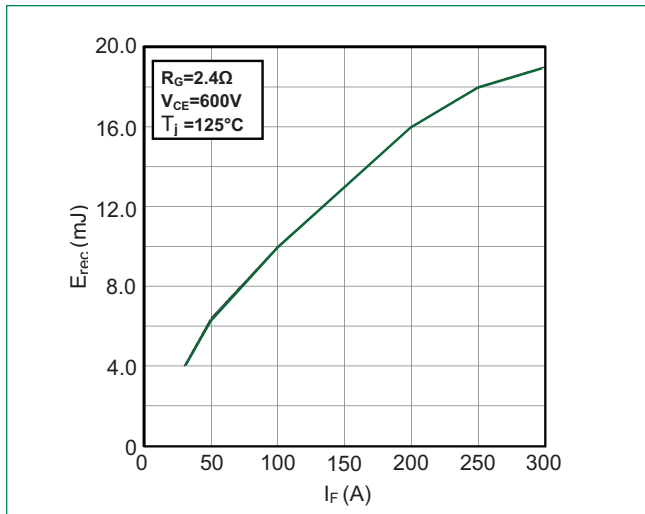


Figure 10: Transient Thermal Impedance of Diode and IGBT Inverter

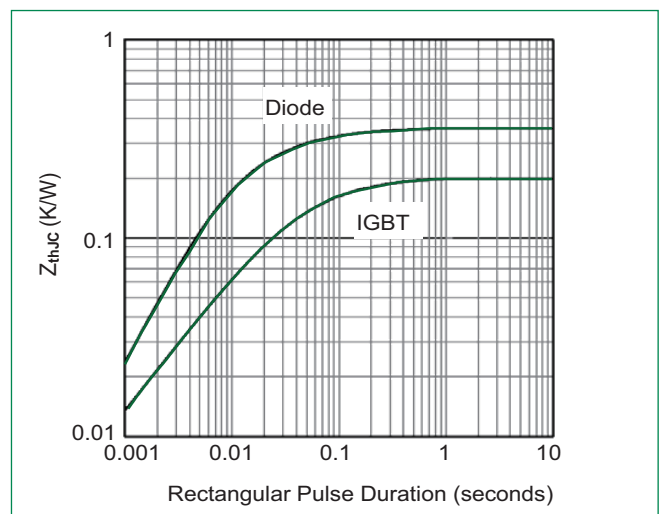
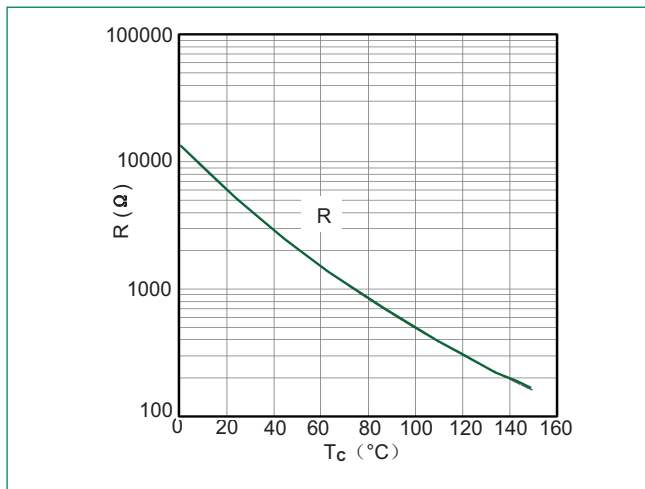
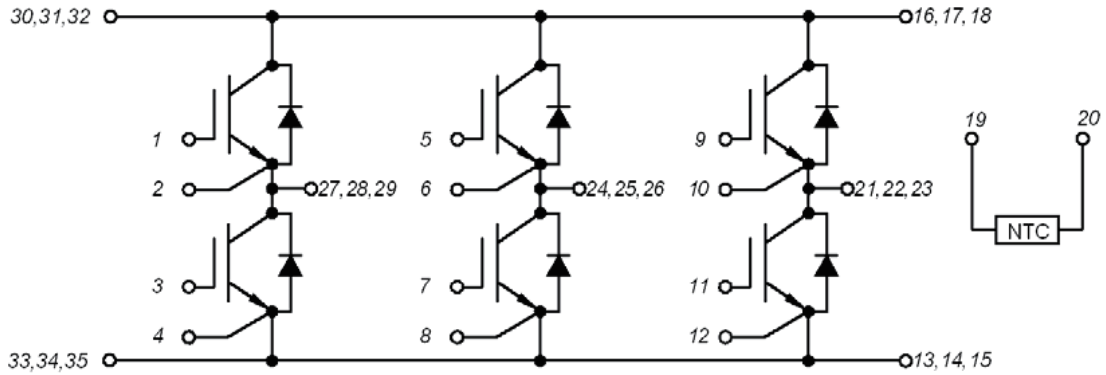


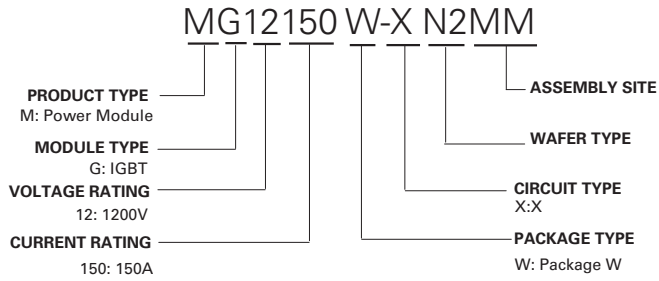
Figure 11: NTC Characteristics



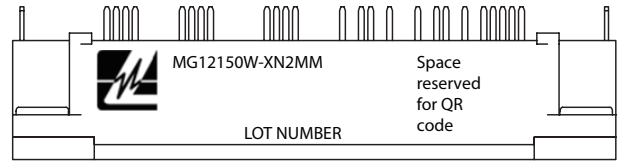
Circuit Diagram



Part Numbering System



Part Marking System



Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG12150W-XN2MM	MG12150W-XN2MM	300g	Bulk Pack	20

Dimensions-Package W

