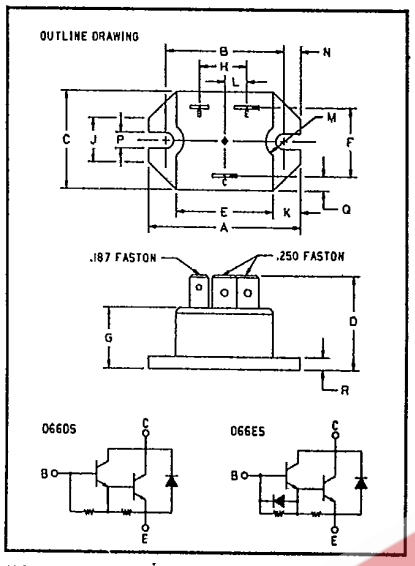
POWEREX

D66DS
D66ES

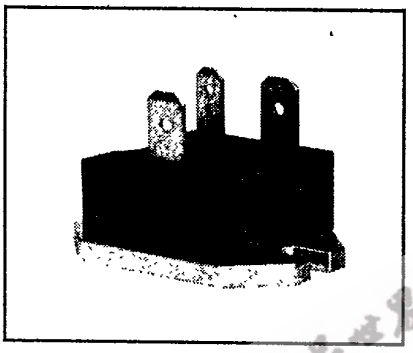
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

Fast Switching Single Darlington Transistor Module
20 Amperes
500-600-700 Volts



500-600-700 Volts D66DS, D66ES
Outline Drawing

Dimension	Inches	Millimeters
A	1.52	38.6
B	1.186±.006	30±0.15
C	1000±.015	25.4±0.4
D	.97	24.6
E	.96	24.4
F	.694±.010	17.6±0.25
G	.625±.020	15.9±0.5
H	.474± 010	12±0.25
J	.450	11.4
K	.275	7
L	.220±.010	5.6±0.25
M	.180 R	4.6 R
N	.167±.010	4.2±0.25
P	.160±.010	4.1±0.25
Q	.15	3.8
R	.126±.006	3.2±0.15



D66DS
D66ES
Fast Switching Single Darlington Transistor Module
20 Amperes/500-600-700 Volts

Description
Powerex Fast Switching Single Darlington Transistor Modules are designed for use in switching applications. The modules are isolated consisting of one Darlington Transistor with a monolithic reverse parallel connected free-wheel diode.

Features:
- ☐ Isolated Mounting
- ☐ High Gain (h_{FE})
- ☐ Quick Connect Terminals
- ☐ Base Emitter Speed-up Diode (D66ES)

Applications:
- ☐ UPS Inverters
- ☐ DC Motor Control
- ☐ Switching Power Supplies
- ☐ AC Motor Control

Ordering Information
Example: Select the complete six digit module part number you desire from the table - i.e. D66DS7 is a 700 Volt, 20 Ampere Fast Switching Single Darlington Module without speed-up diode. D66ES7 is a 700 Volt, 20 Ampere Fast Switching Darlington Module with speed-up diode.

Type	$V_{CEV(SUS)}$ Volts (×100)	Current Rating Amperes (20)
D66DS/D66ES	5	20
D66DS/D66ES	6	20
D66DS/D66ES	7	20

POWEREX

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

D66DS
D66ES
Fast Switching Single Darlington Transistor Module
20 Amperes/500-600-700 Volts

Maximum Ratings T_J =25°C unless otherwise specified

	Symbol	D66DS/D66ES	Units
Junction Temperature	T_J	−40 to 150	°C
Storage Temperature	T_{STG}	−40 to 150	°C
Collector-Emitter Sustaining Voltage D66DS5/ES5	$V_{CEO(SUS)}$	400	Volts
Collector-Emitter Voltage V_{BE} = −1.5V D66DS5/ES5	V_{CEV}	500	Volts
Collector-Emitter Sustaining Voltage D66DS6/ES6	$V_{CEO(SUS)}$	450	Volts
Collector-Emitter Voltage V_{BE} = −1.5V D66DS6/ES6	V_{CEV}	600	Volts
Collector-Emitter Sustaining Voltage D66DS7/ES7	$V_{CEO(SUS)}$	500	Volts
Collector-Emitter Voltage V_{BE} = −1.5V D66DS7/ES7	V_{CEV}	700	Volts
Emitter-Base Voltage D66DS	V_{EBO}	8	Volts
D66ES	V_{EBO}	5	Volts
Continuous Collector Current	I_C	20	Amperes
Peak (Repetitive) Collector Current	I_{CM}	30	Amperes
Peak (Non-Repetitive) Collector Current	I_{CSM}	50	Amperes
Diode Forward Current	I_{FM}	20	Amperes
Continuous Base Current	I_B	5	Amperes
Peak (Non-Repetitive) Base Current	I_{BM}	10	Amperes
Power Dissipation	P_T	62.5	Watts
Max. Mounting Torque (M3) Mounting Screws	—	8	in.-lb.
V isolation	V_{RMS}	2500	Volts

POWEREX

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

D66DS
D66ES
Fast Switching Single Darlington Transistor Module
20 Amperes/500-600-700 Volts

Electrical and Mechanical Characteristics T_J = 25°C unless otherwise specified

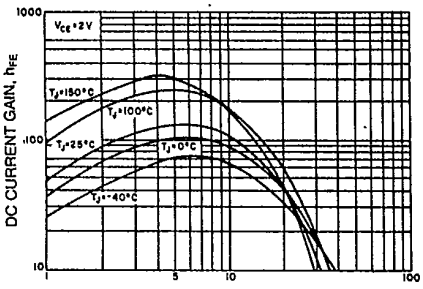
Characteristics	Symbol	Test Conditions	D66DS, D66ES Min.	Typ.	Max.	Units
Collector Cutoff Current	I_{CEV}	V_{CE} = V_{CEV}(rated), V_{BE} = −1.5V	—	—	1	mA
Collector Cutoff Current	I_{CEV}	V_{CE} = V_{CEV}(rated), V_{BE} = −1.5V, T_C = 150°C	—	—	2.5	mA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 4.5V, D66DS	—	—	200	mA
		V_{EB} = 1.5V, D66ES	—	—	200	mA
DC Current Gain	h_{FE}	I_C = 30A, V_{CE} = 5.0V	20	35	—	—
		I_C = 20A, V_{CE} = 5.0V	40	85	—	—
		I_C = 10A, V_{CE} = 5.0V	100	160	—	—
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	I_C = 30A, I_B = 3.0A	—	2.1	3.5	V
		I_C = 20A, I_B = 2.0A	—	1.6	2.5	V
		I_C = 10A, I_B = 1.0A	—	1.2	1.7	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	I_C = 30A, I_B = 3.0A	—	2.65	4.0	V
		I_C = 20A, I_B = 2.0A	—	2.3	3.0	V
		I_C = 10A, I_B = 1.0A	—	1.8	2.5	V
Delay Time*	t_d	V_{CC} = 250V, I_C = 20A, I_{B1} = 1A, $-I_{B2}$ = 2.0A, t_p = 50 μsec	—	0.05	0.5	μs
Rise Time*	t_r		—	0.4	1.0	μs
Storage Time* DS	t_s		—	2.2	5.0	μs
ES			—	1.8	3.0	μs
Fall Time* DS	t_f		—	1.6	3.0	μs
ES			—	.45	1.0	μs
Diode Forward Voltage	V_{FM}	I_{FM} = 10A	—	1.95	3.20	V
		I_{FM} = 25A	—	2.8	4.00	V
		I_{FM} = 25A, T_j = 150°C	—	2.75	4.00	V
Reverse Recovery time	t_{rr}	I_{FM} = 25A, di/dt = 10A/μsec, R_{B1E} = .25Ω	—	3.85	10.0	μs
Forward Turn-On Time	t_{ON}	I_{FM} = 25A, di/dt = 50A/μsec	—	0.42	1.0	μs
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Transistor Part	—	—	2.0	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	Diode Part	—	—	2.0	°C/W

*Resistive Load

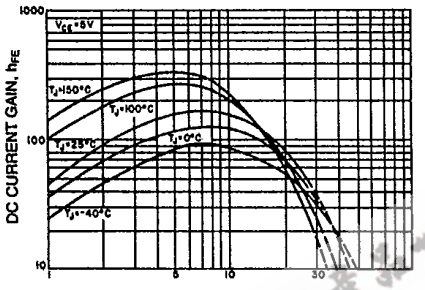
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

D66DS
D66ES
Fast Switching Single Darlington Transistor Module
20 Amperes/500-600-700 Volts

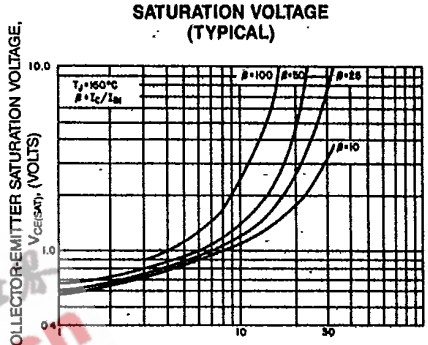
DC CURRENT GAIN (TYPICAL)



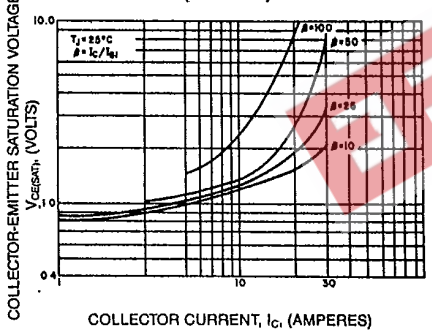
DC CURRENT GAIN (TYPICAL)



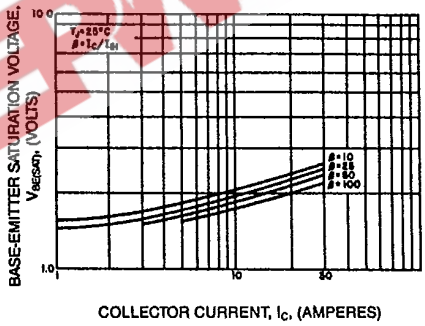
SATURATION VOLTAGE (TYPICAL)



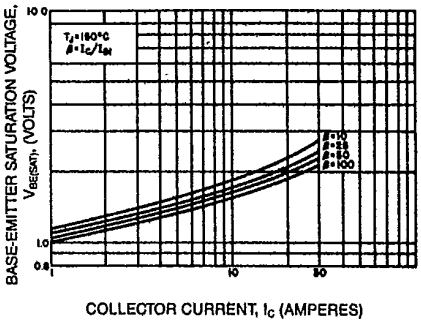
SATURATION VOLTAGE (TYPICAL)



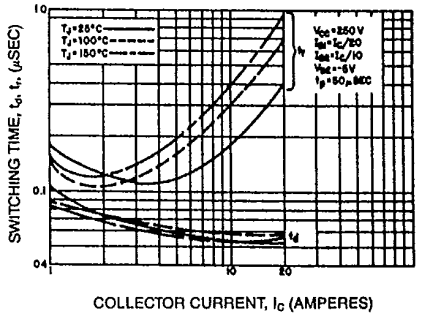
SATURATION VOLTAGE (TYPICAL)



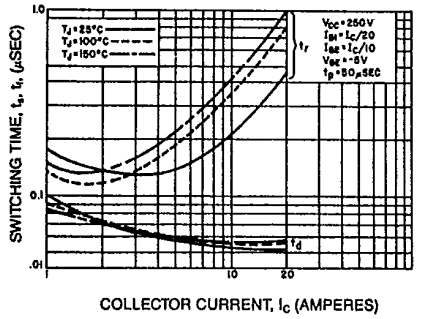
SATURATION VOLTAGE (TYPICAL)



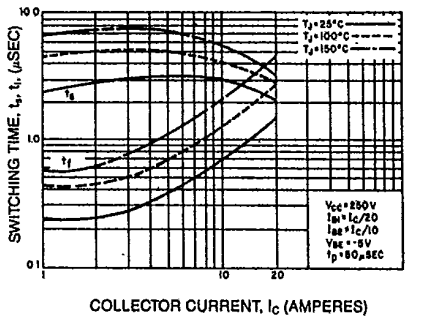
SWITCHING CHARACTERISTICS (TYPICAL)



SWITCHING CHARACTERISTICS (TYPICAL)



SWITCHING CHARACTERISTICS (TYPICAL)

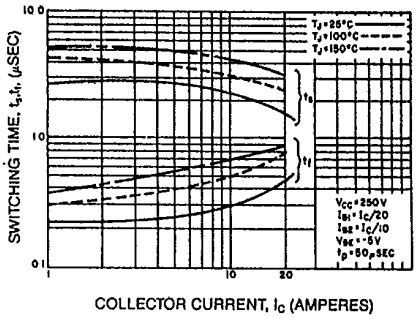


POWEREX

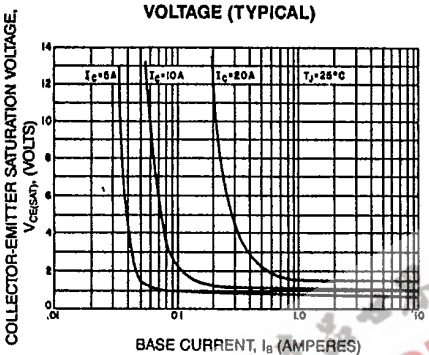
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

D66DS
D66ES
Fast Switching Single Darlington Transistor Module
20 Amperes/500-600-700 Volts

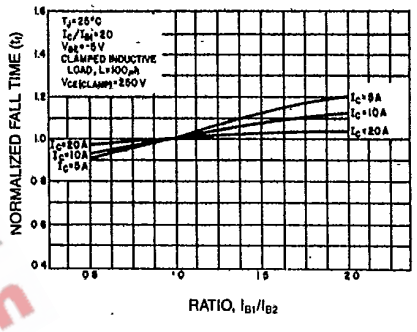
SWITCHING CHARACTERISTICS (TYPICAL)



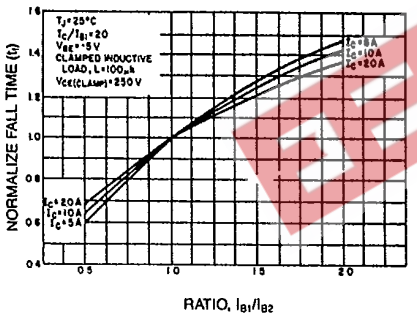
COLLECTOR-EMITTER SATURATION VOLTAGE (TYPICAL)



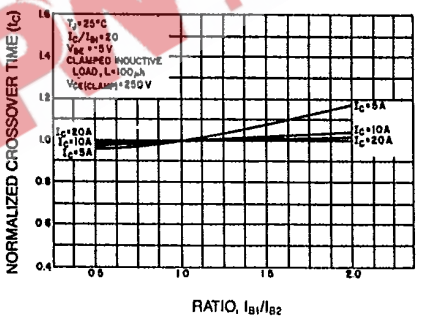
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



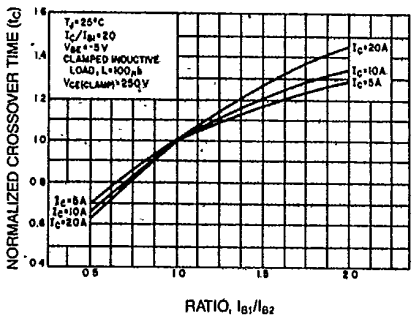
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



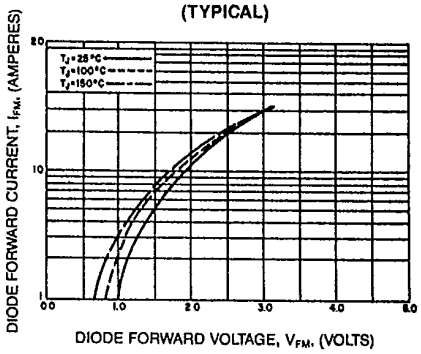
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



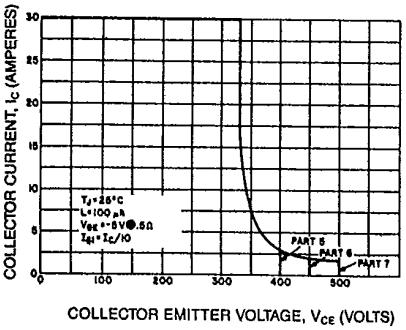
SWITCHING TIME VS. BASE CURRENT (TYPICAL)



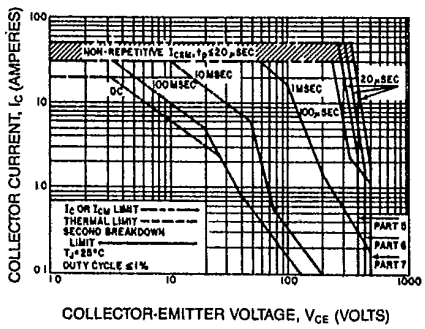
DIODE CHARACTERISTICS (TYPICAL)



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



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

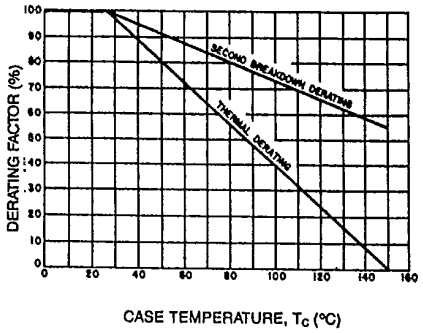


POWEREX

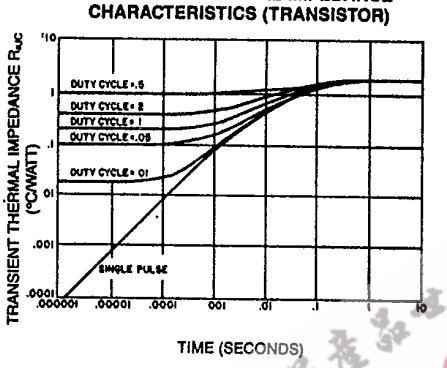
Powerex, Inc., Hillis Street, Youngwood, Pennsylvania 15697 (412) 925-7272

D66DS
D66ES
Fast Switching Single Darlington Transitor Module
20 Ampere/500-600-700 Volts

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



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (TRANSISTOR)



Switching Time Test Circuit