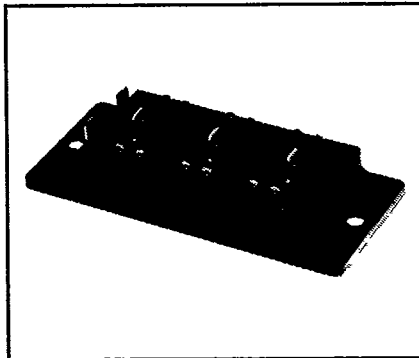
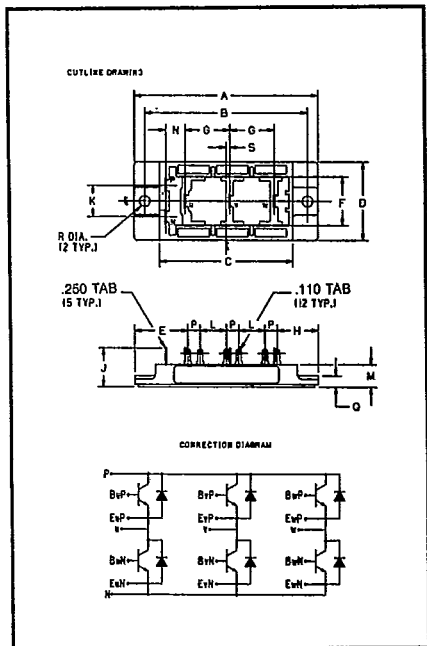


Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272  
 Powerex Europe, S.A., 428 Avenue G. Durand, BP107, 72003 Le Mans, France (43) 41.14.14

### Six-Darlington Transistor Module 20 Amperes/600 Volts



**KED24502**  
**Six-Darlington**  
**Transistor Module**  
 20 Amperes/600 Volts

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**600 Volt KED24502**  
**Outline Drawing**

Dimension	Inches	Millimeters
A	4.134	105
B	3.661 ± .008	93 ± 0.2
C	2.992	76
D	1.772	45
E	1.201	30.5
F	1.102	28
G	1.004	25.5
H	.925	23.5
J	.884	22.45
K	.709	18
L	.591	15
M	.512	13
N	.433	11
P	.276	7
Q	.256	6.5
R	.216 ± .004 Dia.	5.5 ± 0.1 Dia.
S	.079	2

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.

#### 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. KED24502 is a 450  $V_{CE0(SUS)}$  (600  $V_{CEV}$ ), 20 Ampere Six-Darlington Module.

Type	$V_{CE0(SUS)}$ Volts ( $\times 10$ )	Current Rating Amperes ( $\times 10$ )
KED2	45	02

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**KED24502**  
**Six-Darlington Transistor Module**  
 20 Amperes/600 Volts

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

	Symbol	KED24502	Units
Junction Temperature	$T_J$	- 40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	- 40 to 125	$^\circ\text{C}$
Collector-Emitter Voltage	$V_{CEO(SUS)}$	450	Volts
Collector-Emitter Voltage $V_{BE} = -2\text{V}$	$V_{CEV}$	600	Volts
Collector-Base Voltage	$V_{CBO}$	600	Volts
Emitter-Base Voltage	$V_{EBO}$	7	Volts
Continuous Collector Current	$I_C$	20	Amperes
Diode Forward Current	$I_{FM}$	20	Amperes
Continuous Base Current	$I_B$	1	Amperes
Diode Surge Current	$I_{FSM}$	200	Amperes
Power Dissipation, Each Transistor	$P_T$	100	Watts
Mounting Torque M5 Mounting Screw	—	17	in.-lb.
Module Weight	—	90	Grams
V isolation	$V_{RMS}$	2500	Volts

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

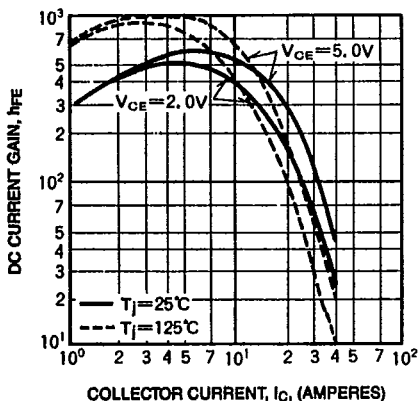
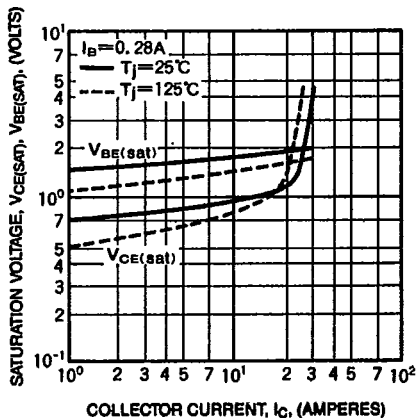
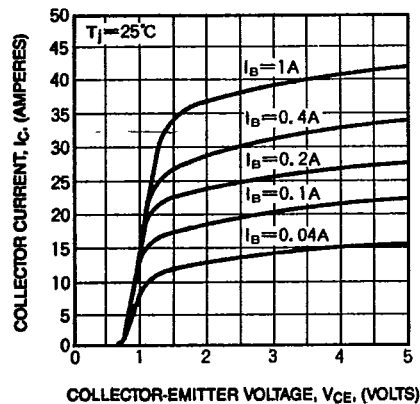
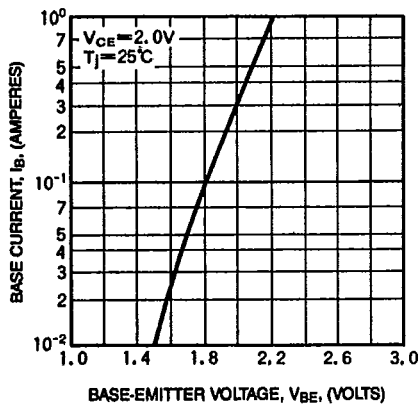
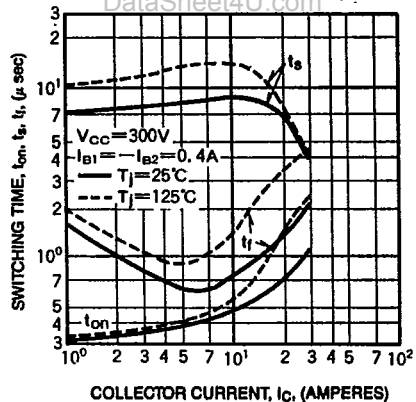
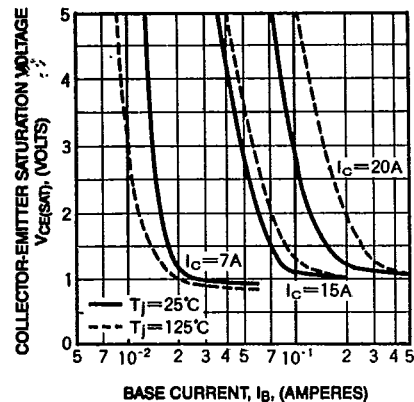
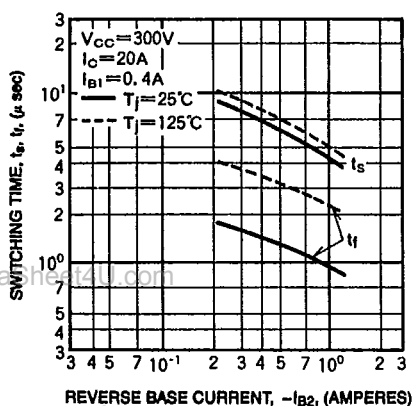
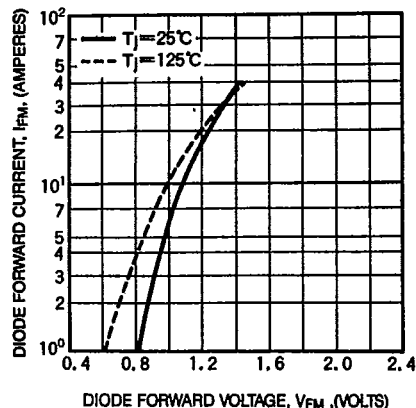
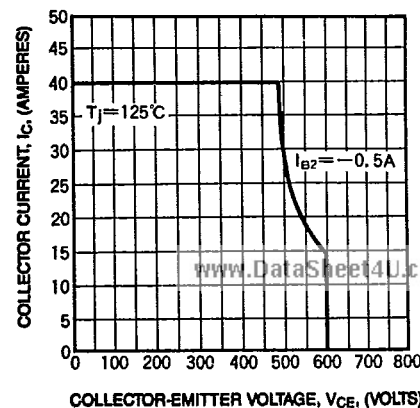
Characteristics	Symbol	Test Conditions	KED24502			Units
			Min.	Typ.	Max.	
Collector Cutoff Current	$I_{CEV}$	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7\text{V}$	—	—	150	mA
DC Current Gain	$h_{FE}$	$I_C = 20\text{A}, V_{CE} = 2\text{V}/5\text{V}$	75/100	—	—	—
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 20\text{A}, I_B = 0.28\text{A}$	—	—	2.0	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 20\text{A}, I_B = 0.28$	—	—	2.5	V
Diode Forward Voltage	$V_{FM}$	$I_{FM} = 20\text{A}$	—	—	2.0	V
Resistive Load Switch Times	Turn On	$V_{CC} = 300\text{V}$ $I_C = 20\text{A}$	—	—	1.5	$\mu\text{s}$
	Storage Time		—	—	12	$\mu\text{s}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	2.0	$^\circ\text{C/W}$
		Diode Part	—	—	1.2	$^\circ\text{C/W}$
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$	—	—	—	0.35	$^\circ\text{C/W}$

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**KED24502****Six-Darlington Transistor Module**

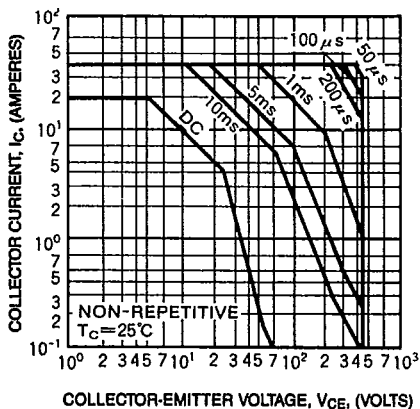
20 Amperes/600 Volts

**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.)**

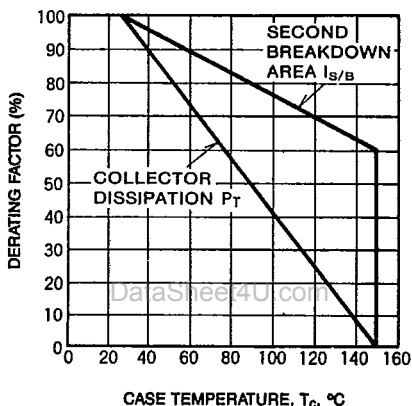
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**KED24502**  
**Six-Darlington Transistor Module**  
 20 Amperes/600 Volts

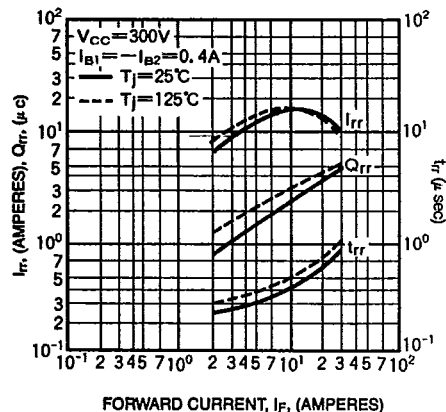
**FORWARD BIAS SAFE OPERATING AREA (S.O.A.)**



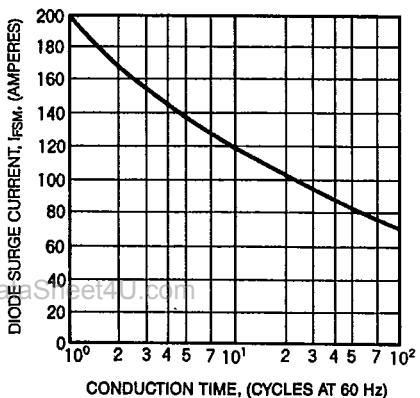
**DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)**



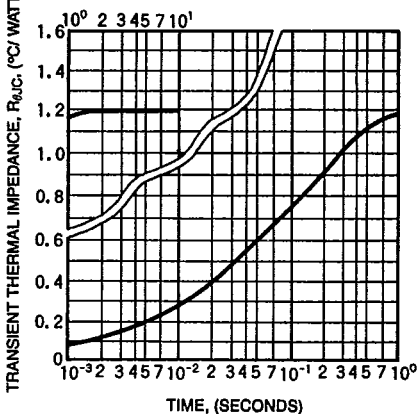
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

