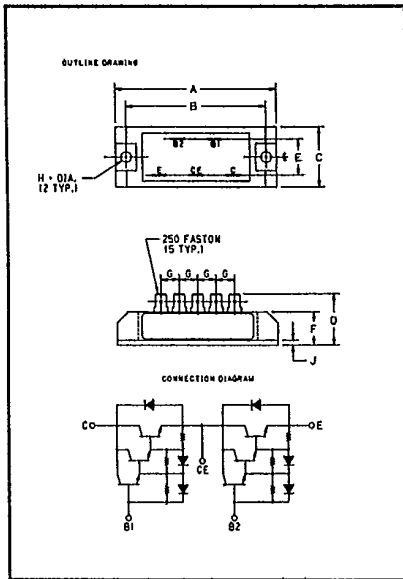
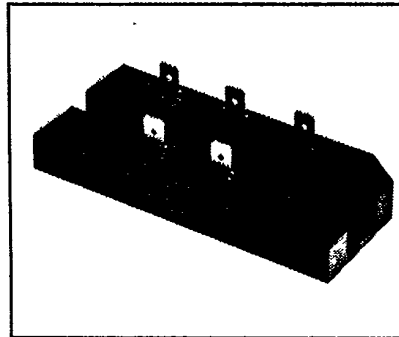


**POWEREX****KD721KA2**

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

**Dual Darlington  
Transistor Module  
25 Amperes/1000 Volts****1000 Volt KD721KA2  
Outline Drawing**

| Dimension | Inches       | Millimeters |
|-----------|--------------|-------------|
| A         | 3.622        | 92          |
| B         | 3.150 ± .012 | 80 ± 0.3    |
| C         | 1.378        | 35          |
| D         | 1.181 Max.   | 30 Max.     |
| E         | .827         | 21          |
| F         | .768         | 19.5        |
| G         | .413         | 10.5        |
| H         | .216 Dia.    | 5.5 Dia.    |
| J         | .177         | 4.5         |

**KD721KA2  
Dual Darlington  
Transistor Module  
25 Amperes/1000 Volts****Description**

Powerex Dual Darlington Transistor Modules are 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 Feed-Back Diode
- High Gain ( $h_{FE}$ )
- Fast On Connections
- Base Emitter Speed Up Diodes

**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. KD721KA2 is a 1000 Volt, 25 Ampere Dual Darlington Module.

| Type | V <sub>CE(SUS)</sub><br>Volts (1000) | Current Rating<br>Amperes (25) |
|------|--------------------------------------|--------------------------------|
| KD72 | 1K                                   | A2                             |



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

**KD721KA2**

Dual Darlington Transistor Module

25 Amperes/1000 Volts

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

|  | Symbol         | KD721KA2   | 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                       | $V_{CE0(SUS)}$ | 800        | Volts            |
| Collector-Emitter Sustaining Voltage $V_{BE} = -2\text{V}$ | $V_{CEV(SUS)}$ | 1000       | Volts            |
| Collector-Base Voltage                                     | $V_{CB0}$      | 1000       | Volts            |
| Emitter-Base Voltage                                       | $V_{EB0}$      | 7          | Volts            |
| Collector-Emitter Voltage $V_{BE} = -2\text{V}$            | $V_{CEV}$      | 1000       | Volts            |
| Continuous Collector Current                               | $I_C$          | 25         | Amperes          |
| Diode Forward Current                                      | $I_{FM}$       | 25         | Amperes          |
| Continuous Base Current                                    | $I_B$          | 1.5        | Amperes          |
| Diode Surge Current  | $I_{FSM}$      | 250        | Amperes          |
| Power Dissipation, Each Transistor                         | $P_T$          | 208        | Watts            |
| Max. Mounting Torque M5 Mounting Screws                    | —              | 17         | in.-lb.          |
| Module Weight  | —              | 155        | Grams            |
| V isolation  | $V_{RMS}$      | 2500       | Volts            |

**Electrical and Mechanical Characteristics  $T_J = 25^\circ\text{C}$  unless otherwise specified**

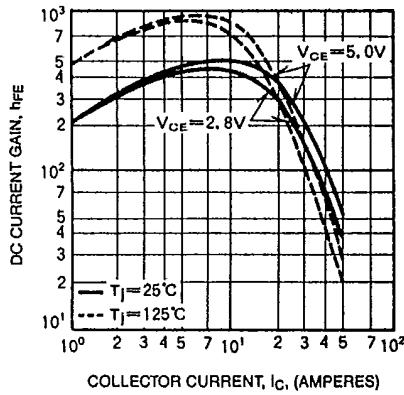
| Characteristics                             | Symbol          | Test Conditions                              | KD721KA2 |      |      | Units              |
|---|-----------------|--|----------|------|------|--------------------|
|   |                 |  | Min.     | Typ. | Max. |                    |
| Collector Cutoff Current                    | $I_{CEV}$       | $V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}$ | —        | —    | 1    | mA                 |
| Emitter Cutoff Current                      | $I_{EBO}$       | $V_{EB} = 7\text{V}$                         | —        | —    | 200  | mA                 |
| DC Current Gain                             | $h_{FE}$        | $I_C = 25\text{A}, V_{CE} = 2.8\text{V}$     | 75       | —    | —    | —                  |
| DC Current Gain                             | $h_{FE}$        | $I_C = 25\text{A}, V_{CE} = 5\text{V}$       | 100      | —    | —    | —                  |
| Diode Forward Voltage                       | $V_{FM}$        | $I_{FM} = 25\text{A}$                        | —        | —    | 1.8  | V                  |
| Collector-Emitter Saturation Voltage        | $V_{CE(SAT)}$   | $I_C = 25\text{A}, I_B = 0.5\text{A}$        | —        | —    | 2.5  | V                  |
| Base-Emitter Saturation Voltage             | $V_{BE(SAT)}$   | $I_C = 25\text{A}, I_B = 0.5\text{A}$        | —        | —    | 3.5  | V                  |
| Resistive Turn On                           | $t_{on}$        | $V_{CC} = 600\text{V}$                       | —        | —    | 2.5  | $\mu\text{s}$      |
| Load Storage Time                           | $t_s$           | $I_C = 25\text{A}$                           | —        | —    | 15   | $\mu\text{s}$      |
| Switch Times Fall Time                      | $t_f$           | $I_{B1} = -I_{B2} = 0.5\text{A}$             | —        | —    | 3.0  | $\mu\text{s}$      |
| Thermal Resistance, Case to Sink Lubricated | $R_{\theta CS}$ | Per Half Module                              | —        | —    | 0.15 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case        | $R_{\theta JC}$ | Transistor Part                              | —        | —    | 0.6  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case        | $R_{\theta JC}$ | Diode Part                                   | —        | —    | 1.5  | $^\circ\text{C/W}$ |



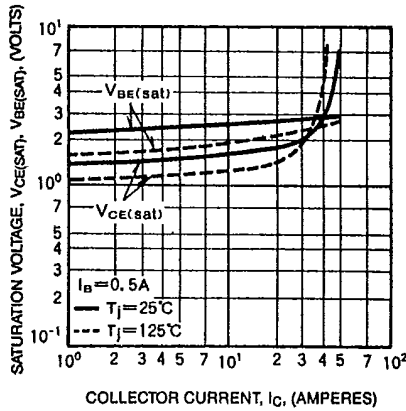
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

**KD721KA2**  
Dual Darlington Transistor Module  
25 Amperes/1000 Volts

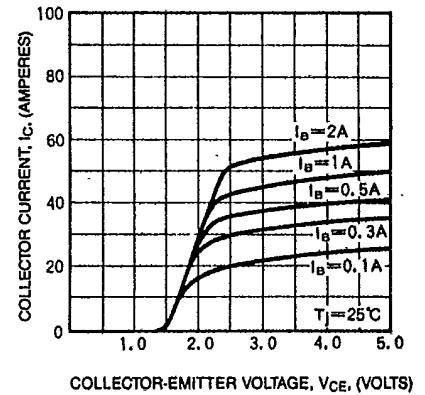
**DC CURRENT GAIN (TYPICAL)**



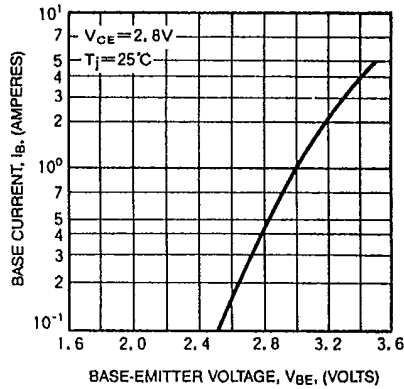
**SATURATION VOLTAGE (TYPICAL)**



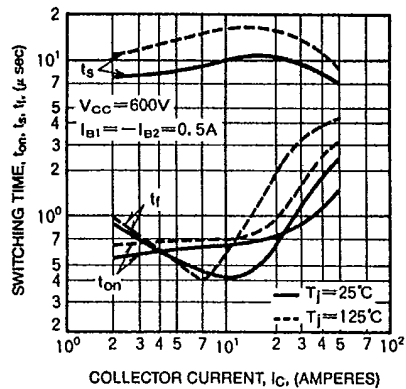
**COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)**



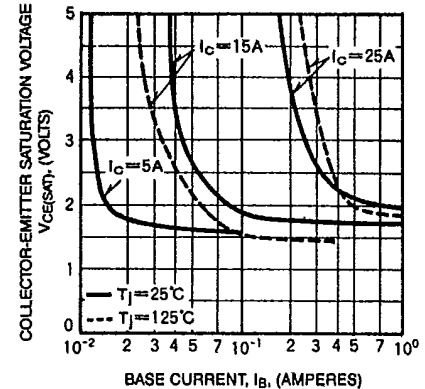
**COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)**



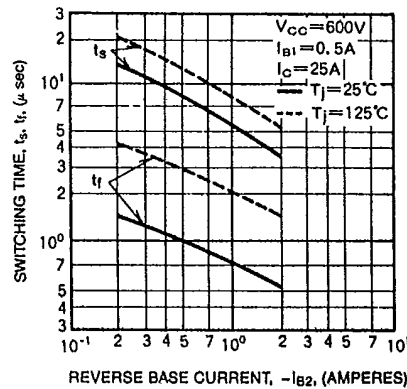
**SWITCHING CHARACTERISTICS (TYPICAL)**



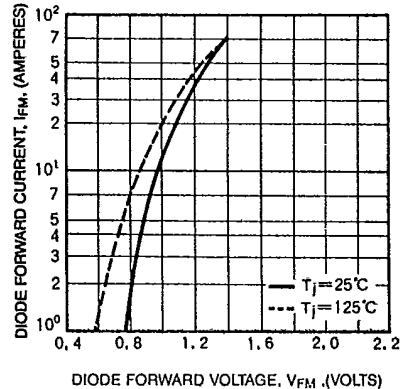
**COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)**



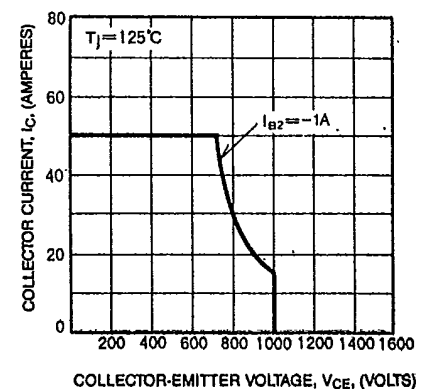
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



**DIODE CHARACTERISTICS (TYPICAL)**



**REVERSE BIAS SAFE OPERATING AREA (R.B.S.O.A.)**

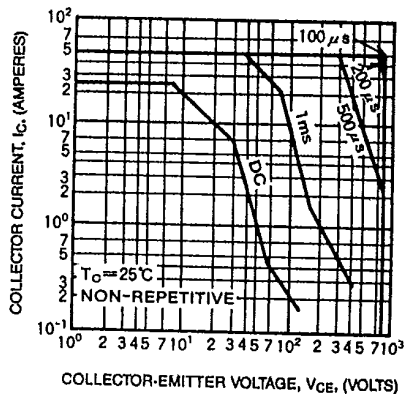




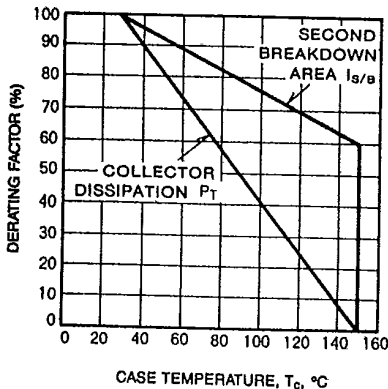
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

**KD721KA2**  
Dual Darlington Transistor Module  
25 Amperes/1000 Volts

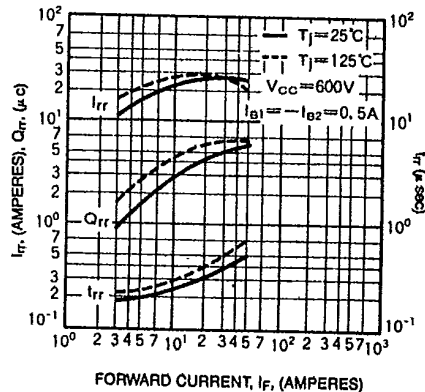
**FORWARD BIAS SAFE OPERATING AREA (S.O.A.)**



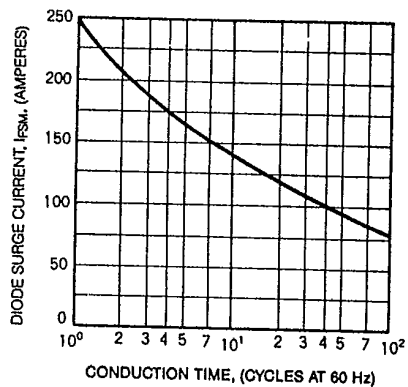
**DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)**



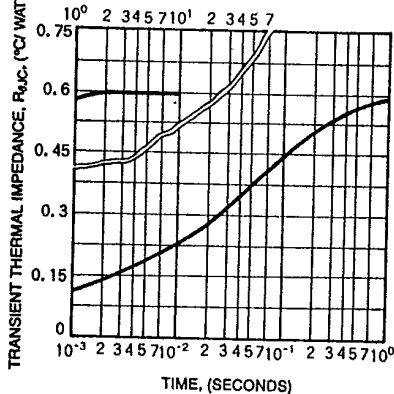
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

