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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.

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MITSUBISHI IGBT MODULES
CM400DU-12F

HIGH POWER SWITCHING USE

CM400DU-12F



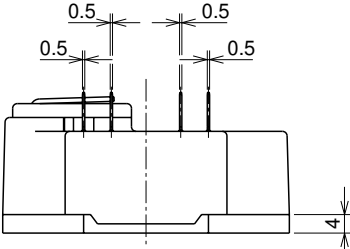
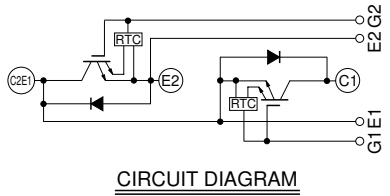
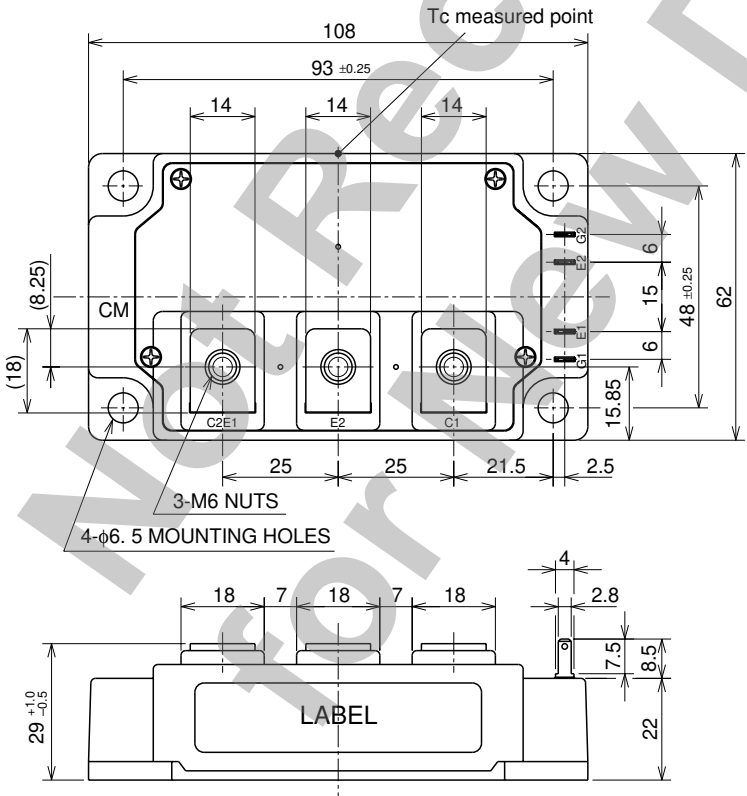
- Ic 400A
- VCES 600V
- Insulated Type
- 2-elements in a pack

APPLICATION

General purpose inverters & Servo controls, etc

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



MAXIMUM RATINGS (T_j = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V _{CE}	Collector-emitter voltage	G-E Short	600	V
V _{GE}	Gate-emitter voltage	C-E Short	±20	V
I _C	Collector current	T _c = 25°C	400	A
I _{CM}		Pulse (Note 2)	800	
I _E (Note 1)	Emitter current	T _c = 25°C	400	A
I _{EM} (Note 1)		Pulse (Note 2)	800	
P _C (Note 3)	Maximum collector dissipation	T _c = 25°C	960	W
T _j	Junction temperature		-40 ~ +150	°C
T _{stg}	Storage temperature		-40 ~ +125	°C
V _{iso}	Isolation voltage	Main terminal to base plate, AC 1 min.	2500	V
—	Torque strength	Main Terminal M6	3.5 ~ 4.5	N • m
		Mounting holes M6	3.5 ~ 4.5	N • m
—	Weight	Typical value	400	g

ELECTRICAL CHARACTERISTICS (T_j = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I _{CE}	Collector cutoff current	V _{CE} = V _{CE} , V _{GE} = 0V	—	—	1	mA
V _{GE(th)}	Gate-emitter threshold voltage	I _C = 40mA, V _{CE} = 10V	5	6	7	V
I _{GE}	Gate leakage current	V _{GE} = V _{CE} , V _{CE} = 0V	—	—	40	μA
V _{CE(sat)}	Collector-emitter saturation voltage	T _j = 25°C T _j = 125°C I _C = 400A, V _{GE} = 15V	—	1.6	2.2	V
C _{ies}	Input capacitance		—	—	110	
C _{oes}	Output capacitance	V _{CE} = 10V	—	—	7.2	nF
C _{res}	Reverse transfer capacitance	V _{GE} = 0V	—	—	4.0	
Q _G	Total gate charge	V _{CC} = 300V, I _C = 400A, V _{GE} = 15V	—	2480	—	nC
t _{d(on)}	Turn-on delay time		—	—	400	ns
t _r	Turn-on rise time	V _{CC} = 300V, I _C = 400A	—	—	200	
t _{d(off)}	Turn-off delay time	V _{GE1} = V _{GE2} = 15V	—	—	700	
t _f	Turn-off fall time	R _G = 3.1Ω, Inductive load switching operation	—	—	250	
t _{rr} (Note 1)	Reverse recovery time	I _E = 400A	—	—	200	ns
Q _{rr} (Note 1)	Reverse recovery charge		—	7.7	—	μC
V _{EC} (Note 1)	Emitter-collector voltage	I _E = 400A, V _{GE} = 0V	—	—	2.6	V
R _{th(j-c)Q}	Thermal resistance*1	IGBT part (1/2 module)	—	—	0.13	°C/W
R _{th(j-c)R}		FWDi part (1/2 module)	—	—	0.18	
R _{th(c-f)}	Contact thermal resistance	Case to fin, Thermal compound applied*2 (1/2 module)	—	0.04	—	
R _{th(j-c)Q}	Thermal resistance	T _c measured point is just under the chips	—	—	0.076*3	
R _G	External gate resistance		3.1	—	31	Ω

Note 1. I_E, V_{EC}, 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. (T_j) does not exceed T_{jmax} rating.

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

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

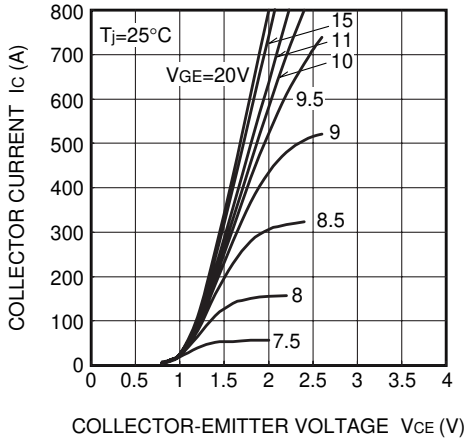
*1 : T_c measured point is indicated in OUTLINE DRAWING.

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

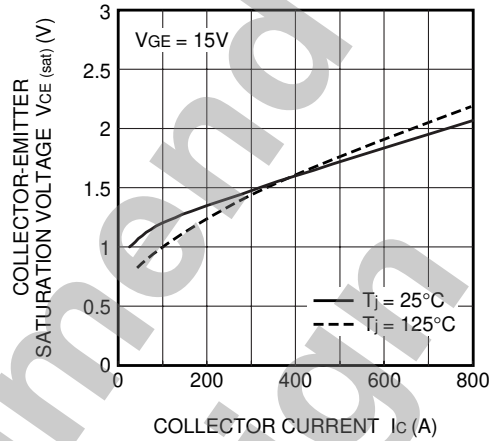
*3 : If you use this value, R_{th(f-a)} should be measured just under the chips.

PERFORMANCE CURVES

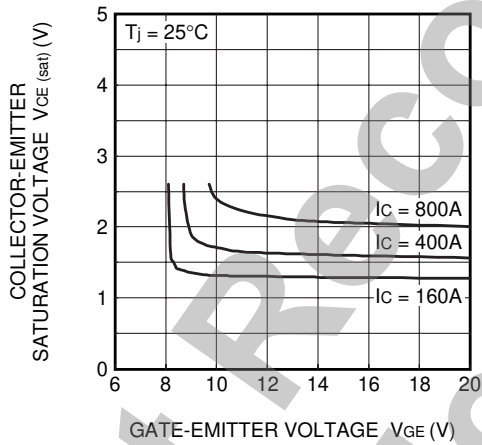
OUTPUT CHARACTERISTICS (TYPICAL)



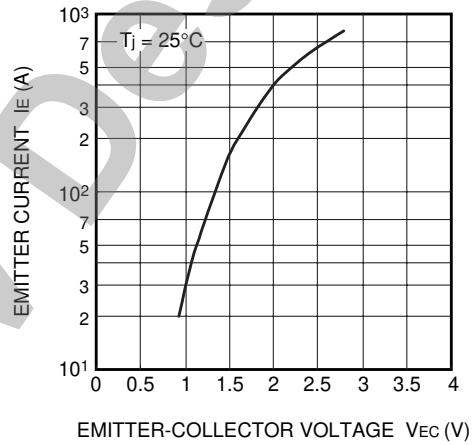
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



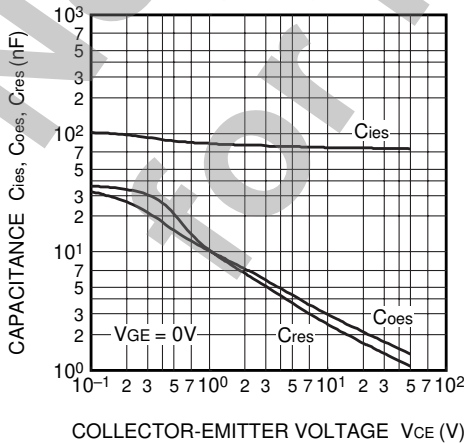
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



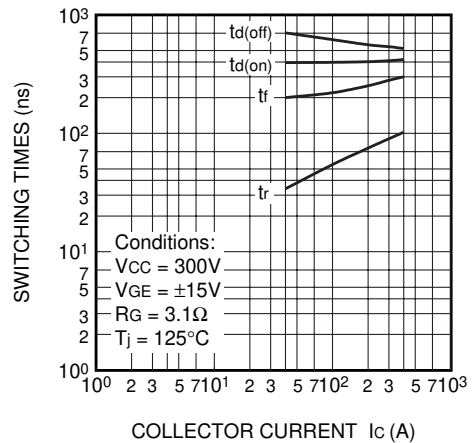
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



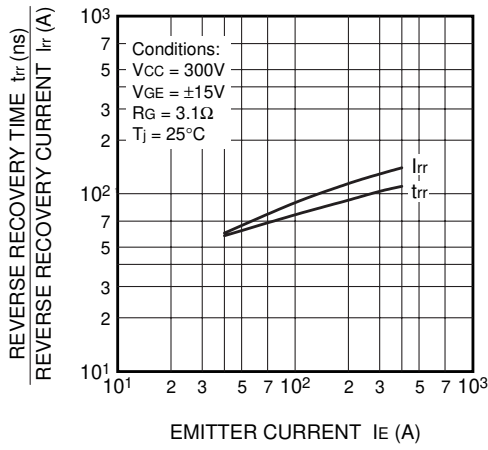
CAPACITANCE-VCE CHARACTERISTICS (TYPICAL)



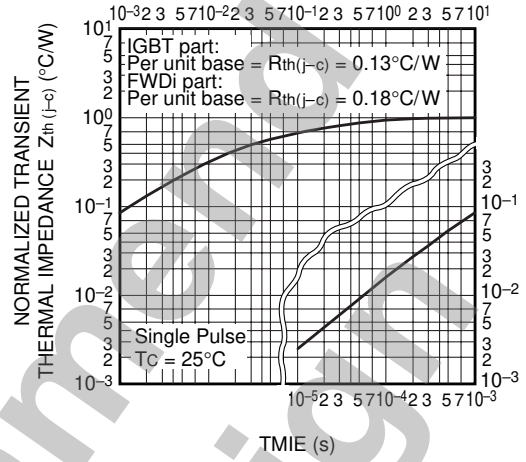
HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)



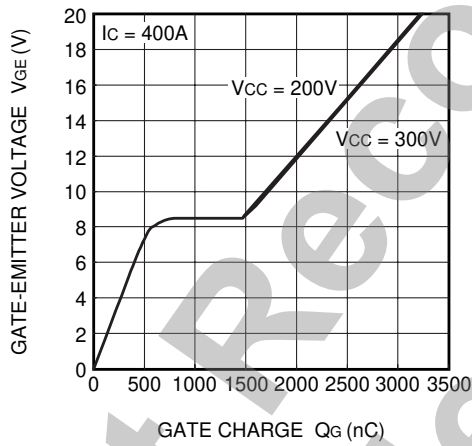
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT part & FWDi part)



GATE CHARGE CHARACTERISTICS (TYPICAL)



Not Recommended for New Design