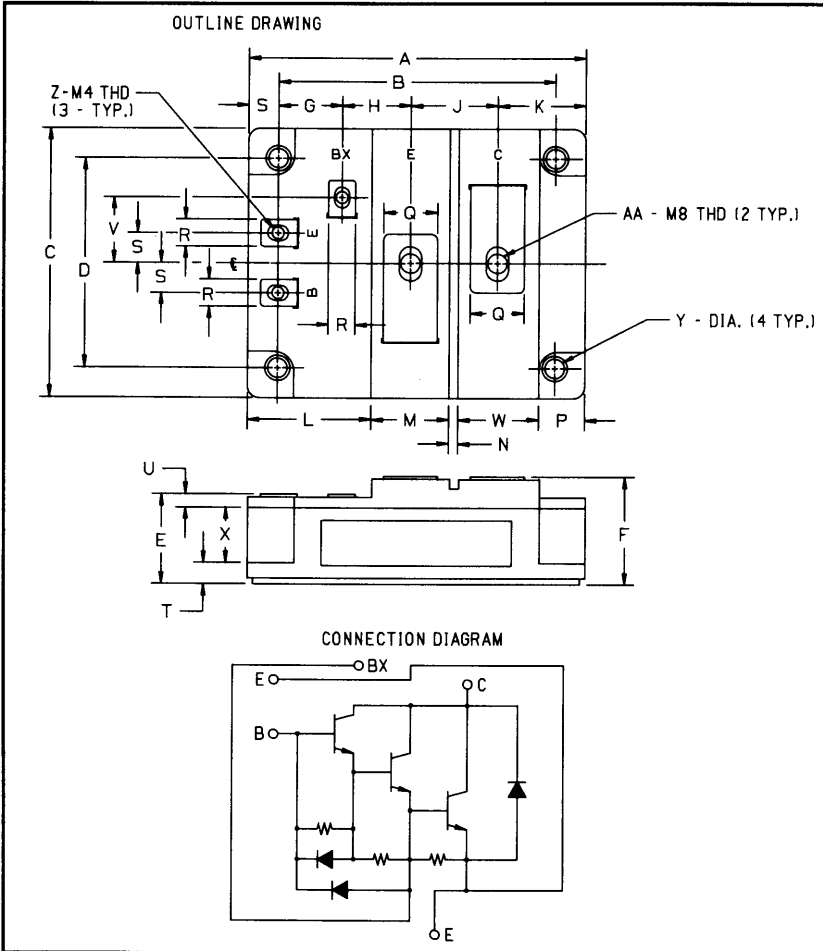


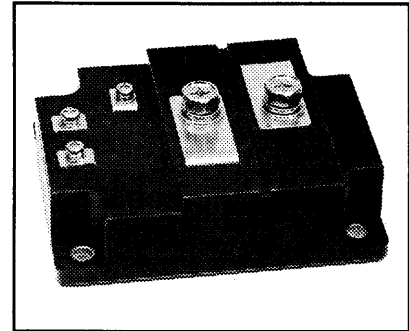
Single Darlington Transistor Module 400 Amperes/1000 Volts



Outline Drawing

Dimensions	Inches	Millimeters
A	4.449 Max.	113 Max.
B	3.661 ± 0.012	93 ± 0.3
C	3.543 Max.	90 Max.
D	2.756 ± 0.012	70 ± 0.3
E	1.181 Max.	30 Max.
F	1.417 Max.	36 Max.
G	0.846	21.5
H	0.906	23
J	1.142	29
K	1.161	29.5
L	1.634	41.5
M	1.024	26
N	0.118	3

Dimensions	Inches	Millimeters
P	0.610	15.5
Q	0.709	18
R	0.354	9
S	0.394	10
T	0.276	7
U	0.177	4.5
V	0.866	22
W	1.063	27
X	0.728	18.5
Y	0.256 Dia.	6.5 Dia.
Z	M4 Metric	M4
AA	M8 Metric	M8



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. KS621K40 is a 1000 Volt, 400 Ampere Single Darlington Module.

Type	V _{CEO(sus)} Volts (1000)	Current Rating Amperes (X 10)
KS62	1K	40



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

KS621K40
Single Darlington Transistor Module
 400 Amperes/1000 Volts

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

Ratings	Symbol	KS621K40	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, $V_{BE} = -2\text{V}$	$V_{CEV(\text{sus})}$	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	400	Amperes
Diode Forward Current	I_{FM}	400	Amperes
Continuous Base Current	I_B	20	Amperes
Diode Surge Current	I_{FSM}	4000	Amperes
Power Dissipation	P_t	3120	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)	-	870	Grams
V Isolation	V_{RMS}	2500	Volts

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

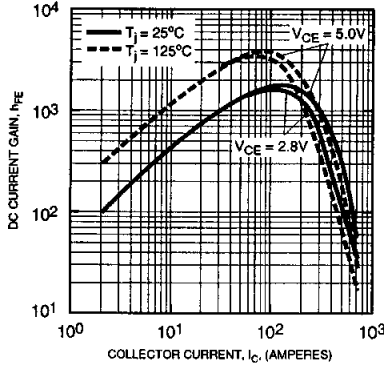
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current	I_{CEV}	$V_{CE} = 1000\text{V}$, $V_{BE} = -2\text{V}$	-	-	8	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	-	-	600	mA
DC Current Gain	h_{FE}	$I_C = 400\text{A}$, $V_{CE} = 2.8\text{V}$	75	-	-	-
Diode Forward Voltage	V_{FM}	$I_{FM} = 400\text{A}$	-	-	1.8	Volts
Collector-Emitter Saturation Voltage	$V_{CE(\text{sat})}$	$I_C = 400\text{A}$, $I_B = 8\text{A}$	-	-	2.5	Volts
Base-Emitter Saturation Voltage	$V_{BE(\text{sat})}$	$I_C = 400\text{A}$, $I_B = 8\text{A}$	-	-	3.5	Volts
Resistive Turn-on	t_{on}	$V_{CC} = 600\text{V}$	-	-	3.0	μs
Load Storage Time	t_s	$I_C = 400\text{A}$	-	-	16	μs
Switch Times Fall Time	t_f	$I_{B1} = I_{B2} = -8\text{A}$	-	-	3.0	μs

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

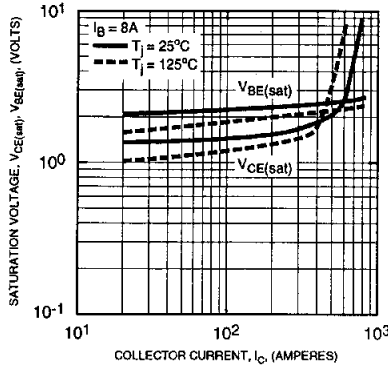
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c-s)}$	-	-	-	0.02	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	-	-	0.04	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	-	-	0.175	$^\circ\text{C/W}$

KS621K40
Single Darlington Transistor Module
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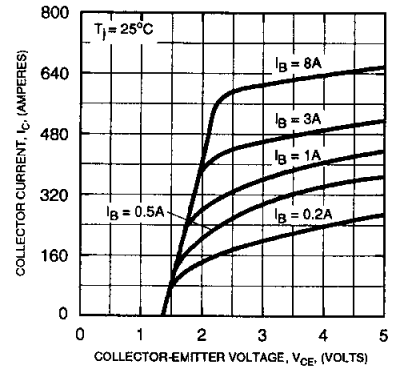
DC CURRENT GAIN (TYPICAL)



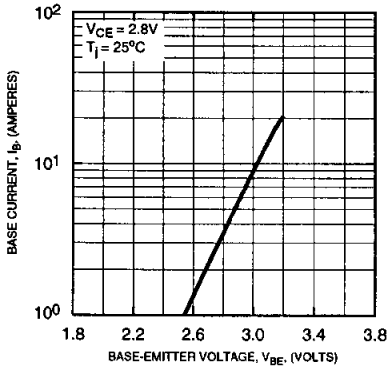
SATURATION VOLTAGE (TYPICAL)



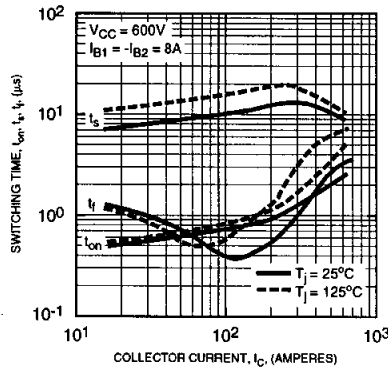
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



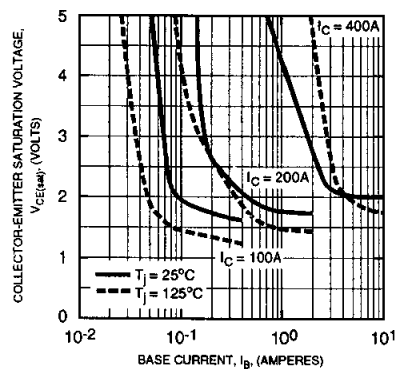
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



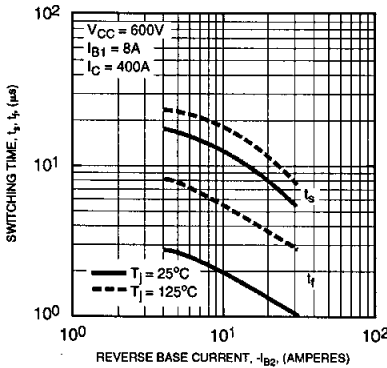
SWITCHING CHARACTERISTICS (TYPICAL)



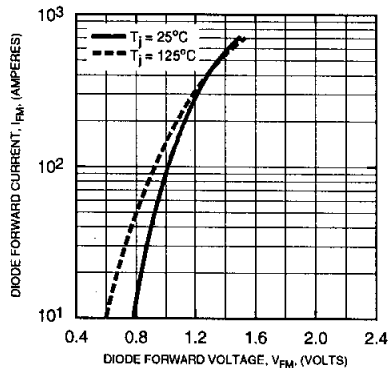
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



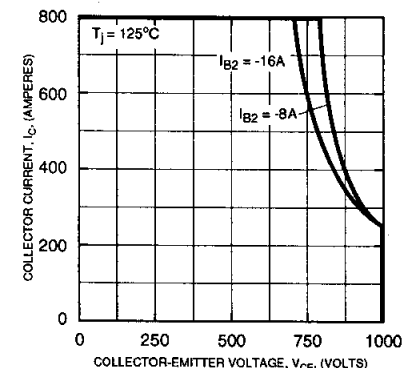
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)

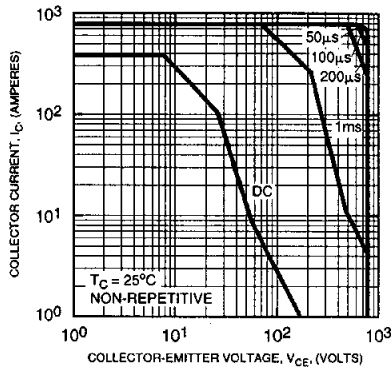


REVERSE BIAS SAFE OPERATING AREA (RBSOA)

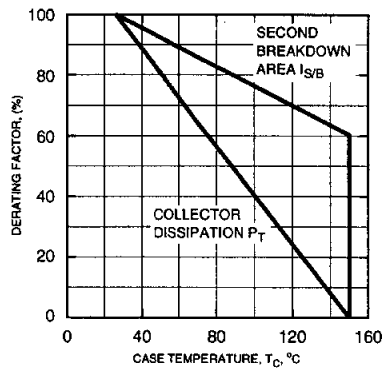


KS621K40
Single Darlington Transistor Module
 400 Amperes/1000 Volts

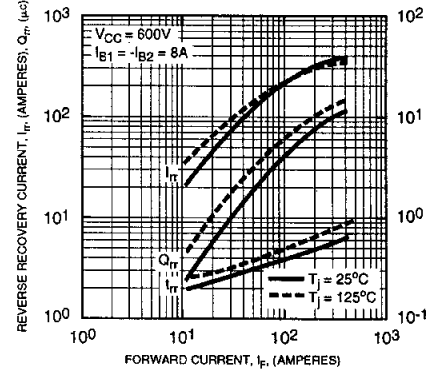
FORWARD BIAS SAFE OPERATING AREA (SOA)



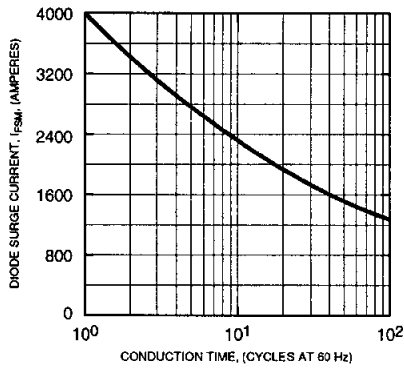
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



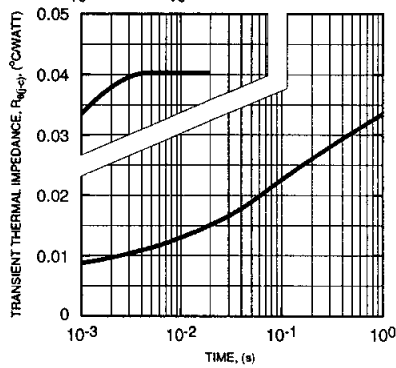
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

