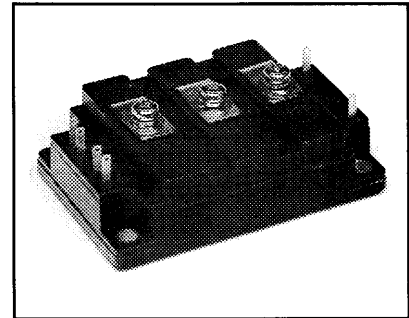
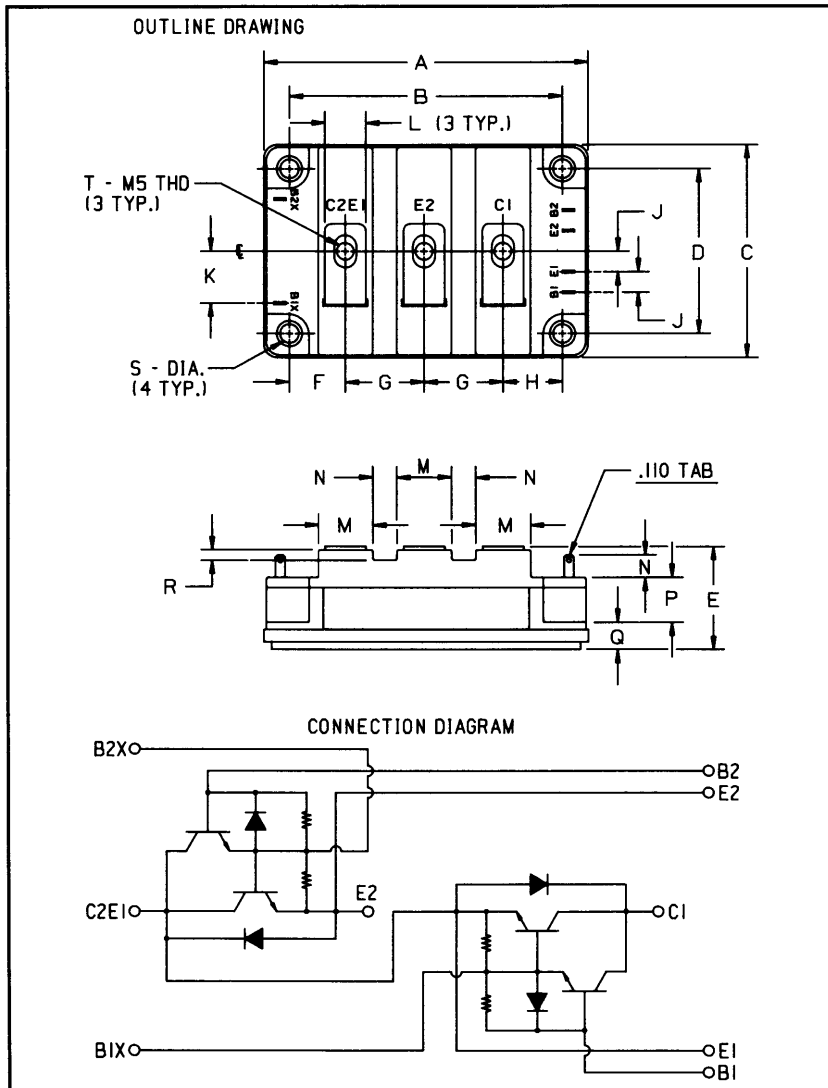


Dual Darlington Transistor Module 100 Amperes/600 Volts



Description:

The Powerex Dual Darlington Transistor Modules are high power devices designed for use in switching applications. The modules are isolated, consisting of two Darlington Transistors with each transistor having a reverse parallel connected high-speed diode.

Features:

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

Applications:

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

Ordering Information:

Example: Select the complete eight digit module part number you desire from the table - i.e. KD324510 is a 450 $V_{CE0(sus)}$ (600 V_{CEV}), 100 Ampere Dual Darlington Module.

Outline Drawing

| Dimensions | Inches | Millimeters |
|------------|--------------|-------------|
| A | 3.740 Max. | 95 Max. |
| B | 3.150 ± 0.01 | 80 ± 0.25 |
| C | 2.441 Max. | 62 Max. |
| D | 1.890 ± 0.01 | 48 ± 0.25 |
| E | 1.181 Max. | 30 Max. |
| F | 0.650 | 16.5 |
| G | 0.906 | 23 |
| H | 0.689 | 17.5 |
| J | 0.236 | 6 |

| Dimensions | Inches | Millimeters |
|------------|------------|-------------|
| K | 0.596 | 15 |
| L | 0.472 | 12 |
| M | 0.630 | 16 |
| N | 0.276 | 7 |
| P | 0.512 | 13 |
| Q | 0.315 | 8 |
| R | 0.118 | 3 |
| S | 0.216 Dia. | 5.5 Dia. |
| T | M5 Metric | M5 |

| Type | $V_{CE0(sus)}$ Volts (X 10) | Current Rating Amperes (X 10) |
|------|--------------------------------|----------------------------------|
| KD32 | 45 | 10 |



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

KD324510
Dual Darlington Transistor Module
 100 Amperes/600 Volts

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

| Ratings | Symbol | KD324510 | 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 | $V_{\text{CEO(sus)}}$ | 450 | Volts |
| Collector-Emitter Sustaining Voltage, $V_{\text{BE}} = -2\text{V}$ | $V_{\text{CEV(sus)}}$ | 600 | Volts |
| Collector-Base Voltage | V_{CBO} | 600 | Volts |
| Emitter-Base Voltage | V_{EBO} | 7 | Volts |
| Collector-Emitter Voltage, $V_{\text{BE}} = -2\text{V}$ | V_{CEV} | 600 | Volts |
| Continuous Collector Current | I_C | 100 | Amperes |
| Diode Forward Current | I_{FM} | 100 | Amperes |
| Continuous Base Current | I_B | 6 | Amperes |
| Diode Surge Current | I_{FSM} | 1000 | Amperes |
| Power Dissipation (Each Transistor) | P_t | 620 | Watts |
| Max. Mounting Torque M5 Terminal Screws | — | 17 | in.-lb. |
| Max. Mounting Torque M5 Mounting Screws | — | 17 | in.-lb. |
| Module Weight (Typical) | — | 420 | Grams |
| V Isolation | V_{RMS} | 2500 | Volts |

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

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units | |
|--------------------------------------|----------------------|--|---|------|------|-------|---------------|
| Collector Cutoff Current | I_{CEV} | $V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}$ | — | — | 2 | mA | |
| | | $V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}, T_C = 125^\circ\text{C}$ | — | — | 15 | mA | |
| Emitter Cutoff Current | I_{EBO} | $V_{\text{EB}} = 7\text{V}$ | — | — | 100 | mA | |
| DC Current Gain | h_{FE} | $I_C = 100\text{A}, V_{\text{CE}} = 2\text{V}$ | 75 | — | — | — | |
| | | $I_C = 100\text{A}, V_{\text{CE}} = 5\text{V}$ | 100 | — | — | — | |
| Diode Forward Voltage | V_{FM} | $I_{\text{FM}} = 100\text{A}$ | — | — | 1.75 | Volts | |
| Collector-Emitter Saturation Voltage | $V_{\text{CE(sat)}}$ | $I_C = 100\text{A}, I_B = 1.3\text{A}$ | — | — | 2.0 | Volts | |
| Base-Emitter Saturation Voltage | $V_{\text{BE(sat)}}$ | $I_C = 100\text{A}, I_B = 1.3\text{A}$ | — | — | 2.5 | Volts | |
| Resistive | Turn-on | t_{on} | $V_{\text{CC}} = 300\text{V}$ | — | — | 2.0 | μs |
| | Storage Time | | | | | | |
| Switch Times | Fall Time | t_f | $I_{\text{B1}} = 2\text{A}, I_{\text{B2}} = -2\text{A}$ | — | — | 3.0 | μs |

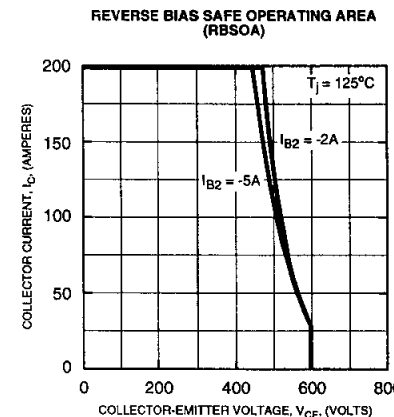
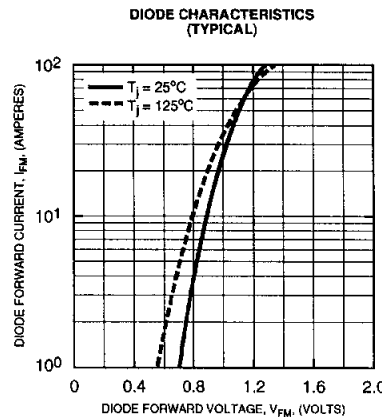
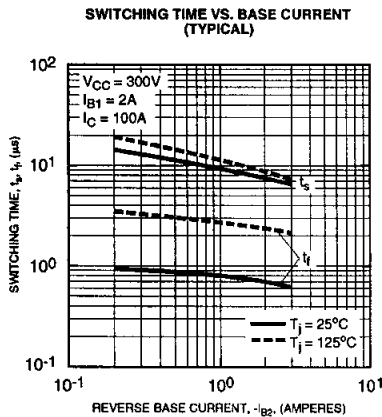
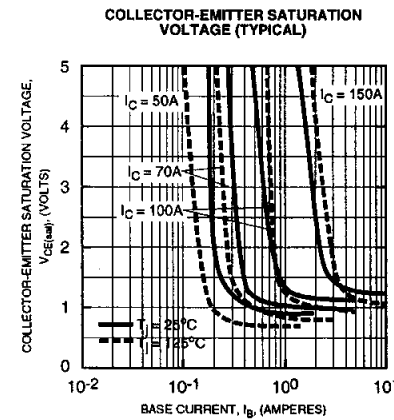
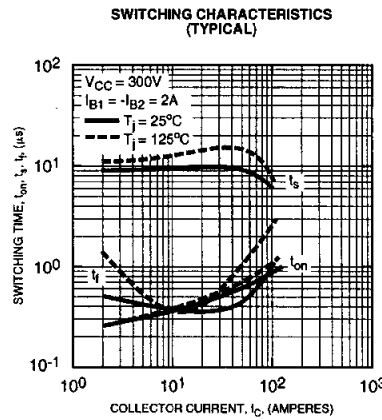
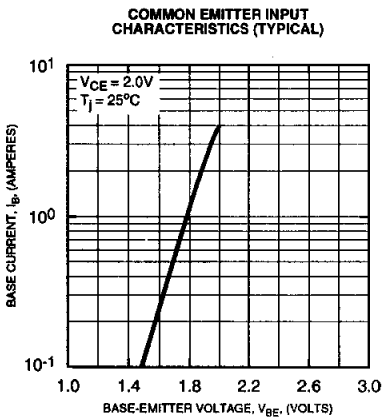
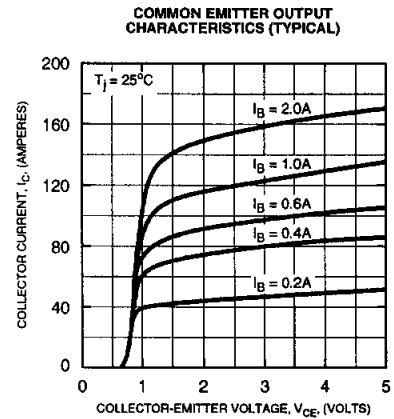
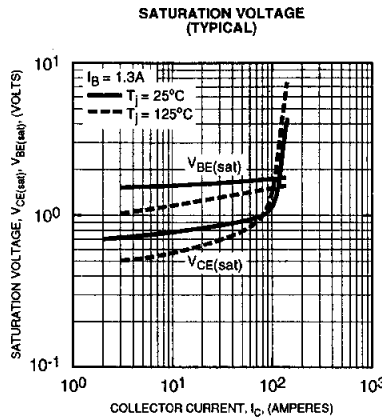
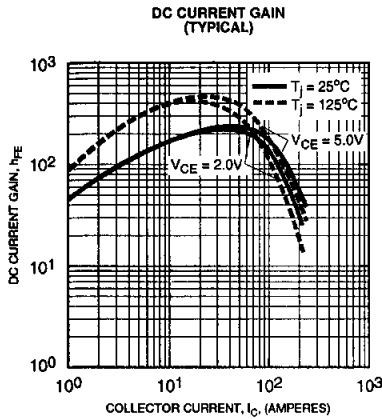
Thermal and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------------------------|--------------------------|-----------------|------|------|------|--------------------|
| Thermal Resistance, Case-to-Sink | $R_{\theta(\text{c-s})}$ | Per 1/2 Module | — | — | 0.1 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(\text{j-c})}$ | Transistor Part | — | — | 0.2 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(\text{j-c})}$ | Diode Part | — | — | 0.65 | $^\circ\text{C/W}$ |



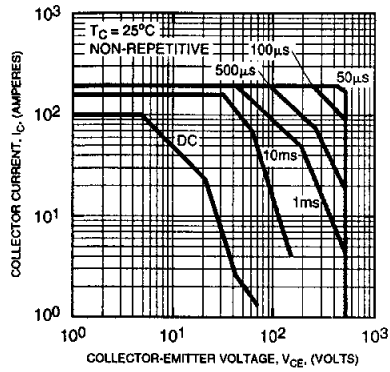
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KD324510
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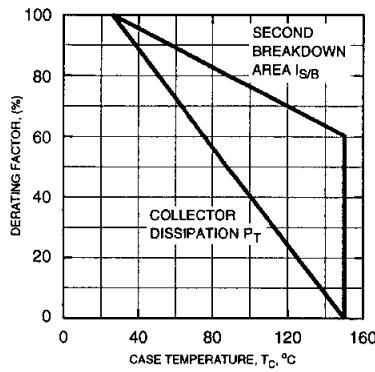


KD324510
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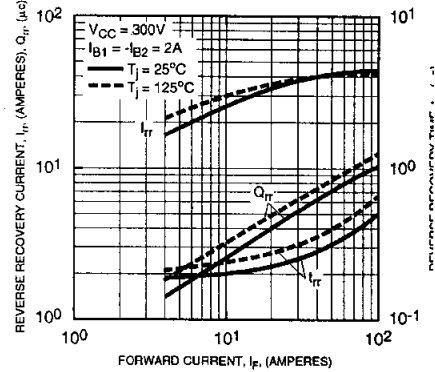
FORWARD BIAS SAFE OPERATING AREA (SOA)



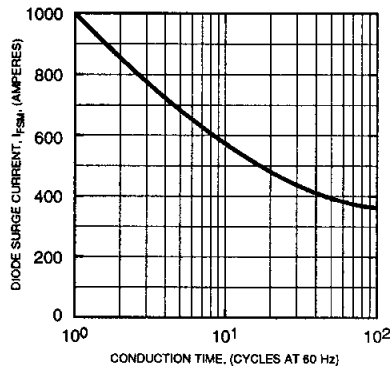
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



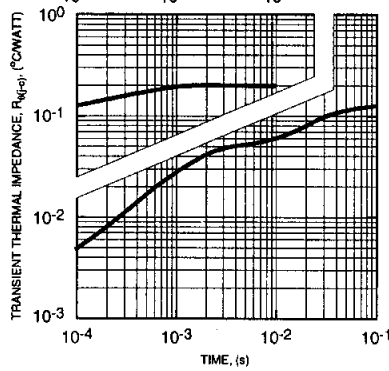
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

