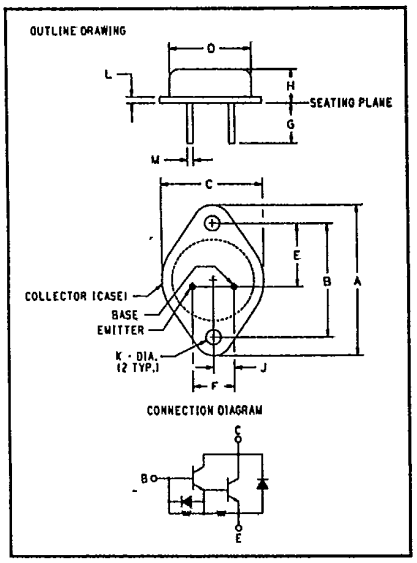
POWEREX

# D64EV

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

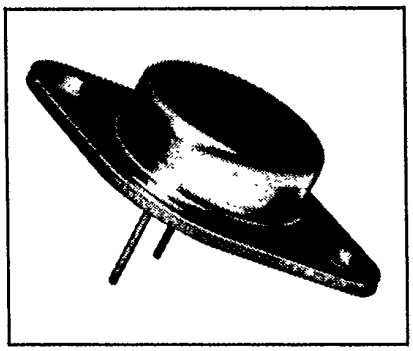
## Fast Switching Single Darlington Transistor Module

### 50 Amperes
### 500-600-700 Volts




**500-600-700 Volts D64EV Outline Drawing**

| Dimension | Inches | Millimeters |
|---|---|---|
| A | 1.573 Max. | 39.96 |
| B | 1.187±.010 | 30±0.15 |
| C | 1.050 Max. | 26.68 Max. |
| D | .845 Dia. | 21.47 Dia. |
| E | .662±.012 | 18.8±0.3 |
| F | .430±.005 | 11±0.12 |
| G | .426 Min. | 10.82 Min. |
| H | .358 Max. | 9.1 Max. |
| J | .215±.005 | 5.5±0.12 |
| K | .156±.006 Dia. | 4±0.15 Dia. |
| L | .065 Max. | 1.65 Max. |
| M | .060±.003 Dia. | 1.5±0.08 Dia. |



**D64EV**
**Fast Switching Single Darlington Transistor Module**
50 Amperes/500-600-700 Volts

**Description**
Powerex Fast Switching Single Darlington Transistor Modules are designed for use in switching applications.

**Features:**
- ☐ High Speed
- ☐ High Gain ($h_{FE}$)
- ☐ Base Emitter Speed-up Diode

**Applications:**
- ☐ UPS Inverters
- ☐ DC Motor Control
- ☐ Switching Power Supplies
- ☐ AC Motor Control
- ☐ HF Power Conversion

**Ordering Information**
Example: Select the complete six digit module part number for the rating you desire from the table - i.e. D64EV7 is a 700 Volt, 50 Ampere Fast Switching Single Darlington Module with speed-up diode.

| Type | $V_{CEV(SUS)}$ Volts (×100) | Current Rating Amperes (50) |
|---|---|---|
| D64EV | 5 | 50 |
| D64EV | 6 | 50 |
| D64EV | 7 | 50 |

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## Maximum Ratings $T_J$ =25°C unless otherwise specified

| | Symbol | D64EV | Units |
|---|---|---|---|
| Junction Temperature | $T_J$ | −65 to 150 | °C |
| Storage Temperature | $T_{STG}$ | −65 to 150 | °C |
| Collector-Emitter Sustaining Voltage D64EV5 | $V_{CEO(SUS)}$ | 400 | Volts |
| Collector-Base Voltage D64EV5 | $V_{CBO}$ | 500 | Volts |
| Collector-Emitter Sustaining Voltage D64EV6 | $V_{CEO(SUS)}$ | 450 | Volts |
| Collector-Base Voltage D64EV6 | $V_{CBO}$ | 600 | Volts |
| Collector-Emitter Sustaining Voltage D64EV7 | $V_{CEO(SUS)}$ | 500 | Volts |
| Collector-Base Voltage D64EV7 | $V_{CBO}$ | 700 | Volts |
| Emitter-Base Voltage | $V_{EBO}$ | 5 | Volts |
| Continuous Collector Current | $I_C$ | 50 | Amperes |
| Peak (Repetitive) Collector Current | $I_{CM}$ | 75 | Amperes |
| Peak (Non-Repetitive) Collector Current | $I_{CSM}$ | 125 | Amperes |
| Diode Forward Current | $I_{FM}$ | 50 | Amperes |
| Continuous Base Current | $I_B$ | 10 | Amperes |
| Peak (Non-Repetitive) Base Current | $I_{BM}$ | 20 | Amperes |
| Power Dissipation | $P_T$ | 180 | Watts |

## Electrical and Mechanical Characteristics $T_J$ =25°C unless otherwise specified

| Characteristics | Symbol | Test Conditions | D64EV Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Collector Cutoff Current | $I_{CEV}$ | $V_{CE}=V_{CE}$(rated), $V_{BE}=-1.5V$ | — | — | 1 | mA |
| Collector Cutoff Current | $I_{CEV}$ | $V_{CE}=V_{CE}$(rated), $V_{BE}=-1.5V$, $T_C$=150°C | — | — | 2.5 | mA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$=1.5V | — | — | 350 | mA |
| DC Current Gain | $h_{FE}$ | $I_C$=75A, $V_{CE}$=5.0V | 25 | 60 | — | — |
| | | $I_C$=50A, $V_{CE}$=5.0V | 50 | 135 | — | — |
| | | $I_C$=20A, $V_{CE}$=5.0V | 100 | 250 | — | — |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C$=75A, $I_B$=5.0A | — | 2.2 | 3.0 | V |
| | | $I_C$=50A, $I_B$=4.0A | — | 1.7 | 2.0 | V |
| | | $I_C$=20A, $I_B$=2.0A | — | 1.15 | 1.5 | V |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | $I_C$=75A, $I_B$=5.0A | — | 2.8 | 3.5 | V |
| | | $I_C$=50A, $I_B$=4.0A | — | 2.45 | 3.0 | V |
| | | $I_C$=20A, $I_B$=2.0A | — | 1.95 | 2.5 | V |
| Delay Time* | $t_d$ | $V_{CC}$=250V, $I_C$=50A, $I_{B1}$=2.5A, $-I_{B2}$=5A, $t_p$=50 μsec | — | 0.09 | 0.5 | μs |
| Rise Time* | $t_r$ | | — | 0.5 | 1.0 | μs |
| Storage Time* | $t_s$ | | — | 2.0 | 3.0 | μs |
| Fall Time* | $t_f$ | | — | .64 | 1.0 | μs |
| Diode Power Dissipation | $P_D$ | $I_{B1}$=0 | — | — | 125 | W |
| Diode Forward Voltage | $V_{FM}$ | $I_{FM}$=25A | — | 1.95 | 3.20 | V |
| | | $I_{FM}$=50A | — | 2.6 | 3.80 | V |
| | | $I_{FM}$=50A, $T_j$=150°C | — | 2.3 | 3.50 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_{FM}$=50A, di/dt=25A/μsec, $R_{B1E}$=.25Ω | — | 3.85 | 10.0 | μs |
| Forward Turn-On Time | $t_{ON}$ | $I_{FM}$=100A, di/dt=100A/μsec | — | 0.75 | 1.5 | μs |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | Transistor Part | — | — | .7 | °C/W |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | Diode Part | — | — | 1.0 | °C/W |
| Max Lead Temp for Soldering | $T_L$ | 1/8" From case for 5 sec. | — | — | 300 | °C |

*Resistive Load.

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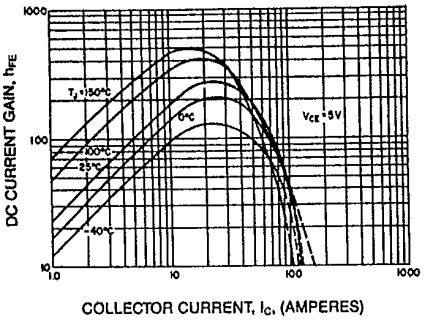
**DC CURRENT GAIN (TYPICAL)**

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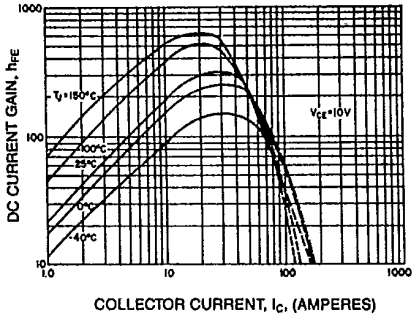
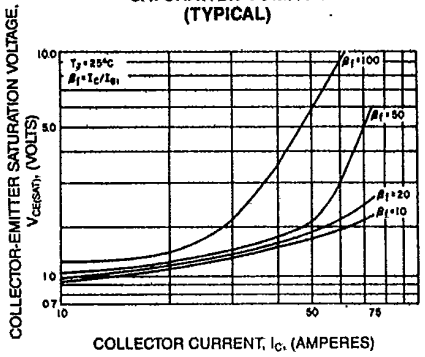



**SATURATION VOLTAGE (TYPICAL)**

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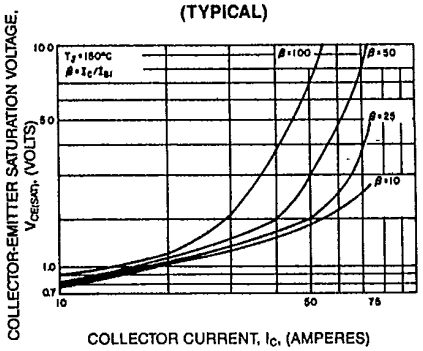


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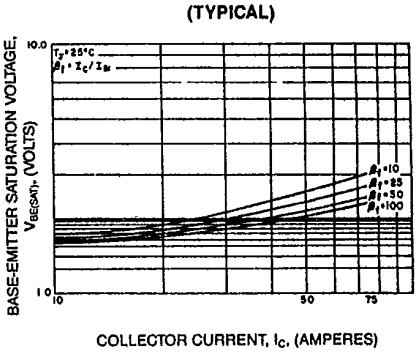


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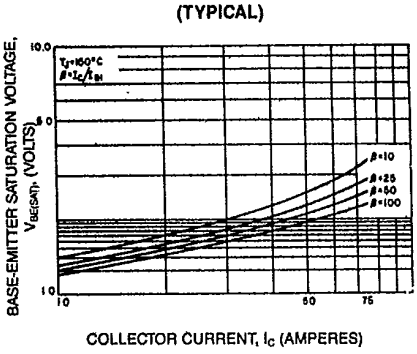
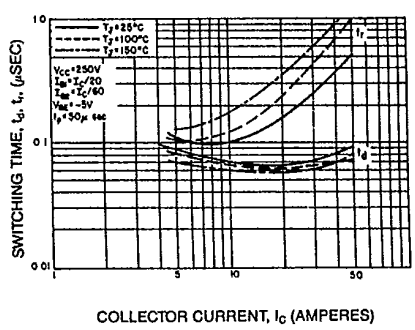



**SWITCHING CHARACTERISTICS (TYPICAL)**

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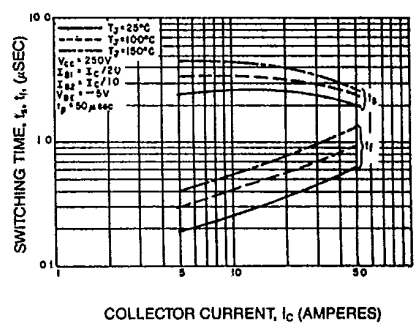
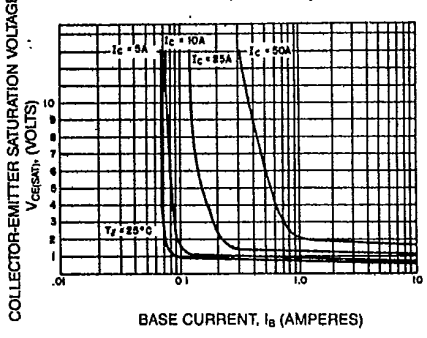



**COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)**



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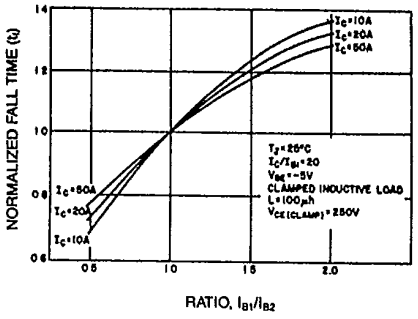
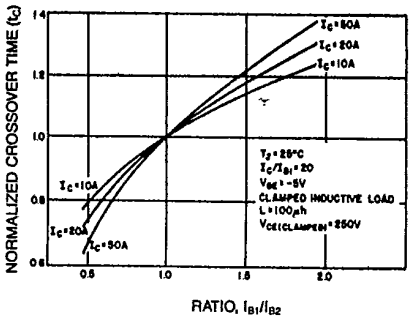
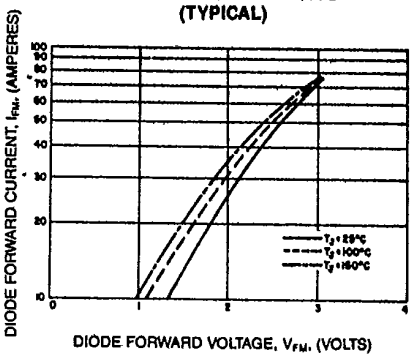
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



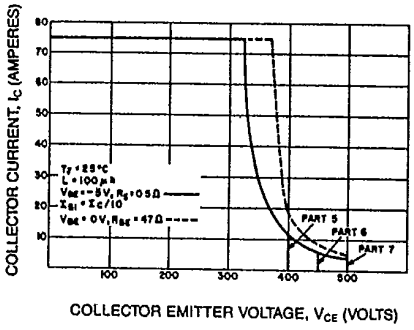

**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



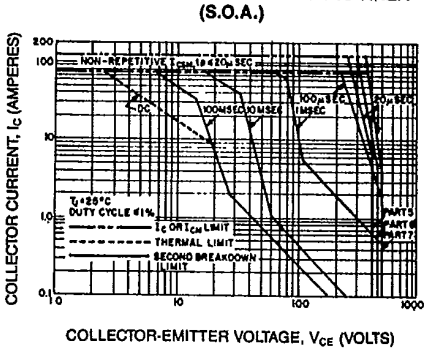

**DIODE CHARACTERISTICS (TYPICAL)**



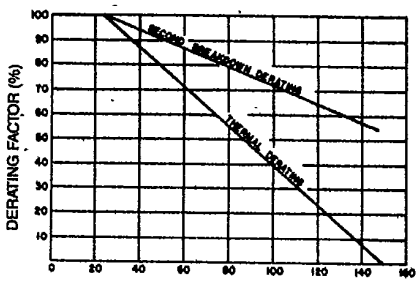

**REVERSE BIAS SAFE OPERATING AREA (R.B.S.O.A.)**



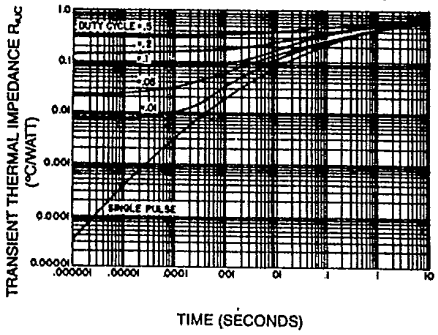

**FORWARD BIAS SAFE OPERATING AREA (S.O.A.)**



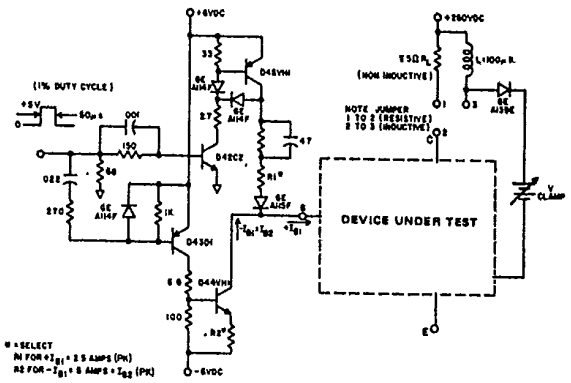

**DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)**




**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**




**Switching Time Test Circuit**



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