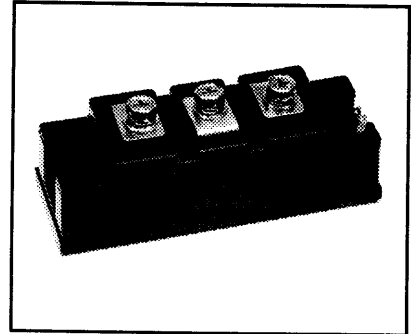
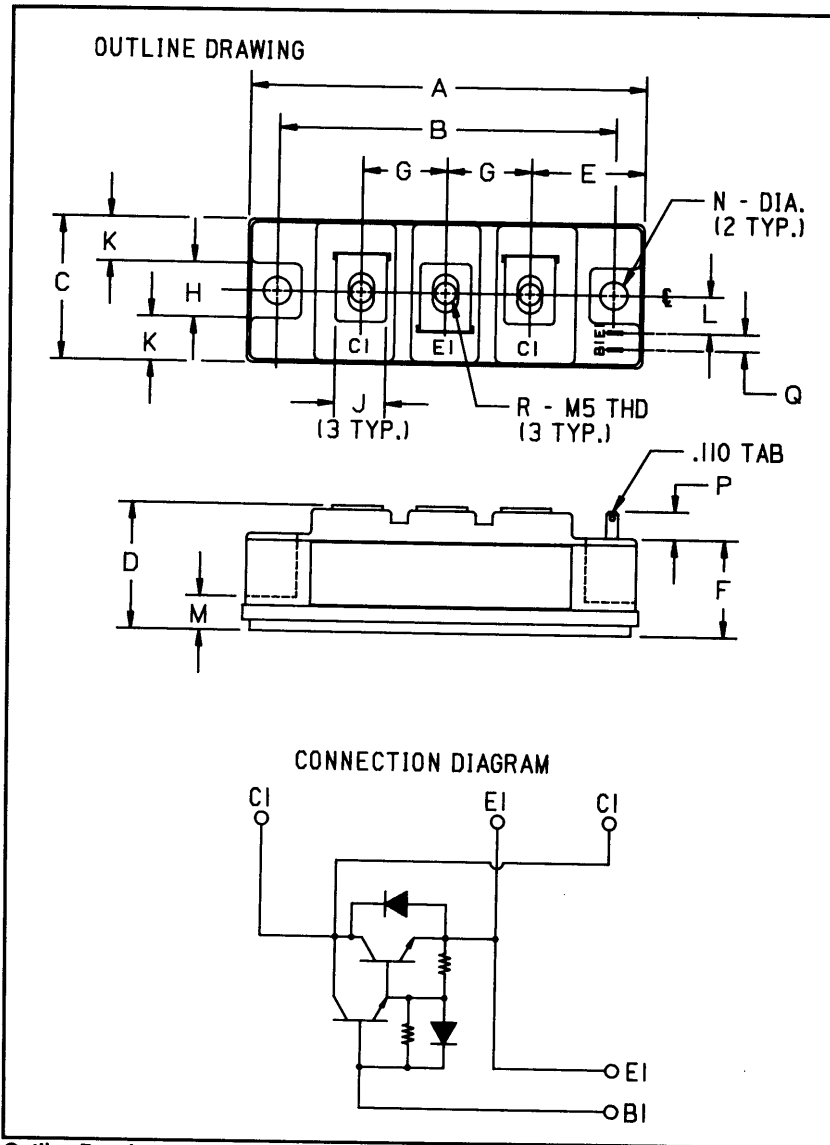


### Single Darlington Transistor Module 150 Amperes/600 Volts



#### Description:

The Powerex Single Darlington Transistor Modules are high power devices designed for use in switching applications. The modules are isolated, consisting of one Darlington Transistor with a reverse parallel connected high-speed diode and base-to-emitter speed-up diode.

#### Features:

- Isolated Mounting
- Planar Chips
- Discrete Fast Recovery Feedback Diode
- High Gain ( $h_{FE}$ )
- TAB Quick-Connect Terminals
- Base-Emitter Speed-up Diode

#### Applications:

- Inverters
- DC Motor Control
- Switching Power Supplies
- AC Motor Control

#### Ordering Information:

Example: Select the complete eight digit module part number you desire from the table - i.e. KS224515 is a 450  $V_{CE(sus)}$  (600  $V_{CEV}$ ), 150 Ampere Single Darlington Module.

Outline Drawing

| Dimensions | Inches        | Millimeters |
|------------|---------------|-------------|
| A          | 3.701 Max.    | 94 Max.     |
| B          | 3.150 ± 0.010 | 80 ± 0.25   |
| C          | 1.339 Max.    | 34 Max.     |
| D          | 1.181 Max.    | 30 Max.     |
| E          | 1.063         | 27          |
| F          | 0.906         | 23          |
| G          | 0.787         | 20          |
| H          | 0.512         | 13          |

| Dimensions | Inches     | Millimeters |
|------------|------------|-------------|
| J          | 0.472      | 12          |
| K          | 0.413      | 10.5        |
| L          | 0.344      | 8.75        |
| M          | 0.315      | 8           |
| N          | 0.256 Dia. | 6.5 Dia.    |
| P          | 0.256 Min. | 6.5 Min.    |
| Q          | 0.157      | 4           |
| R          | M5 Metric  | M5          |

| Type | $V_{CE(sus)}$<br>Volts (X 10) | Current Rating<br>Amperes (X 10) |
|------|-------------------------------|----------------------------------|
| KS22 | 45                            | 15                               |



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

**KS224515**  
**Single Darlington Transistor Module**  
 150 Amperes/600 Volts

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

| Ratings                                                     | Symbol         | KS224515   | Units            |
|-------------------------------------------------------------|----------------|------------|------------------|
| Junction Temperature                                        | $T_j$          | -40 to 150 | $^\circ\text{C}$ |
| Storage Temperature                                         | $T_{stg}$      | -40 to 125 | $^\circ\text{C}$ |
| Collector-Emitter Sustaining Voltage                        | $V_{CE(sus)}$  | 450        | Volts            |
| Collector-Emitter Sustaining Voltage, $V_{BE} = -2\text{V}$ | $V_{CEV(sus)}$ | 600        | Volts            |
| Collector-Base Voltage                                      | $V_{CBO}$      | 600        | Volts            |
| Emitter-Base Voltage                                        | $V_{EBO}$      | 7          | Volts            |
| Collector-Emitter Voltage                                   | $V_{CEV}$      | 600        | Volts            |
| Continuous Collector Current                                | $I_C$          | 150        | Amperes          |
| Diode Forward Current                                       | $I_{FM}$       | 150        | Amperes          |
| Continuous Base Current                                     | $I_B$          | 9          | Amperes          |
| Diode Surge Current                                         | $I_{FSM}$      | 1500       | Amperes          |
| Power Dissipation                                           | $P_t$          | 690        | Watts            |
| Max. Mounting Torque M5 Terminal Screws                     | —              | 17         | in.-lb.          |
| Max. Mounting Torque M6 Mounting Screws                     | —              | 26         | in.-lb.          |
| Module Weight (Typical)                                     | —              | 200        | Grams            |
| V Isolation                                                 | $V_{RMS}$      | 2000       | Volts            |

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

| Characteristics                      | Symbol        | Test Conditions                                                      | Min. | Typ. | Max. | Units         |
|--------------------------------------|---------------|----------------------------------------------------------------------|------|------|------|---------------|
| Collector Cutoff Current             | $I_{CEV}$     | $V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$                          | —    | —    | 2    | mA            |
|                                      |               | $V_{CE} = 600\text{V}, V_{BE} = -2\text{V}, T_C = 125^\circ\text{C}$ | —    | —    | 15   | mA            |
| Emitter Cutoff Current               | $I_{EBO}$     | $V_{EB} = 7\text{V}$                                                 | —    | —    | 350  | mA            |
| DC Current Gain                      | $h_{FE}$      | $I_C = 150\text{A}, V_{CE} = 2\text{V}$                              | 75   | —    | —    | —             |
|                                      |               | $I_C = 150\text{A}, V_{CE} = 5\text{V}$                              | 100  | —    | —    | —             |
| Diode Forward Voltage                | $V_{FM}$      | $I_{FM} = 150\text{A}$                                               | —    | —    | 1.85 | Volts         |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 150\text{A}, I_B = 2\text{A}$                                 | —    | —    | 2.0  | Volts         |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | $I_C = 150\text{A}, I_B = 2\text{A}$                                 | —    | —    | 2.5  | Volts         |
| Resistive Turn-on                    | $t_{on}$      | $V_{CC} = 300\text{V}$                                               | —    | —    | 2.5  | $\mu\text{s}$ |
| Load Storage Time                    | $t_s$         | $I_C = 150\text{A}$                                                  | —    | —    | 12   | $\mu\text{s}$ |
| Switch Times Fall Time               | $t_f$         | $I_{B1} = 2\text{A}, I_{B2} = -2\text{A}$                            | —    | —    | 3.0  | $\mu\text{s}$ |

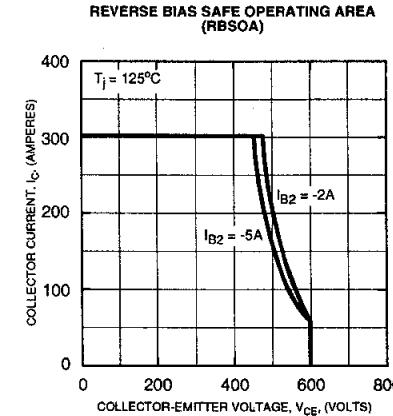
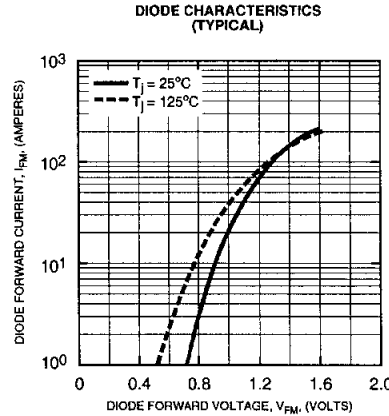
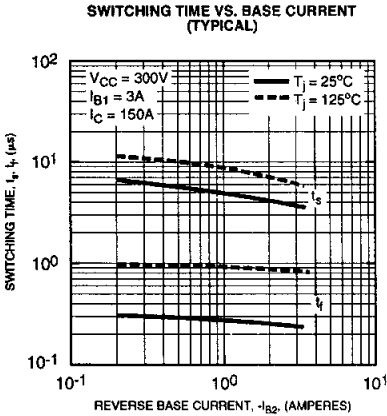
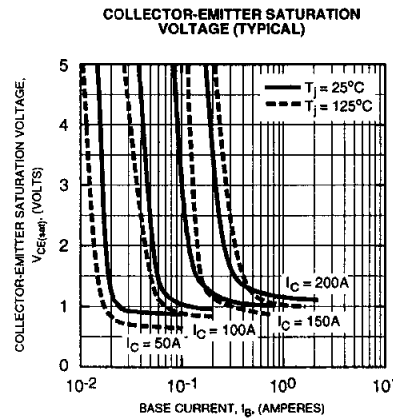
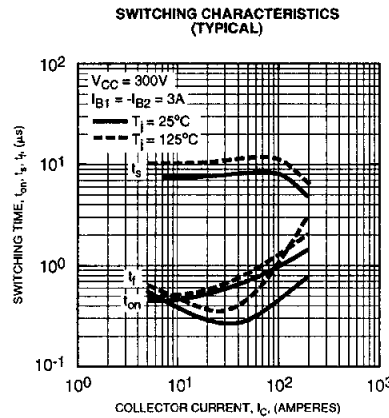
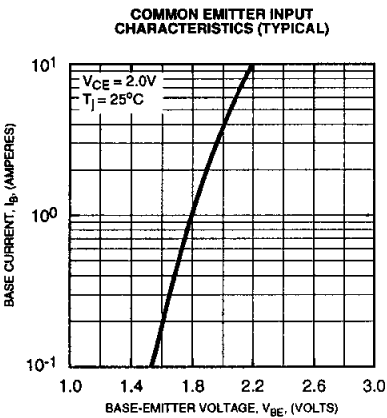
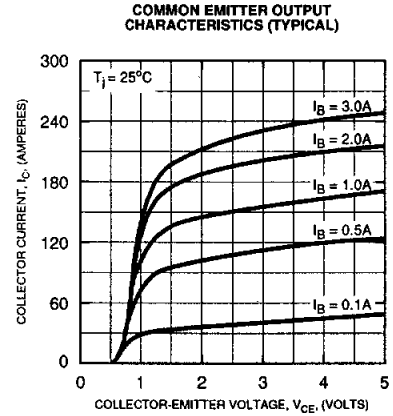
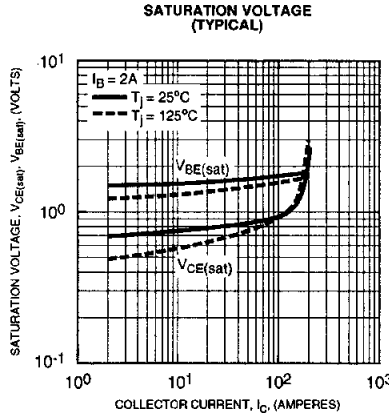
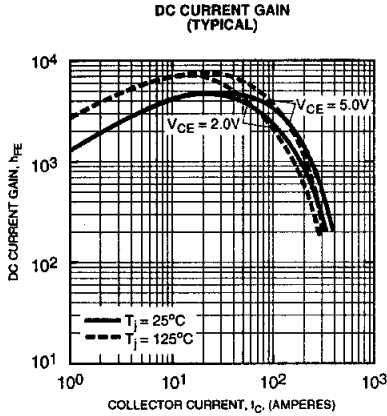
**Thermal and Mechanical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

| Characteristics                      | Symbol            | Test Conditions | Min. | Typ. | Max. | Units              |
|--------------------------------------|-------------------|-----------------|------|------|------|--------------------|
| Thermal Resistance, Case-to-Sink     | $R_{\theta(c-s)}$ | —               | —    | —    | 0.15 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(j-c)}$ | Transistor Part | —    | —    | 0.18 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(j-c)}$ | Diode Part      | —    | —    | 0.6  | $^\circ\text{C/W}$ |



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