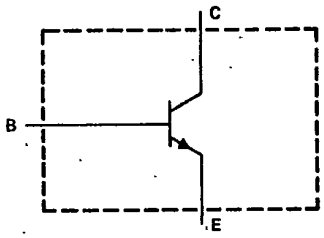
BUY70A, BUY70B, BUY70C
N-P-N SILICON POWER TRANSISTORS

T-33-13

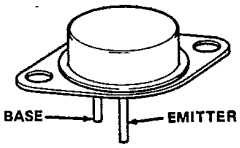
OCTOBER 1982 – REVISED OCTOBER 1984

- 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



THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE CASE

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 ≤ 25 %.

BUY70A, BUY70B, BUY70C
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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 mA, I_E = 0, See Note 2	1000			800			500			V
$V_{CEO(sus)}$	I_B = 0, I_C = 50 mA	400			325			200			V
$V_{(BR)EBO}$	I_B = 10 mA	8			8			8			V
I_{CEX}	V_{CE} = 1000 V, V_{BE} = −2 V			1							mA
	V_{CE} = 800 V, V_{BE} = −2 V						1				
	V_{CE} = 500 V, V_{BE} = −2 V									1	
h_{FE}	V_{CE} = 10 V, I_{CE} = 1 A, See Note 3	15			15			15			
$V_{BE(sat)}$	I_B = 0.8 A, I_C = 4 A, See Note 3			1.5			1.5			1.5	V
$V_{CE(sat)}$	I_B = 0.8 A, I_C = 4 A, See Note 3			5			5			5	V
f_T	V_{CE} = 10 V, I_C = 0.5 A	6			6			6			MHz
C_{obo}	V_{CB} = 20 V, I_C = 0			150			150			150	pF

NOTES: 2. These parameters must be measured using pulse techniques, $t_w \leq 500\ \mu s$, duty cycle ≤ 25 %.
3. These parameters must be measured using pulse techniques, $t_w \leq 300\ \mu s$, duty cycle ≤ 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 A, I_{B1} = 0.8 A, I_{B2} = −0.8 A, V_{CC} = 40 V, See Figure 1			1	μs

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

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N-P-N SILICON POWER TRANSISTORS

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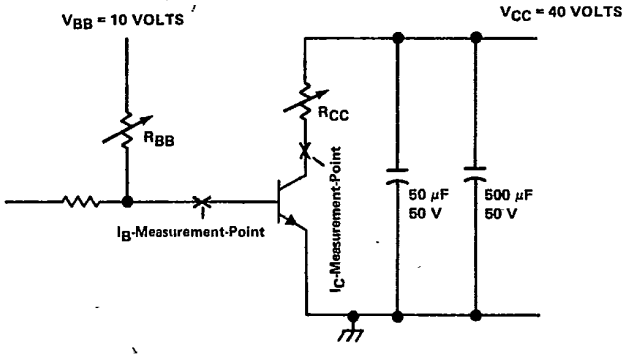
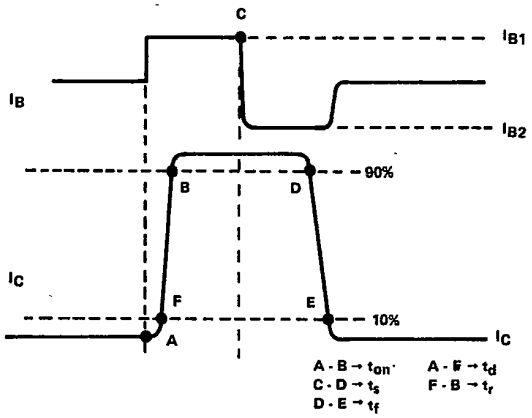
PARAMETER MEASUREMENT INFORMATION



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 μs, duty cycle ≤ 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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TYPICAL CHARACTERISTICS

STATIC FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

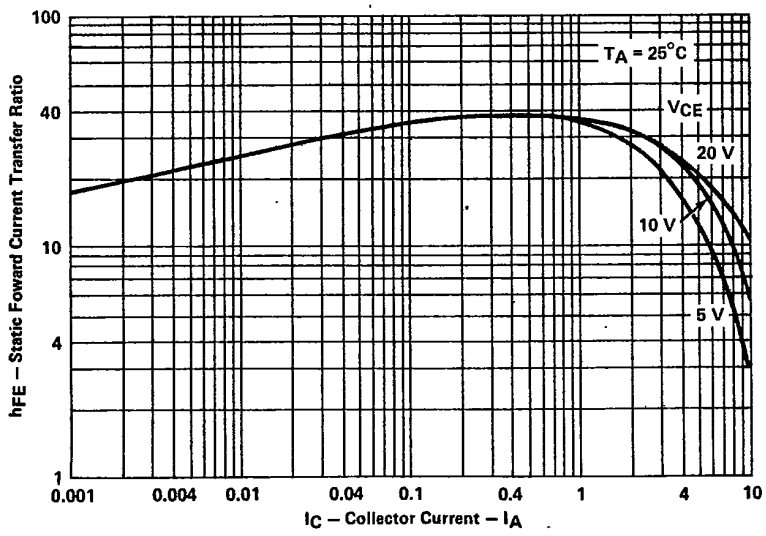

FIGURE 2

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TYPICAL CHARACTERISTICS

COLLECTOR-EMITTER SATURATION VOLTAGE vs COLLECTOR CURRENT

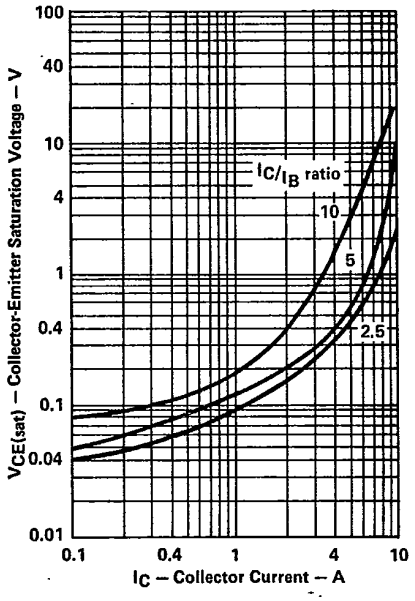

FIGURE 3

SWITCHING TIMES vs COLLECTOR CURRENT

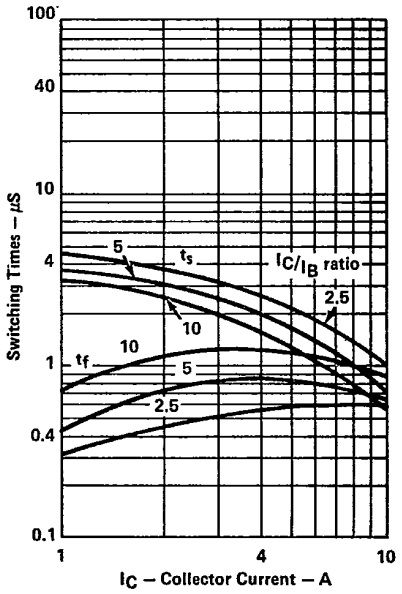

FIGURE 4

BUY70A, BUY70B, BUY70C
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TYPICAL CHARACTERISTICS

COLLECTOR-BASE LEAKAGE CURRENT
vs
TEMPERATURE

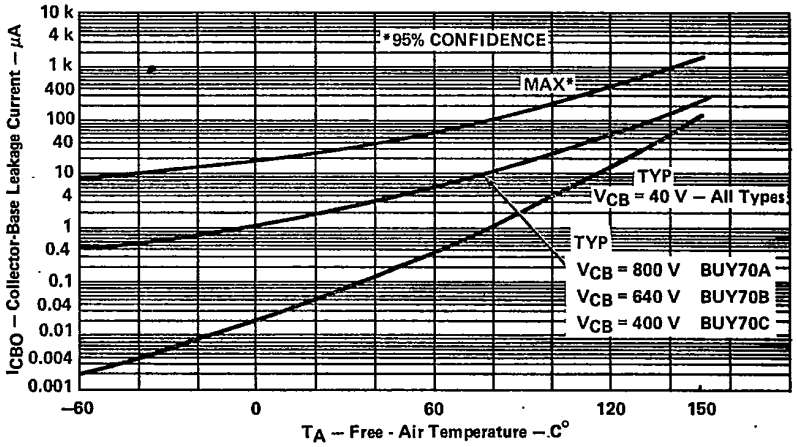

FIGURE 5

BASE-EMITTER SATURATION VOLTAGE
vs
COLLECTOR CURRENT

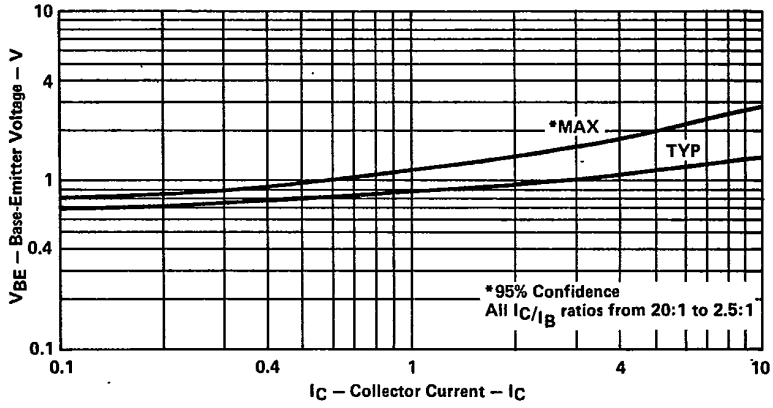

FIGURE 6

TYPICAL CHARACTERISTICS

TRANSITION FREQUENCY
vs
COLLECTOR CURRENT

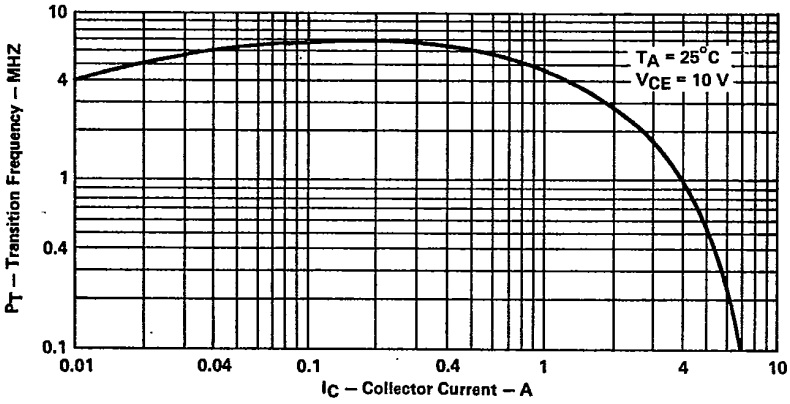

FIGURE 7

MAXIMUM SAFE OPERATING AREA

FORWARD-BIAS SAFE OPERATING AREA

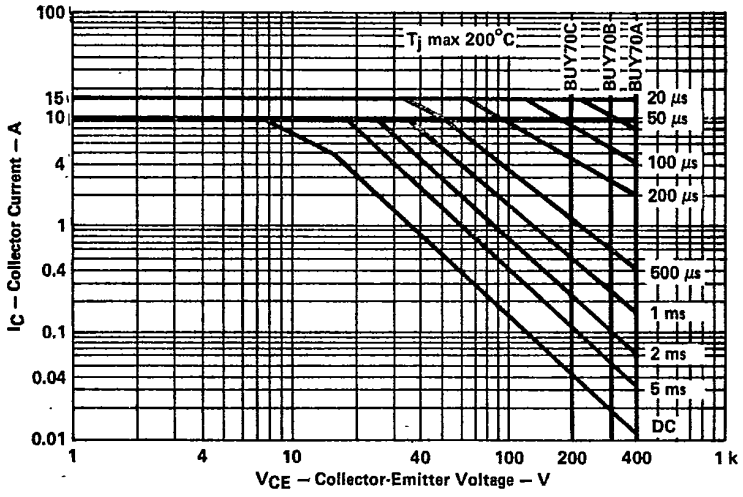

FIGURE 8

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THERMAL INFORMATION

DISSIPATION DERATING CURVE

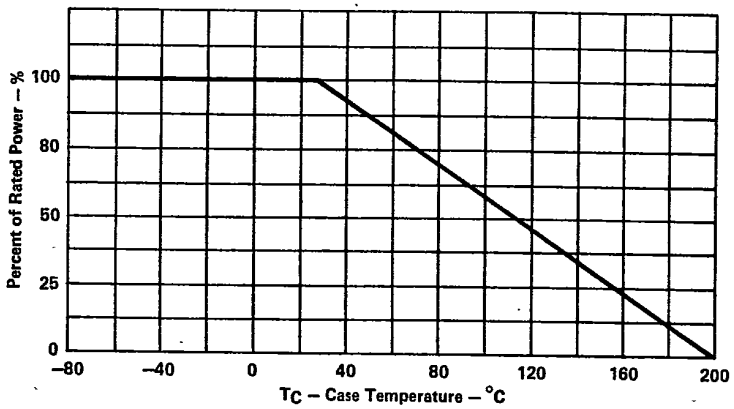

FIGURE 9

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