

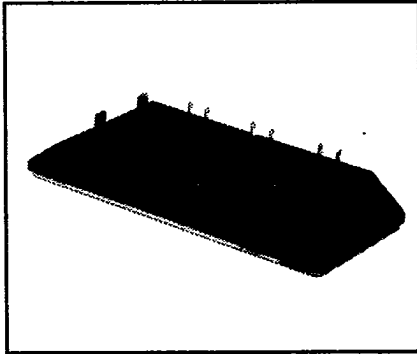
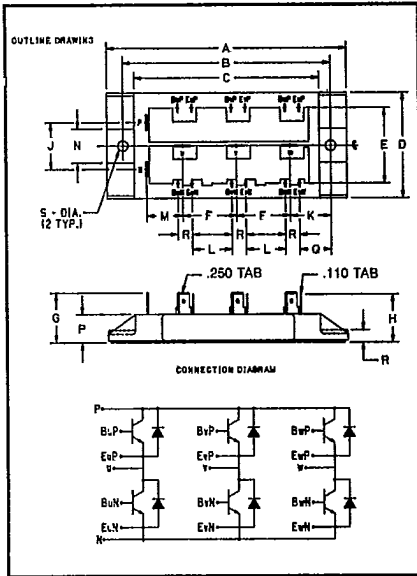


KE721K03

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/1000 Volts



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Description

Powerex Six-Darlington Transistor Modules 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 and base emitter speed up diodes. 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})
- Base-Emitter Speed Up Diode
- Quick Connect Terminals

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. KE721K03 is a 1000 Volt, 30 Ampere Six-Darlington Module.

1000 Volt KE721K03 Outline Drawing

Dimension	Inches	Millimeters
A	5.000	127
B	4.331 ± .012	110 ± 0.3
C	3.858	98
D	2.205	56
E	1.575	40
F	1.122	28.5
G	1.043	26.5
H	1.008	25.6
J	.984	25
K	.846	21.5
L	.827	21
M	.748	19
N	.709	18
P	.689	17.5
Q	.650	16.5
R	.295	7.5
S	.216 Dia.	5.5 Dia.

Note: Each Transistor symbol represents a Triple Darlington Transistor with base emitter resistors on each stage and base emitter speed up diodes on the input stages.

Type	V _{CE(SUS)} Volts (1000)	Current Rating Amperes (x10)
KE72	1K	03



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

	Symbol	KE721K03	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 $V_{BE} = -2\text{V}$	$V_{CE(SUS)}$	1000	Volts
Collector-Base Voltage	V_{CBO}	1000	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Emitter Voltage $V_{BE} = -2\text{V}$	V_{CEV}	1000	Volts
Continuous Collector Current	I_C	30	Amperes
Diode Forward Current	I_{FM}	30	Amperes
Continuous Base Current	I_B	2	Amperes
Diode Surge Current	I_{FSM}	300	Amperes
Power Dissipation, Each Transistor	P_T	310	Watts
Max. Mounting Torque M5 Mounting Screws	—	17	in.-lb.
Module Weight	—	500	Grams
V Isolation	V_{RMS}	2500	Volts

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

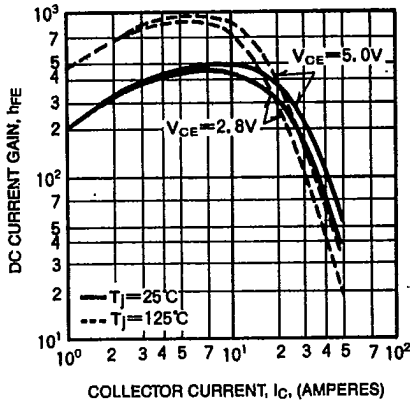
Characteristics	Symbol	Test Conditions	KE721K03			Units
			Min.	Typ.	Max.	
Collector Cutoff Current	I_{CEV}	$V_{CE} = 1200\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	—	—	200	mA
DC Current Gain	h_{FE}	$I_C = 30\text{A}, V_{CE} = 2.8\text{V}$	75	—	—	—
DC Current Gain	h_{FE}	$I_C = 30\text{A}, V_{CE} = 5\text{V}$	100	—	—	—
Diode Forward Voltage	V_{FM}	$I_{FM} = 30\text{A}$	—	—	1.8	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 30\text{A}, I_B = 0.6\text{A}$	—	—	3.0	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 30\text{A}, I_B = 0.6\text{A}$	—	—	3.5	V
Resistive Turn On	t_{on}	$V_{CC} = 600\text{V}$	—	—	2.5	μs
Load Storage Time	t_s	$I_C = 30\text{A}$	—	—	15	μs
Switch Times Fall Time	t_f	$I_{B1} = -I_{B2} = -0.6\text{A}$	—	—	3.0	μs
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$	—	—	—	.15	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	0.4	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	1.5	$^\circ\text{C/W}$



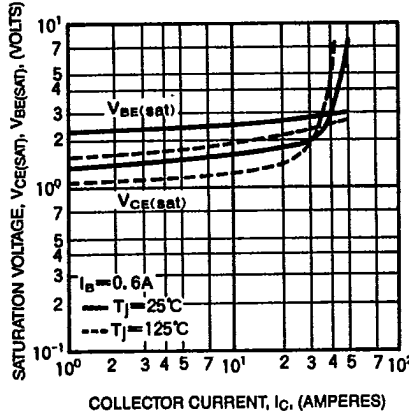
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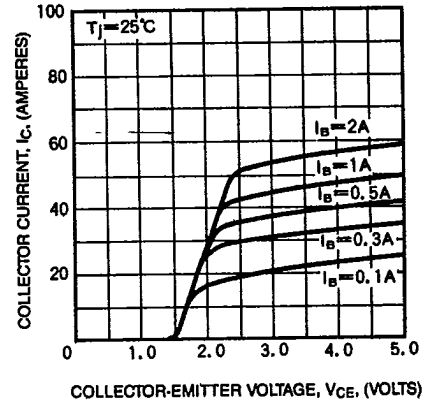
DC CURRENT GAIN (TYPICAL)



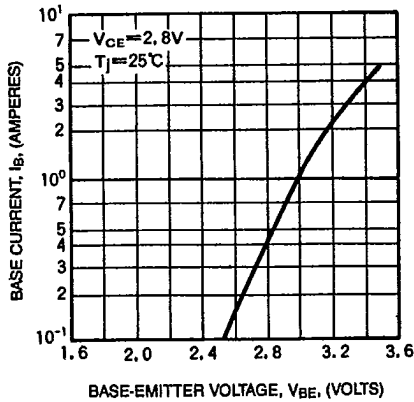
SATURATION VOLTAGE (TYPICAL)



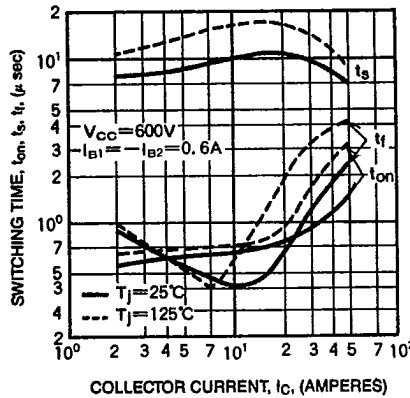
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



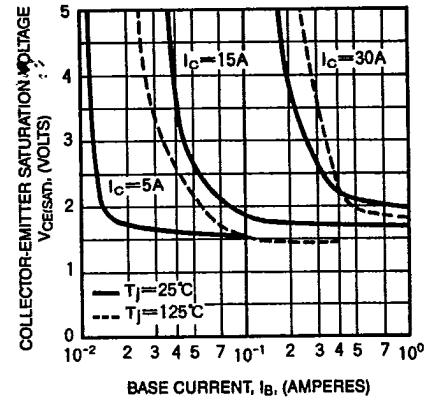
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



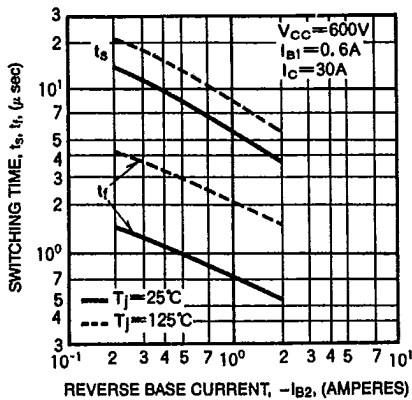
SWITCHING CHARACTERISTICS (TYPICAL)



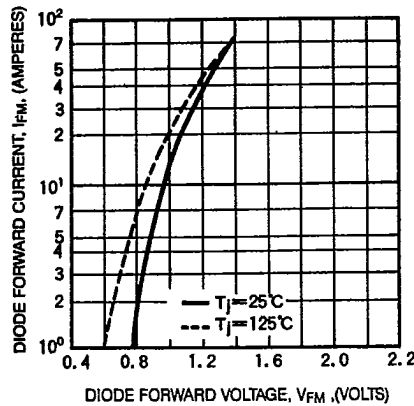
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



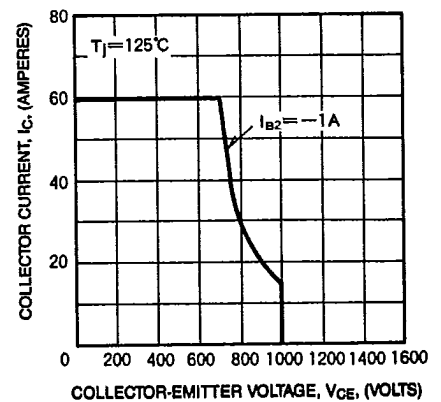
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



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

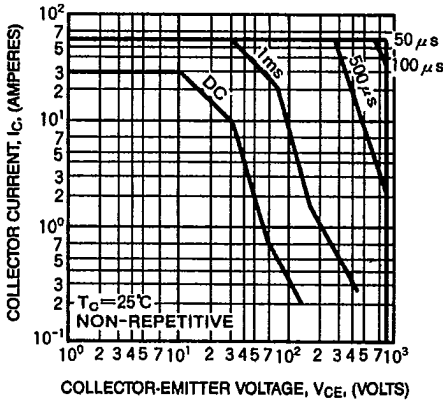




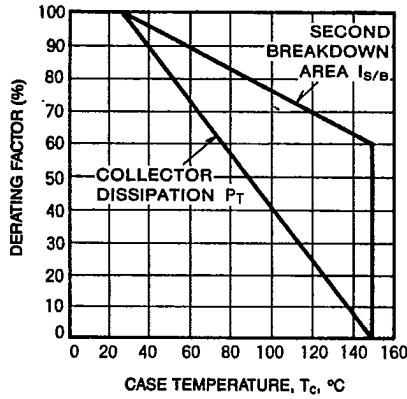
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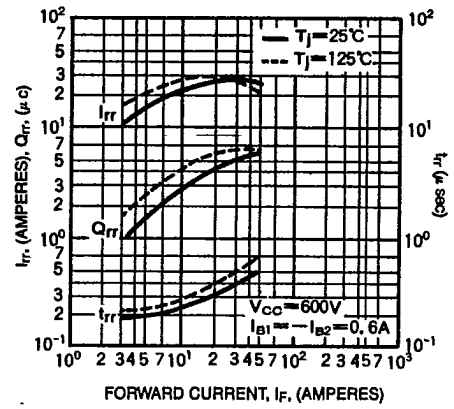
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



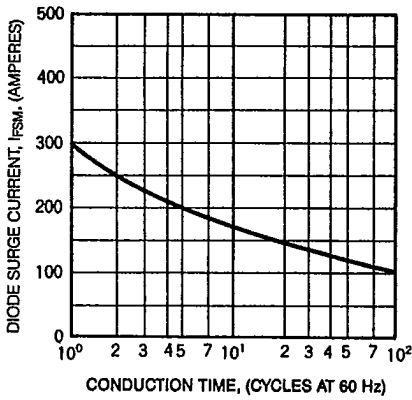
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



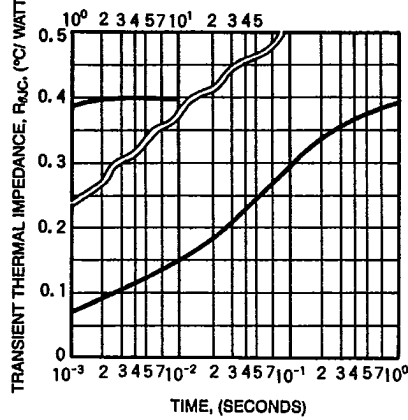
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

