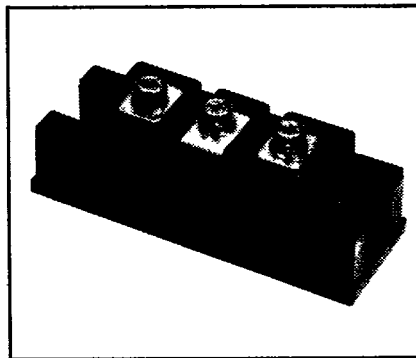
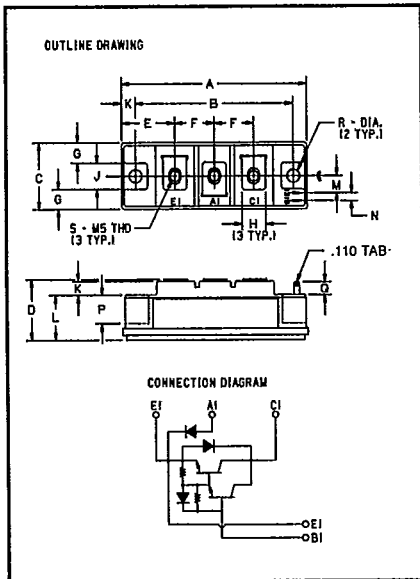




KR224503

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

Chopper Darlington Transistor Module
30 Amperes/600 Volts



KR224503
Chopper Darlington Transistor Module
 30 Amperes/600 Volts

Description

Powerex Chopper Darlington Transistor Modules are designed for use in switching applications. The modules are isolated, consisting of one Darlington Transistor having a reverse parallel connected and emitter-cathode connected high-speed diode.

Features:

- Isolated Mounting
- Planar Chips
- Discrete Fast Recovery Feed-Back Diode
- Load Free Wheel Diode
- Base Emitter Speed Up Diode
- High Gain (h_{FE})
- Quick Connect Terminals

Applications:

- Chopper
- DC Motor Control
- Buck Regulator

Ordering Information

Example: Select the complete eight digit module part number you desire from the table - i.e. KR224503 is a 450 $V_{CE0(SUS)}$ (600 V_{CEV}), 30 Ampere Chopper Darlington Module.

600 Volt KR224503
Outline Drawing

Dimension	Inches	Millimeters
A	3.701 Max.	94 Max.
B	3.150 ± .01	80 ± 0.25
C	1.339 Max.	34 Max.
D	1.220 Max.	31 Max.
E	1.063	27
F	.787	20
G	.413	10.5
H	.472	12
J	.512	13
K	.276	7
L	.906	23
M	.344	8.75
N	.157	4
P	.571	14.5
Q	.256 Min.	6.5 Min.
R	.256 Dia.	6.5 Dia.
S	M5 Metric	M5

Type	$V_{CE0(SUS)}$ Volts (x10)	Current Rating Amperes (x10)
KR22	45	03



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

	Symbol	KR224503	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	$V_{CE(SUS)}$	450	Volts
Collector-Emitter Sustaining Voltage $V_{BE} = -2\text{V}$	$V_{CEV(SUS)}$	600	Volts
Collector-Base Voltage	V_{CBO}	600	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Emitter Voltage $V_{BE} = -2\text{V}$	V_{CEV}	600	Volts
Continuous Collector Current	I_C	30	Amperes
Diode Forward Current	I_{FM}	30	Amperes
Continuous Base Current	I_B	1.8	Amperes
Diode Surge Current	I_{FSM}	300	Amperes
Power Dissipation	P_T	250	Watts
Max. Mounting Torque M5 Terminal Screws	—	17	in.-lb.
Max. Mounting Torque M6 Mounting Screws	—	26	in.-lb.
Module Weight	—	200	Grams
V isolation	V_{RMS}	2000	Volts

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

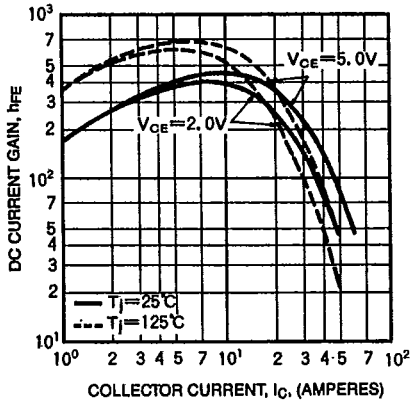
Characteristics	Symbol	Test Conditions	KR224503			Units
			Min.	Typ.	Max.	
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	—	—	200	mA
DC Current Gain	h_{FE}	$I_C = 30\text{A}, V_{CE} = 5.0\text{V}$	100	—	—	—
DC Current Gain	h_{FE}	$I_C = 30\text{A}, V_{CE} = 2.0\text{V}$	75	—	—	—
Diode Forward Voltage	V_{FM}	$I_{FM} = 30\text{A}$	—	—	1.85	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 30\text{A}, I_B = 0.4\text{A}$	—	—	2.0	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 30\text{A}, I_B = 0.4\text{A}$	—	—	2.5	V
Resistive Turn On	t_{on}	$V_{CC} = 300\text{V}$	—	—	1.5	μs
Load Storage Time	t_s	$I_C = 30\text{A}$	—	—	12	μs
Switch Times Fall Time	t_f	$I_{B1} = -I_{B2} = 0.6\text{A}$	—	—	3.0	μs
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$				0.15	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	0.5	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	2.0	$^\circ\text{C/W}$



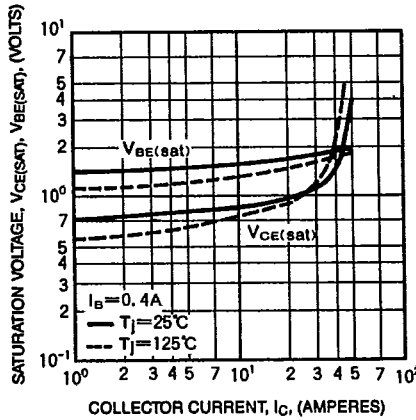
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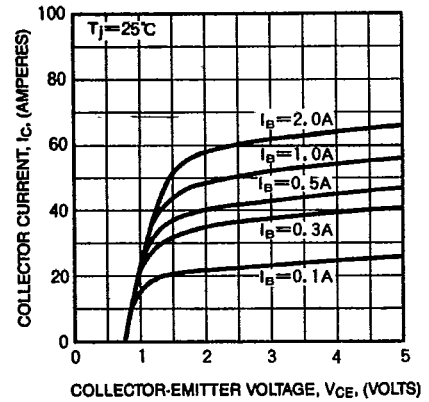
DC CURRENT GAIN (TYPICAL)



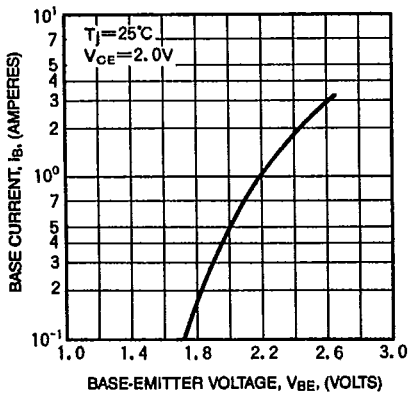
SATURATION VOLTAGE (TYPICAL)



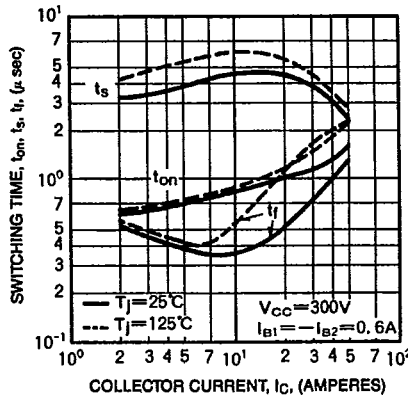
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



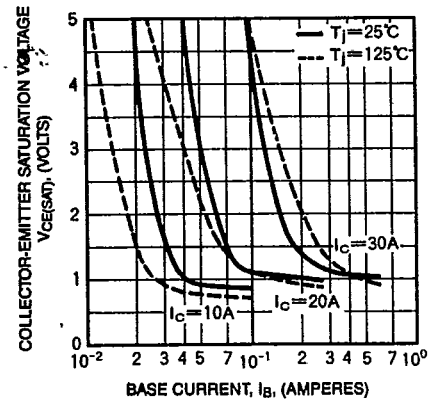
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



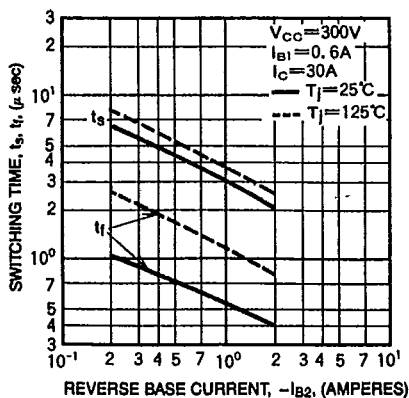
SWITCHING CHARACTERISTICS (TYPICAL)



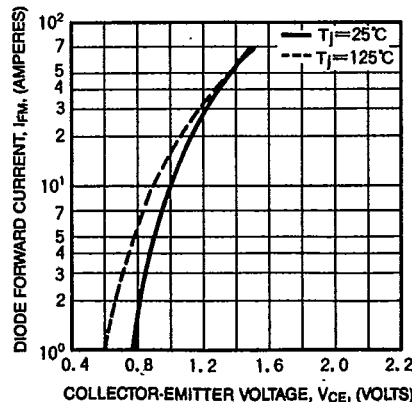
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



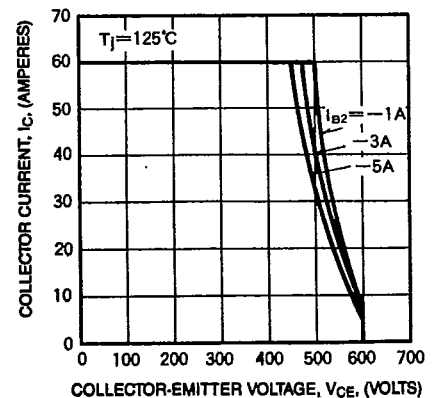
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



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

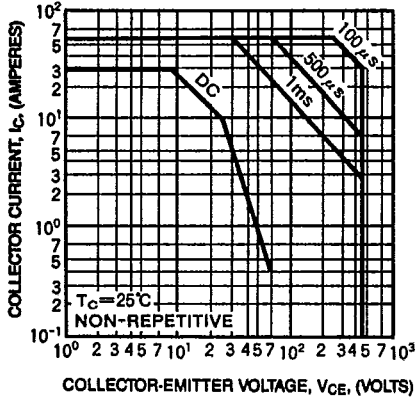




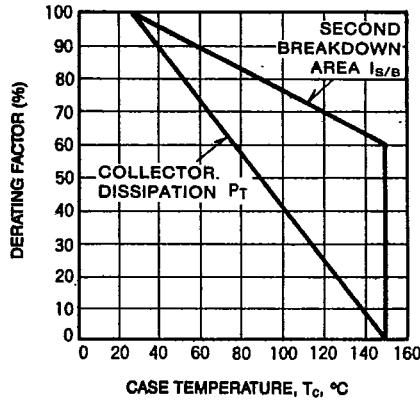
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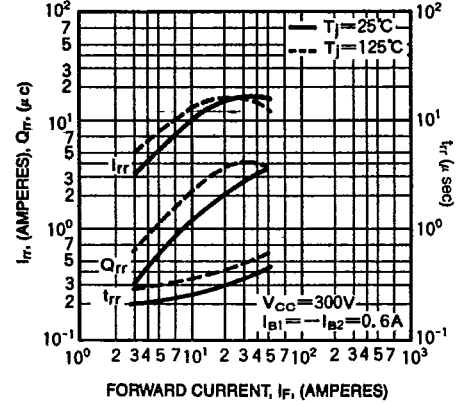
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



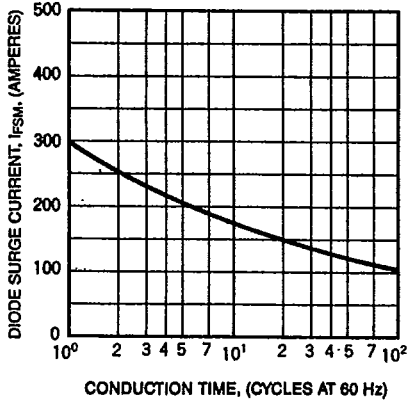
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



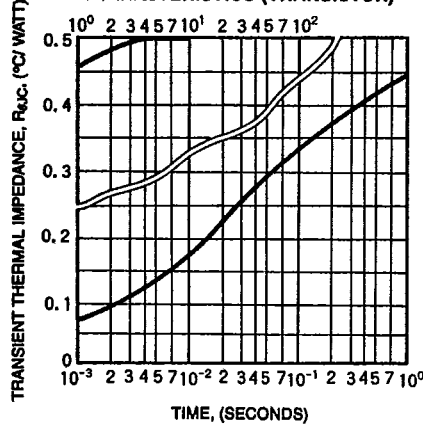
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

