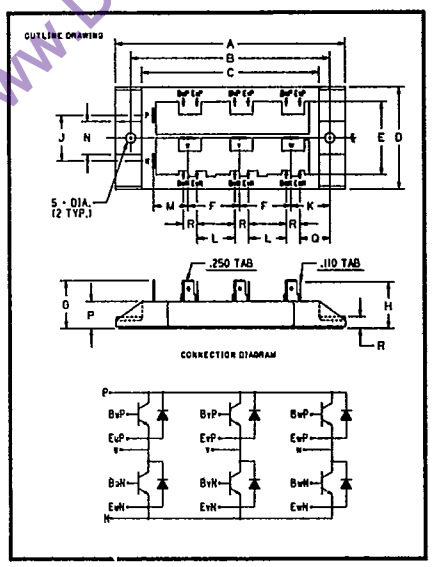
POWEREX

KE721K03HB 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

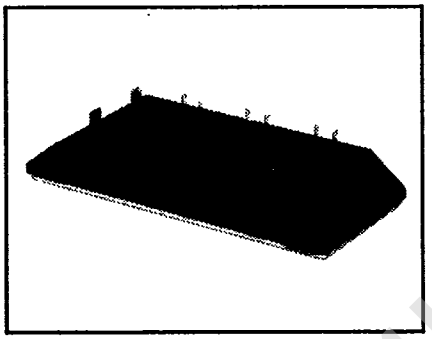
High-Beta Six-Darlington Transistor Module

30 Amperes/1000 Volts



1000 Volts KE721K03HB
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.



KE721K03HB
High-Beta Six-Darlington Transistor Module
30 Amperes/1000 Volts

Description
Powerex High-Beta 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. The transistors are connected in a three phase bridge configuration.

Features:
- ☐ Isolated Mounting
- ☐ Planar Chips
- ☐ Discrete Fast Recovery Feed-Back Diode
- ☐ Very High Gain (h_{FE})
- ☐ Quick Connect Terminals
- ☐ Base Emitter Speed Up Diode

Applications:
- ☐ Inverters
- ☐ DC Motor Control
- ☐ Switching Power Supplies
- ☐ AC Motor Control

Ordering Information
Example: Select the complete ten digit module part number you desire from the table - i.e. KE721K03HB is an 850 $V_{CEO(SUS)}$, (1000 V_{CEV}), 30 Ampere High-Beta Six-Darlington Module with a gain of 750 at rated current (30 Amperes).

Type	$V_{CEO(SUS)}$ Volts (1000)	Current Rating Amperes (x10)	High Beta
KE72	1K	03	HB

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Absolute Maximum Ratings

	Symbol	KE721K03HB	Units
Junction Temperature	T_J	−40 to 150	°C
Storage Temperature	T_{STG}	−40 to 125	°C
Collector-Emitter Sustaining Voltage	$V_{CEO(SUS)}$	850	Volts
Collector-Emitter Sustaining Voltage V_{BE} = −2V	$V_{CEV(SUS)}$	1000	Volts
Collector-Base Voltage	V_{CBO}	1000	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Emitter Voltage V_{BE} = −2V	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	P_T	300	Watts
Maximum Mounting Torque M5 Mounting Screws	—	17	in.-lb.
Module Weight (Typical)	—	500	Grams
V Isolation	V_{RMS}	2500	Volts

Electrical and Mechanical Characteristics, T_C = 25°C unless otherwise specified

Characteristics		Symbol	Test Conditions	KE721K03HB Min.	Typ.	Max.	Units
Collector Cutoff Current		I_{CEV}	V_{CE} = 1000V, V_{BE} = −2V	—	—	2	mA
Emitter Cutoff Current		I_{EBO}	V_{EB} = 7V	—	—	50	mA
DC Current Gain		h_{FE}	I_C = 30A, V_{CE} = 4.0V	750	—	—	—
Diode Forward Voltage		V_{FM}	I_{FM} = 30A	—	—	1.8	Volts
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	I_C = 30A, I_B = 40mA	—	—	4.0	Volts
Base-Emitter Saturation Voltage		$V_{BE(SAT)}$	I_C = 30A, I_B = 40mA	—	—	4.0	Volts
Resistive Load Switch Times	Turn-on	t_{on}	V_{CC} = 600V	—	—	2.5	μs
	Storage Time	t_s	I_C = 30A	—	—	15.0	μs
	Fall Time	t_f	I_{B1} = 0.06A, I_{B2} = −0.6A	—	—	3.0	μs
Thermal Resistance, Case to Sink Lubricated		$R_{\theta CS}$	Per 1/6 Module	—	—	0.25	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	Transistor Part	—	—	0.4	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	Diode Part	—	—	1.5	°C/W

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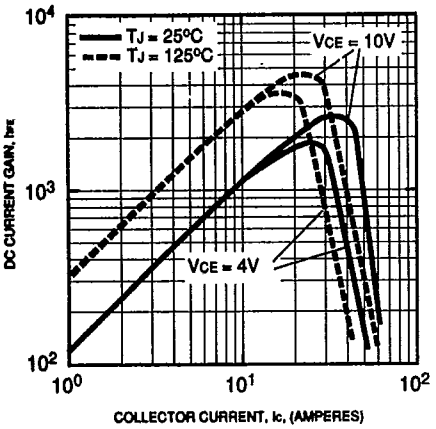
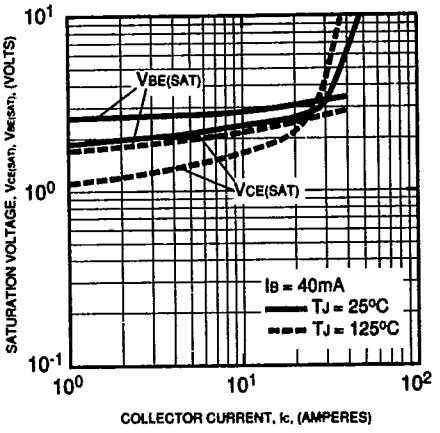
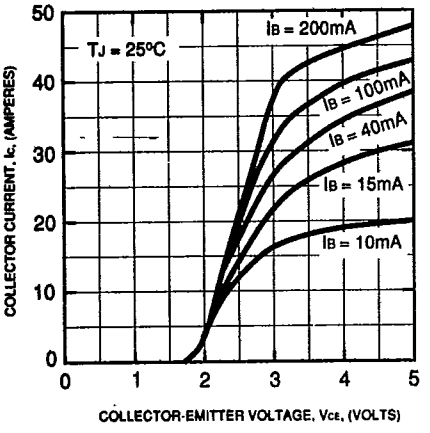
DC CURRENT GAIN (TYPICAL)



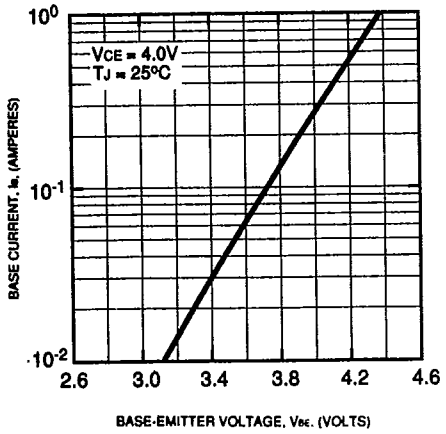
SATURATION VOLTAGE (TYPICAL)



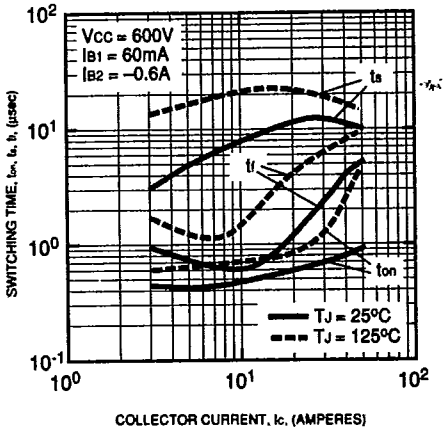
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



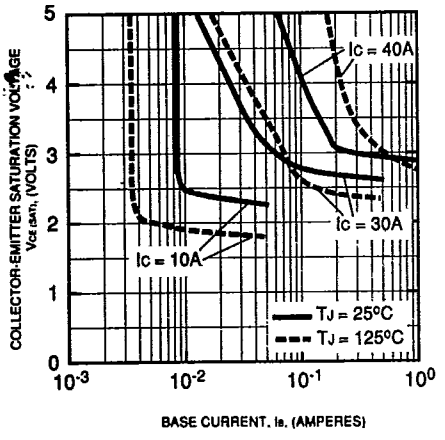
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



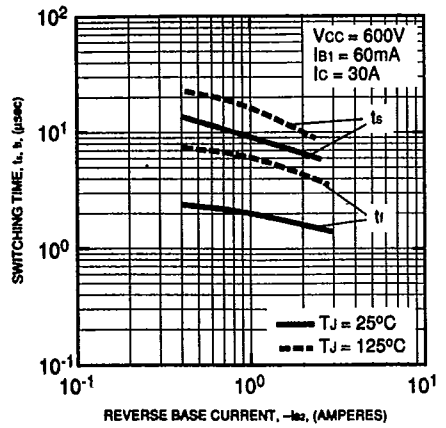
SWITCHING CHARACTERISTICS (TYPICAL)



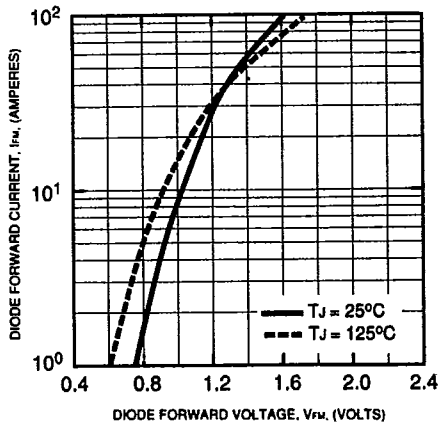
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



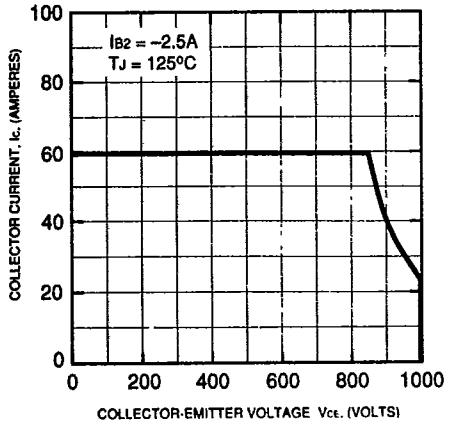
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



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



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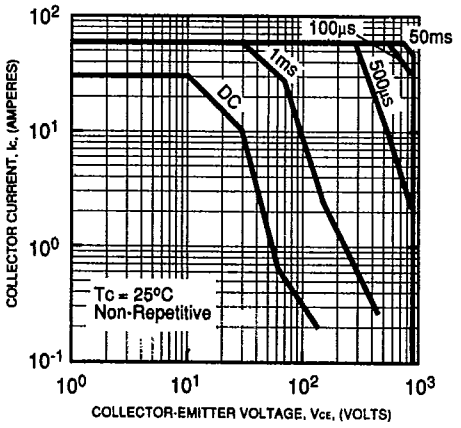
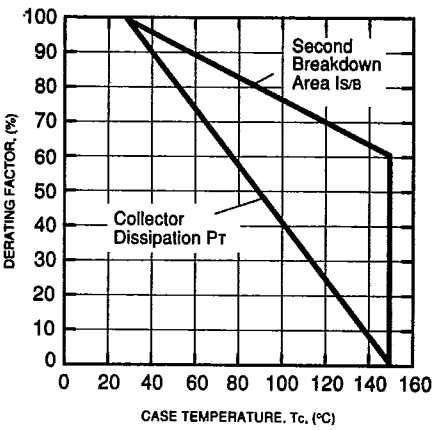
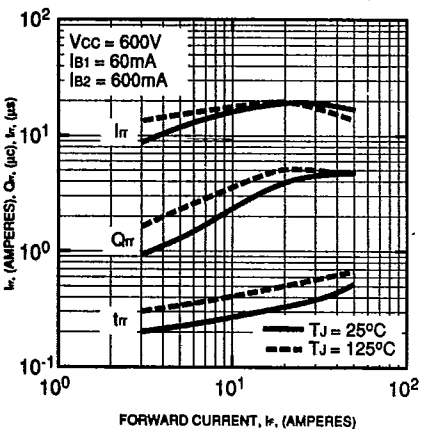
FORWARD BIAS SAFE OPERATING AREA (S.O.A)



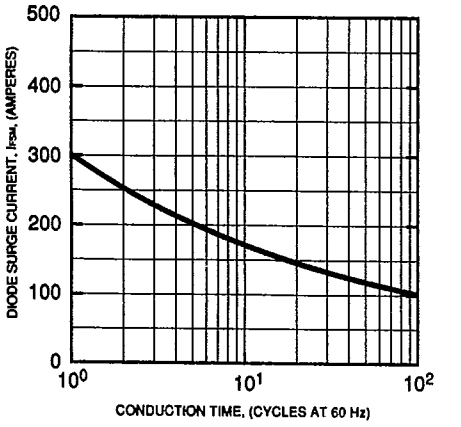
DERATING FACTOR OF S.O.A.



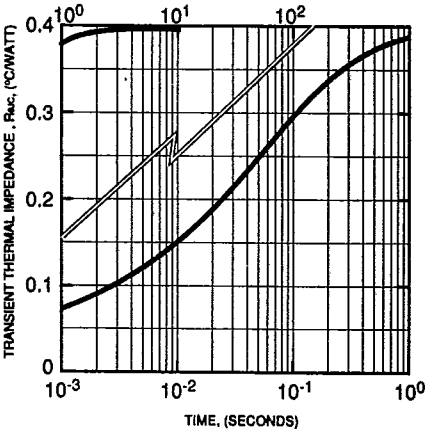
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)