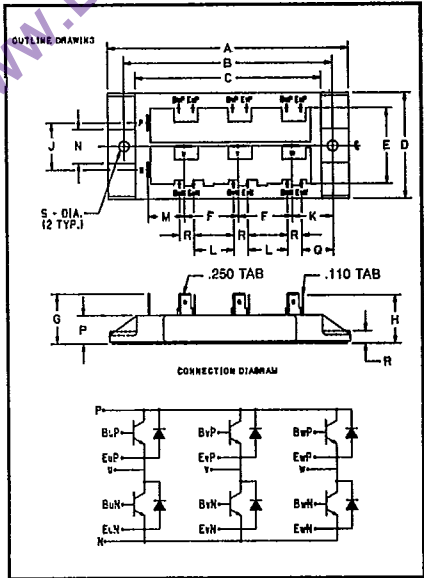




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KE721K03 T-33-35

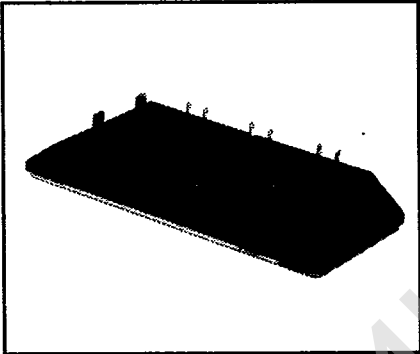
Six-Darlington  
Transistor Module  
30 Amperes/1000 Volts



1000 Volt KE721K03  
Outline Drawing

| Dimension | Inches       | Millimeters |
|-----------|--------------|-------------|
| A         | 5.000        | 127         |
| B         | 4.331 ± .012 | 110 ± 0.3   |
| C         | 3.858        | 98          |
| D         | 2.205        | 56          |
| E         | 1.575        | 40          |
| F         | 1.122        | 28.5        |
| G         | 1.043        | 26.5        |
| H         | 1.008        | 25.6        |
| J         | .984         | 25          |
| K         | .846         | 21.5        |
| L         | .827         | 21          |
| M         | .748         | 19          |
| N         | .709         | 18          |
| P         | .689         | 17.5        |
| Q         | .650         | 16.5        |
| R         | .295         | 7.5         |
| S         | .216 Dia.    | 5.5 Dia.    |

Note: Each Transistor symbol represents a Triple Darlington Transistor with base emitter resistors on each stage and base emitter speed up diodes on the input stages.



KE721K03  
Six-Darlington  
Transistor Module  
30 Amperes/1000 Volts

Description

Powerex Six-Darlington Transistor Modules are designed for use in switching applications. The modules are isolated, consisting of six Darlington Transistors with each transistor having a reverse parallel connected high-speed diode and base emitter speed up diodes. The transistors are connected in a three phase bridge configuration.

Features:

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

Applications:

- Inverters
- Switching Power Supplies
- AC Motor Control

Ordering Information

Example: Select the complete eight digit module part number you desire from the table - i.e. KE721K03 is a 1000 Volt, 30 Ampere Six-Darlington Module.

| Type | VCE(SUS)<br>Volts (1000) | Current Rating<br>Amperes (x10) |
|------|--------------------------|---------------------------------|
| KE72 | 1K                       | 03                              |



-T-33-35

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**KE721K03****Six-Darlington Transistor Module**

30 Amperes/1000 Volts

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

|                                                            | Symbol         | KE721K03   | 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 $V_{BE} = -2\text{V}$ | $V_{CEV(SUS)}$ | 1000       | Volts            |
| Collector-Base Voltage                                     | $V_{CBO}$      | 1000       | Volts            |
| Emitter-Base Voltage                                       | $V_{EBO}$      | 7          | Volts            |
| Collector-Emitter Voltage $V_{BE} = -2\text{V}$            | $V_{CEV}$      | 1000       | Volts            |
| Continuous Collector Current                               | $I_C$          | 30         | Amperes          |
| Diode Forward Current                                      | $I_{FM}$       | 30         | Amperes          |
| Continuous Base Current                                    | $I_B$          | 2          | Amperes          |
| Diode Surge Current                                        | $I_{FSM}$      | 300        | Amperes          |
| Power Dissipation, Each Transistor                         | $P_T$          | 310        | Watts            |
| Max. Mounting Torque M5 Mounting Screws                    | —              | 17         | in.-lb.          |
| Module Weight                                              | —              | 500        | Grams            |
| V Isolation                                                | $V_{RMS}$      | 2500       | Volts            |

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

| Characteristics                             | Symbol          | Test Conditions                              | Min. | KE721K03<br>Typ. | Max. | Units              |
|---------------------------------------------|-----------------|----------------------------------------------|------|------------------|------|--------------------|
| Collector Cutoff Current                    | $I_{CEV}$       | $V_{CE} = 1200\text{V}, V_{BE} = -2\text{V}$ | —    | —                | 1    | mA                 |
| Emitter Cutoff Current                      | $I_{EBO}$       | $V_{EB} = 7\text{V}$                         | —    | —                | 200  | mA                 |
| DC Current Gain                             | $h_{FE}$        | $I_C = 30\text{A}, V_{CE} = 2.8\text{V}$     | 75   | —                | —    | —                  |
| DC Current Gain                             | $h_{FE}$        | $I_C = 30\text{A}, V_{CE} = 5\text{V}$       | 100  | —                | —    | —                  |
| Diode Forward Voltage                       | $V_{FM}$        | $I_{FM} = 30\text{A}$                        | —    | —                | 1.8  | V                  |
| Collector-Emitter Saturation Voltage        | $V_{CE(SAT)}$   | $I_C = 30\text{A}, I_B = 0.6\text{A}$        | —    | —                | 3.0  | V                  |
| Base-Emitter Saturation Voltage             | $V_{BE(SAT)}$   | $I_C = 30\text{A}, I_B = 0.6\text{A}$        | —    | —                | 3.5  | V                  |
| Resistive Turn On                           | $t_{on}$        | $V_{CC} = 600\text{V}$                       | —    | —                | 2.5  | $\mu\text{s}$      |
| Load Storage Time                           | $t_s$           | $I_C = 30\text{A}$                           | —    | —                | 15   | $\mu\text{s}$      |
| Switch Times Fall Time                      | $t_f$           | $I_{B1} = -I_{B2} = -0.6\text{A}$            | —    | —                | 3.0  | $\mu\text{s}$      |
| Thermal Resistance, Case to Sink Lubricated | $R_{\theta CS}$ | —                                            | —    | —                | .15  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case        | $R_{\theta JC}$ | Transistor Part                              | —    | —                | 0.4  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case        | $R_{\theta JC}$ | Diode Part                                   | —    | —                | 1.5  | $^\circ\text{C/W}$ |



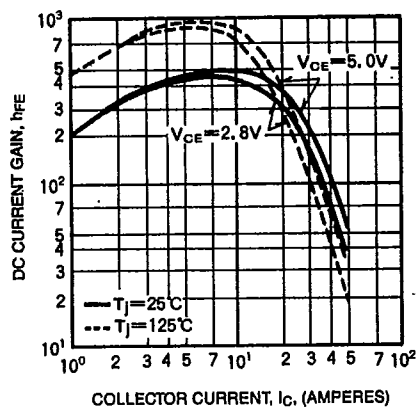
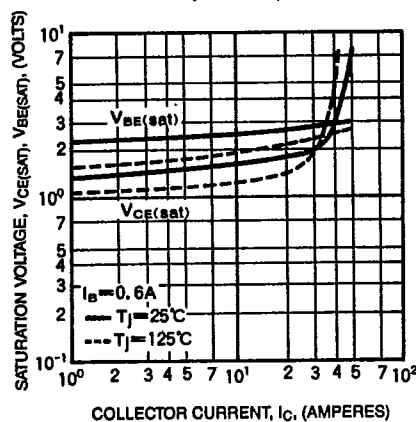
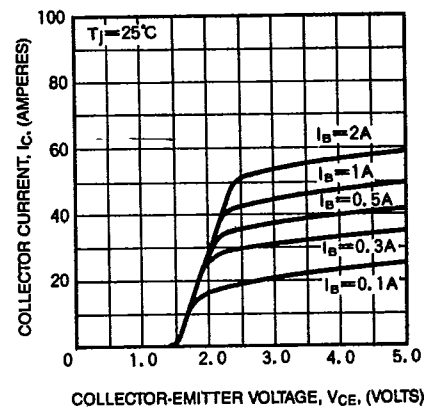
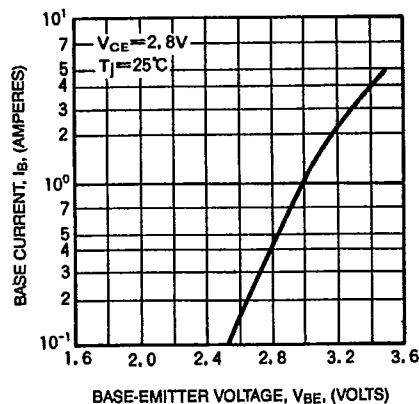
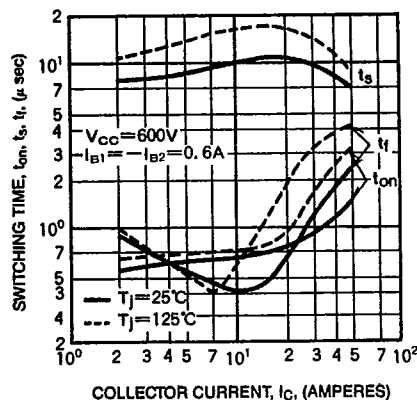
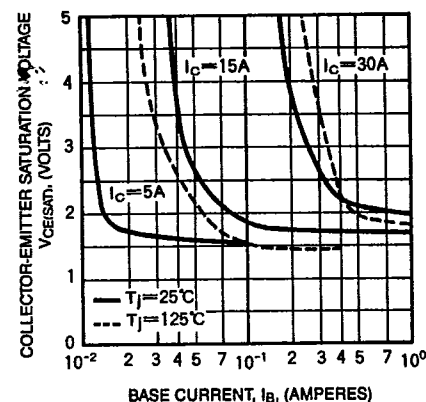
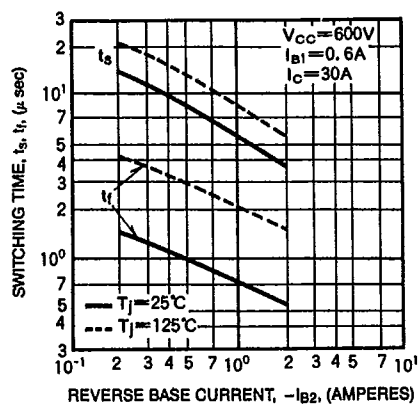
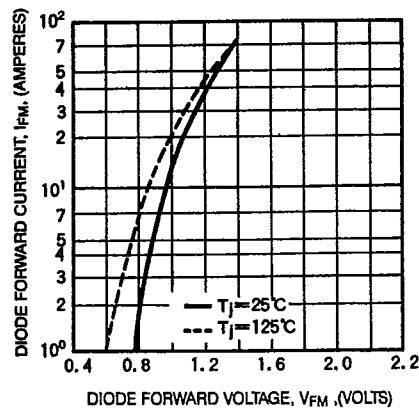
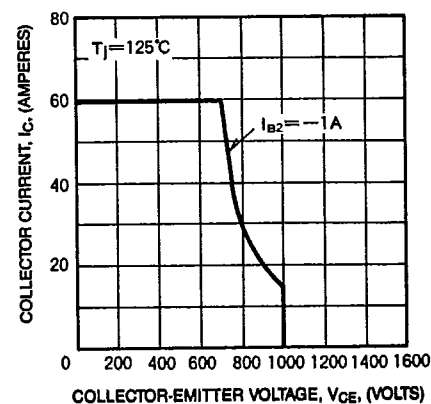
T-33-35

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**KE721K03****Six-Darlington Transistor Module**

30 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.)**



T-33-35

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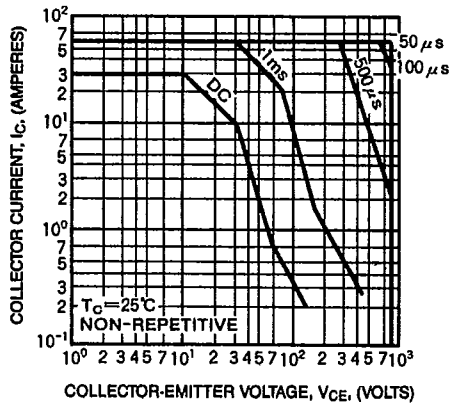
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KE721K03

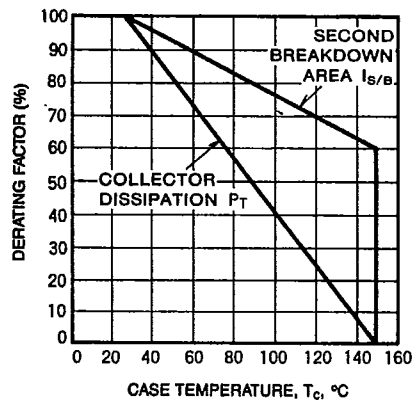
Six-Darlington Transistor Module

30 Amperes/1000 Volts

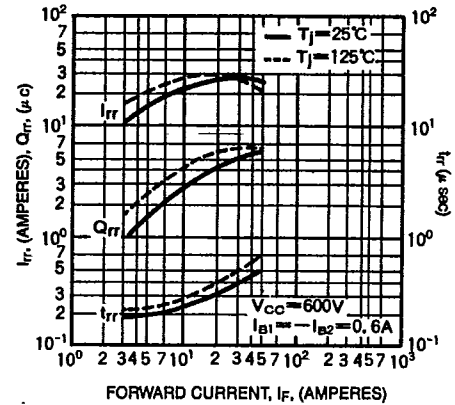
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



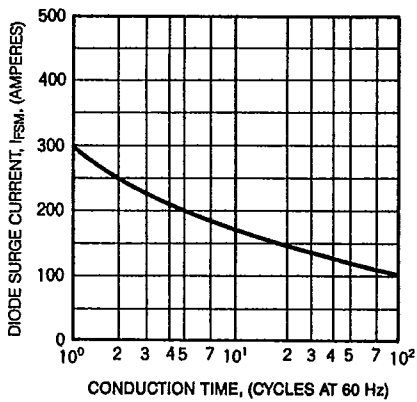
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



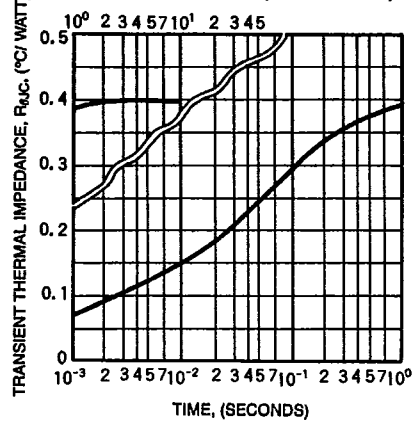
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

