

MITSUBISHI IGBT MODULES
CM600HU-24H
 HIGH POWER SWITCHING USE
 INSULATED TYPE

CM600HU-24H



- Ic 600A
- VCES 1200V
- Insulated Type
- 1-element in a pack
- UL Recognized

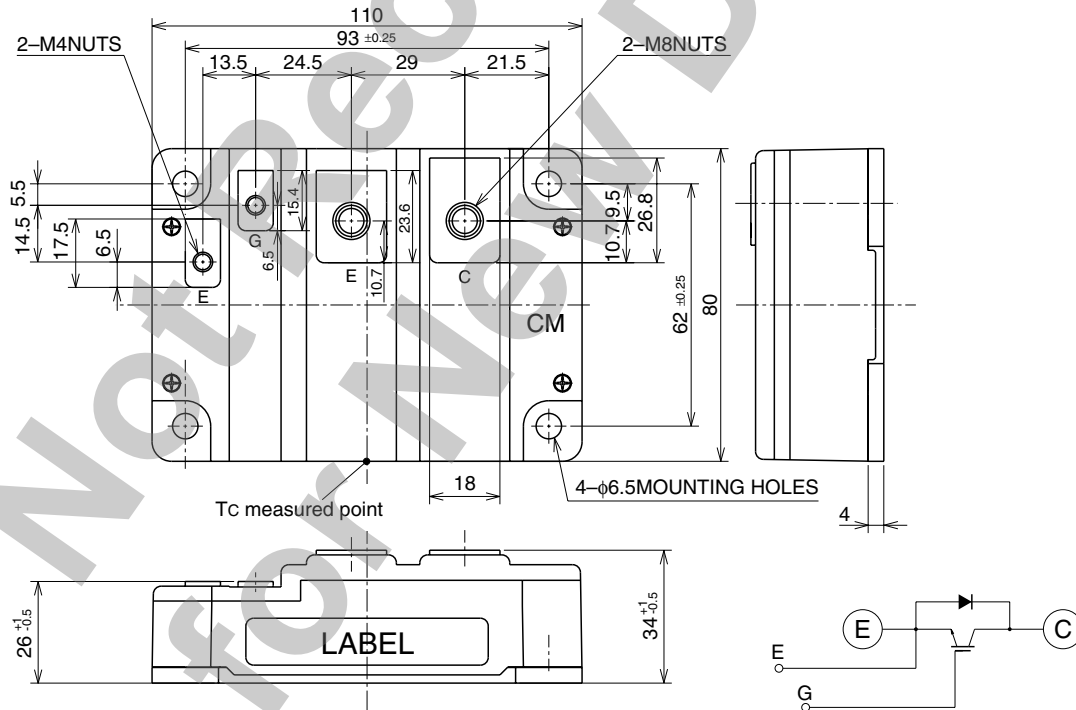
Yellow Card No. E80276
 File No. E80271

APPLICATION

UPS, NC machine, AC-Drive control, Servo, Welders

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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MAXIMUM RATINGS (Tj = 25°C, unless otherwise specified)

Symbol	Item	Conditions	Ratings	Unit
V _{CE} S	Collector-emitter voltage	V _{GE} = 0V	1200	V
V _{GE} S	Gate-emitter voltage	V _{CE} = 0V	±20	V
I _C	Collector current	T _C = 25°C	600	A
I _{CM}		Pulse (Note 1)	1200	A
I _E (Note 2)	Emitter current	T _C = 25°C	600	A
I _{EM} (Note 2)		Pulse (Note 1)	1200	A
P _C (Note 3)	Maximum collector dissipation	T _C = 25°C	3100	W
T _j	Junction temperature	—	-40 ~ +150	°C
T _{stg}	Storage temperature	—	-40 ~ +125	°C
V _{iso}	Isolation voltage	Charged part to base plate, f = 60Hz, AC 1 minute	2500	V _{rms}
—	Mounting torque	Main terminals M8 screw	9.8 ~ 10.8	N·m
		Mounting M6 screw	3.5 ~ 4.5	N·m
		Auxiliary terminals M4 screw	1.3 ~ 1.7	N·m
—	Weight	Typical value	600	g

ELECTRICAL CHARACTERISTICS (Tj = 25°C, unless otherwise specified)

Symbol	Item	Test Conditions	Limits			Unit
			Min	Typ	Max	
I _{CES}	Collector cutoff current	V _{CE} = V _{CE} S, V _{GE} = 0V	—	—	2	mA
V _{GE(th)}	Gate-emitter threshold voltage	I _C = 60mA, V _{CE} = 10V	4.5	6	7.5	V
I _{GES}	Gate-leakage current	±V _{GE} = V _{GE} S, V _{CE} = 0V	—	—	0.5	μA
V _{CE(sat)}	Collector-emitter saturation voltage	I _C = 600A, V _{GE} = 15V (Note 4)	—	2.9	3.7	V
		T _j = 25°C T _j = 125°C	—	2.85	—	
C _{ies}	Input capacitance	V _{CE} = 10V	—	—	90	nF
C _{oes}	Output capacitance	V _{GE} = 0V	—	—	31.5	nF
C _{res}	Reverse transfer capacitance	—	—	—	18	nF
Q _G	Total gate charge	V _{CC} = 600V, I _C = 600A, V _{GE} = 15V	—	2250	—	nC
t _{d(on)}	Turn-on delay time	V _{CC} = 600V, I _C = 600A	—	—	300	ns
t _r	Turn-on rise time	V _{GE} = ±15V	—	—	700	ns
t _{d(off)}	Turn-off delay time	R _G = 2.1Ω	—	—	450	ns
t _f	Turn-off fall time	Resistive load	—	—	350	ns
V _{EC} (Note 2)	Emitter-collector voltage	I _E = 600A, V _{GE} = 0V	—	—	3.2	V
t _{rr} (Note 2)	Reverse recovery time	I _E = 600A,	—	—	300	ns
Q _{rr} (Note 2)	Reverse recovery charge	die / dt = -1200A / μs	—	3.3	—	μC
R _{th(j-c)Q}	Thermal resistance (Note 5)	Junction to case, IGBT part	—	—	0.04	K/W
R _{th(j-c)R}		Junction to case, FWDi part	—	—	0.06	K/W
R _{th(c-f)}	Contact thermal resistance	Case to heat sink, conductive grease applied (Note 6)	—	0.015	—	K/W

Note 1. Pulse width and repetition rate should be such that the device junction temperature (Tj) does not exceed Tjmax rating.

2. I_E, V_{EC}, t_{rr}, Q_{rr} & die/dt represent characteristics of the anti-parallel, emitter-collector free-wheel diode.

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.

5. Case temperature (Tc) measured point is shown in page OUTLINE DRAWING.

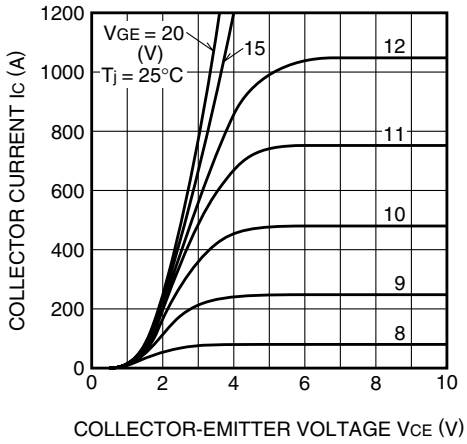
6. Typical value is measured by using thermally conductive grease of λ = 0.9[W/(m · K)].

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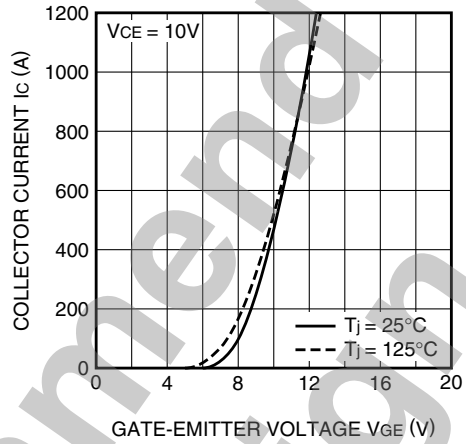
HIGH POWER SWITCHING USE
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PERFORMANCE CURVES

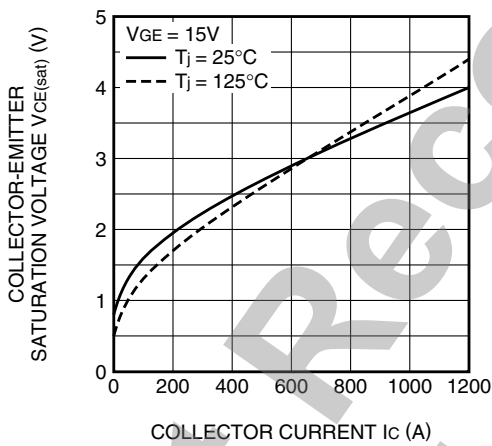
OUTPUT CHARACTERISTICS (TYPICAL)



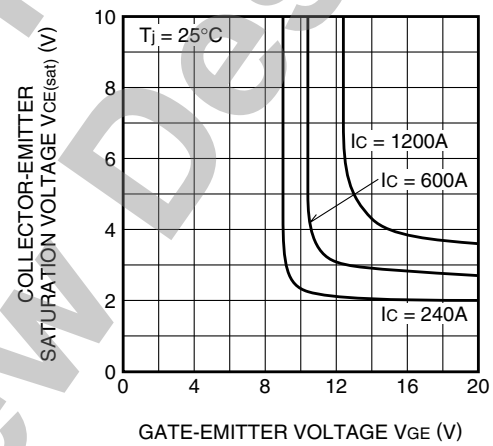
TRANSFER CHARACTERISTICS (TYPICAL)



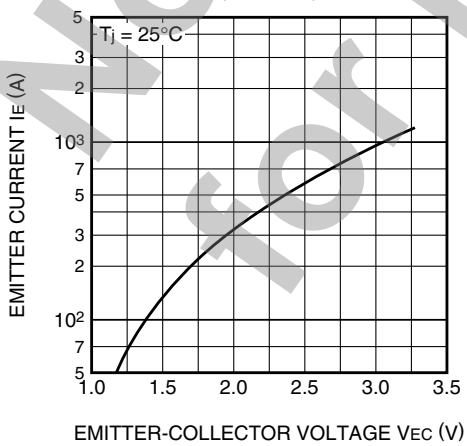
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



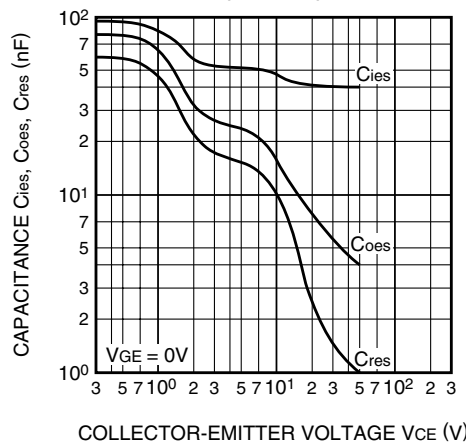
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



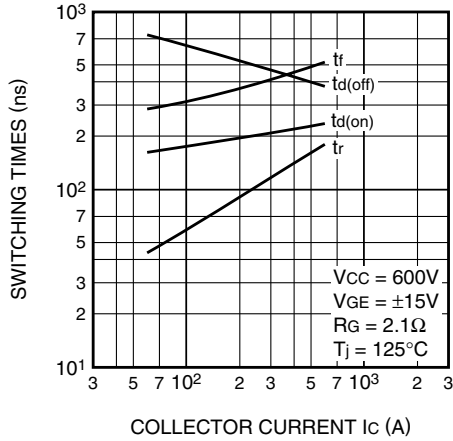
CAPACITANCE CHARACTERISTICS (TYPICAL)



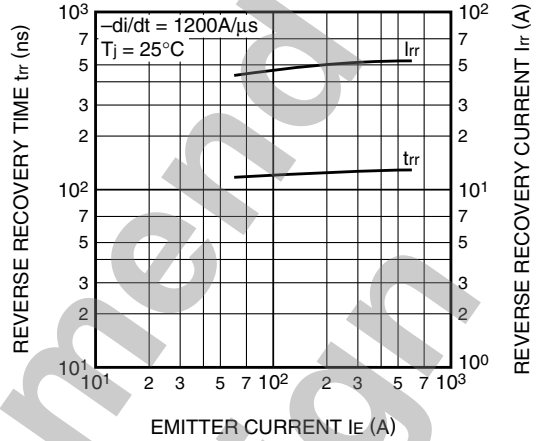
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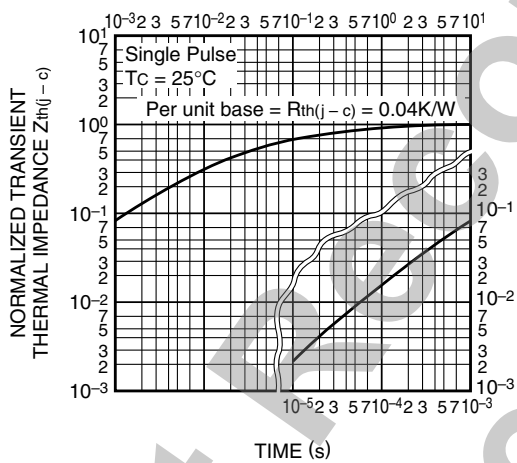
HALF-BRIDGE
SWITCHING TIME CHARACTERISTICS
(TYPICAL)



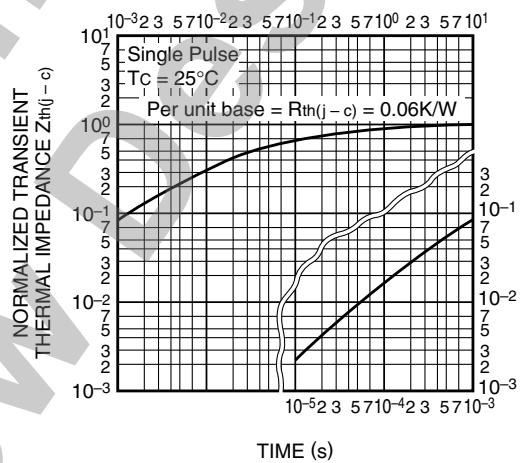
REVERSE RECOVERY CHARACTERISTICS
OF FREE-WHEEL DIODE
(TYPICAL)



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(IGBT part)



TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(FWDi part)



GATE CHARGE CHARACTERISTICS
(TYPICAL)

