CM75DU-12F

HIGH POWER SWITCHING USE

CM75DU-12F

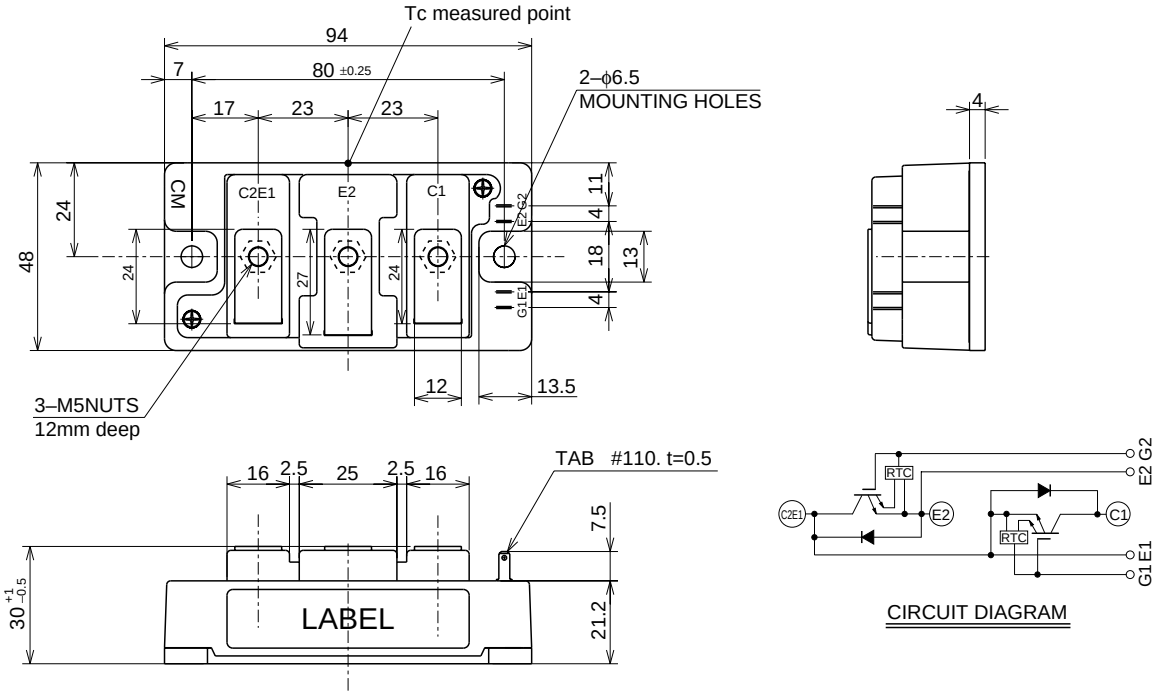
- I_C 75A
- V_{CES} 600V
- Insulated Type
- 2-elements in a pack

APPLICATION

General purpose inverters & Servo controls, etc

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



MITSUBISHI ELECTRIC

MAXIMUM RATINGS (Tj = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{CES}	Collector-emitter voltage	G-E Short	600	V
V_{GES}	Gate-emitter voltage	C-E Short	±20	V
I_C	Collector current	T_C = 25°C	75	A
I_{CM}		Pulse (Note 2)	150	A
I_E (Note 1)	Emitter current	T_C = 25°C	75	A
I_{EM} (Note 1)		Pulse (Note 2)	150	A
P_C (Note 3)	Maximum collector dissipation	T_C = 25°C	290	W
T_j	Junction temperature		–40 ~ +150	°C
T_{stg}	Storage temperature		–40 ~ +125	°C
V_{iso}	Isolation voltage	Charged part to base plate, AC 1 min.	2500	V
—	Torque strength	Main Terminal M5	2.5 ~ 3.5	N • m
		Mounting holes M6	3.5 ~ 4.5	N • m
—	Weight	Typical value	310	g

ELECTRICAL CHARACTERISTICS (Tj = 25°C)

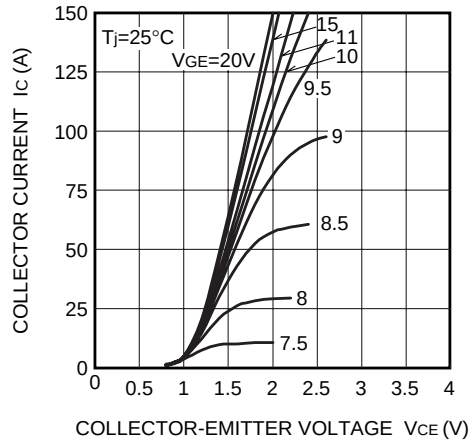
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
I_{CES}	Collector cutoff current	V_{CE} = V_{CES}, V_{GE} = 0V	—	—	1	mA
$V_{GE(th)}$	Gate-emitter threshold voltage	I_C = 7.5mA, V_{CE} = 10V	5	6	7	V
I_{GES}	Gate leakage current	V_{GE} = V_{CES}, V_{CE} = 0V	—	—	20	µA
$V_{CE(sat)}$	Collector-emitter saturation voltage	T_j = 25°C, I_C = 75A, V_{GE} = 15V	—	1.6	2.2	V
		T_j = 125°C, I_C = 75A, V_{GE} = 15V	—	1.6	—	V
C_{ies}	Input capacitance	V_{CE} = 10V	—	—	20	nF
C_{oes}	Output capacitance	V_{GE} = 0V	—	—	1.4	nF
C_{res}	Reverse transfer capacitance		—	—	0.75	nF
Q_G	Total gate charge	V_{CC} = 300V, I_C = 75A, V_{GE} = 15V	—	465	—	nC
$t_{d(on)}$	Turn-on delay time	V_{CC} = 300V, I_C = 75A, V_{GE1} = V_{GE2} = 15V, R_G = 8.3Ω, Inductive load switching operation, I_E = 75A	—	—	100	ns
t_r	Turn-on rise time		—	—	80	ns
$t_{d(off)}$	Turn-off delay time		—	—	300	ns
t_f	Turn-off fall time		—	—	250	ns
t_{rr} (Note 1)	Reverse recovery time		—	—	150	ns
Q_{rr} (Note 1)	Reverse recovery charge		—	1.4	—	µC
V_{EC}(Note 1)	Emitter-collector voltage	I_E = 75A, V_{GE} = 0V	—	—	2.6	V
$R_{th(j-c)Q}$	Thermal resistance*1	IGBT part (1/2 module)	—	—	0.43	°C/W
$R_{th(j-c)R}$		FWDi part (1/2 module)	—	—	0.9	°C/W
$R_{th(c-f)}$	Contact thermal resistance	Case to fin, Thermal compound applied*2 (1/2 module)	—	0.07	—	°C/W
$R_{th(j-c')Q}$	Thermal resistance	Tc measured point is just under the chips	—	—	0.34*3	°C/W
R_G	External gate resistance		8.3	—	83	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.

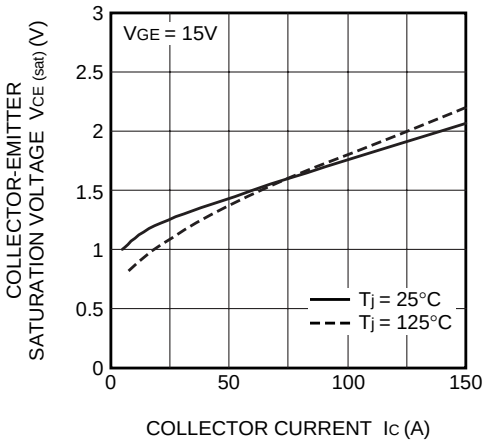
*1 : Tc measured point is indicated in OUTLINE DRAWING.
*2 : Typical value is measured by using Shin-etsu Silicone “G-746”.
*3 : If you use this value, $R_{th(f-a)}$ should be measured just under the chips.

PERFORMANCE CURVES

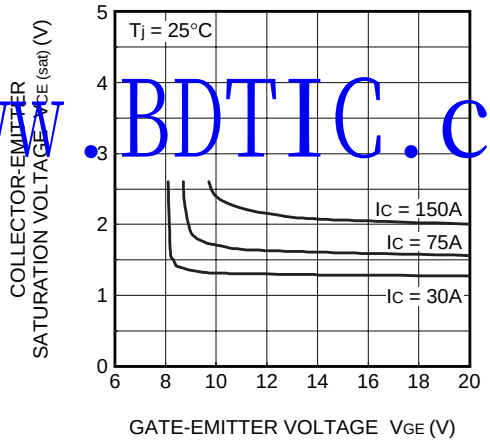
OUTPUT CHARACTERISTICS (TYPICAL)



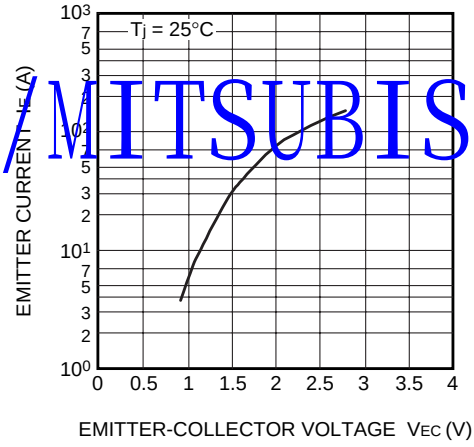
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



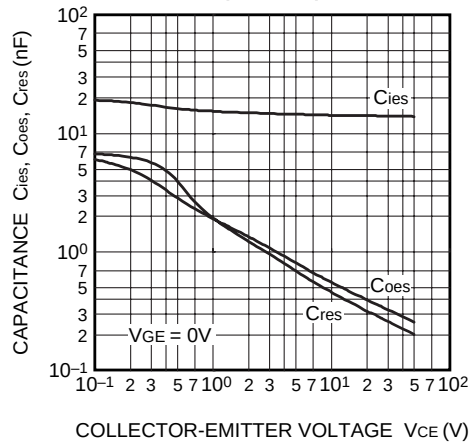
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



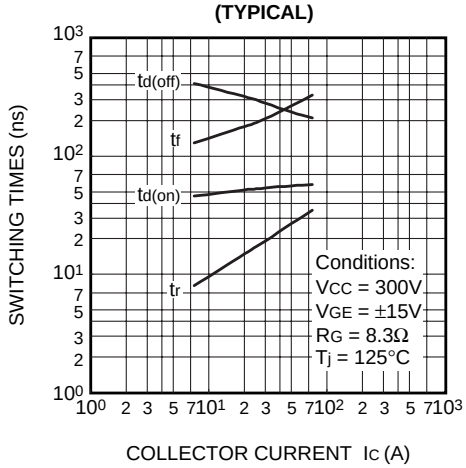
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



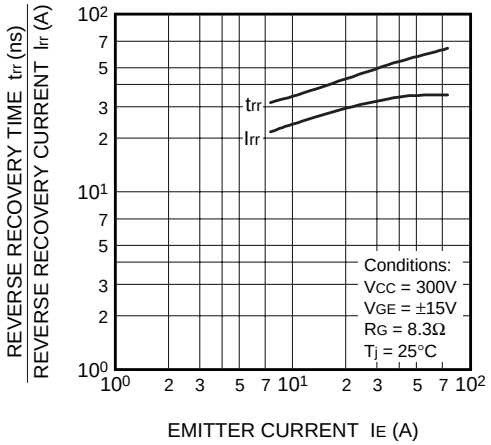
CAPACITANCE–VCE CHARACTERISTICS (TYPICAL)



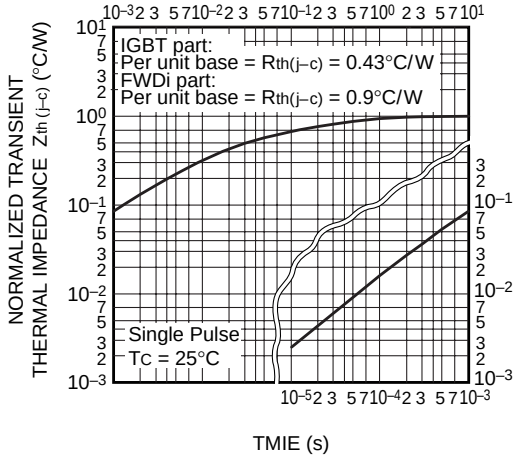
HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT part & FWDi part)



GATE CHARGE CHARACTERISTICS (TYPICAL)