

PRELIMINARY
 Notice: This is not a final specification.
 Some parametric limits are subject to change.

MITSUBISHI HVIGBT MODULES

CM1200HA-34H

HVIGBT (High Voltage Insulated Gate Bipolar Transistor) Modules

HIGH POWER SWITCHING USE
 INSULATED TYPE

CM1200HA-34H



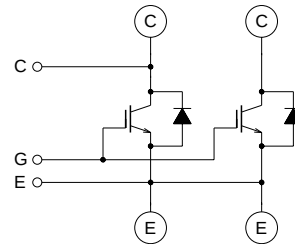
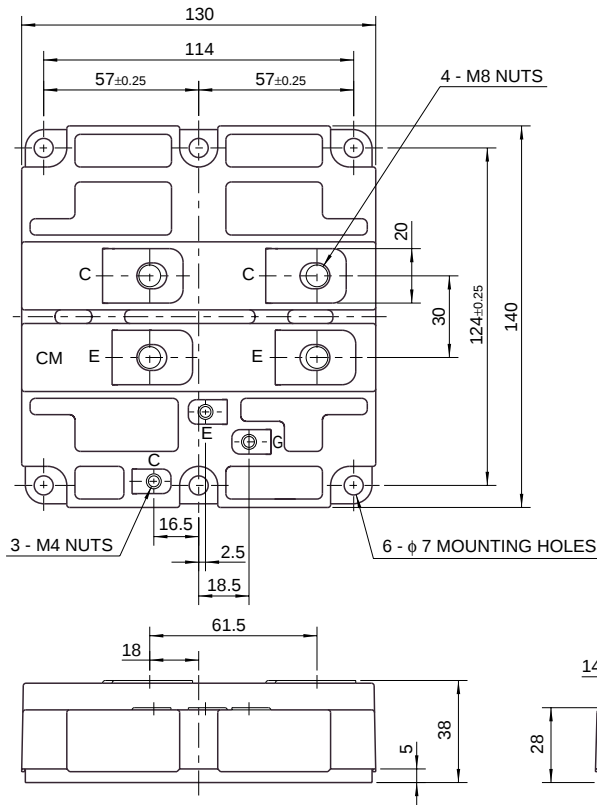
- IC 1200A
- VCES 1700V
- Insulated Type
- 1-element in a pack

APPLICATION

Inverters, Converters, DC choppers, Induction heating, DC to DC converters.

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



CIRCUIT DIAGRAM

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Mar. 2001

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MAXIMUM RATINGS (Tj = 25°C)

Symbol	Item	Conditions	Ratings	Unit
VCES	Collector-emitter voltage	VGE = 0V	1700	V
VGES	Gate-emitter voltage	VCE = 0V	±20	V
IC	Collector current	Tc = 25°C	1200	A
ICM		Pulse (Note 1)	2400	A
IE (Note 2)	Emitter current	Tc = 25°C	1200	A
IEM (Note 2)		Pulse (Note 1)	2400	A
PC (Note 3)	Maximum collector dissipation	Tc = 25°C, IGBT part	12500	W
Tj	Junction temperature	—	−40 ~ +150	°C
Tstg	Storage temperature	—	−40 ~ +125	°C
Viso	Isolation voltage	Charged part to base plate, rms, sinusoidal, AC 60Hz 1min.	4000	V
—	Mounting torque	Main terminals screw M8	6.67 ~ 13.00	N·m
		Mounting screw M6	2.84 ~ 6.00	N·m
		Auxiliary terminals screw M4	0.88 ~ 2.00	N·m
—	Mass	Typical value	1.5	kg

ELECTRICAL CHARACTERISTICS (Tj = 25°C)

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
ICES	Collector cutoff current	VCE = VCES, VGE = 0V	—	—	24	mA
VGE(th)	Gate-emitter threshold voltage	IC = 120mA, VCE = 10V	4.5	5.5	6.5	V
IGES	Gate-leakage current	VGE = VGES, VCE = 0V	—	—	0.5	μA
VCE(sat)	Collector-emitter saturation voltage	Tj = 25°C	—	2.75	3.58	V
		Tj = 125°C	—	3.30	—	
Cies	Input capacitance	VCE = 10V VGE = 0V	—	140	—	nF
Coes	Output capacitance		—	20.0	—	nF
Cres	Reverse transfer capacitance		—	7.6	—	nF
QG	Total gate charge	VCC = 850V, IC = 1200A, VGE = 15V	—	6.6	—	μC
td (on)	Turn-on delay time	VCC = 850V, IC = 1200A	—	—	1.20	μs
tr	Turn-on rise time	VGE1 = VGE2 = 15V	—	—	1.50	μs
td (off)	Turn-off delay time	RG = 1.6Ω	—	—	2.00	μs
tf	Turn-off fall time	Resistive load switching operation	—	—	0.60	μs
VEC (Note 2)	Emitter-collector voltage	IE = 1200A, VGE = 0V	—	2.40	3.12	V
trr (Note 2)	Reverse recovery time	IE = 1200A	—	—	2.00	μs
Qrr (Note 2)	Reverse recovery charge	die / dt = −2400A / μs	—	200	—	μC
Rth(j-c)Q	Thermal resistance	Junction to case, IGBT part	—	—	0.010	K/W
Rth(j-c)R		Junction to case, FWDi part	—	—	0.032	K/W
Rth(c-f)	Contact thermal resistance	Case to fin, conductive grease applied	—	0.008	—	K/W

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

2. IE, VEC, trr, Qrr & die/dt represent characteristics of the anti-parallel, emitter to 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.

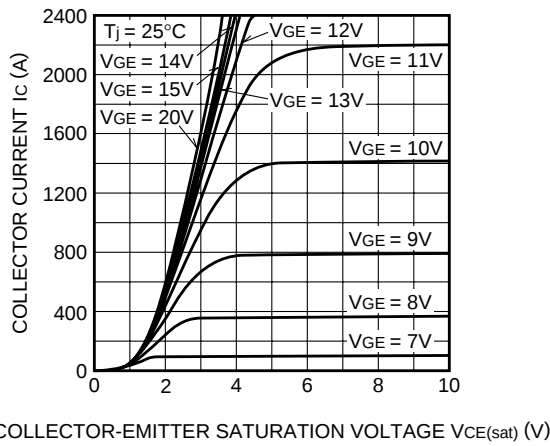
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HIGH POWER SWITCHING USE
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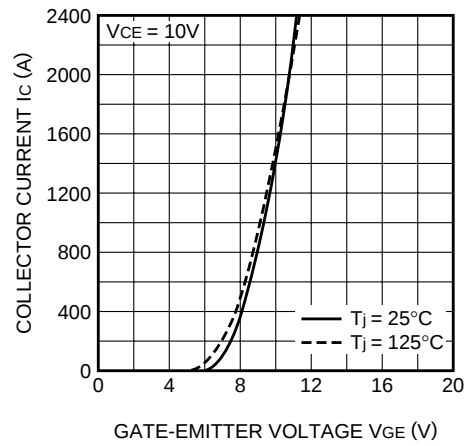
HVIGBT (High Voltage Insulated Gate Bipolar Transistor) Modules

PERFORMANCE CURVES

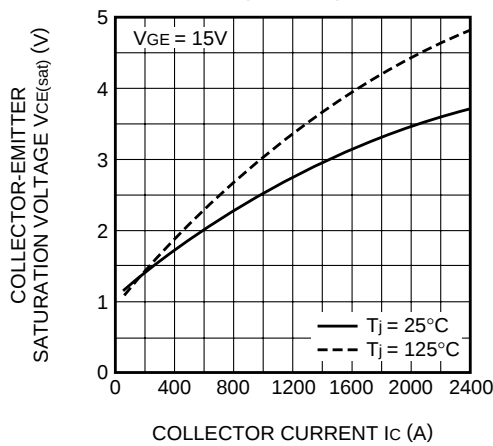
OUTPUT CHARACTERISTICS
 (TYPICAL)



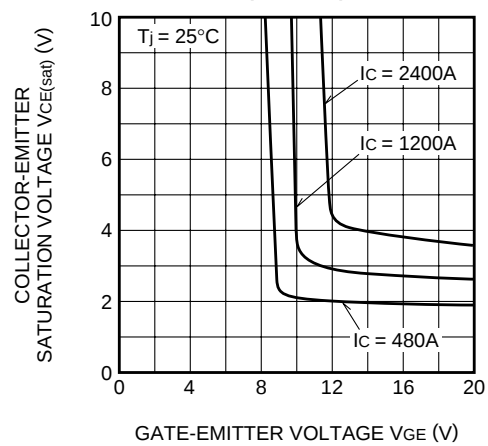
TRANSFER CHARACTERISTICS
 (TYPICAL)



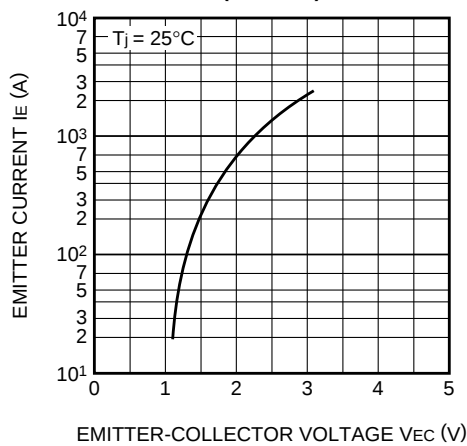
COLLECTOR-EMITTER SATURATION
 VOLTAGE CHARACTERISTICS
 (TYPICAL)



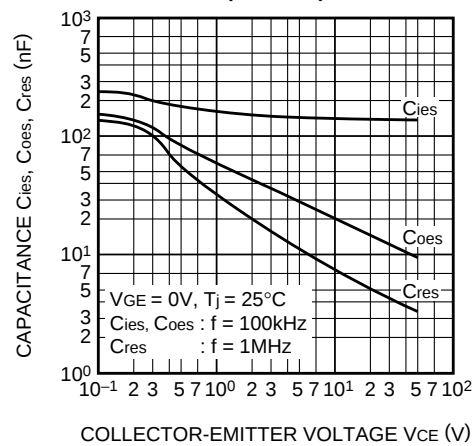
COLLECTOR-EMITTER SATURATION
 VOLTAGE CHARACTERISTICS
 (TYPICAL)



FREE-WHEEL DIODE
 FORWARD CHARACTERISTICS
 (TYPICAL)



CAPACITANCE VS. V_{CE}
 (TYPICAL)

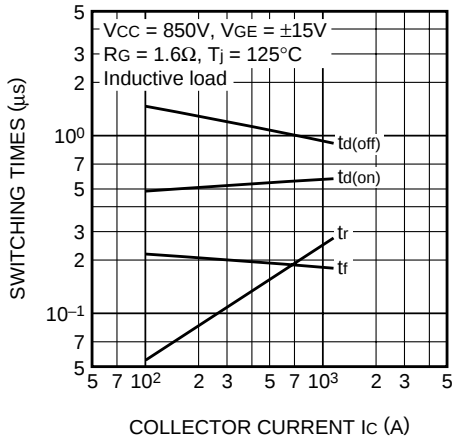


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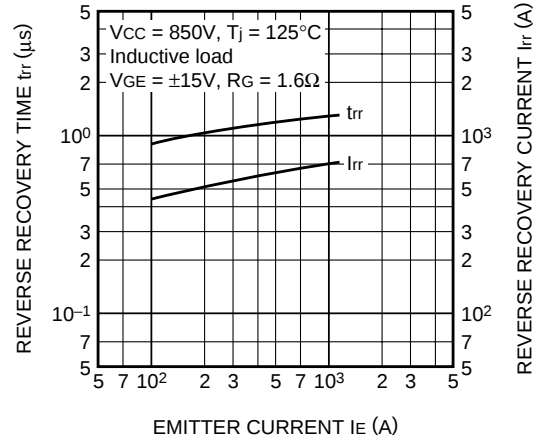
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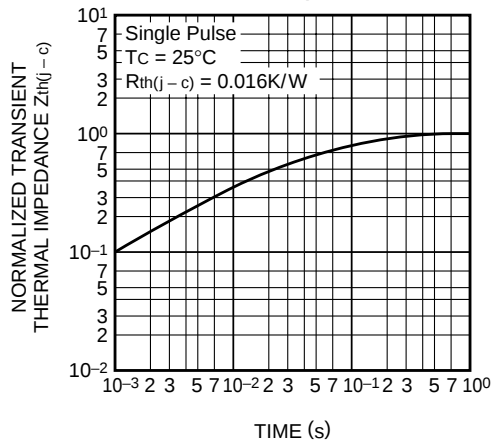
**HALF-BRIDGE
 SWITCHING CHARACTERISTICS
 (TYPICAL)**



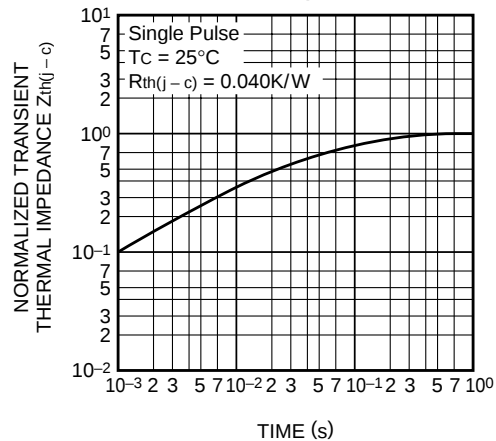
**REVERSE RECOVERY CHARACTERISTICS
 OF FREE-WHEEL DIODE
 (TYPICAL)**



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



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



**V_{GE} - GATE CHARGE
 (TYPICAL)**

