



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!



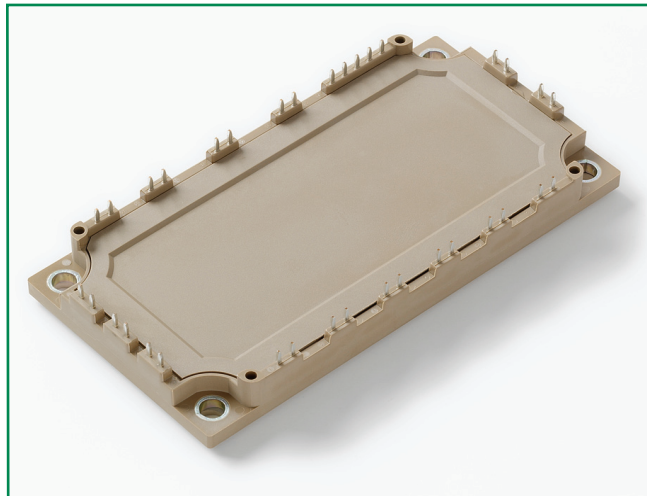
Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





Features

- High level of integration—only one power semiconductor module required for the whole drive
- Low saturation voltage and positive temperature coefficient
- Fast switching and short tail current
- Free wheeling diodes with fast and soft reverse recovery
- Industry standard package with insulated copper base plate and soldering 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
$T_{J\text{max}}$	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				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	$T_C=25^\circ\text{C}$	75	A
		$T_C=80^\circ\text{C}$	50	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	100	A
P_{tot}	Power Dissipation Per IGBT		260	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	1200	V
$I_{\text{F(AV)}}$	Average Forward Current	$T_C=25^\circ\text{C}$	75	A
		$T_C=80^\circ\text{C}$	50	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	100	A
I^2t		$T_J=125^\circ\text{C}$, t=10ms, $V_R=0\text{V}$	680	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	$V_{CE}=V_{GE}, I_C=2.0\text{mA}$	5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter	$I_C=50\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		1.7		V
	Saturation Voltage	$I_C=50\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		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			4.0		Ω
Q_{ge}	Gate Charge	$V_{CE}=600\text{V}, I_C=50\text{A}, V_{GE}=\pm 15\text{V}$		0.47		μC
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		3.6		nF
C_{RES}	Reverse Transfer Capacitance			0.16		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=600\text{V}$ $I_C=50\text{A}$ $R_G=18\Omega$ $V_{GE}=\pm 15\text{V}$ Inductive Load	$T_J=25^\circ\text{C}$	90		ns
			$T_J=125^\circ\text{C}$	90		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		$T_J=25^\circ\text{C}$	4.9		mJ
			$T_J=125^\circ\text{C}$	6.6		mJ
E_{off}	Turn - off Energy	$T_J=25^\circ\text{C}$	4.0		mJ	
		$T_J=125^\circ\text{C}$	4.9		mJ	
I_{SC}	Short Circuit Current	$t_{psc} \leq 10\mu\text{s}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}, V_{CC}=900\text{V}$		200		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)				0.48	K/W
Diode						
V_F	Forward Voltage	$I_F=50\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.65		V
		$I_F=50\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.65		V
t_{RR}	Reverse Recovery Time	$I_F=50\text{A}, V_R=600\text{V}$ $di_p/dt=1200\text{A}/\mu\text{s}$ $T_J=125^\circ\text{C}$		275		ns
I_{RRM}	Max. Reverse Recovery Current			50		A
E_{rec}	Reverse Recovery Energy			4.4		mJ
R_{thJD}	Junction-to-Case Thermal Resistance (Per Diode)				0.78	K/W

Diode-Rectifier Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Values	Unit
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	1600	V
$I_{F(AV)}$	Average Forward Current	$T_C=80^\circ\text{C}$	50	A
I_{FRM}	Non-Repetitive Surge Forward Current	$T_J=45^\circ\text{C}$, $t=10\text{ms}$, 50Hz	350	A
		$T_J=45^\circ\text{C}$, $t=8.3\text{ms}$, 60Hz	385	
I^2t		$T_J=45^\circ\text{C}$, $t=10\text{ms}$, 50Hz	612	A ² s
		$T_J=45^\circ\text{C}$, $t=8.3\text{ms}$, 60Hz	741	

Diode-Rectifier Electrical and Thermal Specifications ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
V_F	Forward Voltage	$I_F=50\text{A}$, $T_J=25^\circ\text{C}$		1.1		V
		$I_F=50\text{A}$, $T_J=125^\circ\text{C}$		1.05		V
I_R	Reverse Leakage Current	$V_R=1600\text{V}$, $T_J=25^\circ\text{C}$			50	μA
		$V_R=1600\text{V}$, $T_J=125^\circ\text{C}$			1	mA
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)				0.68	K/W

Brake-Chopper 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	$T_C=25^\circ\text{C}$	55	A
		$T_C=80^\circ\text{C}$	40	A
I_{CM}	Repetitive Peak Collector Current	$t_p=1\text{ms}$	80	A
P_{tot}	Power Dissipation Per IGBT		195	W
Diode				
V_{RRM}	Repetitive Reverse Voltage	$T_J=25^\circ\text{C}$	1200	V
$I_{F(AV)}$	Average Forward Current	$T_C=25^\circ\text{C}$	25	A
		$T_C=80^\circ\text{C}$	15	A
I_{FRM}	Repetitive Peak Forward Current	$t_p=1\text{ms}$	30	A
I^2t		$T_J=125^\circ\text{C}$, $t=10\text{ms}$, $V_R=0\text{V}$	60	A ² s

Brake-Chopper Electrical and Thermal Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
IGBT						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=1.5\text{mA}$	5.0	5.8	6.5	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	$I_C=40\text{A}, V_{GE}=15\text{V}, T_J=25^\circ\text{C}$		1.8		V
		$I_C=40\text{A}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}$		2.05		V
I_{ICES}	Collector Leakage Current	$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$			0.25	μA
		$V_{CE}=1200\text{V}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$			2	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			6		Ω
Q_{ge}	Gate Charge	$V_{CE}=600\text{V}, I_C=40\text{A}, V_{GE}=\pm 15\text{V}$		0.33		μC
C_{ies}	Input Capacitance	$V_{CE}=25\text{V}, V_{GE}=0\text{V}, f=1\text{MHz}$		2.5		nF
C_{RES}	Reverse Transfer Capacitance			0.11		nF
$t_{d(on)}$	Turn - on Delay Time	$V_{CC}=600\text{V}$ $I_C=40\text{A}$ $R_G=27\Omega$ $V_{GE}=\pm 15\text{V}$ Inductive Load	$T_J=25^\circ\text{C}$	90		ns
			$T_J=125^\circ\text{C}$	90		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		$T_J=25^\circ\text{C}$	4.1		mJ
			$T_J=125^\circ\text{C}$	6.0		mJ
E_{off}	Turn - off Energy	$T_J=25^\circ\text{C}$	3.1		mJ	
		$T_J=125^\circ\text{C}$	3.6		mJ	
I_{SC}	Short Circuit Current	$t_{psc}\leq 10\mu\text{s}, V_{GE}=15\text{V}, T_J=125^\circ\text{C}, V_{CC}=900\text{V}$		160		A
R_{thJC}	Junction-to-Case Thermal Resistance (Per IGBT)				0.62	K/W
Diode						
V_F	Forward Voltage	$I_F=15\text{A}, V_{GE}=0\text{V}, T_J=25^\circ\text{C}$		1.65		V
		$I_F=15\text{A}, V_{GE}=0\text{V}, T_J=125^\circ\text{C}$		1.75		V
t_{RR}	Reverse Recovery Time	$I_F=15\text{A}, V_R=600\text{V}$ $di_f/dt=-400\text{A}/\mu\text{s}$ $T_J=125^\circ\text{C}$		150		ns
I_{RRM}	Max. Reverse Recovery Current			15		A
E_{rec}	Reverse Recovery Energy			1.15		mJ
R_{thJCD}	Junction-to-Case Thermal Resistance (Per Diode)				1.55	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

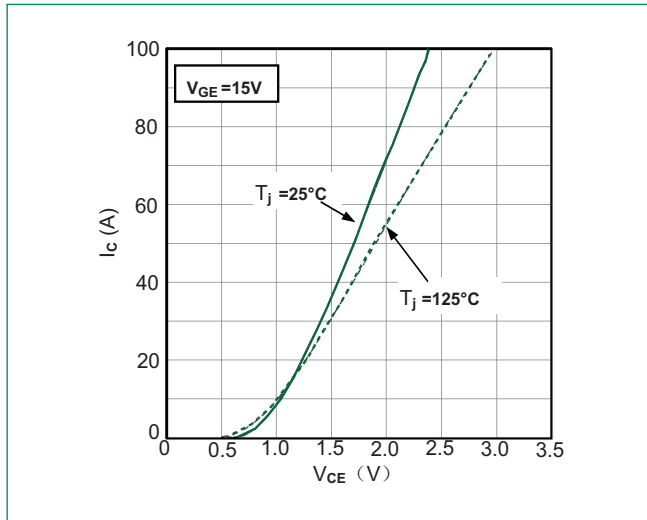


Figure 2: Typical Output Characteristics for IGBT Inverter

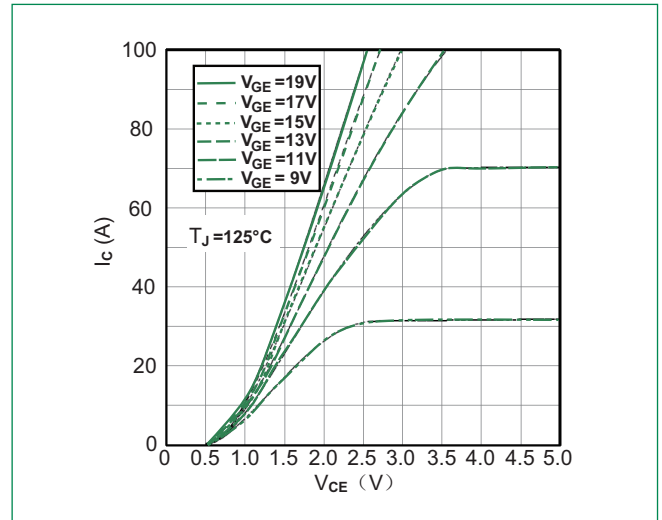


Figure 3: Typical Transfer Characteristics for IGBT Inverter

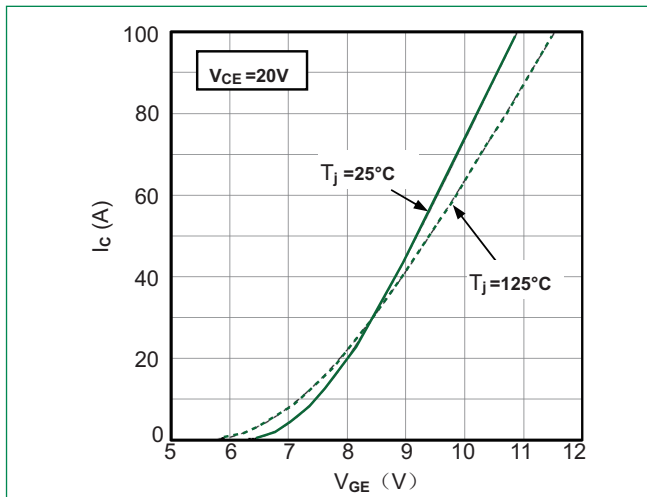


Figure 4: Switching Energy vs. Gate Resistor for IGBT Inverter

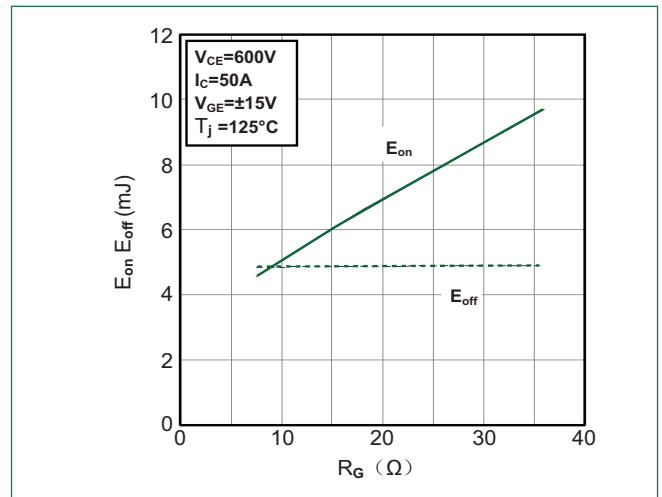


Figure 5: Switching Energy vs. Collector Current for IGBT Inverter

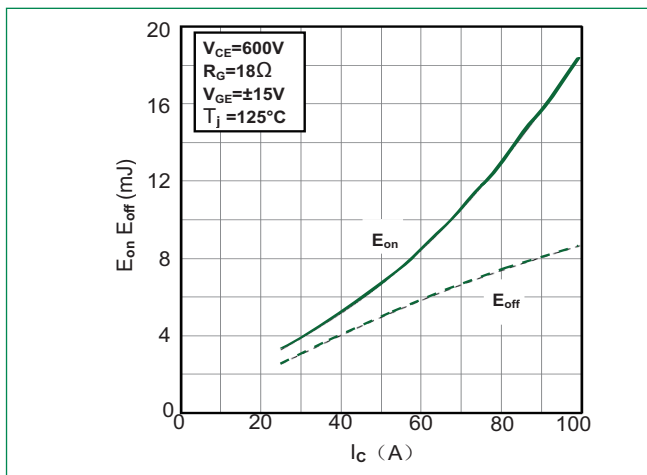


Figure 6: Reverse Biased Safe Operating Area for IGBT Inverter

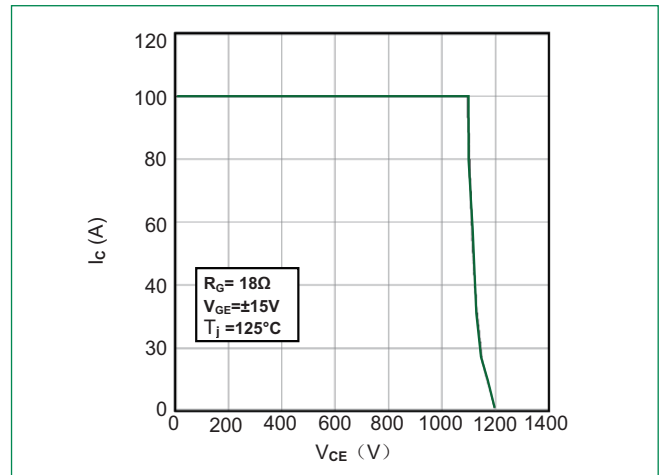


Figure 7: Diode Forward Characteristics for Diode Inverter

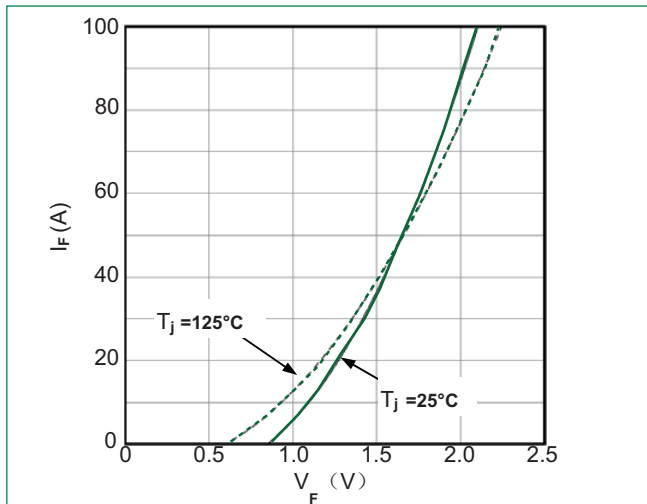


Figure 8: Switching Energy vs. Gate Resistort for Diode Inverter

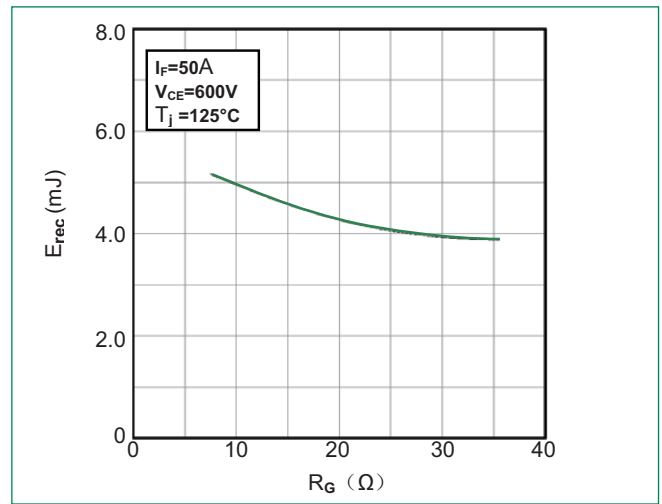


Figure 9: Switching Energy vs. Forward Current for Diode Inverter

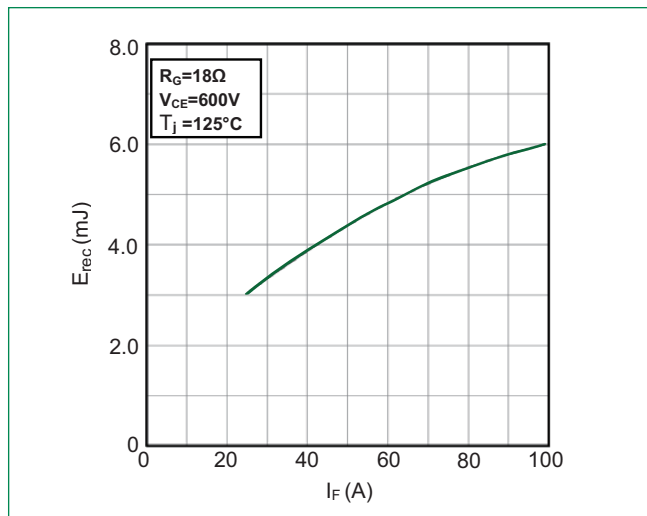


Figure 10: Transient Thermal Impedance of Diode and IGBT Inverter

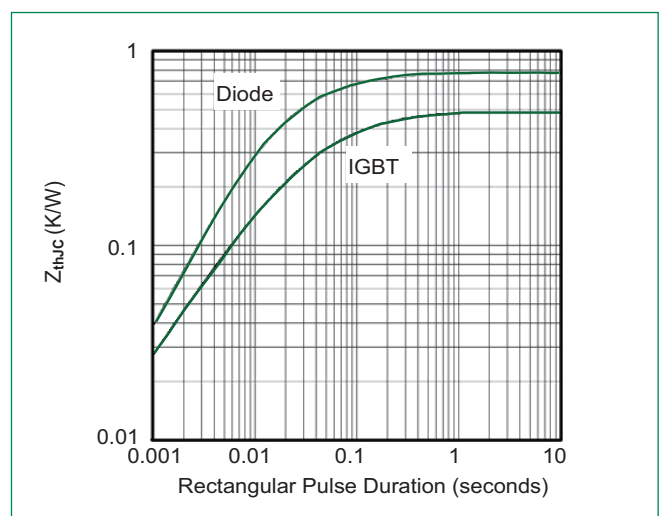


Figure 11: Diode Forward Characteristics for IGBT Inverter

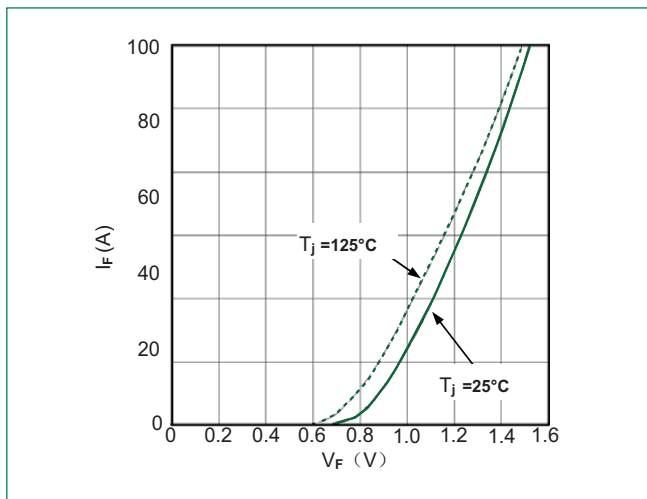


Figure 12: Typical Output Characteristics for IGBT Brake Chopper

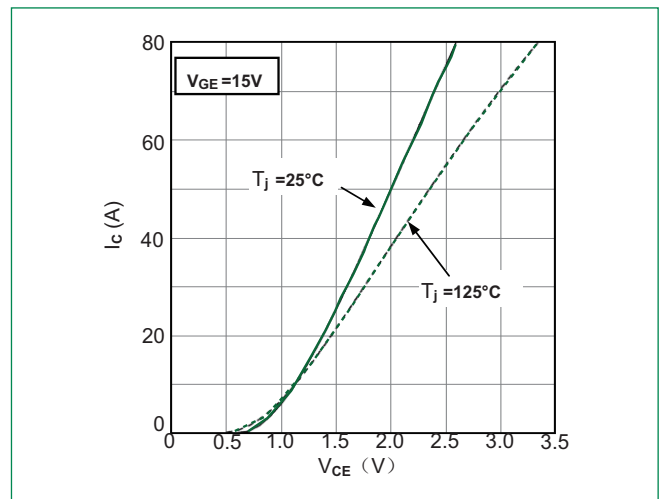


Figure 13: Diode Forward Characteristics for Diode Brake Chopper

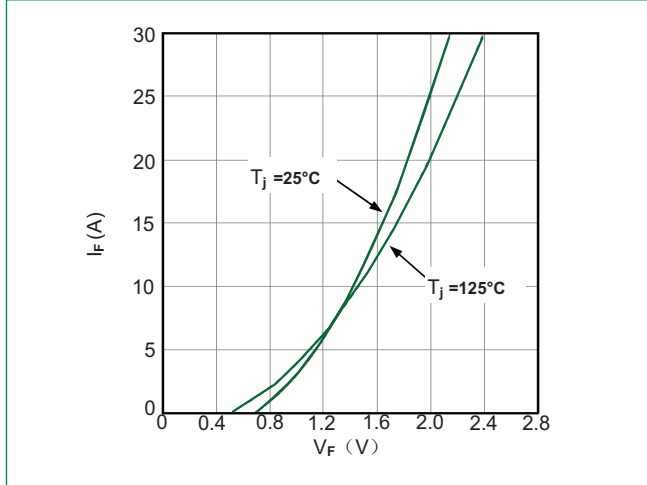
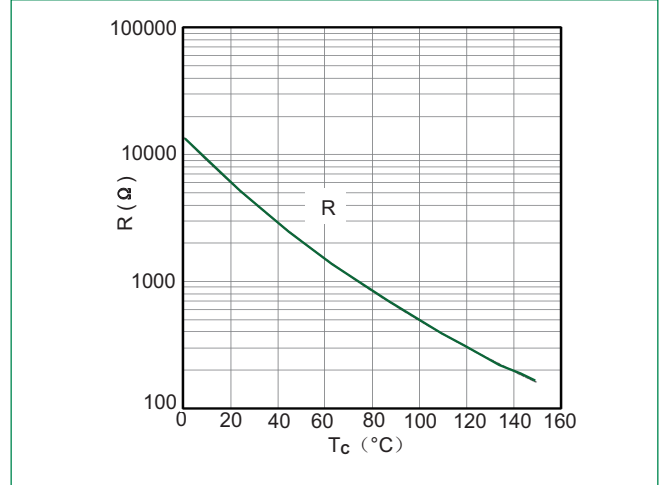
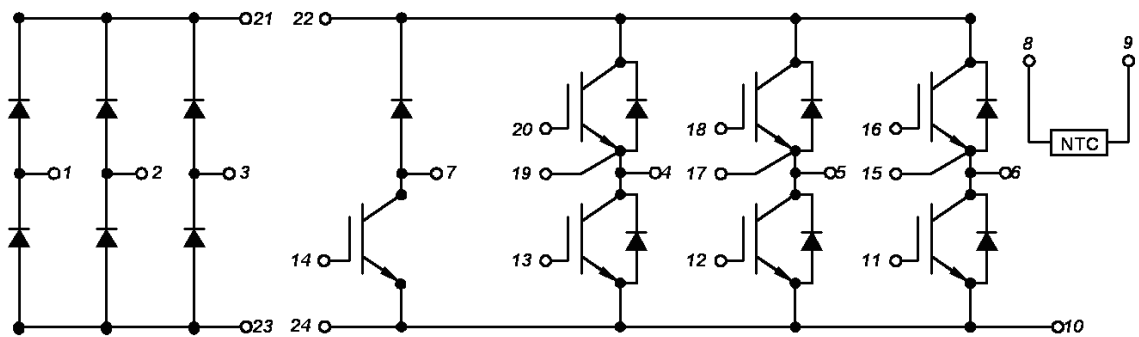


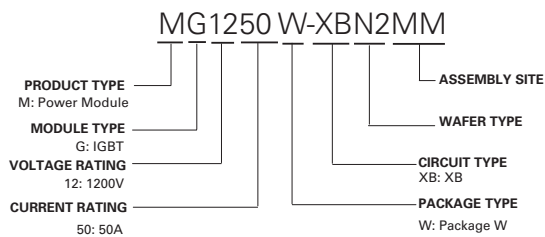
Figure 14: NTC Characteristics



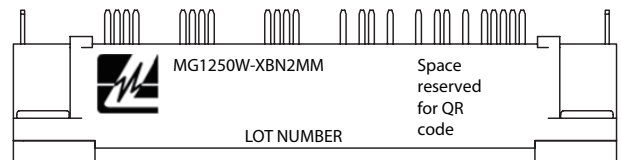
Circuit Diagram



Part Numbering System



Part Marking System



Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q
MG1250W-XBN2MM	MG1250W-XBN2MM	300g	Bulk Pack	20

Dimensions-Package W

