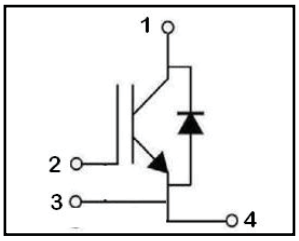
MMG75J120U

1200V 75A IGBT Module

May 2011 **PRELIMINARY** **RoHS Compliant**

FEATURES

- Ultra Low Loss
- High Ruggedness
- High Short Circuit Capability
- Positive Temperature Coefficient
- Electrically Isolated by DBC Ceramic
- Popular SOT-227 Package



APPLICATIONS

- Invertor
- Convertor
- Welder
- SMPS and UPS
- Induction Heating

ABSOLUTE MAXIMUM RATINGS

T_C=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Values	Unit
V_{CES}	Collector - Emitter Voltage		1200	V
V_{GES}	Gate - Emitter Voltage		±20	V
I_C	DC Collector Current	T_C=25°C	105	A
		T_C=80°C	75	A
I_{Cpuls}	Pulsed Collector Current	T_C=25°C, t_p=1ms	210	A
		T_C=80°C, t_p=1ms	150	A
P_{tot}	Power Dissipation		625	W
T_J	Junction Temperature Range		-40 to +150	°C
T_{STG}	Storage Temperature Range		-40 to +125	°C
V_{isol}	Insulation Test Voltage	AC, t=1min	3000	V
R_{thJC}	Junction-to-Case Thermal Resistance		0.20	K /W
Torque	Module-to-Sink	Recommended（M4）	0.7～1.1	N· m
Torque	Module Electrodes	Recommended（M4）	0.7～1.1	N· m
Weight			16.5	g

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ELECTRICAL CHARACTERISTICS

T_C=25°C unless otherwise specified

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	V_{CE}=V_{GE}, I_C=3mA	5	6.2	7	V
$V_{CE(sat)}$	Collector - Emitter Saturation Voltage	I_C=75A, V_{GE}=15V, T_J=25°C		1.8		V
		I_C=75A, V_{GE}=15V, T_J=125°C		2.0		V
I_{CES}	Collector Leakage Current	V_{CE}=1200V, V_{GE}=0V, T_J=25°C		0.2	0.5	mA
		V_{CE}=1200V, V_{GE}=0V, T_J=125°C		2		mA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±20V	-100		100	nA
Q_{ge}	Gate Charge	V_{CC}=600V, I_C=75A, V_{GE}=±15V		780		nC
C_{ies}	Input Capacitance	V_{CE}=25V, V_{GE}=0V, f =1MHz		5.52		nF
C_{oes}	Output Capacitance			0.4		nF
C_{res}	Reverse Transfer Capacitance			0.26		nF
$t_{d(on)}$	Turn - on Delay Time	V_{CC}=600V, I_C=75A		150		ns
t_r	Rise Time	R_G =15Ω, V_{GE}=±15V		65		ns
$t_{d(off)}$	Turn - off Delay Time	T_J=25°C		440		ns
t_f	Fall Time	Inductive Load		55		ns
$t_{d(on)}$	Turn - on Delay Time	V_{CC}=600V, I_C=75A		160		ns
t_r	Rise Time	R_G =15Ω, V_{GE}=±15V		65		ns
$t_{d(off)}$	Turn - off Delay Time	T_J=125°C		500		ns
t_f	Fall Time	Inductive Load		70		ns
E_{on}	Turn - on Switching Energy	V_{CC}=600V, I_C=75A, T_J=25°C		7.45		mJ
		R_G =15Ω, T_J=125°C		10.3		mJ
E_{off}	Turn - off Switching Energy	V_{GE}=±15V, T_J=25°C		4.9		mJ
		Inductive Load, T_J=125°C		7.8		mJ

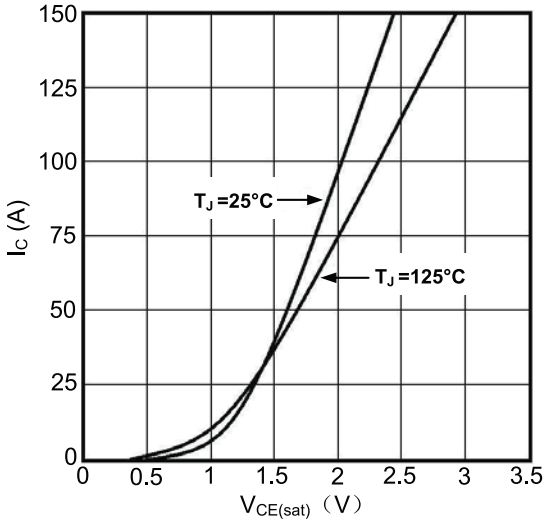


Figure1. Typical Output characteristics

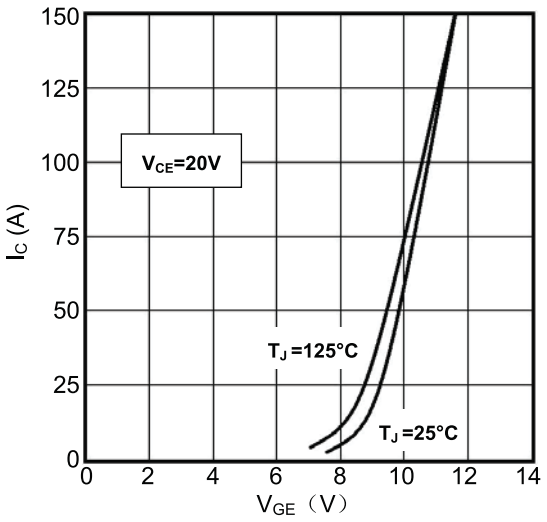


Figure2. Typical Transfer characteristics

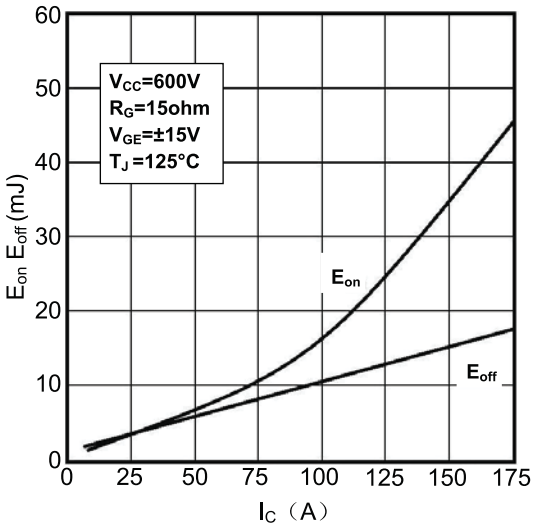


Figure3. Switching Energy vs. Collector Current

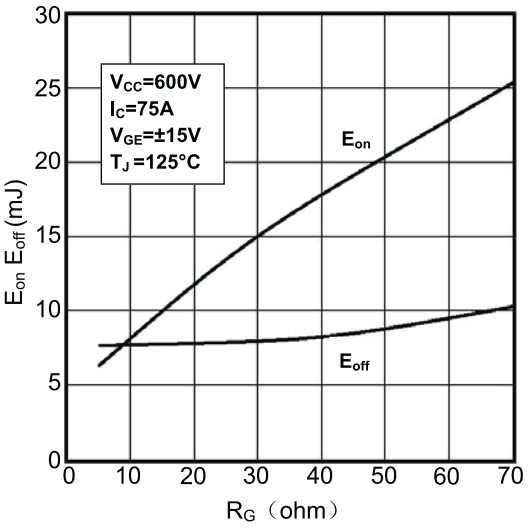


Figure4. Switching Energy vs. Gate Resistor

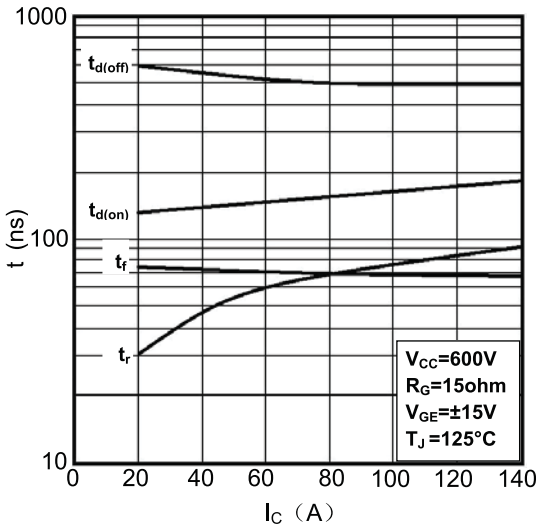


Figure5. Switching Times vs. Collector Current

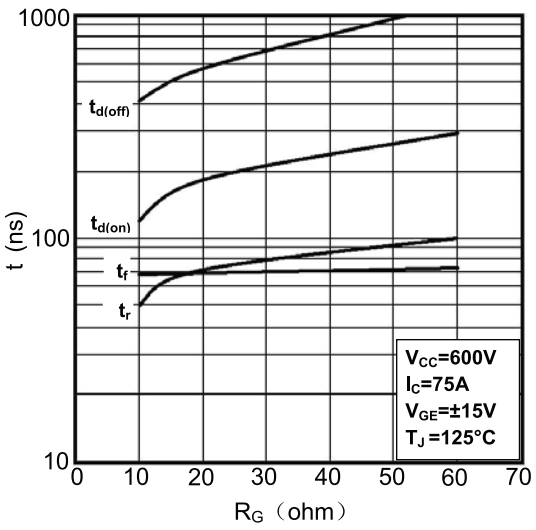


Figure6. Switching Times vs. Gate Resistor

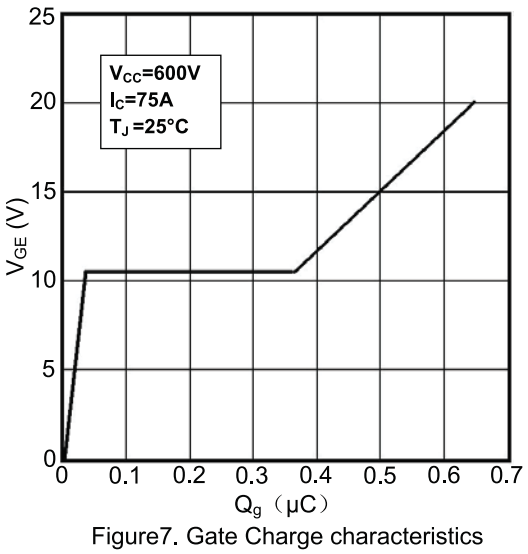


Figure7. Gate Charge characteristics

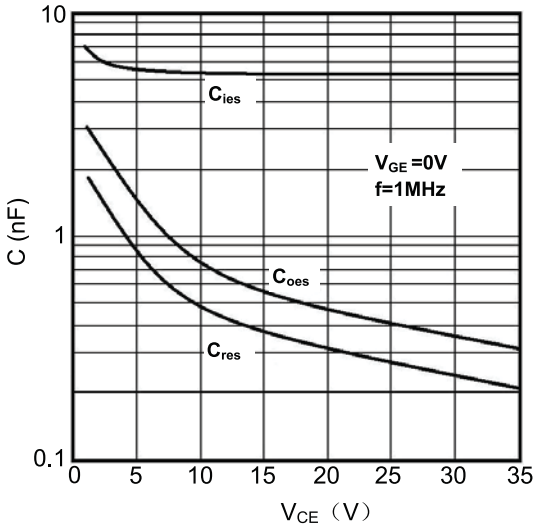


Figure8. Typical Capacitances vs. V_{CE}

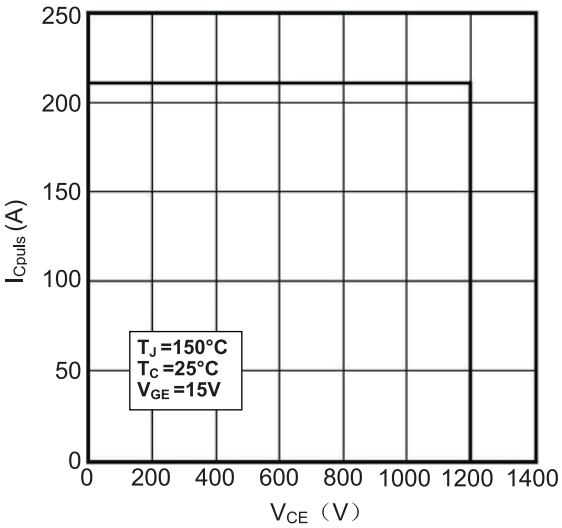


Figure9. Reverse Biased Safe Operating Area

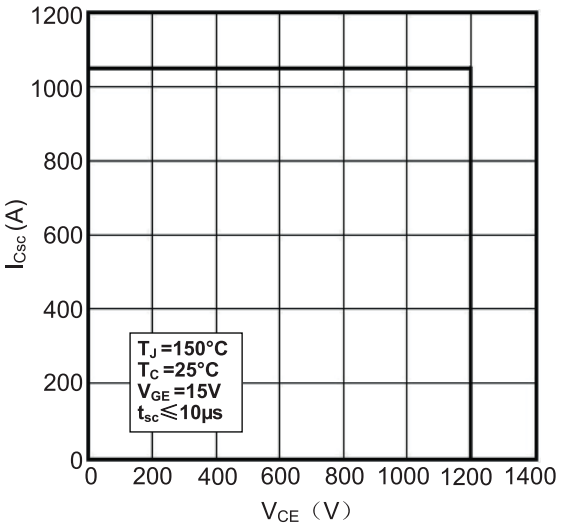


Figure10. Short Circuit Safe Operating Area

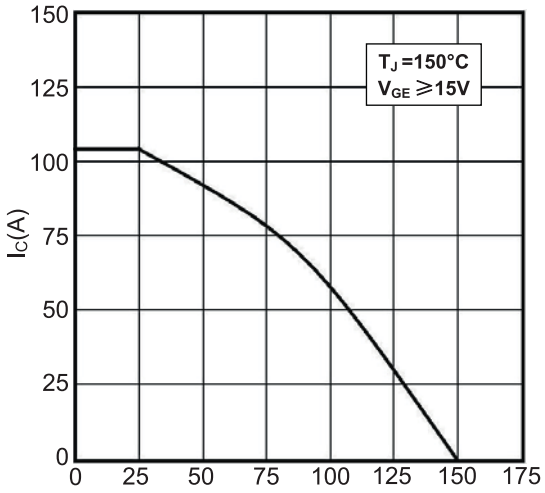


Figure11. Rated Current vs. T_C

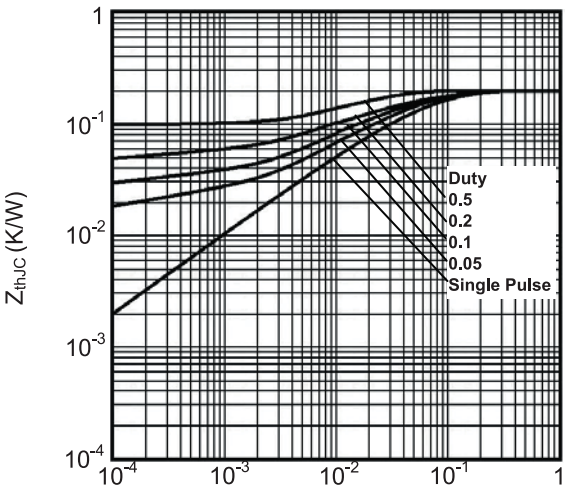
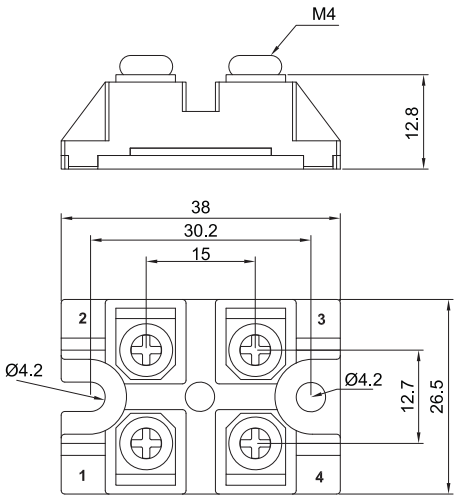


Figure12. Transient Thermal Impedance



Dimensions in mm

Figure13. Package Outlines