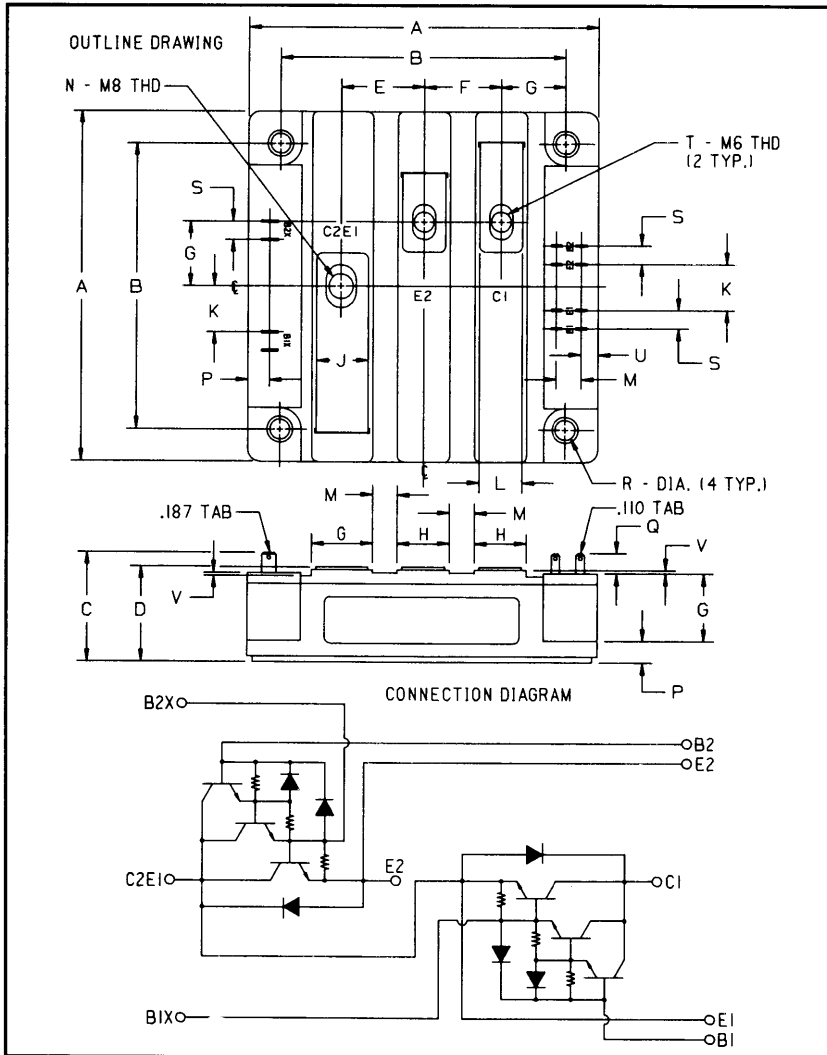


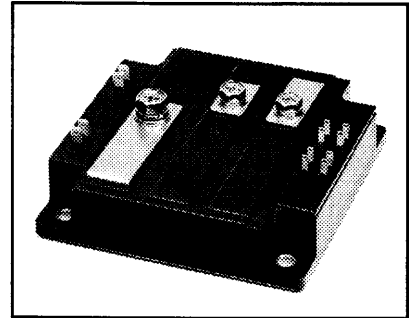
### Dual Darlington Transistor Module 300 Amperes/1000 Volts



Outline Drawing

Dimensions	Inches	Millimeters
A	4.488 Max.	114 Max.
B	3.661 ± 0.012	93 ± 0.3
C	1.358	34.5
D	1.220 Max.	31 Max.
E	1.063	27
F	0.984	25
G	0.827	21
H	0.669	17
J	0.630	16
K	0.591	15

Dimensions	Inches	Millimeters
L	0.551	14
M	0.315	8
N	M8 Metric	M8
P	0.276	7
Q	0.256 Min.	6.5 Min.
R	0.256 Min.	6.5 Min.
S	0.236	6
T	M6 Metric	M6
U	0.216	5.5
V	0.039	1



#### 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. KD621K30 is a 1000 Volt, 300 Ampere Dual Darlington Module.

Type	$V_{CE0(sus)}$ Volts (1000)	Current Rating Amperes (X 10)
KD62	1K	30



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

**KD621K30**  
**Dual Darlington Transistor Module**  
**300 Amperes/1000 Volts**

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

Ratings	Symbol	KD621K30	Units
Junction Temperature	$T_j$	-40 to 150	$^\circ\text{C}$
Storage Temperature	$T_{\text{stg}}$	-40 to 125	$^\circ\text{C}$
Collector-Emitter Sustaining Voltage, $V_{BE} = -2\text{V}$	$V_{\text{CEV(sus)}}$	1000	Volts
Collector-Base Voltage	$V_{\text{CBO}}$	1000	Volts
Emitter-Base Voltage	$V_{\text{EBO}}$	7	Volts
Collector-Emitter Voltage, $V_{BE} = -2\text{V}$	$V_{\text{CEV}}$	1000	Volts
Continuous Collector Current	$I_C$	300	Amperes
Diode Forward Current	$I_{\text{FM}}$	300	Amperes
Continuous Base Current	$I_B$	16	Amperes
Diode Surge Current	$I_{\text{FSM}}$	3000	Amperes
Power Dissipation (Each Transistor)	$P_t$	1980	Watts
Max. Mounting Torque M6 Terminal Screws	-	26	in.-lb.
Max. Mounting Torque M6 Mounting Screws	-	26	in.-lb.
Module Weight (Typical)	-	1200	Grams
V Isolation	$V_{\text{RMS}}$	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	$I_{\text{CEV}}$	$V_{\text{CE}} = 1000\text{V}, V_{\text{BE}} = -2\text{V}$	-	-	4	mA	
Emitter Cutoff Current	$I_{\text{EBO}}$	$V_{\text{EB}} = 7\text{V}$	-	-	800	mA	
DC Current Gain	$h_{\text{FE}}$	$I_C = 300\text{A}, V_{\text{CE}} = 2.8\text{V}$	75	-	-	-	
		$I_C = 300\text{A}, V_{\text{CE}} = 5.0\text{V}$	100	-	-	-	
Diode Forward Voltage	$V_{\text{FM}}$	$I_{\text{FM}} = 300\text{A}$	-	-	1.8	Volts	
Collector-Emitter Saturation Voltage	$V_{\text{CE(sat)}}$	$I_C = 300\text{A}, I_B = 6\text{A}$	-	-	2.5	Volts	
Base-Emitter Saturation Voltage	$V_{\text{BE(sat)}}$	$I_C = 300\text{A}, I_B = 6\text{A}$	-	-	3.5	Volts	
Resistive	Turn-on	$t_{\text{on}}$	$V_{\text{CC}} = 600\text{V}$	-	-	3.0	$\mu\text{s}$
Load	Storage Time	$t_s$	$I_C = 300\text{A}$	-	-	15	$\mu\text{s}$
Switch Times	Fall Time	$t_f$	$I_{\text{B1}} = -I_{\text{B2}} = 6\text{A}$	-	-	3.0	$\mu\text{s}$

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

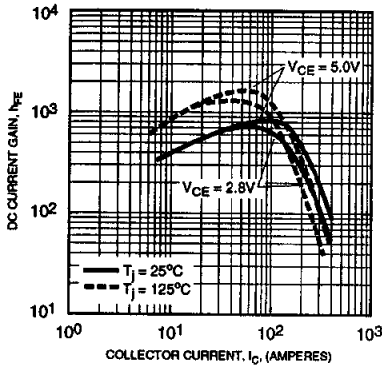
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	-	-	0.063	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	-	-	0.3	$^\circ\text{C/W}$



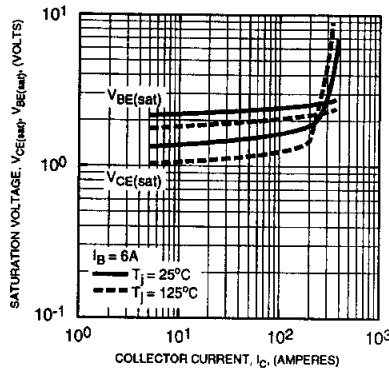
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**KD621K30**  
**Dual Darlington Transistor Module**  
**300 Amperes/1000 Volts**

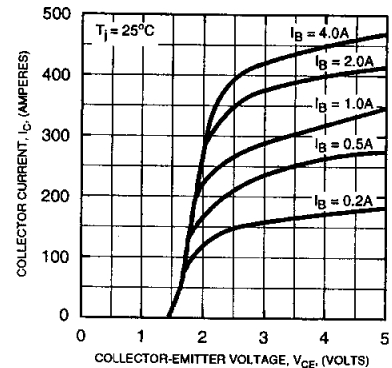
**DC CURRENT GAIN (TYPICAL)**



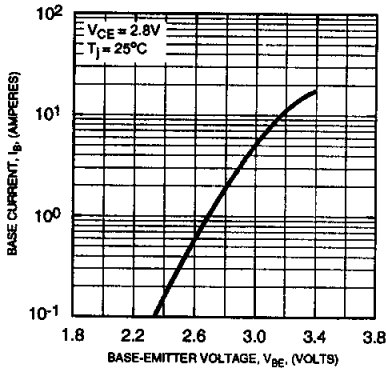
**SATURATION VOLTAGE (TYPICAL)**



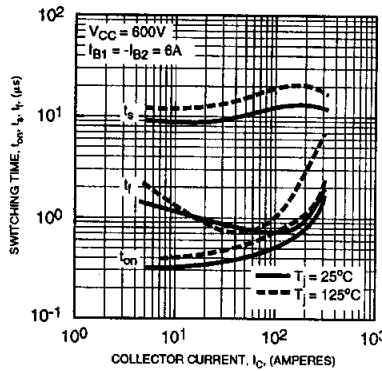
**COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)**



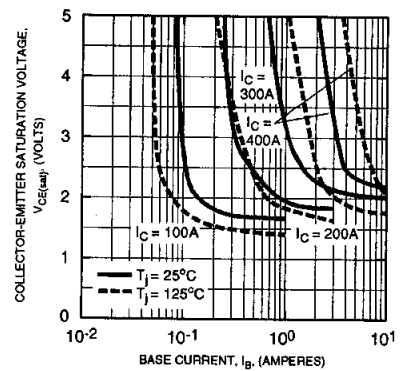
**COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)**



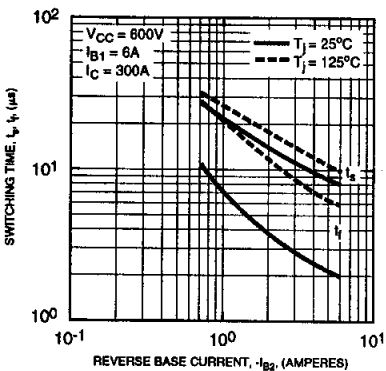
**SWITCHING CHARACTERISTICS (TYPICAL)**



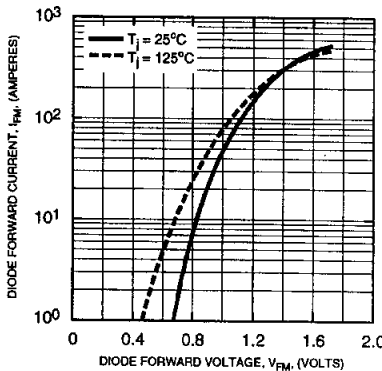
**COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)**



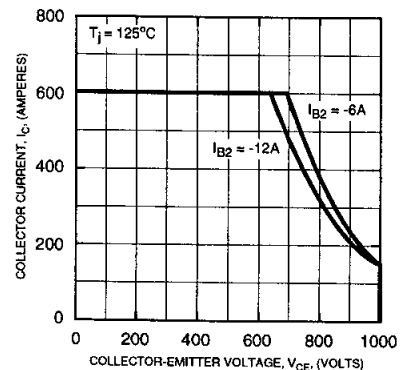
**SWITCHING TIME VS. BASE CURRENT (TYPICAL)**



**DIODE CHARACTERISTICS (TYPICAL)**



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

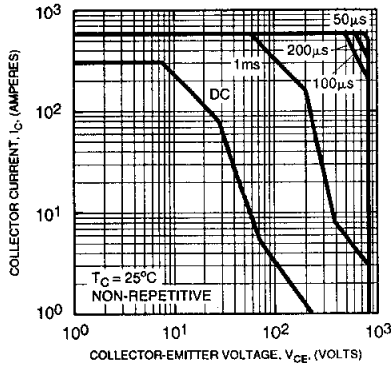




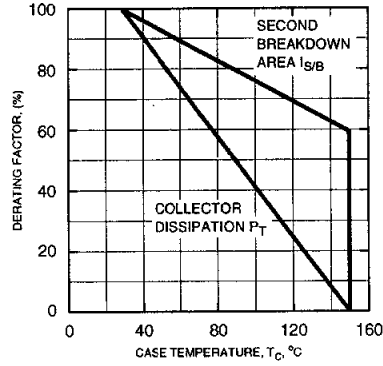
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**KD621K30**  
**Dual Darlington Transistor Module**  
 300 Amperes/1000 Volts

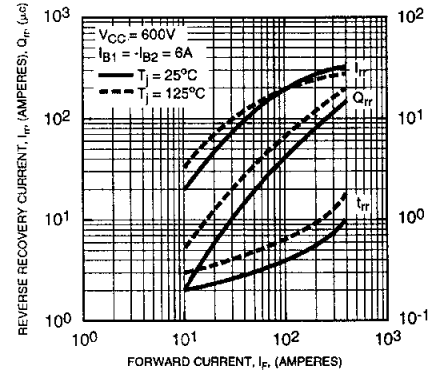
**FORWARD BIAS SAFE OPERATING AREA (SOA)**



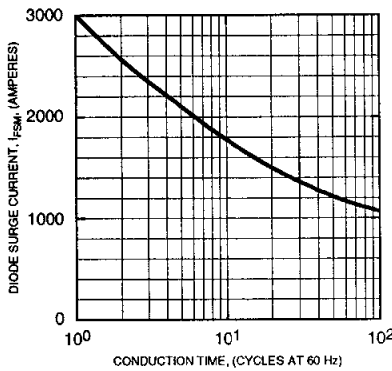
**DERATING FACTOR OF SAFE OPERATING AREA (SOA)**



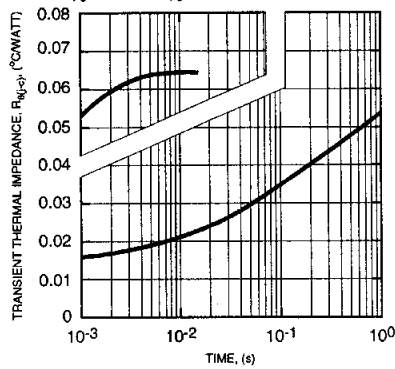
**REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)**



**DIODE FORWARD SURGE CURRENT**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)**



**TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)**

