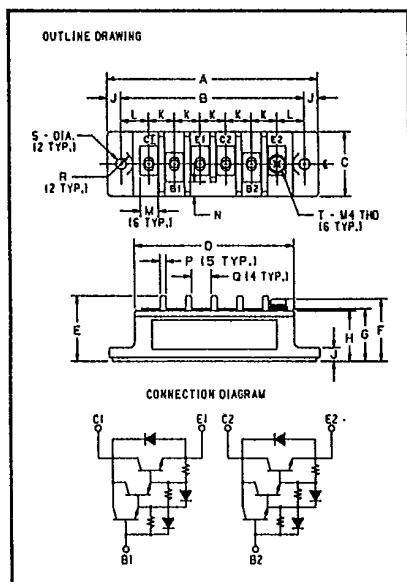
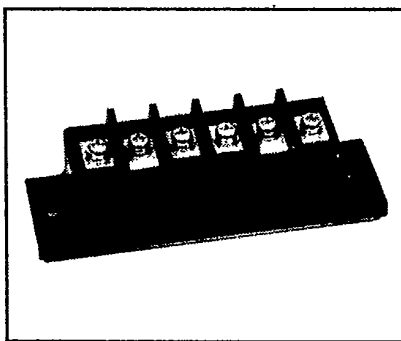


**POWEREX****KT521205**

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

**Split-Dual Darlington  
Transistor Module****50 Amperes/1200 Volts****1200 Volt KT521205  
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             |

**KT521205  
Split-Dual Darlington  
Transistor Module  
50 Amperes/1200 Volts****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. KT521205 is a 1200 Volt, 50 Ampere Split-Dual Darlington Module.

| Type | V <sub>CE(SUS)</sub><br>Volts (x100) | Current Rating<br>Amperes (x10) |
|------|--------------------------------------|---------------------------------|
| KT52 | 12                                   | 05                              |



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

KT521205

Split-Dual Darlington Transistor Module  
50 Amperes / 1200 Volts

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

|                                                            | Symbol         | KT521205   | 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                               | $I_C$          | 50         | Amperes          |
| Diode Forward Current                                      | $I_{FM}$       | 50         | Amperes          |
| Continuous Base Current                                    | $I_B$          | 3          | Amperes          |
| Diode Surge Current                                        | $I_{FSM}$      | 500        | Amperes          |
| Power Dissipation, Each Transistor                         | $P_T$          | 400        | Watts            |
| Max. Mounting Torque M5 Terminal Screws                    | —              | 17         | in.-lb.          |
| Max. Mounting Torque M6 Mounting Screws                    | —              | 26         | in.-lb.          |
| Module Weight                                              | —              | 9          | Oz               |
| Module Weight                                              | —              | 250        | Grams            |
| V isolation                                                | $V_{RMS}$      | 2500       | Volts            |

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

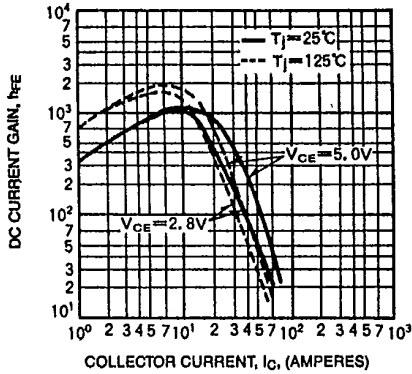
| Characteristics                                | Symbol          | Test Conditions                                                           | KT521205 |      |      | Units              |
|------------------------------------------------|-----------------|---------------------------------------------------------------------------|----------|------|------|--------------------|
|                                                |                 |                                                                           | Min.     | Typ. | Max. |                    |
| Collector Cutoff Current                       | $I_{CEV}$       | $V_{CE} = 1200\text{V}, V_{BE} = -2\text{V}$                              | —        | —    | 1    | mA                 |
| Collector Cutoff Current                       | $I_{CEV}$       | $V_{CE} = 1200\text{V}, V_{BE} = -2\text{V}$<br>$T_C = 125^\circ\text{C}$ | —        | —    | -10  | mA                 |
| Emitter Cutoff Current                         | $I_{EBO}$       | $V_{EB} = 7\text{V}$                                                      | —        | —    | 200  | mA                 |
| DC Current Gain                                | $h_{FE}$        | $I_C = 50\text{A}, V_{CE} = 5\text{V}$                                    | 75       | —    | —    | —                  |
| Diode Forward Voltage                          | $V_{FM}$        | $I_{FM} = 50\text{A}$                                                     | —        | —    | 1.8  | V                  |
| Collector-Emitter Saturation Voltage           | $V_{CE(SAT)}$   | $I_C = 50\text{A}, I_B = 1\text{A}$                                       | —        | —    | 3.0  | V                  |
| Base-Emitter Saturation Voltage                | $V_{BE(SAT)}$   | $I_C = 50\text{A}, I_B = 1\text{A}$                                       | —        | —    | 3.5  | V                  |
| Resistive Turn On                              | $t_{on}$        | $V_{CC} = 600\text{V}$                                                    | —        | —    | 2.5  | $\mu\text{s}$      |
| Load Storage Time                              | $t_s$           | $I_C = 50\text{A}$                                                        | —        | —    | 15   | $\mu\text{s}$      |
| Switch Times Fall Time                         | $t_f$           | $I_{B1} = 1\text{A}, I_{B2} = -1\text{A}$                                 | —        | —    | 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                                                           | —        | —    | .31  | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Case           | $R_{\theta JC}$ | Diode Part                                                                | —        | —    | 1.2  | $^\circ\text{C/W}$ |



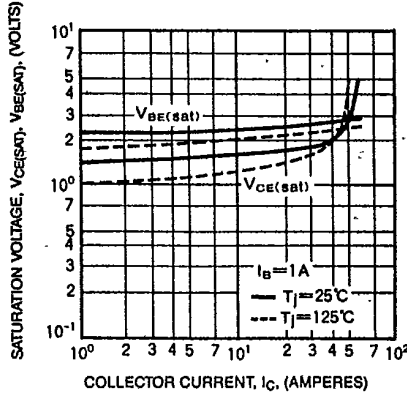
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**KT521205**  
**Split-Dual Darlington Transistor Module**  
 50 Amperes / 1200 Volts

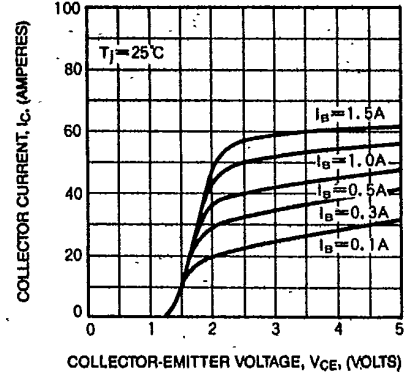
**DC CURRENT GAIN (TYPICAL)**



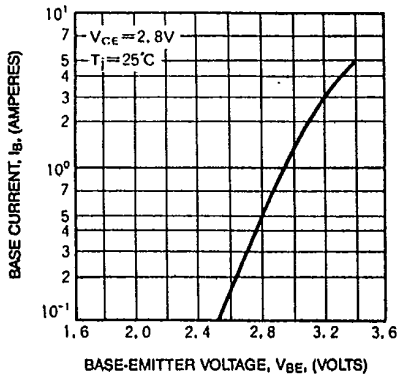
**SATURATION VOLTAGE (TYPICAL)**



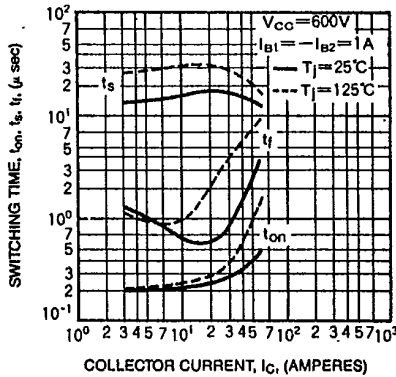
**COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)**



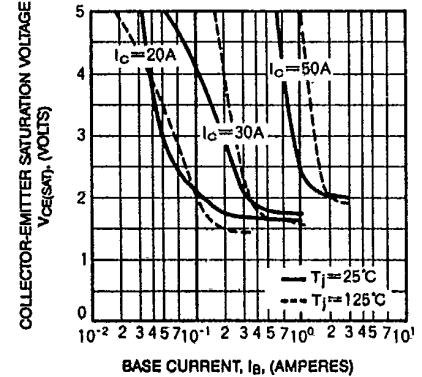
**COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)**



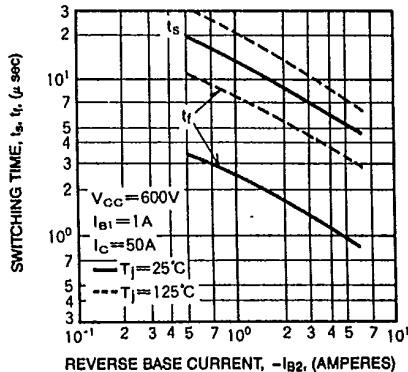
**SWITCHING CHARACTERISTICS (TYPICAL)**



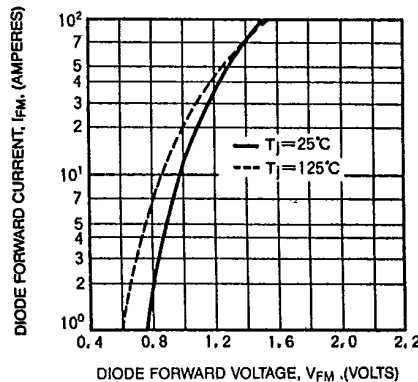
**COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)**



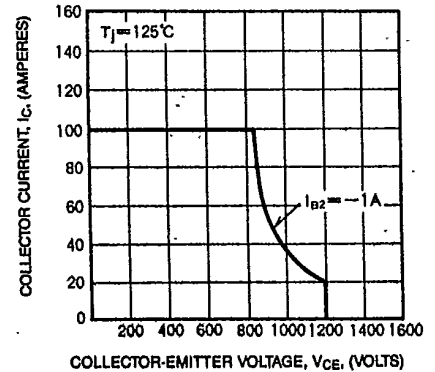
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



**DIODE CHARACTERISTICS (TYPICAL)**



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

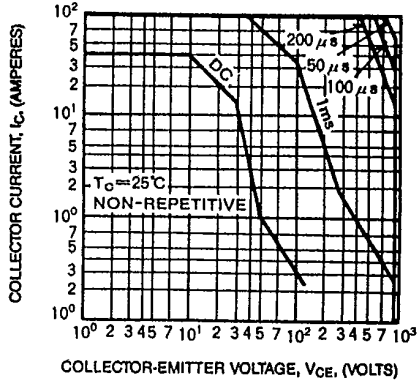




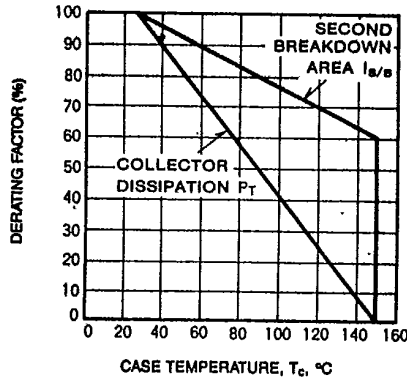
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KT521205  
Split-Dual Darlington Transistor Module  
50 Amperes / 1200 Volts

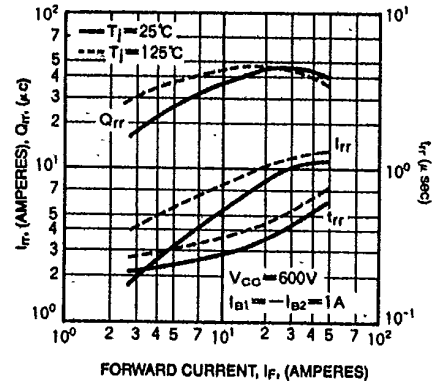
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



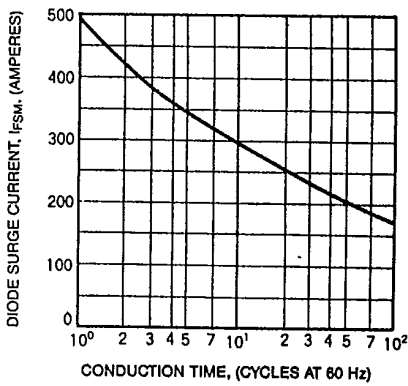
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



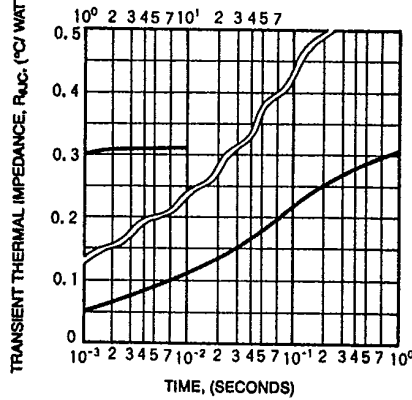
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

