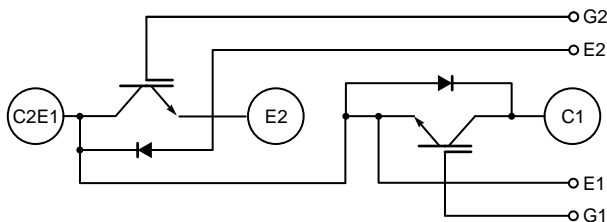
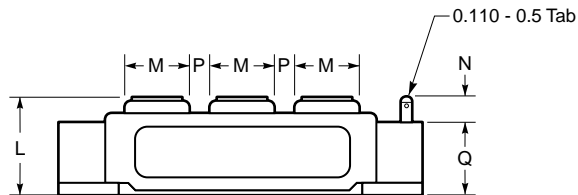
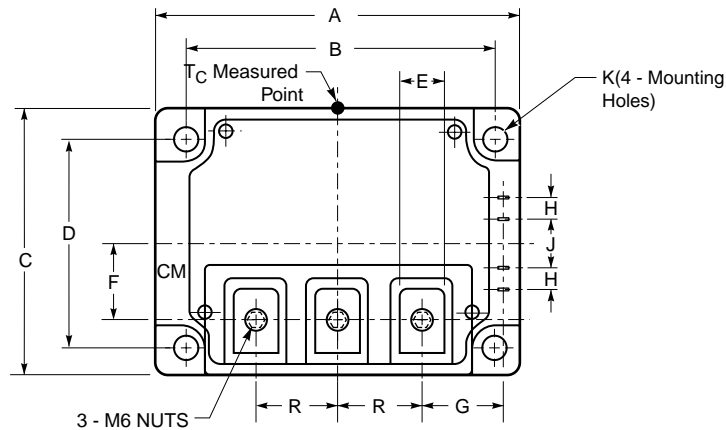


# MITSUBISHI IGBT MODULES

## CM300DU-24H

HIGH POWER SWITCHING USE  
INSULATED TYPE



### Description:

Mitsubishi IGBT Modules are designed for use in switching applications. Each module consists of two IGBTs in a half-bridge configuration with each transistor having 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 module number you desire from the table - i.e. CM300DU-24H is a 1200V ( $V_{CES}$ ), 300 Ampere Dual IGBT Module.

Type	Current Rating Amperes	$V_{CES}$ Volts (x 50)
CM	300	24

### Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.33	110.0
B	3.66±0.01	93.0±0.25
C	3.15	80.0
D	2.44±0.01	62.0±0.25
E	0.55	14.0
F	0.86	21.75
G	0.94	24.0
H	0.24	6.0

Dimensions	Inches	Millimeters
J	0.59	15.0
K	0.26 Dia.	6.5 Dia.
L	1.14 +0.04/-0.02	29 +1.0/-0.5
M	0.71	18.0
N	0.33	8.5
P	0.28	7.0
Q	0.83	21.0
R	0.98	25.0

**Absolute Maximum Ratings,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

	Symbol	Ratings	Units
Junction Temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 to 125	$^\circ\text{C}$
Collector-Emitter Voltage (G-E SHORT)	$V_{CES}$	1200	Volts
Gate-Emitter Voltage (C-E SHORT)	$V_{GES}$	$\pm 20$	Volts
Collector Current ( $T_c = 25^\circ\text{C}$ )	$I_C$	300	Amperes
Peak Collector Current ( $T_j \leq 150^\circ\text{C}$ )	$I_{CM}$	600*	Amperes
Emitter Current** ( $T_c = 25^\circ\text{C}$ )	$I_E$	300	Amperes
Peak Emitter Current**	$I_{EM}$	600*	Amperes
Maximum Collector Dissipation ( $T_c = 25^\circ\text{C}$ )	$P_C$	1130	Watts
Mounting Torque, M6 Main Terminal	–	3.5–4.5	N · m
Mounting Torque, M6 Mounting	–	3.5–4.5	N · m
Weight	–	580	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,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	$I_{CES}$	$V_{CE} = V_{CES}, V_{GE} = 0V$	–	–	1	mA
Gate Leakage Voltage	$I_{GES}$	$V_{GE} = V_{GES}, V_{CE} = 0V$	–	–	0.5	$\mu\text{A}$
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 30\text{mA}, V_{CE} = 10V$	4.5	6	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 300\text{A}, V_{GE} = 15V, T_j = 25^\circ\text{C}$	–	2.9	3.7	Volts
		$I_C = 300\text{A}, V_{GE} = 15V, T_j = 125^\circ\text{C}$	–	2.85	–	Volts
Total Gate Charge	$Q_G$	$V_{CC} = 600V, I_C = 300\text{A}, V_{GE} = 15V$	–	1125	–	nC
Emitter-Collector Voltage*	$V_{EC}$	$I_E = 300\text{A}, V_{GE} = 0V$	–	–	3.2	Volts

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

**Dynamic Electrical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	$C_{ies}$		–	–	45	nF
Output Capacitance	$C_{oes}$	$V_{CE} = 10V, V_{GE} = 0V$	–	–	15	nF
Reverse Transfer Capacitance	$C_{res}$		–	–	9	nF
Resistive	Turn-on Delay Time	$V_{CC} = 600V, I_C = 300\text{A},$ $V_{GE1} = V_{GE2} = 15V,$	–	–	200	ns
	Rise Time					
Load			–	–	300	ns
Switch	Turn-off Delay Time	$R_G = 1.0\Omega, \text{Resistive}$	–	–	350	ns
	Fall Time					
Diode Reverse Recovery Time	$t_{rr}$	$I_E = 300\text{A}, di_E/dt = -600\text{A}/\mu\text{s}$	–	–	300	ns
Diode Reverse Recovery Charge	$Q_{rr}$	$I_E = 300\text{A}, di_E/dt = -600\text{A}/\mu\text{s}$	–	1.65	–	$\mu\text{C}$

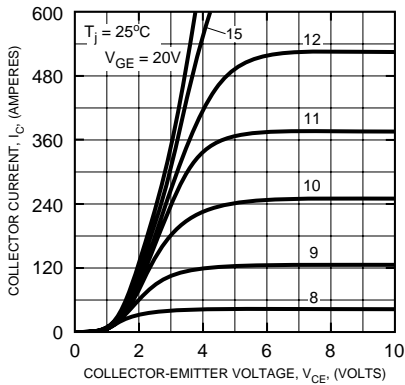
**Thermal and Mechanical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)Q}$	Per IGBT 1/2 Module	–	–	0.11	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)D}$	Per FWDi 1/2 Module	–	–	0.18	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	0.010	–	$^\circ\text{C}/\text{W}$

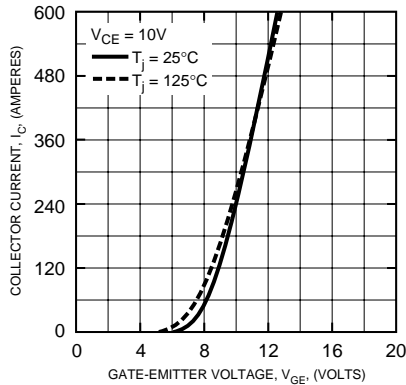
# CM300DU-24H

HIGH POWER SWITCHING USE  
INSULATED TYPE

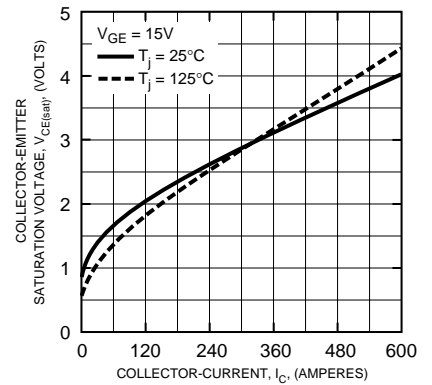
**OUTPUT CHARACTERISTICS (TYPICAL)**



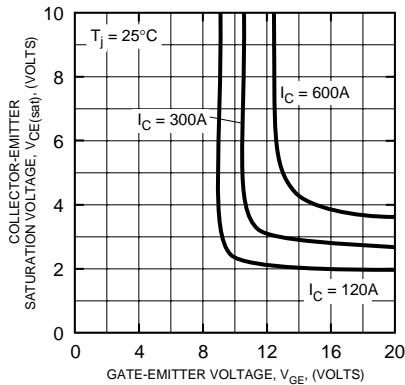
**TRANSFER CHARACTERISTICS (TYPICAL)**



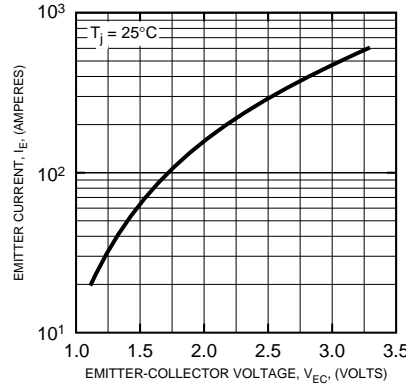
**COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)**



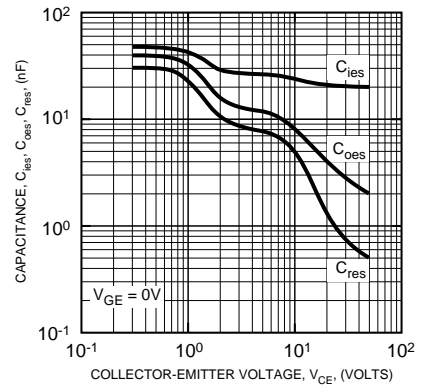
**COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)**



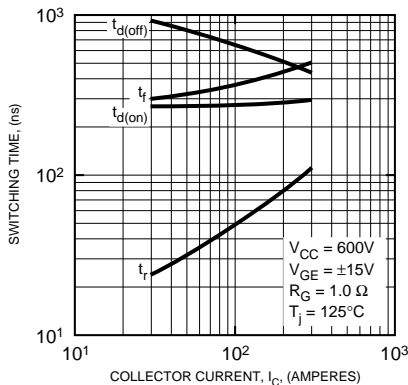
**FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)**



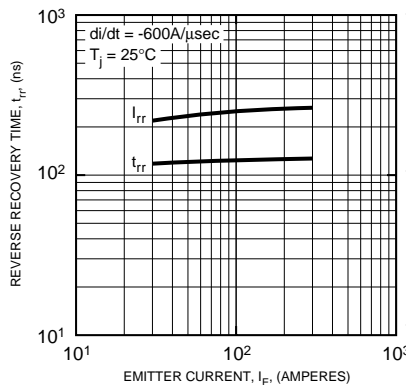
**CAPACITANCE VS.  $V_{CE}$  (TYPICAL)**



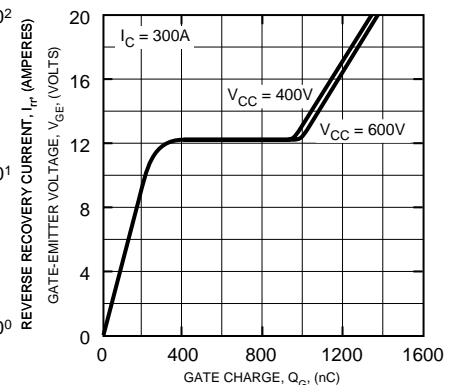
**HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)**



**REVERSE RECOVERY CHARACTERISTICS (TYPICAL)**



**GATE CHARGE,  $V_{GE}$**



# CM300DU-24H

HIGH POWER SWITCHING USE  
INSULATED TYPE

