

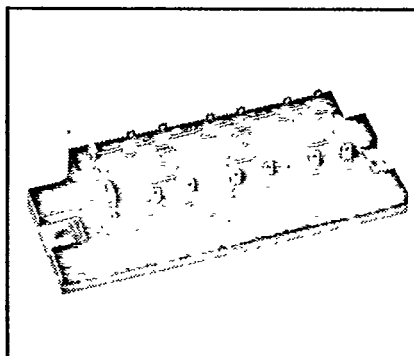
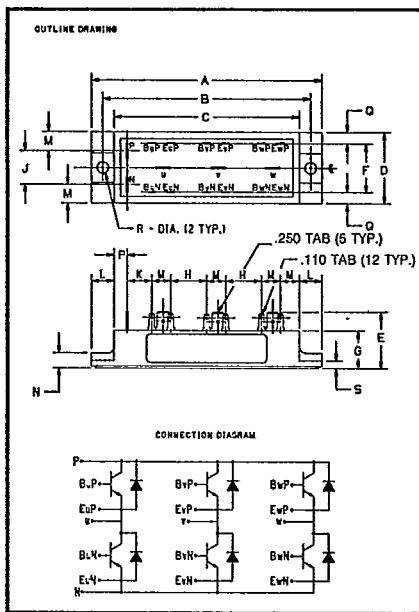


KE724502

T-33-35

Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272
 Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

Six-Darlington Transistor Module
20 Amperes/600 Volts



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Description

Powerex Six-Darlington Transistor Modules are medium power devices which are designed for use in switching applications. The modules are isolated, consisting of six Darlington Transistors with each transistor having a reverse parallel connected high-speed diode. The transistors are connected in a three phase bridge configuration.

Features:

- Isolated Mounting
- Planar Chips
- Discrete Fast Recovery Feed-Back Diode
- High Gain (h_{FE})
- Quick Connect Terminals
- Base-Emitter Speed Up Diodes
- Fast On Connections

Applications:

- Inverters
- Switching Power Supplies
- AC Motor Control

Ordering Information

Example: Select the complete eight digit module part number you desire from the table - i.e. KE724502 is a 450 $V_{CE0(SUS)}$ (600 V_{CEV}), 20 Ampere Six-Darlington Module.

600 Volt KE724502 Outline Drawing

Dimension	Inches	Millimeters
A	4.803	122
B	4.331	110
C	3.858	98
D	1.496	38
E	1.181	30
F	1.024	26
G	.787	20
H	.748	19
J	.709	18
K	.512	13
L	.472	12
M	.394	10
N	.315	8
P	.276	7
Q	.236	6
R	.216 + .008/ - .000 Dia.	5.4 + 0.2/ - 0.0 Dia.
S	.157	4

Note: Each Transistor symbol represents a Darlington Transistor with base emitter resistors on each stage and a base emitter speed up diode on the input stage.

Type	$V_{CE0(SUS)}$ Volts (x10)	Current Rating Amperes (x10)
KE72	45	02



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Maximum Ratings $T_J = 25^\circ\text{C}$ unless otherwise specified

	Symbol	KE724502	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	$V_{CEO(SUS)}$	450	Volts
Collector-Base Voltage	V_{CBO}	600	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Emitter Voltage $V_{BE} = -2\text{V}$	V_{CEV}	600	Volts
Continuous Collector Current	I_C	20	Amperes
Diode Forward Current	I_{FM}	20	Amperes
Continuous Base Current	I_B	1.0	Amperes
Diode Surge Current	I_{FSM}	200	Amperes
Power Dissipation, Each Transistor	P_T	155	Watts
Max. Mounting Torque M5 Mounting Screw	—	17	in.-lb.
Module Weight (typical)	—	9	Oz
Module Weight (typical)	—	240	Grams
V isolation	V_{RMS}	2500	Volts

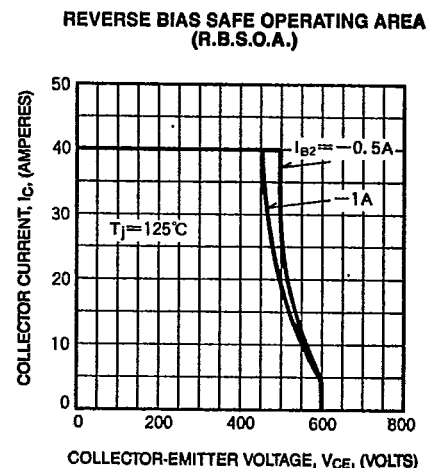
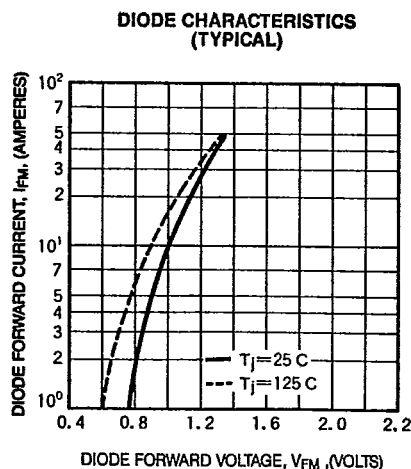
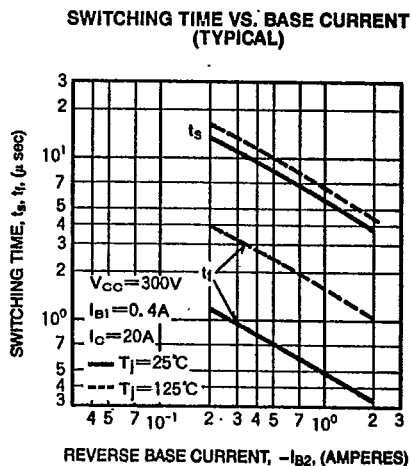
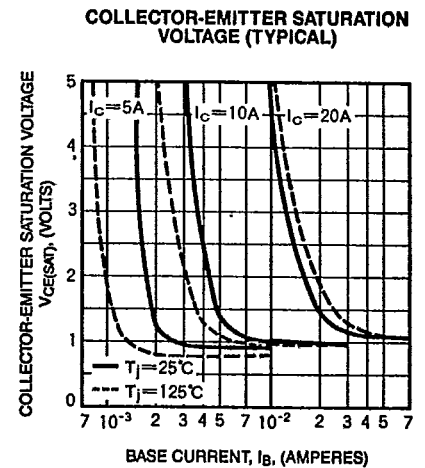
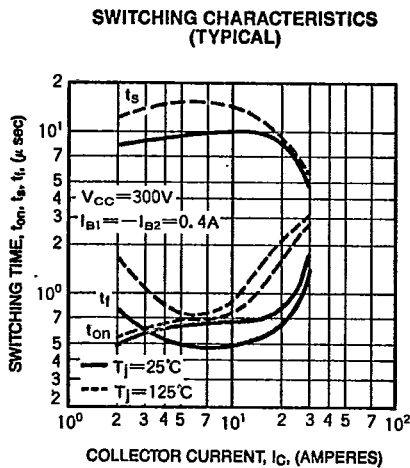
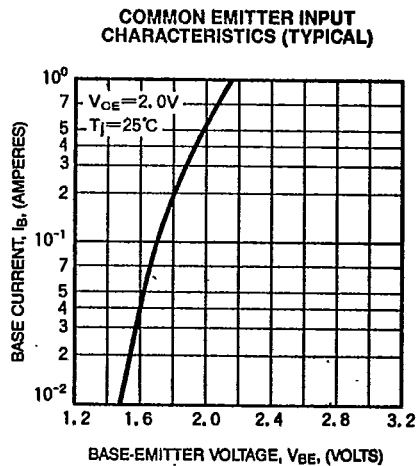
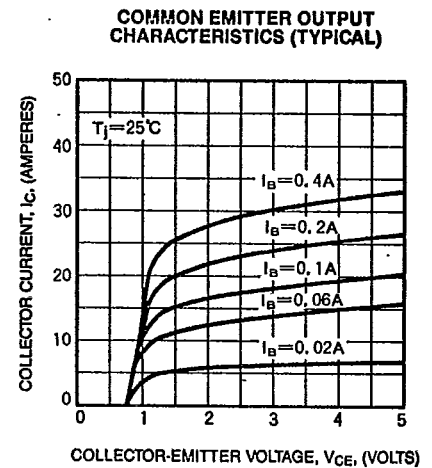
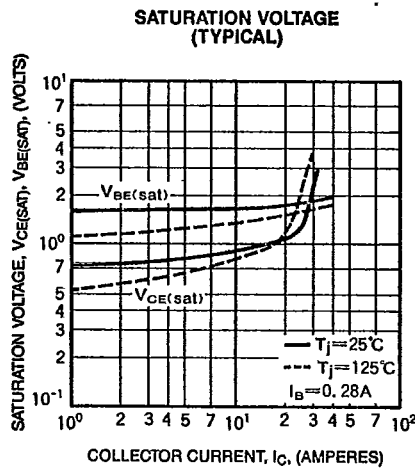
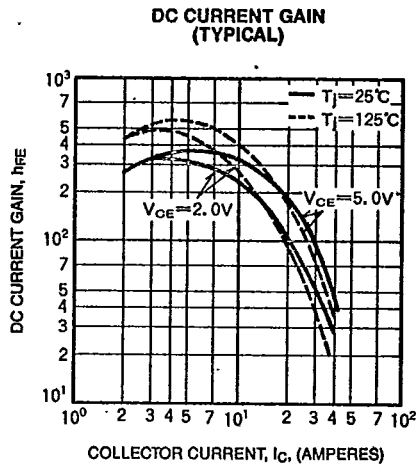
Electrical and Mechanical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	KE724502			Units	
			Min.	Typ.	Max.		
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA	
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$ $T_C = 125^\circ\text{C}$	—	—	5	mA	
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	—	—	150	mA	
DC Current Gain	h_{FE}	$I_C = 20\text{A}, V_{CE} = 2\text{V}$	75	—	—	—	
DC Current Gain	h_{FE}	$I_C = 20\text{A}, V_{CE} = 5\text{V}$	100	—	—	—	
Diode Forward Voltage	V_{FM}	$I_{FM} = 20\text{A}$	—	—	1.5	V	
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 20\text{A}, I_B = .28\text{A}$	—	—	2.0	V	
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 20\text{A}, I_B = .28\text{A}$	—	—	2.5	V	
Resistive	Turn On	t_{on}	$V_{CC} = 300\text{V}$	—	—	1.5	μs
Load	Storage Time	t_s	$I_C = 20\text{A}$	—	—	12	μs
Switch Times	Fall Time	t_f	$I_{B1} = .4\text{A}, I_{B2} = -.4\text{A}$	—	—	2.0	μs
Thermal Resistance, Case to Sink	$R_{\theta CS}$	—	—	—	.25	$^\circ\text{C/W}$	
Lubricated	$R_{\theta JC}$	—	—	—	.8	$^\circ\text{C/W}$	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	.8	$^\circ\text{C/W}$	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	2.2	$^\circ\text{C/W}$	



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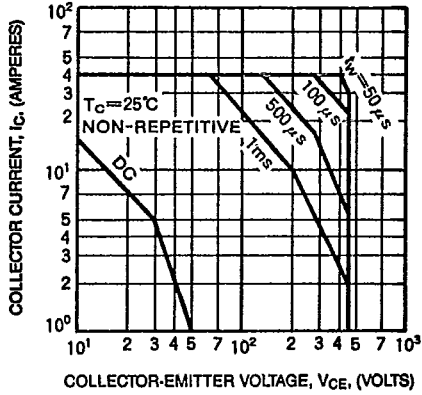




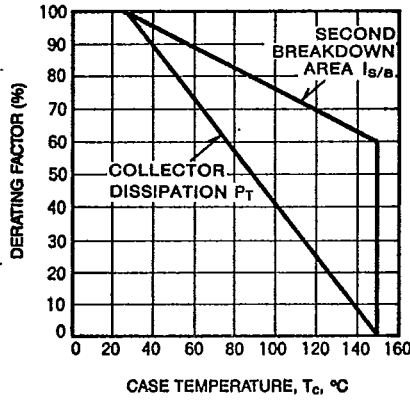
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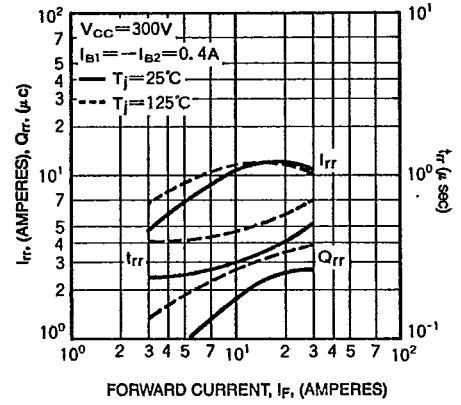
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



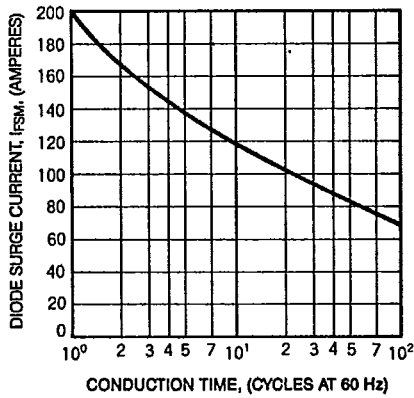
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



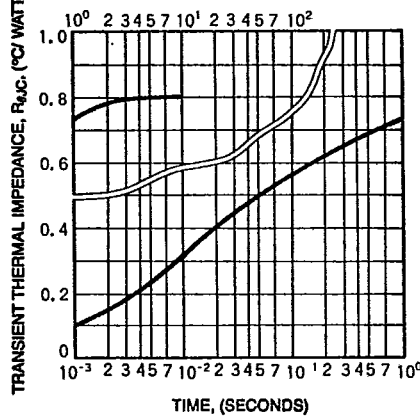
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

