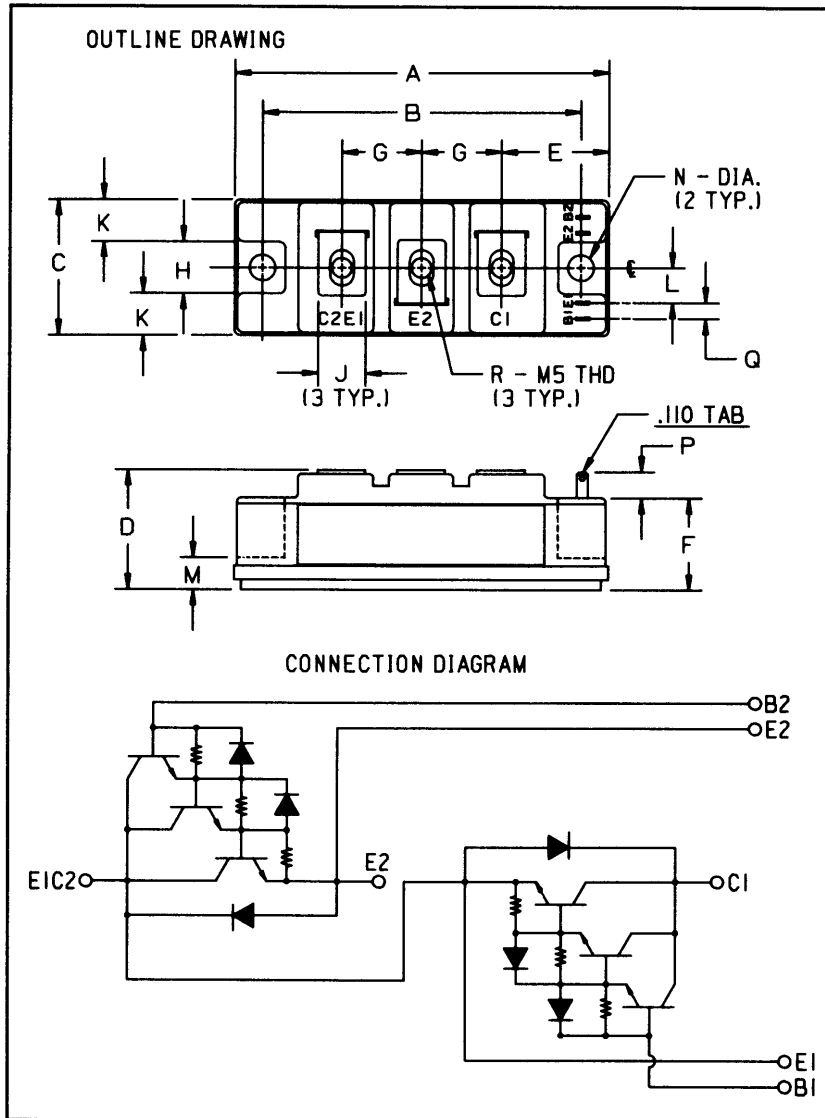


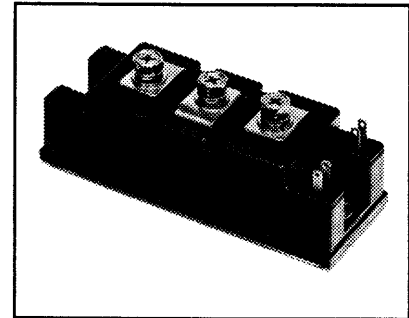
High-Beta Dual Darlington Transistor Module 75 Amperes/600 Volts



Outline Drawing

Dimensions	Inches	Millimeters
A	3.701 Max.	94 Max.
B	3.150 ± 0.010	80 ± 0.25
C	1.339 Max.	34 Max.
D	1.181 Max.	30 Max.
E	1.063	27
F	0.906	23
G	0.787	20
H	0.512	13

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



Description:

The Powerex High-Beta 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
- ☐ Very High Gain (h_{FE})
- ☐ Quick Connect Signal Terminals
- ☐ Base-Emitter Speed-up Diodes

Applications:

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

Ordering Information:

Example: Select the complete ten digit module part number you desire from the table - i.e.

KD224575HB is a 450 $V_{CEO(sus)}$ (600 V_{CEV}), 75 Ampere High-Beta Dual Darlington Module with a gain of 750 at rated current (75 Amperes).

Type	$V_{CEO(sus)}$ Volts (X 10)	Current Rating Amperes (75)	High Beta
KD22	45	75	HB



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

KD224575HB
High-Beta Dual Darlington Transistor Module
 75 Amperes/600 Volts

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

Ratings	Symbol	KD224575HB	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	$V_{CEO(sus)}$	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	75	Amperes
Diode Forward Current	I_{FM}	75	Amperes
Continuous Base Current	I_B	4.5	Amperes
Diode Surge Current	I_{FSM}	750	Amperes
Power Dissipation (Each Transistor)	P_t	350	Watts
Max. Mounting Torque M5 Terminal Screws	—	17	in.-lb.
Max. Mounting Torque M6 Mounting Screws	—	26	in.-lb.
Module Weight (Typical)	—	210	Grams
V Isolation	V_{RMS}	2000	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}	$V_{CE} = 600\text{V}, V_{BE} = -2\text{V}$	—	—	1	mA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 7\text{V}$	—	—	150	mA
DC Current Gain	h_{FE}	$I_C = 75\text{A}, V_{CE} = 2.5\text{V}$	750	—	—	—
Diode Forward Voltage	V_{FM}	$I_{FM} = 75\text{A}$	—	—	1.8	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 75\text{A}, I_B = 100\text{mA}$	—	—	2.5	Volts
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 75\text{A}, I_B = 100\text{mA}$	—	—	3.0	Volts
Resistive Turn-on	t_{on}	$V_{CC} = 300\text{V}$	—	—	2.0	μs
Load Storage Time	t_s	$I_C = 75\text{A}$	—	—	8.0	μs
Switch Times Fall Time	t_f	$I_{B1} = 0.15\text{A}, I_{B2} = -1.5\text{A}$	—	—	3.0	μs

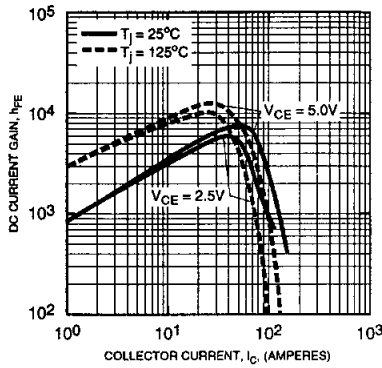
Thermal and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Case-to-Sink	$R_{\theta(c-s)}$	Per 1/2 Module	—	—	0.15	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Transistor Part	—	—	0.35	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta(j-c)}$	Diode Part	—	—	1.3	$^\circ\text{C/W}$

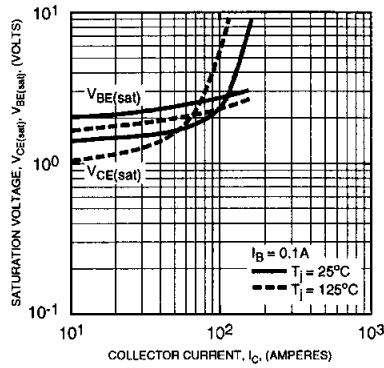
KD224575HB

High-Beta Dual Darlington Transistor Module
75 Amperes/600 Volts

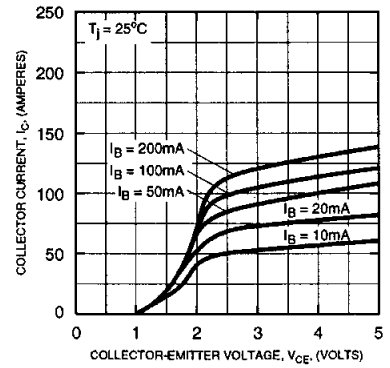
DC CURRENT GAIN
(TYPICAL)



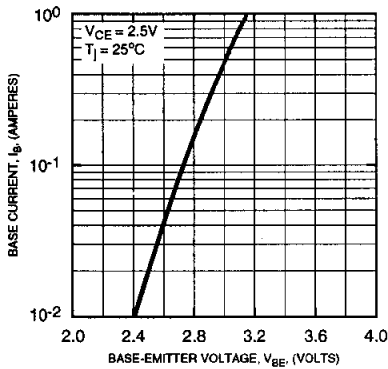
SATURATION VOLTAGE
(TYPICAL)



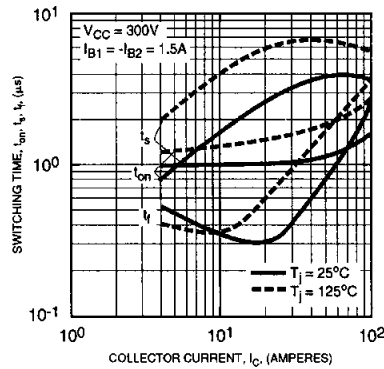
COMMON EMITTER OUTPUT
CHARACTERISTICS (TYPICAL)



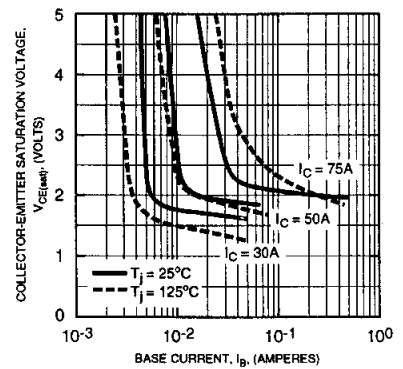
COMMON EMITTER INPUT
CHARACTERISTICS (TYPICAL)



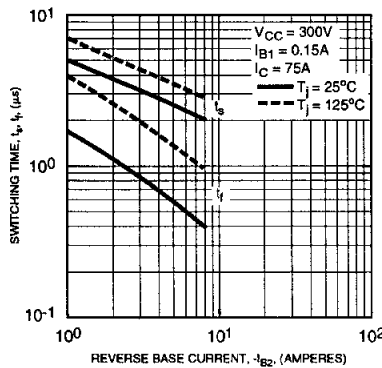
SWITCHING CHARACTERISTICS
(TYPICAL)



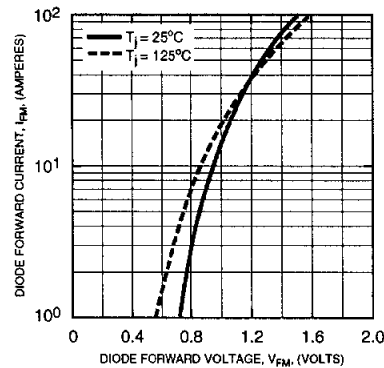
COLLECTOR-EMITTER SATURATION
VOLTAGE (TYPICAL)



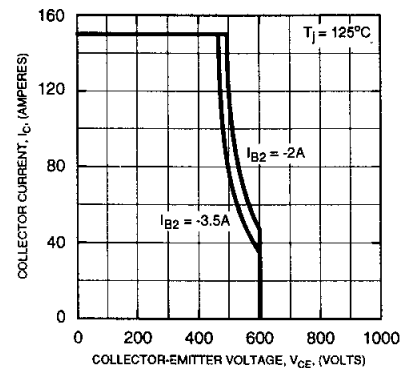
SWITCHING TIME VS. BASE CURRENT
(TYPICAL)



DIODE CHARACTERISTICS
(TYPICAL)



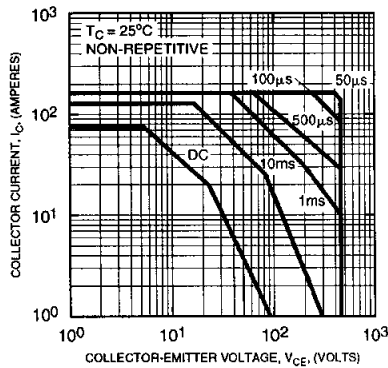
REVERSE BIAS SAFE OPERATING AREA
(RBSOA)



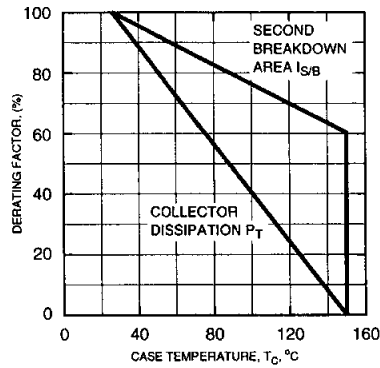
KD224575HB

High-Beta Dual Darlington Transistor Module
75 Amperes/600 Volts

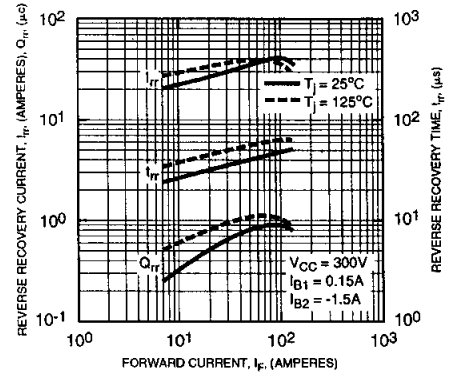
FORWARD BIAS SAFE OPERATING AREA (SOA)



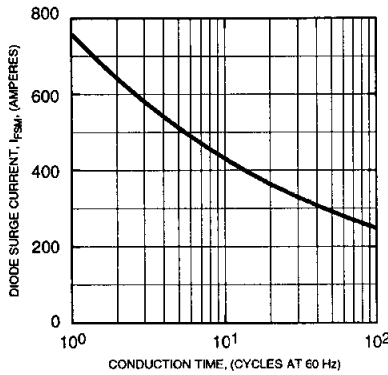
DERATING FACTOR OF SAFE OPERATING AREA (SOA)



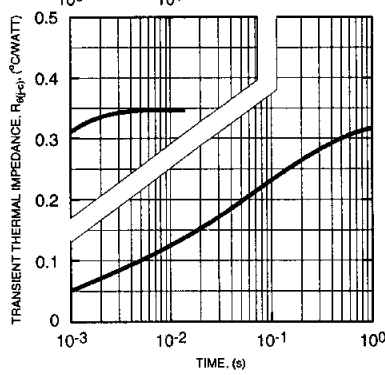
REVERSE RECOVERY CHARACTERISTICS OF FREE-WHEEL DIODE (TYPICAL)



DIODE FORWARD SURGE CURRENT



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (DIODE)

