

8961726 TEXAS INSTR (OPT0)

62C 36683

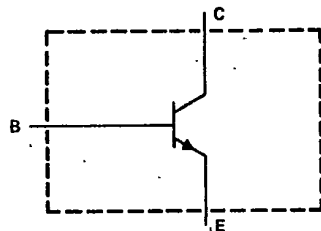
D

BUY70A, BUY70B, BUY70C
N-P-N SILICON POWER TRANSISTORS
T-33-13

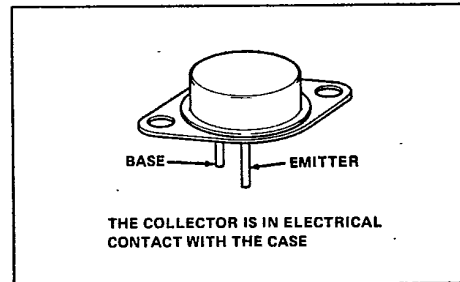
OCTOBER 1982 - REVISED OCTOBER 1984

- 75 W at 25°C Case Temperature
- 10 A Continuous Collector Current
- 15 A Peak Collector Current
- Designed for Switching Mode Power Supplies, Inverters, and CRT Scanning Systems

device schematic



TO-3 PACKAGE



absolute maximum ratings at 25°C case temperature (unless otherwise noted)

	BUY70A	BUY70B	BUY70C
Collector-base voltage	1000 V	800 V	500 V
Collector-emitter voltage ($I_B = 0$)	400 V	325 V	200 V
Emitter-base voltage	8 V		
Continuous collector current	10 A		
Peak collector current (see Note 1)	15 A		
Continuous base current	3 A		
Continuous device dissipation (see Figure 9) ($V_{CE} \leq 17$ V)	75 W		
Operating temperature range	- 65°C to 200°C		

NOTE 1: This value applies for $t_W \leq 500 \mu s$, duty cycle $\leq 25\%$.

BD, BDW, BDX, BU, BUX, BUY Devices

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electrical characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	BUY70A			BUY70B			BUY70C			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
$V_{(BR)CBO}$	$I_C = 1 \text{ mA}$, See Note 2			1000			800			500	V
$V_{CE(sus)}$	$I_B = 0$, $I_C = 50 \text{ mA}$			400			325			200	V
$V_{(BR)EBO}$	$I_B = 10 \text{ mA}$			8			8			8	V
I_{CEX}	$V_{CE} = 1000 \text{ V}$, $V_{BE} = -2 \text{ V}$						1				mA
	$V_{CE} = 800 \text{ V}$, $V_{BE} = -2 \text{ V}$									1	
	$V_{CE} = 500 \text{ V}$, $V_{BE} = -2 \text{ V}$									1	
h_{FE}	$V_{CE} = 10 \text{ V}$, See Note 3			15			15			15	
$V_{BE(sat)}$	$I_B = 0.8 \text{ A}$, See Note 3			1.5			1.5			1.5	V
$V_{CE(sat)}$	$I_B = 0.8 \text{ A}$, See Note 3			5			5			5	V
f_T	$V_{CE} = 10 \text{ V}$, $I_C = 0.5 \text{ A}$			6			6			6	MHz
C_{obo}	$V_{CB} = 20 \text{ V}$, $I_C = 0$			150			150			150	pF

NOTES: 2. These parameters must be measured using pulse techniques, $t_w \leq 500 \mu\text{s}$, duty cycle $\leq 25\%$.
3. These parameters must be measured using pulse techniques, $t_w \leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$			2.3	°C/W

resistive-load switching characteristics at 25°C case temperature

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_f	$I_C = 4 \text{ A}$, $V_{CC} = 40 \text{ V}$, $I_{B1} = 0.8 \text{ A}$, $I_{B2} = -0.8 \text{ A}$, See Figure 1			1	μs

BD, BDW, BDX, BU, BUX, BUY Devices

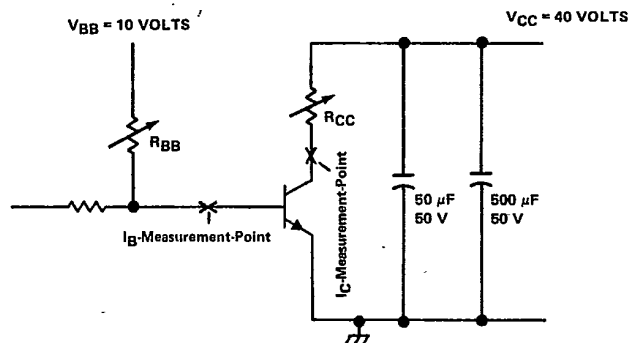
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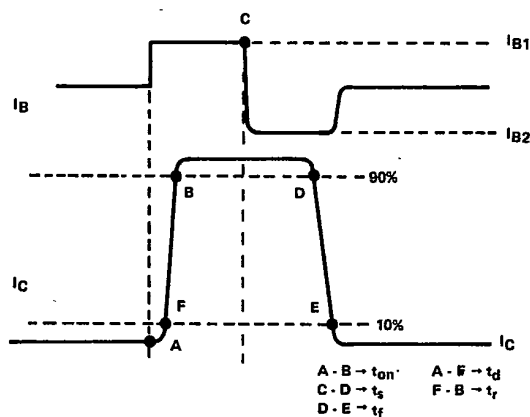
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N-P-N SILICON POWER TRANSISTORS

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PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

- NOTES: A. R_{BB} and R_{CC} adjusted to give I_B and I_C .
 B. Input resistor should correctly terminate pulse generator (normally 50 Ω). Input pulse = 25 V, $t_W = 10 \mu s$, duty cycle $\leq 2\%$.
 C. Oscilloscope rise time less than 20 ns.
 D. Recommended current probe: Tektronix P6019, P6020, or P6042.
 E. For typical variation of switching time with collector current, see Figure 4.

FIGURE 1. RESISTIVE-LOAD SWITCHING

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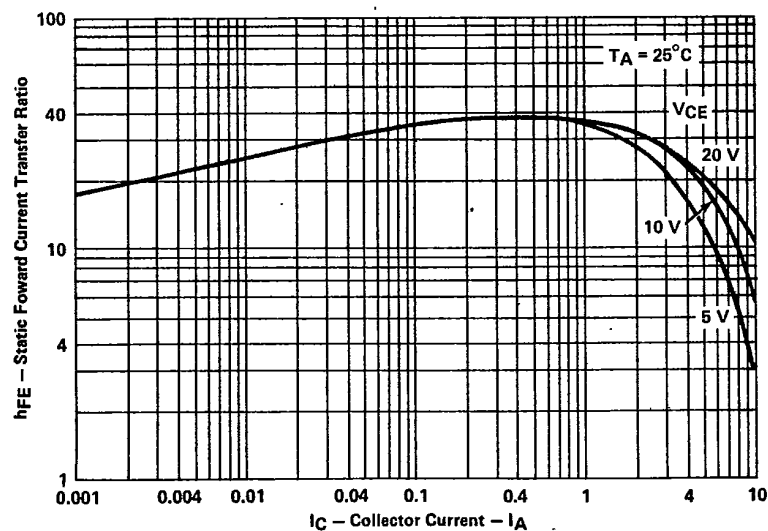
BUY70A, BUY70B, BUY70C
N-P-N SILICON POWER TRANSISTORSTYPICAL CHARACTERISTICS
STATIC FORWARD CURRENT TRANSFER RATIO
VS
COLLECTOR CURRENT

FIGURE 2

BD, BDW, BDY, BU, BUX, BUY Devices

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BUY70A, BUY70B, BUY70C
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TYPICAL CHARACTERISTICS

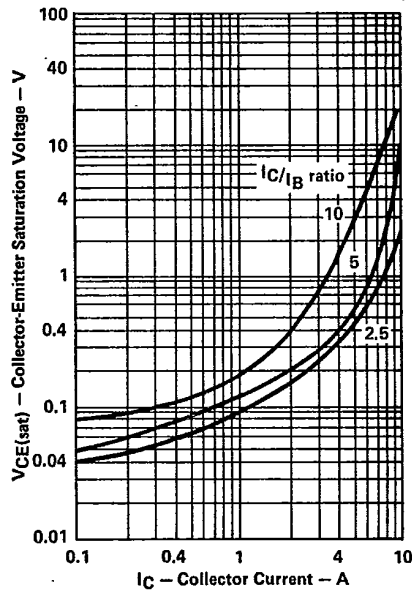
COLLECTOR-EMITTER
SATURATION VOLTAGE
vs
COLLECTOR CURRENT

FIGURE 3

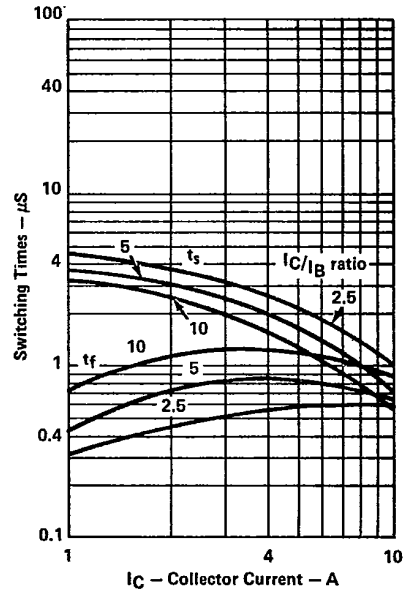
SWITCHING TIMES
vs
COLLECTOR CURRENT

FIGURE 4

BD, BDW, BDX, BU, BUX, BUY Devices

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TYPICAL CHARACTERISTICS

COLLECTOR-BASE LEAKAGE CURRENT
VS
TEMPERATURE

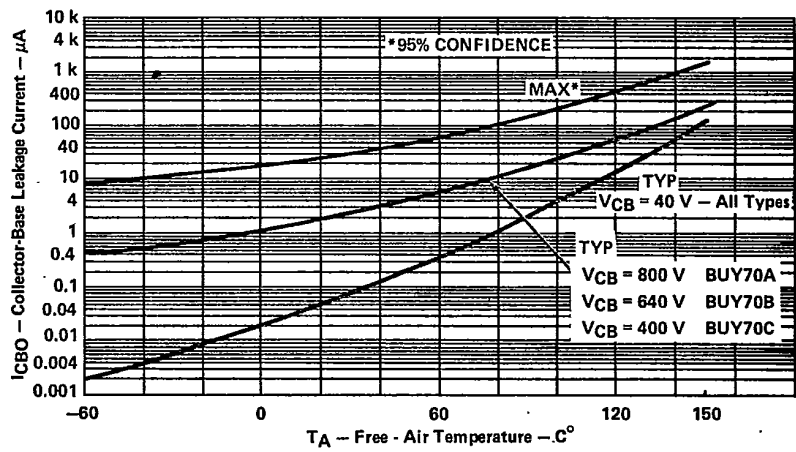


FIGURE 5

BASE-EMITTER SATURATION VOLTAGE
VS
COLLECTOR CURRENT

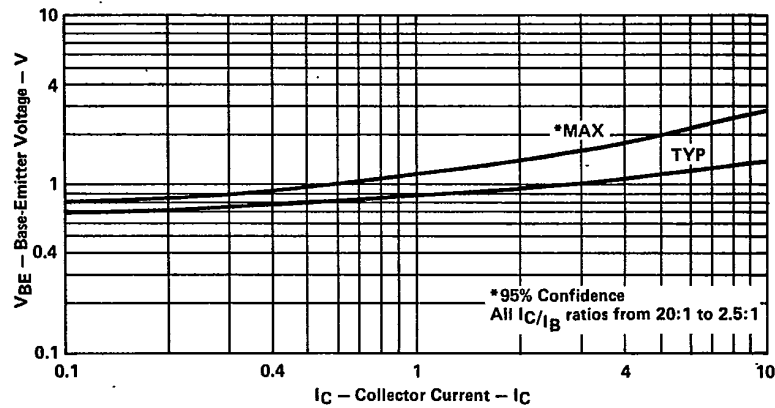


FIGURE 6

BD, BDW, BDX, BU, BUX, BUY Devices

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TYPICAL CHARACTERISTICS

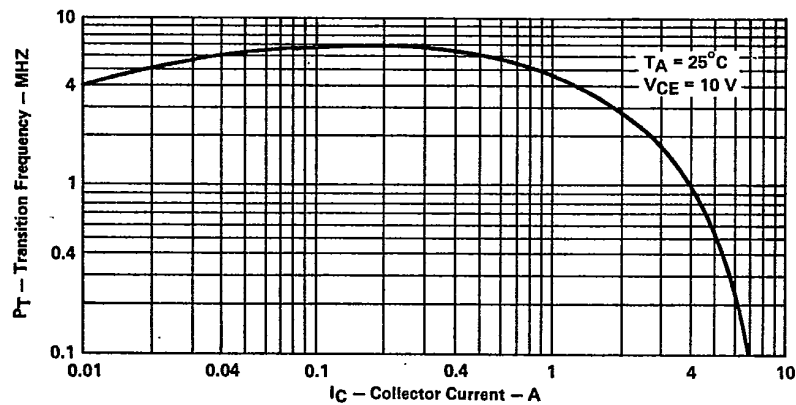
TRANSITION FREQUENCY
vs
COLLECTOR CURRENT

FIGURE 7

MAXIMUM SAFE OPERATING AREA

FORWARD-BIAS SAFE OPERATING AREA

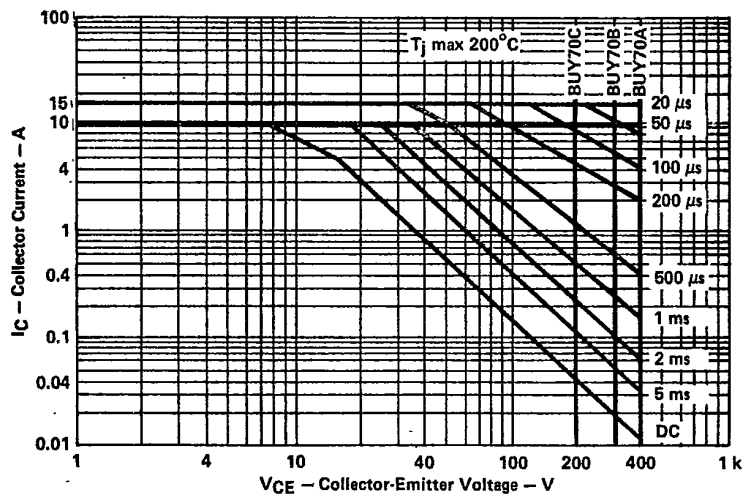


FIGURE 8

BD, BDW, BDX, BU, BUX, BUY Devices

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THERMAL INFORMATION

DISSIPATION DERATING CURVE

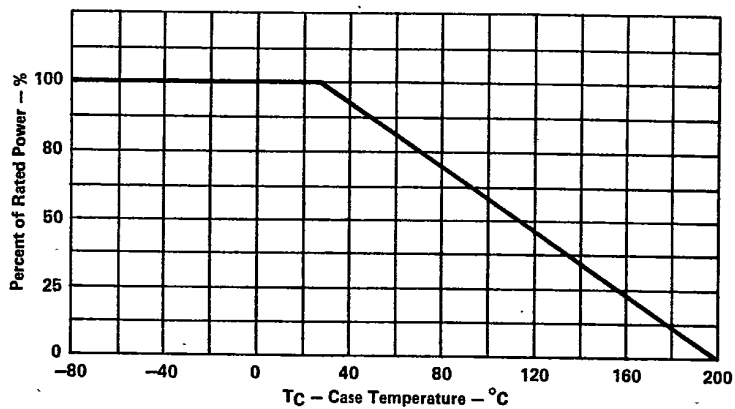


FIGURE 9

BD, BDW, BDX, BU, BUX, BUY Devices