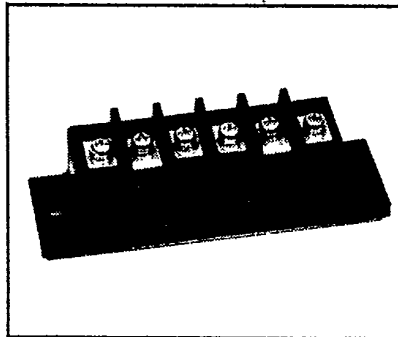
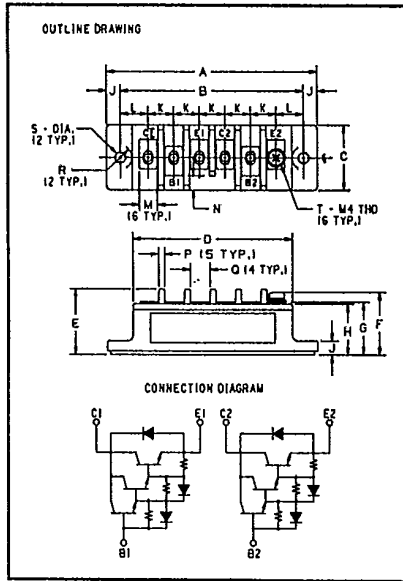




**KT521203**

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

**Split-Dual Darlington Transistor Module**  
30 Amperes/1200 Volts



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**1200 Volt KT521203**  
**Outline Drawing**

| Dimension | Inches           | Millimeters    |
|-----------|------------------|----------------|
| A         | 4.213            | 107            |
| B         | 3.661            | 93             |
| C         | 1.339            | 34             |
| D         | 3.189            | 81             |
| E         | 1.319            | 33.5           |
| F         | 1.260 Max.       | 32 Max.        |
| G         | 1.063            | 27             |
| H         | 1.024            | 26             |
| J         | .276             | 7              |
| K         | .512             | 13             |
| L         | .551             | 14             |
| M         | .354             | 9              |
| N         | .295             | 7.5            |
| P         | .118             | 3              |
| Q         | .394             | 10             |
| R         | .236 R           | R6             |
| S         | .216 ± .004 Dia. | 5.5 ± 0.1 Dia. |
| T         | M4 Metric        | M4             |

**Description**

Powerex Split-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 ( $h_{FE}$ )
- 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. KT521203 is a 1200 Volt, 30 Ampere Split-Dual Darlington Module.

| Type | V <sub>CE(SUS)</sub><br>Volts (×100) | Current Rating<br>Amperes (×10) |
|------|--------------------------------------|---------------------------------|
| KT52 | 12                                   | 03                              |



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

|  | Symbol         | KT521203   | 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 $V_{BE} = -2\text{V}$ | $V_{CEV(SUS)}$ | 1200       | Volts            |
| Collector-Base Voltage                                     | $V_{CBO}$      | 1200       | Volts            |
| Emitter-Base Voltage                                       | $V_{EBO}$      | 7          | Volts            |
| Collector-Emitter Voltage                                  | $V_{CEV}$      | 1200       | 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                         | $P_T$          | 300        | Watts            |
| Max. Mounting Torque M5 Terminal Screws                    | —              | 17         | in. lb.          |
| Max. Mounting Torque M6 Mounting Screws                    | —              | 25         | in. lb.          |
| Module Weight  | —              | 210        | Grams            |
| V isolation  | $V_{RMS}$      | 2500       | Volts            |

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

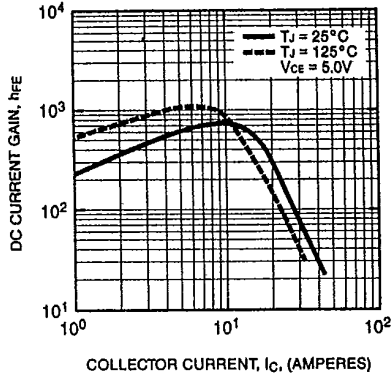
| Characteristics                                | Symbol          | Test Conditions                               | KT521203                         |      |      | Units              |               |
|--|-----------------|---|----------------------------------|------|------|--------------------|---------------|
|  |                 |   | Min.                             | Typ. | Max. |                    |               |
| Collector Cutoff Current                       | $I_{CEV}$       | $V_{CE} = 1200\text{V}, V_{BE} = -2\text{V}$  | —                                | —    | 1    | mA                 |               |
| Emitter Cutoff Current                         | $I_{EBO}$       | $V_{EB} = 7\text{V}$                          | —                                | —    | 150  | mA                 |               |
| DC Current Gain                                | $h_{FE}$        | $I_C = 30\text{A}, V_{CE} = 5\text{V}$        | 75                               | —    | —    | —                  |               |
| Diode Forward Voltage                          | $V_{FM}$        | $I_{FM} = 30\text{A}$                         | —                                | —    | 1.5  | 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         | $V_{CC} = 600\text{V},$<br>$I_C = 25\text{A}$ | —                                | —    | 2.5  | $\mu\text{s}$      |               |
| Load   | Storage Time    |   | $I_C = 25\text{A}$               | —    | —    | 15                 | $\mu\text{s}$ |
| Switch Times                                   | Fall Time       |   | $I_{B1} = -I_{B2} = 0.6\text{A}$ | —    | —    | 3.0                | $\mu\text{s}$ |
| Thermal Resistance, Case to Sink<br>Lubricated | $R_{\theta CS}$ | Per Half Module                               | —                                | —    | 0.15 | $^\circ\text{C/W}$ |               |
| 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  | $^\circ\text{C/W}$ |               |



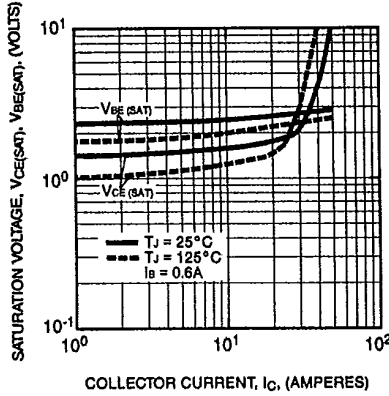
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KT521203  
Split-Dual Darlington Transistor Module  
30 Amperes / 1200 Volts

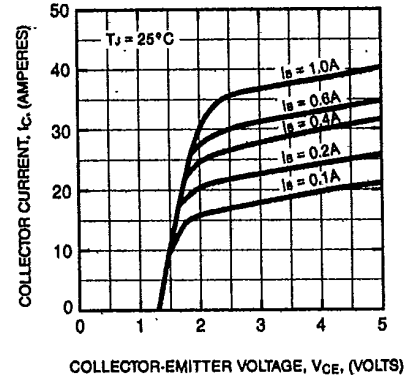
DC CURRENT GAIN (TYPICAL)



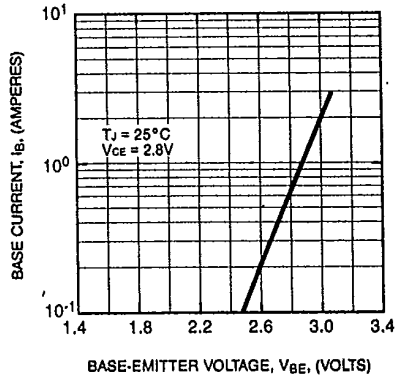
SATURATION VOLTAGE (TYPICAL)



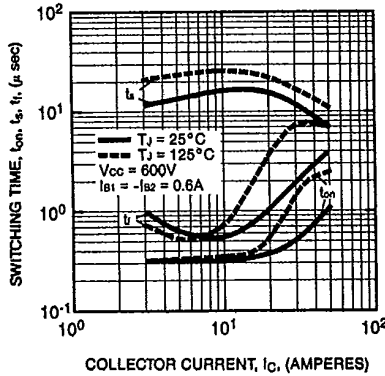
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



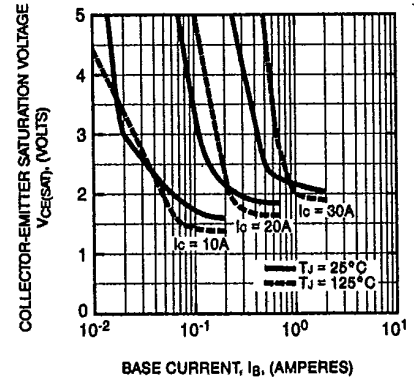
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



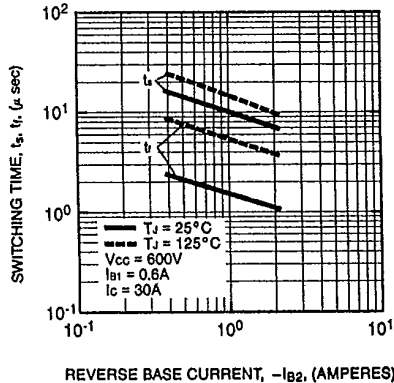
SWITCHING CHARACTERISTICS (TYPICAL)



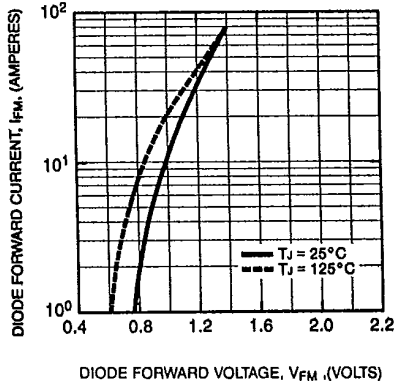
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



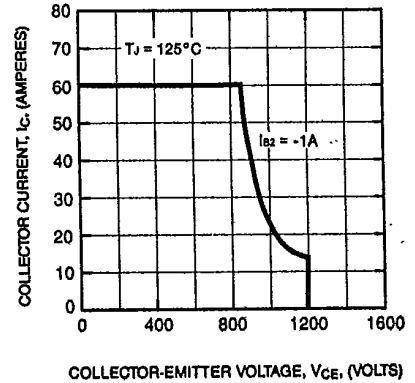
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



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



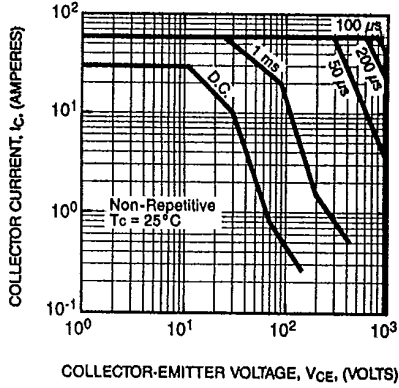


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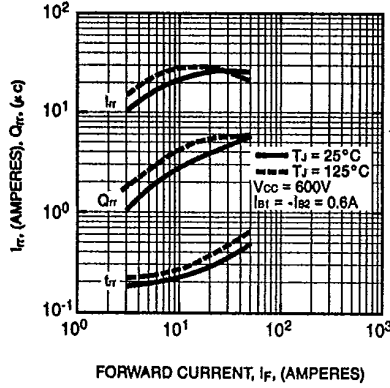
KT521203

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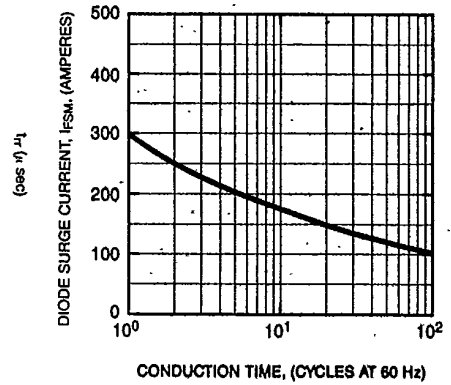
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



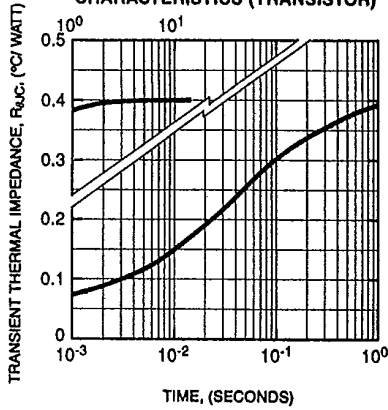
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

