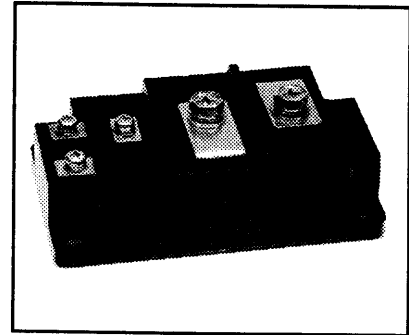
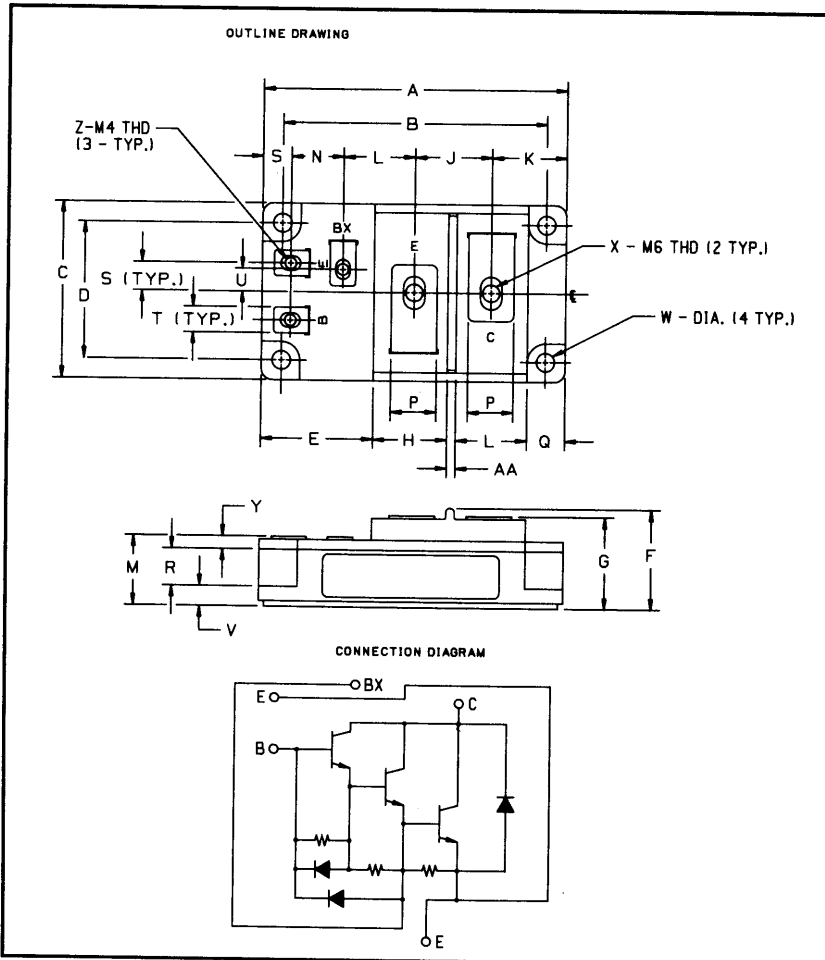


High-Beta Single Darlington Transistor Module 400 Amperes/600 Volts



Description:

The Powerex High-Beta 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. KS624540 is a 450 $V_{CE0(sus)}$ (600 V_{CEV}), 400 Ampere Single Darlington Module.

Outline Drawing

Dimensions	Inches	Millimeters
A	4.212	107
B	3.661	93
C	2.441	62
D	1.890 $\pm$ 0.010	48 $\pm$ 0.25
E	1.476	37.5
F	1.378 Max.	35 Max.
G	1.268	32.2
H	1.102	28
J	1.063	27
K	1.043	26.5
L	0.984	25
M	0.964	24.5
N	0.728	18.5

Dimensions	Inches	Millimeters
P	0.630	16
Q	0.531	13.5
R	0.512	13
S	0.394	10
T	0.354	9
U	0.315	8
V	0.276	7
W	0.256 Dia.	6.5 Dia.
X	M6 Metric	M6
Y	0.177	4.5
Z	M4 Metric	M4
AA	0.118	3

Type	$V_{CE0(sus)}$ Volts (X 10)	Current Rating Amperes (25)
KS62	45	40

KS624540

High-Beta Single Darlington Transistor Module

400 Amperes/600 Volts

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

Ratings	Symbol	KS624540	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	$V_{\text{CEO(sus)}}$	450	Volts
Collector-Emitter Sustaining Voltage, $V_{\text{BE}} = -2\text{V}$	$V_{\text{CEV(sus)}}$	600	Volts
Collector-Base Voltage	V_{CBO}	600	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Emitter Voltage	V_{CEV}	600	Volts
Continuous Collector Current	I_{C}	400	Amperes
Diode Forward Current	I_{FM}	400	Amperes
Continuous Base Current	I_{B}	10	Amperes
Diode Surge Current	I_{FSM}	4000	Amperes
Power Dissipation	P_t	1500	Watts
Max. Mounting Torque M6 Terminal Screws (E, C)	—	26	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)	—	640	Grams
V Isolation	V_{RMS}	2500	Volts

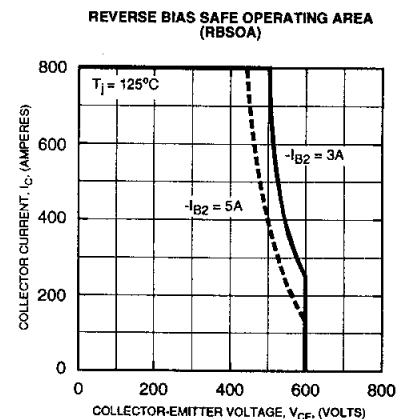
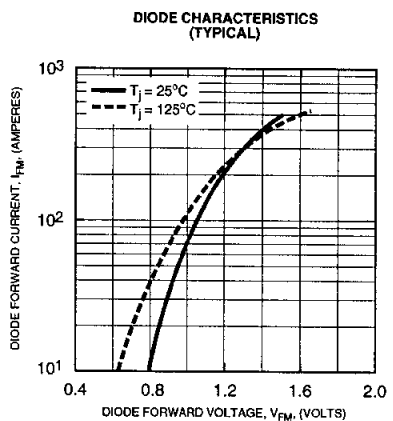
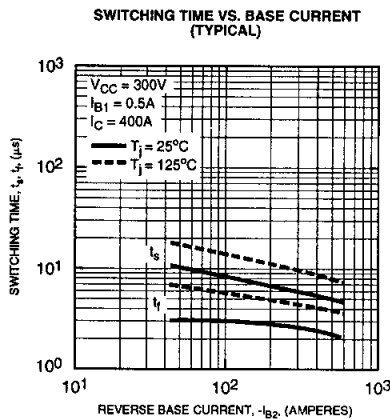
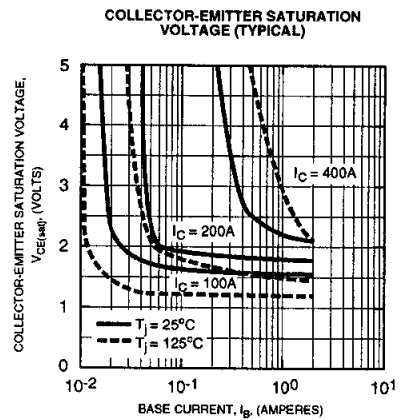
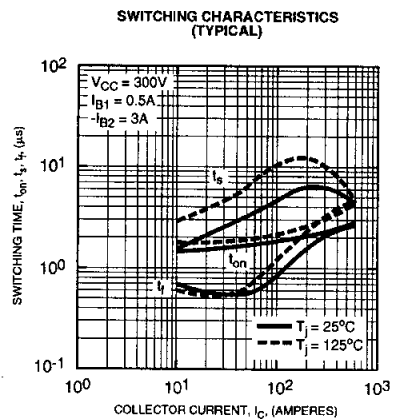
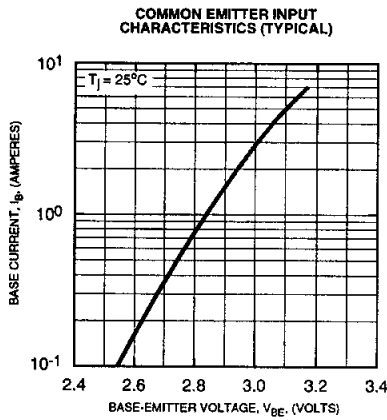
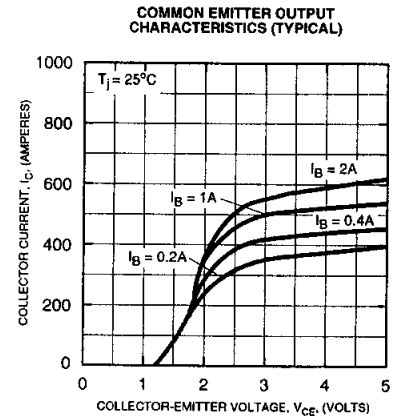
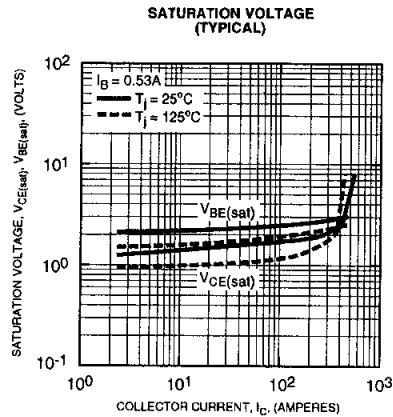
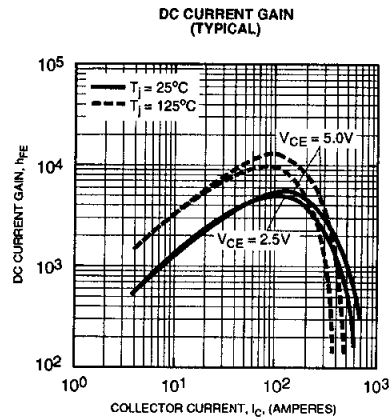
Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current	I_{CEV}	$V_{\text{CE}} = 600\text{V}$, $V_{\text{BE}} = -2\text{V}$	—	—	5	mA
Emitter Cutoff Current	I_{EBO}	$V_{\text{EB}} = 7\text{V}$	—	—	400	mA
DC Current Gain	h_{FE}	$I_{\text{C}} = 400\text{A}$, $V_{\text{CE}} = 2.5\text{V}$	75	—	—	—
Diode Forward Voltage	V_{FM}	$I_{\text{FM}} = 400\text{A}$	—	—	1.8	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_{\text{C}} = 400\text{A}$, $I_{\text{B}} = 0.53\text{A}$	—	—	2.5	Volts
Base-Emitter Saturation Voltage	$V_{\text{BE(sat)}}$	$I_{\text{C}} = 400\text{A}$, $I_{\text{B}} = 0.53\text{A}$	—	—	3.5	Volts
Resistive Turn-on	t_{on}	$V_{\text{CC}} = 300\text{V}$	—	—	3.0	μs
Load Storage Time	t_{s}	$I_{\text{C}} = 400\text{A}$	—	—	10	μs
Switch Times Fall Time	t_{f}	$I_{\text{B1}} = 0.8\text{A}$, $I_{\text{B2}} = -3.0\text{A}$	—	—	3.5	μs

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

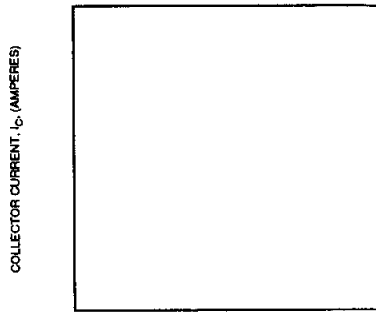
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(\text{c-s})}$	—	—	—	0.04	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(\text{j-c})}$	Transistor Part	—	—	0.083	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(\text{j-c})}$	Diode Part	—	—	0.25	$^\circ\text{C/W}$

KS624540
High-Beta Single Darlington Transistor Module
400 Amperes/600 Volts



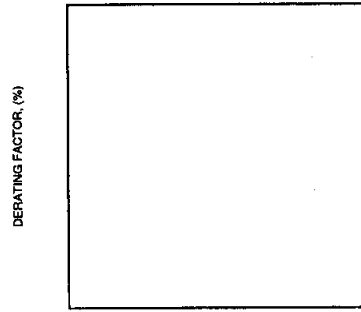
KS624540
High-Beta Single Darlington Transistor Module
 400 Amperes/600 Volts

FORWARD BIAS SAFE OPERATING AREA (SOA)



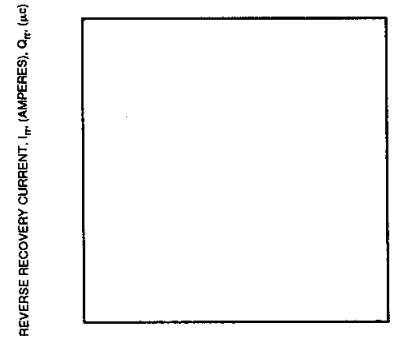
COLLECTOR-EMITTER VOLTAGE, V_{CE} (VOLTS)

DERATING FACTOR OF SAFE OPERATING AREA (SOA)



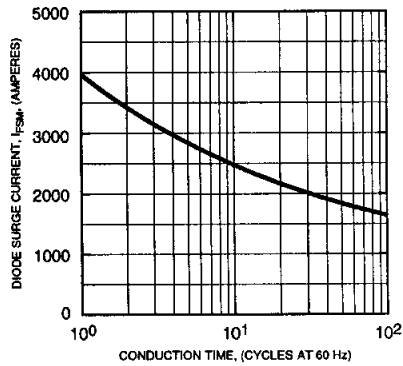
CASE TEMPERATURE, T_C (°C)

REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)

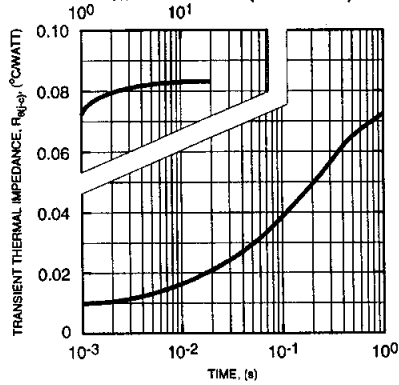


FORWARD CURRENT, I_F (AMPERES)

DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

