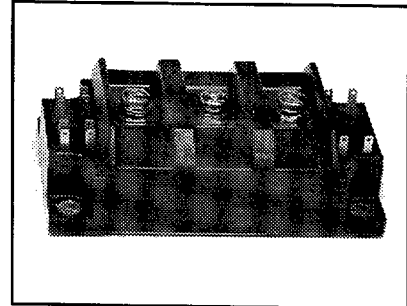
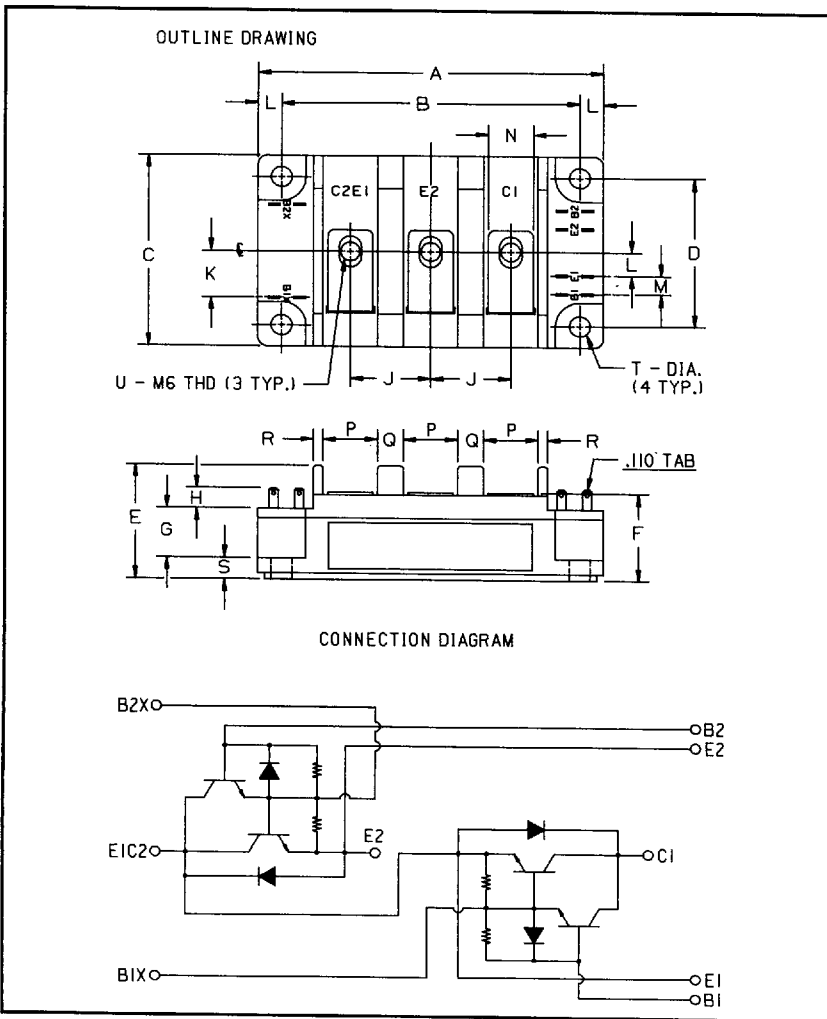


Dual Darlington Transistor Module 200 Amperes/600 Volts



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 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. KD424520 is a 450 $V_{CE0(sus)}$ (600 V_{CEV}), 200 Ampere Dual Darlington Module.

Outline Drawing

| Dimensions | Inches | Millimeters |
|------------|---------------|-------------|
| A | 4.252 Max. | 108 Max. |
| B | 3.661 ± 0.012 | 93 ± 0.3 |
| C | 2.441 Max. | 62 Max. |
| D | 1.890 ± 0.012 | 48 ± 0.3 |
| E | 1.457 | 37 |
| F | 1.181 Max. | 30 Max. |
| G | 0.630 | 16 |
| H | 0.256 Min. | 6.5 Min. |
| J | 0.984 | 25 |
| K | 0.591 | 15 |

| Dimensions | Inches | Millimeters |
|------------|------------|-------------|
| L | 0.295 | 7.5 |
| M | 0.236 | 6 |
| N | 0.551 | 14 |
| P | 0.669 | 17 |
| Q | 0.315 | 8 |
| R | 0.118 | 3 |
| S | 0.276 | 7 |
| T | 0.256 Dia. | 6.5 Dia. |
| U | M6 Metric | M6 |

| Type | $V_{CE0(sus)}$ Volts (X 10) | Current Rating Amperes (X 10) |
|------|--------------------------------|----------------------------------|
| KD42 | 45 | 20 |

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KD424520
Dual Darlington Transistor Module
 200 Amperes/600 Volts

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

| Ratings | Symbol | KD424520 | 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 | $V_{CEO(sus)}$ | 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, $V_{BE} = -2\text{V}$ | V_{CEV} | 600 | Volts |
| Continuous Collector Current | I_C | 200 | Amperes |
| Diode Forward Current | I_{FM} | 200 | Amperes |
| Continuous Base Current | I_B | 12 | Amperes |
| Diode Surge Current | I_{FSM} | 2000 | Amperes |
| Power Dissipation (Each Transistor) | P_t | 1250 | Watts |
| Max. Mounting Torque M6 Terminal Screws | - | 26 | in.-lb. |
| Max. Mounting Torque M6 Mounting Screws | - | 26 | in.-lb. |
| Module Weight (Typical) | - | 470 | Grams |
| V Isolation | V_{RMS} | 2500 | 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} | $V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$ | - | - | 4 | mA | |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 7\text{V}$ | - | - | 800 | mA | |
| DC Current Gain | h_{FE} | $I_C = 200\text{A}, V_{CE} = 2\text{V}$ | 75 | - | - | - | |
| Diode Forward Voltage | V_{FM} | $I_{FM} = 200\text{A}$ | - | - | 1.75 | Volts | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 200\text{A}, I_B = 2.6\text{A}$ | - | - | 2.0 | Volts | |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = 200\text{A}, I_B = 2.6\text{A}$ | - | - | 2.5 | Volts | |
| Resistive | Turn-on | t_{on} | $V_{CC} = 300\text{V}$ | - | - | 2.0 | μs |
| Load | Storage Time | t_s | $I_C = 2050\text{A}$ | - | - | 12 | μs |
| Switch Times | Fall Time | t_f | $I_{B1} = -I_{B2} = 4.0\text{A}$ | - | - | 3.0 | μs |

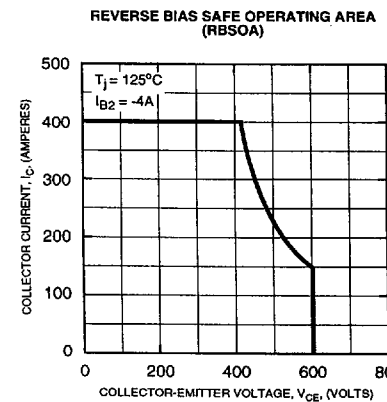
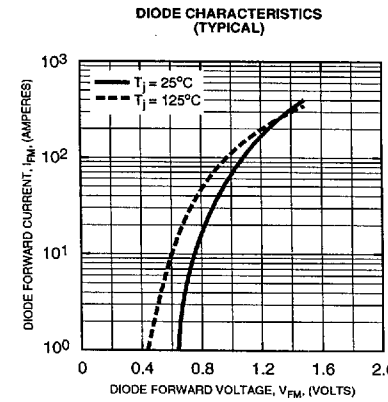
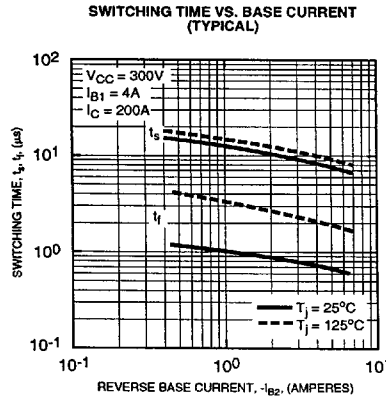
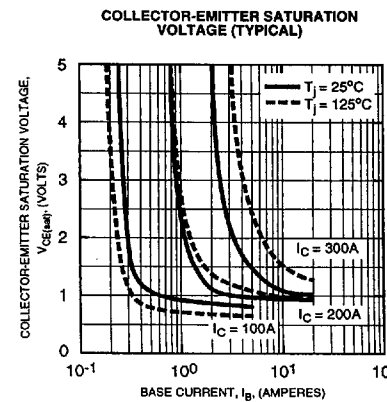
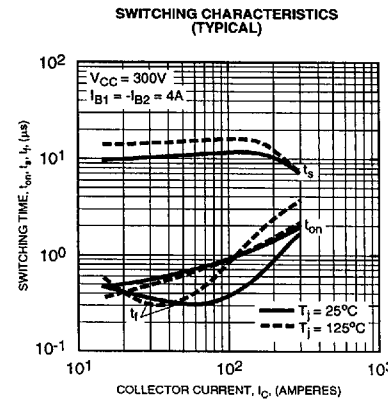
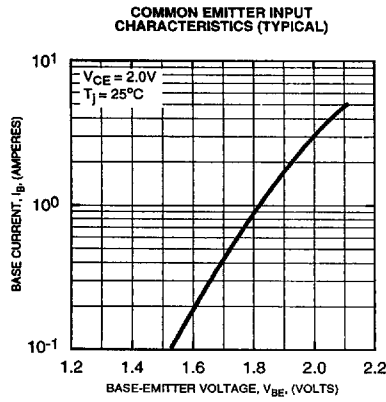
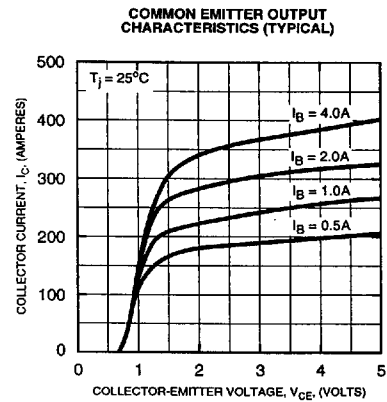
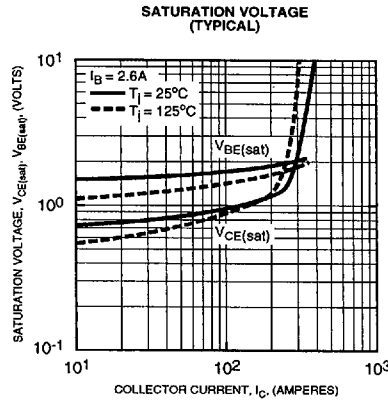
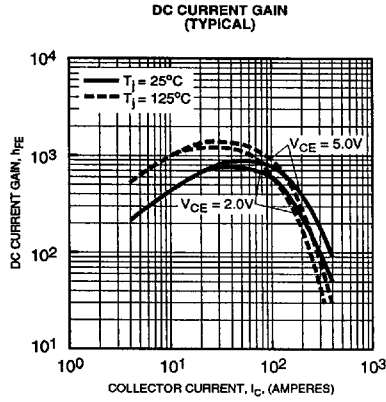
Thermal and Mechanical Characteristics, $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified

| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------------------------|-------------------|-----------------|------|------|------|--------------------|
| Thermal Resistance, Case-to-Sink | $R_{\theta(c-s)}$ | Per Half Module | - | - | 0.4 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(j-c)}$ | Transistor Part | - | - | 0.12 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(j-c)}$ | Diode Part | - | - | 0.33 | $^\circ\text{C/W}$ |



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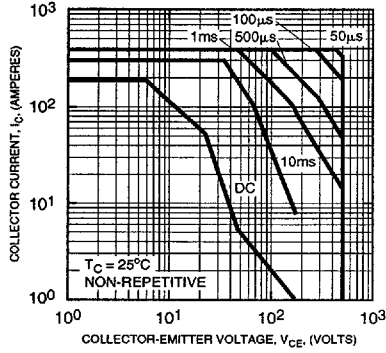
KD424520
Dual Darlington Transistor Module
 200 Amperes/600 Volts



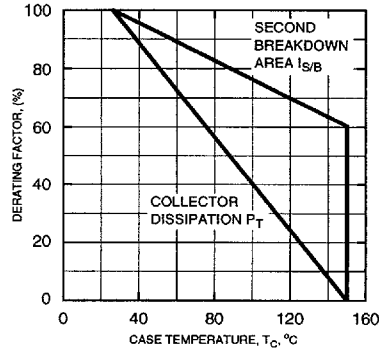
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KD424520
Dual Darlington Transistor Module
 200 Amperes/600 Volts

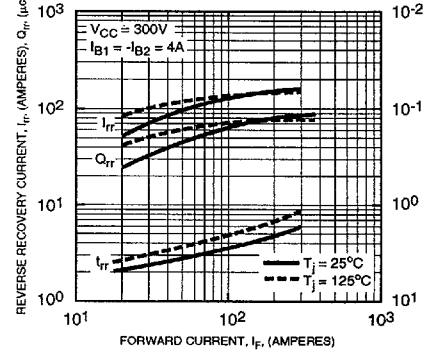
FORWARD BIAS SAFE OPERATING AREA (SOA)



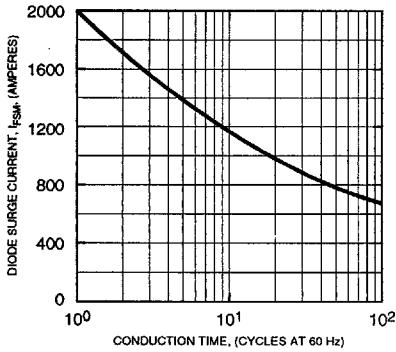
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



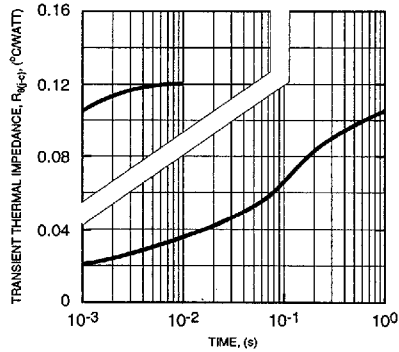
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

