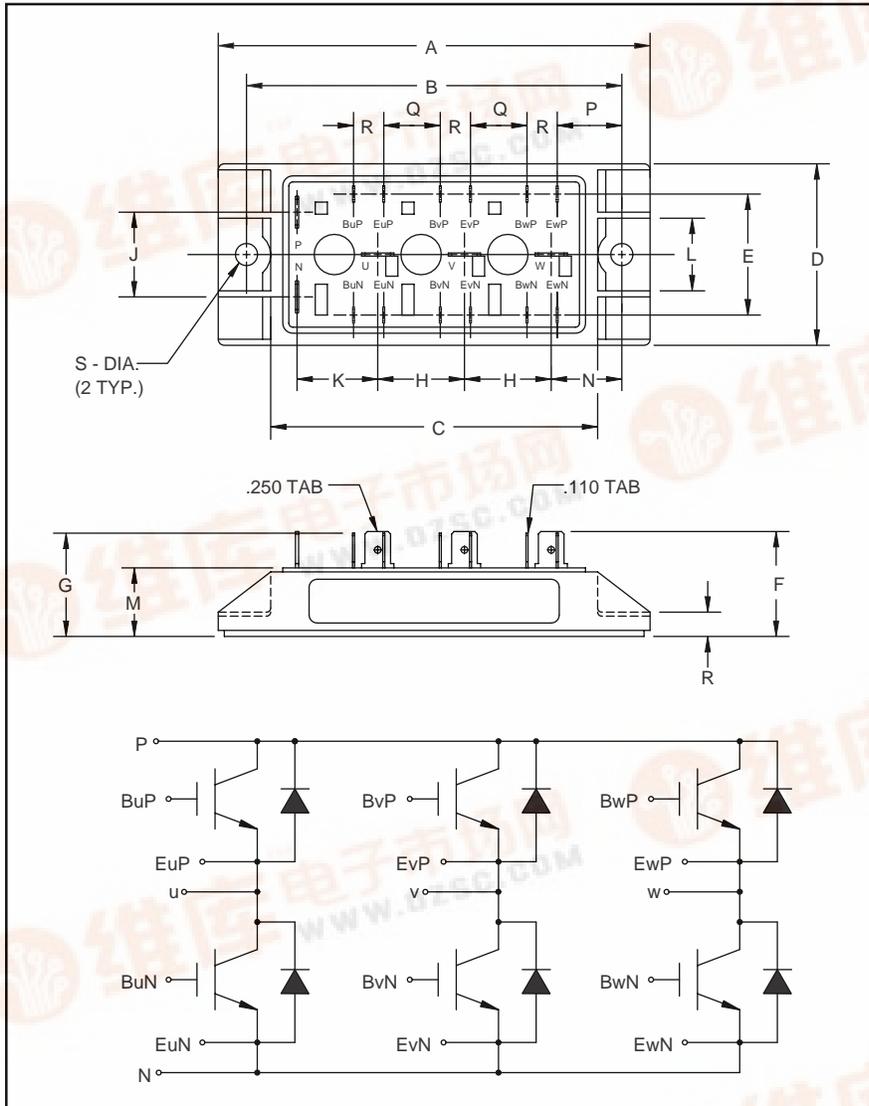




Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

## CM20TF-24H

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



#### 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.

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
	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

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





Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

**CM20TF-24H**  
**Six-IGBT IGBTMOD™ H-Series Module**  
 20 Amperes/1200 Volts

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

Ratings	Symbol	CM20TF-24H	Units
Junction Temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to 125	$^\circ\text{C}$
Collector-Emitter Voltage (G-E SHORT)	$V_{\text{CES}}$	1200	Volts
Gate-Emitter Voltage	$V_{\text{GES}}$	$\pm 20$	Volts
Collector Current	$I_C$	20	Amperes
Peak Collector Current	$I_{\text{CM}}$	40*	Amperes
Diode Forward Current	$I_F$	40	Amperes
Diode Forward Surge Current	$I_{\text{FM}}$	40*	Amperes
Power Dissipation	$P_d$	250	Watts
Max. Mounting Torque M5 Mounting Screws	-	17	in-lb
Module Weight (Typical)	-	260	Grams
V Isolation	$V_{\text{RMS}}$	2500	Volts

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

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector-Cutoff Current	$I_{\text{CES}}$	$V_{\text{CE}} = V_{\text{CES}}, V_{\text{GE}} = 0\text{V}$	-	-	1.0	mA
Gate Leakage Current	$I_{\text{GES}}$	$V_{\text{GE}} = V_{\text{GES}}, V_{\text{CE}} = 0\text{V}$	-	-	0.5	$\mu\text{A}$
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
		$I_C = 20\text{A}, V_{\text{GE}} = 15\text{V}, T_j = 150\text{ }^\circ\text{C}$	-	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	$V_{\text{FM}}$	$I_E = 20\text{A}, V_{\text{GS}} = 0\text{V}$	-	-	3.5	Volts

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

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	$C_{\text{ies}}$		-	-	4	nF
Output Capacitance	$C_{\text{oes}}$	$V_{\text{GE}} = 0\text{V}, V_{\text{CE}} = 10\text{V}, f = \text{MHz}$	-	-	1.4	nF
Reverse Transfer Capacitance	$C_{\text{res}}$		-	-	0.8	nF
Resistive	Turn-on Delay Time	$t_{\text{d(on)}}$	-	-	100	ns
	Rise Time	$t_r$	-	-	200	ns
Switching	Turn-off Delay Time	$t_{\text{d(off)}}$	-	-	150	ns
	Fall Time	$t_f$	-	-	350	ns
Diode Reverse Recovery Time	$t_{\text{rr}}$	$I_E = 20\text{A}, di_E/dt = -40\text{A}/\mu\text{s}$	-	-	250	ns
Diode Reverse Recovery Charge	$Q_{\text{rr}}$	$I_E = 20\text{A}, di_E/dt = -40\text{A}/\mu\text{s}$	-	0.15	-	$\mu\text{C}$

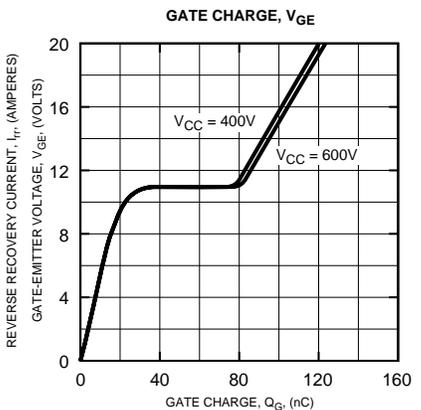
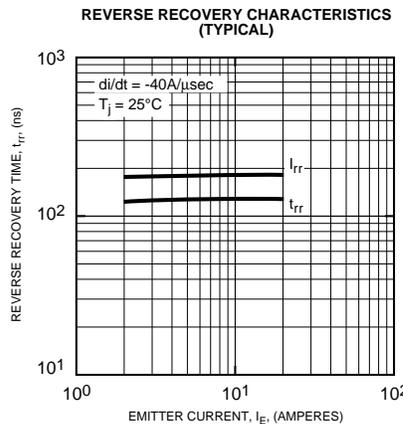
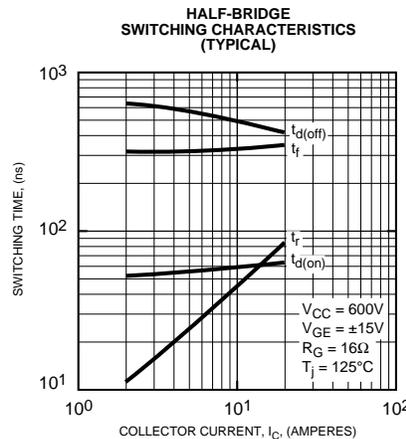
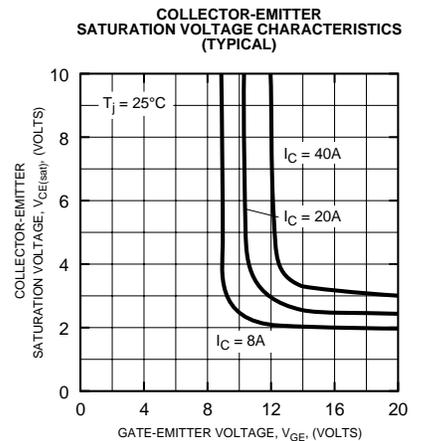
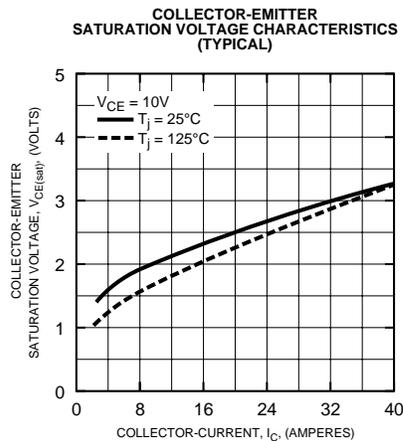
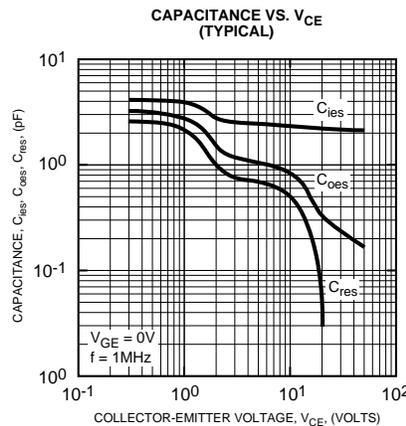
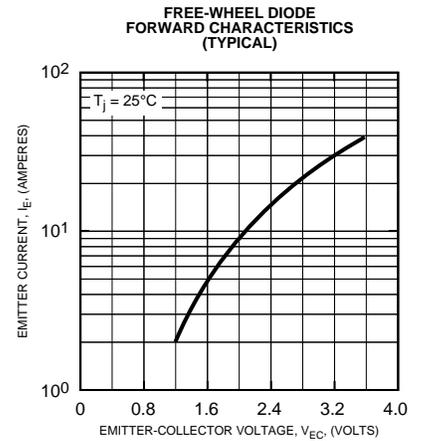
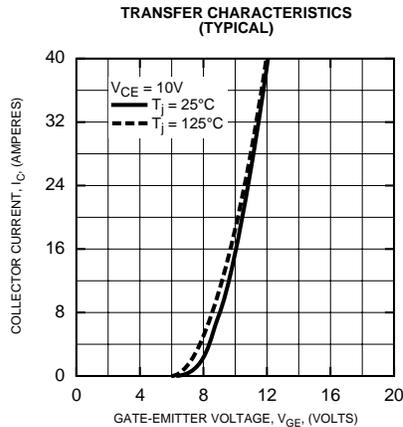
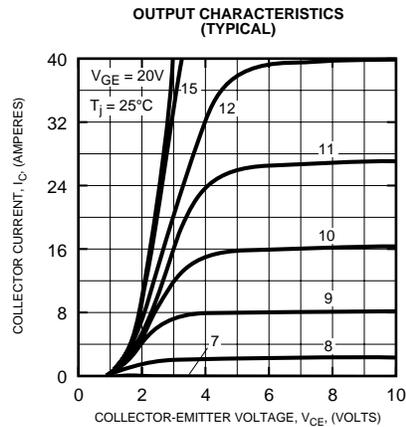
### Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{\text{th(j-c)}}$	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	$^\circ\text{C}/\text{W}$



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

**CM20TF-24H**  
**Six-IGBT IGBTMOD™ H-Series Module**  
 20 Amperes/1200 Volts





Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

**CM20TF-24H**  
**Six-IGBT IGBTMOD™ H-Series Module**  
20 Amperes/1200 Volts

