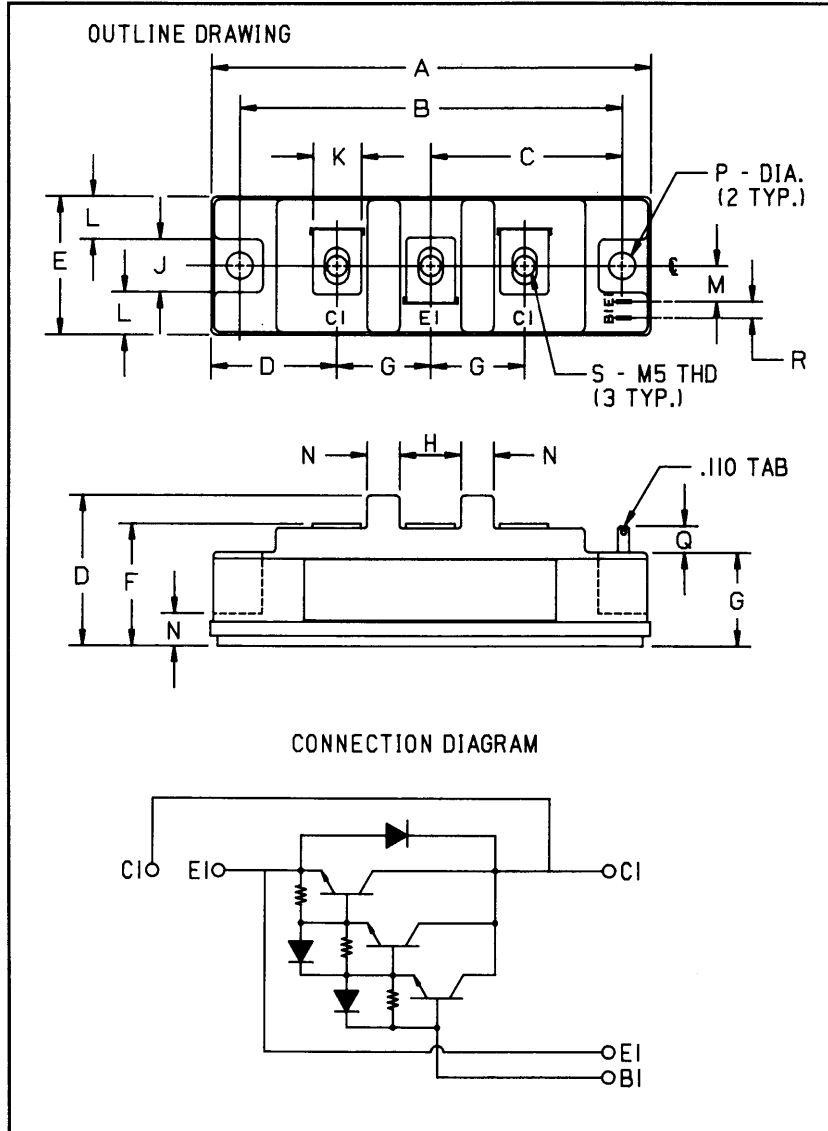


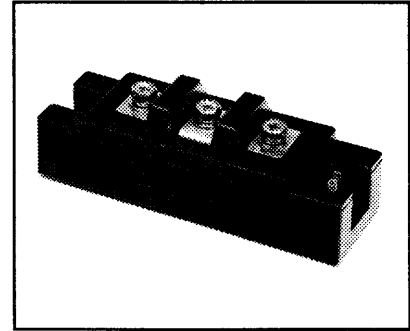
### Single Darlington Transistor Module 150 Amperes/1000 Volts



Outline Drawing

Dimensions	Inches	Millimeters
A	4.252 Max.	108 Max.
B	3.661 ± 0.012	93 ± 0.3
C	1.831	46.5
D	1.457	37
E	1.339 Max.	34 Max.
F	1.181 Max.	30 Max.
G	0.906	23
H	0.591	15
J	0.512	13

Dimensions	Inches	Millimeters
K	0.472	12
L	0.413	10.5
M	0.344	8.75
N	0.315	8
P	0.256 Dia.	6.5 Dia.
Q	0.256 Min.	6.5 Min.
R	0.157	4
S	M5 Metric	M5



#### 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 ( $h_{FE}$ )
- TAB Quick-Connect Terminals
- 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. KS221K15 is a 1000 Volt, 150 Ampere Single Darlington Module.

Type	$V_{CE0(sus)}$ Volts (1000)	Current Rating Amperes (X 10)
KS22	1K	15



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

**KS221K15**  
**Single Darlington Transistor Module**  
 150 Amperes/1000 Volts

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

Ratings	Symbol	KS221K15	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, $V_{BE} = -2\text{V}$	$V_{CEV(sus)}$	1000	Volts
Collector-Base Voltage	$V_{CBO}$	1000	Volts
Emitter-Base Voltage	$V_{EBO}$	7	Volts
Collector-Emitter Voltage	$V_{CEV}$	1000	Volts
Continuous Collector Current	$I_C$	150	Amperes
Diode Forward Current	$I_{FM}$	150	Amperes
Continuous Base Current	$I_B$	8	Amperes
Diode Surge Current	$I_{FSM}$	1500	Amperes
Power Dissipation	$P_t$	1000	Watts
Max. Mounting Torque M5 Terminal Screws	-	17	in.-lb.
Max. Mounting Torque M6 Mounting Screws	-	26	in.-lb.
Module Weight (Typical)	-	250	Grams
V Isolation	$V_{RMS}$	2500	Volts

**Electrical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current	$I_{CEV}$	$V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}$	-	-	2	mA
		$V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}, T_C = 125^\circ\text{C}$	-	-	20	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7\text{V}$	-	-	400	mA
DC Current Gain	$h_{FE}$	$I_C = 150\text{A}, V_{CE} = 5\text{V}$	100	-	-	-
Diode Forward Voltage	$V_{FM}$	$I_{FM} = 150\text{A}$	-	-	1.8	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{A}, I_B = 2\text{A}$	-	-	2.5	Volts
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{A}, I_B = 2\text{A}$	-	-	3.5	Volts
Resistive	Turn-on	$t_{on}$				
		$V_{CC} = 600\text{V}$	-	-	3.0	$\mu\text{s}$
Load	Storage Time	$t_s$				
		$I_C = 150\text{A}$	-	-	15	$\mu\text{s}$
Switch Times	Fall Time	$t_f$				
		$I_{B1} = 2\text{A}, I_{B2} = -2\text{A}$	-	-	3.0	$\mu\text{s}$

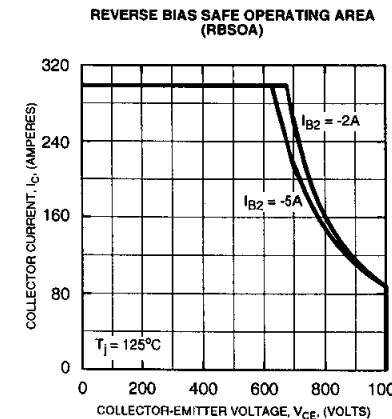
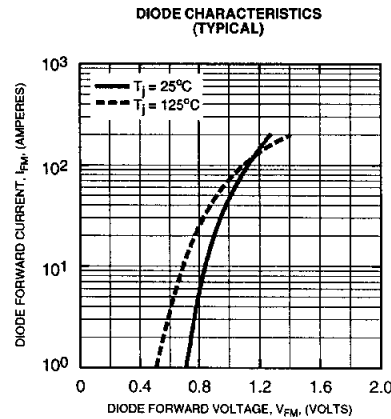
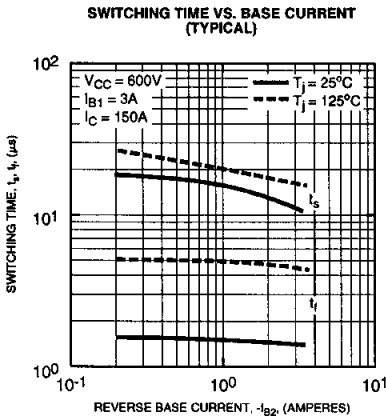
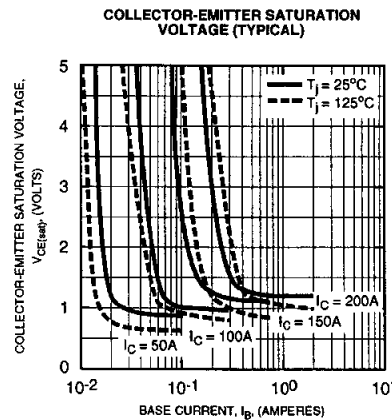
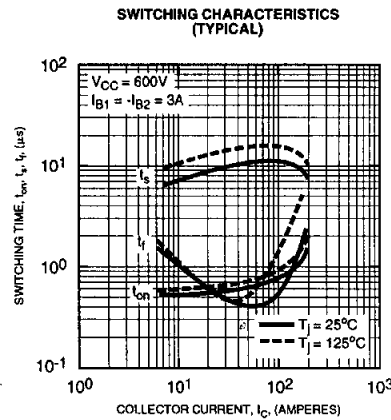
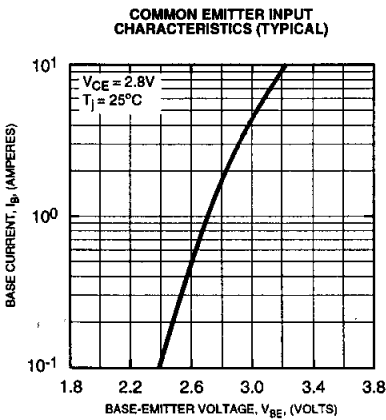
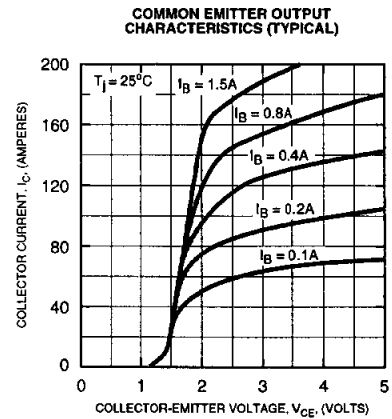
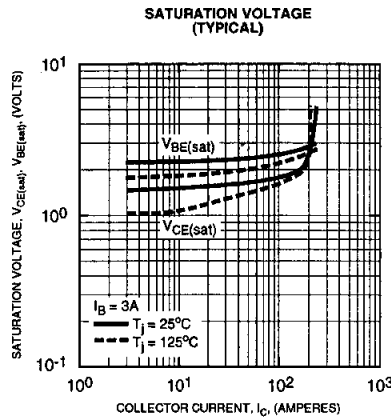
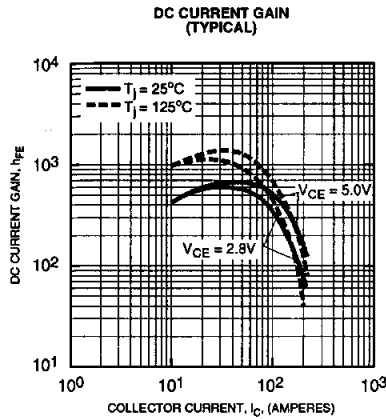
**Thermal and Mechanical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c-s)}$	-	-	-	0.13	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	-	-	0.125	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	-	-	0.6	$^\circ\text{C/W}$



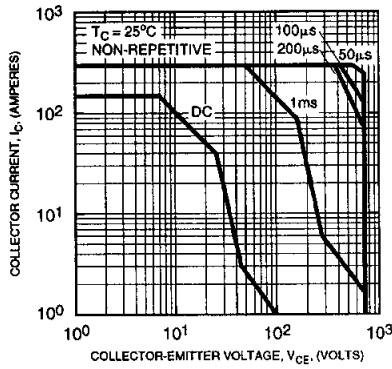
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

**KS221K15**  
**Single Darlington Transistor Module**  
 150 Amperes/1000 Volts

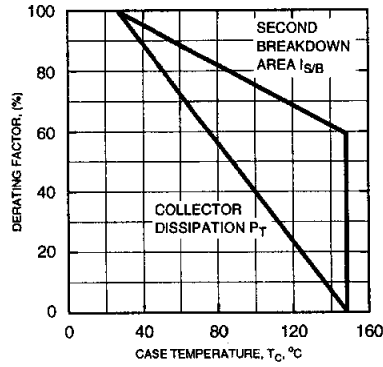


**KS221K15**  
**Single Darlington Transistor Module**  
 150 Amperes/1000 Volts

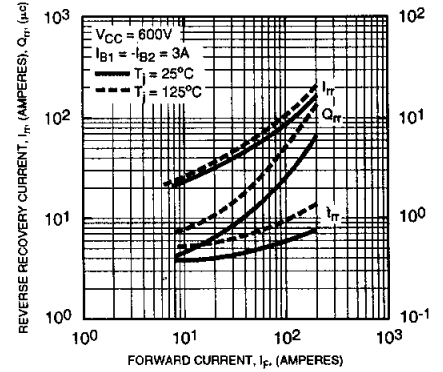
**FORWARD BIAS SAFE OPERATING AREA (SOA)**



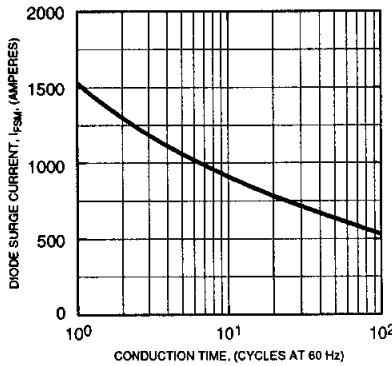
**DERATING FACTOR OF SAFE OPERATING AREA (SOA)**



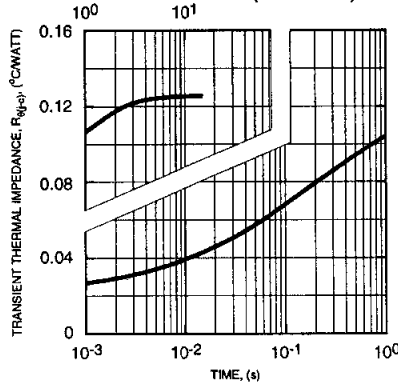
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

