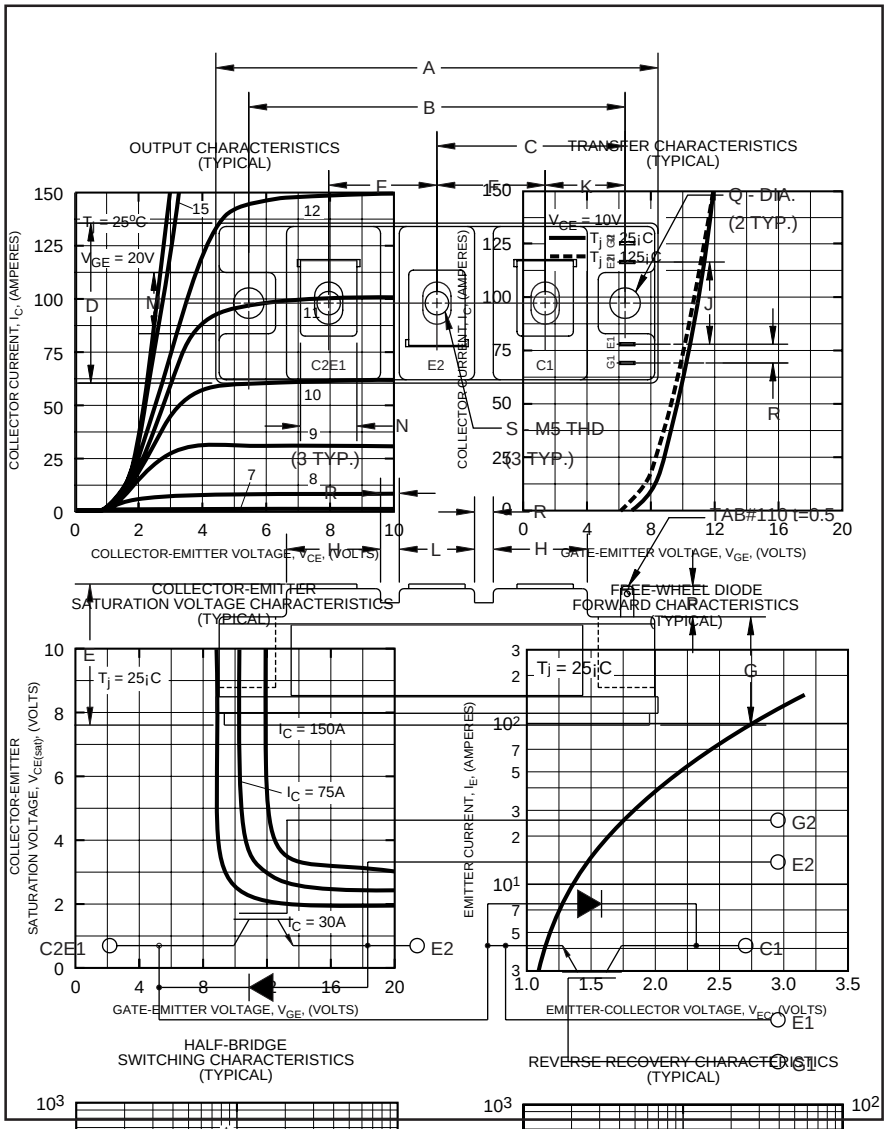
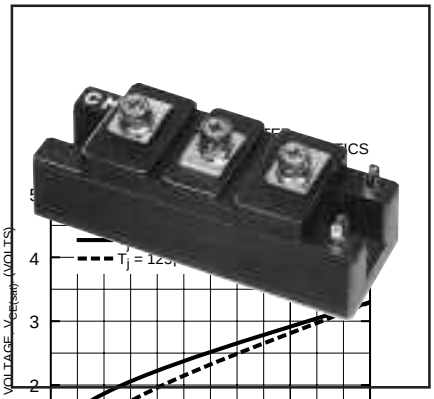
CM75DY-24H





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. CM75DY-24H is a 1200V (V_{CES}), 75 Ampere Dual IGBT Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	75	24

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	3.70	94.0
B	3.150 ± 0.01	80.0 ± 0.25
C	1.57	40.0
D	1.34	34.0
E	1.22 Max.	31.0 Max.
F	0.90	23.0
G	0.85	21.5
H	0.79	20.0
J	0.71	18.0

Dimensions	Inches	Millimeters
K	0.67	17.0
L	0.63	16.0
M	0.51	13.0
N	0.47	12.0
P	0.28	7.0
Q	0.256 Dia.	Dia. 6.5
R	0.16	4.0
S	M5 Metric	M5

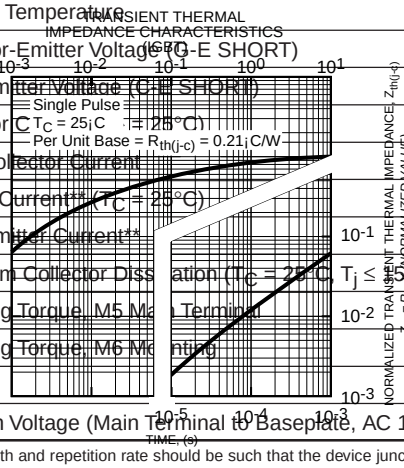
MITSUBISHI ELECTRIC

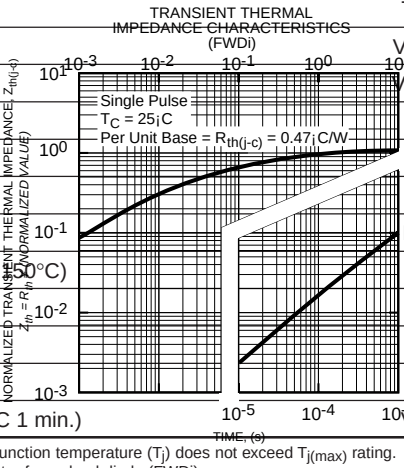
CM75DY-24H

HIGH POWER SWITCHING USE
INSULATED TYPE

Absolute Maximum Ratings, T_j = 25 °C unless otherwise specified

	Symbol	Ratings	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°C)	I_C	75	Amperes
Peak Collector Current	I_{CM}	150*	Amperes
Emitter Current** (T_C = 25°C)	I_E	75	Amperes
Peak Emitter Current**	I_{EM}	150*	Amperes
Maximum Collector Dissipation (T_C = 25°C, $T_j \leq$ 150°C)	P_C	600	Watts
Mounting Torque, M5 Main Terminal	–	1.47 ~ 1.96	N · m
Mounting Torque, M6 Mounting	–	1.96 ~ 2.94	N · m
Weight	–	190	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 °C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	I_{CES}	$V_{CE} = V_{CES}$, V_{GE} = 0V	–	–	1.0	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 = 7.5mA, V_{CE} = 10V	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 75A, V_{GE} = 15V	–	2.5	3.4**	Volts
		I_C = 75A, V_{GE} = 15V, T_j = 150°C	–	2.25	–	Volts
Total Gate Charge	Q_G	V_{CC} = 600V, I_C = 75A, V_{GE} = 15V	–	375	–	nC
Emitter-Collector Voltage	V_{EC}	I_E = 75A, 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 °C unless otherwise specified

Characteristics		Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance		C_{ies}	V_{GE} = 0V, V_{CE} = 10V	–	–	15	nF
Output Capacitance		C_{oes}		–	–	5.3	nF
Reverse Transfer Capacitance		C_{res}		–	–	3	nF
Resistive	Turn-on Delay Time	$t_{d(on)}$	V_{CC} = 600V, I_C = 75A, $V_{GE1} = V_{GE2}$ = 15V, R_G = 4.2Ω	–	–	150	ns
Load	Rise Time	t_r		–	–	350	ns
Switching	Turn-off Delay Time	$t_{d(off)}$		–	–	250	ns
Times	Fall Time	t_f		–	–	350	ns
Diode Reverse Recovery Time		t_{rr}	I_E = 75A, di_E/dt = –150A/µs	–	–	250	ns
Diode Reverse Recovery Charge		Q_{rr}	I_E = 75A, di_E/dt = –150A/µs	–	0.56	–	µC

Thermal and Mechanical Characteristics, T_j = 25 °C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per IGBT	–	–	0.21	°C/W
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	–	–	0.47	°C/W
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	–	0.075	°C/W

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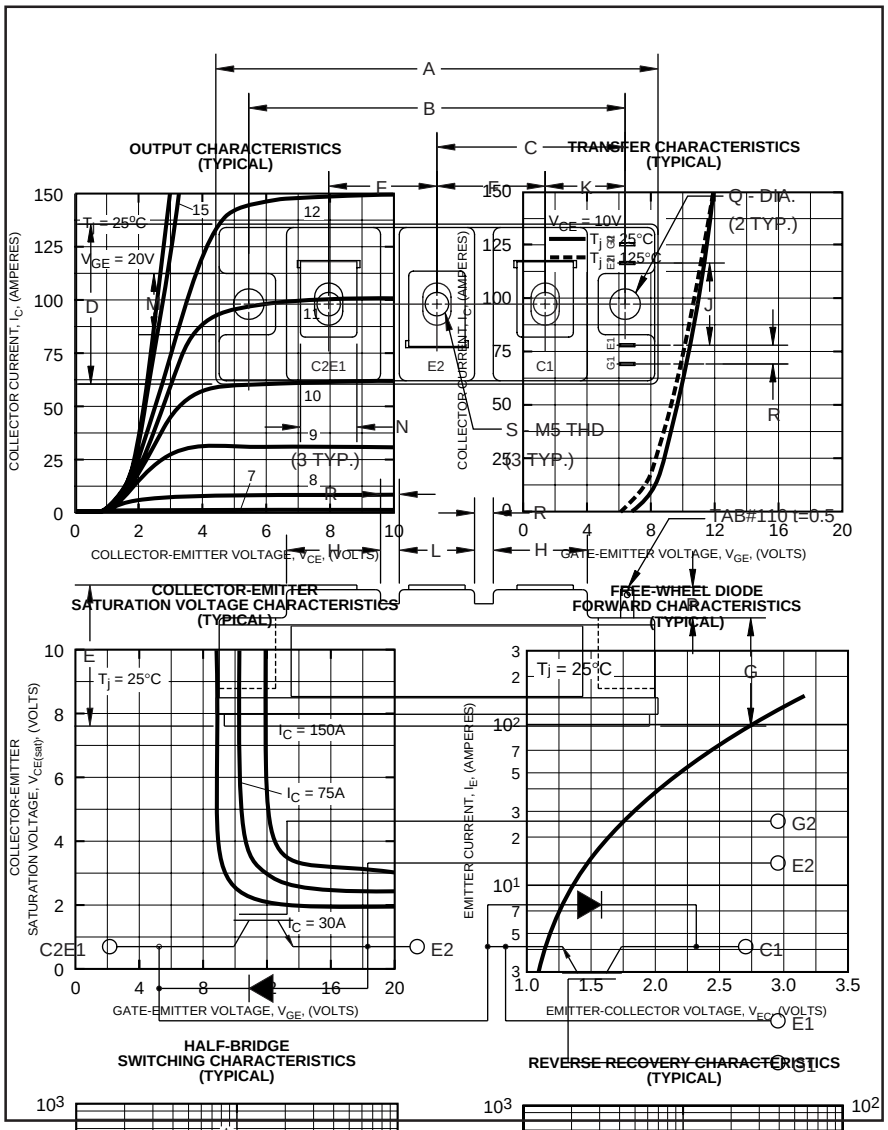

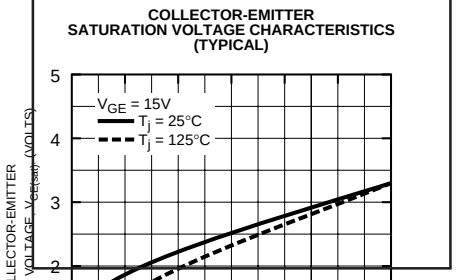

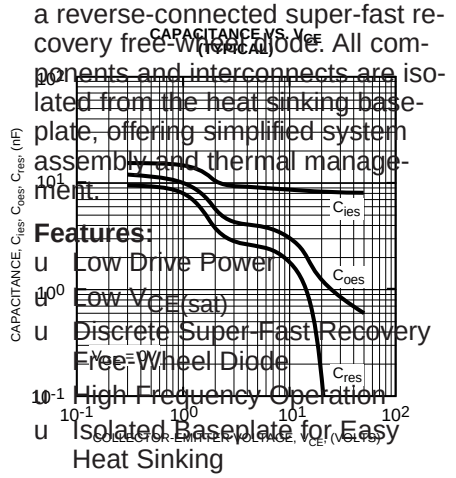

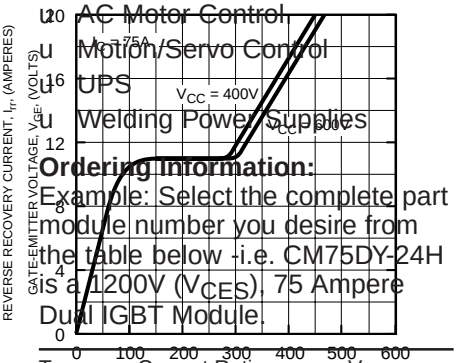

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Example: Select the complete part module number you desire from the table below -i.e. CM75DY-24H is a 1200V (V_{CES}), 75 Ampere Dual IGBT Module.

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Dimensions	Inches	Millimeters
A	3.70	94.0
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P	0.28	7.0
Q	0.256 Dia.	Dia. 6.5
R	0.16	4.0
S	M5 Metric	M5

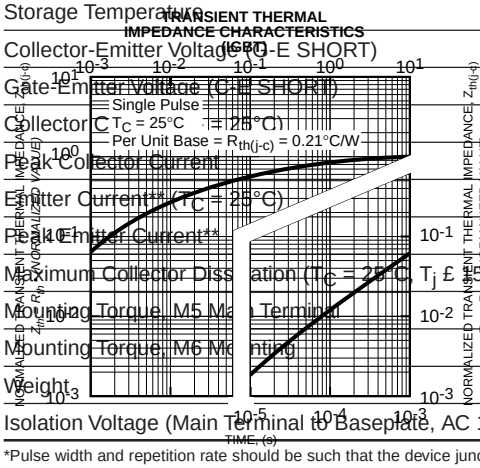
MITSUBISHI ELECTRIC

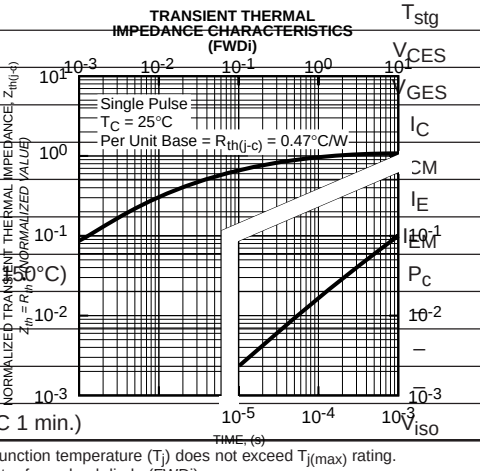
CM75DY-24H

HIGH POWER SWITCHING USE
INSULATED TYPE

Absolute Maximum Ratings, T_j = 25 °C unless otherwise specified

	Symbol	Ratings	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	I_C	75	Amperes
Peak Collector Current	I_{CM}	150*	Amperes
Emitter Current** (T_C = 25°C)	I_E	75	Amperes
Peak Emitter Current**	I_{EM}	150*	Amperes
Maximum Collector Dissipation (T_C = 25°C, T_j ≤ 150°C)	P_C	600	Watts
Mounting Torque, M5 Main Terminal	–	1.47 ~ 1.96	N · m
Mounting Torque, M6 Mounting	–	1.96 ~ 2.94	N · m
Weight	–	190	Grams
Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)	V_{iso}	2500	Vrms





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Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V	–	–	1.0	mA
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Gate-Emitter Threshold Voltage	$V_{GE(th)}$	I_C = 7.5mA, V_{CE} = 10V	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 75A, V_{GE} = 15V	–	2.5	3.4**	Volts
		I_C = 75A, V_{GE} = 15V, T_j = 150°C	–	2.25	–	Volts
Total Gate Charge	Q_G	V_{CC} = 600V, I_C = 75A, V_{GE} = 15V	–	375	–	nC
Emitter-Collector Voltage	V_{EC}	I_E = 75A, V_{GE} = 0V	–	–	3.5	Volts

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

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Characteristics		Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance		C_{ies}		–	–	15	nF
Output Capacitance		C_{oes}	V_{GE} = 0V, V_{CE} = 10V	–	–	5.3	nF
Reverse Transfer Capacitance		C_{res}		–	–	3	nF
Resistive	Turn-on Delay Time	$t_{d(on)}$		–	–	150	ns
Load	Rise Time	t_r	V_{CC} = 600V, I_C = 75A,	–	–	350	ns
Switching	Turn-off Delay Time	$t_{d(off)}$	V_{GE1} = V_{GE2} = 15V, R_G = 4.2Ω	–	–	250	ns
Times	Fall Time	t_f		–	–	350	ns
Diode Reverse Recovery Time		t_{rr}	I_E = 75A, di_E/dt = –150A/μs	–	–	250	ns
Diode Reverse Recovery Charge		Q_{rr}	I_E = 75A, di_E/dt = –150A/μs	–	0.56	–	μC

Thermal and Mechanical Characteristics, T_j = 25 °C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per IGBT	–	–	0.21	°C/W
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	–	–	0.47	°C/W
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	–	0.075	°C/W