

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

MITSUBISHI HVIGBT MODULES
CM800HA-50H

HIGH POWER SWITCHING USE
 INSULATED TYPE

HVIGBT (High Voltage Insulated Gate Bipolar Transistor) Modules

CM800HA-50H



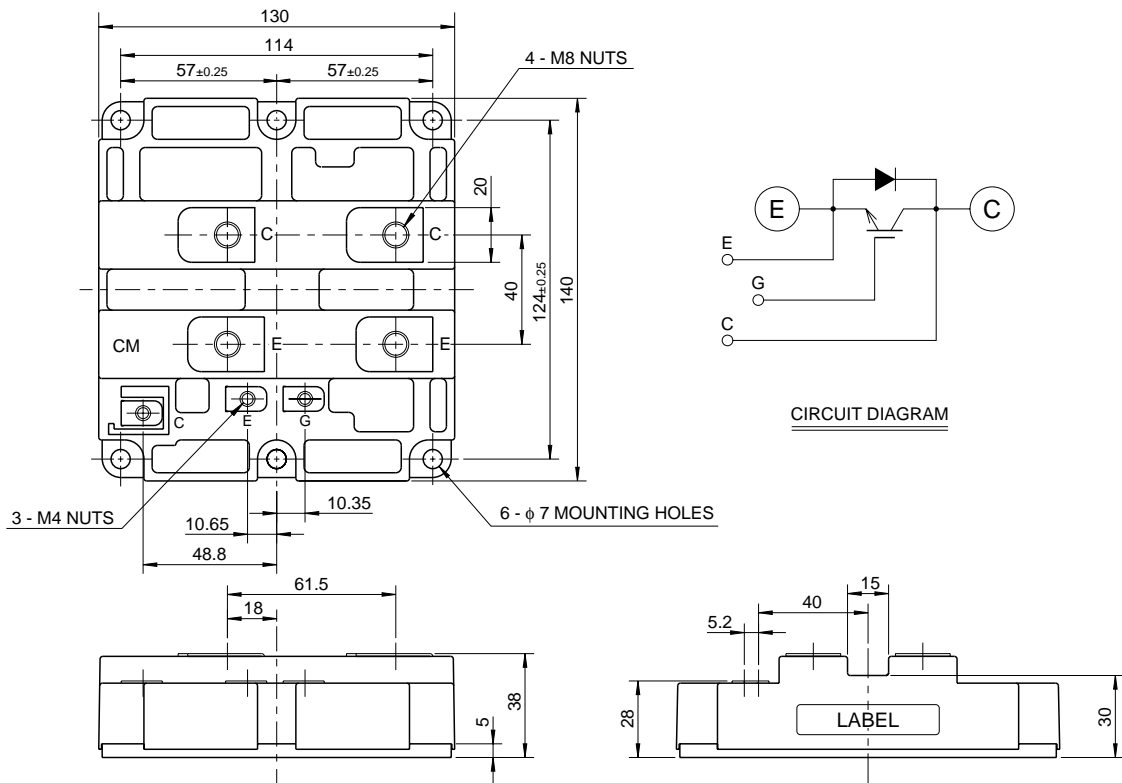
- IC 800A
- VCES 2500V
- Insulated Type
- 1-element in a pack

APPLICATION

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

OUTLINE DRAWING & CIRCUIT DIAGRAM

Dimensions in mm



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Feb.1999

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MAXIMUM RATINGS (T_j = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V _{CES}	Collector-emitter voltage	G-E Short	2500	V
V _{GES}	Gate-emitter voltage	C-E Short	±20	V
I _C	Collector current	T _c = 25°C	800	A
I _{CM}		Pulse (Note 2)	1600	A
I _E (Note 1)	Emitter current	T _c = 25°C	800	A
I _{EM} (Note 1)		Pulse (Note 2)	1600	A
P _C (Note 3)	Maximum collector dissipation	T _c = 25°C	6940	W
T _j	Junction temperature		-40 ~ +150	°C
T _{stg}	Storage temperature		-40 ~ +125	°C
V _{iso}	Isolation voltage	Main terminal to Base, AC for 1 minute	6000	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
—	Weight	Typical value	1.5	kg

ELECTRICAL CHARACTERISTICS (T_j = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit	
			Min	Typ	Max		
I _{CES}	Collector cutoff current	V _{CE} = V _{CES} , V _{GE} = 0V	—	—	10	mA	
V _{GE(th)}	Gate-emitter threshold voltage	I _C = 80mA, V _{CE} = 10V	4.5	6.0	7.5	V	
I _{GES}	Gate-leakage current	V _{GE} = V _{GES} , V _{CE} = 0V	—	—	0.5	μA	
V _{CE(sat)}	Collector-emitter saturation voltage	I _C = 800A, V _{GE} = 15V (Note 4)	T _j = 25°C	—	3.20	4.16	V
			T _j = 125°C	—	3.60	—	
C _{ies}	Input capacitance	V _{CE} = 10V V _{GE} = 0V	—	86	—	nF	
C _{oes}	Output capacitance		—	5.0	—	nF	
C _{res}	Reverse transfer capacitance		—	2.0	—	nF	
Q _G	Total gate charge	V _{CC} = 1250V, I _C = 800A, V _{GE} = 15V	—	6.7	—	μC	
t _{d(on)}	Turn-on delay time	V _{CC} = 1250V, I _C = 800A	—	—	1.60	μs	
t _r	Turn-on rise time	V _{GE1} = V _{GE2} = 15V	—	—	2.00	μs	
t _{d(off)}	Turn-off delay time	R _G = 3.75Ω	—	—	2.50	μs	
t _f	Turn-off fall time	Resistive load switching operation	—	—	1.00	μs	
V _{EC} (Note 1)	Emitter-collector voltage	I _E = 800A, V _{GE} = 0V	—	2.90	3.77	V	
t _{rr} (Note 1)	Reverse recovery time	I _E = 800A	—	—	1.20	μs	
Q _{rr} (Note 1)	Reverse recovery charge	die / dt = -1600A / μs	—	170	—	μC	
R _{th(j-c)Q}	Thermal resistance	IGBT part	—	—	0.018	°C/W	
R _{th(j-c)R}		FWDi part	—	—	0.036	°C/W	
R _{th(c-f)}	Contact thermal resistance	Case to fin, conductive grease applied	—	0.008	—	°C/W	

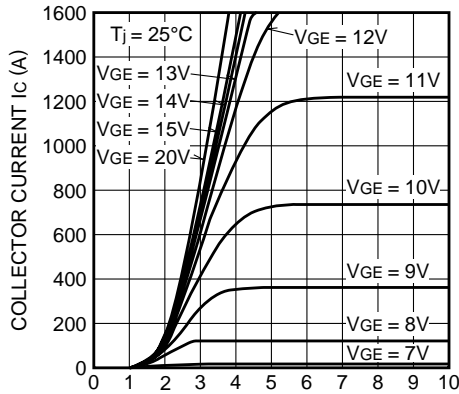
- Note 1. I_E, V_{EC}, t_{rr}, Q_{rr} & die/dt represent characteristics of the anti-parallel, emitter to collector free-wheel diode.
 2. Pulse width and repetition rate should be such that the device junction temp. (T_j) does not exceed T_{jmax} rating.
 3. Junction temperature (T_j) should not increase beyond 150°C.
 4. Pulse width and repetition rate should be such as to cause negligible temperature rise.

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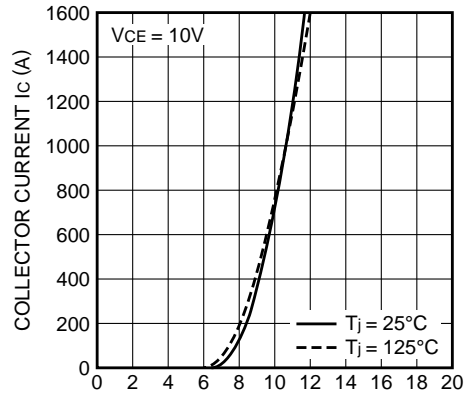
PERFORMANCE CURVES

**OUTPUT CHARACTERISTICS
 (TYPICAL)**



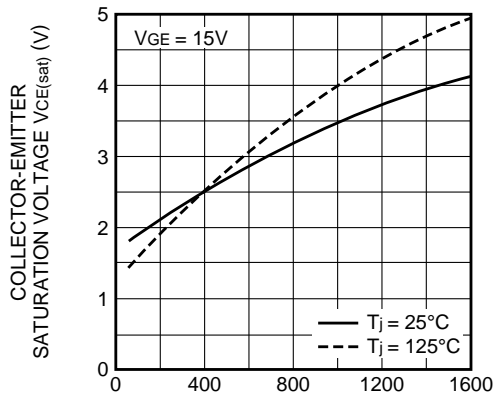
COLLECTOR-EMITTER SATURATION VOLTAGE $V_{CE(sat)}$ (V)

**TRANSFER CHARACTERISTICS
 (TYPICAL)**



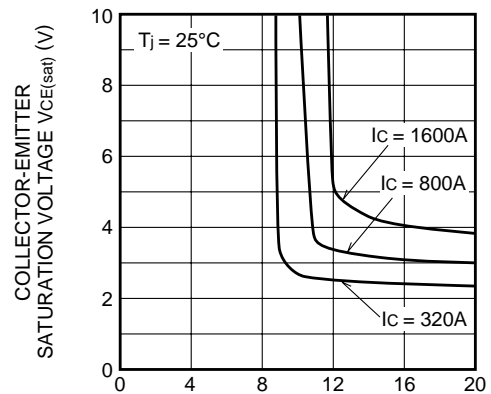
GATE-EMITTER VOLTAGE V_{GE} (V)

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



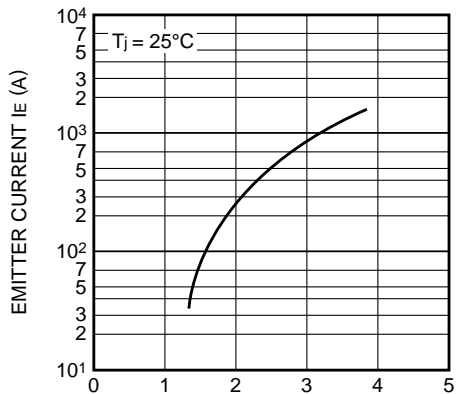
COLLECTOR CURRENT I_c (A)

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



GATE-EMITTER VOLTAGE V_{GE} (V)

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



EMITTER-COLLECTOR VOLTAGE V_{EC} (V)