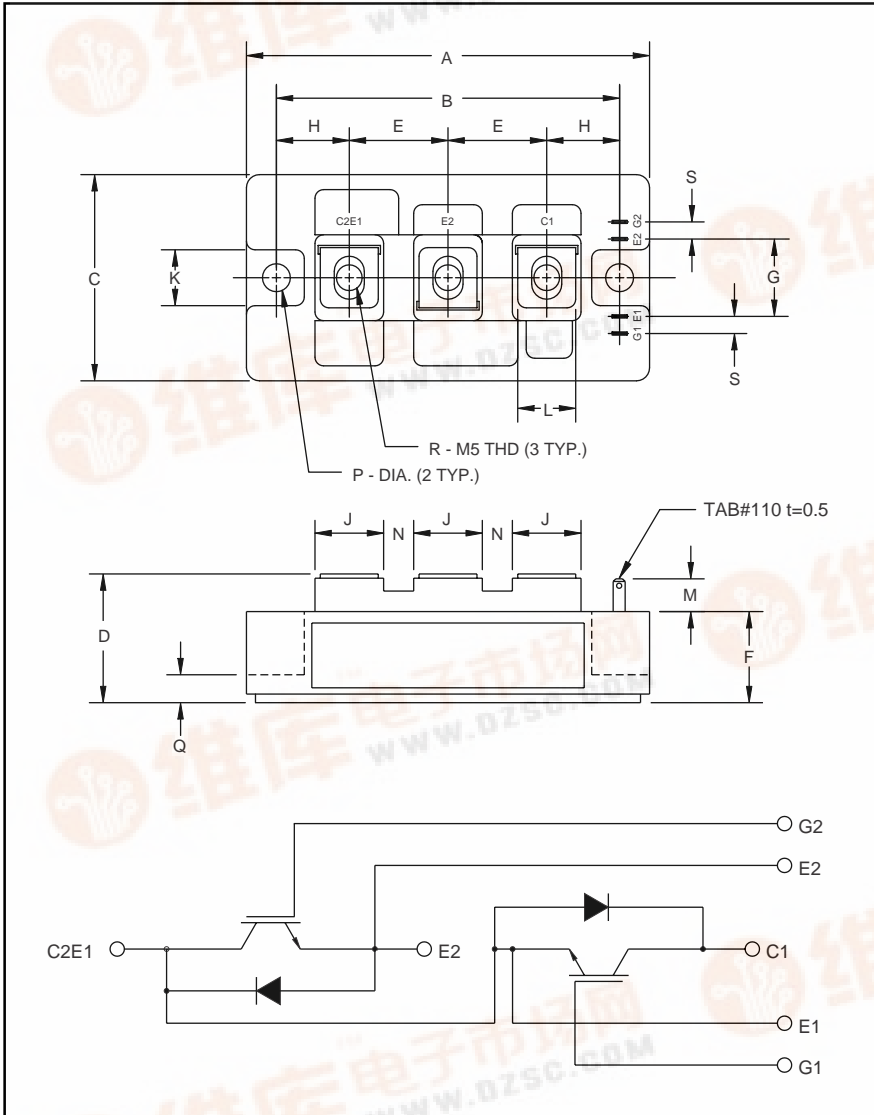


MITSUBISHI IGBT MODULES
CM300DY-12H
 HIGH POWER SWITCHING USE
 INSULATED TYPE



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 part module number you desire from the table below -i.e. CM300DY-12H is a 600V (V_{CES}), 300 Ampere Dual IGBT Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	300	12

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	3.70	94.0
B	3.150±0.01	80.0±0.25
C	1.89	48.0
D	1.18 Max.	30.0 Max.
E	0.90	23.0
F	0.83	21.2
G	0.71	18.0
H	0.67	17.0
J	0.63	16.0

Dimensions	Inches	Millimeters
K	0.51	13.0
L	0.47	12.0
M	0.30	7.5
N	0.28	7.0
P	0.256 Dia.	Dia. 6.5
Q	0.31	8.0
R	M5 Metric	M5
S	0.16	4.0



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

Ratings	Symbol	CM300DY-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 ($T_C = 25\text{ }^\circ\text{C}$)	I_C	300	Amperes
Peak Collector Current	I_{CM}	600*	Amperes
Emitter Current** ($T_C = 25\text{ }^\circ\text{C}$)	I_E	300	Amperes
Peak Emitter Current**	I_{EM}	600*	Amperes
Maximum Collector Dissipation ($T_C = 25\text{ }^\circ\text{C}$, $T_j \leq 150\text{ }^\circ\text{C}$)	P_C	1100	Watts
Mounting Torque, M5 Main Terminal	-	1.47 ~ 1.96	$\text{N} \cdot \text{m}$
Mounting Torque, M6 Mounting	-	1.96 ~ 2.94	$\text{N} \cdot \text{m}$
Weight	-	270	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{iso}	2500	V_{rms}

*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}	$V_{CE} = V_{CES}$, $V_{GE} = 0\text{V}$	-	-	1.0	mA
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}$, $V_{CE} = 0\text{V}$	-	-	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 30\text{mA}$, $V_{CE} = 10\text{V}$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 300\text{A}$, $V_{GE} = 15\text{V}$	-	2.1	2.8**	Volts
		$I_C = 300\text{A}$, $V_{GE} = 15\text{V}$, $T_j = 150\text{ }^\circ\text{C}$	-	2.15	-	Volts
Total Gate Charge	Q_G	$V_{CC} = 300\text{V}$, $I_C = 300\text{A}$, $V_{GE} = 15\text{V}$	-	900	-	nC
Emitter-Collector Voltage	V_{EC}	$I_E = 300\text{A}$, $V_{GE} = 0\text{V}$	-	-	2.8	Volts

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

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}		-	-	30	nF
Output Capacitance	C_{oes}	$V_{GE} = 0\text{V}$, $V_{CE} = 10\text{V}$	-	-	10.5	nF
Reverse Transfer Capacitance	C_{res}		-	-	6	nF
Resistive	Turn-on Delay Time	$t_{d(on)}$	-	-	350	ns
	Rise Time	t_r	-	-	600	ns
Switching	Turn-off Delay Time	$t_{d(off)}$	-	-	350	ns
	Fall Time	t_f	-	-	300	ns
Diode Reverse Recovery Time	t_{rr}	$I_E = 300\text{A}$, $di_E/dt = -600\text{A}/\mu\text{s}$	-	-	110	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 300\text{A}$, $di_E/dt = -600\text{A}/\mu\text{s}$	-	0.81	-	μC

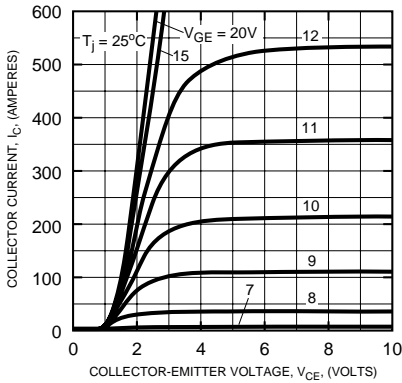
Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per IGBT	-	-	0.11	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	-	-	0.24	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	-	-	0.065	$^\circ\text{C}/\text{W}$

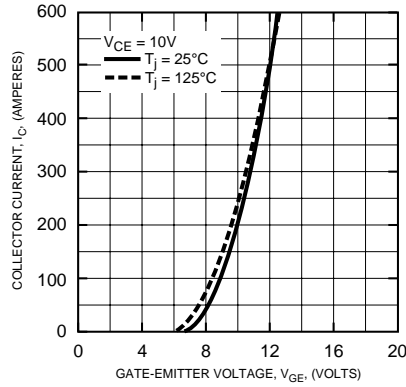
CM300DY-12H

HIGH POWER SWITCHING USE
INSULATED TYPE

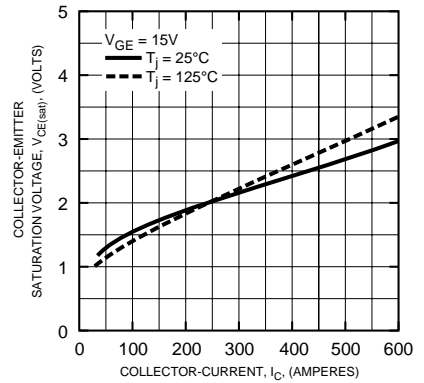
OUTPUT CHARACTERISTICS (TYPICAL)



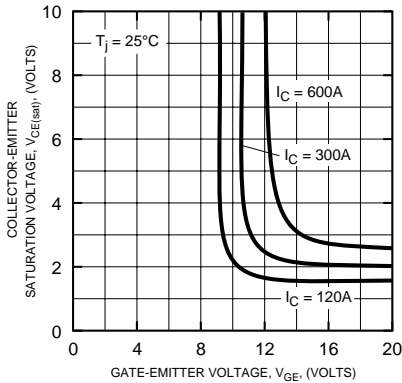
TRANSFER CHARACTERISTICS (TYPICAL)



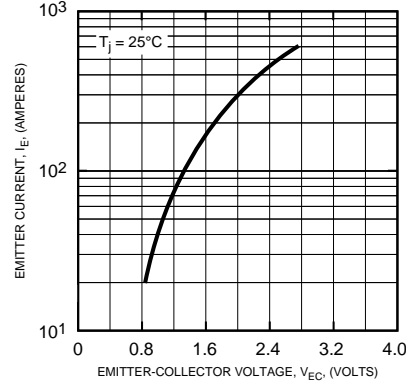
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



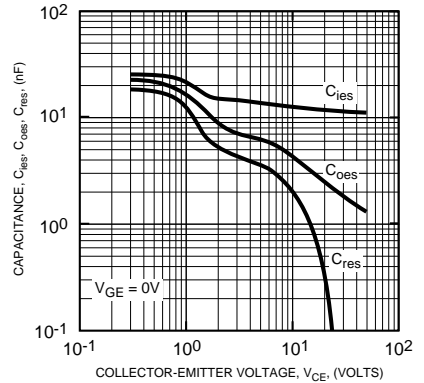
COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS (TYPICAL)



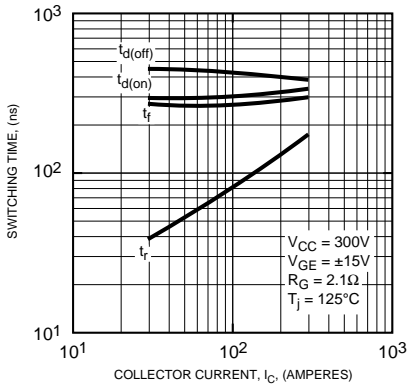
FREE-WHEEL DIODE FORWARD CHARACTERISTICS (TYPICAL)



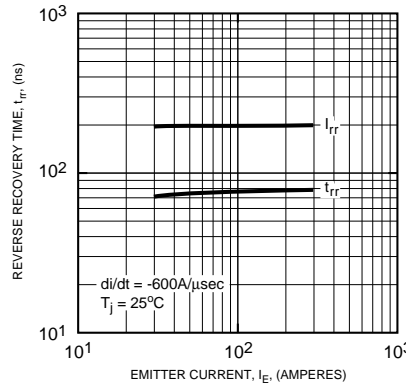
CAPACITANCE VS. VCE (TYPICAL)



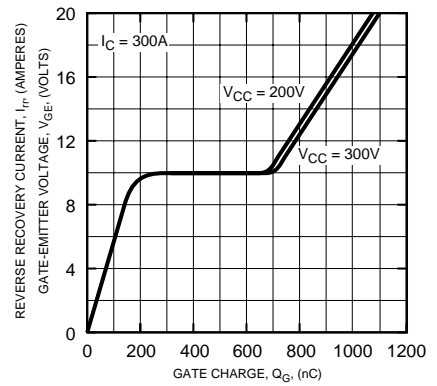
HALF-BRIDGE SWITCHING CHARACTERISTICS (TYPICAL)



REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



GATE CHARGE, VGE



CM300DY-12H

HIGH POWER SWITCHING USE
INSULATED TYPE

