

CM400DU-5F



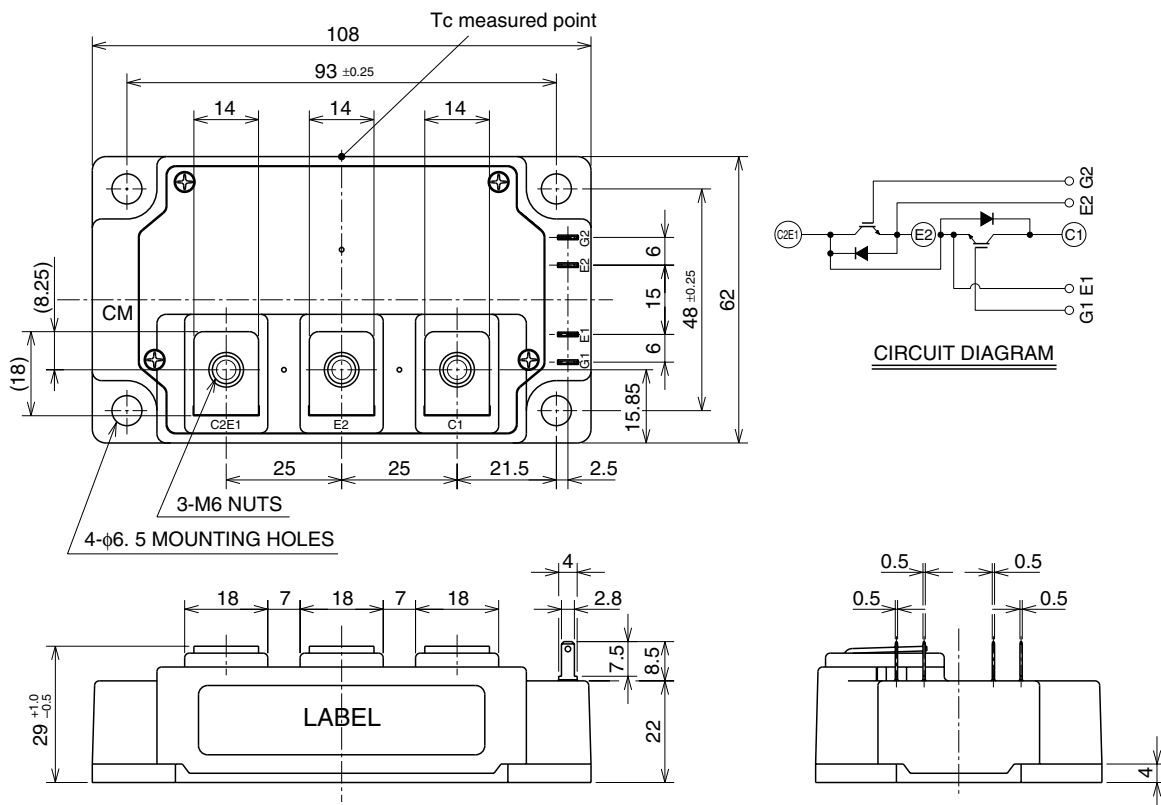
- IC 400A
- VCES 250V
- Insulated Type
- 2-elements in a pack

APPLICATION

DC choper, Inverters for battery source

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



CM400DU-5F

HIGH POWER SWITCHING USE

MAXIMUM RATINGS (Tj = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
VCES	Collector-emitter voltage	G-E Short	250	V
VGES	Gate-emitter voltage	C-E Short	±20	V
IC	Collector current	Tc = 25°C	400	A
ICM		Pulse (Note 2)	800	
IE (Note 1)	Emitter current	Tc = 25°C	400	A
IEM (Note 1)		Pulse (Note 2)	800	
PC (Note 3)	Maximum collector dissipation	Tc = 25°C	890	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
—	Mounting torque	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 (Tj = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
ICES	Collector cutoff current	VCE = VCES, VGE = 0V	—	—	1	mA
VGE(th)	Gate-emitter threshold voltage	IC = 40mA, VCE = 10V	3.0	4.0	5.0	V
IGES	Gate leakage current	VGE = VCES, VCE = 0V	—	—	0.5	μA
VCE(sat)	Collector to emitter saturation voltage	Tj = 25°C	—	1.2	1.7	V
		Tj = 125°C		1.1	—	
Cies	Input capacitance	VCE = 10V VGE = 0V	—	—	110	nF
Coēs	Output capacitance		—	—	7.0	
Cres	Reverse transfer capacitance		—	—	3.8	
QG	Total gate charge	VCC = 100V, IC = 400A, VGE = 10V	—	750	—	nC
td(on)	Turn-on delay time	VCC = 100V, IC = 400A VGE1 = VGE2 = 10V RG = 6.3Ω, Inductive load switching operation IE = 400A	—	—	850	ns
tr	Turn-on rise time		—	—	400	
td(off)	Turn-off delay time		—	—	1100	
tf	Turn-off fall time		—	—	500	
t _{rr} (Note 1)	Reverse recovery time		—	—	300	ns
Q _{rr} (Note 1)	Reverse recovery charge		—	16.0	—	μC
VEC(Note 1)	Emitter-collector voltage	IE = 200A, VGE = 0V	—	—	2	V
Rth(j-c)Q	Thermal resistance*1	IGBT part (1/2 module)	—	—	0.14	°C/W
Rth(j-c)R		FWDi part (1/2 module)	—	—	0.24	
Rth(c-f)	Contact thermal resistance	Case to fin, Thermal compound applied*2 (1/2 module)	—	0.04	—	
Rth(j-c)Q	Thermal resistance*3	Tc measured point is just under the chips	—	—	0.08	

Note 1. IE, VEC, t_{rr}, Q_{rr} and 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.

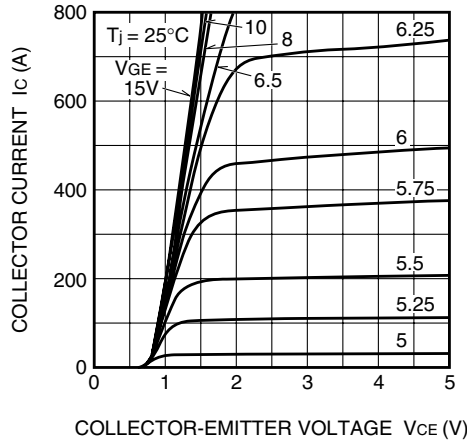
*1 : Tc measured point is indicated in OUTLINE DRAWING.

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

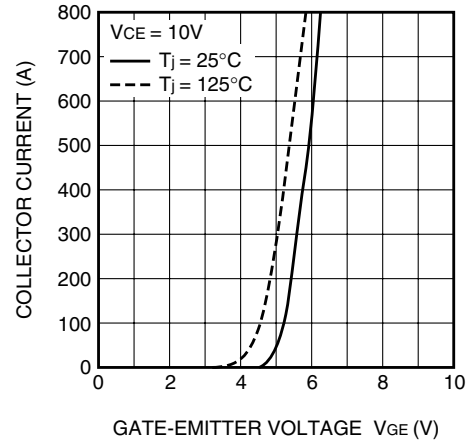
*3 : If you use this value, Rth(f-a) should be measured just under the chips.

PERFORMANCE CURVES

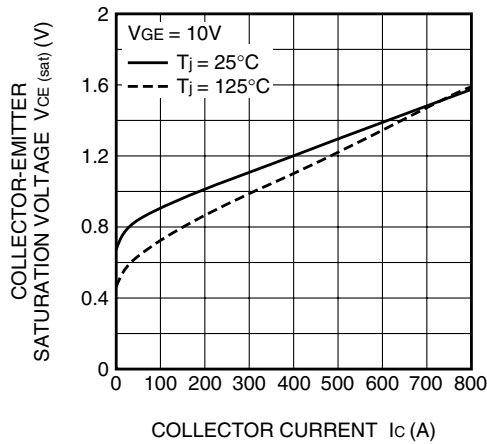
OUTPUT CHARACTERISTICS
(TYPICAL)



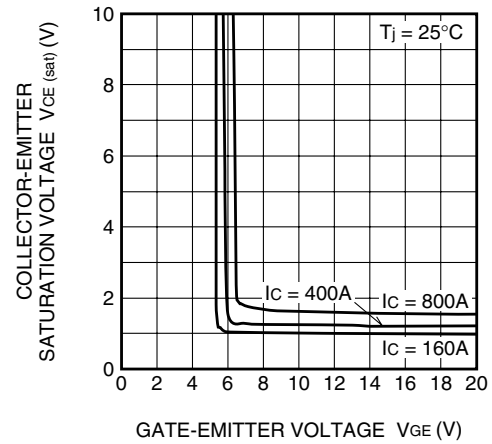
TRANSFER CHARACTERISTICS
(TYPICAL)



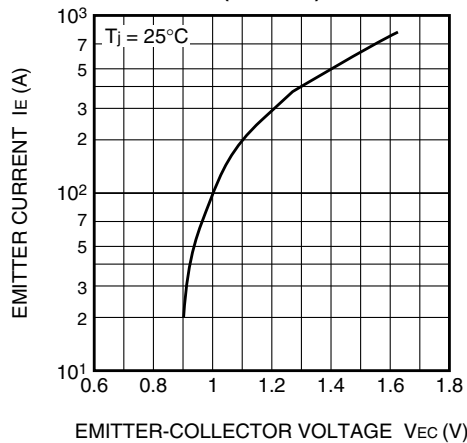
COLLECTOR-EMITTER SATURATION
VOLTAGE CHARACTERISTICS
(TYPICAL)



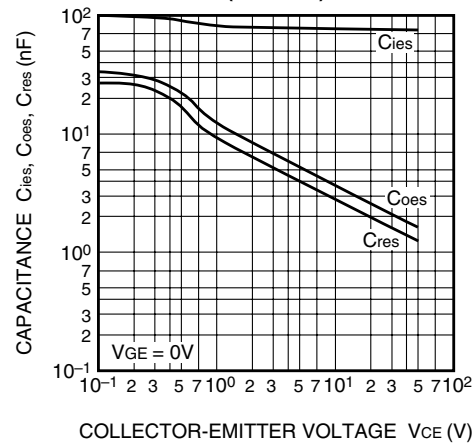
COLLECTOR-EMITTER SATURATION
VOLTAGE CHARACTERISTICS
(TYPICAL)



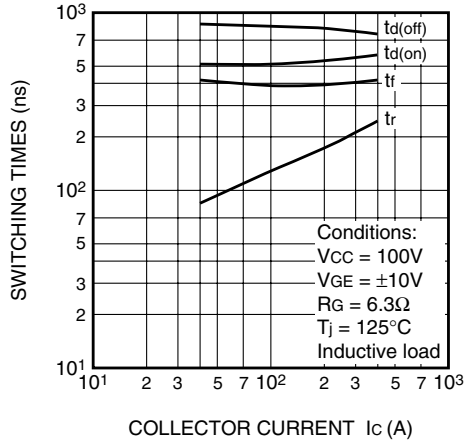
FREE-WHEEL DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



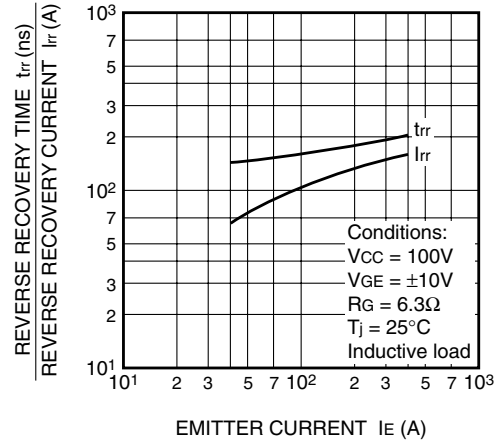
CAPACITANCE- V_{CE}
CHARACTERISTICS
(TYPICAL)



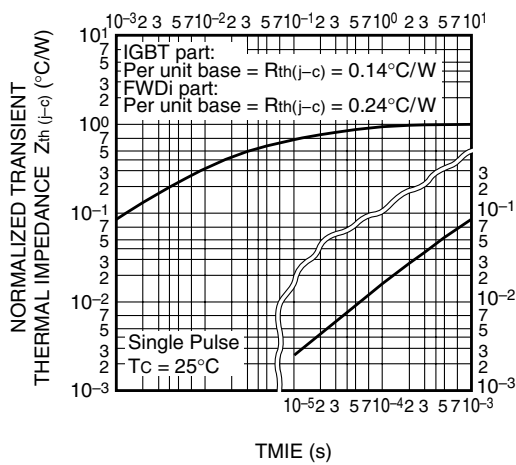
HALF-BRIDGE
SWITCHING CHARACTERISTICS
(TYPICAL)



REVERSE RECOVERY CHARACTERISTICS
OF FREE-WHEEL DIODE
(TYPICAL)



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(IGBT part & FWDi part)



GATE CHARGE
CHARACTERISTICS
(TYPICAL)

