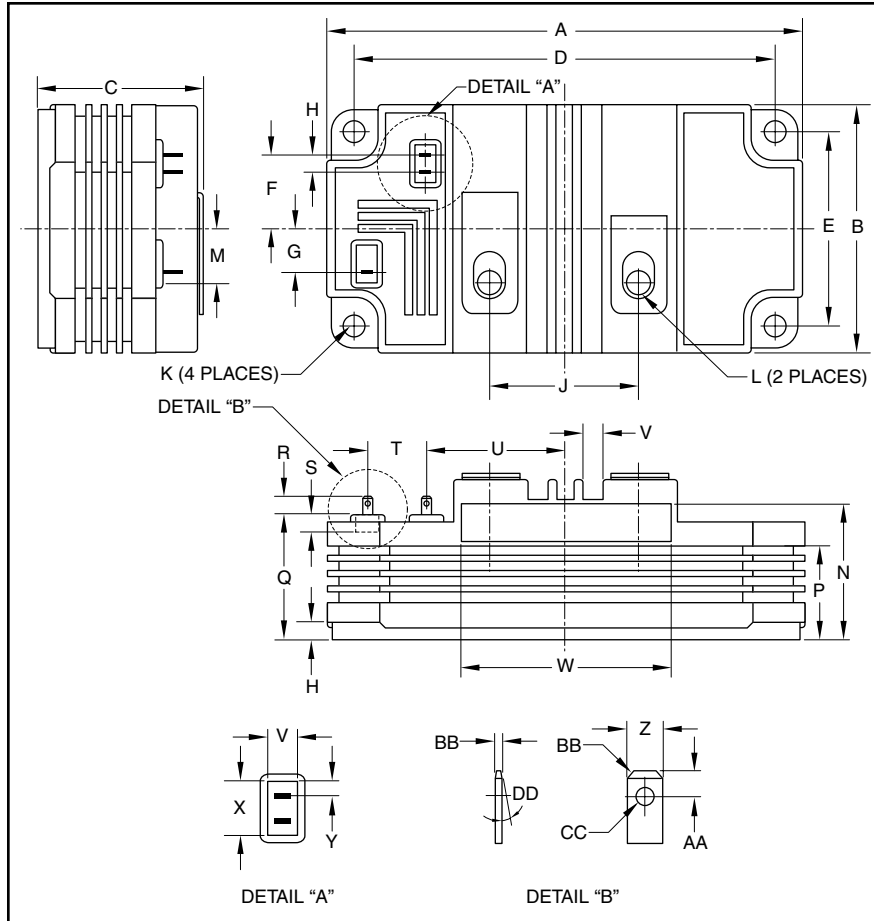


Single IGBTMOD™ HVIGBT Module 200 Amperes/6500 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	5.51	140.0
B	2.87	73.0
C	1.89+0.04/-0.0	48.0+1.0/-0.0
D	4.88	124.0
E	2.24	57.0
F	0.85	21.6
G	0.51	12.9
H	0.20	5.0
J	1.73	44.0
K	M6 Metric	M6
L	M8 Metric	M8
M	0.64	16.2
N	1.59	40.4
P	1.10	28.0

Dimensions	Inches	Millimeters
Q	1.44	36.5
R	0.22	5.5
S	0.16	4.0
T	0.68	17.4
U	1.61	41.0
V	0.24	6.0
W	2.44	62.0
X	0.47	12.0
Y	0.14	3.5
Z	0.11	2.8
AA	0.06	1.6
BB	0.02	0.5
CC	0.05 Dia.	1.2 Dia.
DD	10°	10°



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of one IGBT Transistor in 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 $V_{CE(sat)}$
- ☐ Super-Fast Recovery Free-Wheel Diode
- ☐ Isolated Baseplate for Easy Heat Sinking

Applications:

- ☐ Traction
- ☐ Medium Voltage Drives
- ☐ High Voltage Power Supplies

Ordering Information:

Example: Select the complete part module number you desire from the table below -i.e. CM200HG-130H is a 6500V (V_{CES}), 200 Ampere Single IGBTMOD™ Power Module.

Type	Current Rating Amperes	V_{CES} Volts (x 50)
CM	200	130



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

CM200HG-130H

Single IGBTMOD™ HVIGBT Module

200 Amperes/6500 Volts

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

Ratings	Symbol	CM200HG-130H	Units
Junction Temperature	T_j	-40 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to 125	$^\circ\text{C}$
Operating Temperature	T_{opr}	-40 to 125	$^\circ\text{C}$
Collector-Emitter Voltage ($V_{\text{GE}} = 0\text{V}$, $T_j = -40^\circ\text{C}$)	V_{CES}	5800	Volts
Collector-Emitter Voltage ($V_{\text{GE}} = 0\text{V}$, $T_j = +25^\circ\text{C}$)	V_{CES}	6300	Volts
Collector-Emitter Voltage ($V_{\text{GE}} = 0\text{V}$, $T_j = +125^\circ\text{C}$)	V_{CES}	6500	Volts
Gate-Emitter Voltage ($V_{\text{CE}} = 0\text{V}$)	V_{GES}	± 20	Volts
Collector Current (DC, $T_c = 80^\circ\text{C}$)	I_C	200	Amperes
Peak Collector Current (Pulse)	I_{CM}	400*	Amperes
Emitter Current** ($T_c = 25^\circ\text{C}$)	I_E	200	Amperes
Emitter Surge Current** (Pulse)	I_{EM}	400*	Amperes
Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$, IGBT Part, $T_{j(\text{max})} \leq 125^\circ\text{C}$)	P_C	2900	Watts
Partial Discharge ($V_1 = 6900\text{ V}_{\text{rms}}$, $V_2 = 5100\text{ V}_{\text{rms}}$, 60 Hz (Acc. to IEC 1287))	Q_{pd}	10	pC
Max. Mounting Torque M8 Main Terminal Screws	—	133	in-lb
Max. Mounting Torque M6 Mounting Screws	—	53	in-lb
Module Weight (Typical)	—	0.52	kg
Isolation Voltage (Charged Part to Baseplate, AC 60Hz 1 min.)	V_{iso}	10200	Volts
Maximum Turn-Off Switching Current ($V_{\text{CC}} \leq 4500\text{V}$, $V_{\text{GE}} = \pm 15\text{V}$, $R_{\text{G(off)}} \geq 72\Omega$, $T_j = 125^\circ\text{C}$)	—	400	Amperes
Short Circuit Capability, Maximum Pulse Width ($V_{\text{CC}} \leq 4500\text{V}$, $V_{\text{GE}} = \pm 15\text{V}$, $R_{\text{G(off)}} \geq 72\Omega$, $T_j = 125^\circ\text{C}$)	—	10	μs
Maximum Reverse Recovery Instantaneous Power ($V_{\text{CC}} \leq 4500\text{V}$, $di_{\text{e}}/dt \leq 1000\text{A}/\mu\text{s}$, $T_j = 125^\circ\text{C}$)	—	1200	kW

* Pulse width and repetition rate should be such that device junction temperature (T_j) does not exceed T_{oprmax} rating (125°C).

**Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

CM200HG-130H
Single IGBTMOD™ HVIGBT Module
 200 Amperes/6500 Volts

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}	$V_{CE} = V_{CES}, V_{GE} = 0V, T_j = 25^\circ\text{C}$	–	–	3.0	mA
		$V_{CE} = V_{CES}, V_{GE} = 0V, T_j = 125^\circ\text{C}$	–	10	30.0	mA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$I_C = 20\text{mA}, V_{CE} = 10V$	5.0	6.0	7.0	Volts
Gate Leakage Current	I_{GES}	$V_{GE} = V_{GES}, V_{CE} = 0V$	–	–	0.5	μA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 200\text{A}, V_{GE} = 15V, T_j = 25^\circ\text{C}$	–	5.1	–	Volts
		$I_C = 200\text{A}, V_{GE} = 15V, T_j = 125^\circ\text{C}$	–	5.0	–	Volts
Input Capacitance	C_{ies}	$V_{CE} = 10V, V_{GE} = 0V,$	–	41.0	–	nF
Output Capacitance	C_{oes}	$f = 100\text{kHz},$	–	2.5	–	nF
Reverse Transfer Capacitance	C_{res}	$T_j = 25^\circ\text{C}$	–	0.7	–	nF
Total Gate Charge	Q_G	$V_{CC} = 3600V, I_C = 200\text{A}, V_{GE} = 15V$	–	3.3	–	μC
Emitter-Collector Voltage**	V_{EC}	$I_E = 200\text{A}, V_{GE} = 0V, T_j = 25^\circ\text{C}$	–	4.0	–	Volts
		$I_E = 200\text{A}, V_{GE} = 0V, T_j = 125^\circ\text{C}$	–	3.6	–	Volts
Turn-On Delay Time	$t_{d(on)}$	$V_{CC} = 3600V, I_C = 200\text{A},$	–	1.2	–	μs
Turn-On Rise Time	t_r	$V_{GE1} = -V_{GE2} = 15V, R_{G(on)} = 30\Omega,$	–	0.35	–	μs
Turn-On Switching Energy	E_{on}	$T_j = 125^\circ\text{C}, t_{off} = 60\mu\text{s}, \text{Inductive Load}$	–	1.5	–	J/P
Turn-Off Delay Time	$t_{d(off)}$	$V_{CC} = 3600V, I_C = 200\text{A},$	–	6.6	–	μs
Turn-Off Fall Time 1	t_{f1}	$V_{GE1} = -V_{GE2} = 15V,$	–	0.5	–	μs
Turn-Off Fall Time 2	t_{f2}	$R_{G(off)} = 72\Omega,$	–	3.3	–	μs
Turn-Off Switching Energy	E_{off}	$T_j = 125^\circ\text{C}, t_{off} = 60\mu\text{s}, \text{Inductive Load}$	–	1.2	–	J/P
Reverse Recovery Time 1**	t_{rr1}	$V_{CC} = 3600V, I_E = 200\text{A},$	–	1.0	–	μs
Reverse Recovery Time 2**	t_{rr2}	$di_e/dt = -670\text{A}/\mu\text{s},$	–	2.4	–	μs
Reverse Recovery Charge**	Q_{rr}	$T_j = 125^\circ\text{C},$	–	370	–	μC
Reverse Recovery Energy**	E_{rec}	$t_{off} = 60\mu\text{s}, \text{Inductive Load}$	–	0.7	–	J/P

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

**Represents characteristics of the anti-parallel, emitter-to-collector free-wheel diode (FWDi).

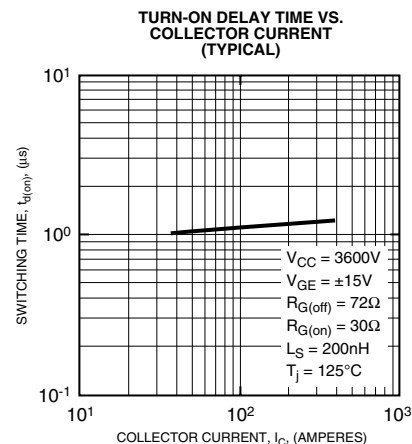
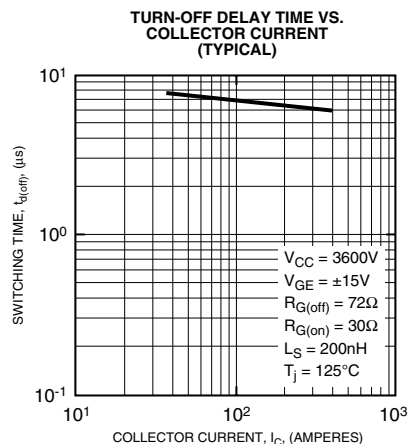
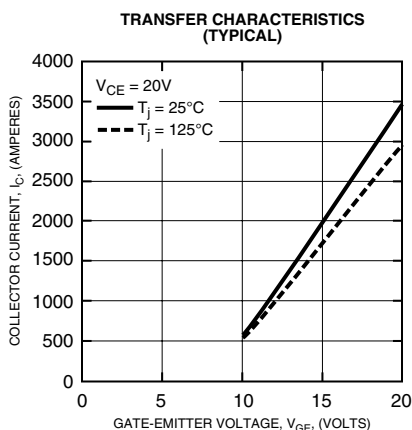
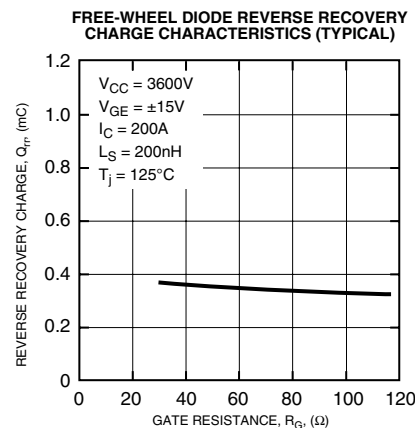
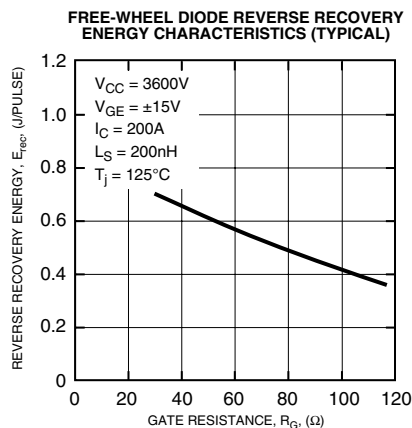
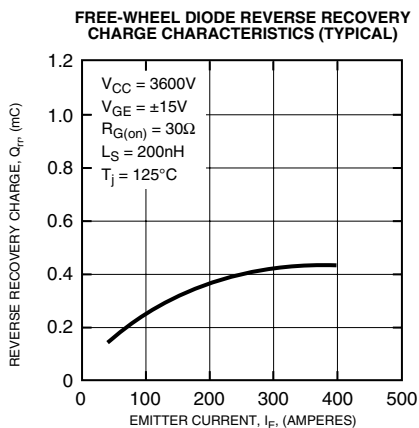
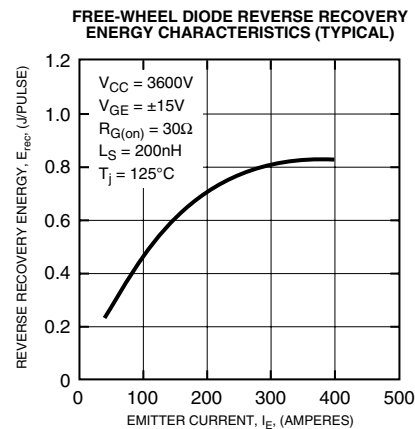
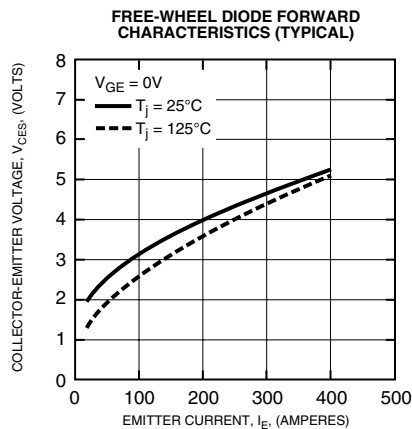
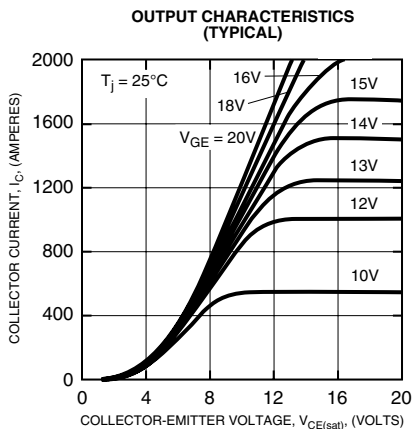
Thermal Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case	$R_{th(j-c)} Q$	Per IGBT	–	–	42.0	K/kW
Thermal Resistance, Junction to Case	$R_{th(j-c)} D$	Per FWDi	–	–	66.0	K/kW
Contact Thermal Resistance, Case to Fin	$R_{th(c-f)}$	Per Module, Thermal Grease Applied	–	18.0	–	K/kW

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Comparative Tracking Index	CTI	–	600	–	–	–
Clearance	–	–	26.0	–	–	mm
Creepage Distance	–	–	56.0	–	–	mm
Internal Inductance	$L_{C-E(int)}$	–	–	54.0	–	μH
Internal Lead Resistance	$R_{C-E(int)}$	–	–	–	–	m Ω

CM200HG-130H
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