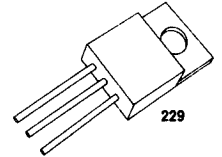


SILICON POWER DARLINGTON TRANSISTORS NPN – HIGH GAIN



GE Type	P_t $T_C = 25^\circ\text{C}$ Max. (W)	V_{CE0} Min. (V)	I_C Cont. (A)	h_{FE} @ 5V, 200mA		f_t Typical (MHz)	COMMENTS	Package Type	Package Outline No.
				Min.	Max.				
D40C1	6.25	30	5	10,000	60,000	75	<ul style="list-style-type: none"> • Very High Gain: 60k typical. High input impedance; 50k ohm typ. 1.2 watts P_r @ 25°C ambient. • Applications: audio output, touch switch, oscillator, buffer, high power transistor driver, relay replacement. 	BROWN Power Pac	198
D40C2	6.25	30	5	40,000	—	75		BROWN Power Pac	198
D40C3	6.25	30	5	90,000	—	75		BROWN Power Pac	198
D40C4	6.25	40	5	10,000	60,000	75		BROWN Power Pac	198
D40C5	6.25	40	5	40,000	—	75		BROWN Power Pac	198
D40C7	6.25	50	5	10,000	60,000	75		BROWN Power Pac	198
D40C8	6.25	50	5	40,000	—	75		BROWN Power Pac	198

SILICON POWER DARLINGTON TRANSISTORS COMPLEMENTARY – 2 AMPERES

GE Type	NPN	PNP	P_t $T_C = 25^\circ\text{C}$ Max. (W)	V_{CE0} Min. (V)	I_C Cont. (A)	h_{FE} @ 5V, 200 mA		f_t Typical (MHz)	COMMENTS	Package Type	Package Outline No.
						Min.	Max.				
D40K1	—		10	30	2	10,000	—	75	TYPICAL APPLICATIONS <ul style="list-style-type: none"> • Driver • Regulator • Touch Switch • IC Interface • Lamp Driver • Audio Output • Relay Substitute • Servo-Amplifier 		198
—	D41K1		10	—30	—2	10,000	—	75			198
D40K2	—		10	50	2	10,000	—	75			198
—	D41K2		10	—50	—2	10,000	—	75			198
—	D41K3		10	—30	—2	10,000	—	75			198
—	D41K4		10	—50	—2	10,000	—	75			198

SILICON POWER DARLINGTON TRANSISTORS COMPLEMENTARY – 10 AMPERES

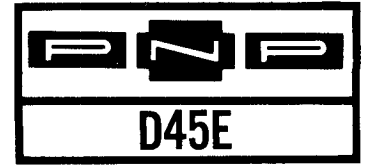
GE Type	NPN	PNP	P_t $T_C = 25^\circ\text{C}$ Max. (W)	V_{CE0} Min. (V)	I_C Cont. (A)	h_{FE} @ 5V, 5A		COMMENTS	Package Type	Package Outline No.
						Min.	Max.			
D44E1	—		50	40	10	1000	—	TYPICAL APPLICATIONS <ul style="list-style-type: none"> • Relay and Solenoid Driver • Regulator • Inverter Power Supply Switch • Audio Output • Relay Substitute • Oscillator • Servo-Amplifier 	RED Power Pac	229
—	D45E1		50	—40	—10	1000	—		GREEN Power Pac	229
D44E2	—		50	60	10	1000	—		RED Power Pac	229
—	D45E2		50	—60	—10	1000	—		GREEN Power Pac	229
D44E3	—		50	80	10	1000	—		RED Power Pac	229
—	D45E3		50	—80	—10	1000	—		GREEN Power Pac	229

Silicon Power Pac

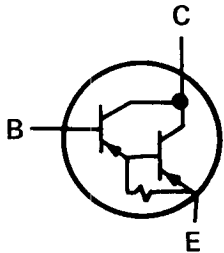
Monolithic Transistor

Very High Gain Darlington Amplifier

"Color Molded"



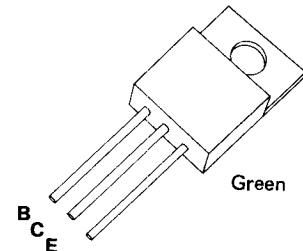
COMPLEMENT TO D44E



Equiv. Circuit

TYPICAL APPLICATIONS:

- | | |
|-----------------------|------------------|
| Driver | Switch |
| Regulator | Audio Output |
| Capacitor Multiplier | Relay Substitute |
| Solenoid Driver | Oscillator |
| Inverter Power Supply | Servo-Amplifier |



JEDEC TO-220 AB

absolute maximum ratings: (25°C) (unless otherwise specified)

		D45E1	D45E2	D45E3	Units
Voltages	Symbol				
Collector to Emitter	V_{CEO}	-40	-60	-80	Volts
Emitter to Base	V_{EBO}	- 7	- 7	- 7	Volts
Collector to Emitter	V_{CES}	-40	-60	-80	Volts
Current⁽¹⁾					
Collector (Continuous)	I_C	←—————	-10	—————→	Amps
Collector (Peak) (50% duty cycle, 25 msec. pulse width)		←—————	-20	—————→	Amps
Base (Continuous)	I_b	←—————	- 1	—————→	Amps
Power Dissipation⁽¹⁾					
Tab at 25°C	P_T	←—————	50	—————→	Watts
Free Air at 25°C		←—————	1.67	—————→	Watts
Thermal Resistance⁽²⁾					
Junction to Case	$R_{\theta JC}$	←—————	2.5	—————→	°C/W
Junction to Ambient	$R_{\theta JA}$	←—————	75	—————→	°C/W
Temperature⁽²⁾					
Operating	T_j	←—————	-55 to +150	—————→	°C
Storage	T_{STG}	←—————	-55 to +150	—————→	°C
Lead Soldering, 1/16" ± 1/32" from case for 10 seconds max.	T_L	←—————	+260	—————→	°C

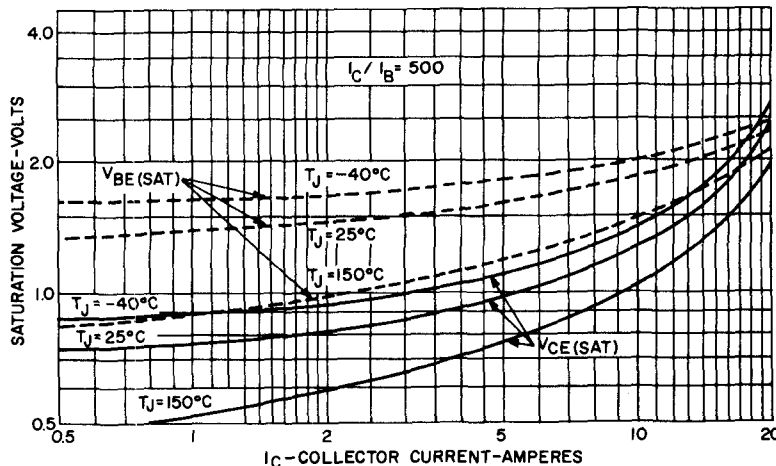
NOTES:

- (1) Refer to the Safe Region of Operation curve for further information.
- (2) Case temperature reference point is indicated on the Dimensional Outline Drawing.

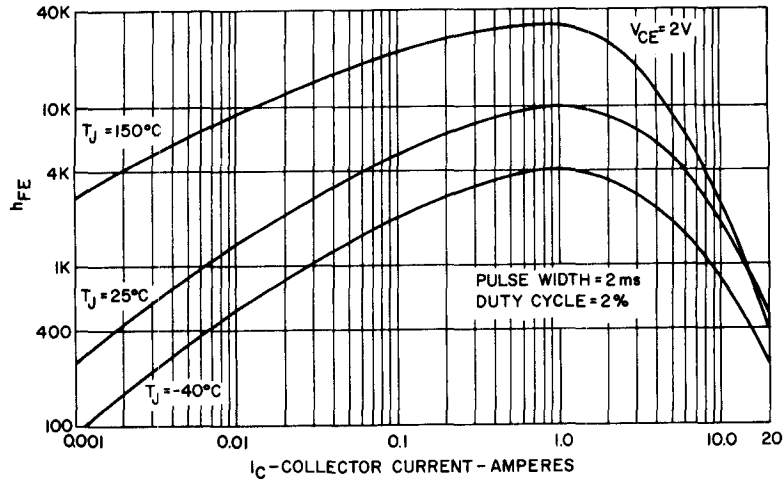
electrical characteristics: (25°C) (unless otherwise specified)

			D45E1 D45E2 D45E3			
Forward Current Transfer Ratio ⁽³⁾ ($I_C = 5A, V_{CE} = 5V$)	h_{FE}	Min.	Typ.			
		1000				
Collector to Emitter Voltage ($I_C = 100\text{ mA}$)	V_{CEO}	Min.	Typ.	Max.		
D45E1		-40	—	—	Volts	
D45E2		-60	—	—	Volts	
D45E3		-80	—	—	Volts	
Collector Saturation Voltage ⁽⁴⁾ ($I_C = -5.0A, I_B = -10mA$)	$V_{CE(SAT)}$	—	—	-1.5	Volts	
($I_C = -10.0A, I_B = -20mA$)	$V_{CE(SAT)}$	—	—	-2.0	Volts	
Base Saturation Voltage ⁽³⁾ ($I_C = -5.0A, I_B = -10mA$)	$V_{BE(SAT)}$	—	—	-2.5	Volts	
Collector Cutoff Current ($V_{CE} = \text{Rated } V_{CES}, T_J = 25^\circ C$)	I_{CES}	—	—	-10	μA	
($V_{CE} = \text{Rated } V_{CES}, T_J = 150^\circ C$)	I_{CES}	—	—	-1.0	mA	
Emitter Cutoff Current ($V_{EB} = -7V$)	I_{EBO}	—	—	-1.0	μA	
Collector Capacitance ($V_{CB} = 10V, f = 1\text{ MHz}$)	C_{CBO}	—	—	220	pF	
Switching Times						
Delay Time and Rise Time ($I_C = -10A, I_{B1} = -20mA$)	$t_d + t_r$	—	0.6	—	μS	
Storage Time ($I_C = -10A, I_{B1} = I_{B2} = -20mA$)	t_s	—	2.0	—	μS	
Fall Time ($I_C = -10A, I_{B1} = I_{B2} = -20mA$)	t_f	—	0.5	—	μS	

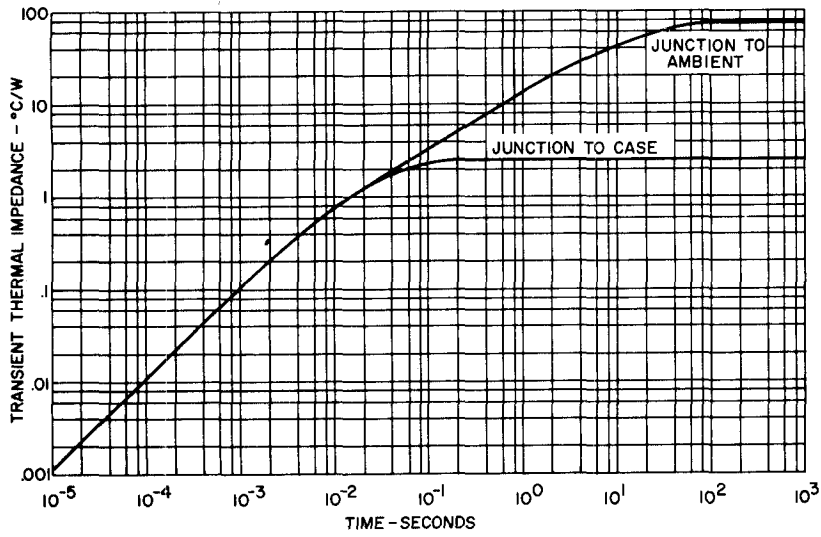
NOTE: (3) Pulsed measurement, 2m sec pulse width, duty cycle $\leq 2\%$.
 (4) Pulsed measurement, 300 μ sec pulse width, duty cycle $\leq 2\%$.



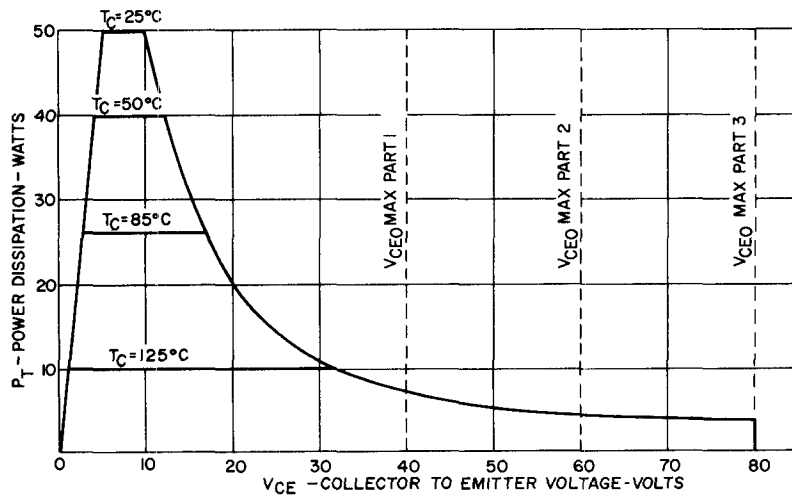
TYPICAL SATURATION VOLTAGE CHARACTERISTICS



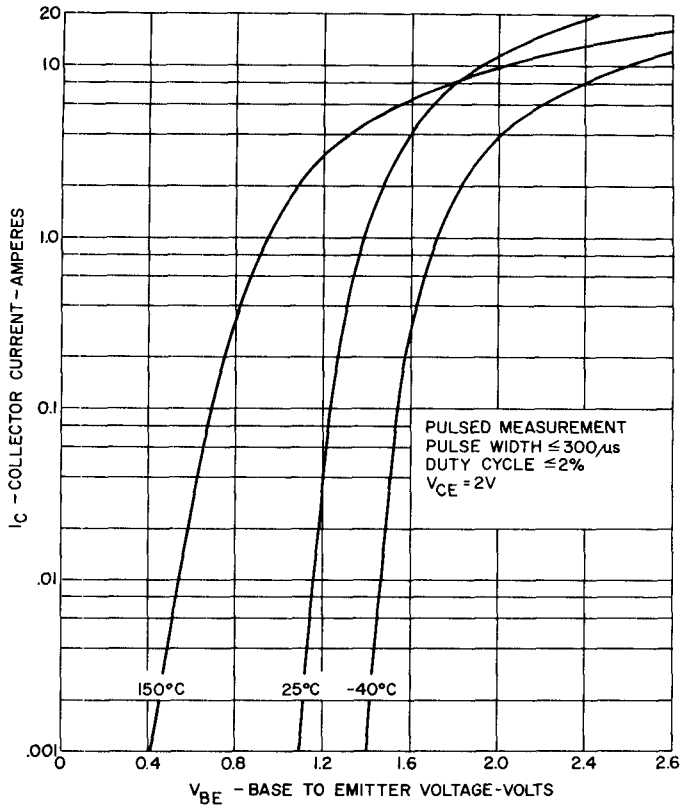
TYPICAL GAIN CHARACTERISTIC



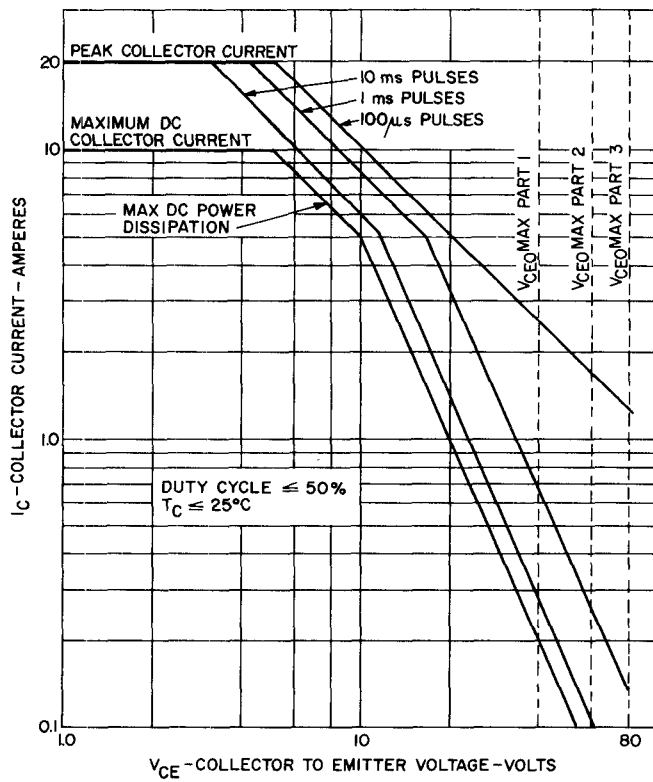
TRANSIENT THERMAL IMPEDANCE



MAXIMUM PERMISSIBLE DC POWER DISSIPATION



TYPICAL TRANSCONDUCTANCE CHARACTERISTICS



SAFE REGION OF OPERATION