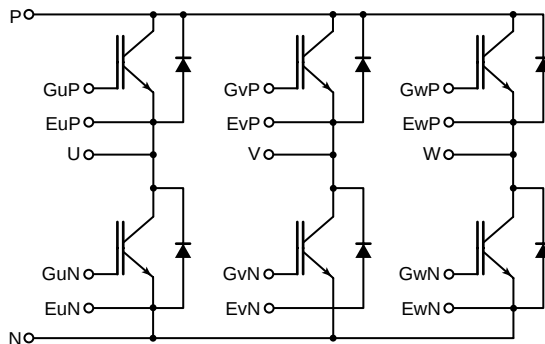
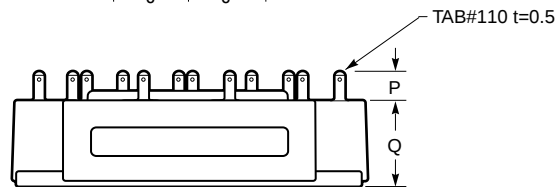
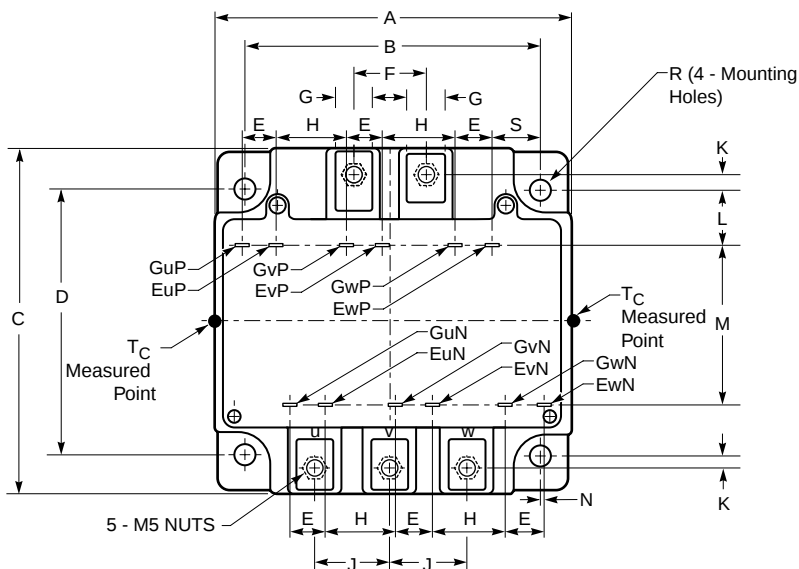


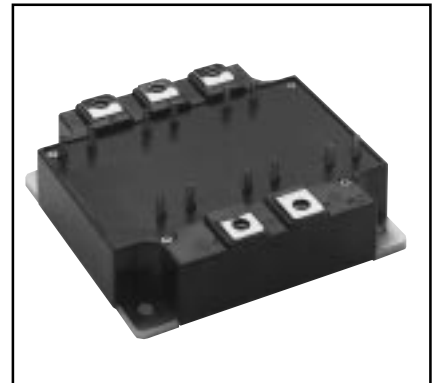
MITSUBISHI IGBT MODULES
CM200TU-12H
HIGH POWER SWITCHING USE
INSULATED TYPE



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.21	107.0
B	3.54±0.01	90.0±0.25
C	4.02	102.0
D	3.15±0.01	80.0±0.25
E	0.43	11.0
F	0.91	23.0
G	0.47	12.0
H	0.85	21.7
J	0.91	23.0

Dimensions	Inches	Millimeters
K	0.15	3.75
L	0.67	17.0
M	1.91	48.5
N	0.03	0.8
P	0.32	8.1
Q	1.02	26.0
R	0.22 Dia.	5.5 Dia.
S	0.57	14.4



Description:

Mitsubishi IGBT Modules are designed for use in switching applications. Each module consists of six IGBTs in a three phase 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. CM200TU-12H is a 600V (V_{CES}), 200 Ampere Six-IGBT Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	200	12

CM200TU-12H**HIGH POWER SWITCHING USE
INSULATED TYPE****Absolute Maximum Ratings, $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified**

Ratings	Symbol	CM200TU-12H	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}	600	Volts
Gate-Emitter Voltage (C-E SHORT)	V_{GES}	± 20	Volts
Collector Current ($T_c = 25^{\circ}\text{C}$)	I_c	200	Amperes
Peak Collector Current ($T_j \leq 150^{\circ}\text{C}$)	I_{CM}	400*	Amperes
Emitter Current**	I_E	200	Amperes
Peak Emitter Current**	I_{EM}	400*	Amperes
Maximum Collector Dissipation ($T_j < 150^{\circ}\text{C}$)	P_c	650	Watts
Mounting Torque, M5 Main Terminal	—	2.5~3.5	N · m
Mounting Torque, M5 Mounting	—	2.5~3.5	N · m
Weight	—	680	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 $T_{j(\text{max})}$ 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}	$V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$	—	—	1	mA
Gate Leakage Voltage	I_{GES}	$V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$	—	—	0.5	μA
Gate-Emitter Threshold Voltage	$V_{\text{GE(th)}}$	$I_c = 15\text{mA}, V_{\text{CE}} = 10\text{V}$	4.5	6	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_c = 200\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 25^{\circ}\text{C}$	—	2.4	3.0	Volts
		$I_c = 200\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 125^{\circ}\text{C}$	—	2.6	—	Volts
Total Gate Charge	Q_G	$V_{\text{CC}} = 300\text{V}, I_c = 200\text{A}, V_{\text{GE}} = 15\text{V}$	—	400	—	nC
Emitter-Collector Voltage*	V_{EC}	$I_E = 200\text{A}, V_{\text{GE}} = 0\text{V}$	—	—	2.6	Volts

* Pulse width and repetition rate should be such that the device junction temperature (T_j) does not exceed $T_{j(\text{max})}$ 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}	V _{CE} = 10V, V _{GE} = 0V	—	—	17.6	nF
Output Capacitance		C _{oes}		—	—	9.6	nF
Reverse Transfer Capacitance		C _{res}		—	—	2.6	nF
Resistive Load	Turn-on Delay Time	t _{d(on)}	V _{CC} = 300V, I _C = 200A,	—	—	150	ns
	Rise Time	t _r	V _{GE1} = V _{GE2} = 15V,	—	—	400	ns
Switch	Turn-off Delay Time	t _{d(off)}	R _G = 3.1Ω, Resistive	—	—	300	ns
Times	Fall Time	t _f	Load Switching Operation	—	—	300	ns
Diode Reverse Recovery Time		t _{rr}	I _E = 200A, di _E /dt = -400A/μs	—	—	160	μC
Diode Reverse Recovery Charge		Q _{rr}	I _E = 200A, di _E /dt = -400A/μs	—	0.48	—	μC

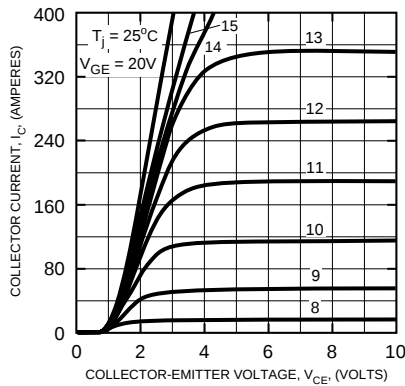
Thermal and Mechanical Characteristics, $T_j = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)Q}}$	Per IGBT 1/6 Module	—	—	0.19	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)D}}$	Per Free-Wheel Diode 1/6 Module	—	—	0.35	$^{\circ}\text{C}/\text{W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	—	0.015	—	$^{\circ}\text{C}/\text{W}$

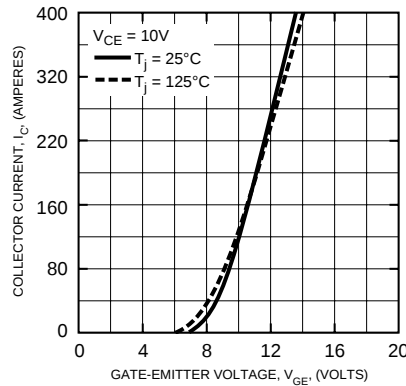
CM200TU-12H

HIGH POWER SWITCHING USE
INSULATED TYPE

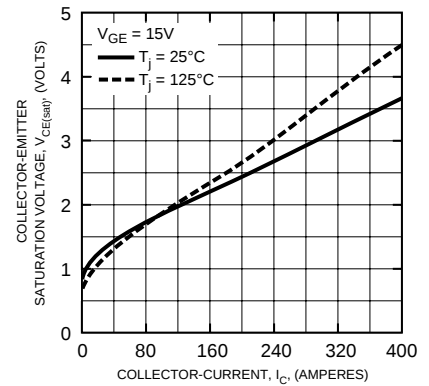
OUTPUT CHARACTERISTICS
(TYPICAL)



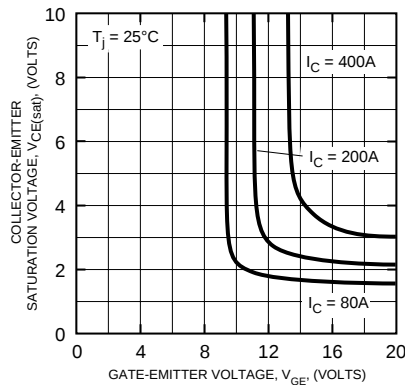
TRANSFER CHARACTERISTICS
(TYPICAL)



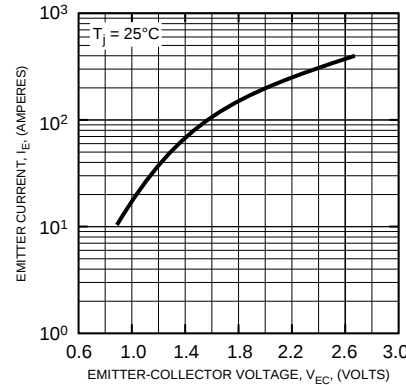
COLLECTOR-EMITTER
SATURATION VOLTAGE CHARACTERISTICS
(TYPICAL)



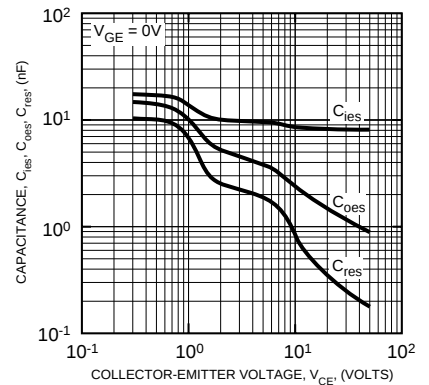
COLLECTOR-EMITTER
SATURATION VOLTAGE CHARACTERISTICS
(TYPICAL)



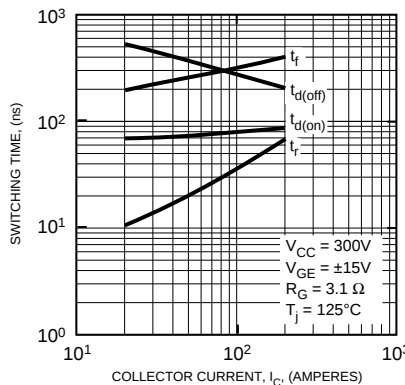
FREE-WHEEL DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



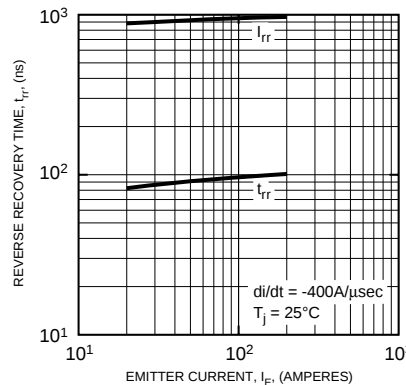
CAPACITANCE VS. V_{CE}
(TYPICAL)



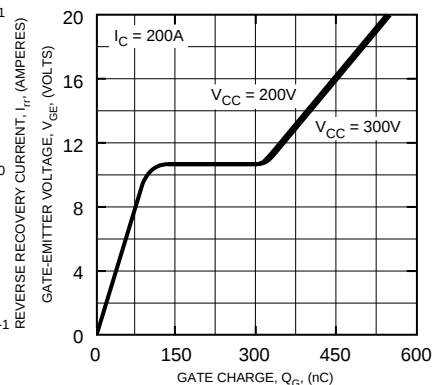
HALF-BRIDGE
SWITCHING CHARACTERISTICS
(TYPICAL)



REVERSE RECOVERY CHARACTERISTICS
(TYPICAL)



GATE CHARGE, V_{GE}



CM200TU-12H

HIGH POWER SWITCHING USE
INSULATED TYPE

