



KD324510

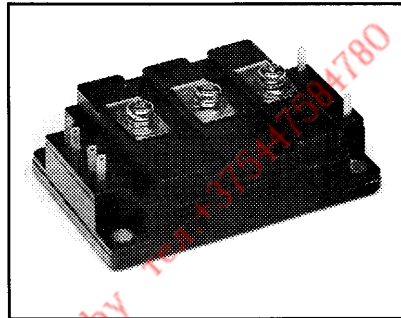
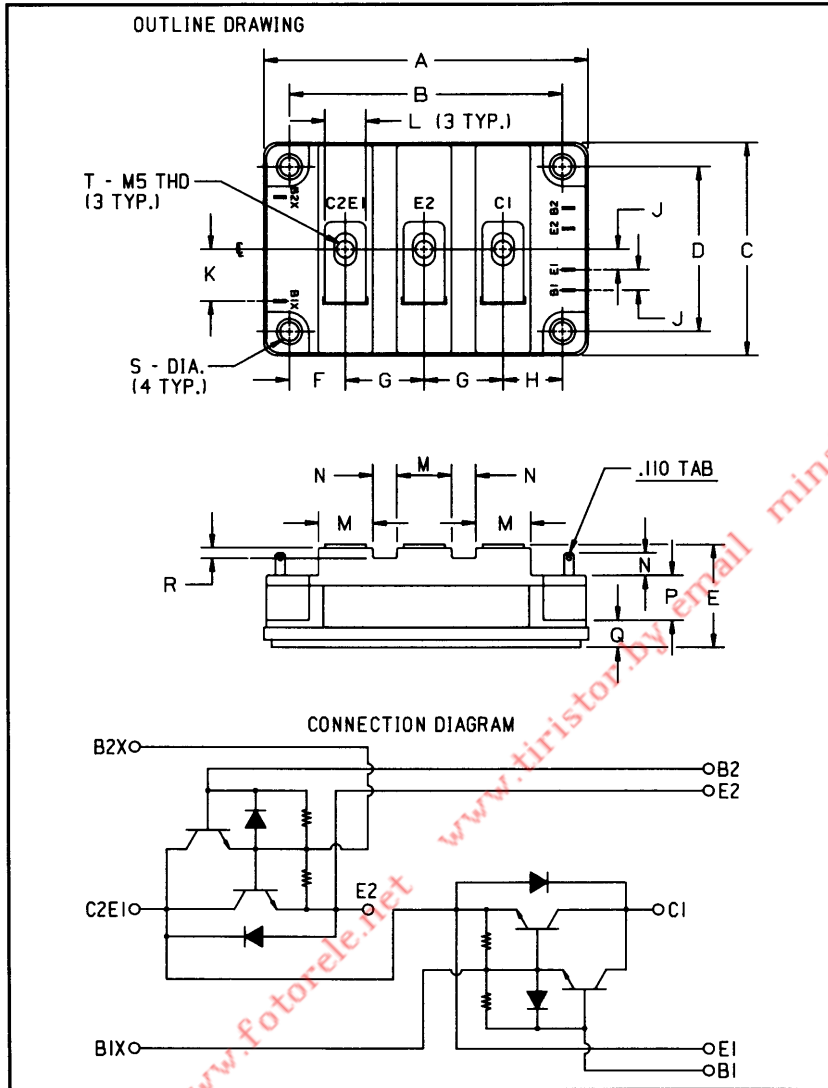
Powerex, Inc., 200 Hillis Street, Youngwood, Pennsylvania 15697-1800 (412) 925-7272

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**Dual Darlington
Transistor Module
100 Amperes/600 Volts**



Description:

The Powerex Dual Darlington Transistor Modules are high power devices designed for use in switching applications. The modules are isolated, consisting of two Darlington Transistors with each transistor having a reverse parallel connected high-speed diode.

Features:

- Isolated Mounting
- Planar Chips
- Discrete Fast Recovery Feedback Diode
- High Gain (h_{FE})
- Quick Connect Base-Emitter Signal Terminals
- Base-Emitter Speed-up Diodes

Applications:

- AC Motor Control
- DC Motor Control
- Switching Power Supplies
- Inverters

Ordering Information:

Example: Select the complete eight digit module part number you desire from the table - i.e. KD324510 is a 450 $V_{CEO(sus)}$ (600 V_{CEV}), 100 Ampere Dual Darlington Module.

Outline Drawing

Dimensions	Inches	Millimeters
A	3.740 Max.	95 Max.
B	3.150 ± 0.01	80 ± 0.25
C	2.441 Max.	62 Max.
D	1.890 ± 0.01	48 ± 0.25
E	1.181 Max.	30 Max.
F	0.650	16.5
G	0.906	23
H	0.689	17.5
J	0.236	6

Dimensions	Inches	Millimeters
K	0.596	15
L	0.472	12
M	0.630	16
N	0.276	7
P	0.512	13
Q	0.315	8
R	0.118	3
S	0.216 Dia.	5.5 Dia.
T	M5 Metric	M5

Type	$V_{CEO(sus)}$ Volts (X 10)	Current Rating Amperes (X 10)
KD32	45	10



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Absolute Maximum Ratings, $T_j = 25^\circ\text{C}$ unless otherwise specified

Ratings	Symbol	KD324510	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	$V_{\text{CEO(sus)}}$	450	Volts
Collector-Emitter Sustaining Voltage, $V_{\text{BE}} = -2\text{V}$	$V_{\text{CEV(sus)}}$	600	Volts
Collector-Base Voltage	V_{CBO}	600	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Emitter Voltage, $V_{\text{BE}} = -2\text{V}$	V_{CEV}	600	Volts
Continuous Collector Current	I_C	100	Amperes
Diode Forward Current	I_{FM}	100	Amperes
Continuous Base Current	I_B	6	Amperes
Diode Surge Current	I_{FSM}	1000	Amperes
Power Dissipation (Each Transistor)	P_t	620	Watts
Max. Mounting Torque M5 Terminal Screws	-	17	in.-lb.
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Module Weight (Typical)	-	420	Grams
V Isolation	V_{RMS}	2500	Volts

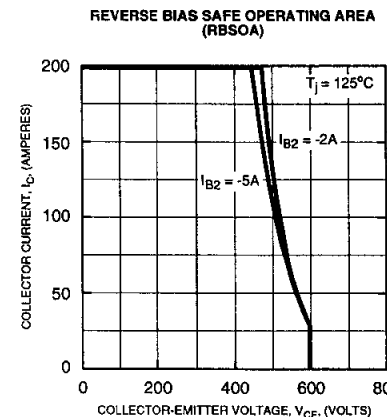
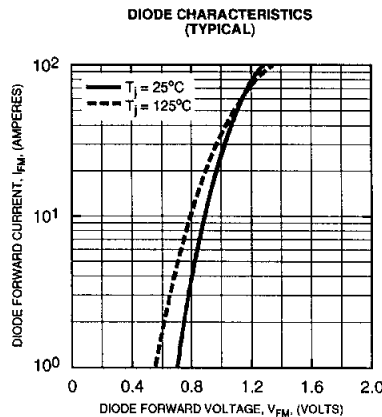
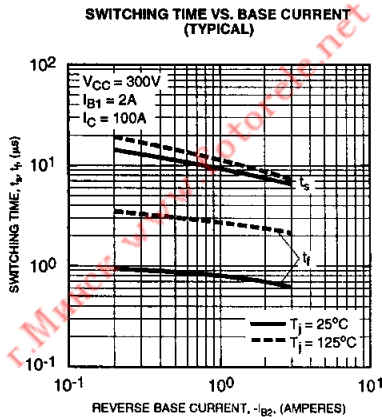
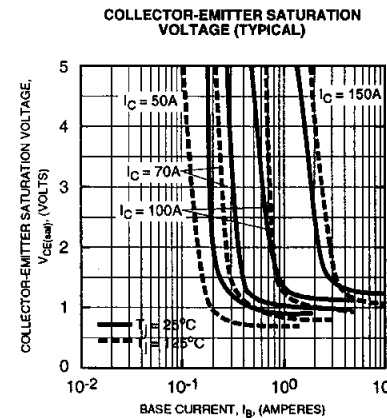
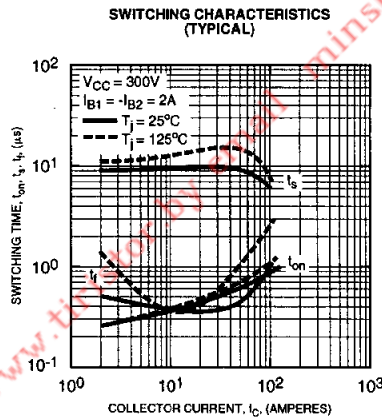
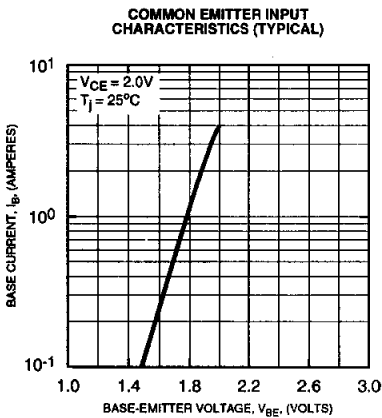
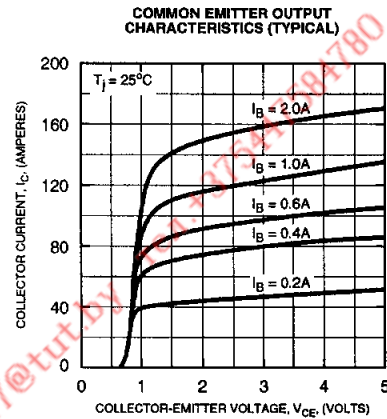
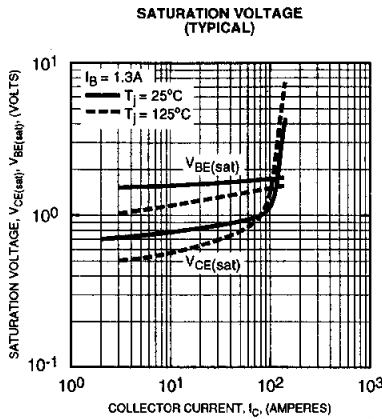
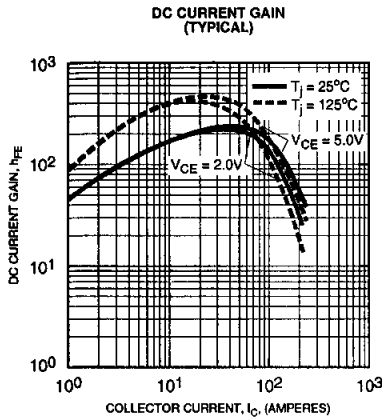
Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current	I_{CEV}	$V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}$	-	-	2	mA
		$V_{\text{CE}} = 600\text{V}, V_{\text{BE}} = -2\text{V}, T_C = 125^\circ\text{C}$	-	-	15	mA
Emitter Cutoff Current	I_{EBO}	$V_{\text{EB}} = 7\text{V}$	-	-	100	mA
DC Current Gain	h_{FE}	$I_C = 100\text{A}, V_{\text{CE}} = 2\text{V}$	75	-	-	-
		$I_C = 100\text{A}, V_{\text{CE}} = 5\text{V}$	100	-	-	-
Diode Forward Voltage	V_{FM}	$I_{\text{FM}} = 100\text{A}$	-	-	1.75	Volts
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 100\text{A}, I_B = 1.3\text{A}$	-	-	2.0	Volts
Base-Emitter Saturation Voltage	$V_{\text{BE(sat)}}$	$I_C = 100\text{A}, I_B = 1.3\text{A}$	-	-	2.5	Volts
Resistive Turn-on	t_{on}	$V_{\text{CC}} = 300\text{V}$	-	-	2.0	μs
Load Storage Time	t_s	$I_C = 100\text{A}$	-	-	12	μs
Switch Times Fall Time	t_f	$I_{\text{B1}} = 2\text{A}, I_{\text{B2}} = -2\text{A}$	-	-	3.0	μs

Thermal and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

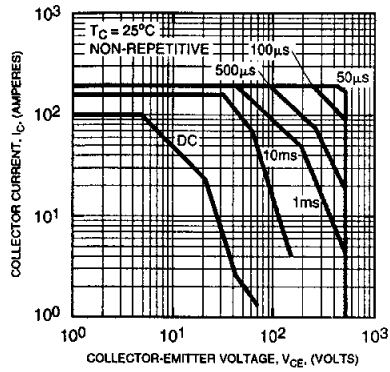
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(\text{c-s})}$	Per 1/2 Module	-	-	0.1	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(\text{j-c})}$	Transistor Part	-	-	0.2	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(\text{j-c})}$	Diode Part	-	-	0.65	$^\circ\text{C/W}$

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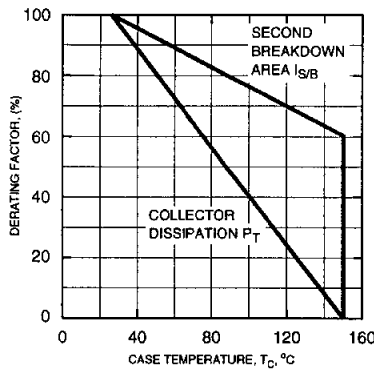


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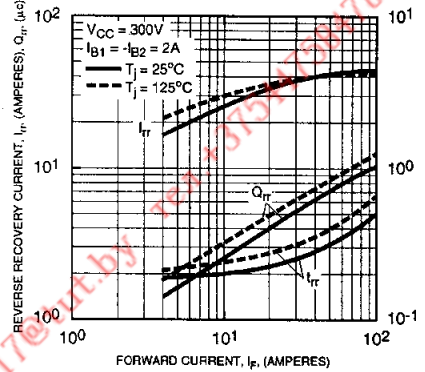
FORWARD BIAS SAFE OPERATING AREA (SOA)



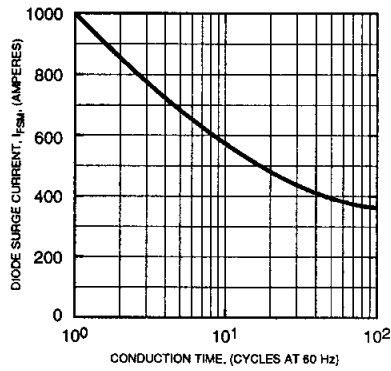
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



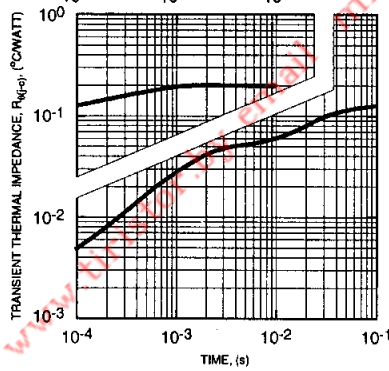
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



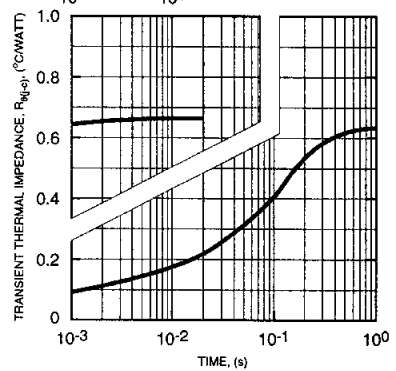
DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)



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