

MITSUBISHI HVIGBT MODULES  
**CM900HB-90H**

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

HIGH POWER SWITCHING USE  
**INSULATED TYPE**

**CM900HB-90H**



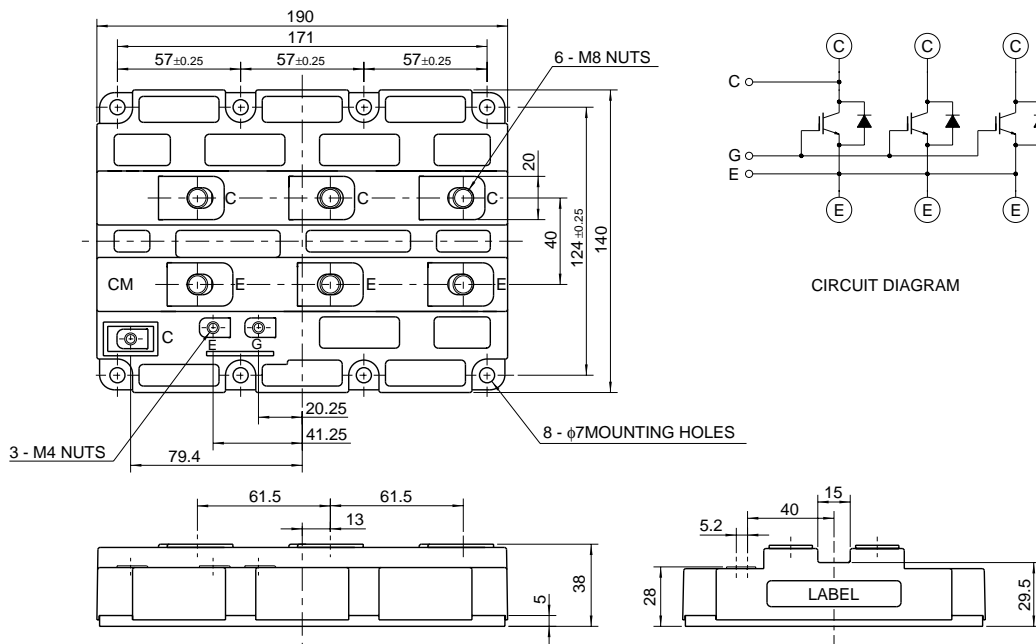
- Ic .....900A
- VCES .....4500V
- Insulated Type
- 1-element in a pack

**APPLICATION**

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

**OUTLINE DRAWING & CIRCUIT DIAGRAM**

Dimensions in mm



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Mar. 2003



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**MAXIMUM RATINGS (Tj = 25°C)**

Symbol	Item	Conditions	Ratings	Unit
VCES	Collector-emitter voltage	VGE = 0V	4500	V
VGES	Gate-emitter voltage	VCE = 0V	±20	V
IC	Collector current	DC, Tc = 85°C	900	A
ICM		Pulse (Note 1)	1800	A
IE (Note 2)	Emitter current		900	A
IEM(Note 2)		Pulse (Note 1)	1800	A
PC (Note 3)	Maximum collector dissipation	Tc = 25°C, IGBT part	11100	W
Tj	Junction temperature	—	-40 ~ +125	°C
Tstg	Storage temperature	—	-40 ~ +125	°C
Viso	Isolation voltage	Charged part to base plate, rms, sinusoidal, AC 60Hz 1min.	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
—	Mass	Typical value	2.2	kg

**ELECTRICAL CHARACTERISTICS (Tj = 25°C)**

Symbol	Item	Conditions	Limits			Unit
			Min	Typ	Max	
ICES	Collector cutoff current	VCE = VCES, VGE = 0V	—	—	18	mA
VGE(th)	Gate-emitter threshold voltage	IC = 90mA, 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	—	3.00	3.90	V
		Tj = 125°C	—	3.30	—	
Cies	Input capacitance	VCE = 10V VGE = 0V	—	162	—	nF
Coes	Output capacitance		—	12.0	—	nF
Cres	Reverse transfer capacitance		—	3.6	—	nF
QG	Total gate charge	VCC = 2250V, IC = 900A, VGE = 15V	—	—	—	µC
td (on)	Turn-on delay time	VCC = 2250V, IC = 900A	—	—	2.40	µs
tr	Turn-on rise time	VGE1 = VGE2 = 15V	—	—	2.40	µs
td (off)	Turn-off delay time	RG = 10Ω	—	—	6.00	µs
tr	Turn-off fall time	Resistive load switching operation	—	—	1.20	µs
VEC(Note 2)	Emitter-collector voltage	IE = 900A, VGE = 0V	—	4.00	5.20	V
trr (Note 2)	Reverse recovery time	IE = 900A,	—	—	1.80	µs
Qrr (Note 2)	Reverse recovery charge	die / dt = -1800A / µs (Note 1)	—	360	—	µC
Rth(j-c)Q	Thermal resistance	Junction to case, IGBT part	—	—	0.009	K/W
Rth(j-c)R		Junction to case, FWDi part	—	—	0.018	K/W
Rth(c-f)	Contact thermal resistance	Case to fin, conductive grease applied	—	0.007	—	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 125°C.  
 4. Pulse width and repetition rate should be such as to cause negligible temperature rise.



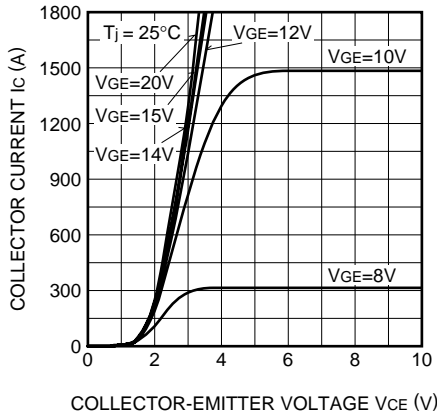
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HIGH POWER SWITCHING USE  
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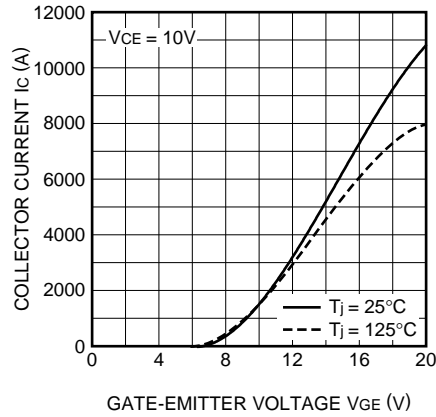
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## PERFORMANCE CURVES

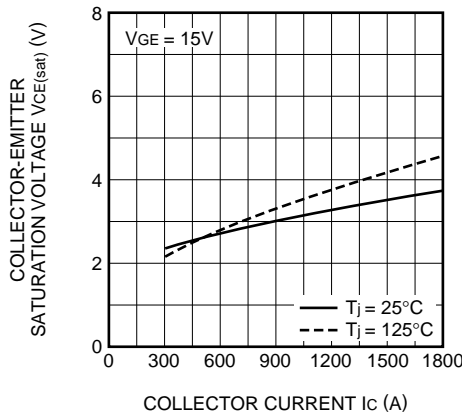
**OUTPUT CHARACTERISTICS (TYPICAL)**



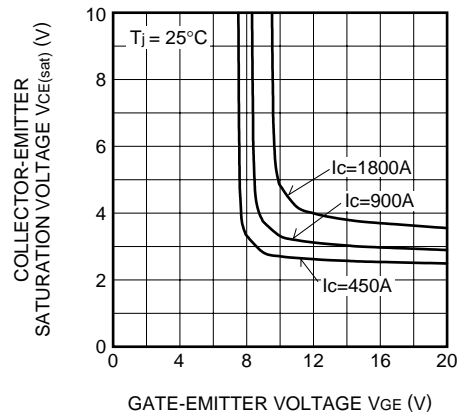
**TRANSFER CHARACTERISTICS (TYPICAL)**



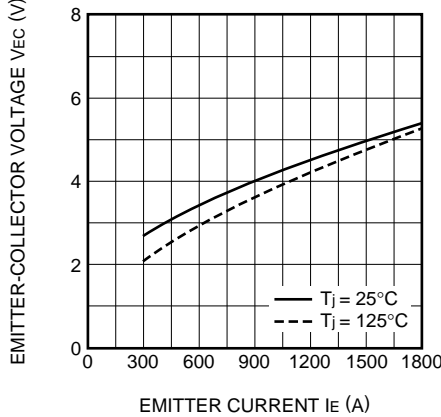
**COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)**



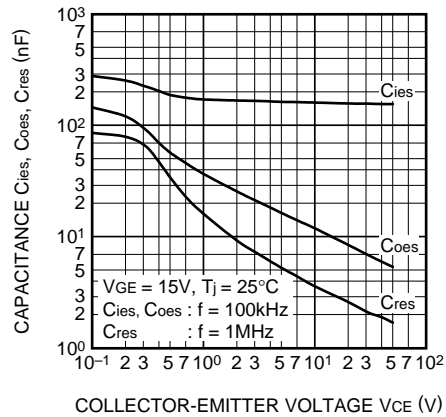
**COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)**



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



**CAPACITANCE CHARACTERISTICS (TYPICAL)**

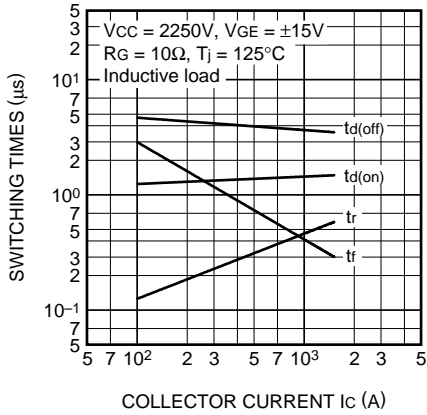


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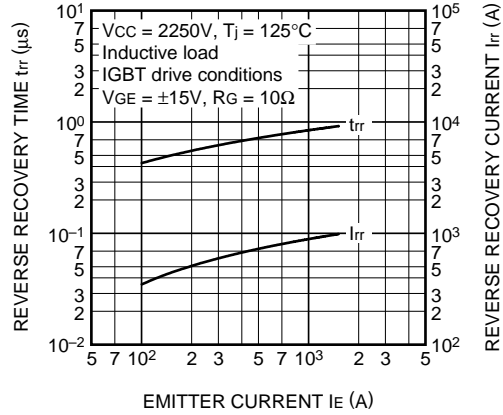
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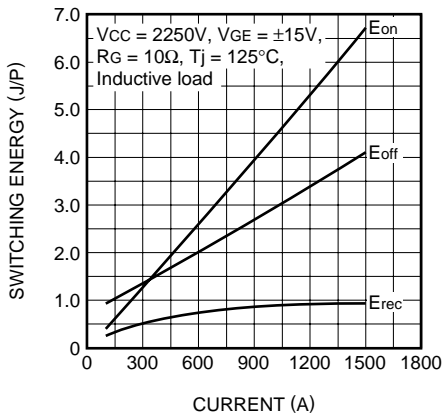
**HALF-BRIDGE SWITCHING TIME CHARACTERISTICS (TYPICAL)**



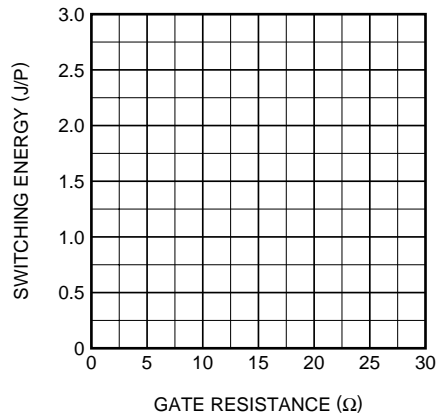
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



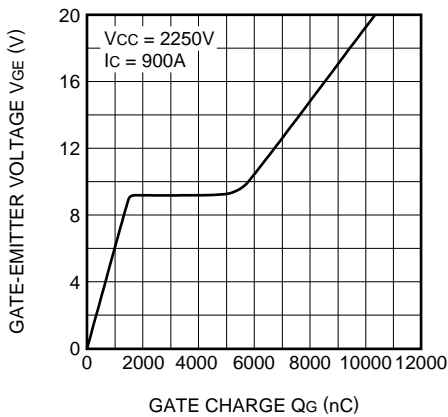
**HALF-BRIDGE SWITCHING ENERGY CHARACTERISTICS (TYPICAL)**



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



**GATE CHARGE CHARACTERISTICS (TYPICAL)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS**

