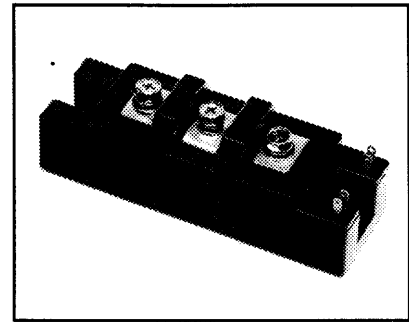
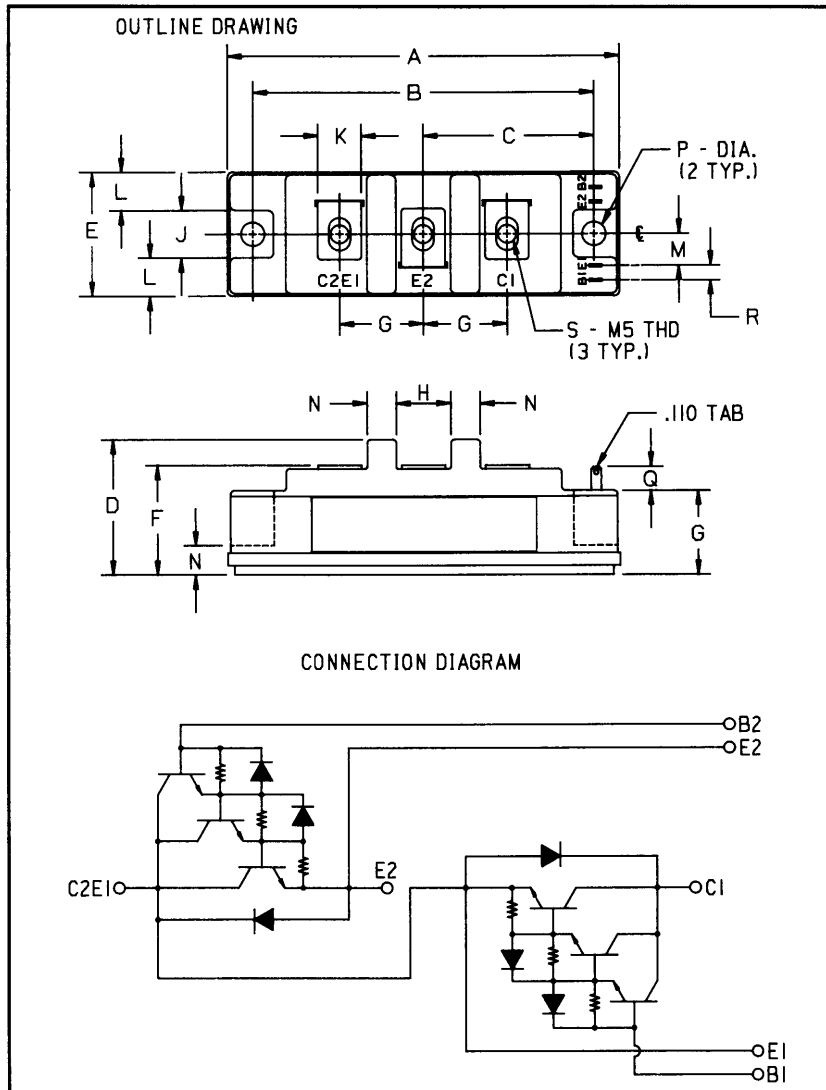


### Dual Darlington Transistor Module 75 Amperes/1000 Volts



#### 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. KD221K75 is a 1000 Volt, 75 Ampere Dual Darlington Module.

Outline Drawing

Dimensions	Inches	Millimeters
A	4.252 Max.	108 Max.
B	3.661 ± 0.012	93 ± 0.3
C	1.831	46.5
D	1.457	37
E	1.339 Max.	34 Max.
F	1.181 Max.	30 Max.
G	0.906	23
H	0.591	15
J	0.512	13

Dimensions	Inches	Millimeters
K	0.472	12
L	0.413	10.5
M	0.344	8.75
N	0.315	8
P	0.256 Dia.	6.5 Dia.
Q	0.256 Min.	6.5 Min.
R	0.157	4
S	M5 Metric	M5

Type	$V_{CE0(sus)}$ Volts (1000)	Current Rating Amperes (75)
KD22	1K	75



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

**KD221K75**  
**Dual Darlington Transistor Module**  
 75 Amperes/1000 Volts

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

Ratings	Symbol	KD221K75	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	$I_C$	75	Amperes
Diode Forward Current	$I_{FM}$	75	Amperes
Continuous Base Current	$I_B$	4	Amperes
Diode Surge Current	$I_{FSM}$	700	Amperes
Power Dissipation (Each Transistor)	$P_t$	500	Watts
Max. Mounting Torque M5 Terminal Screws	—	17	in.-lb.
Max. Mounting Torque M6 Mounting Screws	—	26	in.-lb.
Module Weight (Typical)	—	250	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	$I_{CEV}$	$V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA	
		$V_{CE} = 1000\text{V}, V_{BE} = -2\text{V}, T_C = 125^\circ\text{C}$	—	—	10	mA	
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 7\text{V}$	—	—	200	mA	
DC Current Gain	$h_{FE}$	$I_C = 75\text{A}, V_{CE} = 5\text{V}$	100	—	—	—	
Diode Forward Voltage	$V_{FM}$	$I_{FM} = 75\text{A}$	—	—	1.8	Volts	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 75\text{A}, I_B = 1.5\text{A}$	—	—	2.5	Volts	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 75\text{A}, I_B = 1.5\text{A}$	—	—	3.5	Volts	
Resistive	Turn-on	$t_{on}$	$V_{CC} = 600\text{V}$	—	—	2.5	$\mu\text{s}$
Load	Storage Time	$t_s$	$I_C = 75\text{A}$	—	—	15	$\mu\text{s}$
Switch Times	Fall Time	$t_f$	$I_{B1} = 1.5\text{A}, I_{B2} = -1.5\text{A}$	—	—	3.0	$\mu\text{s}$

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

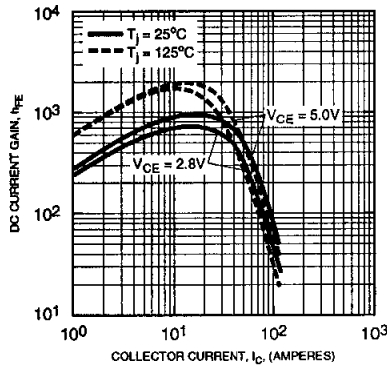
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c-s)}$	Per 1/2 Module	—	—	0.15	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	—	—	0.25	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	—	—	1.2	$^\circ\text{C/W}$



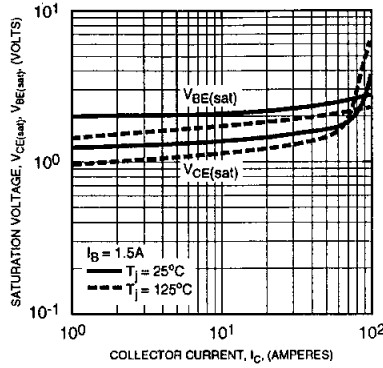
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**KD221K75**  
**Dual Darlington Transistor Module**  
**75 Amperes/1000 Volts**

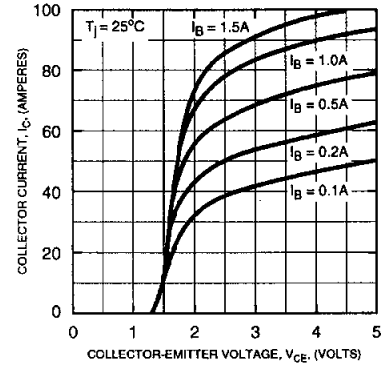
**DC CURRENT GAIN (TYPICAL)**



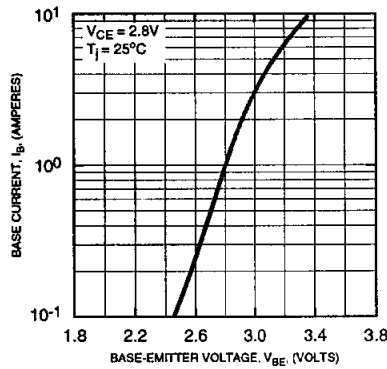
**SATURATION VOLTAGE (TYPICAL)**



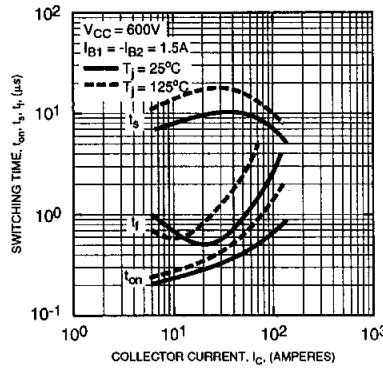
**COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)**



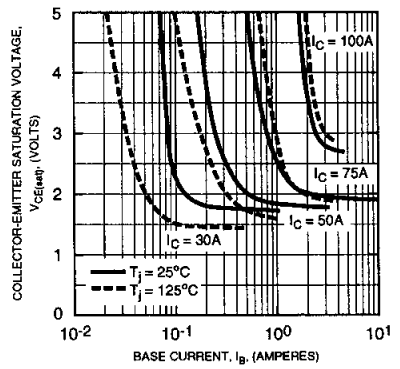
**COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)**



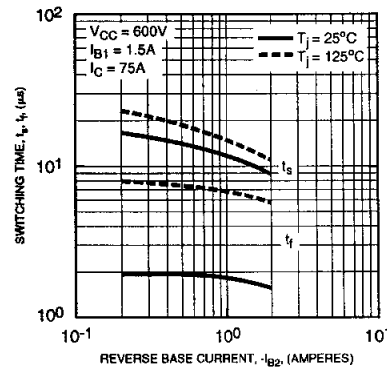
**SWITCHING CHARACTERISTICS (TYPICAL)**



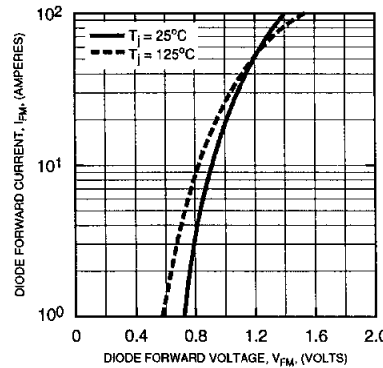
**COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)**



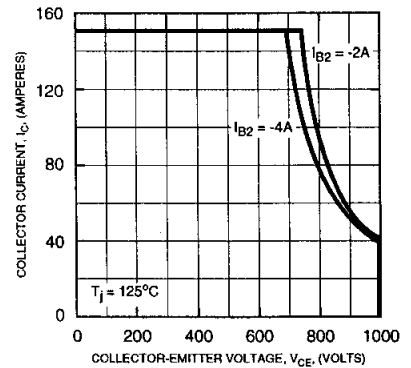
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



**DIODE CHARACTERISTICS (TYPICAL)**



**REVERSE BIAS SAFE OPERATING AREA (RBSOA)**



**KD221K75**  
**Dual Darlington Transistor Module**  
 75 Amperes/1000 Volts

