

MITSUBISHI IGBT MODULES

CM900DU-24NF

HIGH POWER SWITCHING USE

CM900DU-24NF



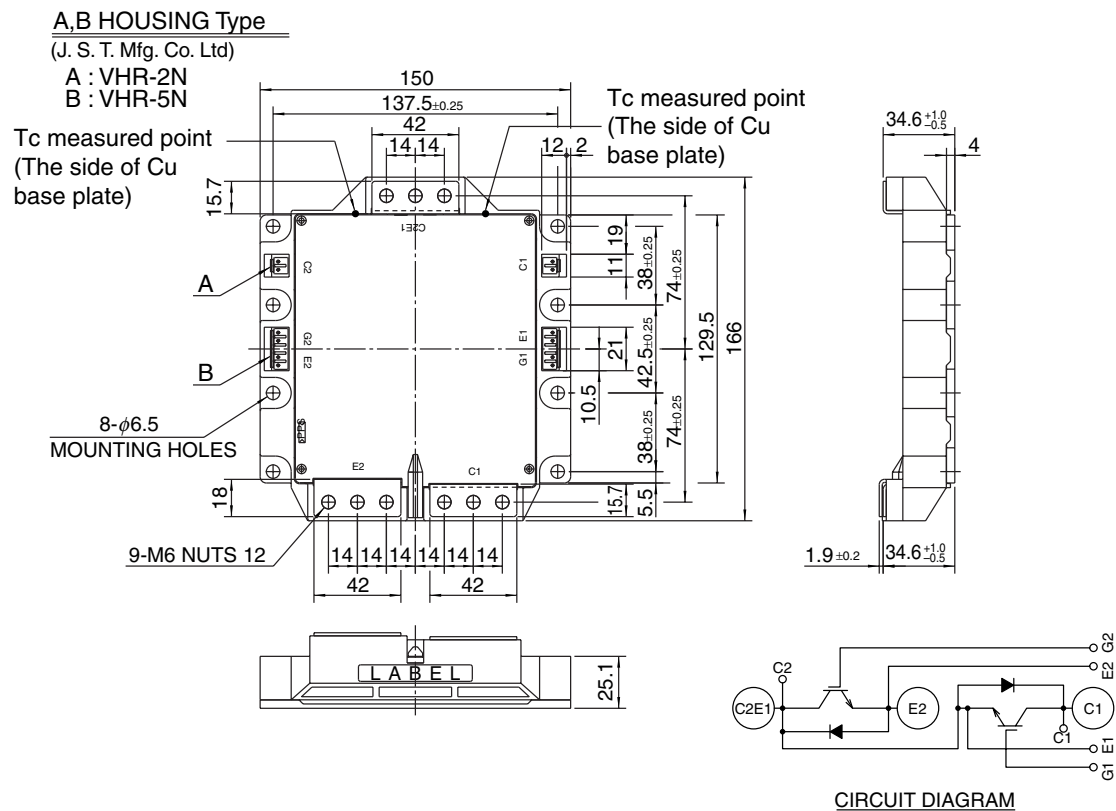
- Ic900A
- VCES 1200V
- Insulated Type
- 2-elements in a pack

APPLICATION

UPS & General purpose inverters, etc

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



Feb. 2009

CM900DU-24NF

HIGH POWER SWITCHING USE

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

Symbol	Parameter	Conditions	Ratings	Unit
VCES	Collector-emitter voltage	G-E Short	1200	V
VGES	Gate-emitter voltage	C-E Short	±20	V
IC	Collector current	Tc' = 96°C*1	900	A
ICM		Pulse (Note 2)	1800	
IE (Note 1)	Emitter current	Tc = 25°C	900	A
IEM (Note 1)		Pulse (Note 2)	1800	
PC (Note 3)	Maximum collector dissipation	Tc = 25°C	2550	W
Tj	Junction temperature		−40 ~ +150	°C
Tstg	Storage temperature*4		−40 ~ +125	°C
Viso	Isolation voltage	Terminals to base plate, f = 60Hz, AC 1 minute	2500	Vrms
—	Torque strength	Main terminals M6 screw	3.5 ~ 4.5	N • m
		Mounting M6 screw	3.5 ~ 4.5	N • m
—	Weight	Typical value	1400	g

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

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 = 90mA, VCE = 10V	6	7	8	V
IGES	Gate leakage current	±VGE = VGES, VCE = 0V	—	—	1	μA
VCE(sat) (chip)	Collector-emitter saturation voltage (without lead resistance)	IC = 900A, VGE = 15V (Note 4)	—	1.8	2.5	V
		Tj = 125°C	—	2.0	—	
R(lead)	Module lead resistance	IC = 900A, terminal-chip	—	0.286	—	mΩ
Cies	Input capacitance	VCE = 10V VGE = 0V	—	—	140	nF
Coes	Output capacitance		—	—	16	
Cres	Reverse transfer capacitance		—	—	3	
QG	Total gate charge	VCC = 600V, IC = 900A, VGE = 15V	—	4800	—	nC
td(on)	Turn-on delay time	VCC = 600V, IC = 900A VGE = ±15V RG = 0.35Ω, Inductive load	—	—	600	ns
tr	Turn-on rise time		—	—	200	
td(off)	Turn-off delay time		—	—	800	
tf	Turn-off fall time		—	—	300	
trr (Note 1)	Reverse recovery time	IE = 900A	—	—	500	ns
Qrr (Note 1)	Reverse recovery charge		—	50	—	μC
VEC(Note 1) (chip)	Emitter-collector voltage (without lead resistance)	IE = 900A, VGE = 0V	—	—	3.2	V
Rth(j-c)Q	Thermal resistance*3	IGBT part (1/2 module)	—	—	0.049	K/W
Rth(j-c)R		FWDi part (1/2 module)	—	—	0.078	
Rth(c-f)	Contact thermal resistance*2	Case to heat sink, Thermal compound applied (1/2 module)	—	0.016	—	
Rth(j-c')Q	Thermal resistance*1	Case temperature measured point is just under the chips (IGBT part)	—	—	0.021	
Rth(j-c')R		Case temperature measured point is just under the chips (FWDi part)	—	—	0.034	
RG	External gate resistance		0.35	—	2.2	Ω

Note 1. IE, VEC, trr & Qrr represent characteristics of the anti-parallel, emitter-collector free-wheel diode (FWDi).

2. Pulse width and repetition rate should be such that the device junction temperature (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 : Case temperature (Tc') measured point is just under the chips.

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

*2 : Typical value is measured by using thermally conductive grease of λ = 0.9[W/(m • K)].

*3 : Case temperature (Tc) measured point is shown in page OUTLINE DRAWING.

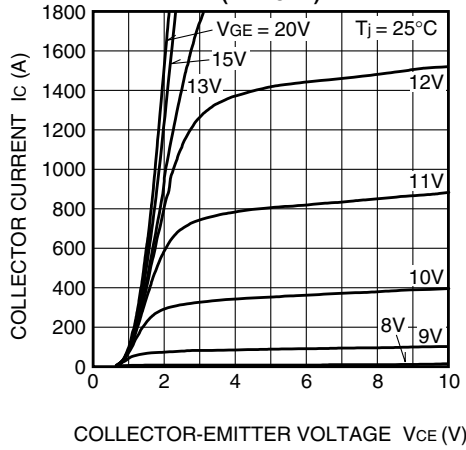
*4 : The operation temperature is restrained by the permission temperature of female connector.

CM900DU-24NF

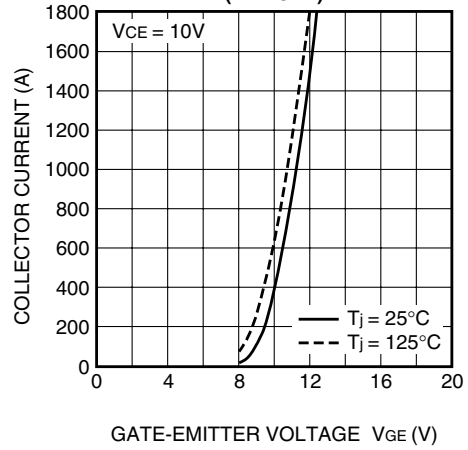
HIGH POWER SWITCHING USE

PERFORMANCE CURVES

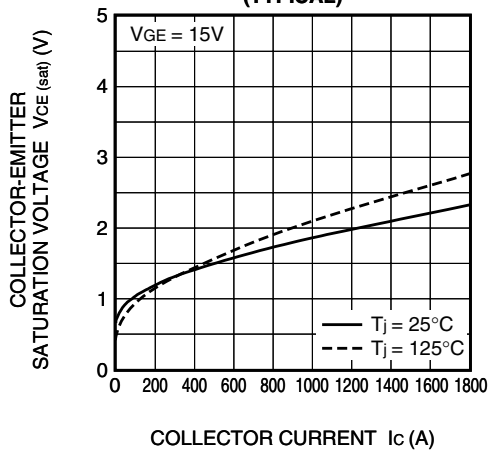
**OUTPUT CHARACTERISTICS
(TYPICAL)**



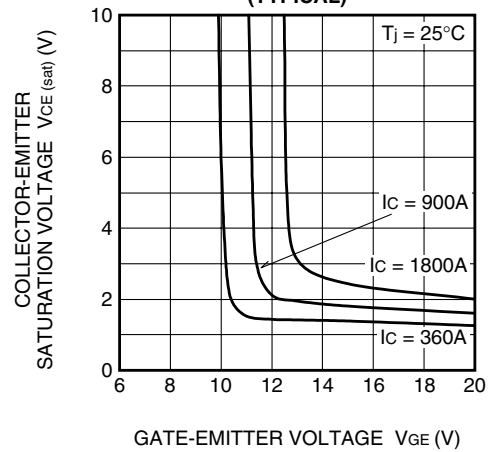
**TRANSFER CHARACTERISTICS
(TYPICAL)**



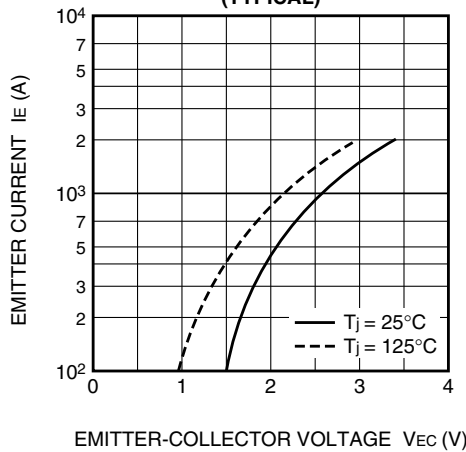
**COLLECTOR-EMITTER SATURATION
VOLTAGE CHARACTERISTICS
(TYPICAL)**



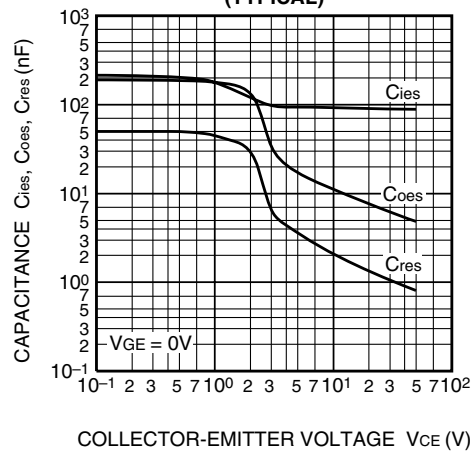
**COLLECTOR-EMITTER SATURATION
VOLTAGE CHARACTERISTICS
(TYPICAL)**



**FREE-WHEEL DIODE
FORWARD CHARACTERISTICS
(TYPICAL)**



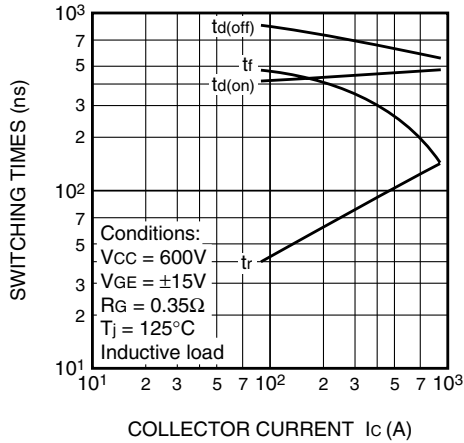
**CAPACITANCE- V_{ce}
CHARACTERISTICS
(TYPICAL)**



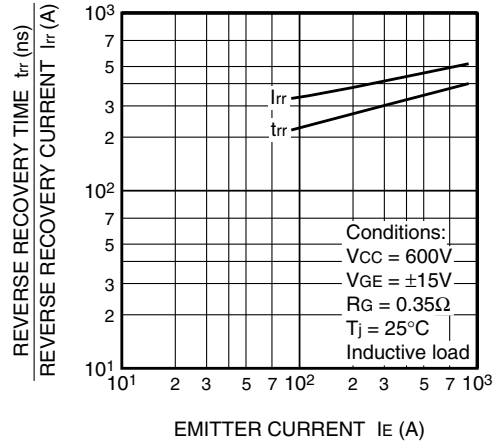
CM900DU-24NF

HIGH POWER SWITCHING USE

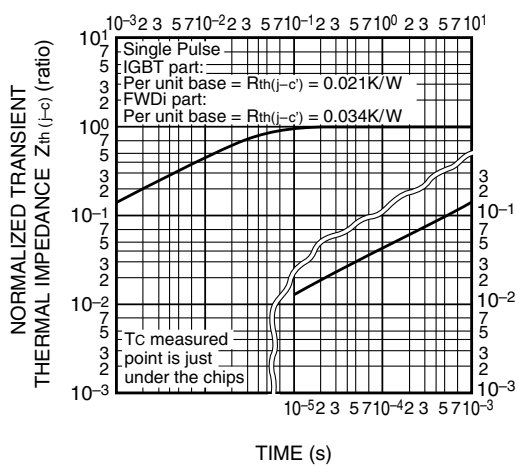
**HALF-BRIDGE
SWITCHING CHARACTERISTICS
(TYPICAL)**



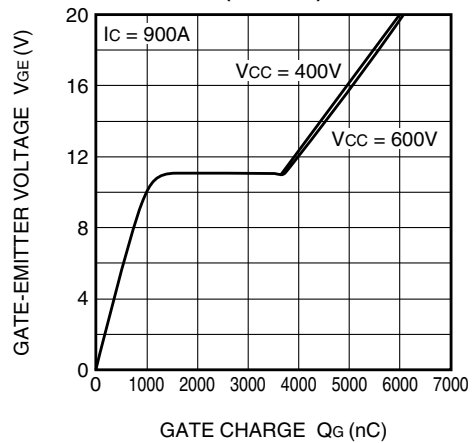
**REVERSE RECOVERY CHARACTERISTICS
OF FREE-WHEEL DIODE
(TYPICAL)**



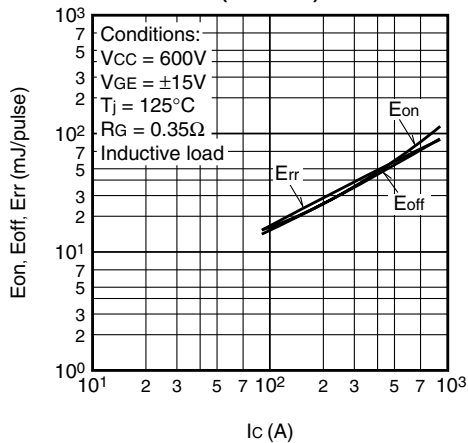
**TRANSIENT THERMAL
IMPEDANCE CHARACTERISTICS
(IGBT part & FWDi part)**



**GATE CHARGE
CHARACTERISTICS
(TYPICAL)**



**I_c -Esw
(TYPICAL)**



**R_G -Esw
(TYPICAL)**

