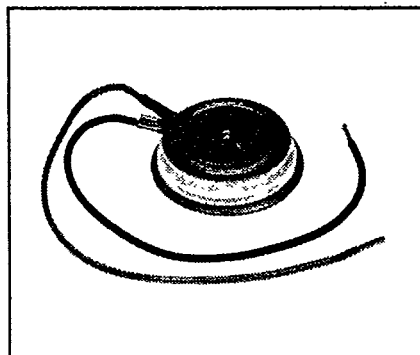


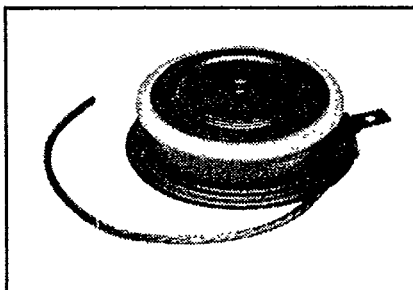
POWEREX**DA11/DB12**

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

NPN
Power Switching
Darlington
Transistor Sets
300-350-800 Amperes/
400-500 Volts



D62T
NPN Power Switching
Darlington Transistors



D7ST
NPN Power Switching
Darlington Transistors

Features:

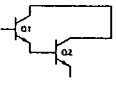
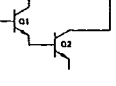
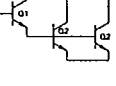
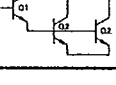
- ☐ Double Sided Cooling
- ☐ 20 kHz Operation
- ☐ Both Bases Accessible
- ☐ Low Thermal Impedance
- ☐ High Currents & Voltages

Applications:

- ☐ High Current Switches
- ☐ AC Motor Controls
- ☐ DC Motor Controls
- ☐ High Frequency Inverters

Ordering Information

Example: A DA11403508 Darlington Transistor Set consists of two discrete transistors, a D62T and a D7ST with voltage, current and gain as shown in the table. These transistors must be mounted on heat sinks for proper operation.

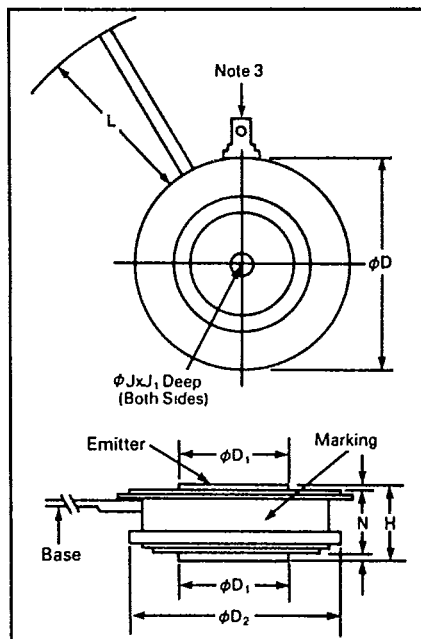
Type	Schematics	V _{CEO(SUS)} Volts ($\times 10$)	Current Rating Amperes ($\times 10$)	Gain ($\times 10$)	Darlington Composition	
					Q1	Q2
DA11403508		40	35	08	D62T	D7ST
DA11503008		50	30	08	D62T	D7ST
DB12408005		40	80	05	D7ST	2-D7ST
DB12508004		50	80	04	D7ST	2-D7ST



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

DA11/DB12

NPN Power Switching Darlington Transistor Sets
300-350-800 Amperes/400-500 Volts



D62T

Outline Drawing

Dimension	Inches		Millimeters	
	Min.	Max.	Min.	Max.
ϕD	1.610	1.650	40.89	41.91
ϕD_1	.745	.755	18.92	19.18
ϕD_2	1.420	1.460	36.07	37.08
H	.500	.560	12.70	14.22
ϕJ	.135	.145	3.43	3.68
J_1	.072	.082	1.83	2.08
L	4.000		101.6	
N	.030		.76	

Creep Distance—.34 in. min. (8.64mm)

Strike Distance—.52 in. min. (13.21mm)

(In accordance with NEMA standards.)

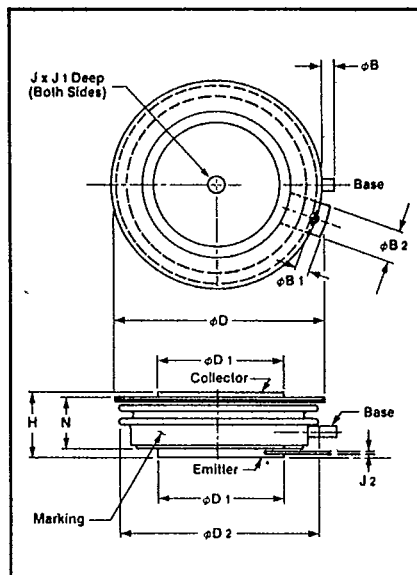
Finish—Nickel Plate.

Approx. Weight—2.1 oz. (60g).

1. Dimension "H" is a clamped dimension.

2. "Base Lead is No. 14 uninsulated flexible stranded wire.

3. Emitter tab for 3/16 inch fast-on terminal.



D7ST

Outline Drawing

Dimension	Inches		Millimeters	
	Min.	Max.	Min.	Max.
ϕB	.121	.171	3.07	4.34
ϕB_1	.097	.122	2.46	3.10
ϕB_2	.307	.317	7.80	8.05
ϕD	1.824	1.99	46.3	50.55
ϕD_1	1.155	1.161	29.34	29.49
ϕD_2	1.78	1.85	45.21	46.99
H	.611	.635	1.55	1.66
J_1	.136	.144	3.45	3.66
J_2	.067	.071	1.70	1.803
N	.433	.453	11.0	11.51

Creep Distance—.390 in. min. (9.9mm)

Strike Distance—.145 in. min. (3.6mm)

Finish—Nickel Plate.

Approx. Weight—3.7 oz. (105 g.)

Dimension H is a clamped dimension.



T-33-29

Powerex, Inc., Hills Street, Youngwood, Pennsylvania 15697 (412) 925-7272

DA11/DB12**NPN Power Switching Darlington Transistor Sets**

300-350-800 Amperes/400-500 Volts

Maximum Ratings

Characteristics	Symbol	DA11/DB12	Units
Operating and Storage Temperature	T_J/T_{STG}	-65 to 200	°C
Emitter Base Voltage	V_{EBO}	7	Volts
Thermal resistance each D7ST transistor Double sided cooling, Junction to Case	$R_{\theta JC}$	.05	°C/W
Case to Sink Lubricated	$R_{\theta CS}$	.02	°C/W
Power Dissipation $T_C = 25^\circ\text{C}$ each D7ST transistor	P_T	3000	Watts
Power Dissipation $T_C = 75^\circ\text{C}$ each D7ST transistor	P_T	2000	Watts
Thermal impedance, double sided cooling D62T transistor Junction to Case	$R_{\theta JC}$	0.09	°C/W
Case to Sink	$R_{\theta CS}$	0.05	°C/W
Power dissipation $T_C = 25^\circ\text{C}$ D62T transistor	P_T	1650	Watts
Power dissipation $T_C = 75^\circ$ D62T transistor	P_T	1100	Watts
Mounting Force D62T		900	lb.
Mounting Force D62T		4.95	kN
Mounting Force D7ST		1200	lb.
Mounting Force D7ST		5.4	kN

		DA11403508	DA11503008	DB12408005	DB12508004	
Collector Emitter Sustaining Voltage ^①	$V_{CE(sus)}$	400	500	400	500	Volts
Collector Emitter Voltage $V_{BE} = -1.5\text{V}$	V_{CEV}	450	550	450	550	Volts
Peak Collector Current	$I_C \text{ Peak}$	600	600	1200	1200	Amperes
Continuous Collector Current	$I_C \text{ Cont.}$	400	400	800	800	Amperes
Continuous Base Current	I_B	20	20	75	75	Amperes

① $V_{CE(sus)}$ must not be measured on a curve tracer.



T-33-29

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

DA11/DB12

NPN Power Switching Darlington Transistor Sets
300-350-800 Amperes/400-500 Volts

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

Characteristics	Symbol	Test Conditions	Min.	DA11/DB12 Typ.	Max.	Units
Collector Cutoff Current DA11 (Base Emitter Reverse Biased) DB12	I_{CEV}	At Rated V_{CEV} $V_{BE(OFF)} = -1.5V$	—	—	5 10	mA mA
Collector Cutoff Current DA11 (Base Emitter Reverse Biased) DB12	I_{CEV}	At Rated V_{CEV} $V_{BE(OFF)} = -1.5V, T_J = 150^\circ\text{C}$	—	—	15 30	mA mA
Emitter Cutoff Current DA11	I_{EBO}	$V_{EB} = 7V$	—	—	150	mA
Emitter Cutoff Current DB12	I_{EBO}	$V_{EB} = 7V$	—	—	300	mA

DA11403508/DA11503008

DC Current Gain DA11403508	h_{FE}	$I_C = 350A, V_{CE} = 5V$	80	—	—	—
DC Current Gain DA11503008	h_{FE}	$I_C = 300A, V_{CE} = 5V$	80	—	—	—
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 300A, I_B = 10A$	—	—	2.5	Volts
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 300A, I_B = 10A$	—	—	3.5	Volts
Turn-On Delay	t_d	$V_{CC} = 300V, I_C = 300A$	—	—	200	ns
Resistive Load Rise Time	t_r	$I_{B1} = -I_{B2} = 15A$	—	—	2	μs
Switch Times ① Storage Time	t_s	$t_p = 50 \mu\text{s}$	—	—	8	μs
Fall Time	t_f	Duty Cycle < 2%	—	—	1.5	μs

DB12408005/DB12508004

DC Current Gain DB12408005	h_{FE}	$I_C = 800A, V_{CE} = 5V$	50	—	—	—
DC Current Gain DB12508004	h_{FE}	$I_C = 800A, V_{CE} = 5V$	40	—	—	—
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C = 600A, I_B = 25A$	—	—	2.5	Volts
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C = 600A, I_B = 25A$	—	—	4.0	Volts
Turn-On Delay	t_d	$V_{CC} = 300V, I_C = 800A$	—	—	200	ns
Resistive Load Rise Time	t_r	$I_{B1} = -I_{B2} = 30A$	—	—	5	μs
Switch Times ① Storage Time	t_s	$t_p = 50 \mu\text{s}$	—	—	8	μs
Fall Time	t_f	Duty Cycle < 2%	—	—	10	μs

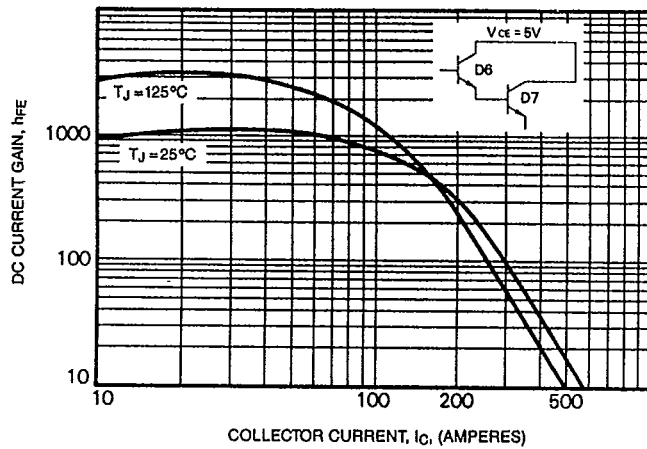
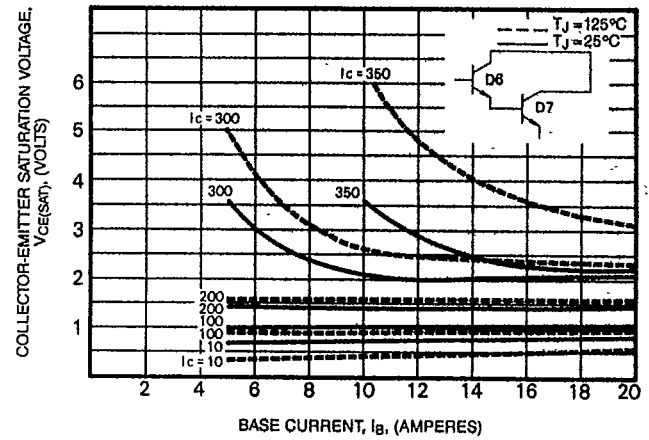
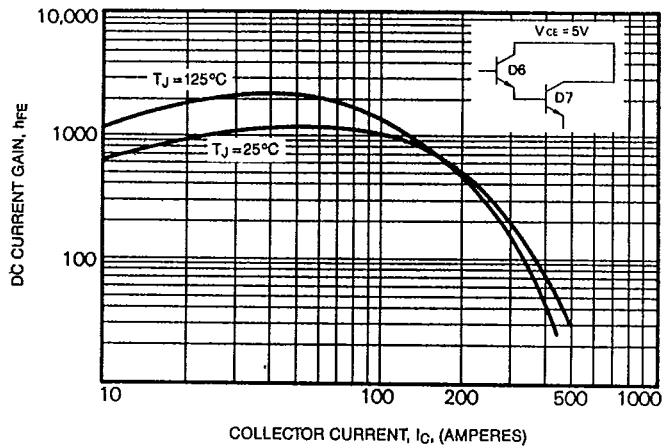
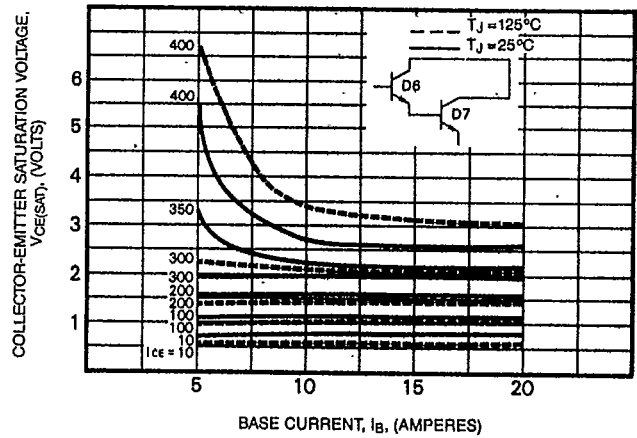
① See curve for switching with resistor between base and emitter and I_B off=0.



T-33-29

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

DA11/DB12

NPN Power Switching Darlington Transistor Sets
300-350-800 Amperes/400-500 VoltsDC CURRENT GAIN
(TYPICAL)
DA11503008SATURATION VOLTAGE
(TYPICAL)
DA11503008DC CURRENT GAIN
(TYPICAL)
DA11403508SATURATION VOLTAGE
(TYPICAL)
DA1140350

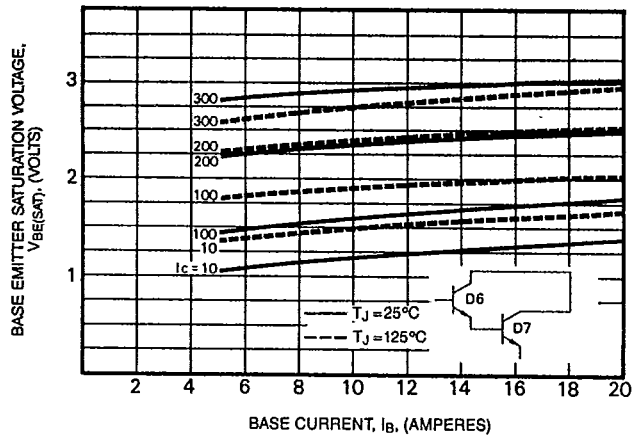


Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

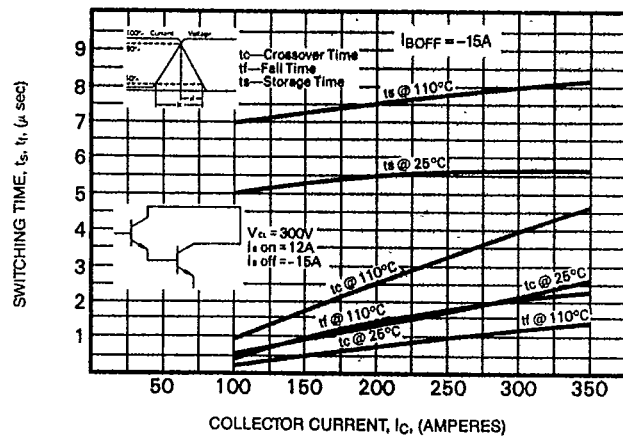
DA11/DB12

NPN Power Switching Darlington Transistor Sets
300-350-800 Amperes/400-500 Volts

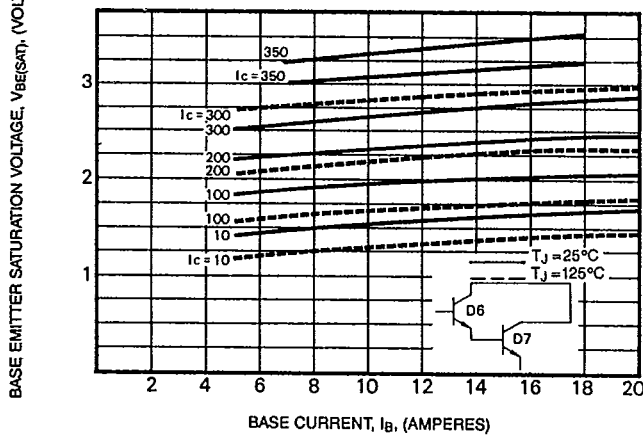
COMMON EMITTER INPUT
CHARACTERISTICS (TYPICAL)
DA11503008



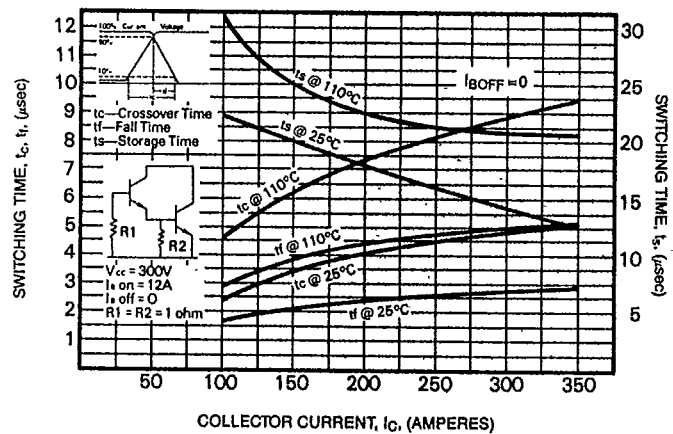
CLAMPED INDUCTIVE SWITCHING TIME
(TYPICAL)
DA11503008/DA11403508



COMMON EMITTER INPUT
CHARACTERISTICS (TYPICAL)
DA11403508



CLAMPED INDUCTIVE SWITCHING TIME
(TYPICAL)
DA11503008/DA11403508





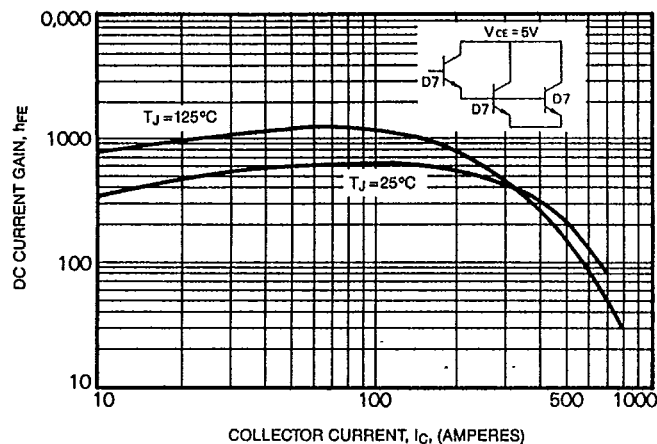
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

DA11/DB12

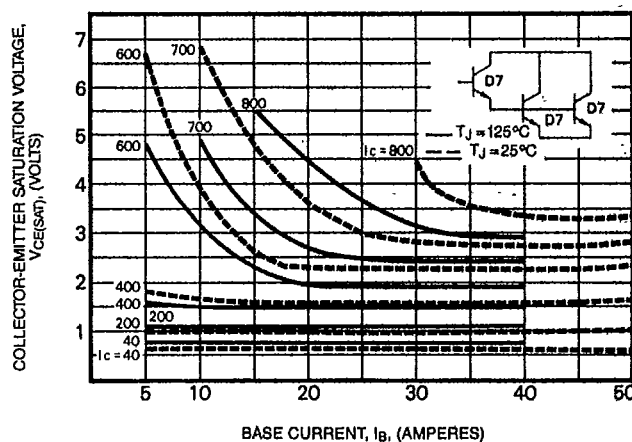
NPN Power Switching Darlington Transistor Sets

300-350-800 Amperes/400-500 Volts

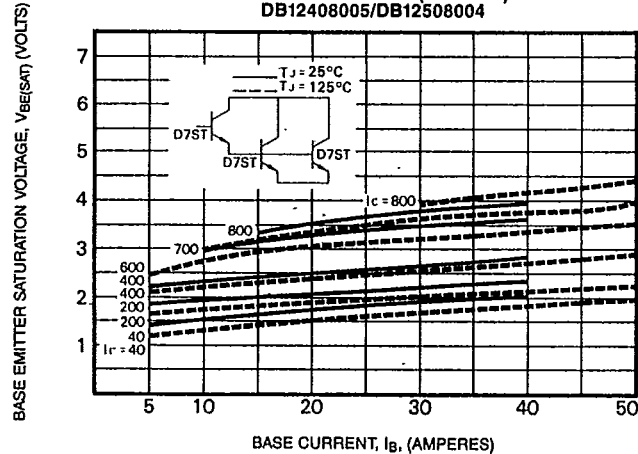
DC CURRENT GAIN
(TYPICAL)
DB12408005/DB12508004



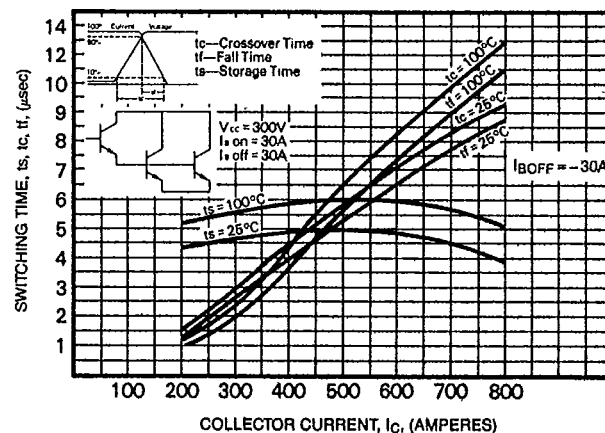
SATURATION VOLTAGE
(TYPICAL)
DB12408005/DB12508004



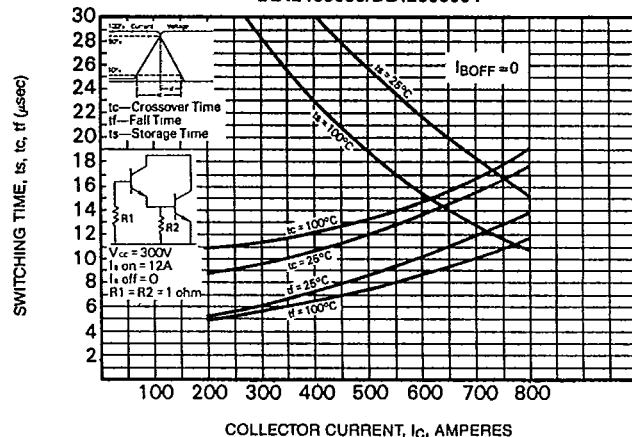
COMMON EMITTER INPUT
CHARACTERISTICS (TYPICAL)
DB12408005/DB12508004



CLAMPED INDUCTIVE SWITCHING TIME
(TYPICAL)
DB12408005/DB12508004



CLAMPED INDUCTIVE SWITCHING
(TYPICAL)
DB12408005/DB12508004



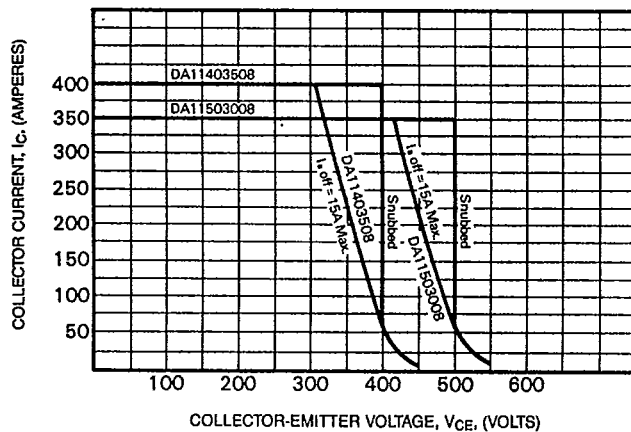


Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

DA11/DB12

NPN Power Switching Darlington Transistor Sets
300-350-800 Amperes/400-500 Volts

REVERSE BIAS SAFE OPERATING AREA, (RBSOA)
DA11



REVERSE BIAS SAFE OPERATING AREA, (RBSOA)
DB12

