

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

MITSUBISHI HVIGBT MODULES

CM1200HB-50H

2nd-Version HVIGBT (High Voltage Insulated Gate Bipolar Transistor) Modules

HIGH POWER SWITCHING USE
 INSULATED TYPE

CM1200HB-50H



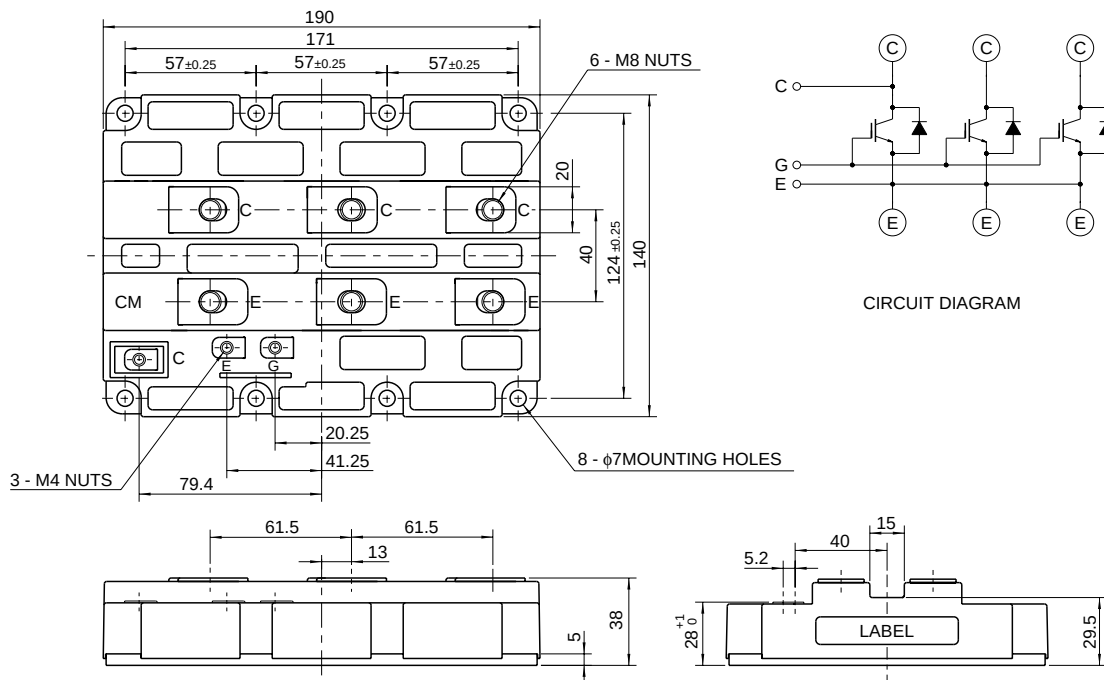
- IC 1200A
- VCES 2500V
- Insulated Type
- 1-element in a pack

APPLICATION

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

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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Aug.1998

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MAXIMUM RATINGS (Tj = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
VCES	Collector-emitter voltage	G-E Short	2500	V
VGES	Gate-emitter voltage	C-E Short	±20	V
IC	Collector current	Tc = 25°C	1200	A
ICM		Pulse (Note 2)	2400	A
IE (Note 1)	Emitter current	Tc = 25°C	1200	A
IEM(Note 1)		Pulse (Note 2)	2400	A
PC (Note 3)	Maximum collector dissipation	Tc = 25°C	15630	W
Tj	Junction temperature	—	−40 ~ +150	°C
Tstg	Storage temperature	—	−40 ~ +125	°C
Viso	Isolation voltage	Main terminal to Bass, AC for 1 minute	6000	V
—	Mounting torque	Main terminals screw M8	6.67 ~ 8.24	N·m
		Mounting screw M6	2.84 ~ 3.43	N·m
		Auxiliary terminals screw M4	0.88 ~ 1.08	N·m
—	Weight	Typical value	2.2	kg

ELECTRICAL CHARACTERISTICS (Tj = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
ICES	Collector cutoff current	VCE = VCES, VGE = 0V	—	—	15	mA
VGE(th)	Gate-emitter threshold voltage	IC = 120mA, VCE = 10V	4.5	6.0	7.5	V
IGES	Gate-leakage current	VGE = VGES, VCE = 0V	—	—	0.5	μA
VCE(sat)	Collector-emitter saturation voltage	Tj = 25°C	—	2.80	3.64	V
		Tj = 125°C	—	3.15	—	
Cies	Input capacitance	VCE = 10V	—	180	—	nF
Coes	Output capacitance	VGE = 0V	—	13.5	—	nF
Cres	Reverse transfer capacitance	f = 1MHz	—	6.0	—	nF
QG	Total gate charge	VCC = 1250V, IC = 1200A, VGE = 15V	—	15	—	μC
td (on)	Turn-on delay time	VCC = 1250V, IC = 1200A	—	—	1.60	μs
tr	Turn-on rise time	VGE1 = VGE2 = 15V	—	—	2.00	μs
td (off)	Turn-off delay time	RG = 1.6Ω	—	—	2.50	μs
tf	Turn-off fall time	Resistive load switching operation	—	—	1.00	μs
VEC(Note 1)	Emitter-collector voltage	IE = 1200A, VGE = 0V	—	2.50	3.25	V
trr (Note 1)	Reverse recovery time	IE = 1200A,	—	—	1.20	μs
Qrr (Note 1)	Reverse recovery charge	die / dt = −2400A / μs (Note 1)	—	350	—	μC
Rth(j-c)Q	Thermal resistance	IGBT part	—	—	0.008	°C/W
Rth(j-c)R		FWDi part	—	—	0.016	°C/W
Rth(c-f)	Contact thermal resistance	Case to fin, conductive grease applied	—	0.006	—	°C/W

Note 1. IE, VEC, trr, Qrr & die/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode.

2. Pulse width and repetition rate should be such that the device junction temp. (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.

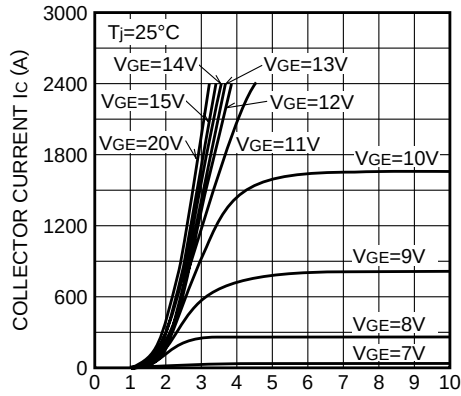
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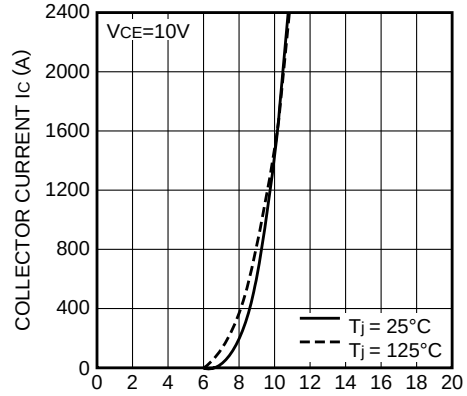
PERFORMANCE CURVES

**OUTPUT CHARACTERISTICS
 (TYPICAL)**



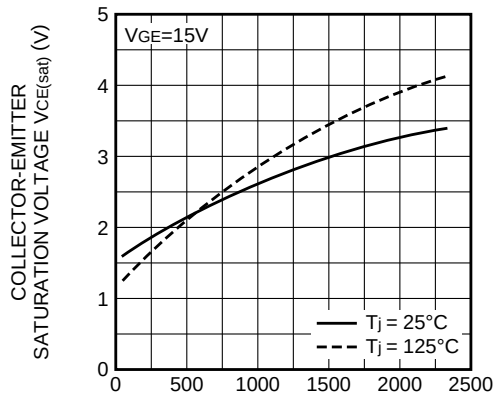
COLLECTOR-EMITTER SATURATION VOLTAGE $V_{CE(sat)}$ (V)

**TRANSFER CHARACTERISTICS
 (TYPICAL)**



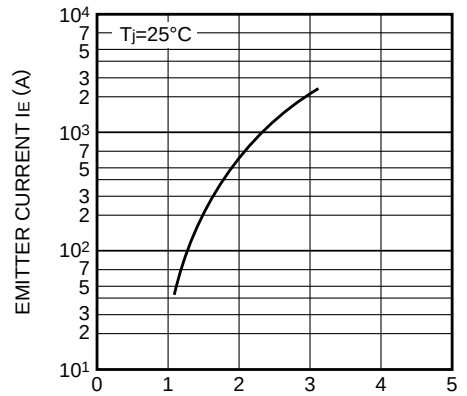
GATE-EMITTER VOLTAGE V_{GE} (V)

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



COLLECTOR CURRENT I_c (A)

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



EMITTER-COLLECTOR VOLTAGE V_{EC} (V)