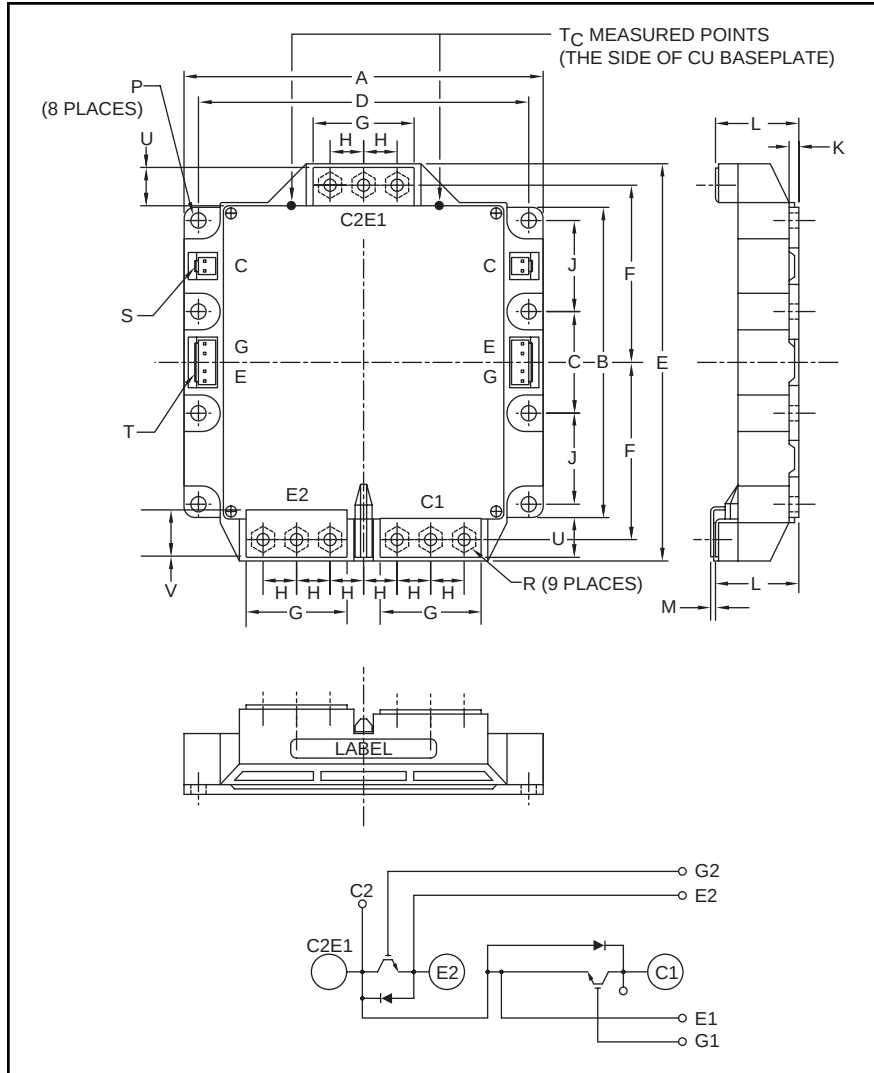


### Mega Power Dual™ IGBTMOD 900 Amperes/1200 Volts



Outline Drawing and Circuit Diagram

| Dimensions | Inches    | Millimeters |
|------------|-----------|-------------|
| A          | 5.91      | 150.0       |
| B          | 5.10      | 129.5       |
| C          | 1.67±0.01 | 42.5±0.25   |
| D          | 5.41±0.01 | 137.5±0.25  |
| E          | 6.54      | 166.0       |
| F          | 2.91±0.01 | 74.0±0.25   |
| G          | 1.65      | 42.0        |
| H          | 0.55      | 14.0        |

#### Housing Type (J.S.T MFG. CO. ①D)

S = VHR-2N

T = VHR-5N

| Dimensions | Inches           | Millimeters    |
|------------|------------------|----------------|
| J          | 1.50±0.01        | 38.0±0.25      |
| K          | 0.16             | 4.0            |
| L          | 1.36 +0.04/-0.02 | 34.6 +1.0/-0.5 |
| M          | 0.075±0.08       | 1.9±0.2        |
| P          | 0.26             | 6.5            |
| R          | M6 Metric        | M6             |
| U          | 0.62             | 15.7           |
| V          | 0.71             | 18.0           |



#### Description:

Powerex IGBTMOD™ Modules are designed for use in switching applications. Each module consists of two IGBT Transistors in a half-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 Free-Wheel Diode
- ☐ Isolated Baseplate for Easy Heat Sinking

#### Applications:

- ☐ High Power UPS
- ☐ Large Motor Drives
- ☐ Utility Interface Inverters

#### Ordering Information:

Example: Select the complete module number you desire from the table - i.e. CM900DU-24NF is a 1200V ( $V_{CES}$ ), 900 Ampere Dual IGBTMOD Power Module.

| Type | Current Rating<br>Amperes | $V_{CES}$<br>Volts (x 50) |
|------|---------------------------|---------------------------|
| CM   | 900                       | 24                        |

## CM900DU-24NF

### Mega Power Dual™ IGBTMOD

900 Amperes/1200 Volts

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

| Ratings                                                                                  | Symbol    | CM900DU-24NF | 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 (C-E SHORT)                                                         | $V_{GES}$ | $\pm 20$     | Volts            |
| Collector Current ( $T_C = 25^\circ\text{C}$ )                                           | $I_C$     | 900          | Amperes          |
| Peak Collector Current ( $T_j \leq 150^\circ\text{C}$ )                                  | $I_{CM}$  | 1800*        | Amperes          |
| Emitter Current ( $T_C = 25^\circ\text{C}$ )**                                           | $I_E$     | 900          | Amperes          |
| Peak Emitter Current**                                                                   | $I_{EM}$  | 1800*        | Amperes          |
| Maximum Collector Dissipation ( $T_j < 150^\circ\text{C}$ ) ( $T_C = 25^\circ\text{C}$ ) | $P_C$     | 5950         | Watts            |
| Mounting Torque, M6 Mounting Screws                                                      | —         | 40           | in-lb            |
| Mounting Torque, M6 Main Terminal Screw                                                  | —         | 40           | in-lb            |
| Weight (Typical)                                                                         | —         | 1400         | Grams            |
| Isolation Voltage (Main Terminal to Baseplate, AC 1 min.)                                | $V_{iso}$ | 2500         | Volts            |

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

| Characteristics                      | Symbol        | Test Conditions                                     | Min. | Typ.  | Max. | Units            |
|--------------------------------------|---------------|-----------------------------------------------------|------|-------|------|------------------|
| Collector-Cutoff Current             | $I_{CES}$     | $V_{CE} = V_{CES}, V_{GE} = 0V$                     | —    | —     | 1    | mA               |
| Gate Leakage Current                 | $I_{GES}$     | $V_{GE} = V_{GES}, V_{CE} = 0V$                     | —    | —     | 0.5  | $\mu\text{A}$    |
| Gate-Emitter Threshold Voltage       | $V_{GE(th)}$  | $I_C = 90\text{mA}, V_{CE} = 10V$                   | 6    | 7     | 8    | Volts            |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 900A, V_{GE} = 15V, T_j = 25^\circ\text{C}$  | —    | 1.9   | 2.5  | Volts            |
| (Without Lead Resistance)            | (Chip)        | $I_C = 900A, V_{GE} = 15V, T_j = 125^\circ\text{C}$ | —    | 2.1   | —    | Volts            |
| Module Lead Resistance               | $R_{(lead)}$  | $I_C = 900A$ , Terminal-chip                        | —    | 0.143 | —    | $\text{m}\Omega$ |
| Total Gate Charge                    | $Q_G$         | $V_{CC} = 600V, I_C = 900A, V_{GE} = 15V$           | —    | 4800  | —    | nC               |
| Emitter-Collector Voltage**          | $V_{EC}$      | $I_E = 900A, V_{GE} = 0V$                           | —    | —     | 3.4  | Volts            |

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

| Characteristics                 |                     | Symbol              | Test Conditions                               | Min. | Typ. | Max. | Units |
|---------------------------------|---------------------|---------------------|-----------------------------------------------|------|------|------|-------|
| Input Capacitance               |                     | C <sub>ies</sub>    | V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0V   | —    | —    | 140  | nF    |
| Output Capacitance              |                     | C <sub>oes</sub>    |                                               | —    | —    | 16   | nF    |
| Reverse Transfer Capacitance    |                     | C <sub>res</sub>    |                                               | —    | —    | 3    | nF    |
| Inductive                       | Turn-on Delay Time  | t <sub>d(on)</sub>  | V <sub>CC</sub> = 600V,                       | —    | —    | 300  | ns    |
| Load                            | Rise Time           | t <sub>r</sub>      | I <sub>C</sub> = 900A, I <sub>E</sub> = 900A, | —    | —    | 200  | ns    |
| Switch                          | Turn-off Delay Time | t <sub>d(off)</sub> | V <sub>GE1</sub> = V <sub>GE2</sub> = 15V,    | —    | —    | 800  | ns    |
| Times                           | Fall Time           | t <sub>f</sub>      | R <sub>G</sub> = 1.0Ω,                        | —    | —    | 300  | ns    |
| Diode Reverse Recovery Time**   |                     | t <sub>rr</sub>     | Inductive Load                                | —    | —    | 500  | ns    |
| Diode Reverse Recovery Charge** |                     | Q <sub>rr</sub>     | Switching Operation                           | —    | 50   | —    | μC    |

\* Pulse width and repetition rate should be such that the 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).

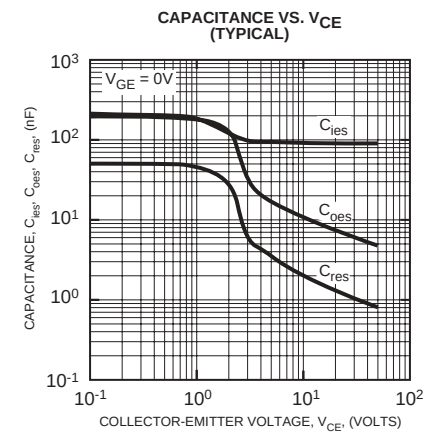
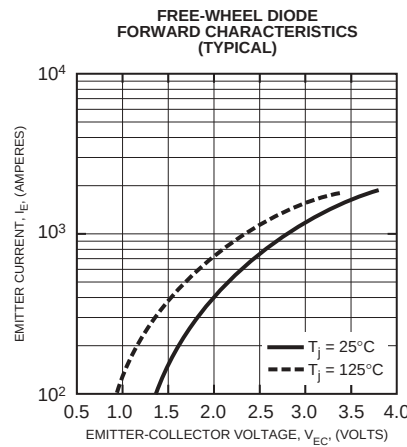
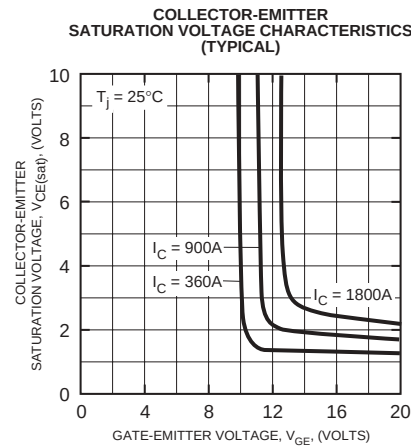
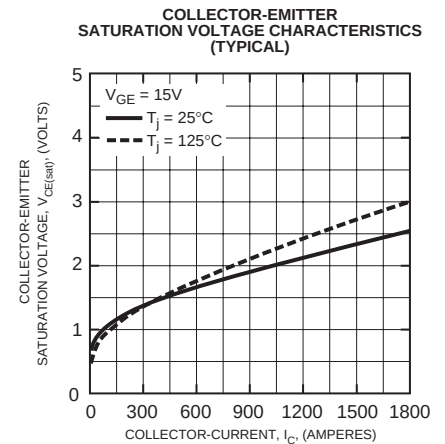
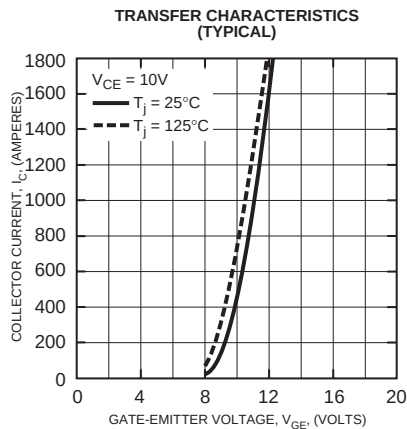
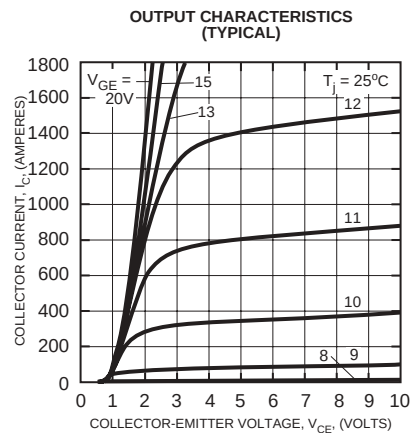
## CM900DU-24NF

### Mega Power Dual™ IGBTMOD

900 Amperes/1200 Volts

## 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 | $R_{th(j-c)}Q$ | Per IGBT 1/2 Module,<br>$T_C$ Reference Point Under Chip                 | —    | —     | 0.021 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case | $R_{th(j-c)}D$ | Per FWDi 1/2 Module, $T_C$ Reference<br>$T_C$ Reference Point Under Chip | —    | —     | 0.034 | $^\circ\text{C/W}$ |
| Contact Thermal Resistance           | $R_{th(c-f)}$  | Per 1/2 Module, Thermal Grease Applied                                   | —    | 0.016 | —     | $^\circ\text{C/W}$ |



## CM900DU-24NF

### Mega Power Dual™ IGBTMOD

900 Amperes/1200 Volts

