



PRELIMINARY

MG150HF12MIC2 **RoHS**
COMPLIANT

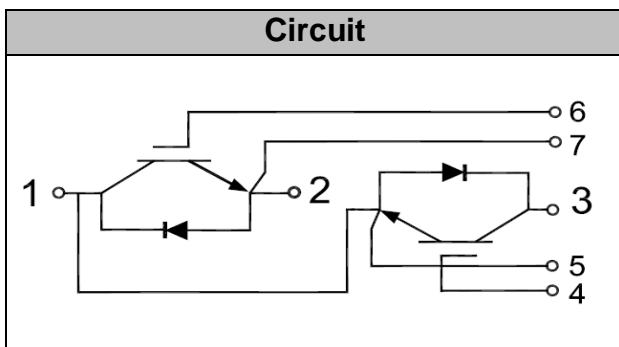
IGBT Modules



V_{CEs} 1200V
I_c 150A

Applications

- Welding Machine
- Power Supplies
- Others



Features

- Short circuit rated 10 μ s
- Low stray Inductance
- Low switching losses
- V_{CE(sat)} with positive temperature coefficient
- Fast switching and short tail current
- Free wheeling diodes with fast and soft reverse recovery

Absolute Maximum Ratings (T_c = 25°C 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°C	210	A
		T _c =80°C	150	A
I _{CM}	Repetitive Peak Collector Current	T _c =25°C, t _p =1ms	300	A
P _{tot}	Power Dissipation Per IGBT	1000	W	
T _J	Junction Temperature Range	40 to +150	°C	
T _{STG}	Storage Temperature Range	40 to +125	°C	
Viso	Insulation Test Voltage	AC, t=1min	3000	V
Mounting Torque	Power Terminals Screw: M6	5±15%	N*m	
	Mounting Screw:M6	5±15%	N*m	

Notes :

(1) Repetitive Rating: Pulse width limited by max. junction temperature



Electrical Characteristics of IGBT ($T_J = 25^\circ\text{C}$ 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	$V_{CE}=1200V, V_{GE}=0V, T_J=25^\circ\text{C}$			0.5	mA
		$V_{CE}=1200V, V_{GE}=0V, T_J=125^\circ\text{C}$			1	mA
I_{GES}	Gate Leakage Current	$V_{CE}=0V, V_{GE}=\pm 20V$	-200		200	nA
ON Characteristics						
$V_{GE(th)}$	Gate - Emitter Threshold Voltage	$V_{CE}=V_{GE}, I_C=4mA$	5	5.9	6.5	V
$V_{CE(sat)}$	Collector – Emitter Saturation Voltage	$I_C=150A, V_{GE}=15V, T_J=25^\circ\text{C}$		1.9	2.1	V
		$I_C=150A, V_{GE}=15V, T_J=125^\circ\text{C}$		2.0	2.3	V
Dynamic Characteristics						
C_{ies}	Input Capacitance	$V_{CE}=25V, V_{GE}=0V, f=1MHz$		10		nF
C_{res}	Reverse Transfer Capacitance			0.42		nF
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=150A, R_G=3.5\Omega, V_{GE}=\pm 15V, T_J=25^\circ\text{C}$ Inductive Load		116		ns
t_r	Rise Time			31		ns
$t_{d(off)}$	Turn-off Delay Time			226		ns
T_f	Fall Time			185		ns
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V, I_C=150A, R_G=3.5\Omega, V_{GE}=\pm 15V, T_J=125^\circ\text{C}$ Inductive Load		127		ns
t_r	Rise Time			35		ns
$t_{d(off)}$	Turn-off Delay Time			305		ns
T_f	Fall Time			300		ns
E_{on}	Turn-on Switching Loss	$V_{CC}=600V, R_G=3.5\Omega, I_C=150A$	$T_J=25^\circ\text{C}$		7.0	mJ
			$T_J=125^\circ\text{C}$		9.9	mJ
E_{off}	Turn-off Switching Loss	$V_{CC}=600V, R_G=3.5\Omega, I_C=150A$	$T_J=25^\circ\text{C}$		8.6	mJ
			$T_J=125^\circ\text{C}$		14.6	mJ
Q_{ge}	Gate Charge	$V_{CC}=600V, I_C=150A, V_{GE}=\pm 15V$		275		nC
SCSOA	Short Circuit Safe Operating Area	$V_{CC} = 600V, V_{GE} = 15V, T_J = 125^\circ\text{C}$	10			μs
				735		A

**Electrical Characteristics of FWD** ($T_C = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Item	Conditions		Min.	Typ	Max.	Units
V_{FM}	Forward Voltage	$I_F=150\text{A}$, $V_{GE}=0\text{V}$;	$T_J=25^\circ\text{C}$,		1.72	1.9	V
			$T_J=125^\circ\text{C}$,		1.82	2.0	
t_{rr}	Reverse Recovery Time	$I_F=150\text{A}$, $V_R=600\text{V}$, $di_F/dt=-2960\text{A}/\mu\text{s}$ $V_{GE} = -15\text{V}$	$T_J=25^\circ\text{C}$,		180		ns
			$T_J=125^\circ\text{C}$,		359		
I_{rr}	Peak Reverse Recovery Current	$I_F=150\text{A}$, $V_R=600\text{V}$, $di_F/dt=-2960\text{A}/\mu\text{s}$ $V_{GE} = -15\text{V}$	$T_J=25^\circ\text{C}$,		110		A
			$T_J=125^\circ\text{C}$,		120		
Q_{rr}	Reverse Recovery Charge	$I_F=150\text{A}$, $V_R=600\text{V}$, $di_F/dt=-2960\text{A}/\mu\text{s}$ $V_{GE} = -15\text{V}$	$T_J=25^\circ\text{C}$,		8.3		mJ
			$T_J=125^\circ\text{C}$,		15.9		

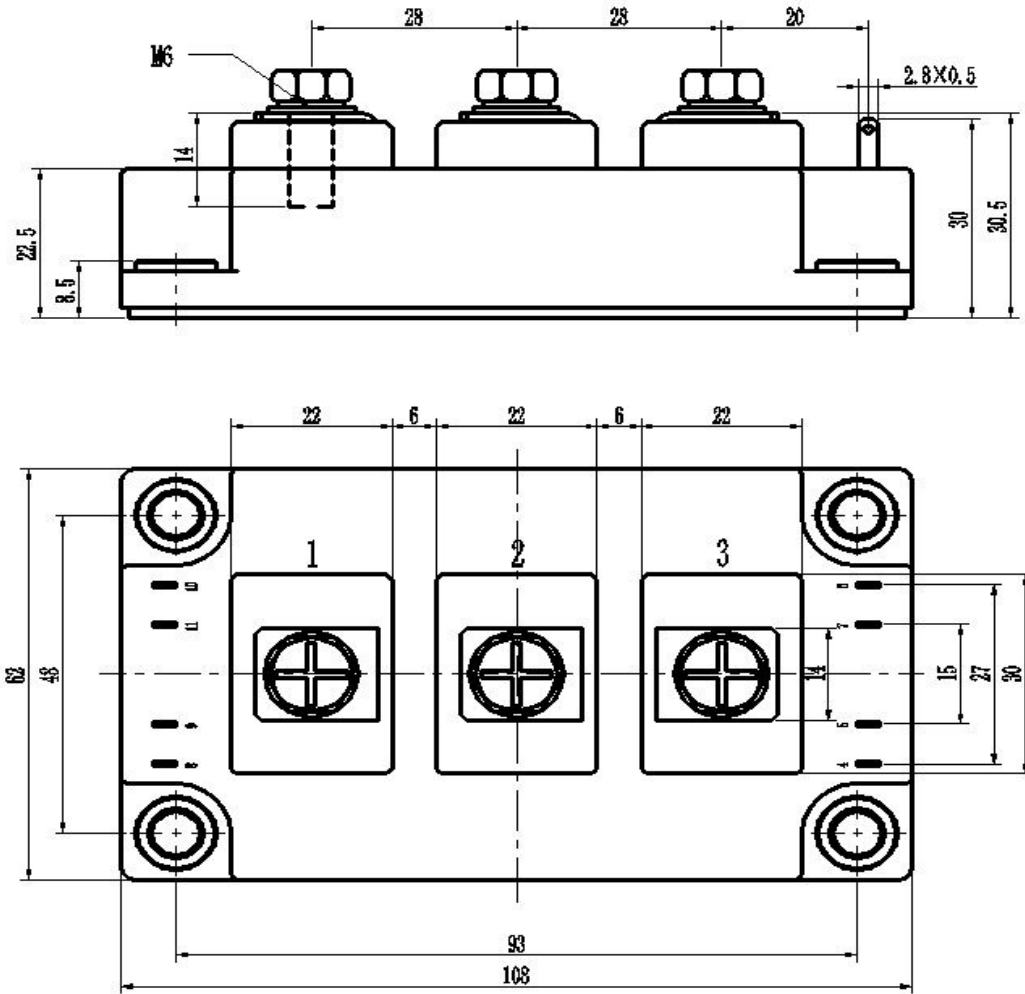
Thermal Resistance Characteristics

Symbol	Description	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-To-Case (IGBT Part, Per Leg)			0.1	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Junction-To-Case (Diode Part, Per Leg)			0.27	$^\circ\text{C}/\text{W}$
$R_{\theta CS}$	Case-To-Sink (Conductive Grease Applied)			0.1	$^\circ\text{C}/\text{W}$
Mt	Power Terminals Screw:M6	3		5	N·m
Ms	Mounting Screw:M6	3		5	N·m
Weight	Weight Of Module			300	g



Package Outline Information

CASE: C2



Dimensions in mm

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