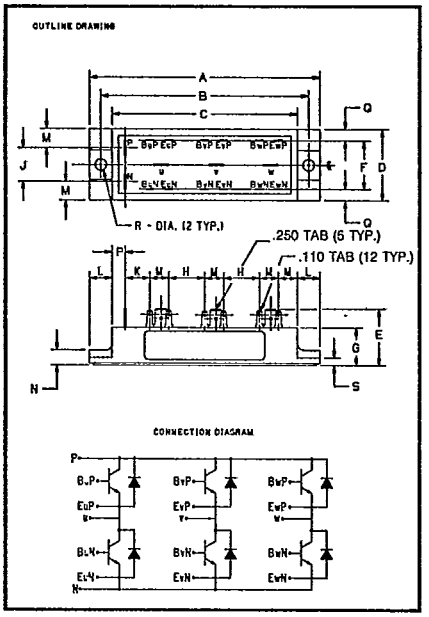
KE724502

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

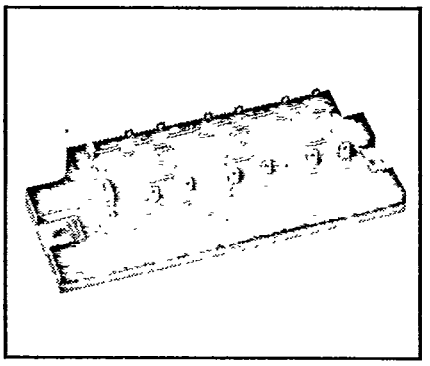
20 Amperes/600 Volts



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.



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20 Amperes/600 Volts

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 $V_{CEO(SUS)}$ (600 V_{CEV}), 20 Ampere Six-Darlington Module.

Type	$V_{CEO(SUS)}$ Volts (×10)	Current Rating Amperes (×10)
KE72	45	02

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Maximum Ratings T_J =25°C unless otherwise specified

	Symbol	KE724502	Units
Junction Temperature	T_J	−40 to 150	°C
Storage Temperature	T_{STG}	−40 to 125	°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} = −2V	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°C unless otherwise specified

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

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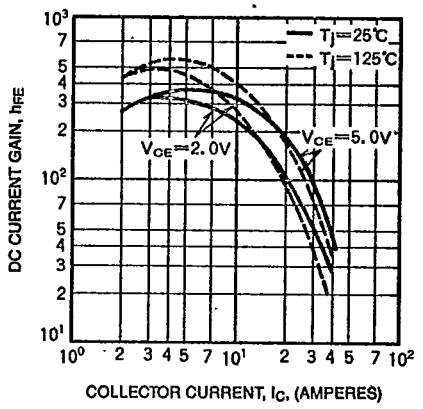
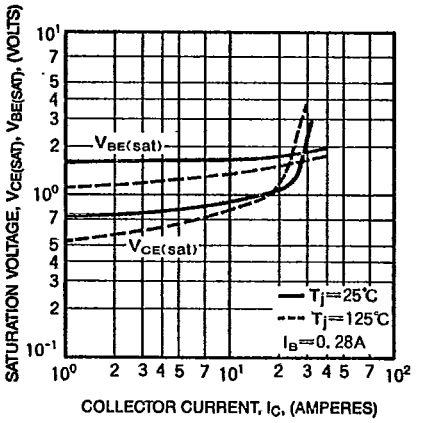
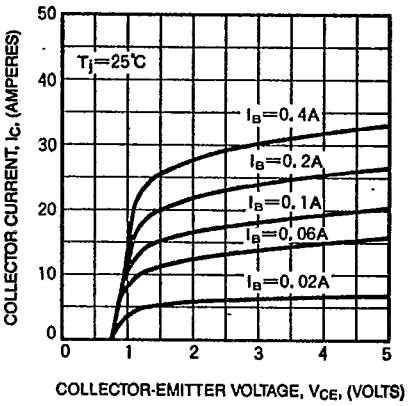
DC CURRENT GAIN (TYPICAL)



SATURATION VOLTAGE (TYPICAL)



COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



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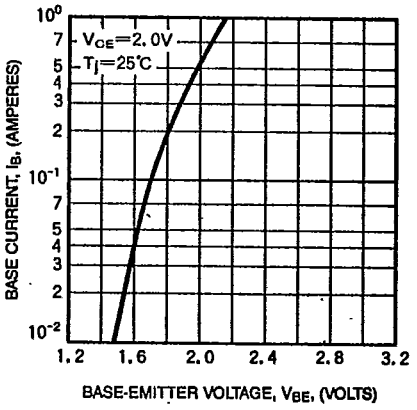
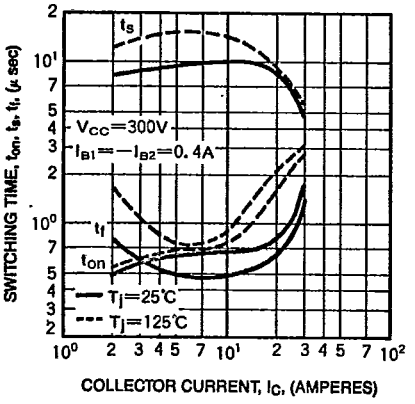
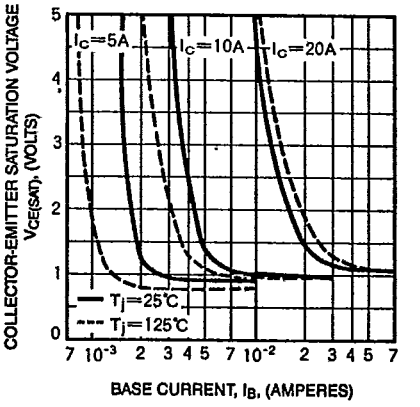


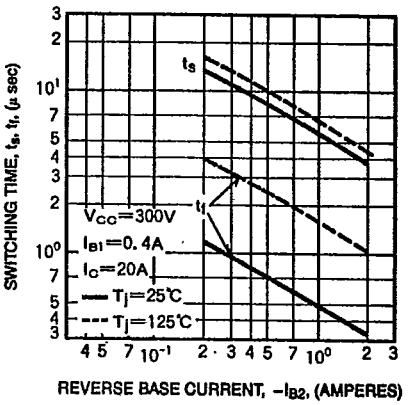
SWITCHING CHARACTERISTICS (TYPICAL)



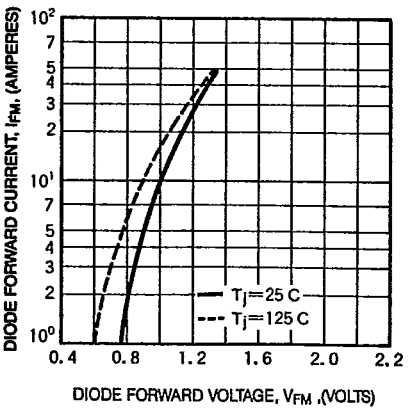
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



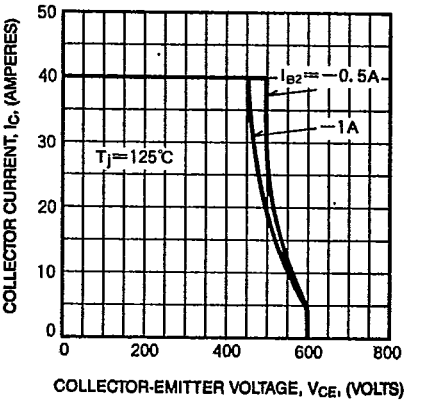
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



REVERSE BIAS SAFE OPERATING AREA (R.B.S.O.A.)



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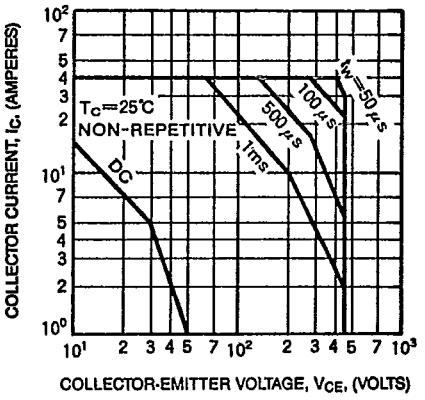
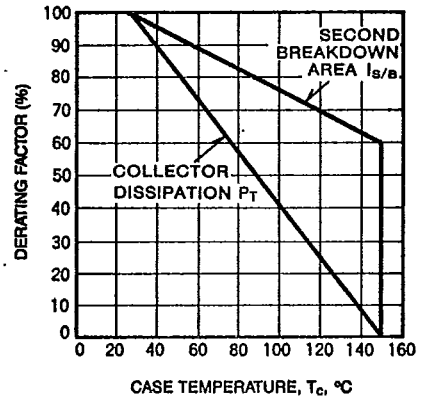
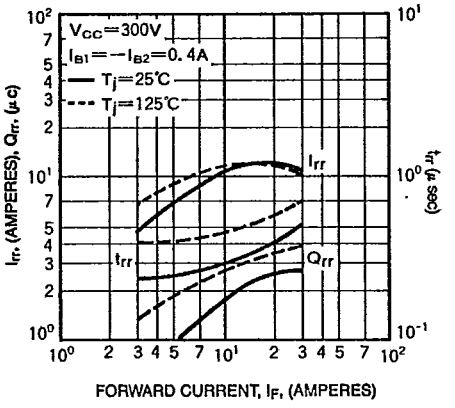
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



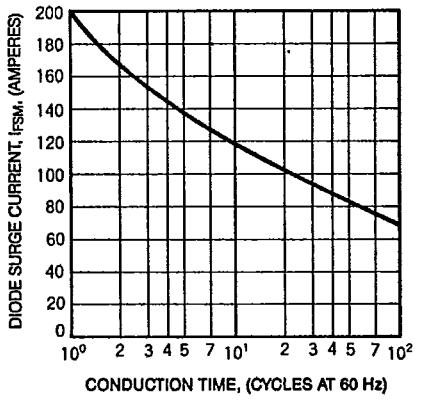
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



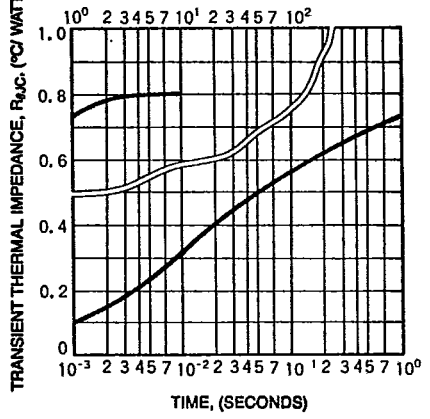
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)