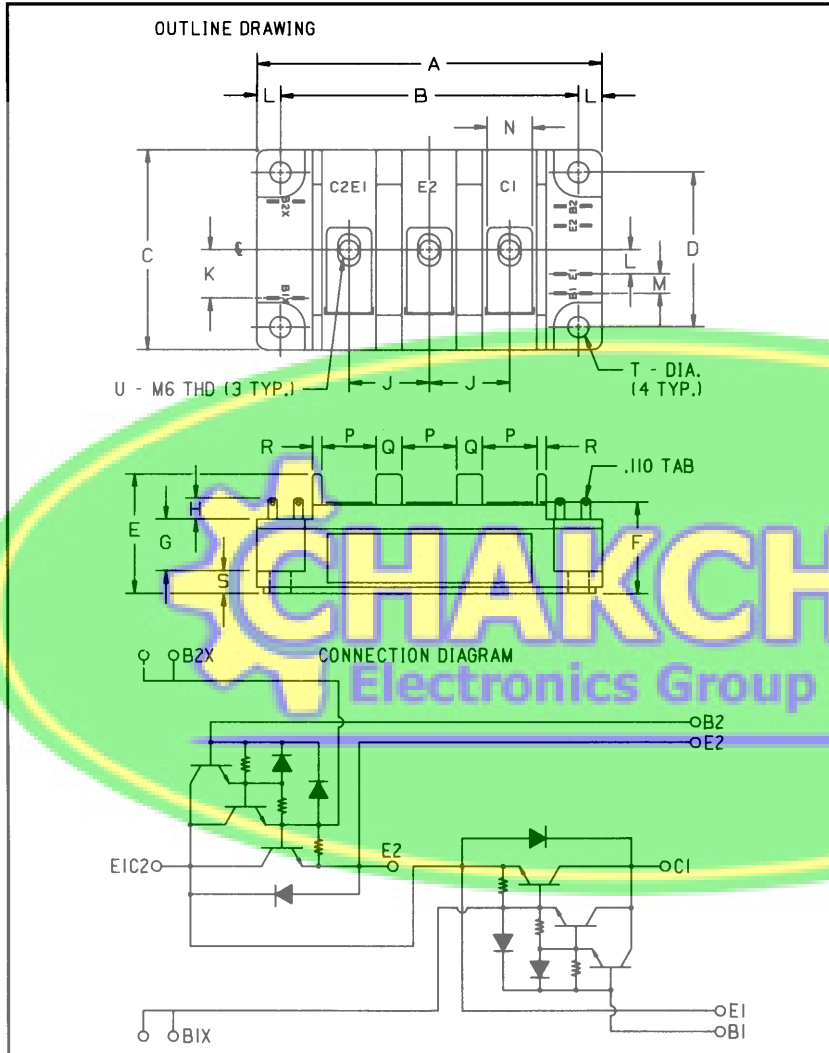


Dual Darlington Transistor Module 150 Amperes/1000 Volts



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. KD421K15 is a 1000 Volt, 150 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 (1000)	Current Rating Amperes (X 10)
KD42	1K	15



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

KD421K15
Dual Darlington Transistor Module
 150 Amperes/1000 Volts

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

Ratings	Symbol	KD421K15	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, $V_{BE} = -2\text{V}$	$V_{CEV(sus)}$	1000	Volts
Collector-Base Voltage	V_{CBO}	1000	Volts
Emitter-Base Voltage	V_{EBO}	7	Volts
Collector-Emitter Voltage, $V_{BE} = -2\text{V}$	V_{CEV}	1000	Volts
Continuous Collector Current	I_C	150	Amperes
Diode Forward Current	I_{FM}	150	Amperes
Continuous Base Current	I_B	8	Amperes
Diode Surge Current	I_{FSM}	1500	Amperes
Power Dissipation (Each Transistor)	P_t	1000	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

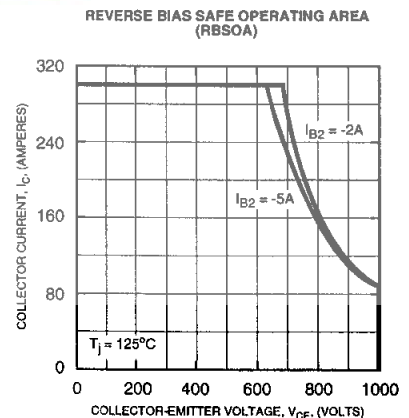
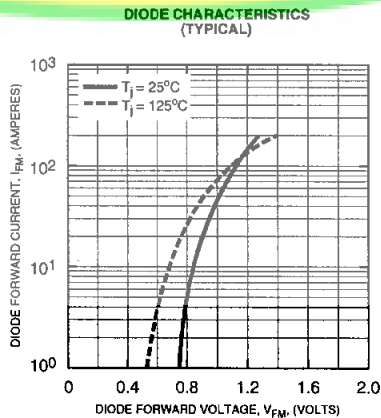
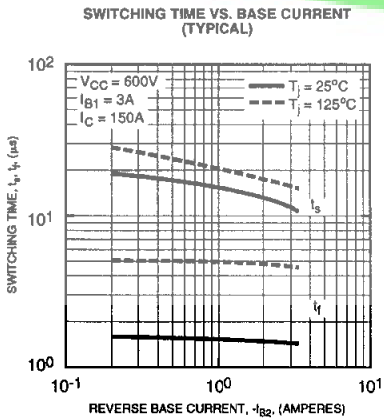
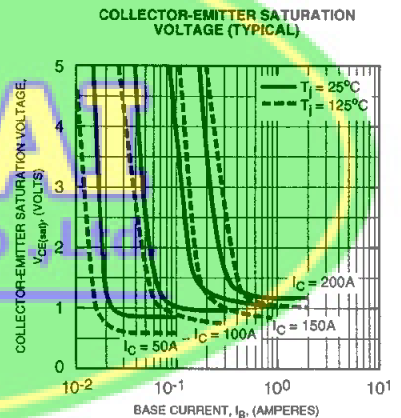
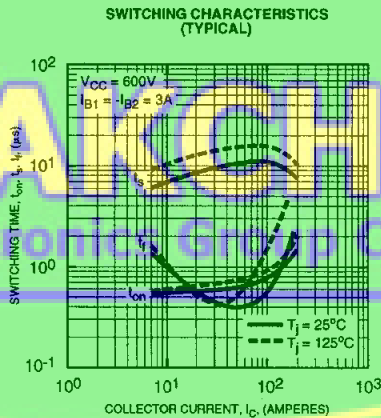
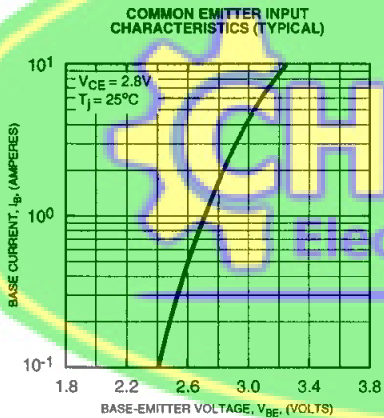
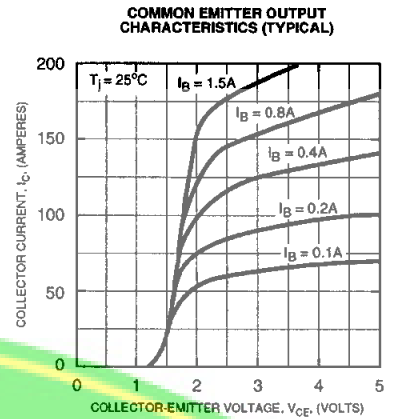
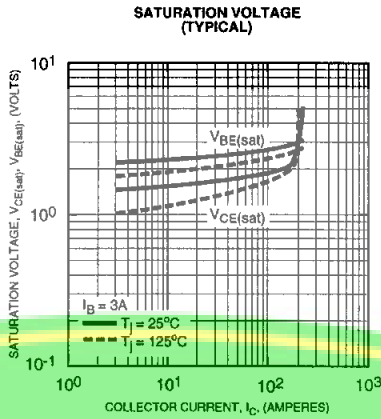
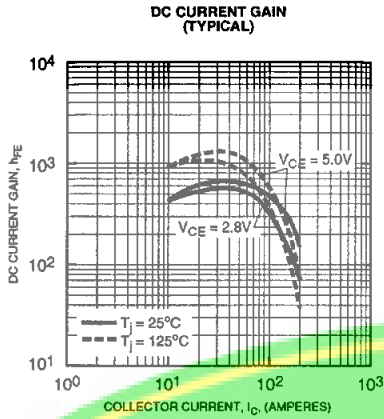
Electrical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units	
Collector Cutoff Current	I_{CEV}	$V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}$	-	-	2	mA	
		$V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}, T_C = 125^\circ\text{C}$	-	-	20	mA	
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	-	-	400	mA	
DC Current Gain	h_{FE}	$I_C = 150\text{A}, V_{CE} = 2.8\text{V}$	75	-	-	-	
		$I_C = 150\text{A}, V_{CE} = 5\text{V}$	100	-	-	-	
Diode Forward Voltage	V_{FM}	$I_{FM} = 150\text{A}$	-	-	1.8	Volts	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 150\text{A}, I_B = 3\text{A}$	-	-	2.5	Volts	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 150\text{A}, I_B = 3\text{A}$	-	-	3.5	Volts	
Resistive	Turn-on	t_{on}	$V_{CC} = 600\text{V}$	-	-	3.0	μs
Load	Storage Time	t_s	$I_C = 150\text{A}$	-	-	15	μs
Switch Times	Fall Time	t_f	$I_{B1} = 3\text{A}, I_{B2} = -3\text{A}$	-	-	3.0	μs

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

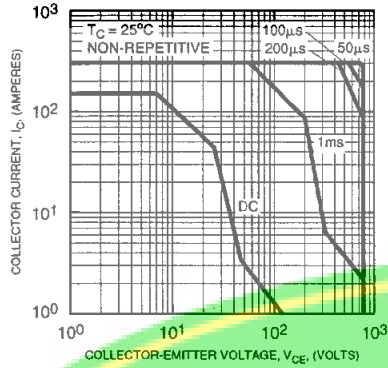
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c-s)}$	Per Half Module	-	-	0.075	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	-	-	0.125	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	-	-	0.6	$^\circ\text{C/W}$

KD421K15
Dual Darlington Transistor Module
 150 Amperes/1000 Volts

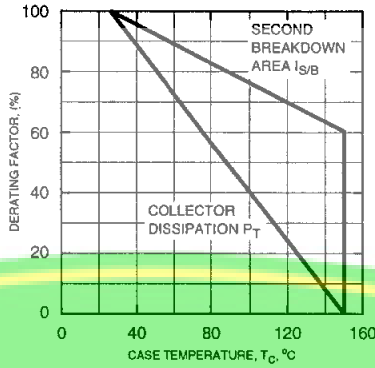


KD421K15
Dual Darlington Transistor Module
 150 Amperes/1000 Volts

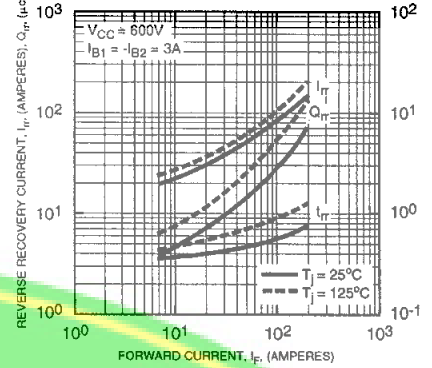
FORWARD BIAS SAFE OPERATING AREA (SOA)



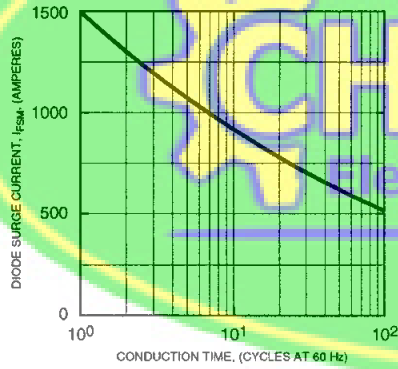
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



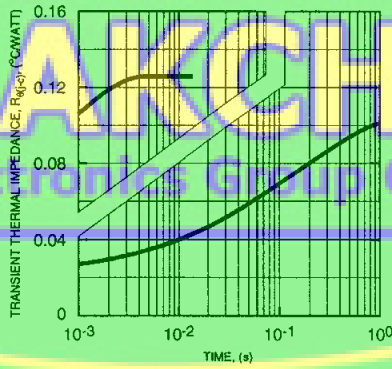
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

