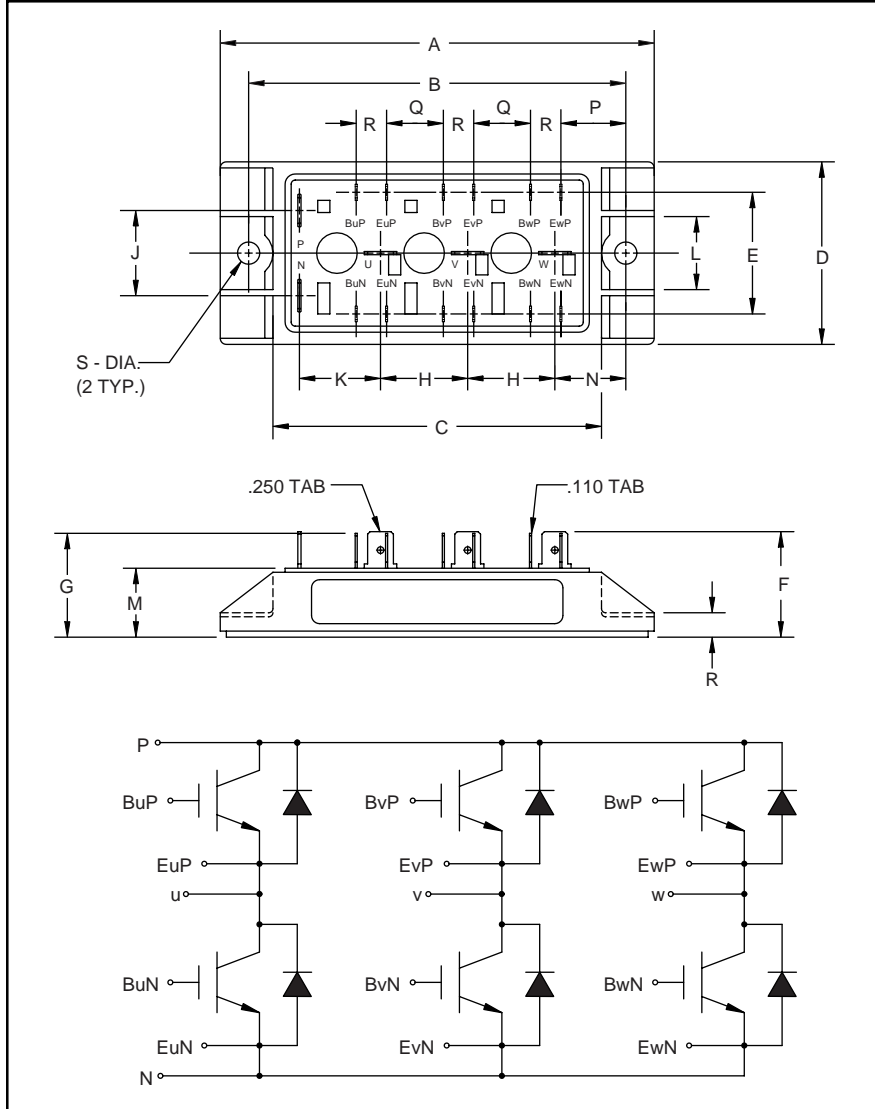


Six-IGBT IGBTMOD™ H-Series Module 20 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.21	107.0
B	3.66±0.01	93.0±0.3
C	3.19	81.0
D	1.77	45.0
E	1.18	30.0
F	1.04	26.5
G	1.01	25.6
H	0.85	21.5
J	0.83	21.0

Dimensions	Inches	Millimeters
K	0.79	20.0
L	0.71	18.0
M	0.69±0.02	17.5±0.5
N	0.69	17.5
P	0.63	16.0
Q	0.55	14.0
R	0.30	7.5
S	0.22 Dia.	Dia. 5.5



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of six IGBT Transistors 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 (135ns) Free-Wheel Diode
- High Frequency Operation (20-25kHz)
- Isolated Baseplate for Easy Heat Sinking

Applications:

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

Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM20TF-24H is a 1200V (V_{CES}), 20 Ampere Six-IGBT IGBTMOD™ Power Module.

Type	Current Rating Amperes (20)	V_{CES} Volts (x 50)
CM	20	24

CM20TF-24H

Six-IGBT IGBTMOD™ H-Series Module

20 Amperes/1200 Volts

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

Ratings	Symbol	CM20TF-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	V_{GES}	±20	Volts
Collector Current	I_C	20	Amperes
Peak Collector Current	I_{CM}	40*	Amperes
Diode Forward Current	I_F	40	Amperes
Diode Forward Surge Current	I_{FM}	40*	Amperes
Power Dissipation	P_d	250	Watts
Max. Mounting Torque M5 Mounting Screws	–	17	in-lb
Module Weight (Typical)	–	260	Grams
V Isolation	V_{RMS}	2500	Volts

* Pulse width and repetition rate should be such that device junction temperature does not exceed the device rating.

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	I_{CES}	$V_{CE} = V_{CES}, V_{GE} = 0V$	–	–	1.0	mA
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}, V_{CE} = 0V$	–	–	0.5	μA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 2mA, V_{CE} = 10V$	4.5	6.0	7.5	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 20A, V_{GE} = 15V$	–	2.5	3.4**	Volts
		$I_C = 20A, V_{GE} = 15V, T_j = 150\text{ °C}$	–	2.25	–	Volts
Total Gate Charge	Q_G	$V_{CC} = 600V, I_C = 20A, V_{GS} = 15V$	–	100	–	nC
Diode Forward Voltage	V_{FM}	$I_E = 20A, V_{GS} = 0V$	–	–	3.5	Volts

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

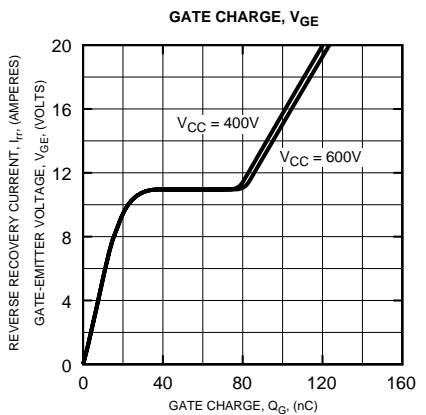
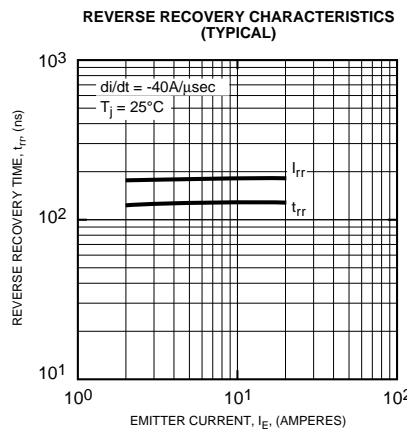
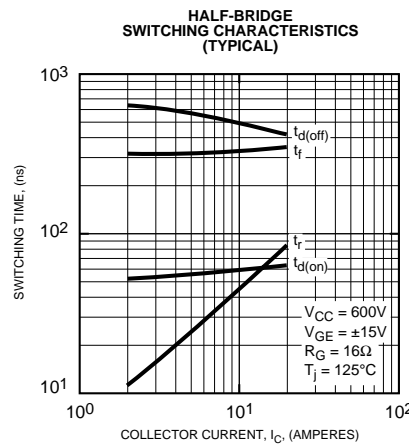
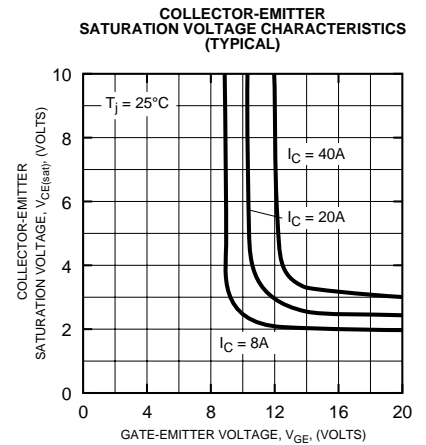
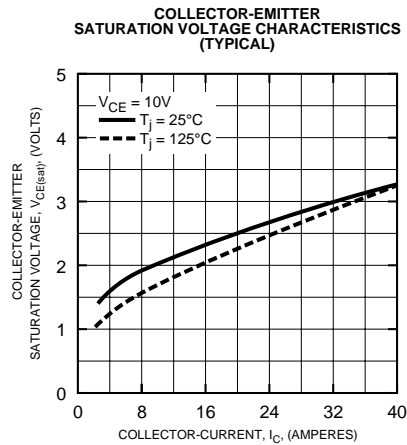
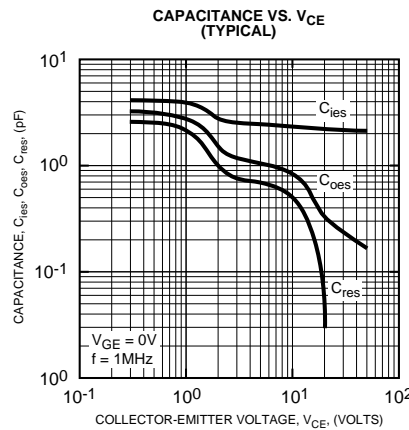
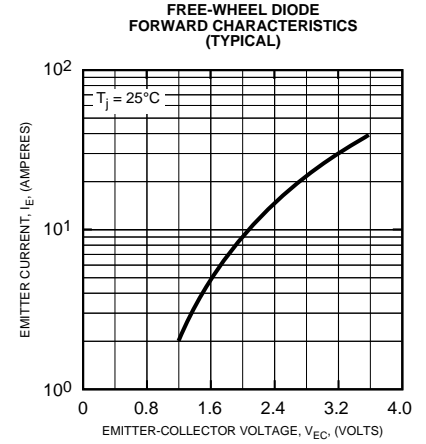
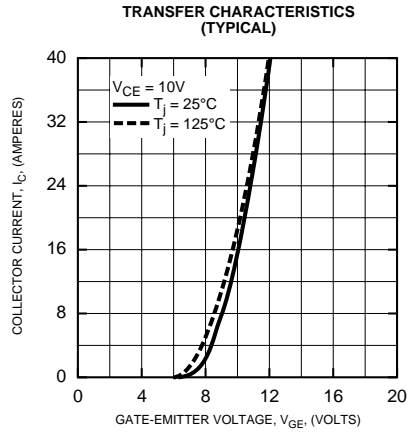
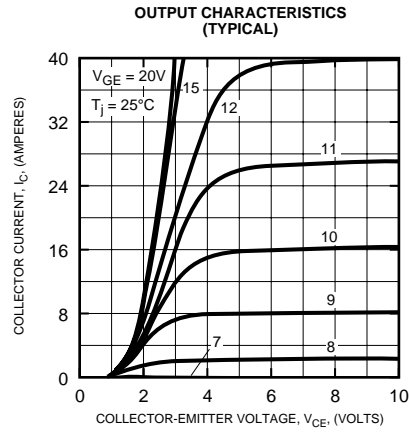
Dynamic Electrical Characteristics, $T_j = 25\text{ °C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}		–	–	4	nF
Output Capacitance	C_{oes}	$V_{GE} = 0V, V_{CE} = 10V, f = \text{MHz}$	–	–	1.4	nF
Reverse Transfer Capacitance	C_{res}		–	–	0.8	nF
Resistive	Turn-on Delay Time	$t_{d(on)}$	–	–	100	ns
Load	Rise Time	t_r	–	–	200	ns
Switching	Turn-off Delay Time	$t_{d(off)}$	–	–	150	ns
	Fall Time	t_f	–	–	350	ns
Diode Reverse Recovery Time	t_{rr}	$I_E = 20A, di_E/dt = -40A/\mu s$	–	–	250	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 20A, di_E/dt = -40A/\mu s$	–	0.15	–	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	–	–	0.63	°C/W
Thermal Resistance, Junction to Case	$R_{th(j-c)}$	Per FWDi	–	–	1.40	°C/W
Contact Thermal Resistance	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	–	0.058	°C/W

CM20TF-24H
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