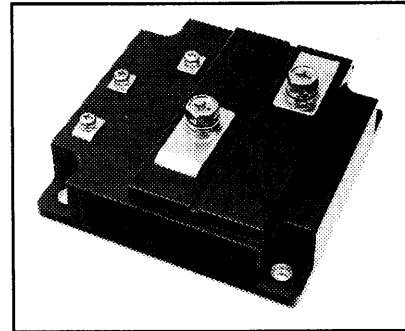
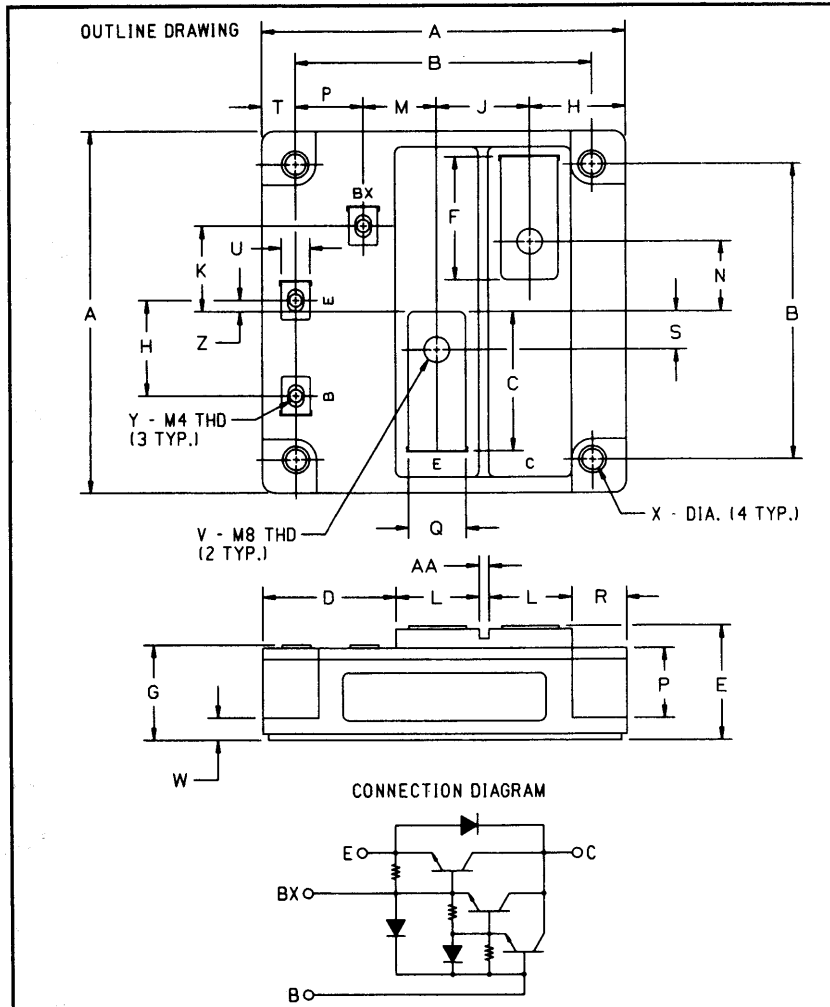


### Single Darlington Transistor Module 600 Amperes/1000 Volts



#### 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. KS621K60 is a 1000 Volt, 600 Ampere Single Darlington Module.

Outline Drawing

Dimensions	Inches	Millimeters
A	4.448	114
B	3.661 ± 0.012	93 ± 0.3
C	1.654	42.
D	1.417 Max.	36 Max.
E	1.181 Max.	30 Max.
F	1.181	30
G	1.142	29
H	1.063	27
J	1.024	26
K	0.906	23
L	0.866	22

Dimensions	Inches	Millimeters
M	0.846	21.5
N	0.709	18
P	0.669	17
Q	0.472	12
R	0.413	10.5
S	0.354	9
T	M8 Metric	M8
U	0.276	7
V	0.256 Dia.	6.5 Dia.
W	M4 Metric	M4
X	0.118	3

Type	V <sub>CEO(sus)</sub> Volts (1000)	Current Rating Amperes (X 10)
KS62	1K	60



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

**KS621K60**  
**Single Darlington Transistor Module**  
**600 Amperes/1000 Volts**

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

Ratings	Symbol	KS621K60	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	$I_C$	600	Amperes
Diode Forward Current	$I_{FM}$	600	Amperes
Continuous Base Current	$I_B$	30	Amperes
Diode Surge Current	$I_{FSM}$	6000	Amperes
Power Dissipation	$P_t$	3500	Watts
Max. Mounting Torque M8 Terminal Screws (E, C)	—	95	in.-lb.
Max. Mounting Torque M4 Terminal Screws (B, Bx, E)	—	12	in.-lb.
Max. Mounting Torque M6 Mounting Screws	—	26	in.-lb.
Modular Weight (Typical)	—	1100	Grams
V Isolation	$V_{RMS}$	2500	Volts

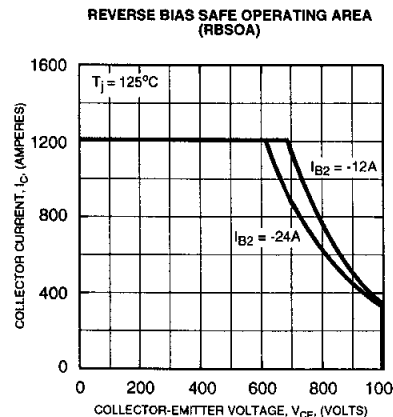
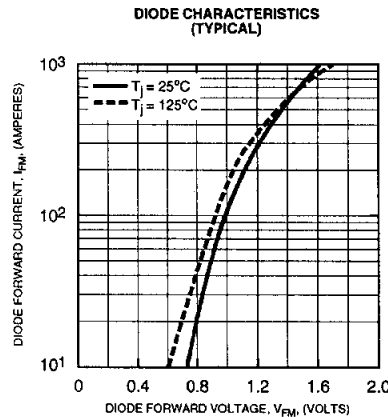
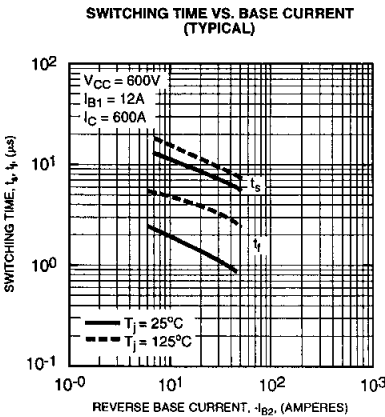
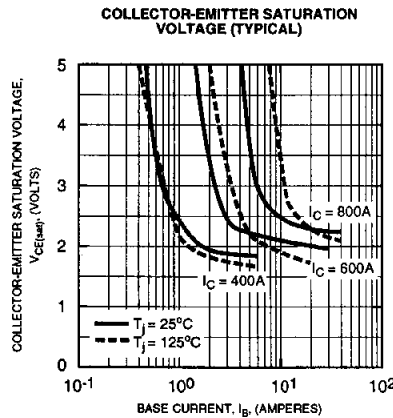
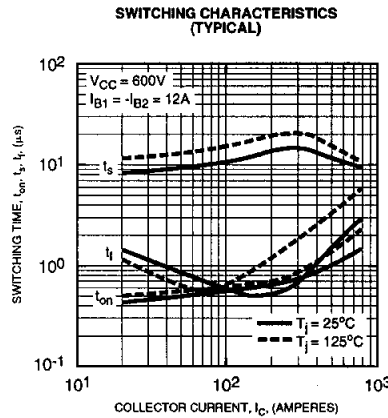
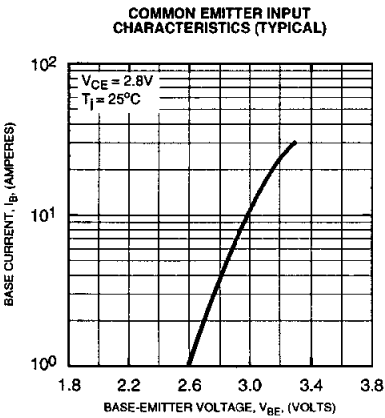
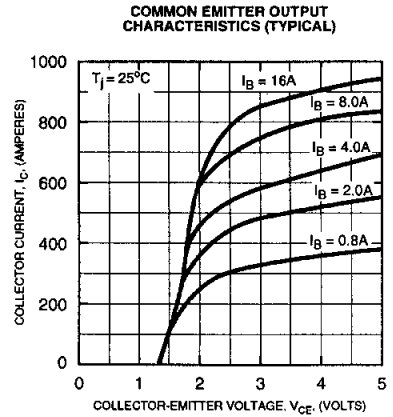
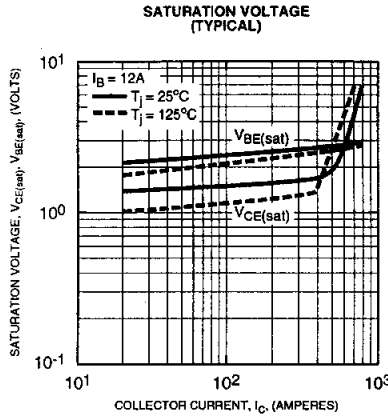
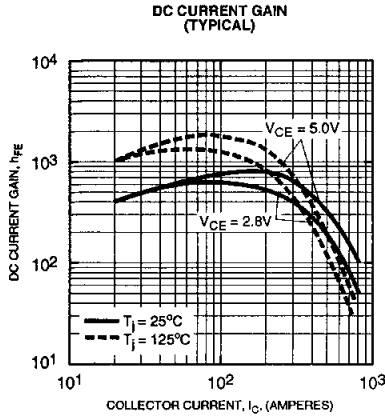
**Electrical Characteristics,  $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified**

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Collector Cutoff Current	$I_{CEV}$	$V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}$	—	—	8	mA	
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7\text{V}$	—	—	800	mA	
DC Current Gain	$h_{FE}$	$I_C = 600\text{A}, V_{CE} = 2.8\text{V}$	75	—	—	—	
Diode Forward Voltage	$V_{FM}$	$I_{FM} = 600\text{A}$	—	—	1.8	Volts	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 600\text{A}, I_B = 12.0\text{A}$	—	—	2.5	Volts	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 600\text{A}, I_B = 12.0\text{A}$	—	—	3.5	Volts	
Resistive	Turn-on	$t_{on}$	$V_{CC} = 600\text{V}$	—	—	3.0	$\mu\text{s}$
Load	Storage Time	$t_s$	$I_C = 600\text{A}$	—	—	16	$\mu\text{s}$
Switch Times	Fall Time	$t_f$	$I_{B1} = -I_{B2} = 12.0\text{A}$	—	—	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	$R_{\theta(c-s)}$	—	—	—	0.02	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	—	—	0.035	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	—	—	0.16	$^\circ\text{C/W}$

**KS621K60**  
**Single Darlington Transistor Module**  
**600 Amperes/1000 Volts**

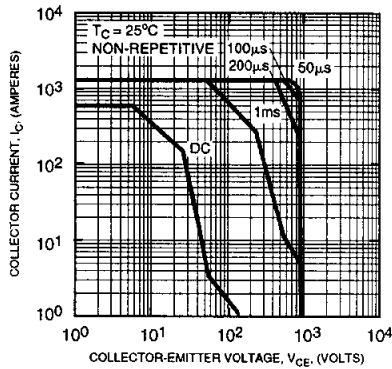




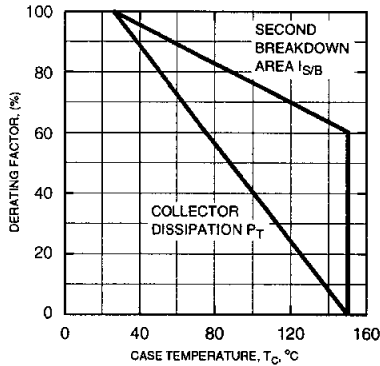
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**KS621K60**  
**Single Darlington Transistor Module**  
 600 Amperes/1000 Volts

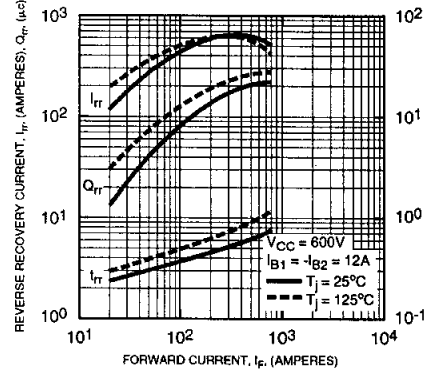
**FORWARD BIAS SAFE OPERATING AREA (SOA)**



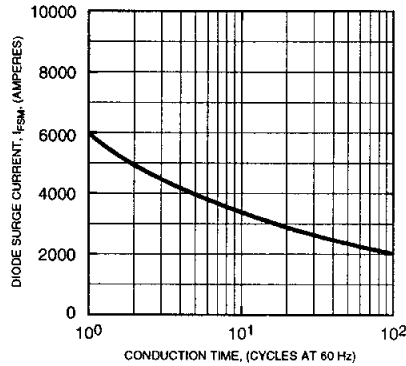
**DERATING FACTOR OF SAFE OPERATING AREA (SOA)**



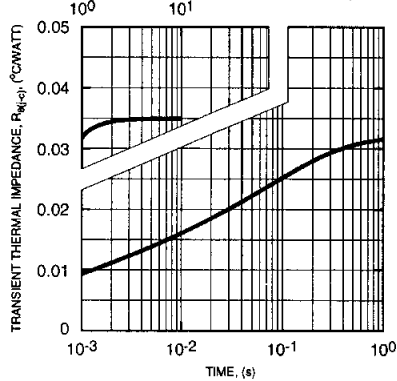
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

