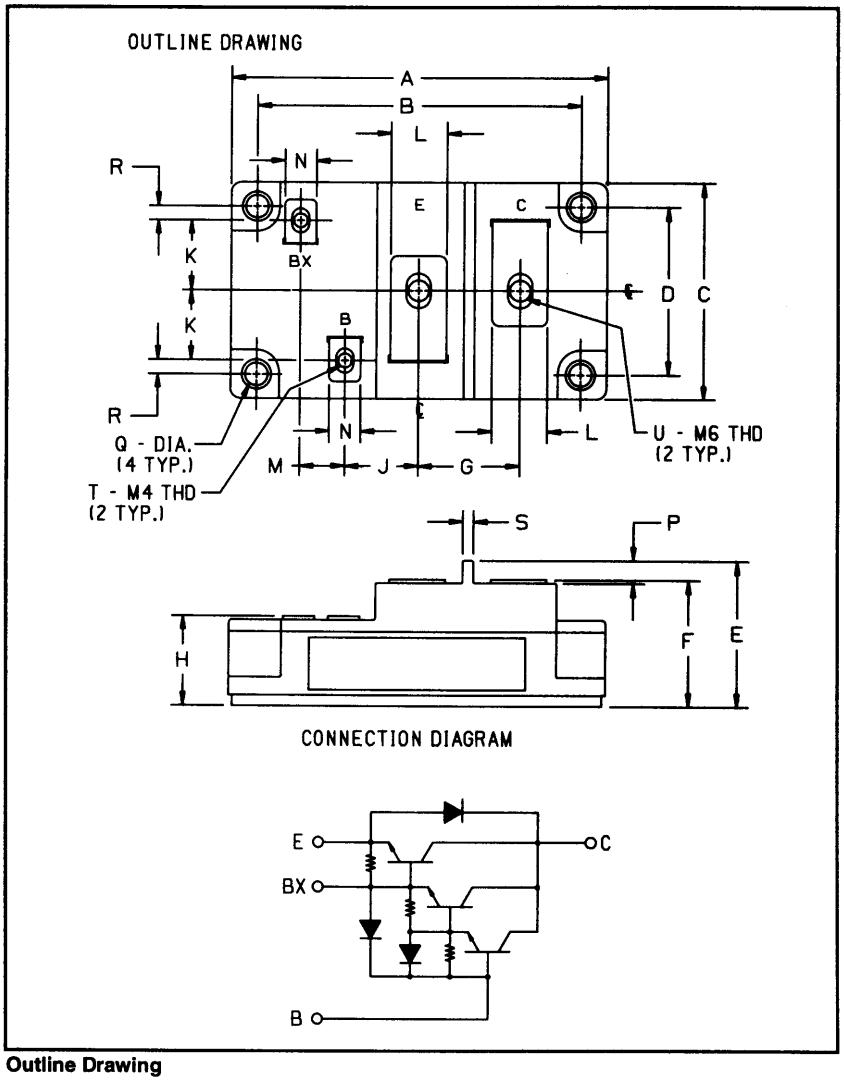
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

KS621K30

Single Darlington Transistor Module

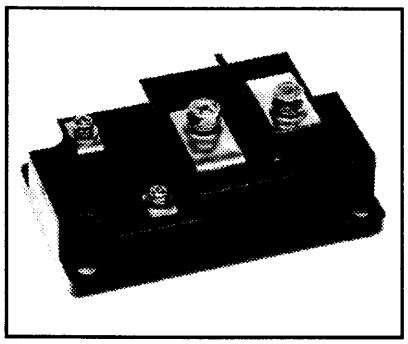
300 Amperes/1000 Volts



Outline Drawing

Dimensions	Inches	Millimeters
A	4.252 Max.	108 Max.
B	3.661 ± 0.012	93 ± 0.3
C	2.441 Max.	62 Max.
D	1.890 ± 0.012	48 ± 0.3
E	1.634 Max.	41.5 Max.
F	1.417 Max.	36 Max.
G	1.142	29
H	1.004	25.5
J	0.827	21
K	0.787	20

Dimensions	Inches	Millimeters
L	0.630	16
M	0.512	13
N	0.354	9
P	0.256	6.5
Q	0.256 Dia.	6.5 Dia.
R	0.157	4
S	0.118	3
T	M4 Metric	M4
U	M6 Metric	M6



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. KS621K30 is a 1000 Volt, 300 Ampere Single Darlington Module.

Type	$V_{CEO(sus)}$ Volts (1000)	Current Rating Amperes (X 10)
KS62	1K	30

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

KS621K30
Single Darlington Transistor Module
300 Amperes/1000 Volts

Absolute Maximum Ratings, T_j = 25 °C unless otherwise specified

Ratings	Symbol	KS621K30	Units
Junction Temperature	T_j	-40 to 150	°C
Storage Temperature	T_{stg}	-40 to 125	°C
Collector-Emitter Sustaining Voltage, V_{BE} = -2V	$V_{CEV(sus)}$	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	300	Amperes
Diode Forward Current	I_{FM}	300	Amperes
Continuous Base Current	I_B	16	Amperes
Diode Surge Current	I_{FSM}	3000	Amperes
Power Dissipation	P_t	1980	Watts
Max. Mounting Torque M6 Terminal Screws (E, C)	–	26	in.-lb.
Max. Mounting Torque M4 Terminal Screws (B, Bx)	–	12	in.-lb.
Max. Mounting Torque M6 Mounting Screws	–	26	in.-lb.
Modular Weight (Typical)	–	470	Grams
V Isolation	V_{RMS}	2500	Volts

Electrical Characteristics, T_j = 25 °C unless otherwise specified

Characteristics		Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current		I_{CEV}	V_{CE} = 1000V, V_{BE} = -2V	–	–	4	mA
			V_{CE} = 1000V, V_{BE} = -2V, T_C = 125°C	–	–	30	mA
Emitter Cutoff Current		I_{EBO}	V_{EB} = 7V	–	–	800	mA
DC Current Gain		h_{FE}	I_C = 300A, V_{CE} = 2.8V	75	–	–	–
			I_C = 300A, V_{CE} = 5.0V	100	–	–	–
Diode Forward Voltage		V_{FM}	I_{FM} = 300A	–	–	1.8	Volts
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C = 300A, I_B = 6.0A	–	–	2.5	Volts
Base-Emitter Saturation Voltage		$V_{BE(sat)}$	I_C = 300A, I_B = 6.0A	–	–	3.5	Volts
Resistive	Turn-on	t_{on}	V_{CC} = 600V	–	–	3.0	µs
Load	Storage Time	t_s	I_C = 300A	–	–	15	µs
Switch Times	Fall Time	t_f	I_{B1} = 6A, I_{B2} = -6A	–	–	3.0	µs

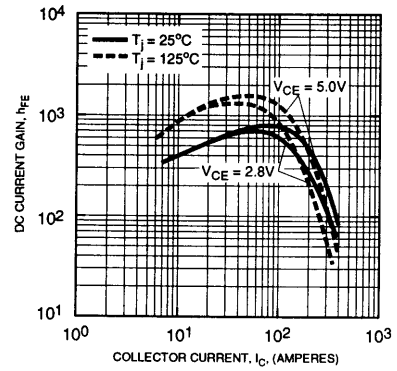
Thermal and Mechanical Characteristics, T_j = 25 °C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c\text{-}s)}$	–	–	–	0.04	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta(j\text{-}c)}$	Transistor Part	–	–	0.063	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta(j\text{-}c)}$	Diode Part	–	–	0.3	°C/W

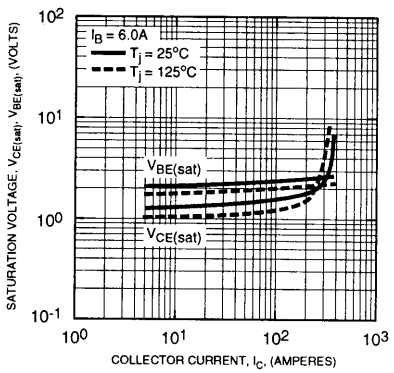
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

KS621K30
Single Darlington Transistor Module
300 Amperes/1000 Volts

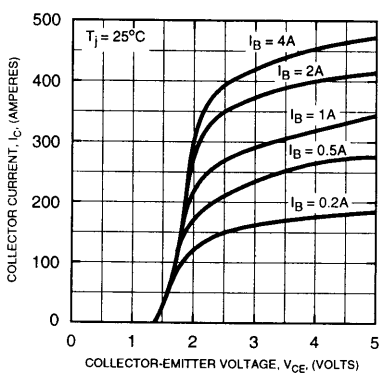
DC CURRENT GAIN (TYPICAL)



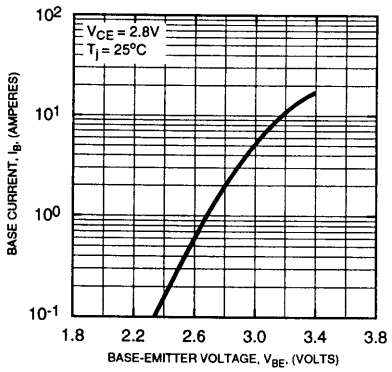
SATURATION VOLTAGE (TYPICAL)



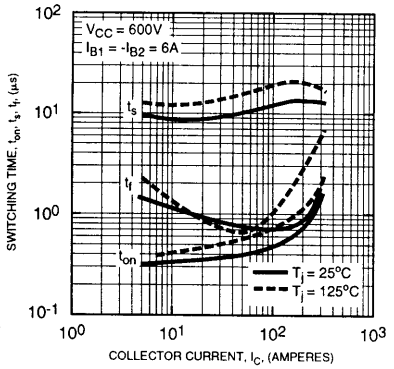
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



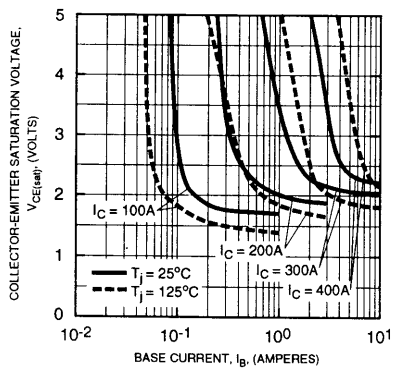
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



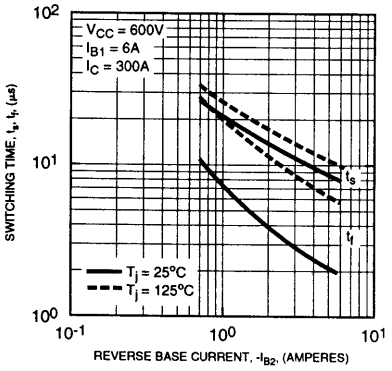
SWITCHING CHARACTERISTICS (TYPICAL)



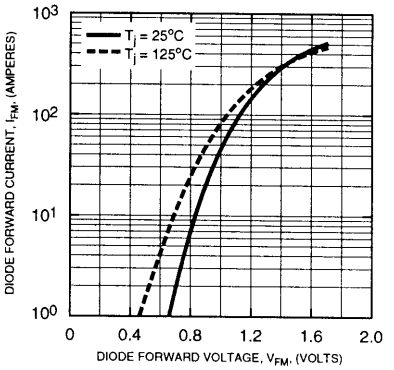
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



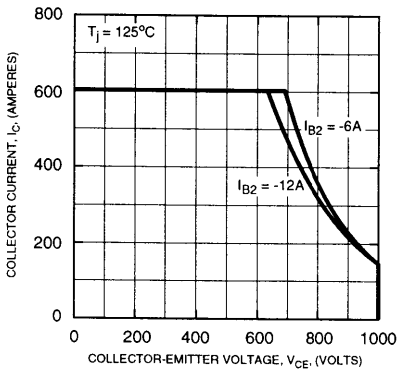
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



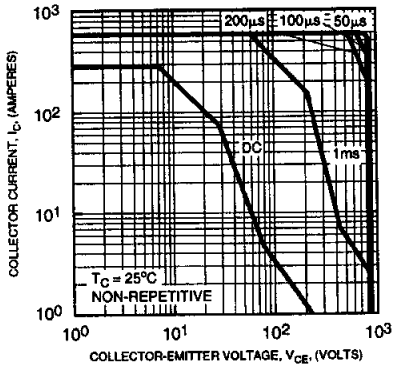
REVERSE BIAS SAFE OPERATING AREA (RBSOA)



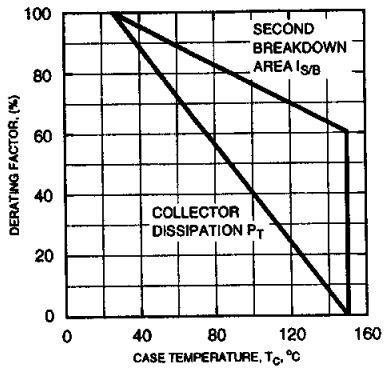
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

KS621K30
Single Darlington Transistor Module
300 Amperes/1000 Volts

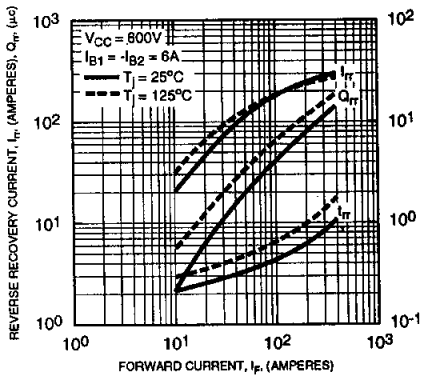
FORWARD BIAS SAFE OPERATING AREA (SOA)



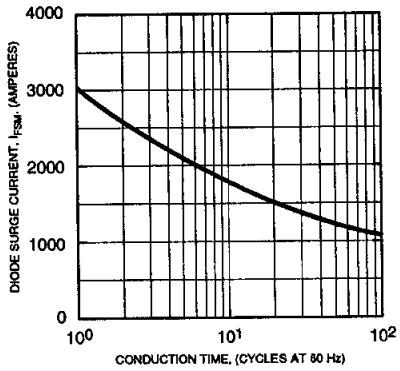
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



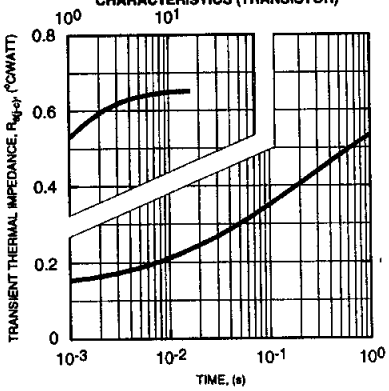
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)