



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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MITSUBISHI IGBT MODULES  
**CM600HU-24F**

HIGH POWER SWITCHING USE

**CM600HU-24F**



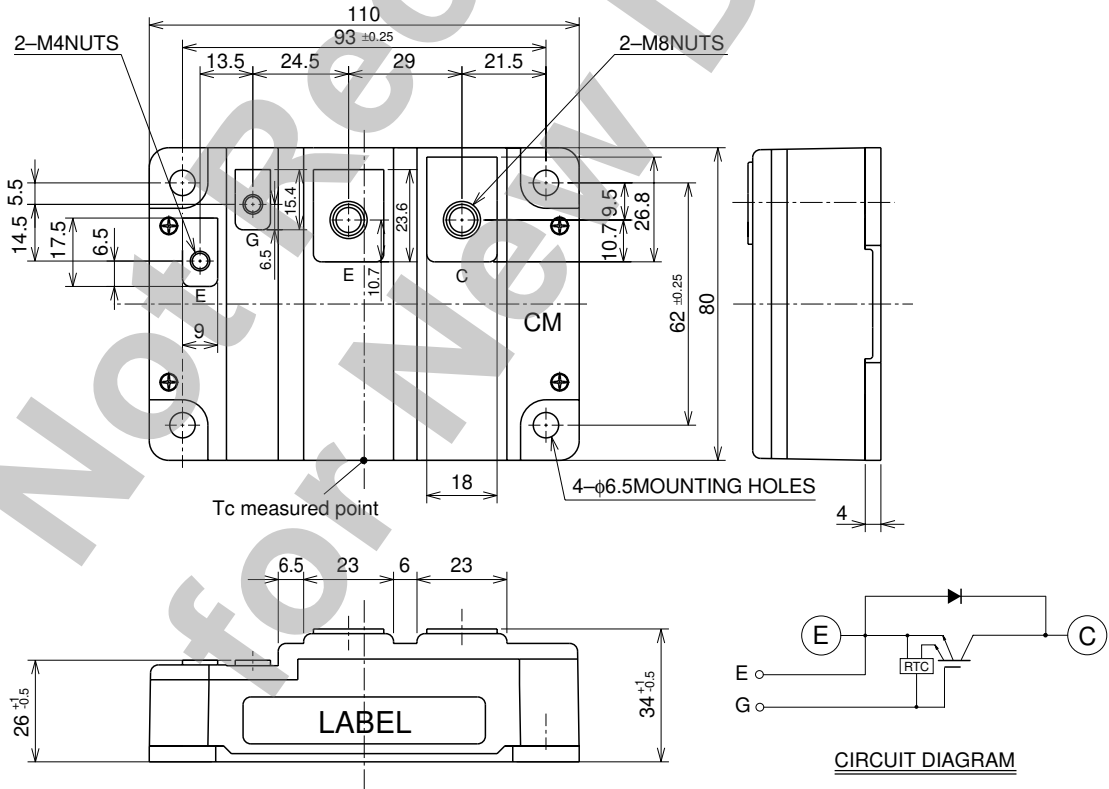
- Ic ..... 600A
- VCES ..... 1200V
- Insulated Type
- 1-elements in a pack

**APPLICATION**

General purpose inverters & Servo controls, etc

**OUTLINE DRAWING & CIRCUIT DIAGRAM**

Dimensions in mm



MAXIMUM RATINGS (T<sub>j</sub> = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V <sub>CE</sub> S	Collector-emitter voltage	G-E Short	1200	V
V <sub>GE</sub> S	Gate-emitter voltage	C-E Short	±20	V
I <sub>C</sub>	Collector current	T <sub>C</sub> = 25°C	600	A
I <sub>CM</sub>		Pulse (Note 2)	1200	
I <sub>E</sub> (Note 1)	Emitter current	T <sub>C</sub> = 25°C	600	A
I <sub>EM</sub> (Note 1)		Pulse (Note 2)	1200	
P <sub>C</sub> (Note 3)	Maximum collector dissipation	T <sub>C</sub> = 25°C	1900	W
T <sub>j</sub>	Junction temperature		-40 ~ +150	°C
T <sub>stg</sub>	Storage temperature		-40 ~ +125	°C
V <sub>iso</sub>	Isolation voltage	Main terminal to base plate, AC 1 min.	2500	V
—	Torque strength	Main Terminal M8	8.8 ~ 10.8	N • m
		Mounting holes M6	3.5 ~ 4.5	N • m
		G(E) Terminal M4	1.3 ~ 1.7	N • m
—	Weight	Typical value	600	g

ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I <sub>CE</sub> S	Collector cutoff current	V <sub>CE</sub> = V <sub>CE</sub> S, V <sub>GE</sub> = 0V	—	—	2	mA
V <sub>GE(th)</sub>	Gate-emitter threshold voltage	I <sub>C</sub> = 60mA, V <sub>CE</sub> = 10V	5	6	7	V
I <sub>GE</sub> S	Gate leakage current	V <sub>GE</sub> = V <sub>CE</sub> S, V <sub>CE</sub> = 0V	—	—	80	μA
V <sub>CE(sat)</sub>	Collector-emitter saturation voltage	T <sub>j</sub> = 25°C	—	1.8	2.4	V
		T <sub>j</sub> = 125°C	—	1.9	—	
C <sub>ies</sub>	Input capacitance	V <sub>CE</sub> = 10V V <sub>GE</sub> = 0V	—	—	230	nF
C <sub>oes</sub>	Output capacitance		—	—	10	
C <sub>res</sub>	Reverse transfer capacitance		—	—	6.0	
Q <sub>G</sub>	Total gate charge	V <sub>CC</sub> = 600V, I <sub>C</sub> = 600A, V <sub>GE</sub> = 15V	—	6600	—	nC
t <sub>d(on)</sub>	Turn-on delay time	V <sub>CC</sub> = 600V, I <sub>C</sub> = 600A V <sub>GE1</sub> = V <sub>GE2</sub> = 15V R <sub>G</sub> = 1.0Ω, Inductive load switching operation	—	—	300	ns
t <sub>r</sub>	Turn-on rise time		—	—	150	
t <sub>d(off)</sub>	Turn-off delay time		—	—	800	
t <sub>f</sub>	Turn-off fall time		—	—	300	
t <sub>rr</sub> (Note 1)	Reverse recovery time		I <sub>E</sub> = 600A	—	—	
Q <sub>rr</sub> (Note 1)	Reverse recovery charge		—	43.2	—	μC
V <sub>EC</sub> (Note 1)	Emitter-collector voltage	I <sub>E</sub> = 600A, V <sub>GE</sub> = 0V	—	—	3.2	V
R <sub>th(j-c)Q</sub>	Thermal resistance*1	IGBT part	—	—	0.063	°C/W
R <sub>th(j-c)R</sub>		FWDi part	—	—	0.075	
R <sub>th(c-f)</sub>	Contact thermal resistance	Case to fin, Thermal compound applied*2	—	0.015	—	
R <sub>th(j-c)Q</sub>	Thermal resistance	T <sub>c</sub> measured point is just under the chips	—	—	0.032*3	
R <sub>G</sub>	External gate resistance		1.0	—	10	Ω

Note 1. I<sub>E</sub>, V<sub>EC</sub>, t<sub>rr</sub>, Q<sub>rr</sub>, die/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode. (FWDi).

2. Pulse width and repetition rate should be such that the device junction temp. (T<sub>j</sub>) does not exceed T<sub>jmax</sub> rating.

3. Junction temperature (T<sub>j</sub>) should not increase beyond 150°C.

4. Pulse width and repetition rate should be such as to cause negligible temperature rise.

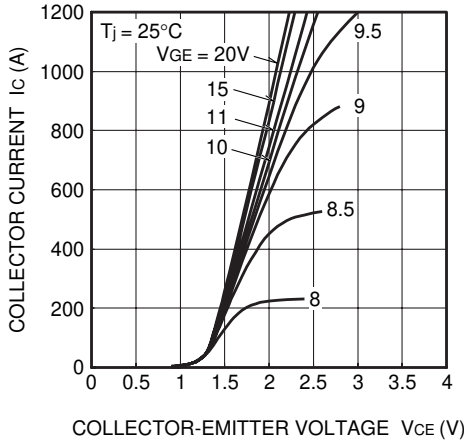
\*1 : T<sub>c</sub> measured point is indicated in OUTLINE DRAWING.

\*2 : Typical value is measured by using Shin-etsu Silicone "G-746".

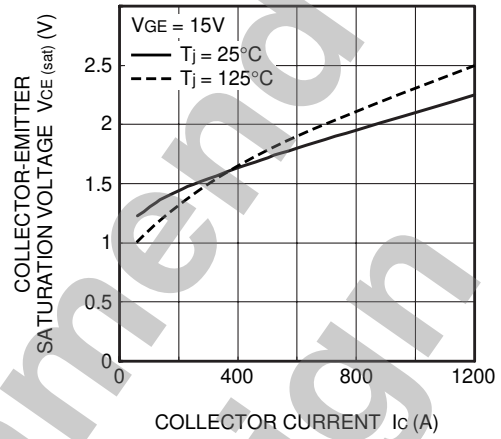
\*3 : If you use this value, R<sub>th(f-a)</sub> should be measured just under the chips.

PERFORMANCE CURVES

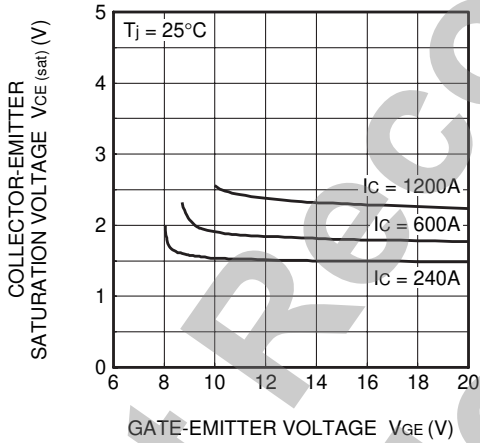
OUTPUT CHARACTERISTICS (TYPICAL)



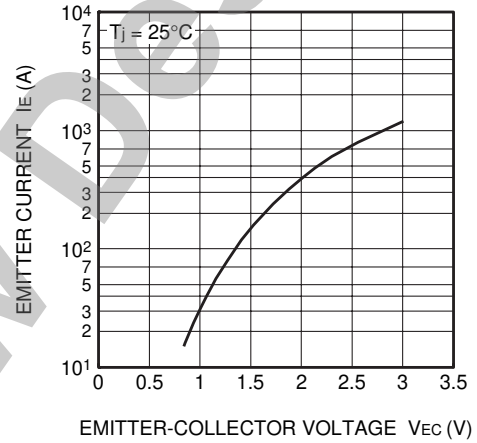
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



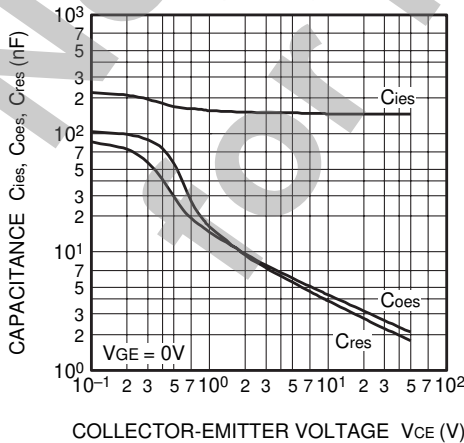
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



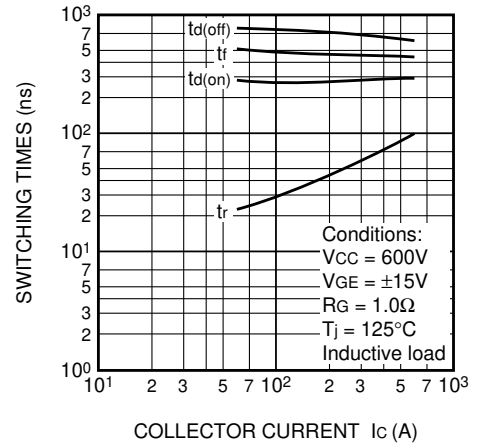
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



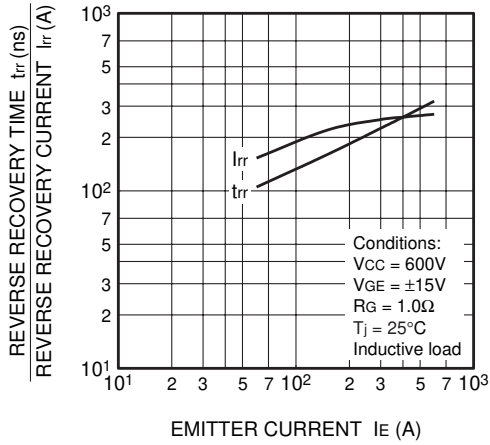
CAPACITANCE-VCE CHARACTERISTICS (TYPICAL)



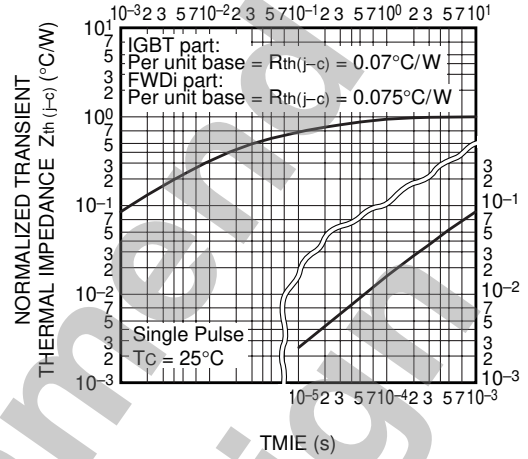
HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)



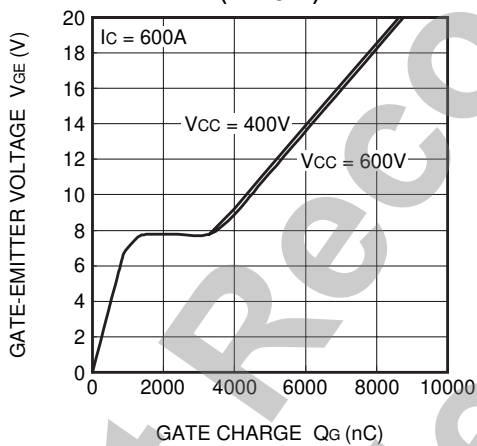
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT part & FWDi part)



GATE CHARGE CHARACTERISTICS (TYPICAL)



Not Recommended for New Design