MG75U12MRGJ

RoHS COMPLIANT

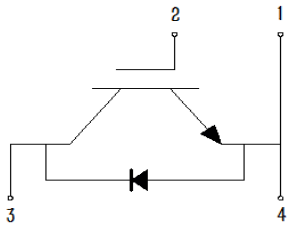
IGBT Modules

VRRM 1200V
IFAV 75 A

Applications

- Invertor
- Uninterruptible Power Supply (UPS)
- Convertor
- Welder
- SMPS
- Convertor

Circuit



Features

- Ultra Low Loss
- Positive Temperature Coefficient
- High Ruggedness
- Fully isolated package
- High Short Circuit Capability
- Popular SOT-227 Package

Absolute Maximum Ratings （T_C = 25℃ unless otherwise specified）

Symbol	Description		Values	Units
V_{CES}	Collector - Emitter Voltage		1200	V
V_{GES}	Gate-Emitter Voltage		±20	V
I_C	DC Collector Current	T_C=25℃	100	A
		T_C=80℃	75	A
I_{CM}	Pulsed collector current	T_J = 80℃	150	A
I_F	Diode Continuous Forward Current	T_J = 25℃	100	A
		T_J = 80℃	75	A
P_D	Maximum Power Dissipation (IGBT)	T_C = 25℃, T_{Jmax}=150℃	420	W
T_{Jmax}	Maximum Junction Temperature		150	℃
T_{JOP}	Operating Temperature		-40 ~ +125	℃
T_{stg}	Storage Temperature		-40 ~ +125	℃
Visol	Isolation Voltage (All Terminals Shorted)	f=50Hz, 1min	3000	V
Weight	Weight Of Module		27	g
Mounting Torque	Module-to-Sink:M4		0.7~1.2	N*m
	Module Electrodes:M4		0.7~1.1	N*m

Electrical Characteristics of IGBT (T_J = 25℃ unless otherwise specified)

Symbol	Item	Conditions	Values			Units
			Min.	Typ.	Max.	
OFF Characteristics						
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage	V_{GE} = 0V, I_C = 1mA	1200			V
I_{CES}	Collector Leakage Current	V_{CE}=V_{CES}, V_{GE}=0V,			100	uA
		V_{CE}=V_{CES}, V_{GE}=0V, T_J=125°C			1	mA
I_{GES}	Gate Leakage Current	V_{CE}=0V, V_{GE}=±20V	-400		400	nA
ON Characteristics						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	V_{CE}=V_{GE}, I_C=3mA	5	5.5	6.5	V
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage	I_C=75A,V_{GE}=15V		2.1	2.3	V
		I_C=75A,V_{GE}=15V, T_J=125°C		2.25	2.5	V
Dynamic Characteristics						
C_{ies}	Input Capacitance	V_{CE} = 25V, V_{GE} = 0V , f=1MHz		5.5		nF
C_{oes}	Output Capacitance			0.4		nF
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 600V, I_C = 75A , R_G = 15Ω, V_{GE} =±15V , Inductive Load, T_J = 25℃		80		ns
t_r	Rise Time			70		ns
$t_{d(off)}$	Turn-off Delay Time			248		ns
T_f	Fall Time			290		ns
E_{on}	Turn-on Switching Loss			7.45		mJ
E_{off}	Turn-off Switching Loss			4.9		mJ
$t_{d(on)}$	Turn-on Delay Time	V_{CC} = 600V, I_C = 75A , R_G = 15Ω, V_{GE} =±15V , Inductive Load, T_J= 125℃		95		ns
t_r	Rise Time			85		ns
$t_{d(off)}$	Turn-off Delay Time			262		ns
T_f	Fall Time			320		ns
E_{on}	Turn-on Switching Loss			10.3		mJ
E_{off}	Turn-off Switching Loss			7.8		mJ
Q_{ge}	Gate Charge	V_{CC}=600V, I_C=75A, V_{GE}=±15V		780		nC
RBSOA	Reverse Bias Safe Operating Area	I_C = 75A ,V_{CC} = 600V, V_p =1200V, Rg = 22Ω, V_{GE}=+15V to 0V, L=500uH， T_J =150°C	Trapezoid			
SCSOA	Short Circuit Safe Operating Area	V_{CC} = 600V, V_{GE} = 15V, T_J = 150℃	10			μs

Electrical Characteristics of FWD（T_C = 25℃ unless otherwise specified）

Symbol	Item	Conditions		Min.	Typ.	Max.	Units
V_{FM}	Forward Voltage	I_F=75A, V_{GE} = 0V	T_J = 25℃		2.1	2.4	V
			T_J = 125℃		2.0	2.3	
t_{rr}	Reverse Recovery Time	I_F=75A, di/dt =200A/μs, V_{rr} = 600V, V_{GE} = -15V	T_J = 25℃		160		ns
			T_J = 125℃		200		
I_{rr}	Peak Reverse Recovery Current		T_J = 25℃		55		A
			T_J = 125℃		70		
Q_{rr}	Reverse Recovery Charge		T_J = 25℃		5.3		μC
			T_J = 125℃		8.2		

Thermal Resistance Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-To-Case (IGBT Part)			0.2	℃/W
$R_{\theta JC}$	Junction-To-Case (Diode Part, Per Leg)			0.5	℃/W
$R_{\theta CS}$	Case-To-Sink (Conductive Grease Applied)		0.05		℃/W

Performance Curves

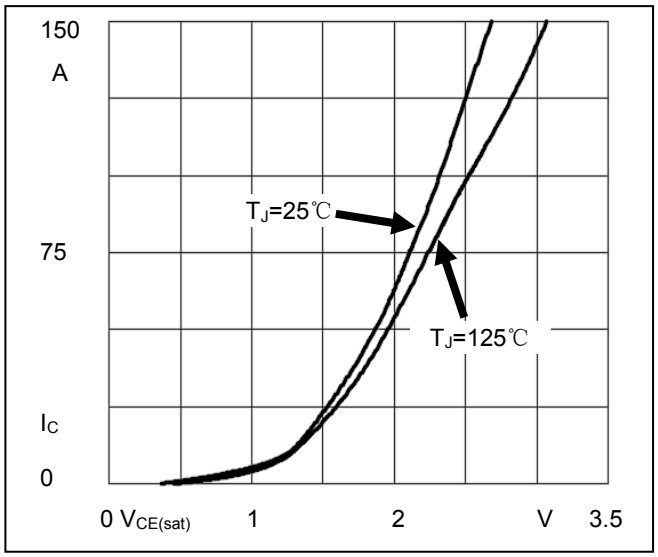


Fig1. Typical Output Characteristics

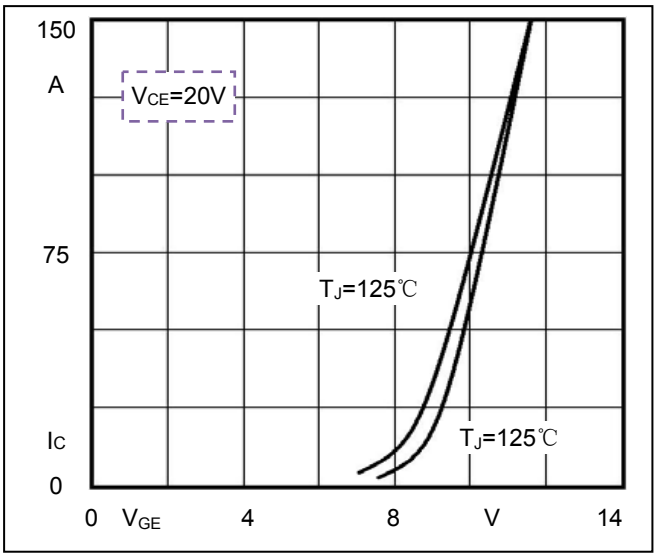


Fig2. Typical Transfer Characteristics

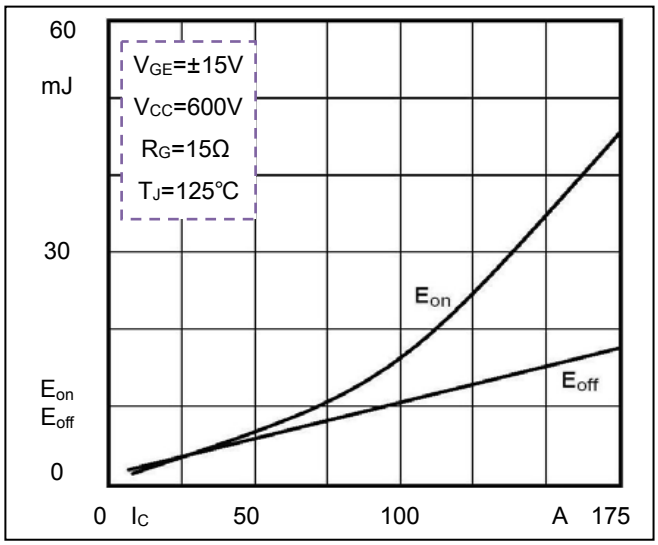


Fig3. Switching Energy vs. Collector Current

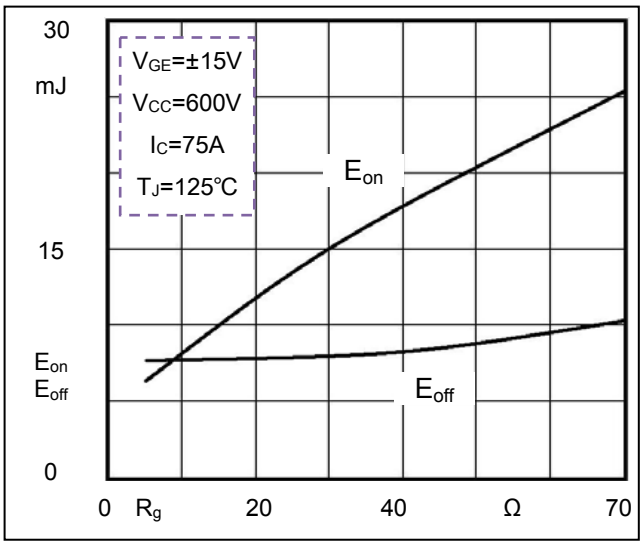


Fig4. Switching Energy vs. Gate Resistor

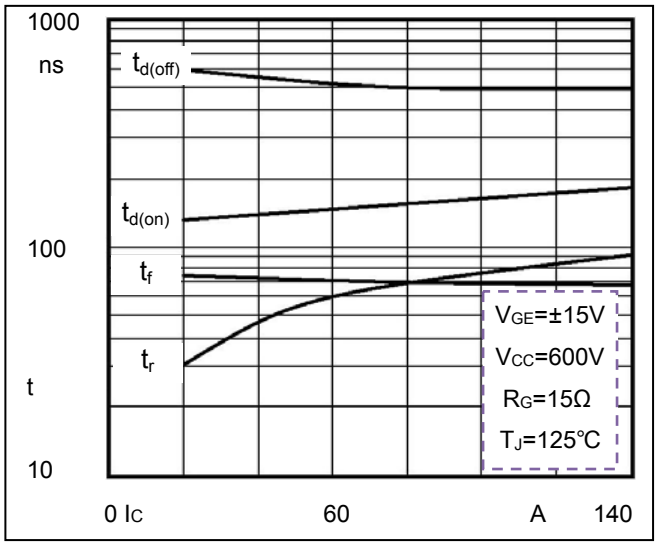


Fig5. Switching Times vs. Collector Current

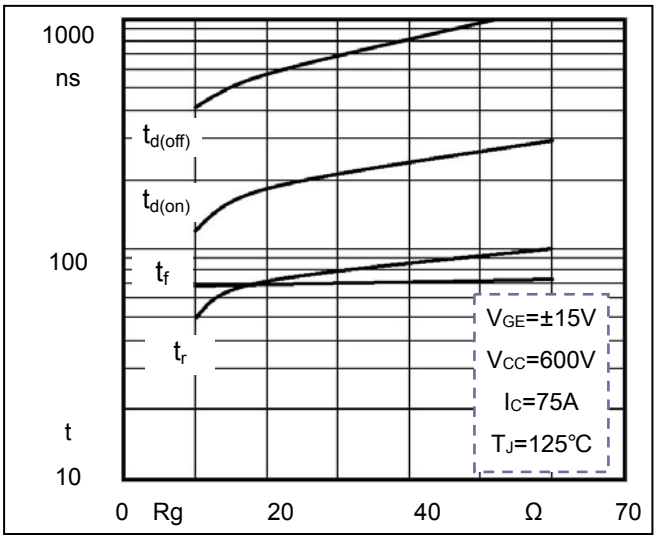


Fig6. Switching Times vs. Gate Resistor

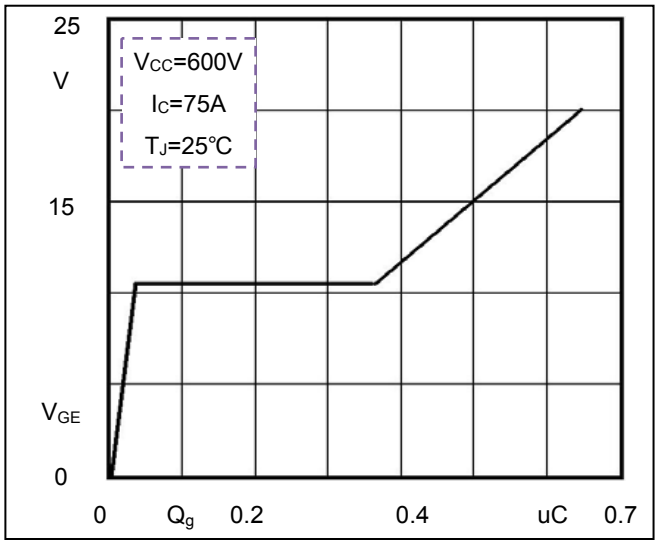


Fig7. Gate Charge characteristics

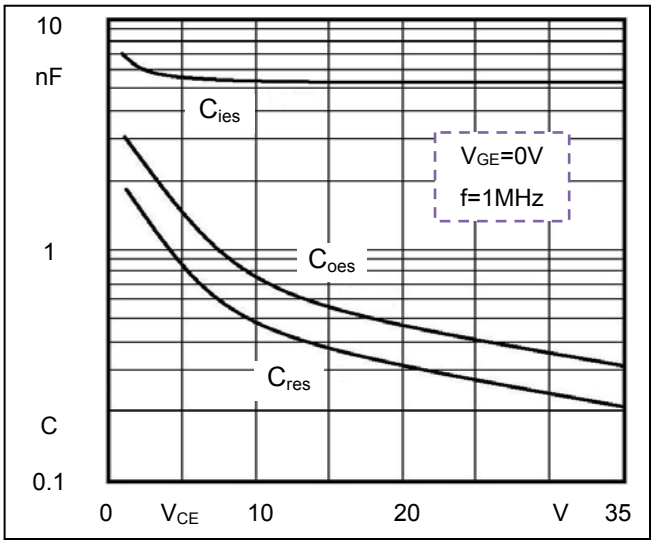


Fig8. Typical Capacitances vs. V_{CE}

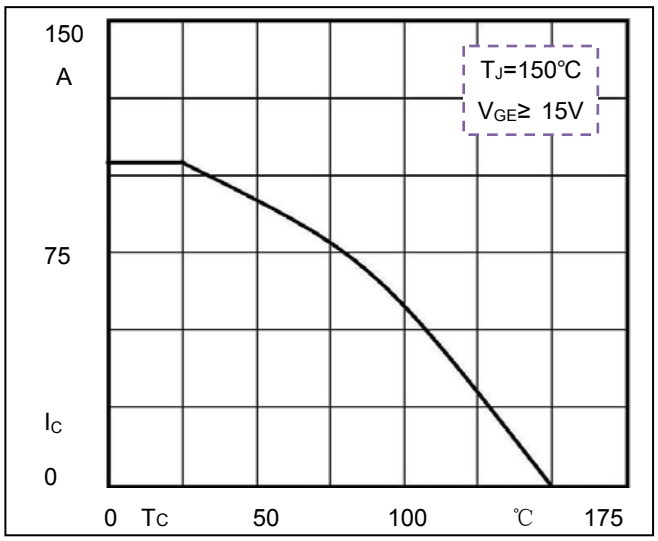


Fig9. Rated Current vs. T_C

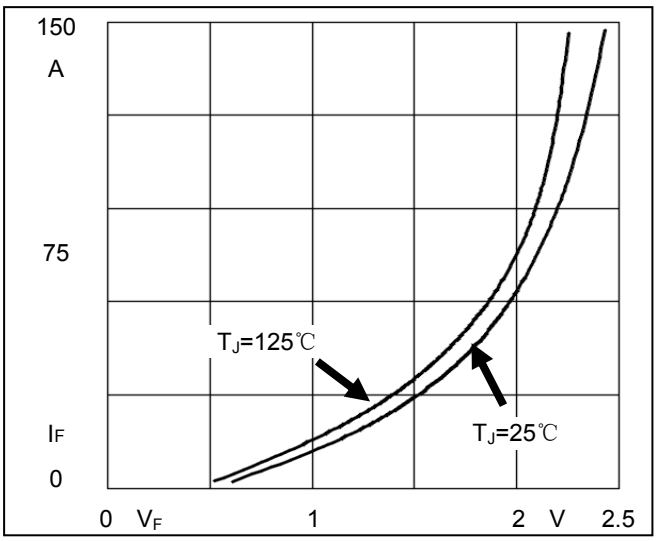


Fig10. Diode Forward Characteristics

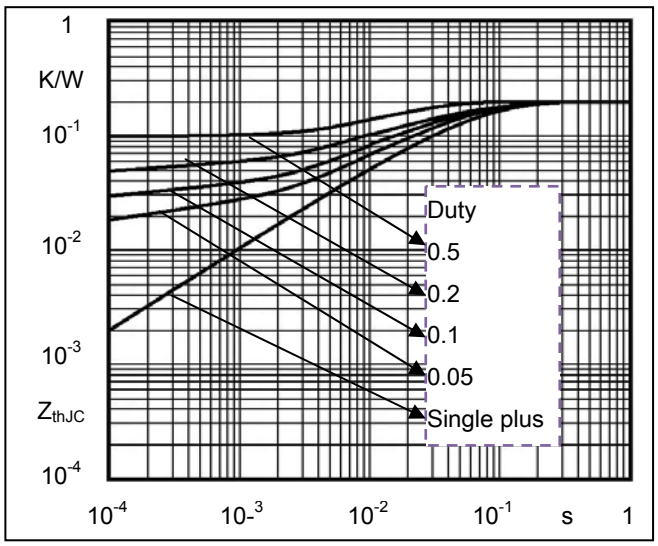


Fig11. Transient Thermal Impedance of IGBT

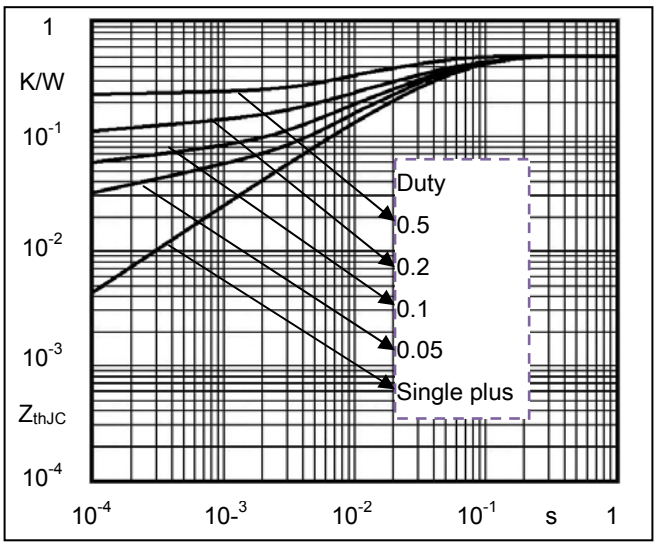
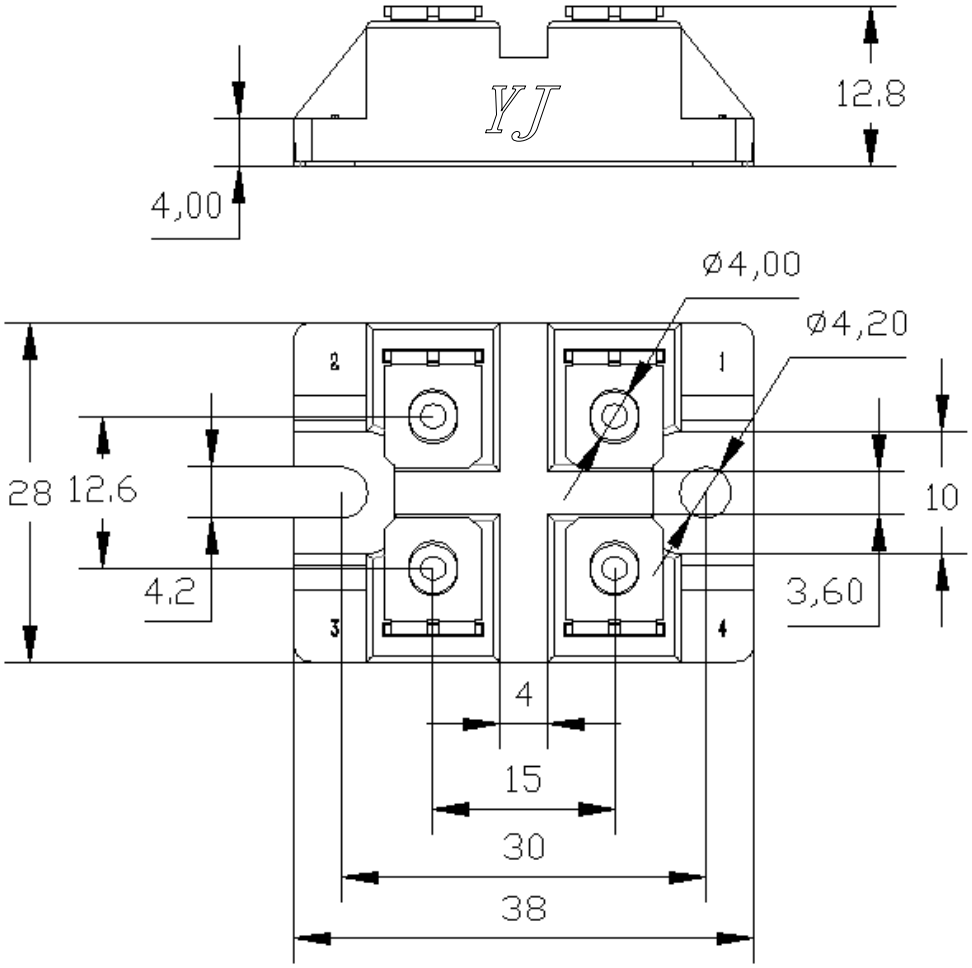


Fig12. Transient Thermal Impedance of Diode

Package Outline Information

CASE: GJ



Dimensions in mm

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