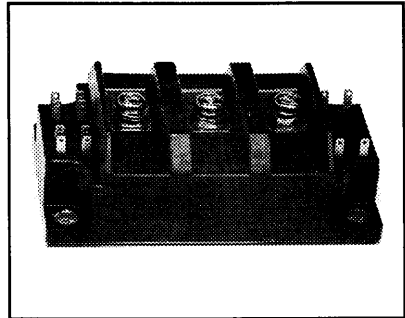
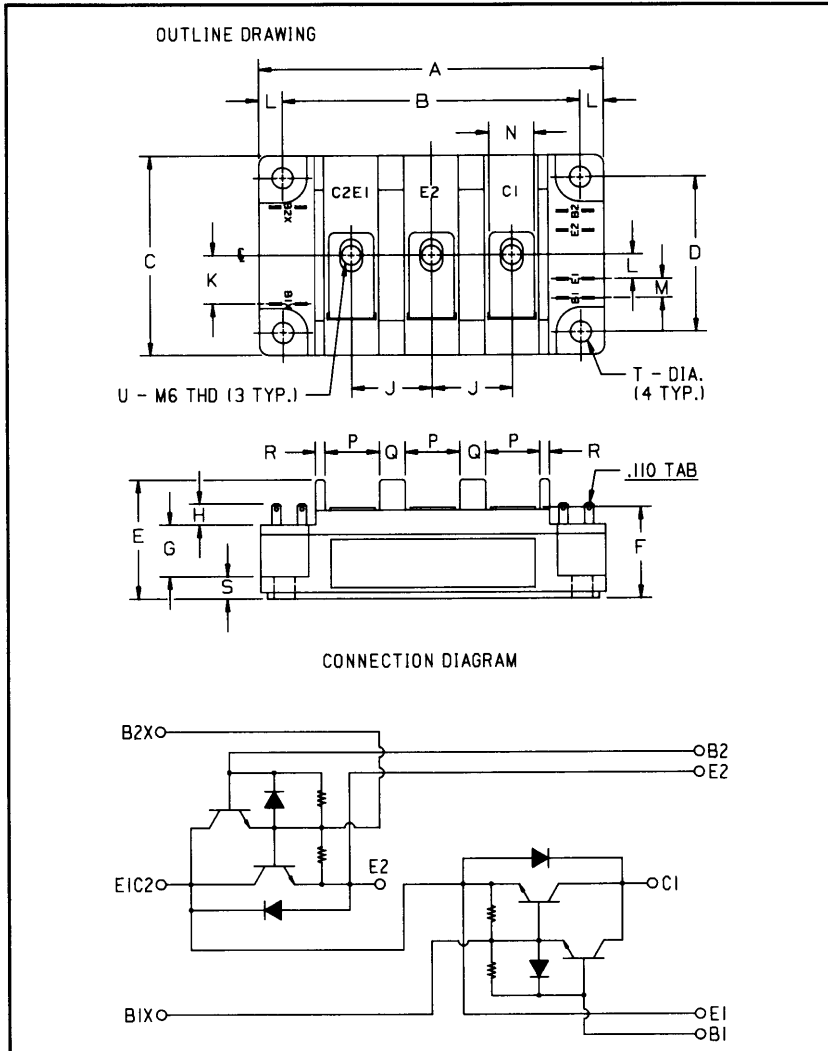


Dual Darlington Transistor Module 200 Amperes/600 Volts



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 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. KD424520 is a 450 $V_{CE0(sus)}$ (600 V_{CEV}), 200 Ampere Dual Darlington Module.

Outline Drawing

Dimensions	Inches	Millimeters
A	4.252 Max.	108 Max.
B	3.661 ± 0.012	93 ± 0.3
C	2.441 Max.	62 Max.
D	1.890 ± 0.012	48 ± 0.3
E	1.457	37
F	1.181 Max.	30 Max.
G	0.630	16
H	0.256 Min.	6.5 Min.
J	0.984	25
K	0.591	15

Dimensions	Inches	Millimeters
L	0.295	7.5
M	0.236	6
N	0.551	14
P	0.669	17
Q	0.315	8
R	0.118	3
S	0.276	7
T	0.256 Dia.	6.5 Dia.
U	M6 Metric	M6

Type	$V_{CE0(sus)}$ Volts (X 10)	Current Rating Amperes (X 10)
KD42	45	20



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

KD424520
Dual Darlington Transistor Module
 200 Amperes/600 Volts

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

Ratings	Symbol	KD424520	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	$V_{CEO(sus)}$	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	200	Amperes
Diode Forward Current	I_{FM}	200	Amperes
Continuous Base Current	I_B	12	Amperes
Diode Surge Current	I_{FSM}	2000	Amperes
Power Dissipation (Each Transistor)	P_T	1250	Watts
Max. Mounting Torque M6 Terminal Screws	-	26	in.-lb.
Max. Mounting Torque M6 Mounting Screws	-	26	in.-lb.
Module Weight (Typical)	-	470	Grams
V Isolation	V_{RMS}	2500	Volts

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	-	-	4	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	-	-	800	mA
DC Current Gain	h_{FE}	$I_C = 200\text{A}, V_{CE} = 2\text{V}$	75	-	-	-
Diode Forward Voltage	V_{FM}	$I_{FM} = 200\text{A}$	-	-	1.75	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 200\text{A}, I_B = 2.6\text{A}$	-	-	2.0	Volts
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 200\text{A}, I_B = 2.6\text{A}$	-	-	2.5	Volts
Resistive Turn-on	t_{on}	$V_{CC} = 300\text{V}$	-	-	2.0	μs
Load Storage Time	t_s	$I_C = 2050\text{A}$	-	-	12	μs
Switch Times Fall Time	t_f	$I_{B1} = -I_{B2} = 4.0\text{A}$	-	-	3.0	μs

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

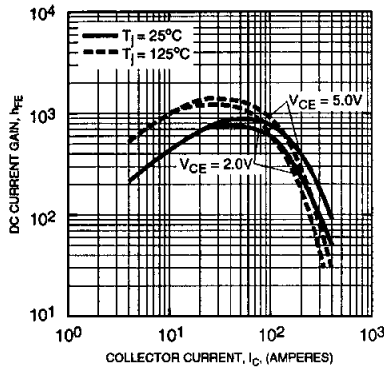
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c-s)}$	Per Half Module	-	-	0.4	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	-	-	0.12	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	-	-	0.33	$^\circ\text{C/W}$



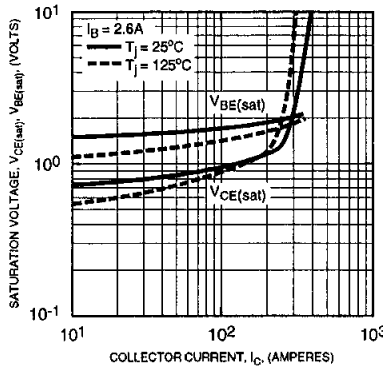
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KD424520
Dual Darlington Transistor Module
200 Amperes/600 Volts

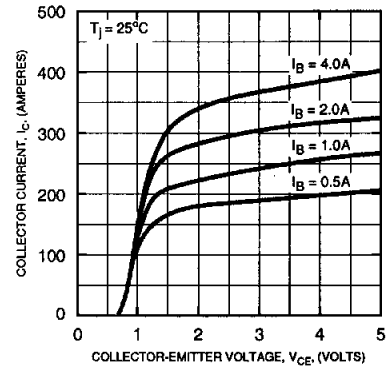
DC CURRENT GAIN (TYPICAL)



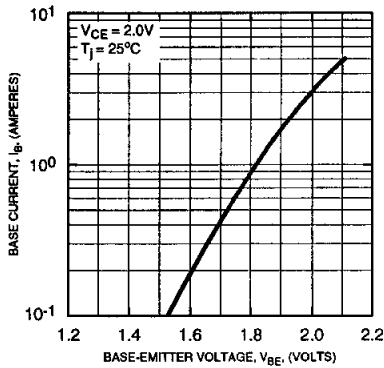
SATURATION VOLTAGE (TYPICAL)



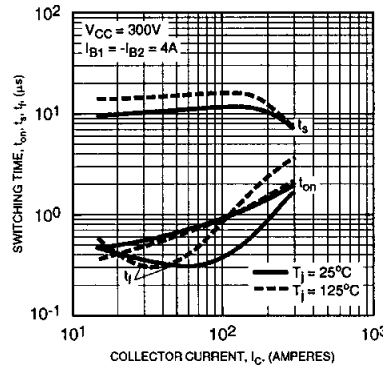
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



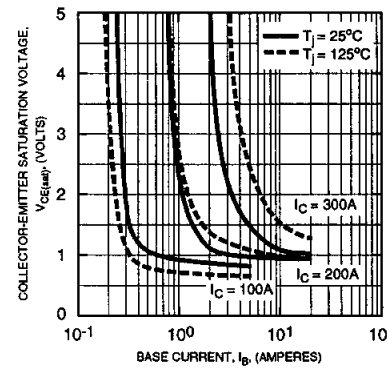
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



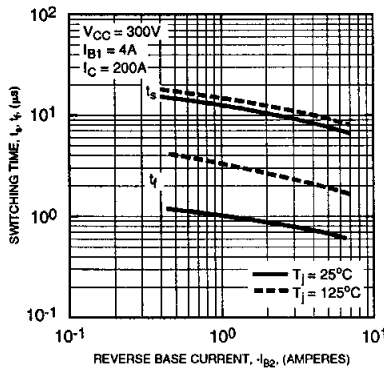
SWITCHING CHARACTERISTICS (TYPICAL)



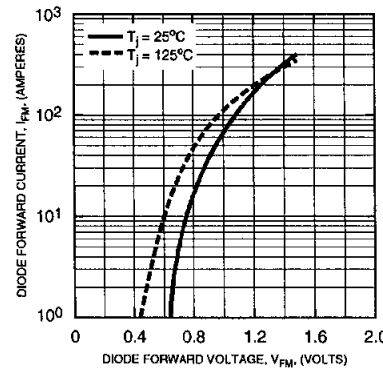
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



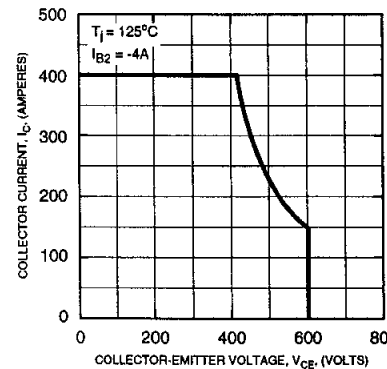
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



REVERSE BIAS SAFE OPERATING AREA (RBSOA)

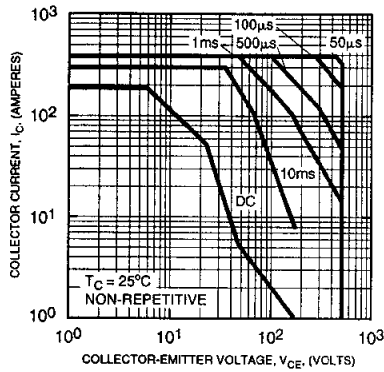




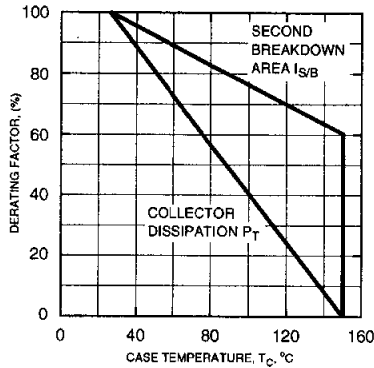
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KD424520
Dual Darlington Transistor Module
 200 Amperes/600 Volts

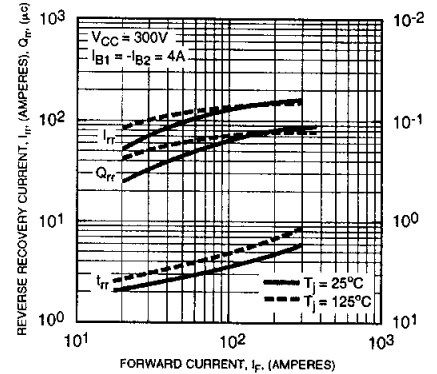
FORWARD BIAS SAFE OPERATING AREA (SOA)



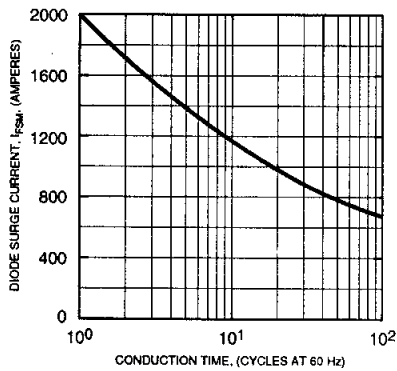
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



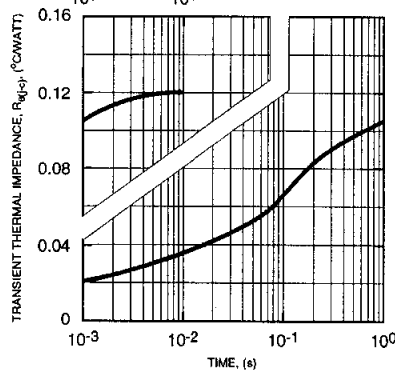
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

