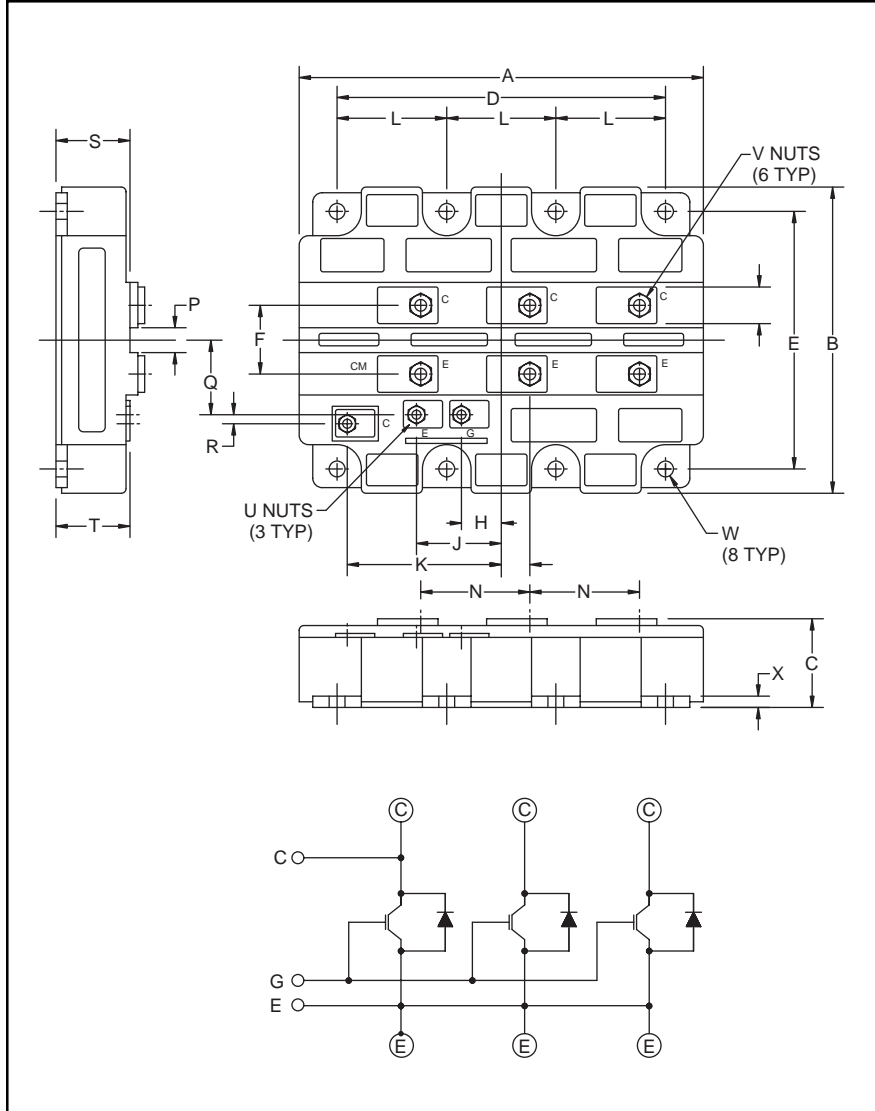


Single IGBTMOD™ HVIGBT 900 Amperes/4500 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches | Millimeters |
|------------|-----------|-------------|
| A | 7.48 | 190.0 |
| B | 5.51 | 140.0 |
| C | 1.50 | 38.0 |
| D | 6.73 | 171.0 |
| E | 4.88±0.01 | 124.0±0.25 |
| F | 1.57 | 40.0 |
| G | 0.79 | 20.0 |
| H | 0.80 | 20.25 |
| J | 1.62 | 41.25 |
| K | 3.13 | 79.4 |
| L | 2.24±0.01 | 57.0±0.25 |

| Dimensions | Inches | Millimeters |
|------------|-----------|-------------|
| M | 0.51 | 13.0 |
| N | 2.42 | 61.5 |
| P | 0.59 | 15.0 |
| Q | 1.57 | 40.0 |
| R | 0.20 | 5.2 |
| S | 1.16 | 29.5 |
| T | 1.10 | 28.0 |
| U | M4 Metric | M4 |
| V | M8 Metric | M8 |
| W | 0.28 Dia. | Dia. 7.0 |
| X | 0.20 | 5.0 |



Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of one IGBT Transistor with 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. CM900HB-90H is a 4500V (V_{CES}), 900 Ampere Single IGBTMOD™ Power Module.

| Type | Current Rating Amperes | V_{CES} Volts (x 50) |
|------|---------------------------|---------------------------|
| CM | 900 | 90 |



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

CM900HB-90H
Single IGBTMOD™ HVIGBT
 900 Amperes/4500 Volts

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

| Ratings | Symbol | CM900HB-90H | Units |
|--|-----------|-------------|------------------|
| Junction Temperature | T_j | -40 to 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | -40 to 125 | $^\circ\text{C}$ |
| Collector-Emitter Voltage ($V_{GE} = 0V$) | V_{CES} | 4500 | Volts |
| Gate-Emitter Voltage ($V_{CE} = 0V$) | V_{GES} | ± 20 | Volts |
| Collector Current ($T_c = 25^\circ\text{C}$) | I_C | 900 | Amperes |
| Peak Collector Current (Pulse) | I_{CM} | 1800* | Amperes |
| Diode Forward Current** ($T_c = 25^\circ\text{C}$) | I_E | 900 | Amperes |
| Diode Forward Surge Current** (Pulse) | I_{EM} | 1800* | Amperes |
| Maximum Collector Dissipation ($T_c = 25^\circ\text{C}$, IGBT Part, $T_j \leq 125^\circ\text{C}$) | P_C | 10000 | Watts |
| Max. Mounting Torque M8 Terminal Screws | – | 115 | in-lb |
| Max. Mounting Torque M6 Mounting Screws | – | 53 | in-lb |
| Max. Mounting Torque M4 Auxiliary Terminal Screws | – | 17 | in-lb |
| Module Weight (Typical) | – | 2.2 | kg |
| V Isolation (Charged Part to Baseplate, AC 60Hz 1 min.) | V_{iso} | 6000 | Volts |

* Pulse width and repetition rate should be such that 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, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------------------------|---------------|--|------|------|------|---------------|
| Collector-Cutoff Current | I_{CES} | $V_{CE} = V_{CES}, V_{GE} = 0V$ | – | – | 18.0 | mA |
| Gate Leakage Current | I_{GES} | $V_{GE} = V_{GES}, V_{CE} = 0V$ | – | – | 0.5 | μA |
| Gate-Emitter Threshold Voltage | $V_{GE(th)}$ | $I_C = 90\text{mA}, V_{CE} = 10V$ | 4.5 | 6.0 | 7.5 | Volts |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 900\text{A}, V_{GE} = 15V, T_j = 25^\circ\text{C}$ | – | 3.0 | 3.9* | Volts |
| | | $I_C = 900\text{A}, V_{GE} = 15V, T_j = 125^\circ\text{C}$ | – | 3.3 | – | Volts |
| Total Gate Charge | Q_G | $V_{CC} = 2250V, I_C = 900\text{A}, V_{GE} = 15V$ | – | 7.5 | – | μC |
| Emitter-Collector Voltage** | V_{EC} | $I_E = 900\text{A}, V_{GE} = 0V$ | – | 4.0 | 5.2 | Volts |

* 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).



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CM900HB-90H
Single IGBTMOD™ HVIGBT
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Dynamic Electrical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|---------------------------------|---------------------|---|--------------|------|------|---------|
| Input Capacitance | C_{ies} | | – | 162 | – | nF |
| Output Capacitance | C_{oes} | $V_{GE} = 0V, V_{CE} = 10V$ | – | 12.0 | – | nF |
| Reverse Transfer Capacitance | C_{res} | | – | 3.6 | – | nF |
| Resistive | Turn-on Delay Time | $V_{CC} = 2250V, I_C = 900A,$ $V_{GE1} = V_{GE2} = 15V,$ $R_G = 10\Omega$ | – | – | 2.4 | μs |
| Load | Rise Time | | $t_{d(on)}$ | | | |
| Switching | Turn-off Delay Time | Resistive Load Switching Operation | – | – | 6.0 | μs |
| Times | Fall Time | | $t_{d(off)}$ | | | |
| Diode Reverse Recovery Time** | t_{rr} | $I_E = 900A, di_E/dt = -1800A/\mu s$ | – | – | 1.8 | μs |
| Diode Reverse Recovery Charge** | Q_{rr} | $I_E = 900A, di_E/dt = -1800A/\mu s$ | – | 360* | – | μC |

* 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).

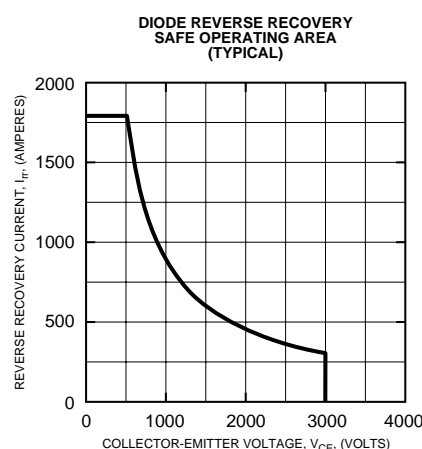
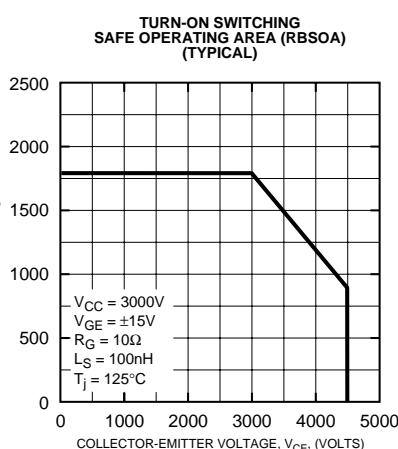
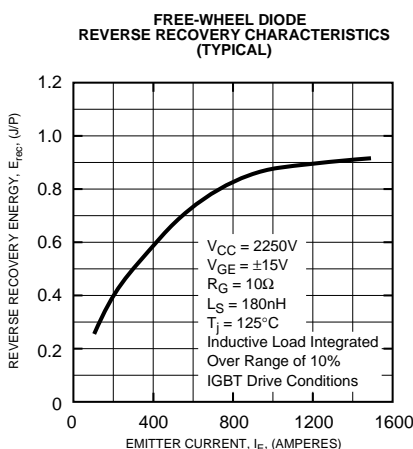
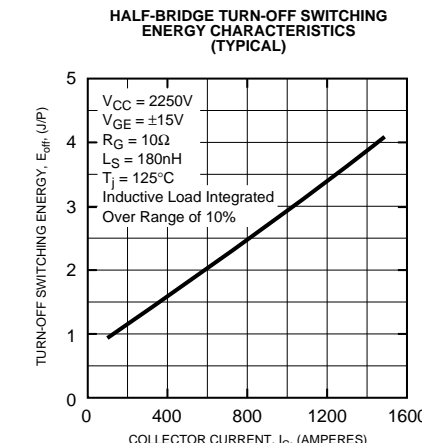
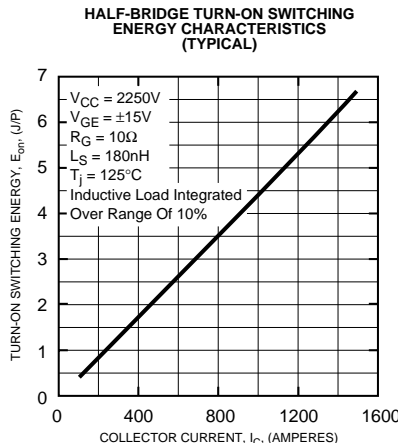
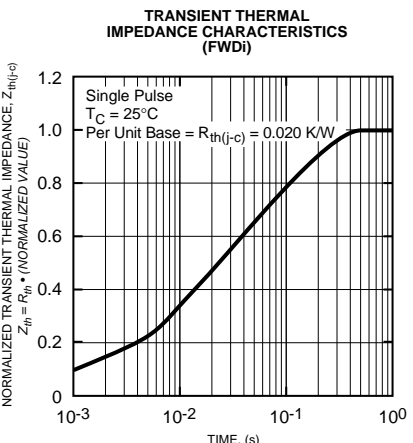
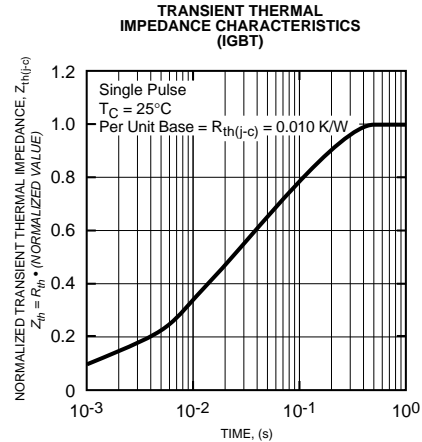
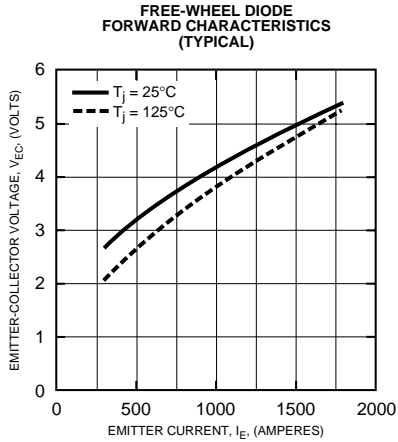
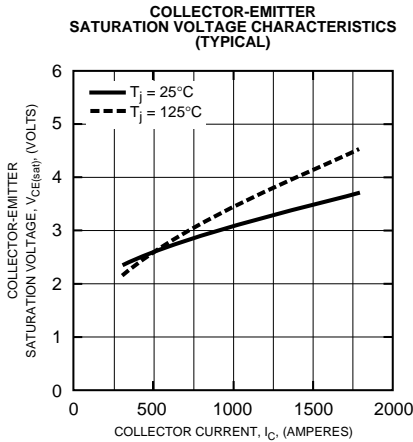
Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|---|-----------------|------------------------------------|------|-------|-------|-------|
| Thermal Resistance, Junction to Case | $R_{th(j-c)}$ Q | Per IGBT | – | – | 0.010 | K/W |
| Thermal Resistance, Junction to Case | $R_{th(j-c)}$ D | Per FWDi | – | – | 0.020 | K/W |
| Contact Thermal Resistance, Case to Fin | $R_{th(c-f)}$ | Per Module, Thermal Grease Applied | – | 0.007 | – | K/W |



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