

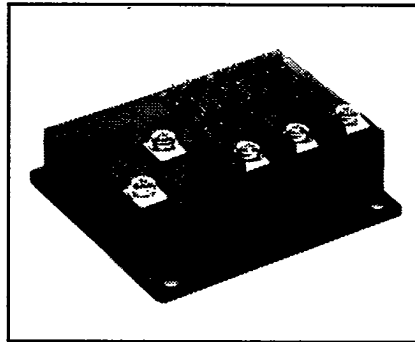
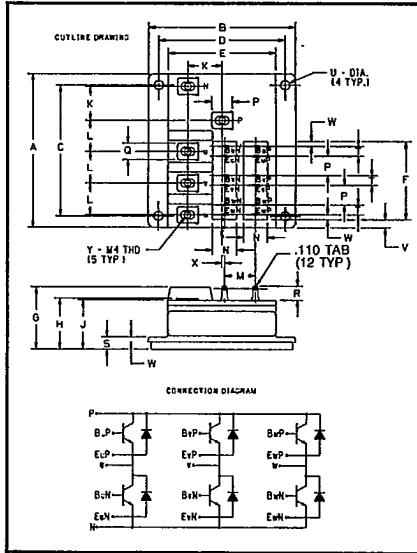


KE924505

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
50 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 Base Emitter Signal Terminals
- Base-Emitter Speed Up Diode
- Base-Emitter Resistors

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. KE924505 is a 450 $V_{CE0(SUS)}$ (600 V_{CEV}), 50 Ampere Six-Darlington Module.

600 Volt KE924505
Outline Drawing

Dimension	Inches	Millimeters
A	3.701	94
B	3.386	86
C	3.150	80
D	2.913	74
E	2.480	63
F	1.890	48
G	1.496	38
H	1.220	31
J	1.181	30
K	.787	20
L	.768	19.5
M	.709	18
N	.551	14
P	.472	12
Q	.394	10
R	.338	8.6
S	.295	7.5
T	.236	6
U	.216 Dia.	5.5 Dia.
V	.197	5
W	.118	3
X	.059	1.5
Y	M4 Metric	M4

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 ($\times 10$)	Current Rating Amperes ($\times 10$)
KE92	45	05



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

	Symbol	KE924505	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	50	Amperes
Diode Forward Current	I_{FM}	50	Amperes
Continuous Base Current	I_B	3	Amperes
Diode Surge Current	I_{FSM}	500	Amperes
Power Dissipation, Each Transistor	P_T	310	Watts
Max. Mounting Torque M4 Terminal Screw	—	12	in.-lb.
Max. Mounting Torque M5 Mounting Screw	—	17	in.-lb.
Module Weight (typical)	—	19	Oz
Module Weight (typical)	—	575	Grams
V isolation	V_{RMS}	2500	Volts

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

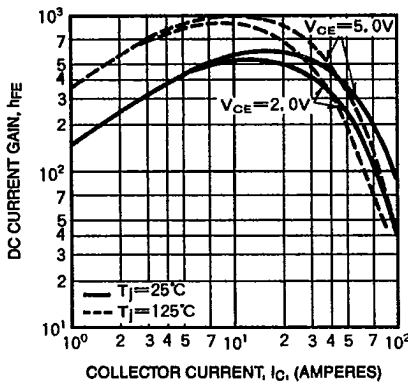
Characteristics	Symbol	Test Conditions	KE924505			Units	
			Min.	Typ.	Max.		
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA	
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2$ $T_C = 125^\circ\text{C}$	—	—	5	mA	
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	—	—	200	mA	
DC Current Gain	h_{FE}	$I_C = 50\text{A}, V_{CE} = 2\text{V}$	75	—	—	—	
DC Current Gain	h_{FE}	$I_C = 50\text{A}, V_{CE} = 5\text{V}$	100	—	—	—	
Diode Forward Voltage	V_{FM}	$I_{FM} = 50\text{A}$	—	—	1.75	V	
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 50\text{A}, I_B = 0.65\text{A}$	—	—	2.0	V	
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 50\text{A}, I_B = 0.65\text{A}$	—	—	2.5	V	
Resistive Load	Turn On	t_{on}	$V_{CC} = 300\text{V}$	—	—	1.5	μs
	Storage Time	t_s	$I_C = 50\text{A}$	—	—	12	μs
Switch Times	Fall Time	t_f	$I_{B1} = - I_{B2} = 1\text{A}$	—	—	3.0	μs
Thermal Resistance, Case to Sink	$R_{\theta CS}$	—	—	—	.2	$^\circ\text{C}/\text{W}$	
Lubricated							
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	0.4	$^\circ\text{C}/\text{W}$	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	1.3	$^\circ\text{C}/\text{W}$	



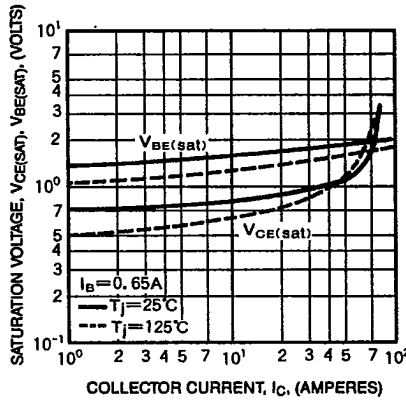
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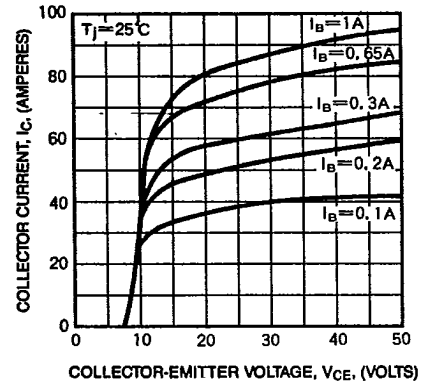
DC CURRENT GAIN (TYPICAL)



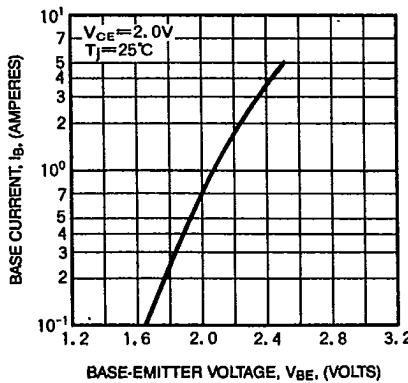
SATURATION VOLTAGE (TYPICAL)



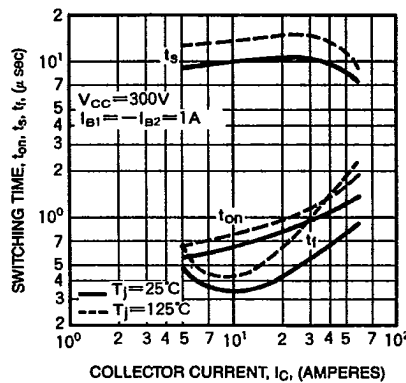
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



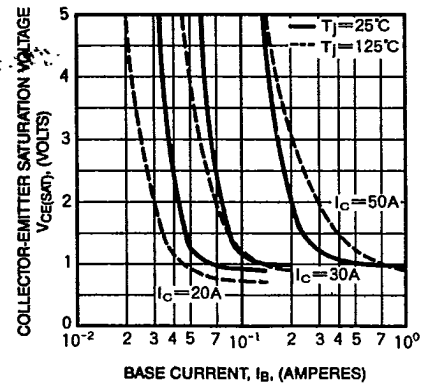
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



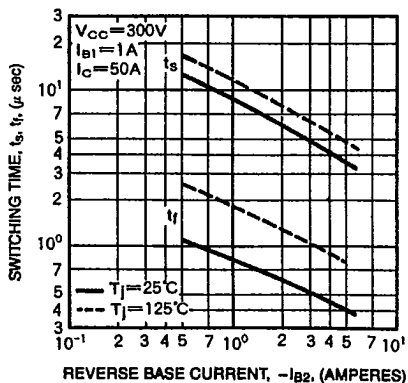
SWITCHING CHARACTERISTICS (TYPICAL)



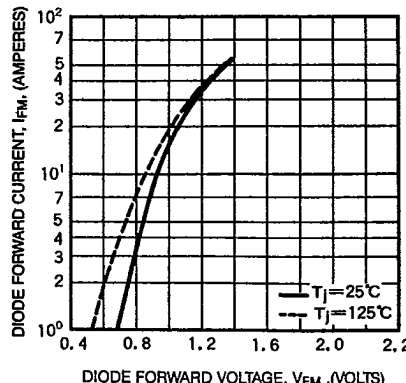
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



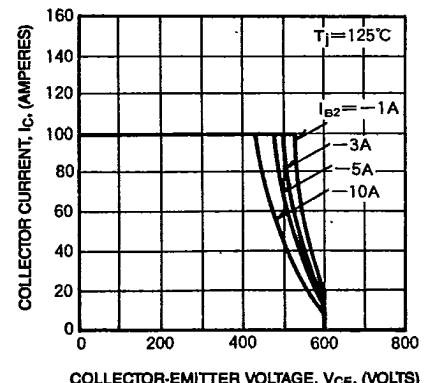
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



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





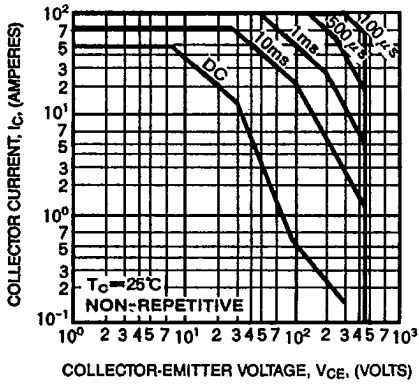
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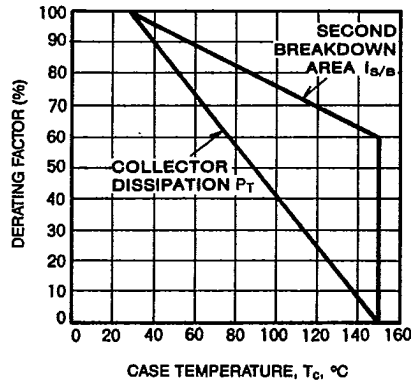
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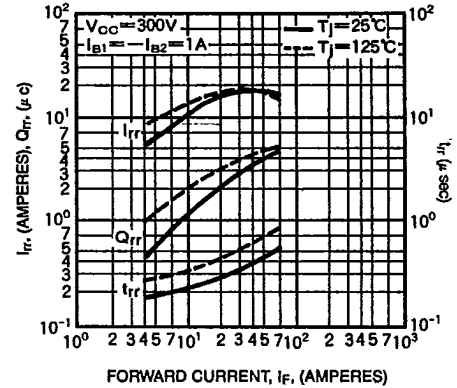
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



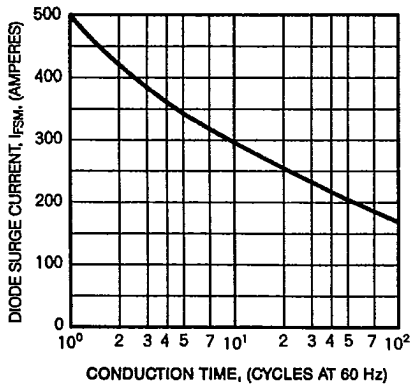
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



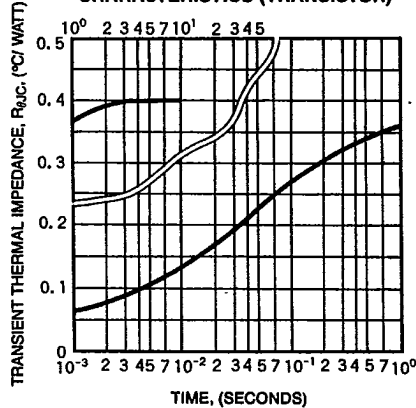
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

