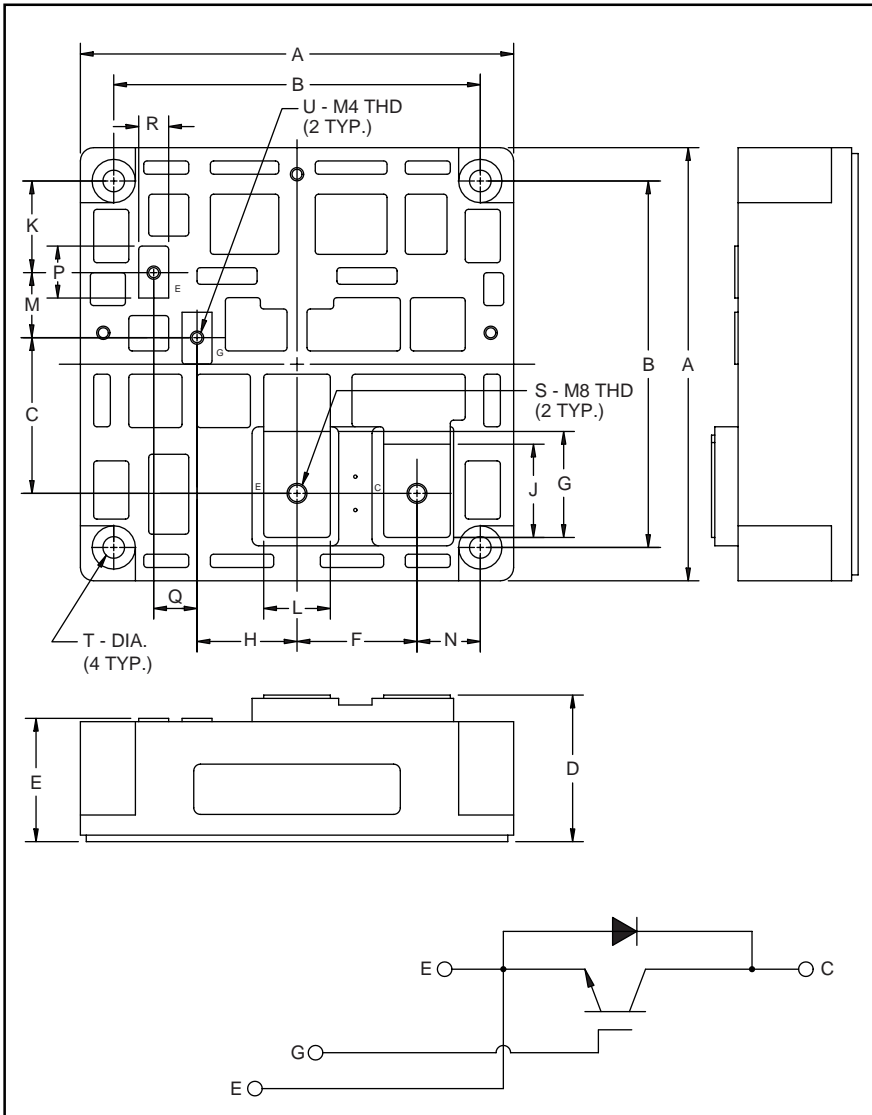


# MITSUBISHI IGBT MODULES

## CM800HA-24H

HIGH POWER SWITCHING USE  
INSULATED TYPE



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.12	130.0
B	4.33±0.01	110.0±0.25
C	1.840	46.75
D	1.73+0.04/-0.02	44.0+1.0/-0.5
E	1.46+0.04/-0.02	37.0+1.0/-0.5
F	1.42	36.0
G	1.25	31.8
H	1.18	30.0
J	1.10	28.0
K	1.08	27.5

Dimensions	Inches	Millimeters
L	0.79	20.0
M	0.77	19.5
N	0.75	19.0
P	0.61	15.6
Q	0.51	13.0
R	0.35	9.0
S	M8 Metric	M8
T	0.26 Dia.	Dia. 6.5
U	M4 Metric	M4



### Description:

Mitsubishi IGBT Modules are designed for use in switching applications. Each module consists of one IGBT in a single configuration with a reverse-connected super-fast recovery free-wheel diode. All components and interconnects are isolated from the heat sinking baseplate, offering simplified system assembly and thermal management.

### Features:

- Low Drive Power
- Low  $V_{CE(sat)}$
- Discrete Super-Fast Recovery Free-Wheel Diode
- High Frequency Operation
- Isolated Baseplate for Easy Heat Sinking

### Applications:

- AC Motor Control
- Motion/Servo Control
- UPS
- Welding Power Supplies

### Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM800HA-24H is a 1200V ( $V_{CES}$ ), 800 Ampere Single IGBT Module.

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	800	24

# CM800HA-24H

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## Absolute Maximum Ratings, $T_j = 25\text{ °C}$ unless otherwise specified

Ratings	Symbol	CM800HA-24H	Units
Junction Temperature	$T_j$	-40 to +150	°C
Storage Temperature	$T_{stg}$	-40 to +125	°C
Collector-Emitter Voltage (G-E SHORT)	$V_{CES}$	1200	Volts
Gate-Emitter Voltage (C-E SHORT)	$V_{GES}$	±20	Volts
Collector Current ( $T_C = 25\text{ °C}$ )	$I_C$	800	Amperes
Peak Collector Current ( $T_j \leq 150\text{ °C}$ )	$I_{CM}$	1600*	Amperes
Emitter Current** ( $T_C = 25\text{ °C}$ )	$I_E$	800	Amperes
Peak Emitter Current**	$I_{EM}$	1600*	Amperes
Maximum Collector Dissipation ( $T_C = 25\text{ °C}$ )	$P_c$	4800	Watts
Mounting Torque, M8 Main Terminal	–	8.83 ~ 10.8	N · m
Mounting Torque, M6 Mounting	–	1.96 ~ 2.94	N · m
Mounting Torque, M4 Terminal	–	0.98 ~ 1.47	N · m
Weight	–	1600	Grams
Isolation Voltage (Main terminal to Baseplate, AC 1 min.)	$V_{iso}$	2500	Vrms

\*Pulse width and repetition rate should be such that the device junction temperature ( $T_j$ ) does not exceed  $T_{j(max)}$  rating.

\*\*Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

## Static Electrical Characteristics, $T_j = 25\text{ °C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	$I_{CES}$	$V_{CE} = V_{CES}, V_{GE} = 0V$	–	–	5.0	mA
Gate Leakage Current	$I_{GES}$	$V_{GE} = V_{GES}, V_{CE} = 0V$	–	–	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 80mA, V_{CE} = 10V$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 800A, V_{GE} = 15V$	–	2.7	3.6	Volts
		$I_C = 800A, V_{GE} = 15V, T_j = 150\text{ °C}$	–	2.4	–	Volts
Total Gate Charge	$Q_G$	$V_{CC} = 600V, I_C = 800A, V_{GE} = 15V$	–	4500	–	nC
Emitter-Collector Voltage	$V_{EC}$	$I_E = 800A, V_{GE} = 0V$	–	–	3.5	Volts

\* Pulse width and repetition rate should be such that device junction temperature rise is negligible.

## Dynamic Electrical Characteristics, $T_j = 25\text{ °C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	$C_{ies}$		–	–	180	nF
Output Capacitance	$C_{oes}$	$V_{GE} = 0V, V_{CE} = 10V$	–	–	64	nF
Reverse Transfer Capacitance	$C_{res}$		–	–	36	nF
Resistive	Turn-on Delay Time	$V_{CC} = 600V, I_C = 800A,$	–	–	500	ns
	Rise Time					
Load	Turn-off Delay Time	$V_{GE1} = V_{GE2} = 15V, R_G = 3.3\Omega$	–	–	1200	ns
	Fall Time					
Switching	Turn-off Delay Time	$V_{GE1} = V_{GE2} = 15V, R_G = 3.3\Omega$	–	–	1000	ns
	Fall Time					
Diode Reverse Recovery Time	$t_{rr}$	$I_E = 800A, di_E/dt = -1600A/\mu s$	–	–	250	ns
Diode Reverse Recovery Charge	$Q_{rr}$	$I_E = 800A, di_E/dt = -1600A/\mu s$	–	5.9	–	μC

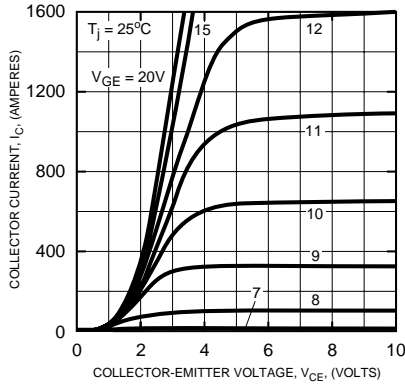
## Thermal and Mechanical Characteristics, $T_j = 25\text{ °C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per IGBT	–	–	0.026	°C/W
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	–	–	0.058	°C/W
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	–	0.018	°C/W

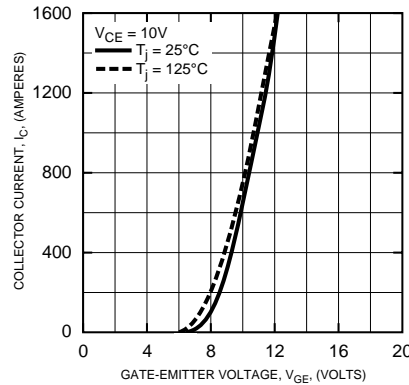
# CM800HA-24H

HIGH POWER SWITCHING USE  
INSULATED TYPE

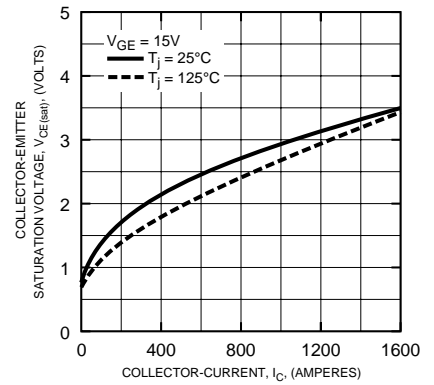
OUTPUT CHARACTERISTICS  
(TYPICAL)



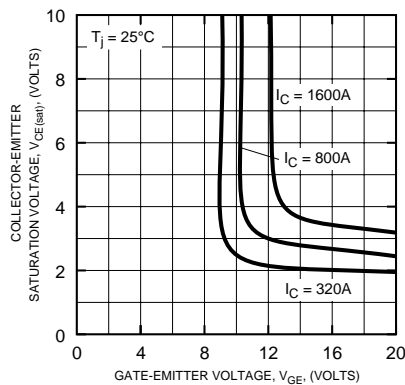
TRANSFER CHARACTERISTICS  
(TYPICAL)



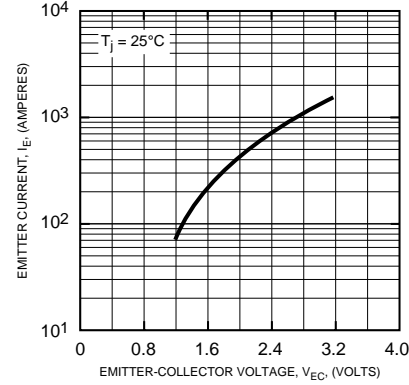
COLLECTOR-EMITTER  
SATURATION VOLTAGE CHARACTERISTICS  
(TYPICAL)



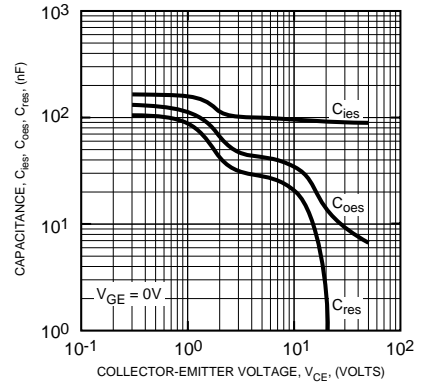
COLLECTOR-EMITTER  
SATURATION VOLTAGE CHARACTERISTICS  
(TYPICAL)



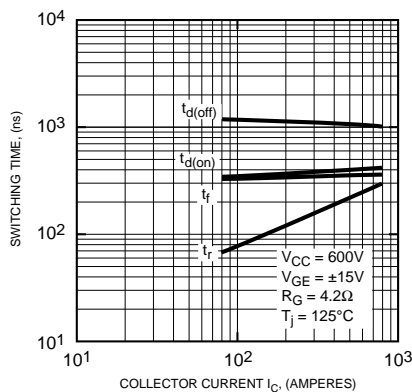
FREE-WHEEL DIODE  
FORWARD CHARACTERISTICS  
(TYPICAL)



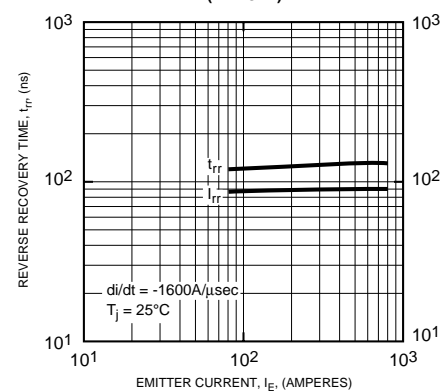
CAPACITANCE VS.  $V_{CE}$   
(TYPICAL)



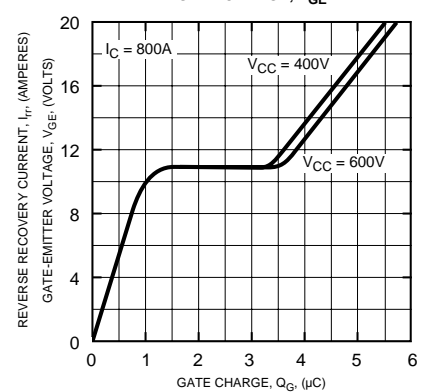
HALF-BRIDGE  
SWITCHING CHARACTERISTICS  
(TYPICAL)



REVERSE RECOVERY CHARACTERISTICS  
(TYPICAL)



GATE CHARGE,  $V_{GE}$



# CM800HA-24H

HIGH POWER SWITCHING USE  
INSULATED TYPE

