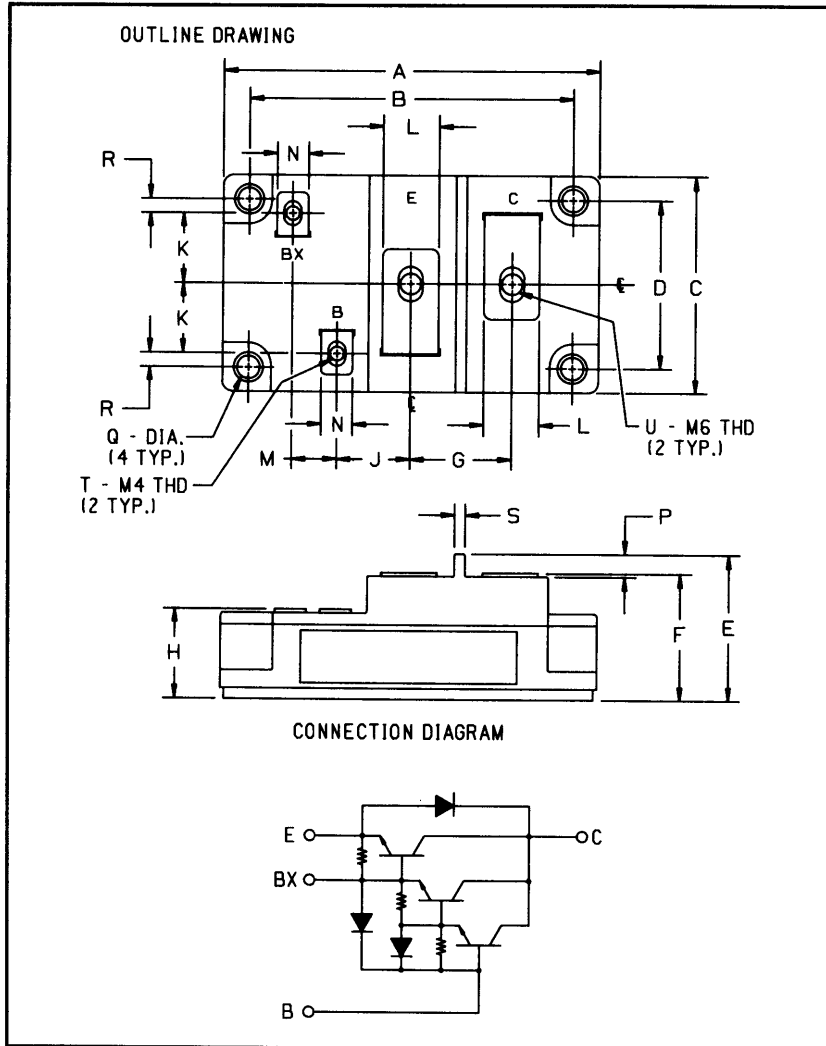


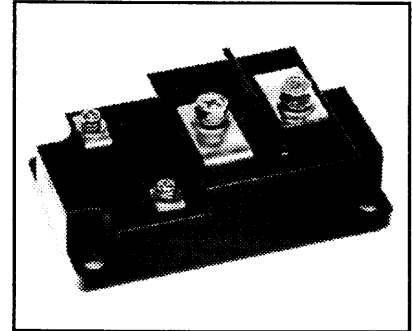
Single Darlington Transistor Module 400 Amperes/1000 Volts



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 | 1.634 Max. | 41.5 Max. |
| F | 1.417 Max. | 36 Max. |
| G | 1.142 | 29 |
| H | 1.004 | 25.5 |
| J | 0.827 | 21 |
| K | 0.787 | 20 |

| Dimensions | Inches | Millimeters |
|------------|------------|-------------|
| L | 0.630 | 16 |
| M | 0.512 | 13 |
| N | 0.354 | 9 |
| P | 0.256 | 6.5 |
| Q | 0.256 Dia. | 6.5 Dia. |
| R | 0.157 | 4 |
| S | 0.118 | 3 |
| T | M4 Metric | M4 |
| U | M6 Metric | M6 |



Description:

The Powerex Single Darlington Transistor Modules are high power devices designed for use in switching applications. The modules are isolated, consisting of one Darlington Transistor with a reverse parallel connected high-speed diode and base-to-emitter speed-up diode.

Features:

- Isolated Mounting
- Planar Chips
- Discrete Fast Recovery Feedback 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. KS621K40A41 is a 1000 Volt, 400 Ampere Single Darlington Module with a gain of 70 at rated current (400 Amperes).

| Type | $V_{CE0(sus)}$ Volts (1000) | Current Rating Amperes (X 10) |
|------|--------------------------------|----------------------------------|
| KS62 | 1K | 40 |



Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

KS621K40A41
Single Darlington Transistor Module
400 Amperes/1000 Volts

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

| Ratings | Symbol | KS621K40A41 | 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, $V_{BE} = -2\text{VA}$ | $V_{CEV(sus)}$ | 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 | 400 | Amperes |
| Diode Forward Current | I_{FM} | 400 | Amperes |
| Continuous Base Current | I_B | 16 | Amperes |
| Diode Surge Current | I_{FSM} | 3000 | Amperes |
| Power Dissipation, Each Transistor | P_t | 1980 | Watts |
| Max. Mounting Torque M6 Main Terminal Screws (E, C) | - | 26 | in.-lb. |
| Max. Mounting Torque M4 Terminal Screws (B, Bx) | - | 12 | in.-lb. |
| Max. Mounting Torque M6 Mounting Screws | - | 26 | in.-lb. |
| Modular Weight (Typical) | - | 470 | Grams |
| V Isolation | V_{RMS} | 2500 | Volts |



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KS621K40A41
Single Darlington Transistor Module
 400 Amperes/1000 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} | $V_{CE} = 1000V, V_{BE} = -2V$ | - | - | 5 | mA | |
| | | $V_{CE} = 1000V, V_{BE} = -2V, T_C = 125^\circ\text{C}$ | - | - | 30 | mA | |
| Emitter Cutoff Current | I_{EBO} | $V_{EB} = 7V$ | - | - | 800 | mA | |
| DC Current Gain | h_{FE} | $I_C = 400A, V_{CE} = 5.0V$ | 70 | - | - | - | |
| Diode Forward Voltage | V_{FM} | $I_{FM} = 300A$ | - | - | 1.8 | Volts | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C = 400A, I_B = 8A$ | - | - | 2.5 | Volts | |
| Base-Emitter Saturation Voltage | $V_{BE(sat)}$ | $I_C = 400A, I_B = 8A$ | - | - | 3.5 | Volts | |
| Resistive | Turn-on | t_{on} | $V_{CC} = 600V$ | - | - | 3.0 | μs |
| Load | Storage Time | t_s | $I_C = 400A$ | - | - | 15 | μs |
| Switch Times | Fall Time | t_f | $I_{B1} = 8A, I_{B2} = -8.0A$ | - | - | 3.0 | μs |

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

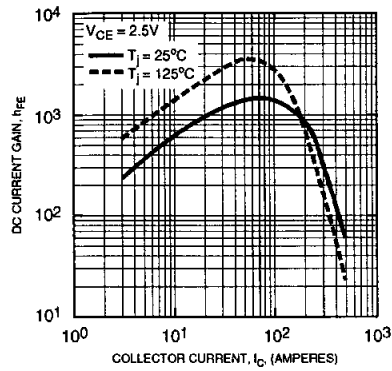
| Characteristics | Symbol | Test Conditions | Min. | Typ. | Max. | Units |
|--------------------------------------|-------------------|-----------------|------|------|-------|--------------------|
| Thermal Resistance, Case-to-Sink | $R_{\theta(c-s)}$ | - | - | - | 0.04 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(j-c)}$ | Transistor Part | - | - | 0.063 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta(j-c)}$ | Diode Part | - | - | 0.3 | $^\circ\text{C/W}$ |



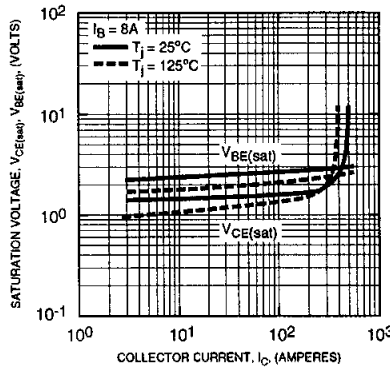
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

KS621K40A41
Single Darlington Transistor Module
 400 Amperes/1000 Volts

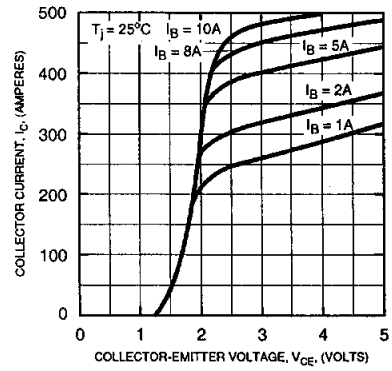
DC CURRENT GAIN (TYPICAL)



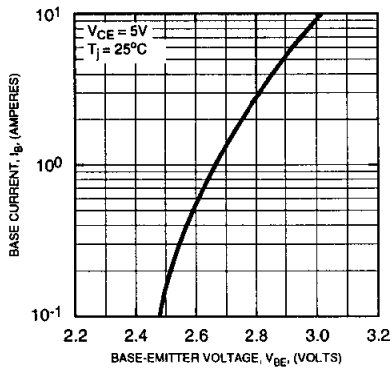
SATURATION VOLTAGE (TYPICAL)



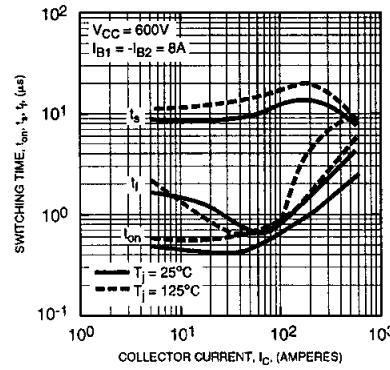
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



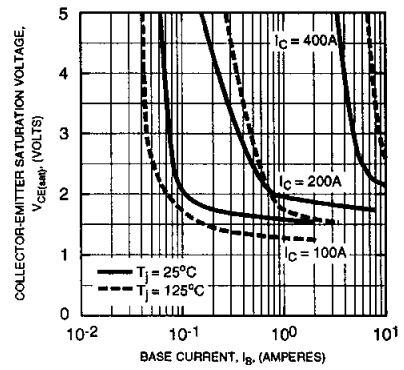
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



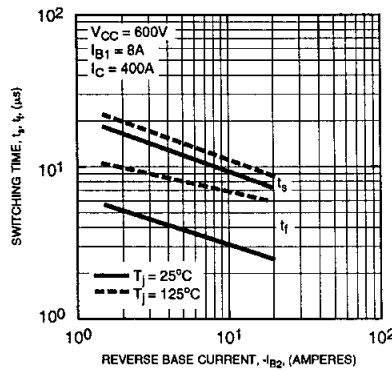
SWITCHING CHARACTERISTICS (TYPICAL)



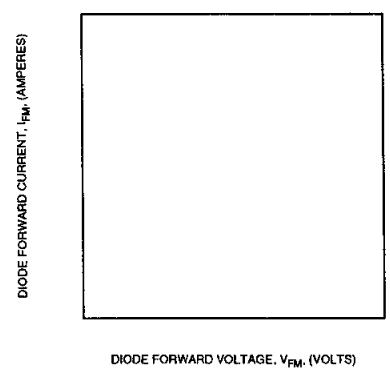
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



REVERSE BIAS SAFE OPERATING AREA (RBSOA)

