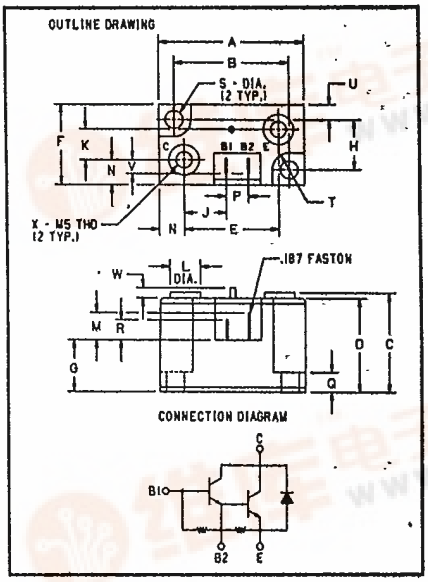
POWEREX

# D67DE

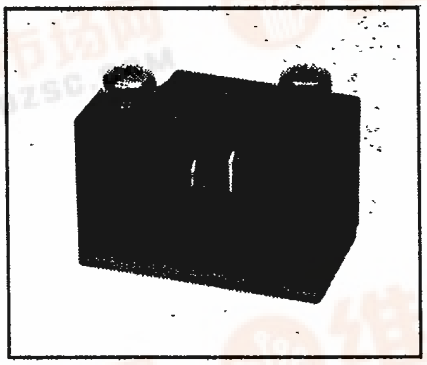
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

## Fast Switching Single Darlington Transistor Module

### 100 Amperes
### 500-600-700 Volts




**500-600-700 Volt D67DE Outline Drawing**



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| Dimension | Inches | Millimeters |
|---|---|---|
| A | 1.800±0.15 | 45.7±0.4 |
| B | 1.420±.010 | 36±0.25 |
| C | 1.242±.030 | 31.55±0.8 |
| D | 1.173±.025 | 29.8±0.6 |
| E | 1.170 | 29.7 |
| F | 1.000±.015 | 25.4±0.4 |
| G | .650±.035 | 16.5±0.9 |
| H | .620±.010 | 15.7±0.25 |
| J | .518 | 13.2 |
| K | .380±.010 | 9.6±0.25 |
| L | .375 Dia. | 9.5 Dia. |
| M | .335 | 8.5 |
| N | .310±.010 | 7.9±0.25 |
| P | .275±.015 | 7±0.4 |
| Q | .250±.015 | 6.4±0.4 |
| R | .245 | 6.2 |
| S | .22 Dia. | 5.6 Dia. |
| T | .21 R | 5.3 R |
| U | .180 | 4.6 |
| V | .170 | 4.3 |
| W | .120 | 3.1 |
| X | M5 Metric | M5 |

**Description**
Powerex Fast Switching Single Darlington Transistor Modules are designed for use in switching applications. The modules are isolated consisting of one Darlington Transistor with a monolithic reverse parallel connected free-wheel diode.

**Features:**
- ☐ Isolated Mounting
- ☐ High Gain ($h_{FE}$)
- ☐ Base 1 and 2 Accessible

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

**Ordering Information**
Example: Select the complete six digit module part number you desire from the table - i.e. D67DE7 is a 700 Volt, 100 Ampere Fast Switching Single Darlington Module.

| Type | $V_{CEV}$ Volts (×100) | Current Rating Amperes (100) |
|---|---|---|
| D67DE | 5 | 100 |
| D67DE | 6 | 100 |
| D67DE | 7 | 100 |

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

| | Symbol | D67DE | Units |
|---|---|---|---|
| Junction Temperature | $T_J$ | −40 to 150 | °C |
| Storage Temperature | $T_{STG}$ | −40 to 150 | °C |
| Collector-Emitter Sustaining Voltage D67DE5 | $V_{CEO(SUS)}$ | 400 | Volts |
| Collector-Emitter Voltage $V_{BE}$ = −1.5V D67DE5 | $V_{CEV}$ | 500 | Volts |
| Collector-Emitter Sustaining Voltage D67DE6 | $V_{CEO(SUS)}$ | 450 | Volts |
| Collector-Emitter Voltage $V_{BE}$ = −1.5V D67DE6 | $V_{CEV}$ | 600 | Volts |
| Collector-Emitter Sustaining Voltage D67DE7 | $V_{CEO(SUS)}$ | 500 | Volts |
| Collector-Emitter Voltage $V_{BE}$ = −1.5V D67DE7 | $V_{CEV}$ | 700 | Volts |
| Emitter-Base Voltage | $V_{EBO}$ | 8 | Volts |
| Continuous Collector Current | $I_C$ | 100 | Amperes |
| Peak (Repetitive) Collector Current | $I_{CM}$ | 150 | Amperes |
| Peak (Non-repetitive) Collector Current | $I_{CSM}$ | 250 | Amperes |
| Diode Forward Current | $I_{FM}$ | 100 | Amperes |
| Continuous Base Current | $I_B$ | 10 | Amperes |
| Peak (Non-repetitive) Base Current | $I_{BM}$ | 20 | Amperes |
| Power Dissipation | $P_T$ | 312.5 | Watts |
| Max. Mounting Torque (M5) Terminal Screws | — | 28 | in.-lb. |
| Max. Mounting Torque (M5) Mounting Screws | — | 25 | in.-lb. |
| V isolation | $V_{RMS}$ | 2500 | Volts |

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

| Characteristics | Symbol | Test Conditions | Min. | D67DE Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| Collector Cutoff Current | $I_{CEV}$ | $V_{CE}$ = $V_{CEV}$ (rated), $V_{BE}$ = −1.5V | — | — | 1 | mA |
| Collector Cutoff Current | $I_{CEV}$ | $V_{CE}$ = $V_{CEV}$ (rated), $V_{BE}$ = −1.5V, $T_J$ =150°C | — | — | 2.5 | mA |
| Emitter Cutoff Current | $I_{EBO}$ | $V_{EB}$ =3.5V | — | — | 500 | mA |
| DC Current Gain | $h_{FE}$ | $I_C$ =150A, $V_{CE}$ =5.0V | 25 | 90 | — | — |
| | | $I_C$ =100A, $V_{CE}$ =5.0V | 50 | 200 | — | — |
| | | $I_C$ =40A, $V_{CE}$ =5.0V | 100 | 275 | — | — |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C$ =150A, $I_B$ =10.0A | — | 1.9 | 3.0 | V |
| | | $I_C$ =100A, $I_B$ =8.0A | — | 1.4 | 2.0 | V |
| | | $I_C$ =40A, $I_B$ =4.0A | — | 1.0 | 1.5 | V |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | $I_C$ =150A, $I_B$ =10.0A | — | 2.75 | 3.5 | V |
| | | $I_C$ =100A, $I_B$ =8.0A | — | 2.3 | 3.0 | V |
| Delay Time* | $t_d$ | $V_{CC}$ =250V | — | 0.1 | 0.5 | μs |
| Rise Time* | $t_{on}$ | $I_C$ =100A | — | 0.45 | 1.0 | μs |
| Storage Time* | $t_s$ | $I_{B1}$ =5A, −$I_{B2}$ =10.0A | — | 3.2 | 5.0 | μs |
| Fall Time* | $t_f$ | $t_P$ =50 μsec | — | 1.1 | 3.0 | μs |
| Diode Forward Voltage | $V_{FM}$ | $I_{FM}$ =100A | — | 1.9 | 3.25 | V |
| | | $I_{FM}$ =100A, $T_J$ =150°C | — | 1.75 | 3.00 | V |
| Reverse Recovery Time | $t_{rr}$ | $I_{FM}$ =100A, di/dt=25A/μsec, $R_{B1E}$ =.25Ω | — | 4.5 | 10.0 | μs |
| Forward Turn-On Time | $t_{ON}$ | $I_{FM}$ =100A, di/dt=100A/μsec | — | 1.7 | 2.5 | μs |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | Transistor Part | — | — | .4 | °C/W |
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | Diode Part | — | — | .4 | °C/W |

*Resistive Load

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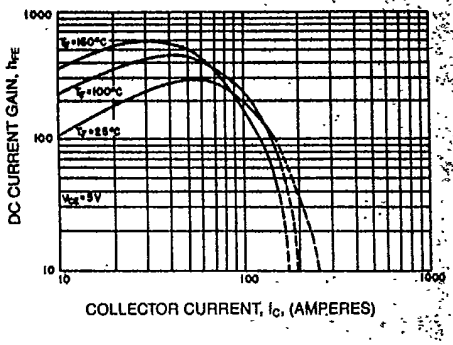
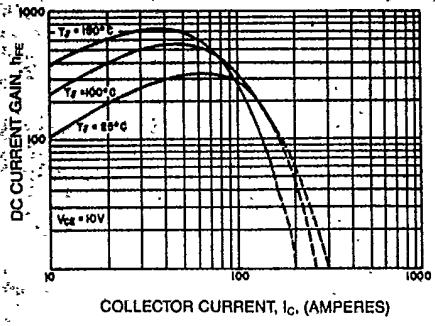
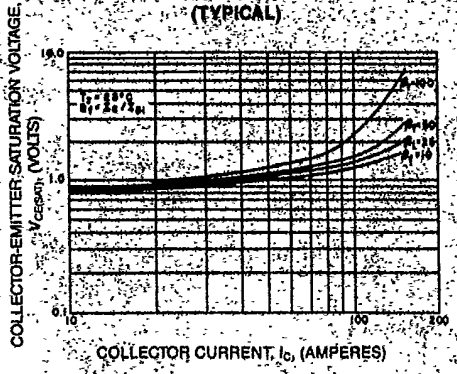
DC CURRENT GAIN (TYPICAL)




DC CURRENT GAIN (TYPICAL)




SATURATION VOLTAGE (TYPICAL)

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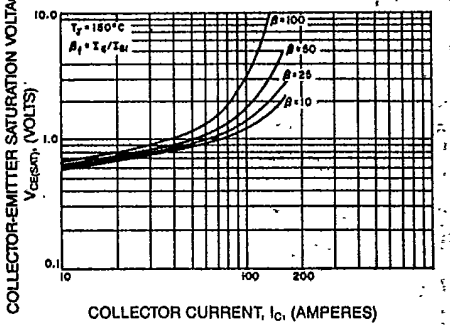


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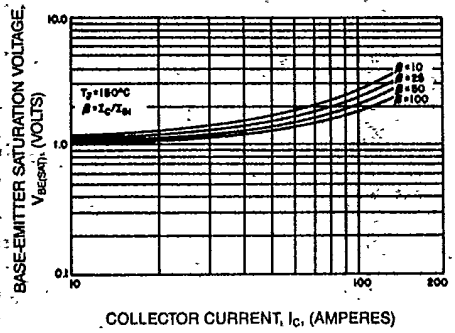
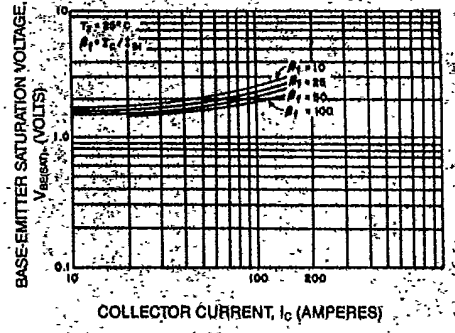
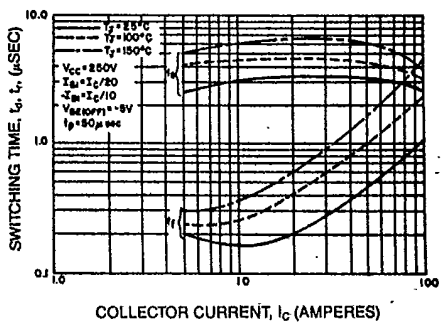


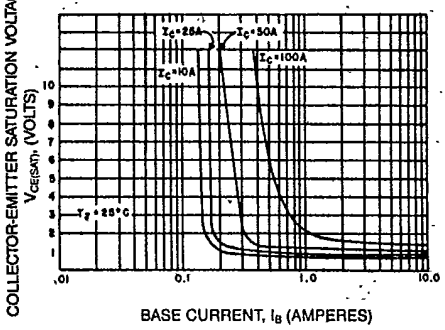

SATURATION VOLTAGE (TYPICAL)



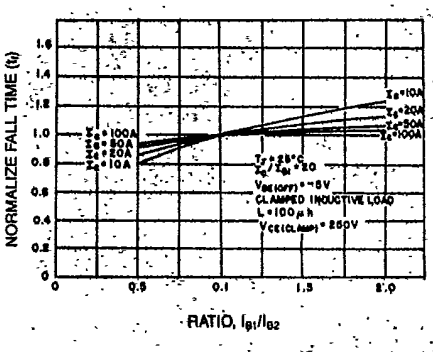

SWITCHING CHARACTERISTICS (TYPICAL)




COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)




SWITCHING TIME VS. BASE CURRENT (TYPICAL)



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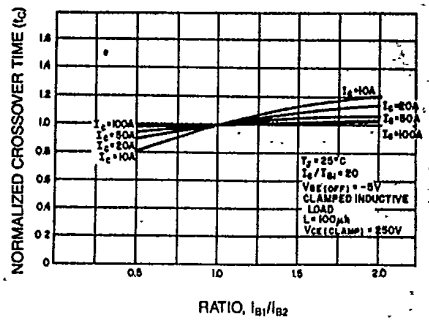
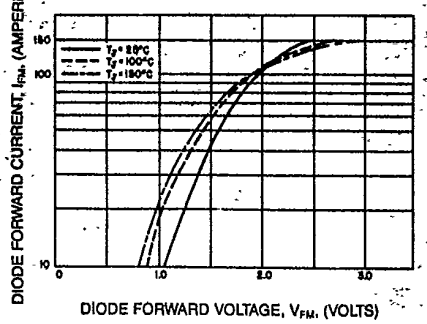
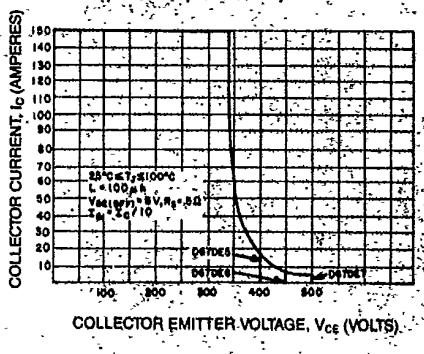
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



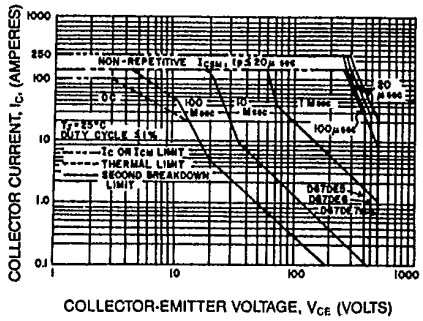

**DIODE CHARACTERISTICS (TYPICAL)**



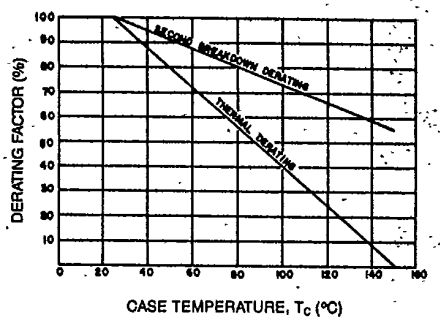

**REVERSE BIAS SAFE OPERATING AREA (R.B.S.O.A.)**



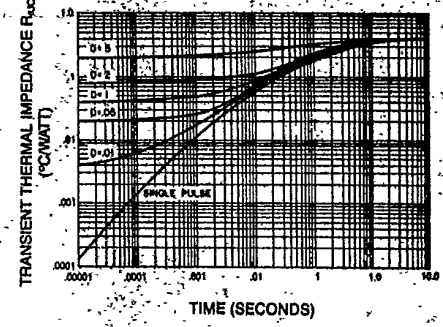

**FORWARD BIAS SAFE OPERATING AREA (S.O.A.)**




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




**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**




**Switching Time Test Circuit**