

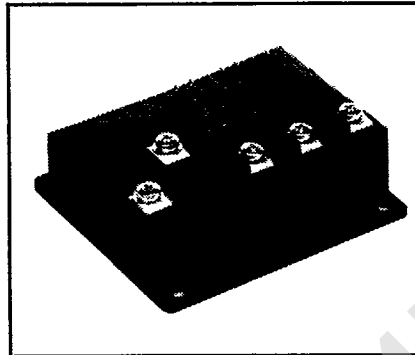
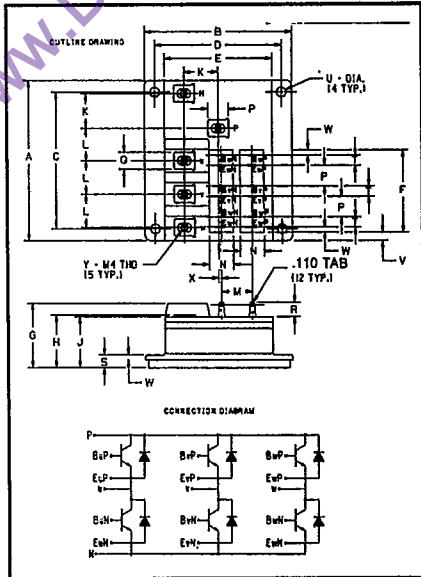


KE924503

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**  
**30 Amperes/600 Volts**



**KE924503**  
**Six-Darlington**  
**Transistor Module**  
 30 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. KE924503 is a 450  $V_{CE0(SUS)}$  (600  $V_{CEV}$ ), 30 Ampere Six-Darlington Module.

**600 Volt KE924503**  
**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	03



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

KE924503

Six-Darlington Transistor Module

30 Amperes/600 Volts

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

	Symbol	KE924503	Units
Junction Temperature	$T_J$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{\text{STG}}$	-40 to 125	$^\circ\text{C}$
Collector-Emitter Sustaining Voltage	$V_{\text{CEO(SUS)}}$	450	Volts
Collector-Base Voltage	$V_{\text{CBO}}$	600	Volts
Emitter-Base Voltage	$V_{\text{EBO}}$	7	Volts
Collector-Emitter Voltage $V_{\text{BE}} = -2\text{V}$	$V_{\text{CEV}}$	600	Volts
Continuous Collector Current	$I_C$	30	Amperes
Diode Forward Current	$I_{\text{FM}}$	30	Amperes
Continuous Base Current	$I_B$	1.8	Amperes
Diode Surge Current	$I_{\text{FSM}}$	300	Amperes
Power Dissipation, Each Transistor	$P_T$	250	Watts
Max. Mounting Torque M5 Mounting Screw	—	17	in.-lb.
Max. Mounting Torque M4 Terminal Screw	—	12	in.-lb.
Module Weight (typical)	—	16	Oz
Module Weight (typical)	—	460	Grams
V isolation	$V_{\text{RMS}}$	2500	Volts

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

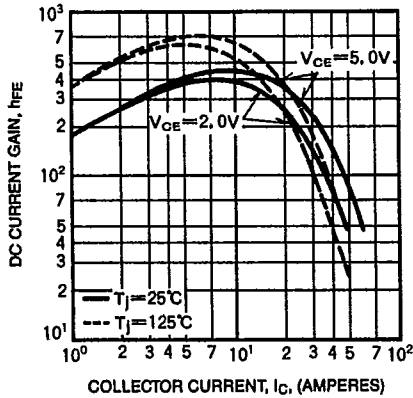
Characteristics	Symbol	Test Conditions	KE924503			Units
			Min.	Typ.	Max.	
Collector Cutoff Current	$I_{\text{CEV}}$	$V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}$	—	—	1	mA
Collector Cutoff Current	$I_{\text{CEV}}$	$V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}$ $T_C = 125^\circ\text{C}$	—	—	5	mA
Emitter Cutoff Current	$I_{\text{EBO}}$	$V_{\text{EB}} = 7\text{V}$	—	—	200	mA
DC Current Gain	$h_{\text{FE}}$	$I_C = 30\text{A}, V_{\text{CE}} = 2\text{V}$	75	—	—	—
DC Current Gain	$h_{\text{FE}}$	$I_C = 30\text{A}, V_{\text{CE}} = 5\text{V}$	100	—	—	—
Diode Forward Voltage	$V_{\text{FM}}$	$I_{\text{FM}} = 30\text{A}$	—	—	1.85	V
Collector-Emitter Saturation Voltage	$V_{\text{CE(SAT)}}$	$I_C = 30\text{A}, I_B = 0.4\text{A}$	—	—	2.0	V
Base-Emitter Saturation Voltage	$V_{\text{BE(SAT)}}$	$I_C = 30\text{A}, I_B = 0.4\text{A}$	—	—	2.5	V
Resistive Turn On	$t_{\text{on}}$	$V_{\text{CC}} = 300\text{V}$	—	—	1.5	$\mu\text{s}$
Load Storage Time	$t_s$	$I_C = 30\text{A}$	—	—	12	$\mu\text{s}$
Switch Times Fall Time	$t_f$	$I_{\text{B1}} = .5\text{A}, I_{\text{B2}} = -.5\text{A}$	—	—	3.0	$\mu\text{s}$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta\text{CS}}$	—	—	—	.2	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta\text{JC}}$	Transistor Part	—	—	.5	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta\text{JC}}$	Diode Part	—	—	1.3	$^\circ\text{C}/\text{W}$



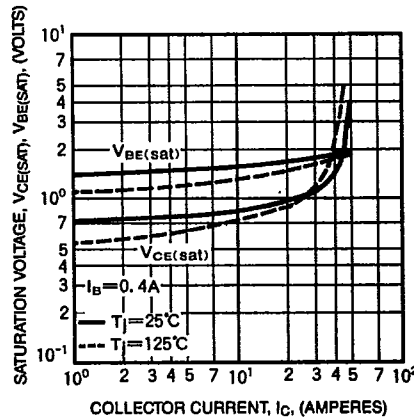
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272  
 Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

KE924503  
 Six-Darlington Transistor Module  
 30 Amperes/600 Volts

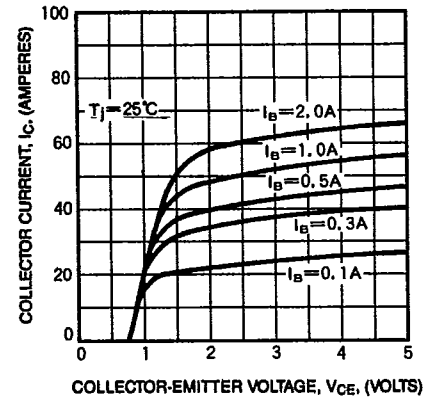
DC CURRENT GAIN (TYPICAL)



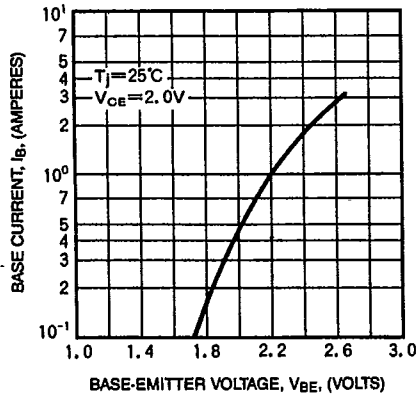
SATURATION VOLTAGE (TYPICAL)



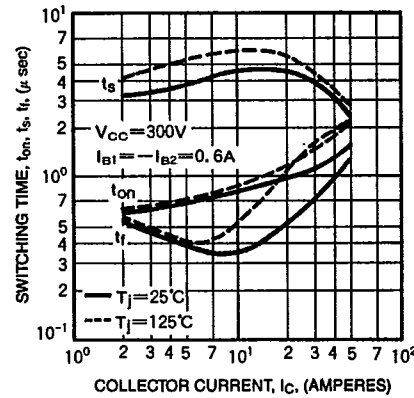
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



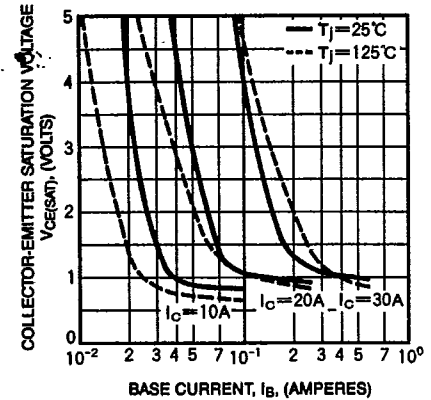
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



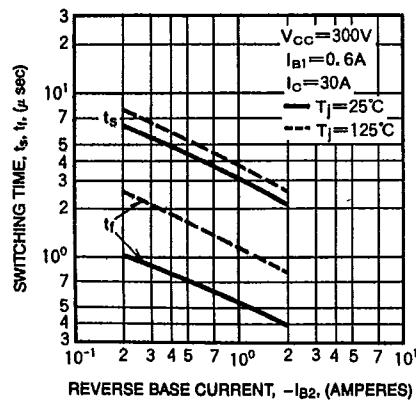
SWITCHING CHARACTERISTICS (TYPICAL)



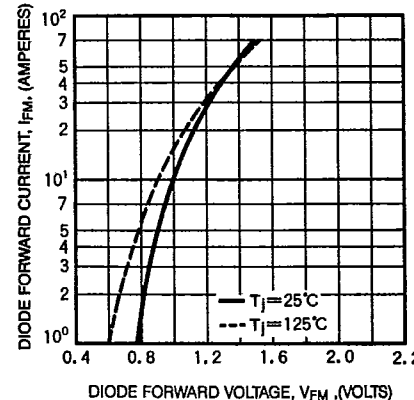
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



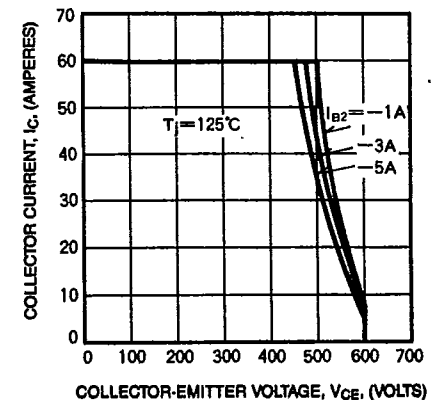
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



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

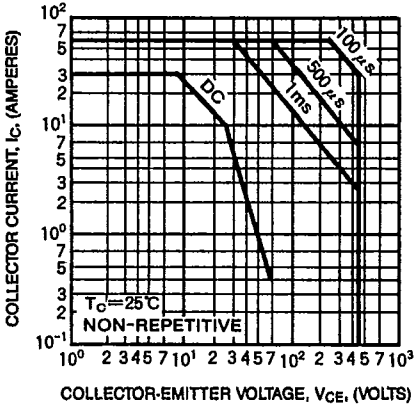




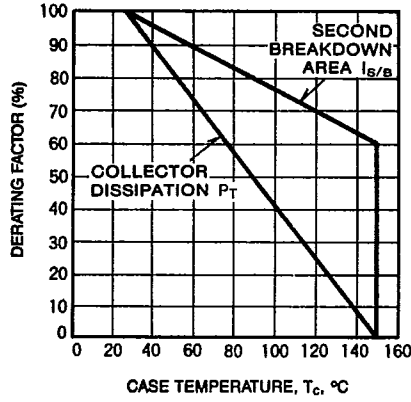
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272  
 Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

KE924503  
 Six-Darlington Transistor Module  
 30 Amperes/600 Volts

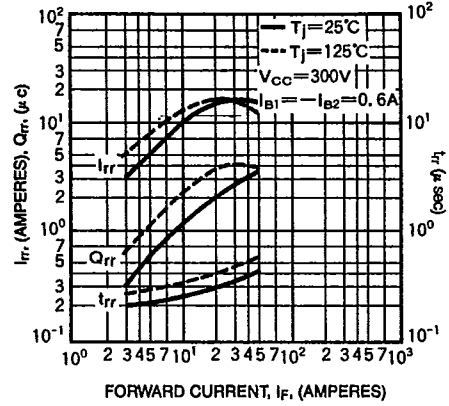
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



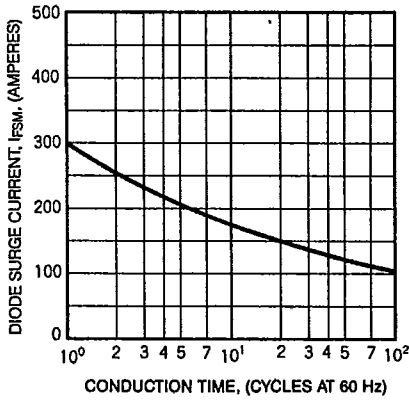
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



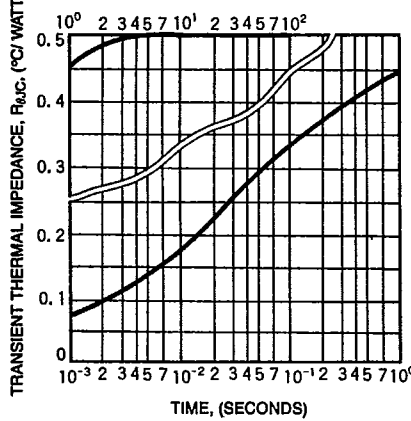
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

