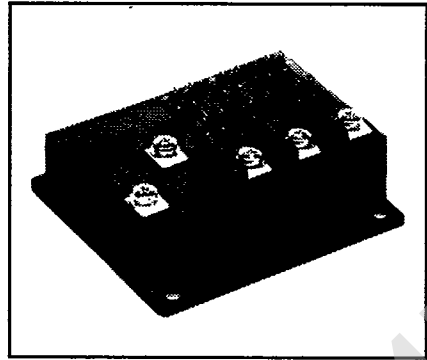
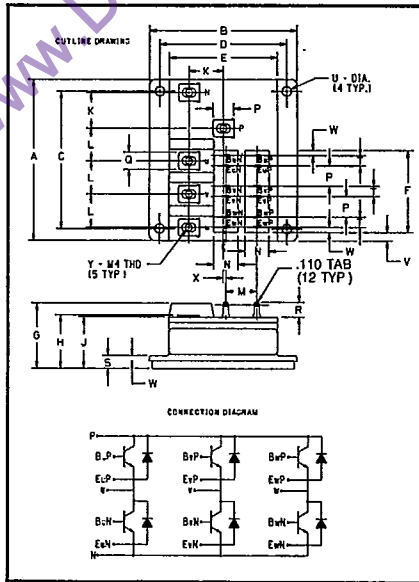




KE924505 T-33-35

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**



**KE924505**  
**Six-Darlington Transistor Module**  
 50 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 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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KE924505

Six-Darlington Transistor Module

50 Amperes/600 Volts

**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**

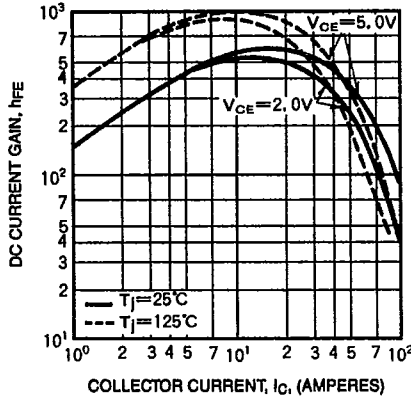
Characteristics	Symbol	Test Conditions	KE924505			Units
			Min.	Typ.	Max.	
Collector Cutoff Current	$I_{CEV}$	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA
Collector Cutoff Current	$I_{CEV}$	$V_{CE} = 600\text{V}, V_{BE} = -2$ $T_C = 125^\circ\text{C}$	—	—	5	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7\text{V}$	—	—	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 Turn On	$t_{on}$	$V_{CC} = 300\text{V}$	—	—	1.5	$\mu\text{s}$
Load Storage Time	$t_s$	$I_C = 50\text{A}$	—	—	12	$\mu\text{s}$
Switch Times Fall Time	$t_f$	$I_{B1} = - I_{B2} = 1\text{A}$	—	—	3.0	$\mu\text{s}$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$	—	—	—	.2	$^\circ\text{C}/\text{W}$
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	$^\circ\text{C}/\text{W}$



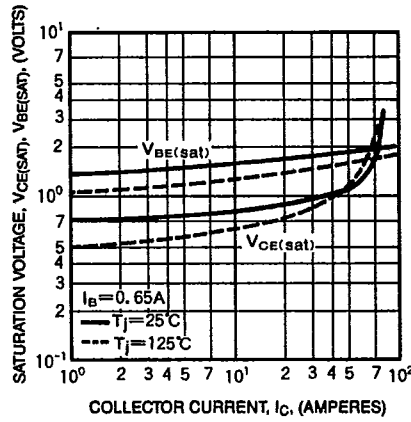
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**KE924505**  
**Six-Darlington Transistor Module**  
 50 Amperes/600 Volts

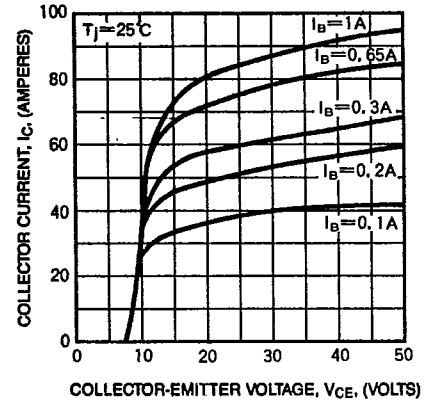
**DC CURRENT GAIN (TYPICAL)**



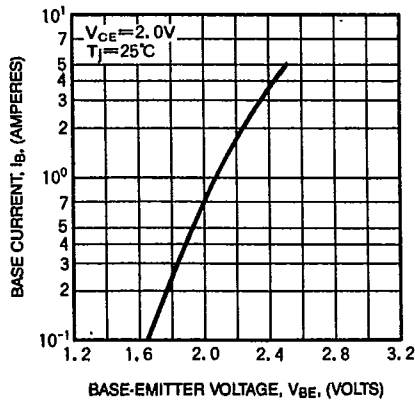
**SATURATION VOLTAGE (TYPICAL)**



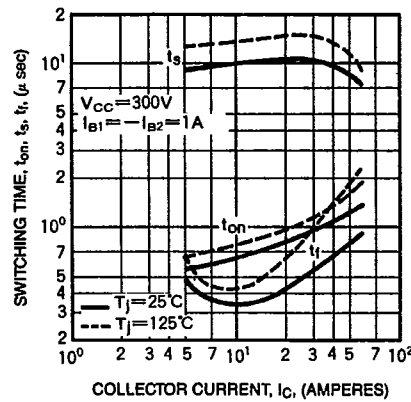
**COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)**



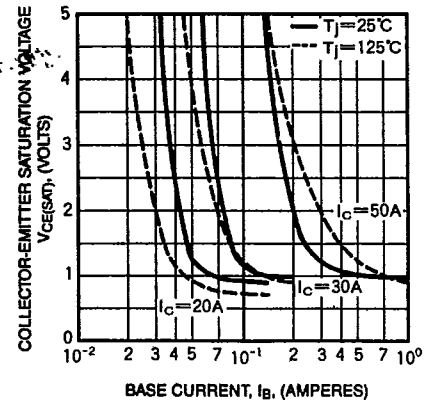
**COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)**



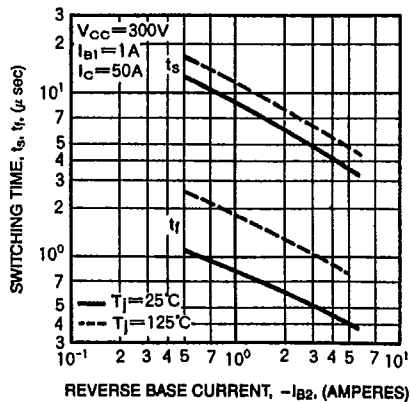
**SWITCHING CHARACTERISTICS (TYPICAL)**



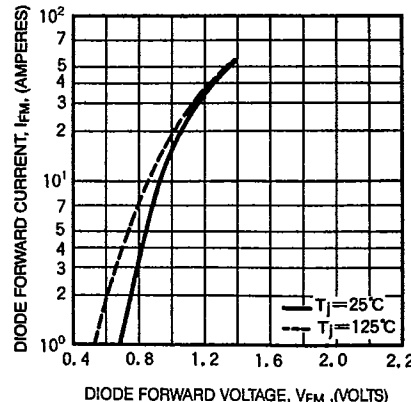
**COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)**



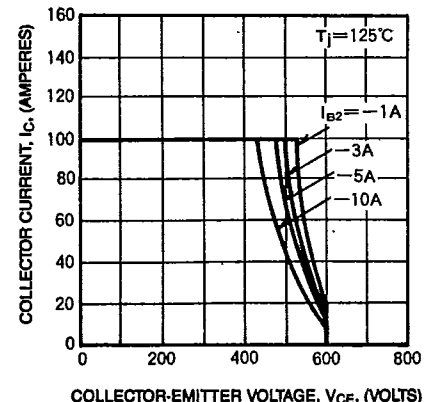
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



**DIODE CHARACTERISTICS (TYPICAL)**



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

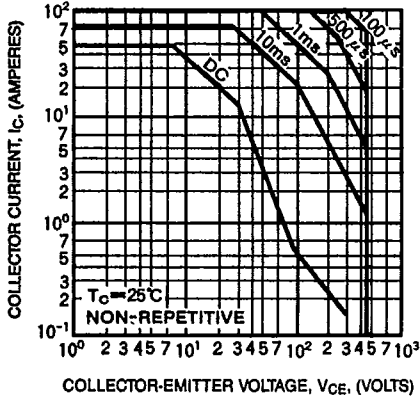




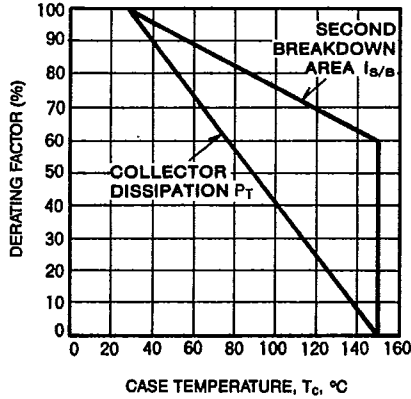
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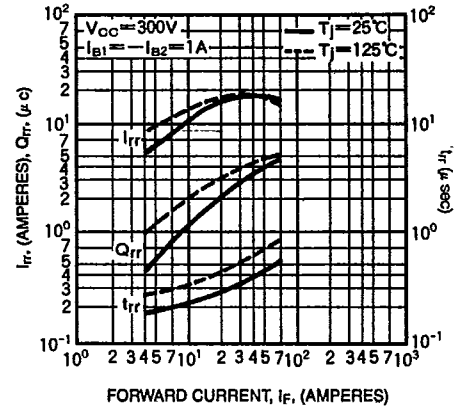
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



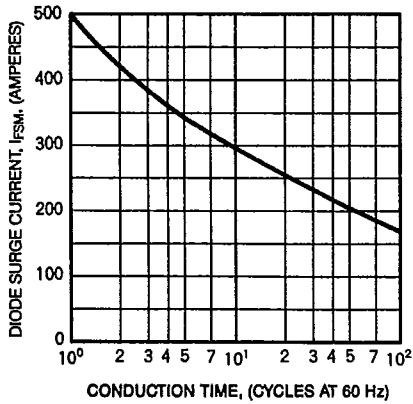
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



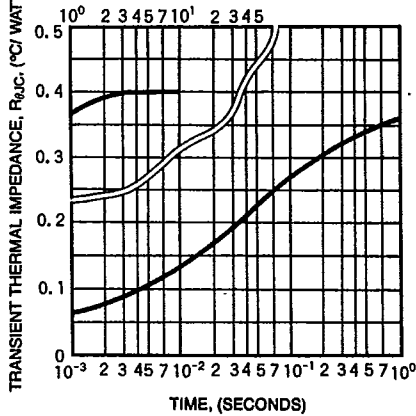
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

