

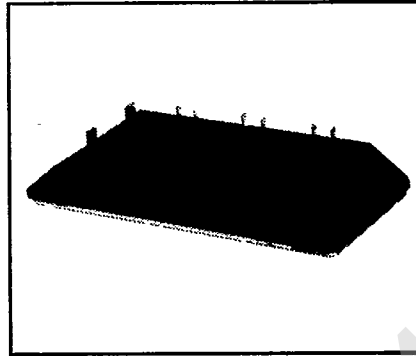
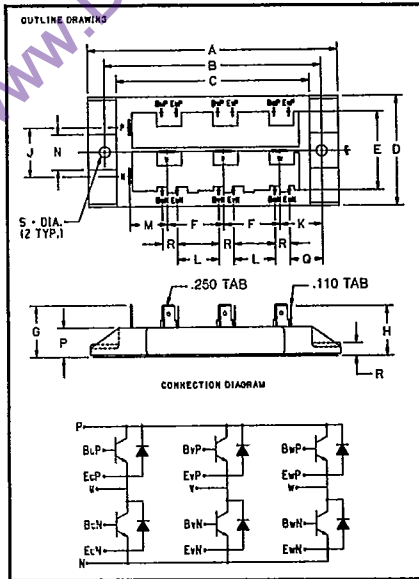


KE721203

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/1200 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 Diodes
- 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. KE721203 is a 1200 Volt, 30 Ampere Six-Darlington Module.

Type	V <sub>CE(SUS)</sub> Volts (x100)	Current Rating Amperes (x10)
KE72	12	03

**1200 Volt KE721203 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.



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

	Symbol	KE721203	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	$V_{CE(SUS)}$	950	Volts
Collector-Emitter Sustaining Voltage $V_{BE} = -2\text{V}$	$V_{CEV(SUS)}$	1200	Volts
Collector-Base Voltage	$V_{CBO}$	1200	Volts
Emitter-Base Voltage	$V_{EBO}$	7	Volts
Collector-Emitter Voltage $V_{BE} = -2\text{V}$	$V_{CEV}$	1200	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	KE721203			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	$h_{FE}$	$I_C = 30\text{A}, V_{CE} = 5\text{V}$	75	—	—	—
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 Load	Turn On	$V_{CC} = 600\text{V}$	—	—	2.5	$\mu\text{s}$
	Storage Time					
Switch Times	Fall Time	$I_{B1} = -I_{B2} = 0.6\text{A}$	—	—	3.0	$\mu\text{s}$
Thermal Resistance, Case to Sink	$R_{\theta CS}$	—	—	—	0.25	$^\circ\text{C/W}$
Lubricated						
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	$^\circ\text{C/W}$

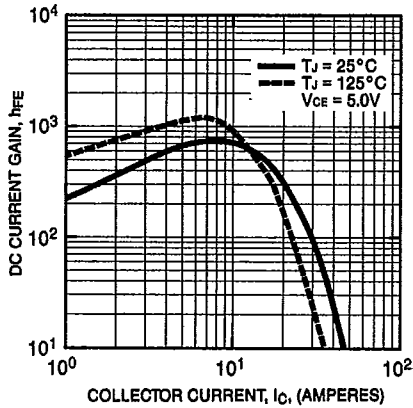


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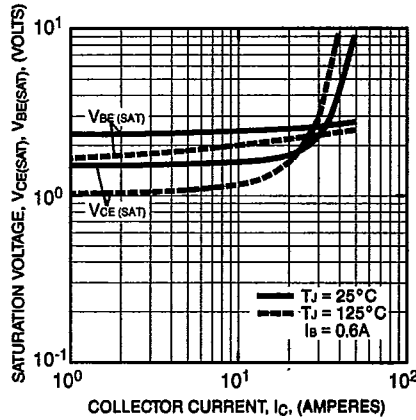
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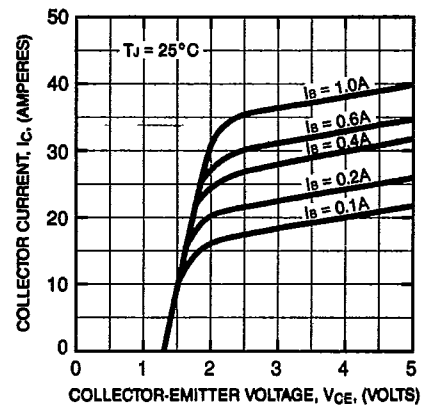
**DC CURRENT GAIN (TYPICAL)**



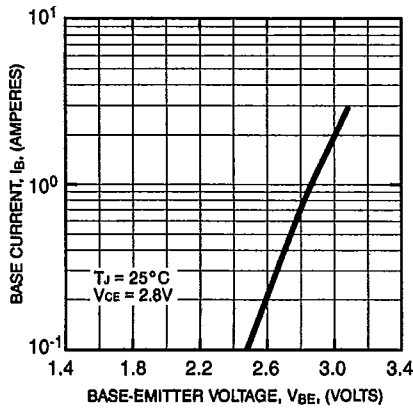
**SATURATION VOLTAGE (TYPICAL)**



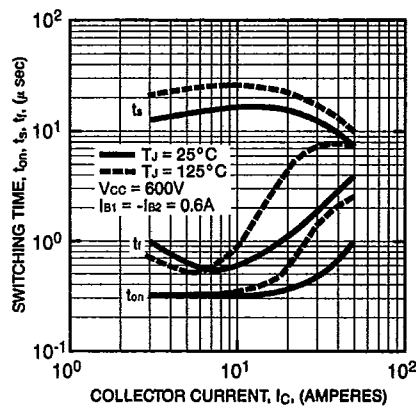
**COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)**



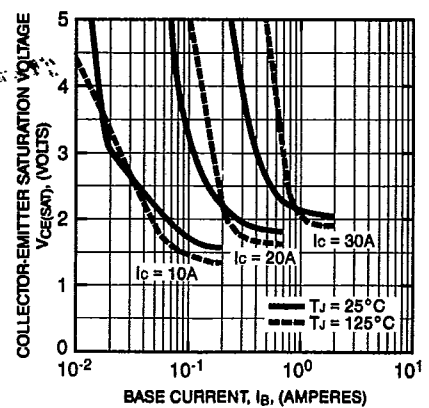
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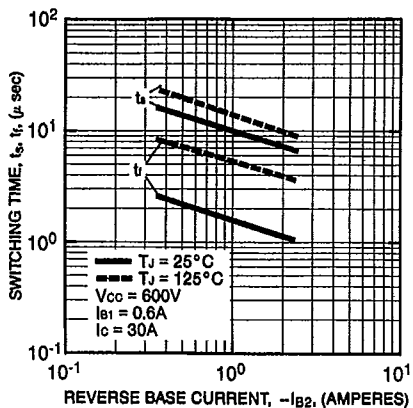
**SWITCHING CHARACTERISTICS (TYPICAL)**



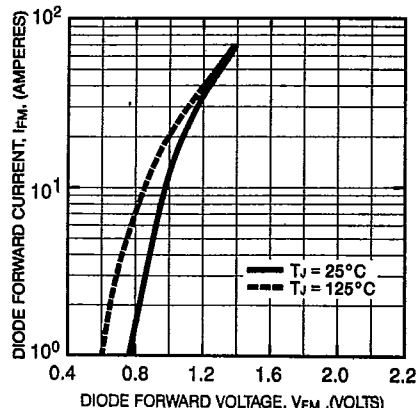
**COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)**



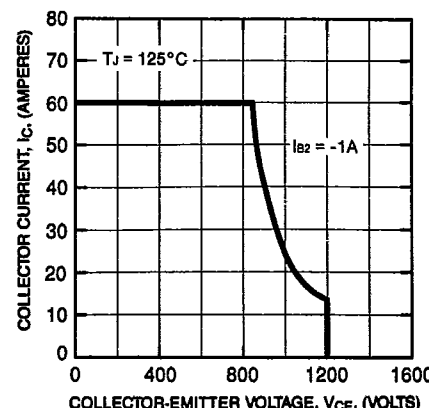
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



**DIODE CHARACTERISTICS (TYPICAL)**



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

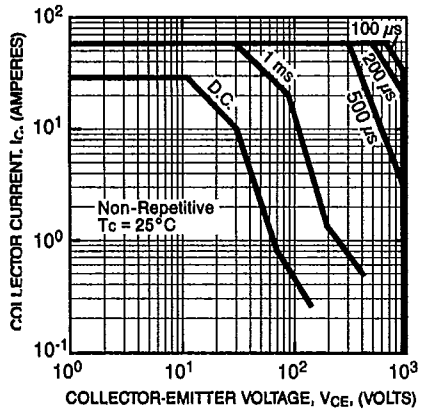




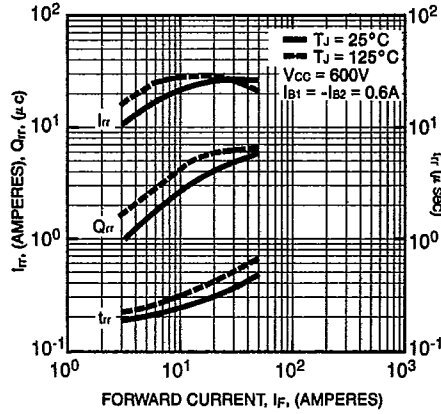
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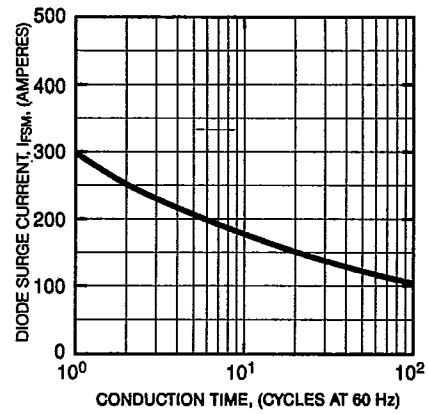
**FORWARD BIAS SAFE OPERATING AREA (S.O.A.)**



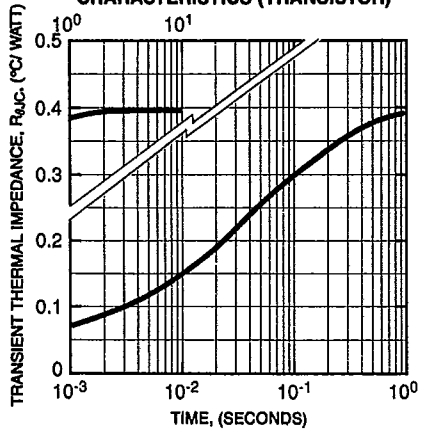
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

