

# CM600DU-5F

HIGH POWER SWITCHING USE

## CM600DU-5F



- IC .....600A
- VCES .....250V
- Insulated Type
- 2-elements in a pack

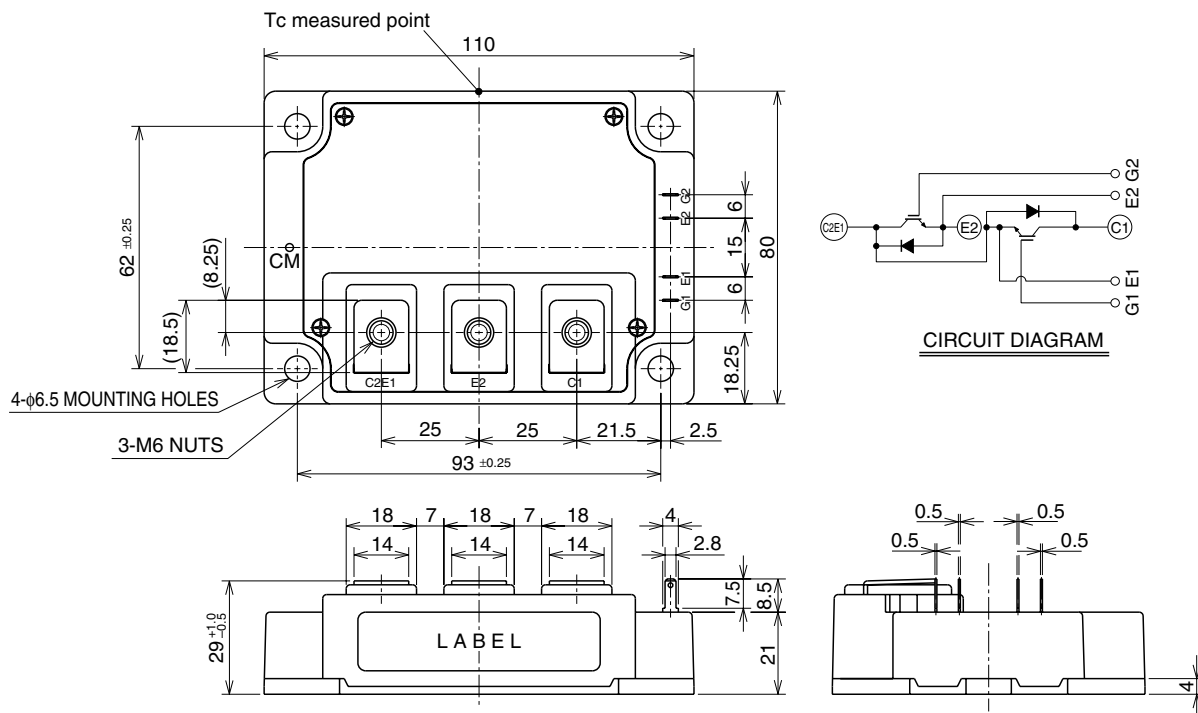
### APPLICATION

AC motor control of forklift (battery power source)

### OUTLINE DRAWING & CIRCUIT DIAGRAM

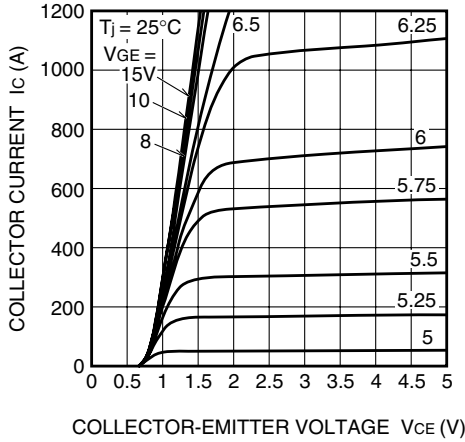
Dimensions in mm

[www.BDTIC.com/MITSUBISHI](http://www.BDTIC.com/MITSUBISHI)

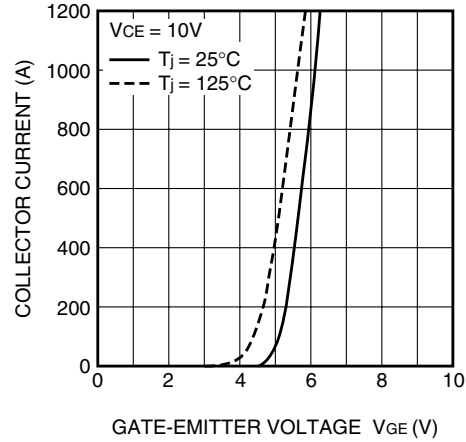


PERFORMANCE CURVES

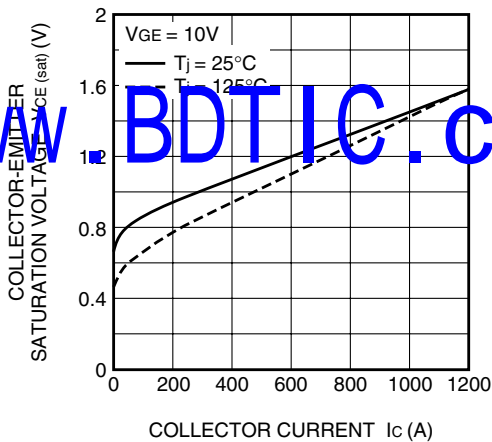
OUTPUT CHARACTERISTICS (TYPICAL)



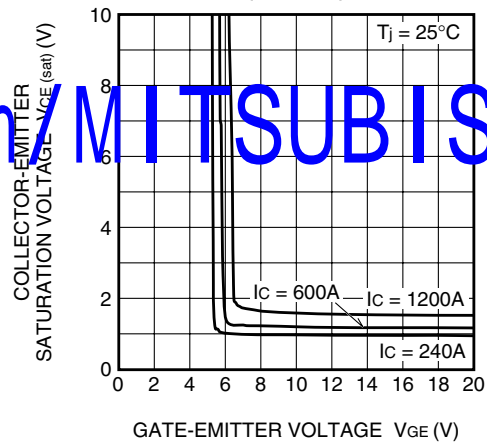
TRANSFER CHARACTERISTICS (TYPICAL)



COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)

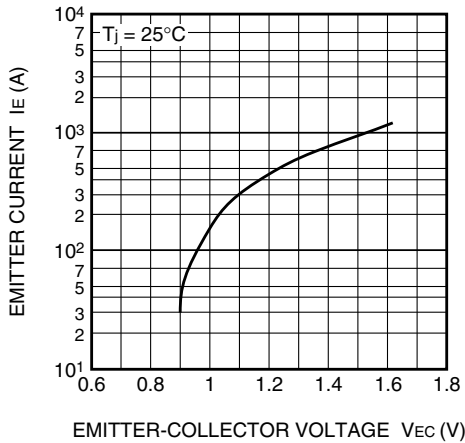


COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)

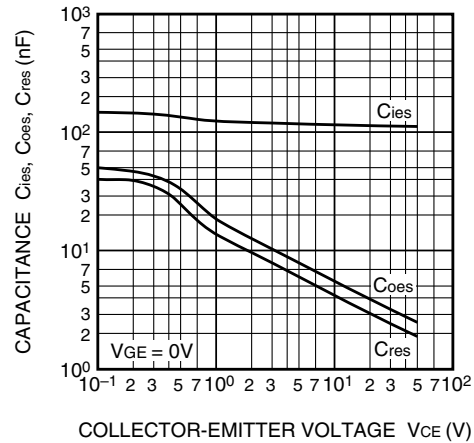


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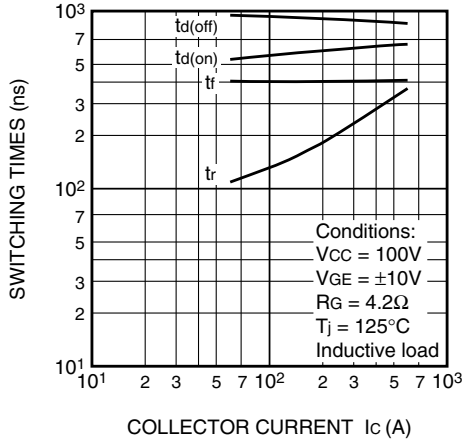
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



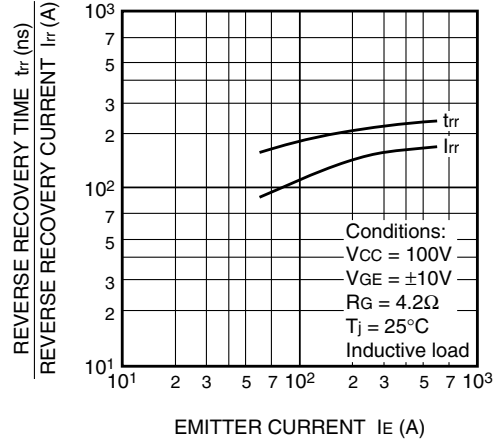
CAPACITANCE-Vce CHARACTERISTICS (TYPICAL)



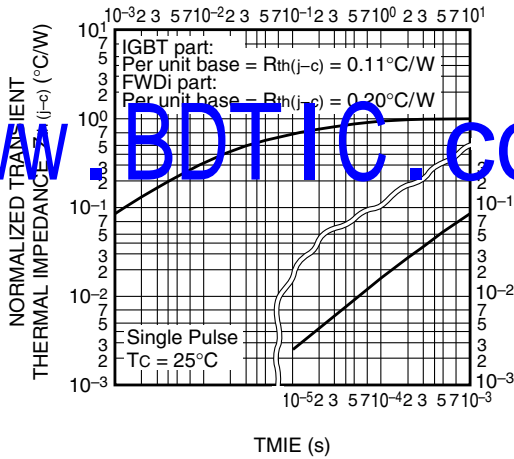
HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)



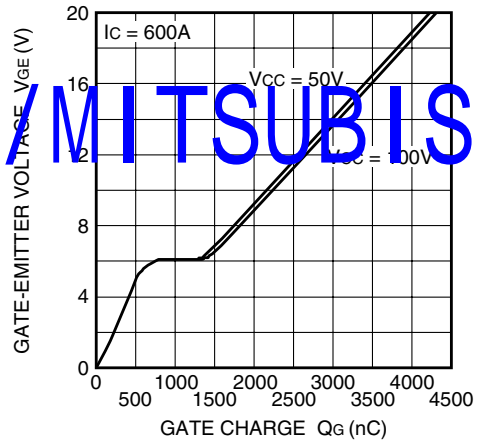
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT part & FWDi part)



GATE CHARGE CHARACTERISTICS (TYPICAL)



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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	600	A
IC(rms)			350	A(rms)
ICM			Pulse (Note 2)	1200
IE (Note 1)	Emitter current	Tc = 25°C	600	A
IE(rms) (Note 1)			350	A(rms)
IEM (Note 1)			Pulse (Note 2)	1200
PC (Note 3)	Maximum collector dissipation	Tc = 25°C	1100	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	580	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 = 60mA, VCE = 10V	3.0	4.0	5.0	V
IGES	Gate leakage current	VGE = VCES, VCE = 0V	—	—	85	μA
VCE(sat)	Collector to emitter saturation voltage	Tj = 25°C, IC = 60A, VGE = 10V	—	4.2	5.7	V
		Tj = 125°C, IC = 60A, VGE = 10V	—	—	—	
Cies	Input capacitance	VCE = 10V VGE = 0V	—	—	170	nF
Coes	Output capacitance		—	—	11	
Cres	Reverse transfer capacitance		—	—	5.7	
QG	Total gate charge	VCC = 100V, IC = 600A, VGE = 10V	—	2200	—	nC
td(on)	Turn-on delay time	VCC = 100V, IC = 600A VGE1 = VGE2 = 10V RG = 4.2Ω, Inductive load switching operation	—	—	850	ns
tr	Turn-on rise time		—	—	600	
td(off)	Turn-off delay time		—	—	1100	
tf	Turn-off fall time		—	—	500	
trr (Note 1)	Reverse recovery time		IE = 600A	—	—	
Qrr (Note 1)	Reverse recovery charge		—	20.0	—	μC
VEC(Note 1)	Emitter-collector voltage	IE = 600A, VGE = 0V	—	—	2	V
Rth(j-c)Q	Thermal resistance*1	IGBT part (1/2 module)	—	—	0.11	°C/W
Rth(j-c)R		FWDi part (1/2 module)	—	—	0.20	
Rth(c-f)	Contact thermal resistance	Case to fin, Thermal compound applied*2 (1/2 module)	—	0.02	—	
Rth(j-c)Q	Thermal resistance*3	Tc measured point is just under the chips	—	—	0.05	

Note 1. IE, VEC, trr, Qrr 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.