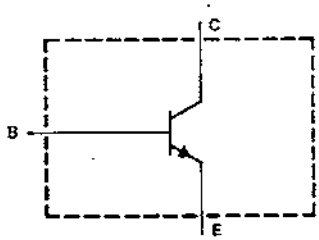
BUX82, BUX83
N-P-N SILICON POWER TRANSISTORS

T-33-11

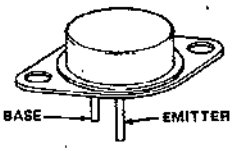
OCTOBER 1982 – REVISED OCTOBER 1984

- 60 W at 50°C Case Temperature
- 6 A Continuous Collector Current
- 8 A Peak Collector Current
- Series Features High-Voltage and Peak Current Ratings, Low Saturation Voltages, and a High Degree of Electrical Robustness
- Designed for Switching-Mode Power Supplies, CRT Scanning, Inverters, and Other Industrial Applications, Where Rapid Switching of Inductive Loads is Necessary

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)

	BUX82	BUX83
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	6 A	
Peak collector current (see Note 1)	8 A	
Continuous base current	2 A	
Peak base current (see Note 1)	3 A	
Continuous device dissipation at (or below) 50°C case temperature	60 W	
Operating junction temperature	−65°C to 150°C	

NOTE 1: These values apply for t_w = 2 ms, duty cycle ≤ 2%.

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

PARAMETER	TEST CONDITIONS			BUX82			BUX83			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
$V_{CEO(sus)}$	I_C = 0.1 A,	L = 25 mH,	See Note 2	400			450			V
$V_{CER(sus)}$	I_C = 0.1 A, See Note 2	L = 15 mH,	R_{BE} = 100 Ω,	500			600			V
I_{CEO}	V_{CE} = 400 V,	I_B = 0				1				μA
	V_{CE} = 450 V,	I_B = 0							1	
I_{CES}	V_{CE} = 800 V,	V_{BE} = 0				1				μA
	V_{CE} = 1000 V,	V_{BE} = 0							1	
	V_{CE} = 800 V,	V_{BE} = 0,	T_C = 125°C			150				
	V_{CE} = 1000 V,	V_{BE} = 0,	T_C = 125°C						150	
I_{EBO}	V_{EB} = 10 V,	I_C = 0				1			1	mA
$V_{CE(sat)}$	I_C = 2.5 A,	I_B = 0.5 A				1			1	V
	I_C = 4 A,	I_B = 1.25 A				2			2	
$V_{BE(sat)}$	I_C = 2.5 A,	I_B = 0.5 A				1.2			1.2	V
	I_C = 4 A,	I_B = 1.25 A				1.4			1.4	
h_{FE}	V_{CE} = 5 V,	I_C = 0.6 A,	See Note 3	40			40			
f_T	V_{CE} = 10 V,	I_C = 0.2 A,	See Note 4	12			12			MHz
C_{obo}	V_{CB} = 20 V,	I_C = 0,	f = 0.1 MHz	110			110			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
$R_{\theta JC}$			1.65	°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 = 2.5 A,	V_{CC} = 250 V,	T_C = 25°C,			0.4	μs
t_s	I_{B1} = 0.5 A,	I_{B2} = −1 A,	See Figure 1			2.5	μs
t_f						0.25	μs
t_{on}	I_C = 2.5 A,	V_{CC} = 250 V,	T_C = 100°C,			0.8	μs
t_s	I_{B1} = 0.5 A,	I_{B2} = −1 A,	See Figure 1			3	μs
t_f						0.5	μs

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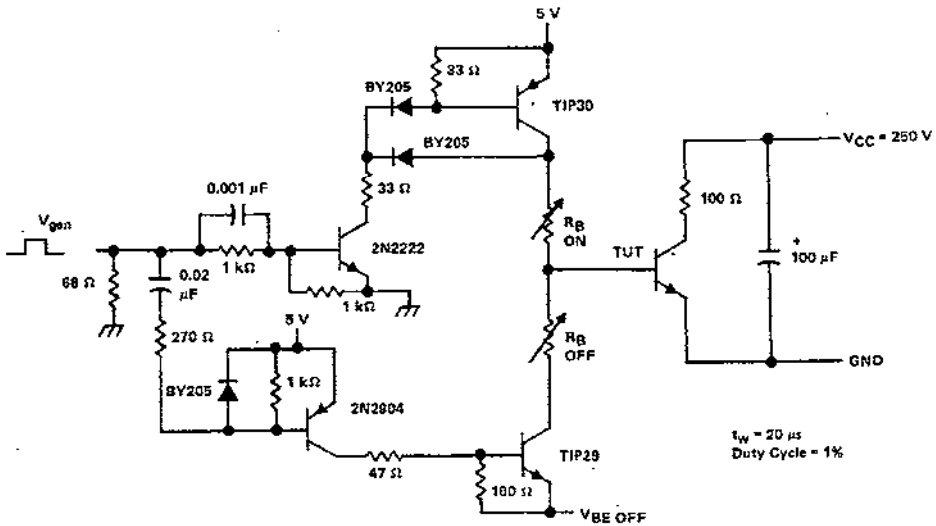
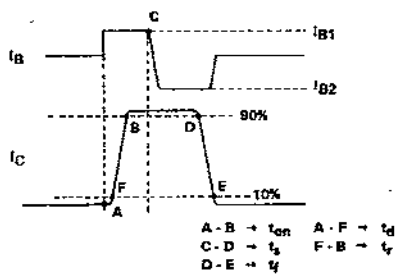
PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



VOLTAGE WAVEFORMS

FIGURE 1. RESISTIVE-LOAD SWITCHING

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TYPICAL CHARACTERISTICS

TURN-ON TIMES
vs
COLLECTOR

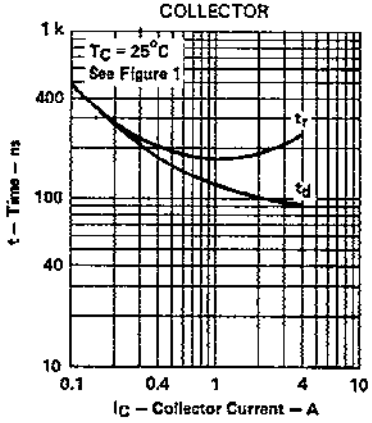

FIGURE 2

TURN-OFF TIMES
vs
COLLECTOR

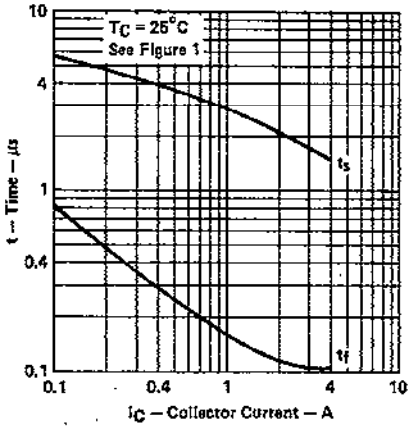

FIGURE 3

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
BASE CURRENT

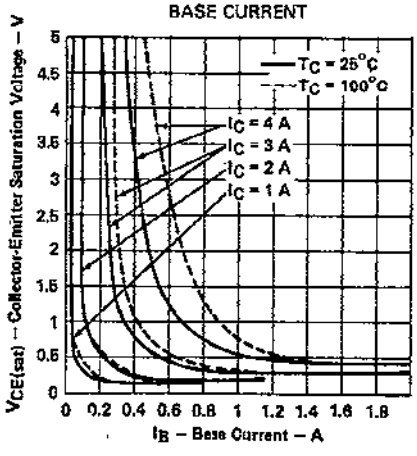

FIGURE 4

BASE-EMITTER SATURATION VOLTAGE
vs
BASE CURRENT

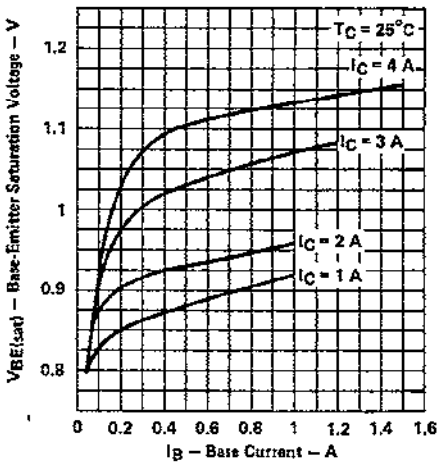

FIGURE 5

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TYPICAL CHARACTERISTICS

FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

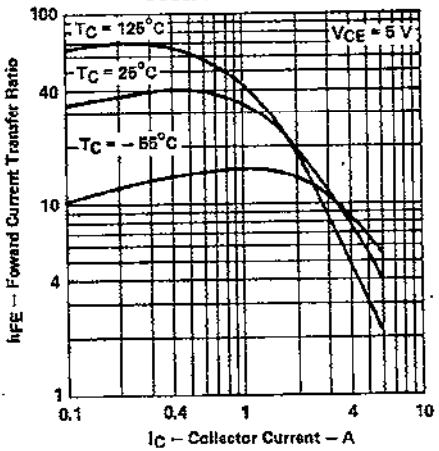

FIGURE 6

COLLECTOR CUTOFF CURRENT
vs
CASE TEMPERATURE

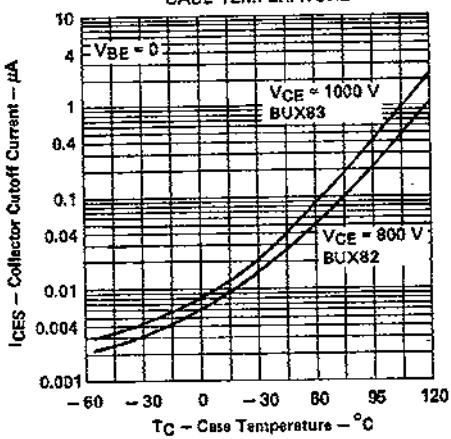

FIGURE 7

COLLECTOR-EMITTER LATCHING VOLTAGE
vs
BASE-EMITTER RESISTANCE

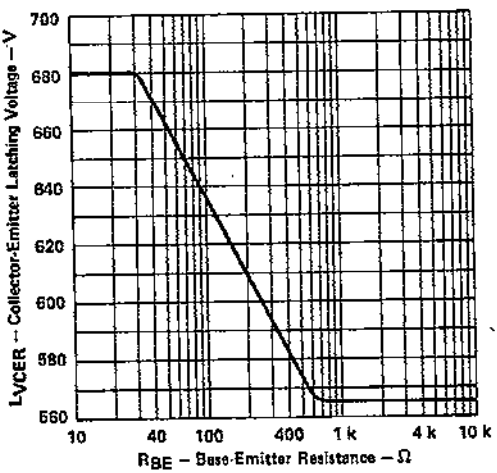

FIGURE 8

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BUX82, BUX83
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MAXIMUM SAFE OPERATING AREAS

FORWARD-BIAS SAFE OPERATING AREA

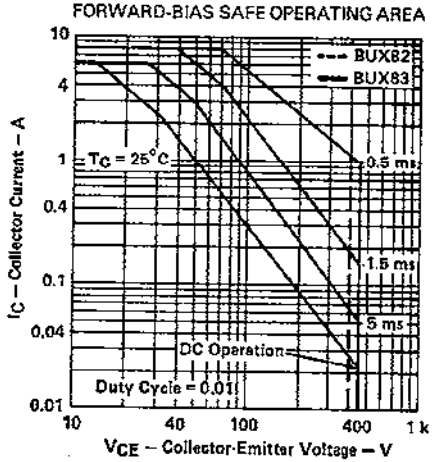

FIGURE 9

LIMITING CONDITIONS FOR POWER-DOWN TRANSIENT

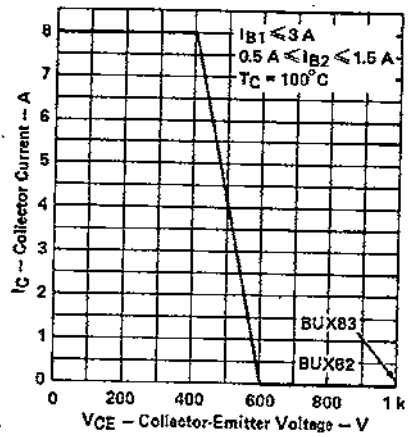

FIGURE 10

THERMAL INFORMATION

THERMAL RESPONSE

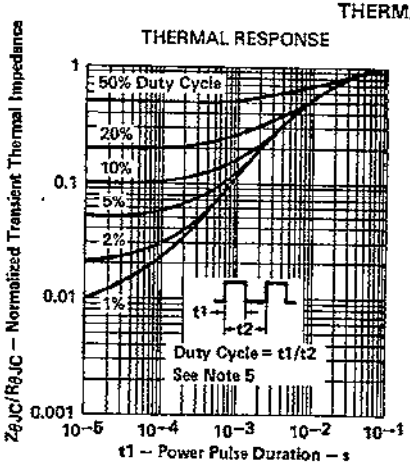

FIGURE 11

DISSIPATION DERATING CURVE

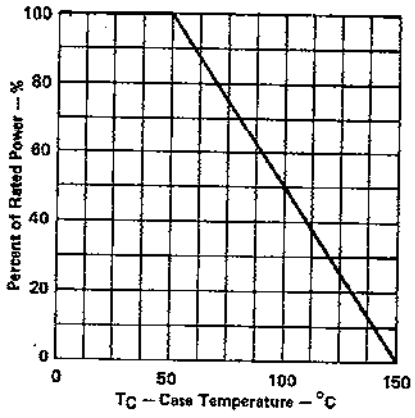

FIGURE 12

NOTE 7: Read time at end of t1, $T_{J(max)} - T_C = P_{D(peak)} \cdot \left(\frac{Z_{\theta JC}}{R_{\theta JC}}\right) \cdot R_{\theta JC(max)}$.

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

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