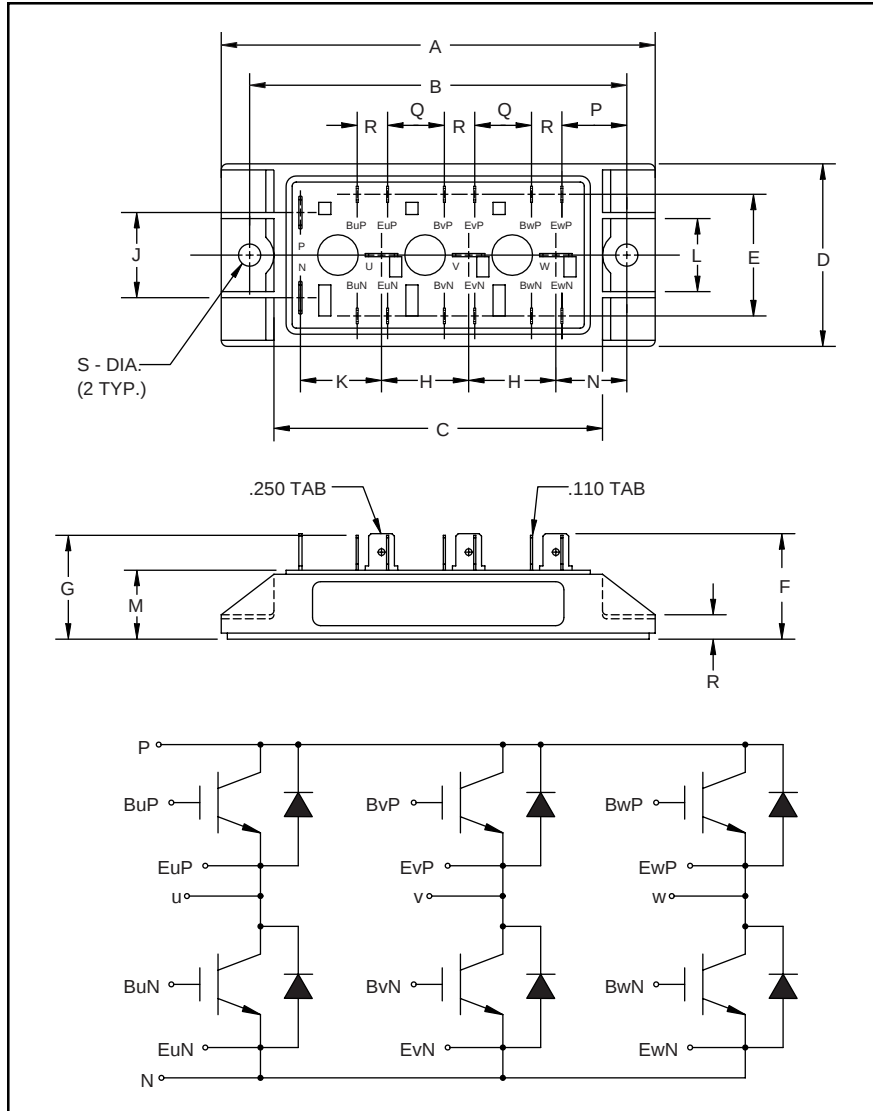


Six-IGBT IGBTMOD™ H-Series Module 20 Amperes/1200 Volts



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

Ratings	Symbol	CM20TF-24H	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	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, $T_j = 25^\circ\text{C}$ unless otherwise specified

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

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

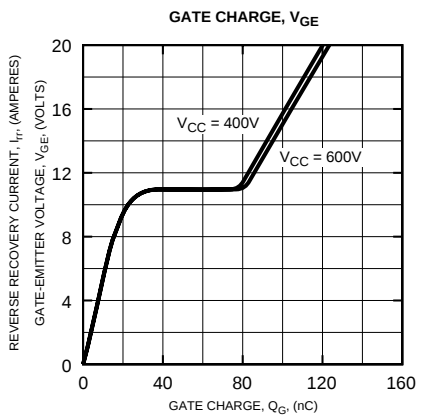
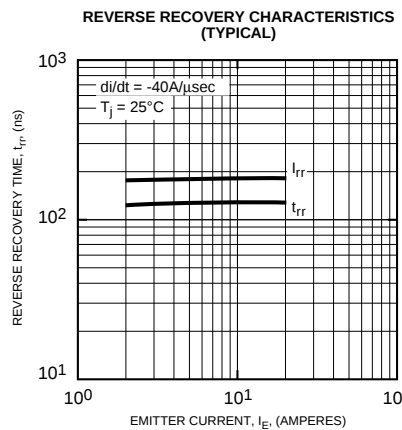
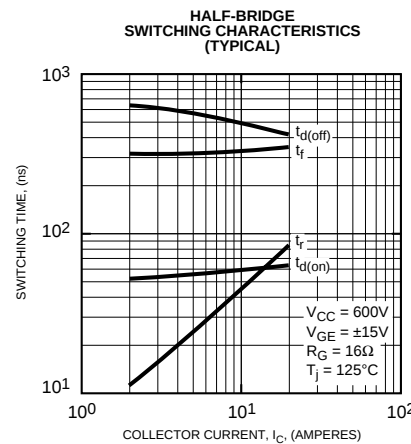
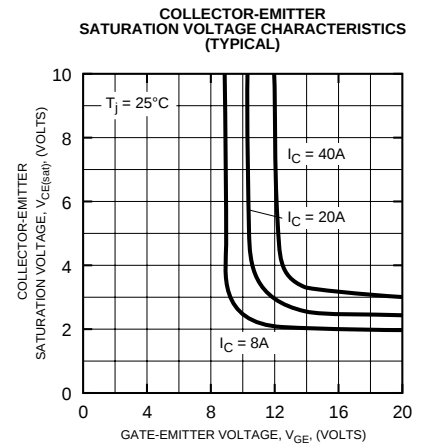
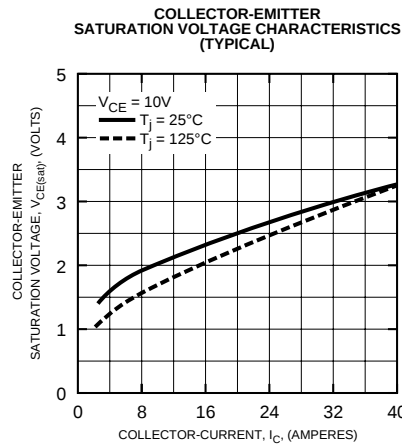
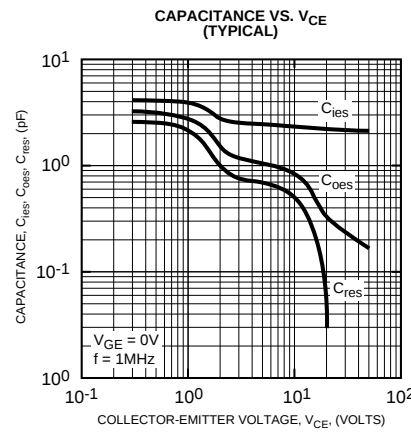
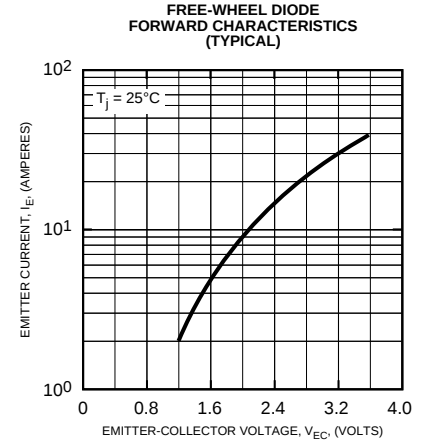
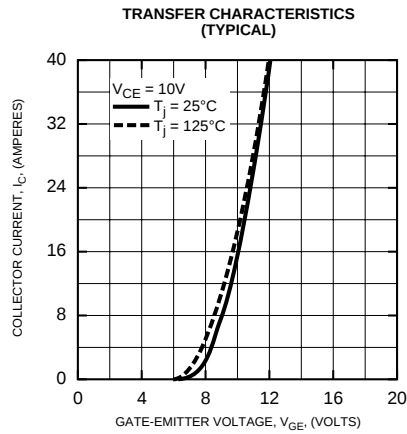
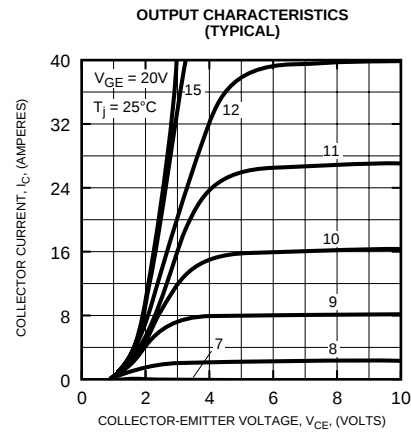
Dynamic Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{ies}	$V_{\text{GE}} = 0\text{V}, V_{\text{CE}} = 10\text{V}, f = \text{MHz}$	—	—	4	nF
Output Capacitance	C_{oes}		—	—	1.4	nF
Reverse Transfer Capacitance	C_{res}		—	—	0.8	nF
Resistive	Turn-on Delay Time	$V_{\text{CC}} = 600\text{V}, I_C = 20\text{A}, V_{\text{GE1}} = V_{\text{GE2}} = 15\text{V}, R_G = 16\Omega$	—	—	100	ns
Load	Rise Time		—	—	200	ns
Switching	Turn-off Delay Time		—	—	150	ns
Times	Fall Time		—	—	350	ns
Diode Reverse Recovery Time	t_{rr}	$I_E = 20\text{A}, di_E/dt = -40\text{A}/\mu\text{s}$	—	—	250	ns
Diode Reverse Recovery Charge	Q_{rr}	$I_E = 20\text{A}, di_E/dt = -40\text{A}/\mu\text{s}$	—	0.15	—	μC

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per IGBT	—	—	0.63	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	Per FWDi	—	—	1.40	$^\circ\text{C}/\text{W}$
Contact Thermal Resistance	$R_{\text{th(c-f)}}$	Per Module, Thermal Grease Applied	—	—	0.058	$^\circ\text{C}/\text{W}$

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