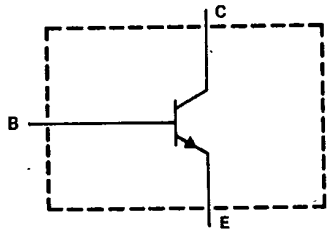
BUX84, BUX85
N-P-N SILICON POWER TRANSISTORS

T-33-11

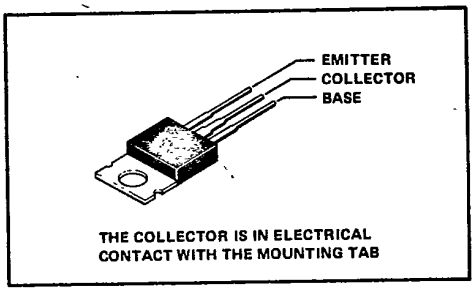
NOVEMBER 1983 – REVISED OCTOBER 1984

- 40 W at 25°C Case Temperature
- 2 A Continuous Collector Current
- 3 A Peak Collector Current
- Typical t_f = 200 ns at 25°C
- Designed for Switching-Mode Power Supplies, CRT Scanning, Inverters, and Other Industrial Applications Where Rapid Switching of Inductive Loads is Necessary

device schematic



TO-220AB PACKAGE



THE COLLECTOR IS IN ELECTRICAL CONTACT WITH THE MOUNTING TAB

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

	BUX84	BUX85
Collector-base voltage	800 V	1000 V
Collector-emitter voltage (V_{BE} = 0)	800 V	1000 V
Collector-emitter voltage (I_B = 0)	400 V	450 V
Continuous collector current	2 A	
Peak collector current (see Note 1)	3 A	
Continuous device dissipation (see Figure 7)	40 W	
Operating junction temperature range	−65°C to 150°C	

NOTE 1: This value applies for $t_w \leq 2$ ms, duty cycle ≤ 2 %.

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electrical characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS			BUX84			BUX85			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
$V_{CEO(sus)}$	I_C = 0.1 A,	L = 25mH,	See Note 2	400			450			V
I_{CES}	V_{CE} = 800 V,	V_{BE} = 0				200				μA
	V_{CE} = 800 V,	V_{BE} = 0,	T_C = 125°C			1				mA
	V_{CE} = 1000 V,	V_{BE} = 0							200	μA
	V_{CE} = 1000 V,	V_{BE} = 0,	T_C = 125°C						1	mA
I_{EBO}	V_{EB} = 5 V,	I_C = 0				1			1	mA
h_{FE}	V_{CE} = 5 V,	I_C = 0.1 A,	See Note 3	35			35			
$V_{BE(sat)}$	I_B = 0.2 A,	I_C = 1 A				1.1			1.1	V
$V_{CE(sat)}$	I_B = 30 mA,	I_C = 0.3 A				0.8			0.8	V
	I_B = 0.2 A,	I_C = 1 A				1			1	
f_T	I_C = 0.2 A,	V_{CE} = 10 V,	See Note 4	12			12			MHz
C_{obo}	V_{CB} = 20 V,	I_E = 0,	f = 0.1 MHz	60			60			pF

NOTES: 2. Inductive loop switching measurement.
3. These parameters must be measured using pulse techniques, t_w = 300 μs, duty cycle ≤ 2%.
4. To obtain f_T, the $|h_{fe}|$ response is extrapolated at the rate of −6 dB per octave from f = 1 MHz to the frequency at which $|h_{fe}| = 1$.

thermal characteristics

PARAMETER	MIN	TYP	MAX	UNIT
$R_{\theta JC}$			2.5	°C/W

resistive-load switching characteristics at 25°C case temperature (unless otherwise noted)

PARAMETER	TEST CONDITIONS			MIN	TYP	MAX	UNIT
t_{on}	I_C = 1 A, V_{CC} = 250 V, See Figure 1, I_{B1} = 0.2 A, I_{B2} = −0.4 A		T_C = 25°C		0.25	0.5	μs
t_s					1.8		μs
t_f					0.2		μs
t_f			T_C = 95°C			0.4	μs

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

TEXAS INSTRUMENTS
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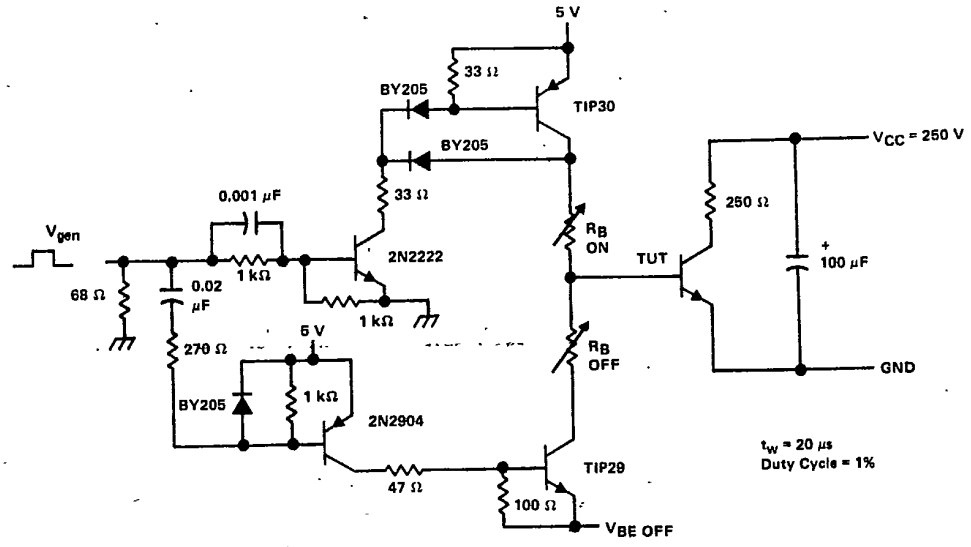
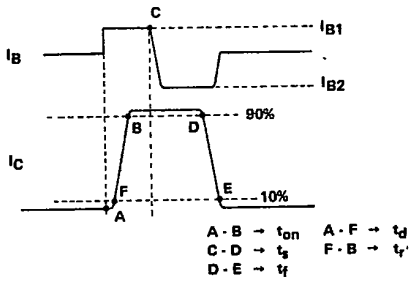
PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



CURRENT WAVEFORMS

FIGURE 1. RESISTIVE-LOAD SWITCHING

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TYPICAL CHARACTERISTICS

FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

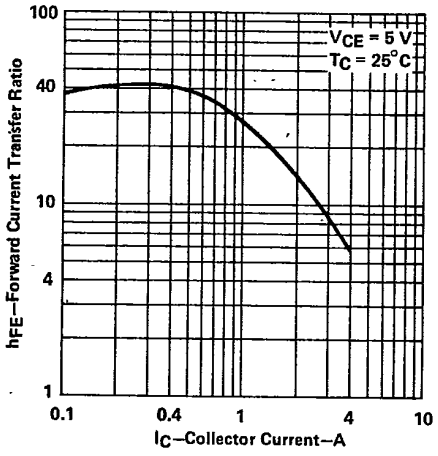

FIGURE 2

COLLECTOR CUTOFF CURRENT
vs
CASE TEMPERATURE

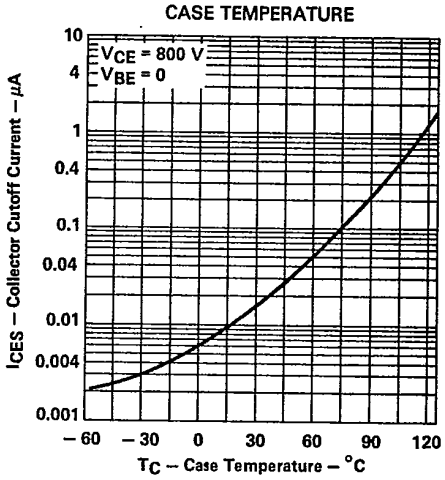

FIGURE 3

MAXIMUM SAFE OPERATING AREA

MAXIMUM COLLECTOR CURRENT
vs
COLLECTOR-EMITTER VOLTAGE

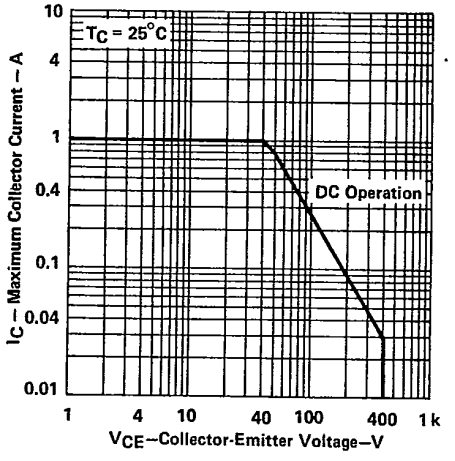

FIGURE 4

LIMITING CONDITIONS
FOR POWER-DOWN TRANSIENT

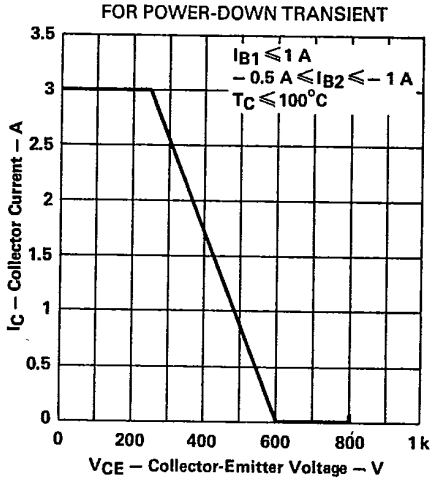

FIGURE 5

THERMAL INFORMATION

THERMAL RESPONSE

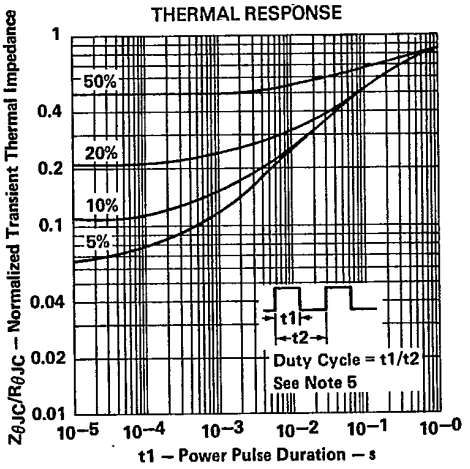

FIGURE 6

DISSIPATION DERATING CURVE

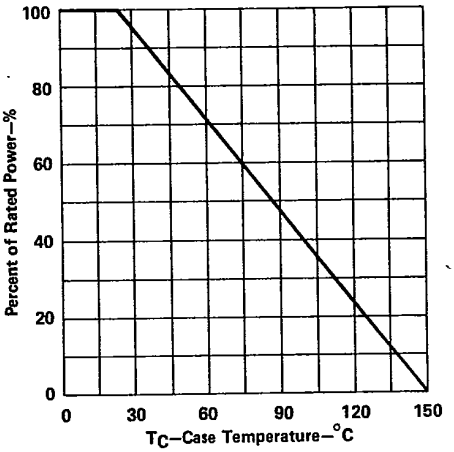

FIGURE 7

NOTE 5: Read time at end of t1, $T_{J(max)} - T_C = P_{D(peak)} \cdot \left(\frac{Z_{\theta JC}}{R_{\theta JC}}\right) \cdot R_{\theta JC(max)}$.