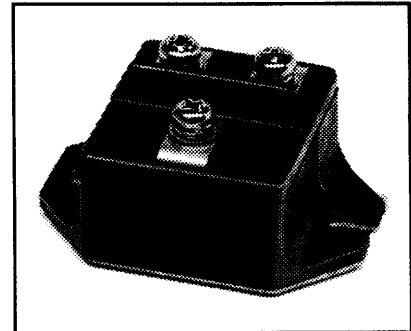
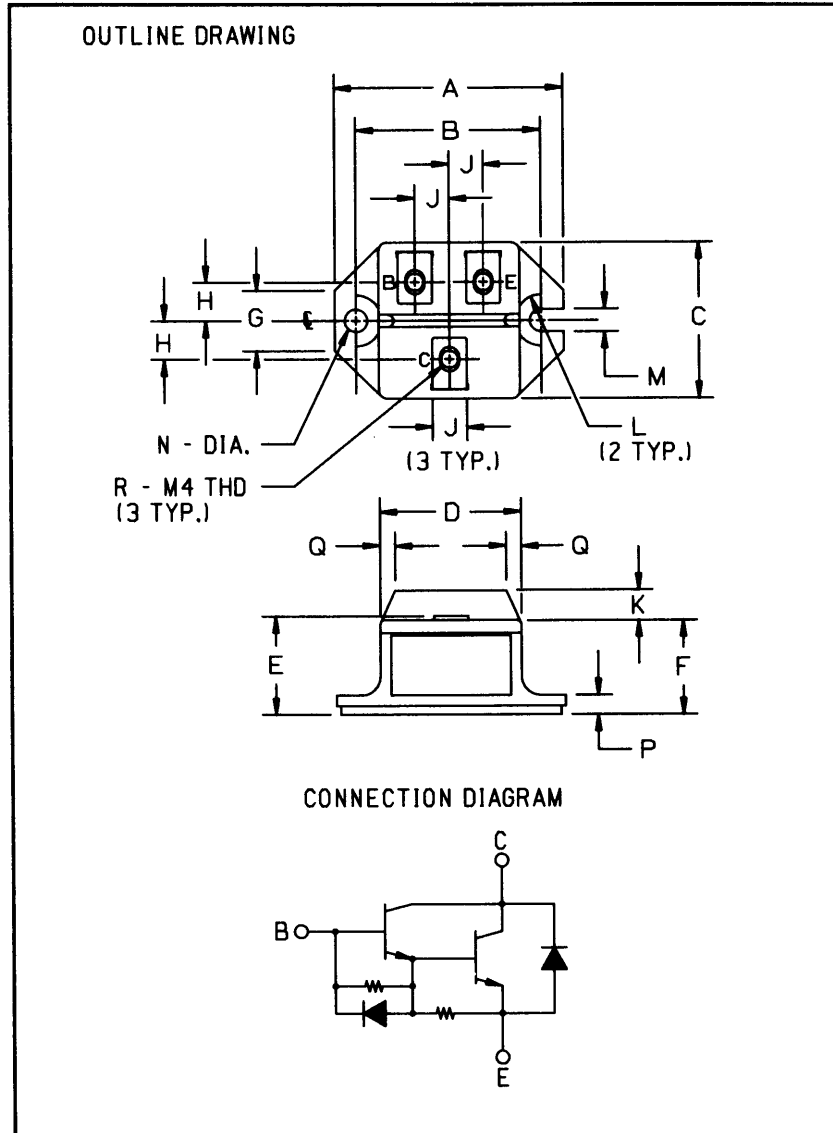


### Single Darlington Transistor Module 30 Amperes/600 Volts



**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. KS524503 is a 450  $V_{CE0(sus)}$  (600  $V_{CEV}$ ), 30 Ampere Single Darlington Module.

Outline Drawing

Dimensions	Inches	Millimeters
A	2.106	53.5
B	1.705 ± 0.008	43.3 ± 0.02
C	1.437	36.5
D	1.299	33
E	0.925	23.5
F	0.866	22
G	0.551	14
H	0.354	9

Dimensions	Inches	Millimeters
J	0.315	8
K	0.276	7
L	0.236 Rad.	6 Rad.
M	0.209	5.3
N	0.209 Dia.	5.3 Dia.
P	0.177	4.5
Q	0.138	3.5
R	M4 Metric	M4

Type	$V_{CE0(sus)}$ Volts (X 10)	Current Rating Amperes (x 10)
KS52	45	03



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

**KS524503**  
**Single Darlington Transistor Module**  
 30 Amperes/600 Volts

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

Ratings	Symbol	KS524503	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, $V_{BE} = -2\text{V}$	$V_{CEV(sus)}$	600	Volts
Collector-Base Voltage	$V_{CBO}$	600	Volts
Emitter-Base Voltage	$V_{EBO}$	7	Volts
Continuous Collector Current	$I_C$	30	Amperes
Diode Forward Current	$I_{FM}$	30	Amperes
Continuous Base Current	$I_B$	1.8	Amperes
Diode Surge Current	$I_{FSM}$	300	Amperes
Power Dissipation	$P_t$	250	Watts
Max. Mounting Torque M4 Terminal Screws	-	12	in.-lb.
Max. Mounting Torque M5 Mounting Screws	-	17	in.-lb.
Module Weight (Typical)	-	90	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	$I_{CEV}$	$V_{CE} = V_{CEV}, V_{BE} = -2\text{V}$	-	-	1	mA	
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7\text{V}$	-	-	200	mA	
DC Current Gain	$h_{FE}$	$I_C = 30\text{A}, V_{CE} = 2\text{V}$	75	-	-	-	
		$I_C = 30\text{A}, V_{CE} = 5\text{V}$	100	-	-	-	
Diode Forward Voltage	$V_{FM}$	$I_{FM} = 30\text{A}$	-	-	1.85	Volts	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 30\text{A}, I_B = 0.4\text{A}$	-	-	2.0	Volts	
Base-emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 30\text{A}, I_B = 0.4\text{A}$	-	-	2.5	Volts	
Resistive	Turn-on	$t_{on}$	$V_{CC} = 300\text{V}$	-	-	1.5	$\mu\text{s}$
Load	Storage Time	$t_s$	$I_C = 30\text{A}$	-	-	12	$\mu\text{s}$
Switch Times	Fall Time	$t_f$	$I_{B1} = -I_{B2} = 0.6\text{A}$	-	-	3.0	$\mu\text{s}$

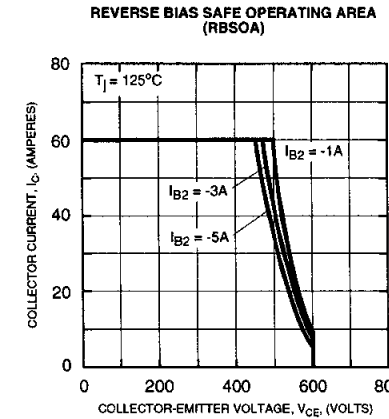
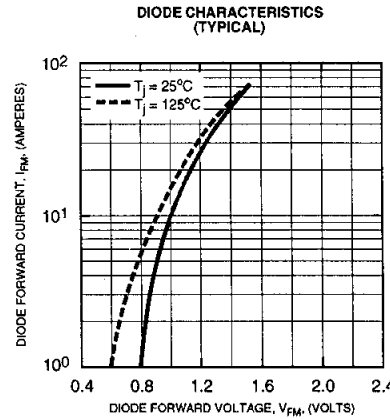
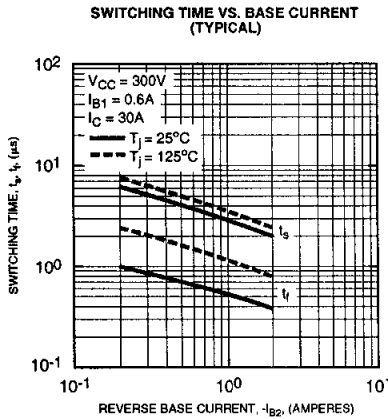
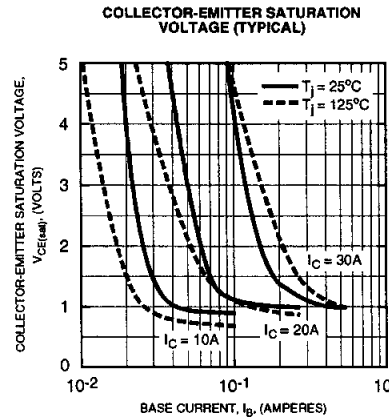
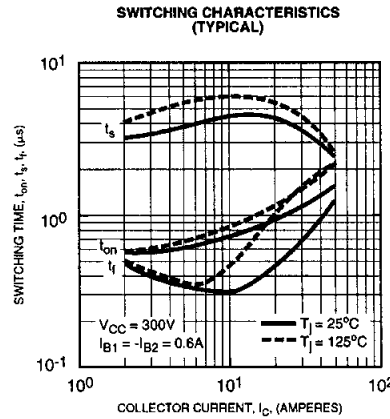
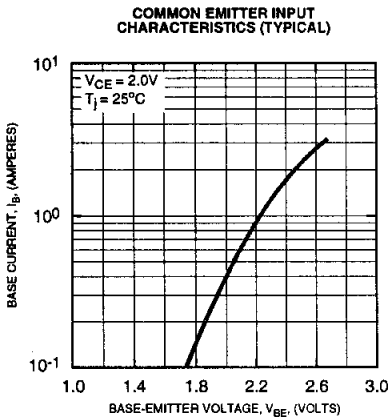
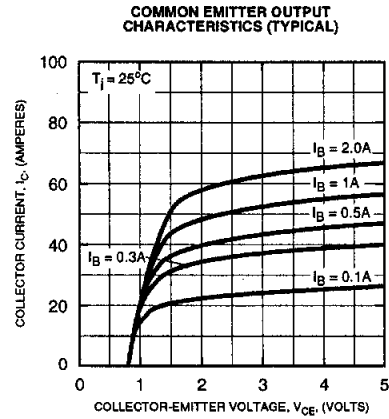
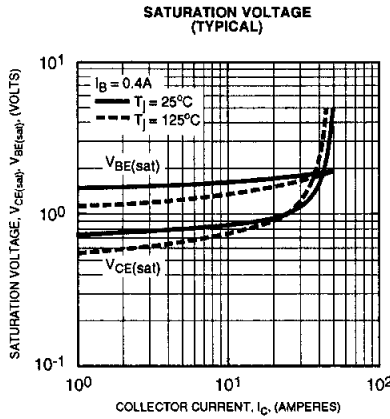
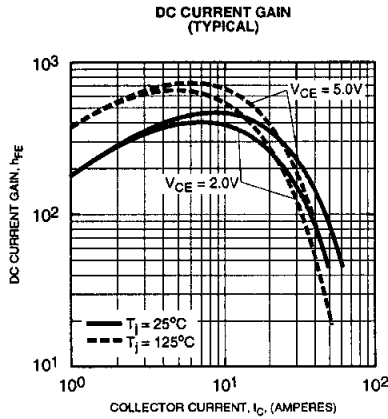
**Thermal and Mechanical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c-s)}$	-	-	-	0.15	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	-	-	0.5	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	-	-	2.0	$^\circ\text{C/W}$



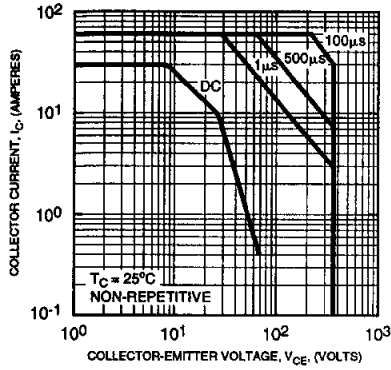
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**KS524503**  
**Single Darlington Transistor Module**  
**30 Amperes/600 Volts**

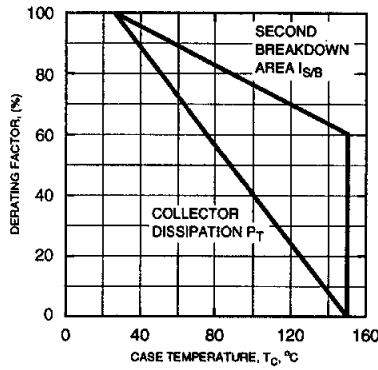


**KS524503**  
**Single Darlington Transistor Module**  
**30 Amperes/600 Volts**

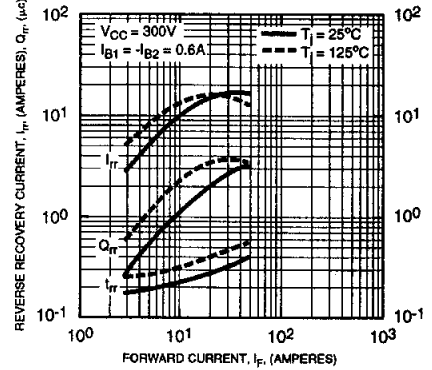
**FORWARD BIAS SAFE OPERATING AREA (SOA)**



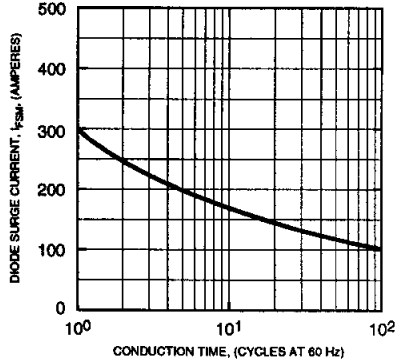
**DERATING FACTOR OF SAFE OPERATING AREA (SOA)**



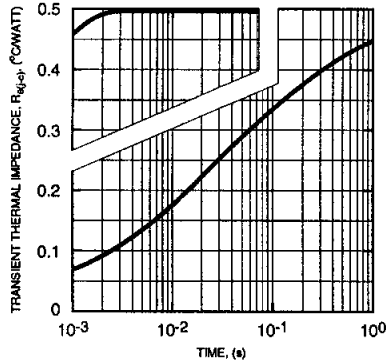
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

