



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_{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_{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	300	Amperes
Diode Forward Current	I_{FM}	300	Amperes
Continuous Base Current	I_B	16	Amperes
Diode Surge Current	I_{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_{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}	$V_{\text{CE}} = 1000\text{V}, V_{\text{BE}} = -2\text{V}$	-	-	4	mA	
Emitter Cutoff Current	I_{EBO}	$V_{\text{EB}} = 7\text{V}$	-	-	800	mA	
DC Current Gain	h_{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_{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_{on}	$V_{\text{CC}} = 600\text{V}$	-	-	3.0	μs
Load	Storage Time	t_s	$I_C = 300\text{A}$	-	-	15	μs
Switch Times	Fall Time	t_f	$I_{\text{B1}} = -I_{\text{B2}} = 6\text{A}$	-	-	3.0	μs

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

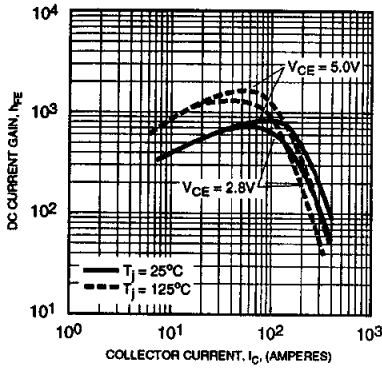
Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	-	-	0.063	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	-	-	0.3	$^\circ\text{C/W}$



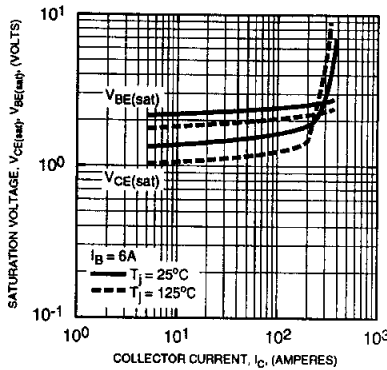
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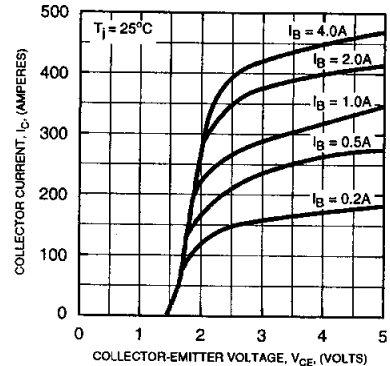
DC CURRENT GAIN (TYPICAL)



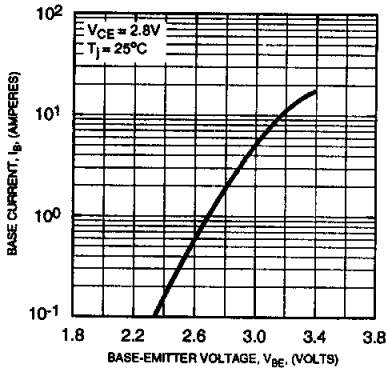
SATURATION VOLTAGE (TYPICAL)



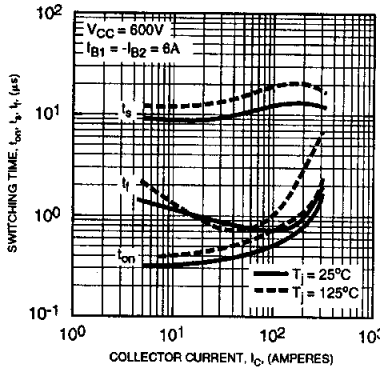
COMMON EMITTER OUTPUT CHARACTERISTICS (TYPICAL)



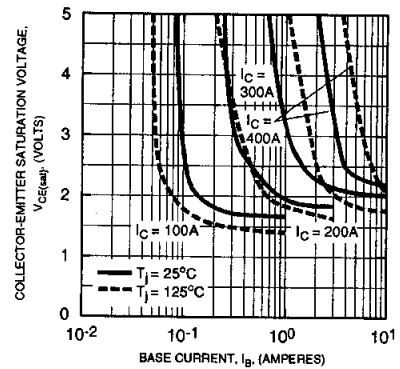
COMMON EMITTER INPUT CHARACTERISTICS (TYPICAL)



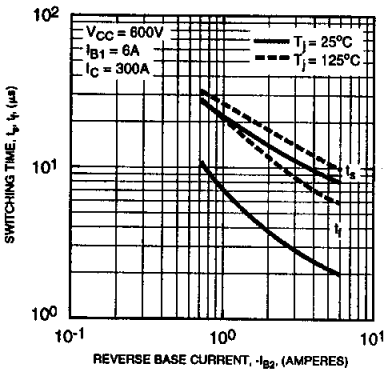
SWITCHING CHARACTERISTICS (TYPICAL)



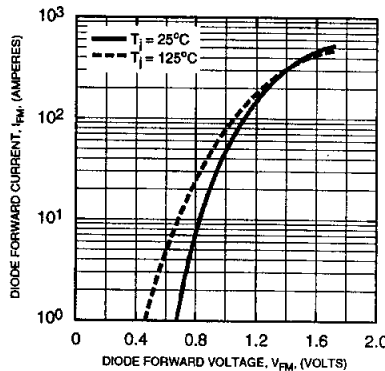
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



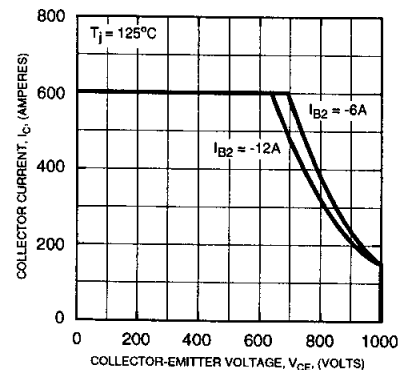
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



DIODE CHARACTERISTICS (TYPICAL)



REVERSE BIAS SAFE OPERATING AREA (RBSOA)

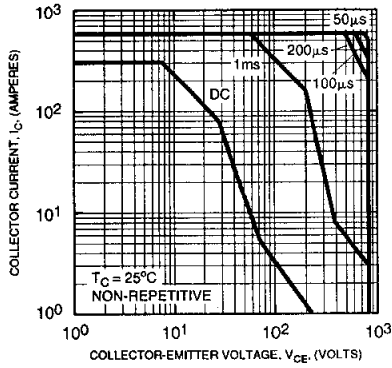




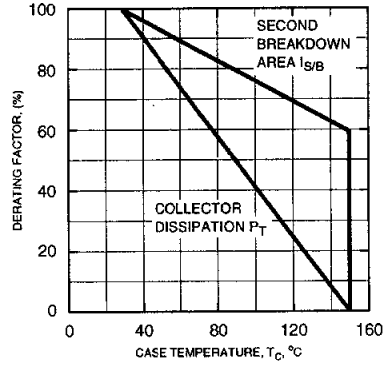
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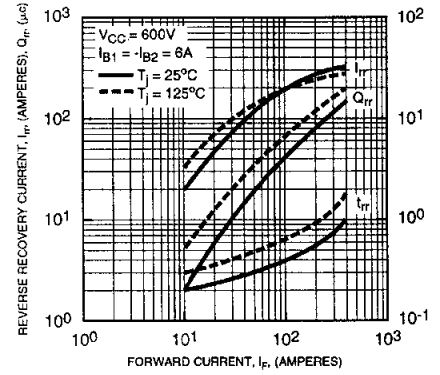
FORWARD BIAS SAFE OPERATING AREA (SOA)



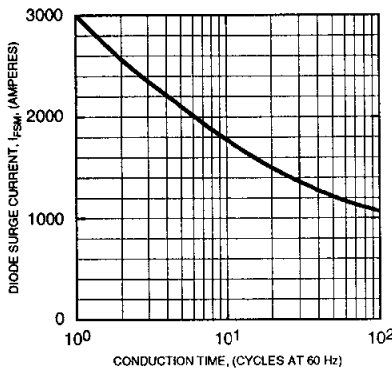
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



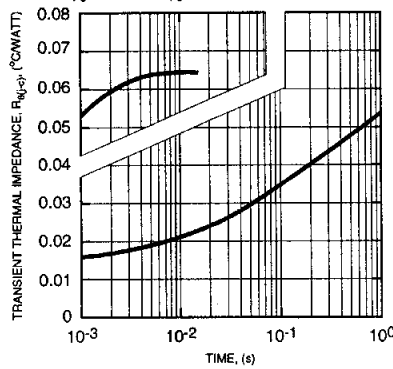
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

