

MITSUBISHI IGBT MODULES
CM300DY-12H
 HIGH POWER SWITCHING USE
 INSULATED TYPE

CM300DY-12H



- Ic 300A
- VCES 600V
- Insulated Type
- 2-elements in a pack
- UL Recognized

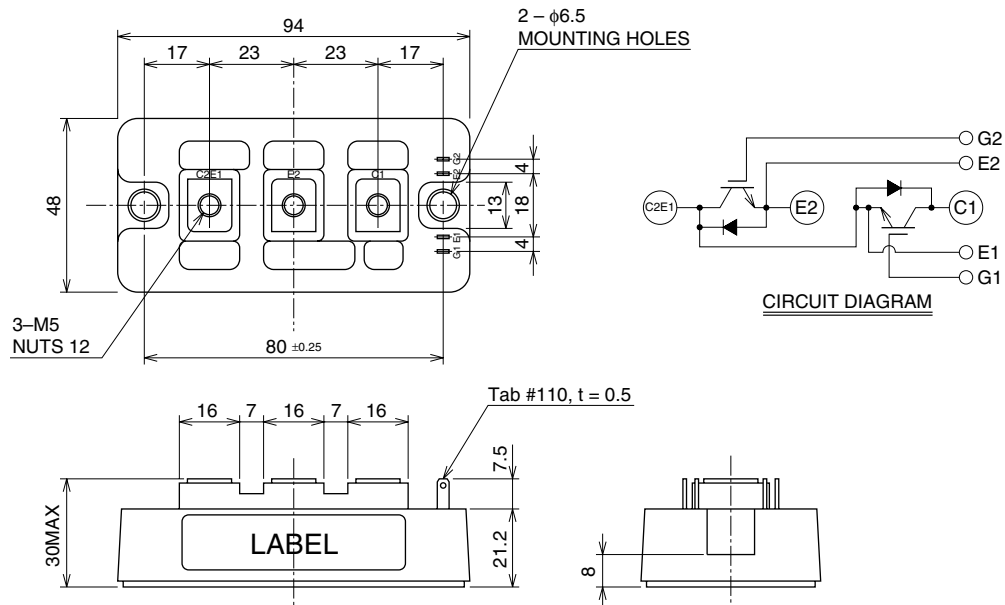
Yellow Card No. E80276
 File No. E80271

APPLICATION

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

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



CM300DY-12H

HIGH POWER SWITCHING USE
INSULATED TYPEABSOLUTE MAXIMUM RATINGS ($T_j = 25^\circ\text{C}$, unless otherwise specified)

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	300	A
I _{CM}		Pulse (Note 2)	600	
I _E (Note 1)	Emitter current	T _C = 25°C	300	A
I _{EM} (Note 1)		Pulse (Note 2)	600	
P _C (Note 3)	Maximum collector dissipation	T _C = 25°C	1100	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 M5	1.47 ~ 1.96	N • m
—		Mounting holes M6	1.96 ~ 2.94	N • m
—	Weight	Typical value	270	g

ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$, unless otherwise specified)

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 = 30mA, V _{CE} = 10V	4.5	6	7.5	V
I _{GE}	Gate leakage current	±V _{GE} = V _{GES} , V _{CE} = 0V	—	—	0.5	μA
V _{CE(sat)}	Collector-emitter saturation voltage	I _C = 300A, V _{GE} = 15V (Note 4)	—	2.1	2.8	V
		T _j = 25°C T _j = 150°C	—	2.15	—	
C _{ies}	Input capacitance	V _{CE} = 10V V _{GE} = 0V	—	—	30	nF
C _{oes}	Output capacitance		—	—	10.5	
C _{res}	Reverse transfer capacitance		—	—	6	
Q _G	Total gate charge	V _{CC} = 300V, I _C = 300A, V _{GE} = 15V	—	900	—	nC
t _{d(on)}	Turn-on delay time	V _{CC} = 300V, I _C = 300A V _{GE1} = V _{GE2} = 15V R _G = 2.1Ω, Inductive load switching operation	—	—	350	ns
t _r	Turn-on rise time		—	—	600	
t _{d(off)}	Turn-off delay time		—	—	350	
t _f	Turn-off fall time		—	—	300	
V _{EC} (Note 1)	Emitter-collector voltage	I _E = 300A, V _{GE} = 0V	—	—	2.8	V
t _{rr} (Note 1)	Reverse recovery time	I _E = 300A	—	—	110	ns
Q _{rr} (Note 1)	Reverse recovery charge	die/dt = -600A/μs	—	0.81	—	μC
R _{th(j-c)Q}	Thermal resistance	IGBT part (1/2 module)	—	—	0.11	°C/W
R _{th(j-c)R}		FWDi part (1/2 module)	—	—	0.24	
R _{th(c-f)}	Contact thermal resistance	Case to fin, Thermal compound Applied (1/2 module)	—	—	0.13	

Note 1. I_E, I_{EM}, 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 temperature (T_j) does not exceed T_{jmax} rating.

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

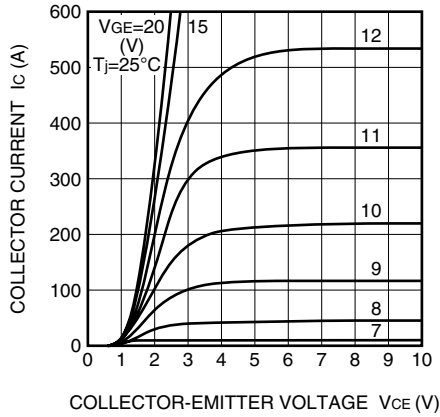
4. Pulse width and repetition rate should be such as to cause negligible temperature rise.

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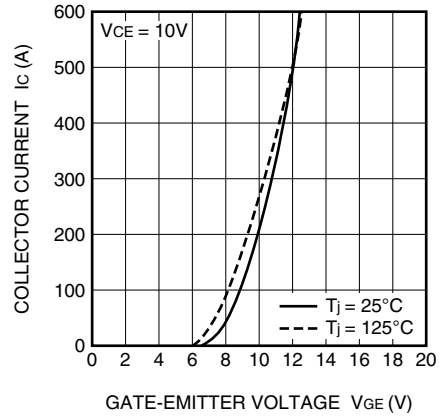
HIGH POWER SWITCHING USE
INSULATED TYPE

PERFORMANCE CURVES

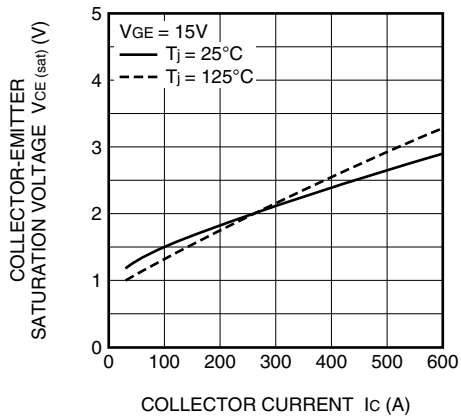
OUTPUT CHARACTERISTICS (TYPICAL)



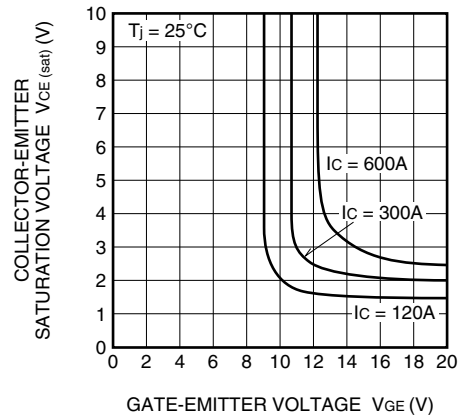
TRANSFER CHARACTERISTICS (TYPICAL)



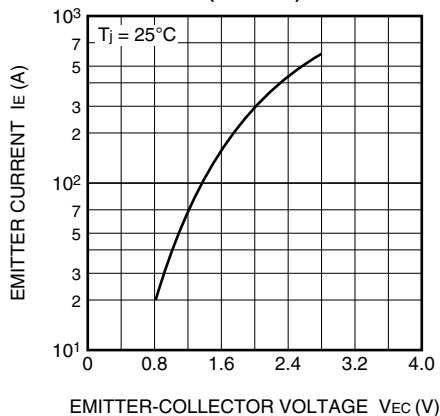
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



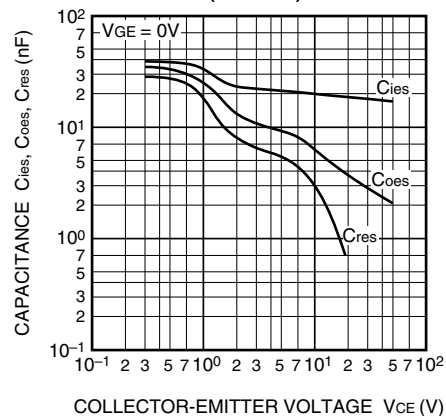
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



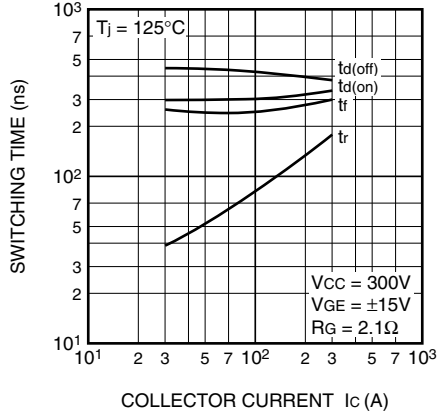
CAPACITANCE- V_{CE} CHARACTERISTICS (TYPICAL)



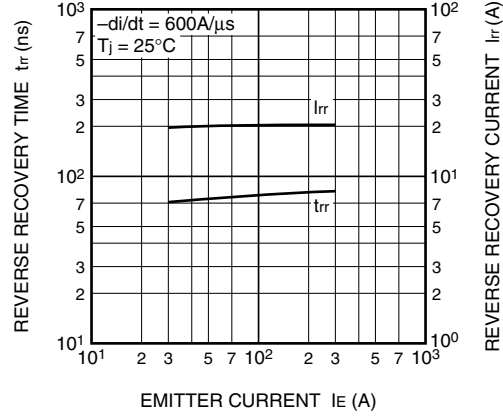
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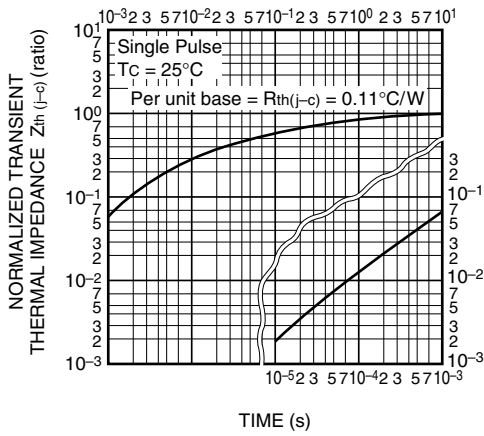
HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)



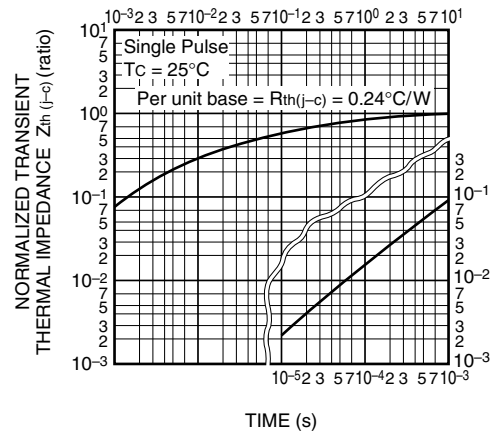
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT part)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (FWDi part)



GATE CHARGE CHARACTERISTICS (TYPICAL)

