



KD524505

Dual Darlington Transistor Module

50 Amperes/600 Volts

Description

Powerex Dual Darlington Transistor Modules are medium power devices which are 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 Feed-Back Diode
- ☐ High Gain (h_{FE})
- ☐ Base Emitter Speed Up Diode

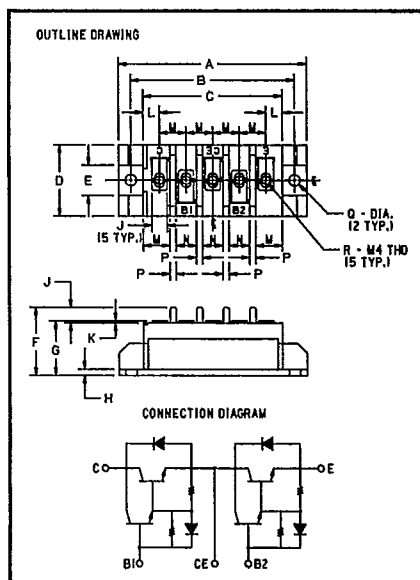
Applications:

- ☐ Inverters
- ☐ DC Motor Control
- ☐ Switching Power Supplies
- ☐ AC Motor Control

Ordering Information

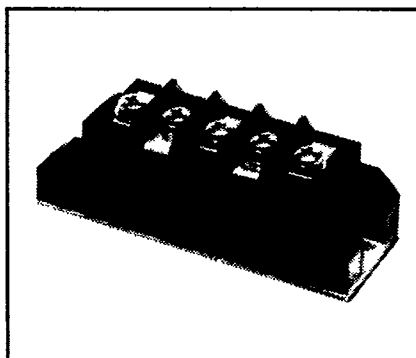
Example: Select the complete eight digit module part number you desire from the table - i.e. KD524505 is a 450 $V_{CE0(SUS)}$ (600 V_{CEV}), 50 Ampere Dual Darlington Module.

Type	$V_{CE0(SUS)}$ Volts ($\times 10$)	Current Rating Amperes ($\times 10$)
KD52	45	05



**600 Volt KD524505
Outline Drawing**

Dimension	Inches	Millimeters
A	3.622 $\pm$.016	92 $\pm$ 0.4
B	3.150 $\pm$.012	80 $\pm$ 0.3
C	2.677 +.00/- .02	68 +0.0/- 0.5
D	1.378 $\pm$.016	35 $\pm$ 0.4
E	.590 $\pm$.016	15 $\pm$ 0.4
F	1.319 Max.	33.5 Max.
G	1.063 +.02/- .00	27 +0.5/- 0.0
H	.122 Max.	3.1 Max.
J	2.95 $\pm$.004	7.5 $\pm$ 0.1
K	.039	1
L	.315	8
M	.512	13
N	.394	10
P	.118	3
Q	.216 +.000/ -.006 Dia.	5.5 +0.00/ -0.15 Dia.
R	M4 Metric	M4



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Maximum Ratings $T_J = 25^\circ\text{C}$ unless otherwise specified

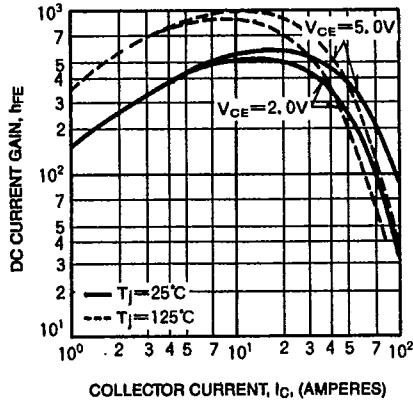
	Symbol	KD524505	Units
Junction Temperature	T_J	-40 to 150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-40 to 125	$^\circ\text{C}$
Collector-Emitter Sustaining Voltage	$V_{CEQ(SUS)}$	450	Volts
Collector-Emitter Sustaining Voltage $V_{BE} = -2\text{V}$	$V_{CEV(SUS)}$	600	Volts
Collector-Base Voltage	V_{CBO}	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	50	Amperes
Diode Forward Current	I_{FM}	50	Amperes
Continuous Base Current	I_B	3	Amperes
Diode Surge Current	I_{FSM}	500	Amperes
Power Dissipation, Each Transistor	P_T	310	Watts
Max. Mounting Torque M4 Terminal Screw	—	12	in.-lb.
Max. Mounting Torque M5 Mounting Screw	—	17	in.-lb.
Module Weight	—	7	Oz.
Module Weight	—	200	Grams
V isolation	V_{RMS}	2000	Volts

Electrical and Mechanical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise specified

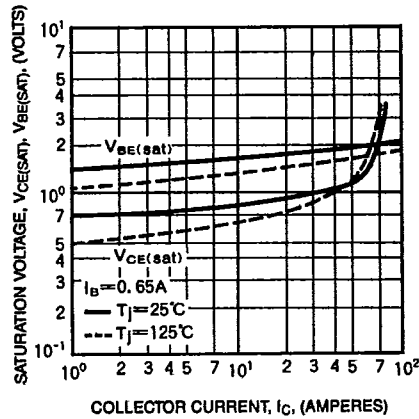
Characteristics	Symbol	Test Conditions	Min.	KD524505 Typ.	Max.	Units
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA
Collector Cutoff Current	I_{CEV}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$ $T_C = 125^\circ\text{C}$	—	—	5	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}$	—	—	200	mA
DC Current Gain	h_{FE}	$I_C = 50\text{A}, V_{CE} = 2\text{V}$	75	—	—	—
DC Current Gain	h_{FE}	$I_C = 50\text{A}, V_{CE} = 5\text{V}$	100	—	—	—
Diode Forward Voltage	V_{FM}	$I_{FM} = 50\text{A}$	—	—	1.75	V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 50\text{A}, I_B = 0.65\text{A}$	—	—	2.0	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 50\text{A}, I_B = 0.65\text{A}$	—	—	2.5	V
Resistive Turn On	t_{on}	$V_{CC} = 300\text{V}$	—	—	1.5	μs
Load Storage Time	t_s	$I_C = 50\text{A}$	—	—	12	μs
Switch Times Fall Time	t_f	$I_{B1} = 1\text{A}, I_{B2} = -1\text{A}$	—	—	3.0	μs
Thermal Resistance, Case to Sink Lubricated	$R_{\theta CS}$	Per Half Module	—	—	0.15	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	0.4	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	1.3	$^\circ\text{C/W}$

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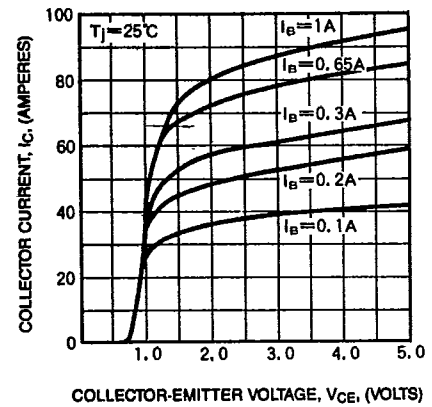
**DC CURRENT GAIN
 (TYPICAL)**



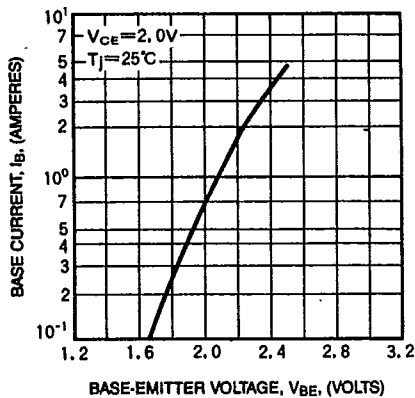
**SATURATION VOLTAGE
 (TYPICAL)**



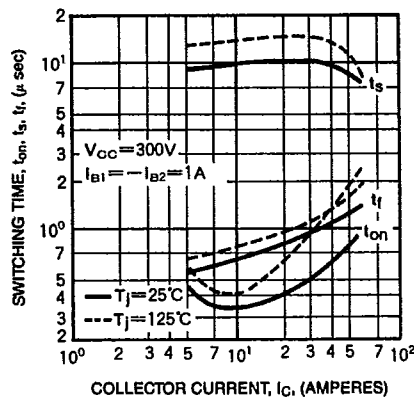
**COMMON EMITTER OUTPUT
 CHARACTERISTICS (TYPICAL)**



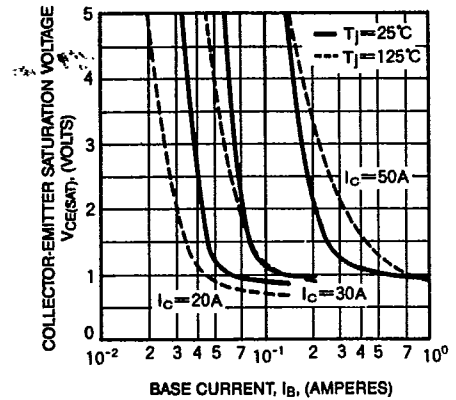
**COMMON EMITTER INPUT
 CHARACTERISTICS (TYPICAL)**



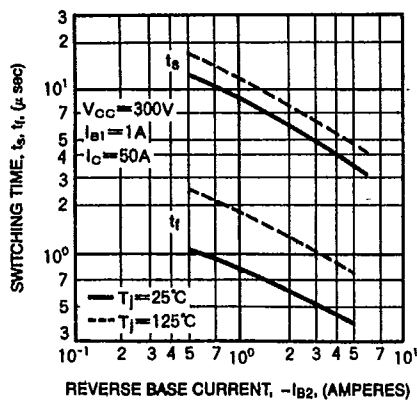
**SWITCHING CHARACTERISTICS
 (TYPICAL)**



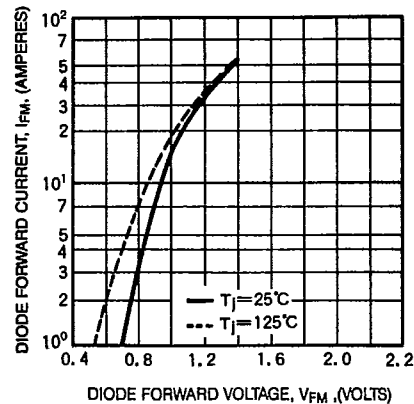
**COLLECTOR-EMITTER SATURATION
 VOLTAGE (TYPICAL)**



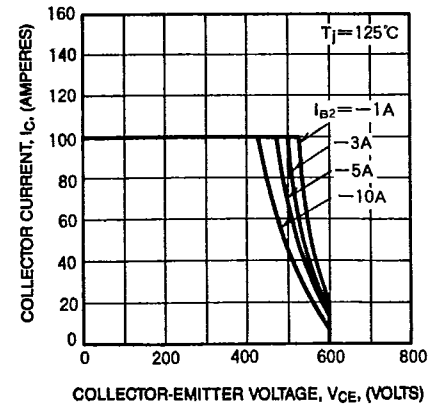
**SWITCHING TIME VS. BASE CURRENT
 (TYPICAL)**



**DIODE CHARACTERISTICS
 (TYPICAL)**

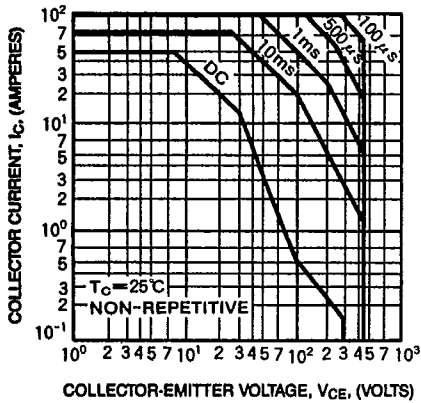


**REVERSE BIAS SAFE OPERATING AREA
 (R.B.S.O.A.)**

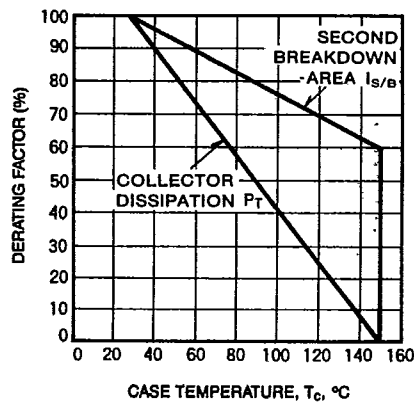


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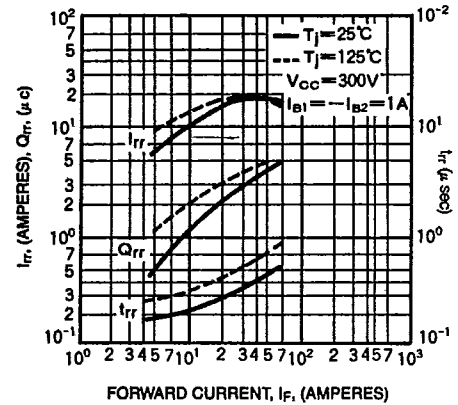
FORWARD BIAS SAFE OPERATING AREA (S.O.A.)



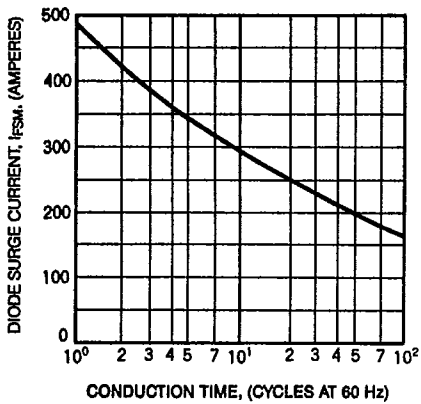
DERATING FACTOR OF SAFE OPERATING AREA (S.O.A.)



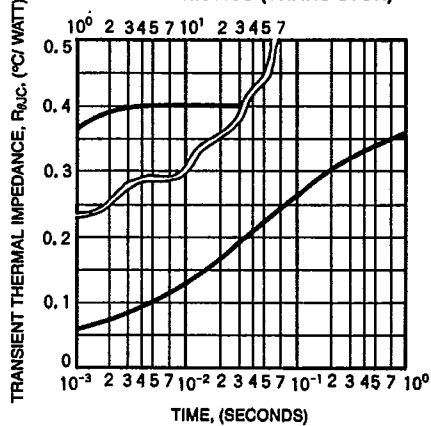
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

