

MITSUBISHI IGBT MODULES

CM600DU-24F

HIGH POWER SWITCHING USE

CM600DU-24F



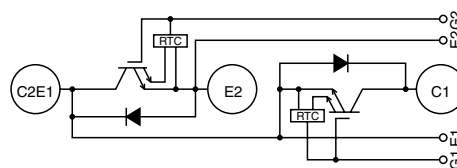
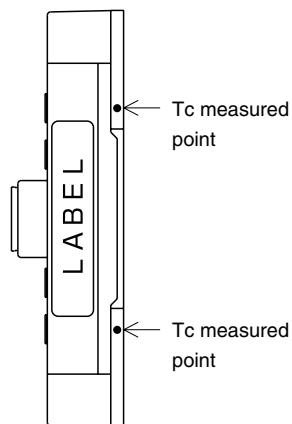
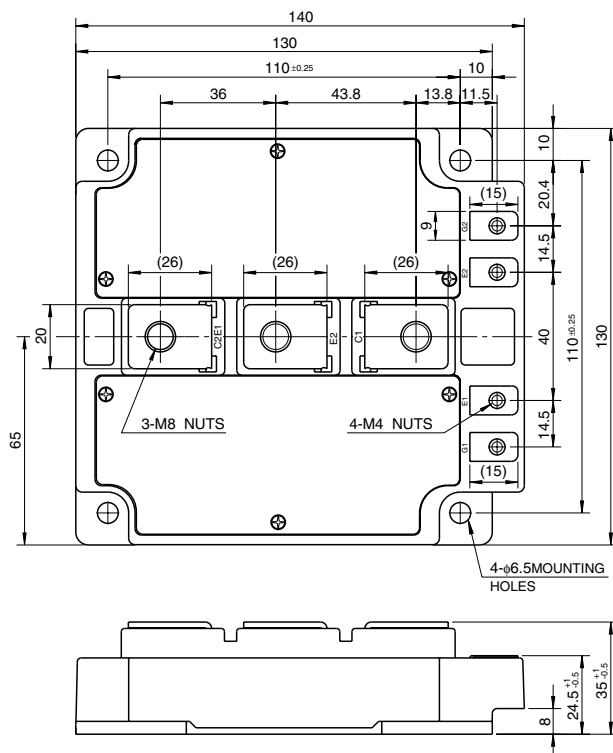
- Ic 600A
- VCES 1200V
- Insulated Type
- 2-elements in a pack

APPLICATION

General purpose inverters & Servo controllers, etc

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



CIRCUIT DIAGRAM

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MAXIMUM RATINGS (Tj = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
VCES	Collector-emitter voltage	G-E Short	1200	V
VGES	Gate-emitter voltage	C-E Short	±20	V
IC	Collector current	Tc = 25°C	600	A
ICM		Pulse (Note 2)	1200	A
IE (Note 1)	Emitter current	Tc = 25°C	600	A
IEM (Note 1)		Pulse (Note 2)	1200	A
PC (Note 3)	Maximum collector dissipation	Tc = 25°C	1540	W
Tj	Junction temperature		−40 ~ +150	°C
Tstg	Storage temperature		−40 ~ +125	°C
Viso	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	
		G(E) Terminal M4	1.3 ~ 1.7	
—	Weight	Typical value	1200	g

ELECTRICAL CHARACTERISTICS (Tj = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
ICES	Collector cutoff current	VCE = VCES, VGE = 0V	—	—	2	mA
VGE(th)	Gate-emitter threshold voltage	IC = 60mA, VCE = 10V	5	6	7	V
IGES	Gate leakage current	VGE = VGES, VCE = 0V	—	—	80	μA
VCE(sat)	Collector-emitter saturation voltage	Tj = 25°C	—	1.95	2.55	V
		Tj = 125°C	—	2.05	—	
Cies	Input capacitance	VCE = 10V VGE = 0V	—	—	230	nF
Coēs	Output capacitance		—	—	10	nF
Cres	Reverse transfer capacitance		—	—	6	nF
QG	Total gate charge	VCC = 600V, IC = 600A, VGE = 15V	—	6600	—	nC
td(on)	Turn-on delay time	VCC = 600V, IC = 600A VGE1 = VGE2 = 15V RG = 1.0Ω, Inductive load switching operation IE = 600A	—	—	450	ns
tr	Turn-on rise time		—	—	200	ns
td(off)	Turn-off delay time		—	—	800	ns
tf	Turn-off fall time		—	—	300	ns
t _{rr} (Note 1)	Reverse recovery time		—	—	500	ns
Q _{rr} (Note 1)	Reverse recovery charge		—	43.2	—	μC
VEC(Note 1)	Emitter-collector voltage	IE = 600A, VGE = 0V	—	—	3.35	V
R _{th(j-c)Q}	Thermal resistance*1	IGBT part (1/2 module)	—	—	0.081	°C/W
R _{th(j-c)R}		FWDi part (1/2 module)	—	—	0.11	°C/W
R _{th(c-f)}	Contact thermal resistance	Case to fin, Thermal compound applied*2 (1/2 module)	—	0.010	—	°C/W
R _{th(j-c)Q}	Thermal resistance*3	Tc measured point is just under the chips	—	—	0.032	°C/W
RG	External gate resistance		1.0	—	5.2	Ω

Note 1. IE, VEC, t_{rr}, Q_{rr} & 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. (Tj) does not exceed Tjmax rating.

3. Junction temperature (Tj) should not increase beyond 150°C.

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

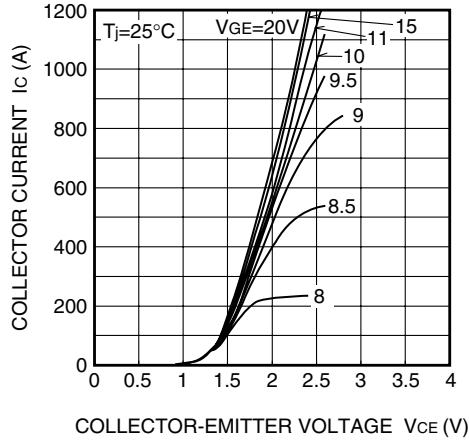
*1 : Tc measured point is indicated in OUTLINE DRAWING.

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

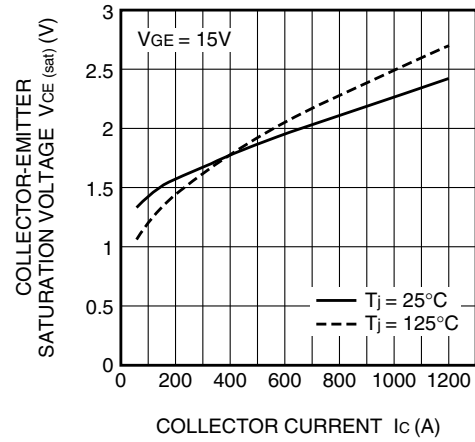
*3 : If you use this value, R_{th(f-a)} should be measured just under the chips.

PERFORMANCE CURVES

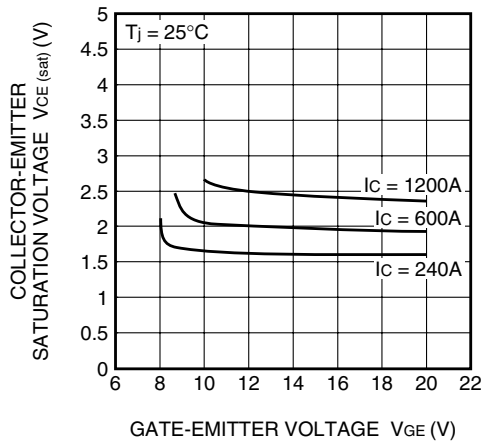
OUTPUT CHARACTERISTICS
(TYPICAL)



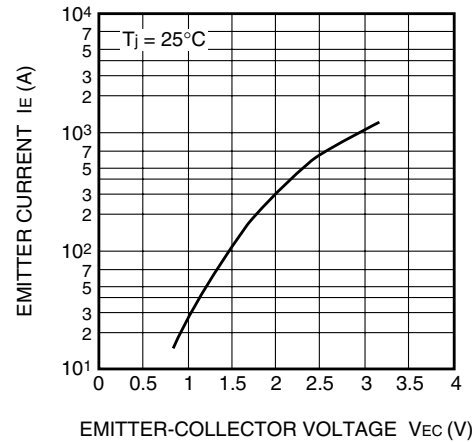
COLLECTOR-EMITTER SATURATION
VOLTAGE CHARACTERISTICS
(TYPICAL)



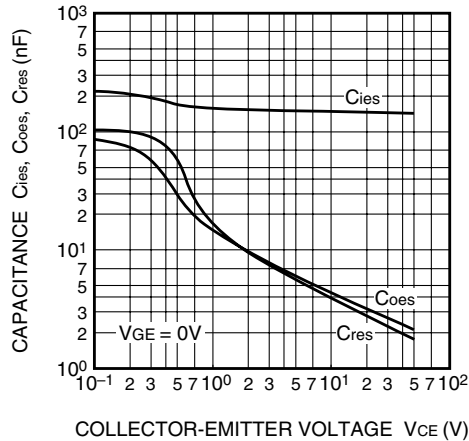
COLLECTOR-EMITTER SATURATION
VOLTAGE CHARACTERISTICS
(TYPICAL)



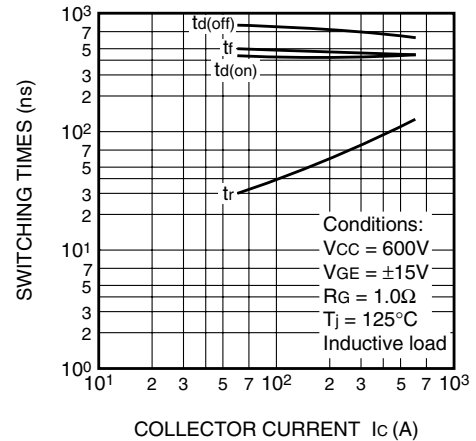
FREE-WHEEL DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



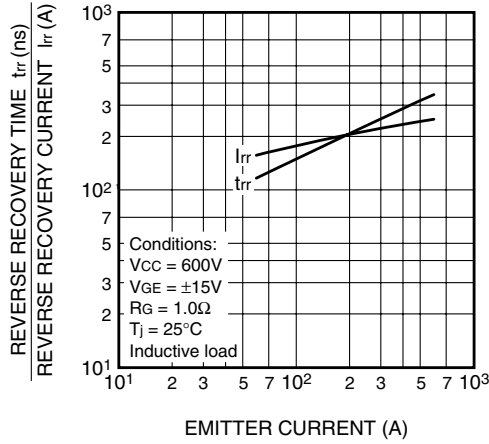
CAPACITANCE- V_{ce}
CHARACTERISTICS
(TYPICAL)



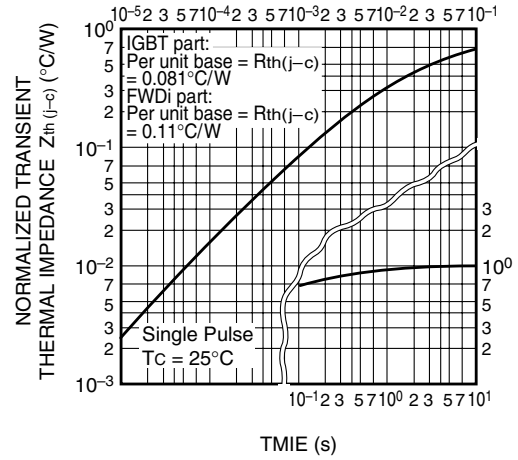
HALF-BRIDGE
SWITCHING CHARACTERISTICS
(TYPICAL)



REVERSE RECOVERY CHARACTERISTICS
OF FREE-WHEEL DIODE
(TYPICAL)



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(IGBT part & FWDi part)



GATE CHARGE
CHARACTERISTICS
(TYPICAL)

