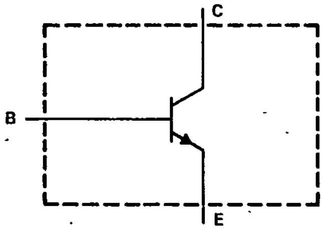
BU406, BU407
N-P-N SILICON POWER TRANSISTORS

T-33-11

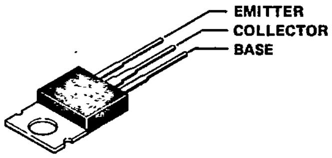
OCTOBER 1982 – REVISED OCTOBER 1984

- **60 W at 25°C Case Temperature**
- **7 A Continuous Collector Current**
- **15 A Peak Collector Current**
- **Specifically Designed for Portable TV Linescan Applications for MTV Receiver with 110-Degree Tubes**

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)

	BU406	BU407
Collector-base voltage	400 V	330 V
Collector-emitter voltage (I_B = 0)	200 V	150 V
Collector-emitter voltage (V_{BE} = – 2V)	400 V	330 V
Emitter-base voltage	6 V	
Continuous base current	4 A	
Continuous collector current	7 A	
Peak collector current (see Note 1)	15 A	
Continuous device dissipation at (or below) 25°C case temperature	60 W	
Operating junction temperature range	– 55°C to 150°C	

NOTE 1: This value applies for t_w = 10 ms, duty cycle = 25%.

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

PARAMETER	TEST CONDITIONS		MIN	TYP	MAX	UNIT
$V_{(BR)CEO}$	I_C = 30 mA, I_B = 0		140			V
I_{CES}	V_{CE} = 400 V, V_{BE} = 0	BU406			5	mA
	V_{CE} = 250 V, V_{BE} = 0				0.1	
	V_{CE} = 250 V, V_{BE} = 0, T_C = 150°C				1	
	V_{CE} = 330 V, V_{BE} = 0	BU407			5	
	V_{CE} = 200 V, V_{BE} = 0				0.1	
	V_{CE} = 200 V, V_{BE} = 0, T_C = 150°C				1	
I_{EBO}	V_{EB} = 6 V, I_C = 0				1	mA
h_{FE}	V_{CE} = 10 V, I_C = 4 A, See Note 2		12			
	V_{CE} = 10 V, I_C = 0.5 A, See Note 2		20			
$V_{CE(sat)}$	I_B = 0.5 A, I_C = 5 A, See Note 2				1	V
$V_{BE(sat)}$	I_B = 0.5 A, I_C = 5 A, See Note 2				1.2	V
f_T	V_{CE} = 5 V, I_C = 0.5 A, See Note 3			6		MHz
C_{obo}	V_{CB} = 20 V, I_E = 0, f = 1 MHz			60		pF

NOTES: 2. These parameters must be measured using pulse techniques, t_w = 300 μs, duty cycle = 2%.
3. 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
$R_{\theta JC}$			2.08	°C/W
$R_{\theta JA}$			70	°C/W

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

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_s	I_C = 5 A, $I_{B(end)}$ = 0.5 A, See Figure 1		2.7		μs
t_{off}				0.75	μs

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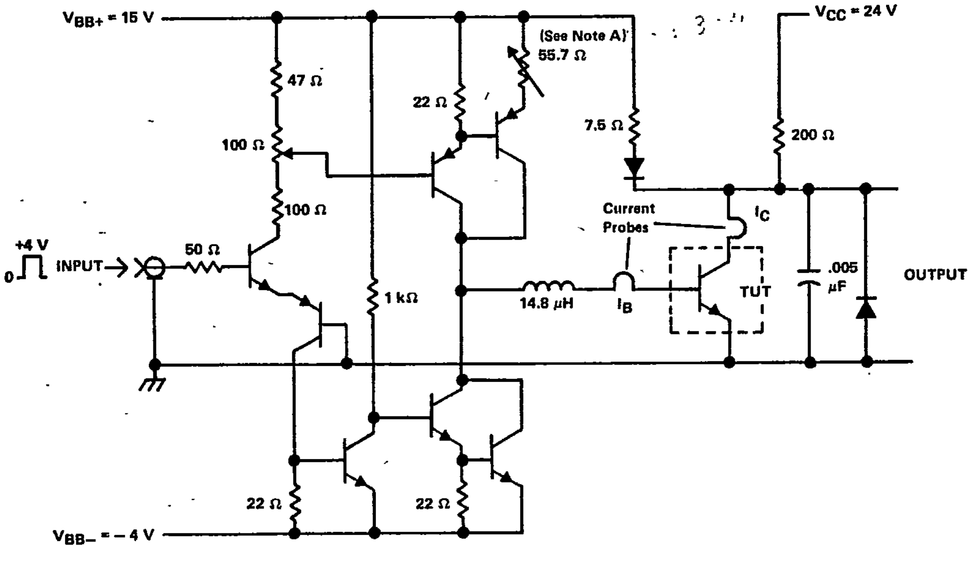
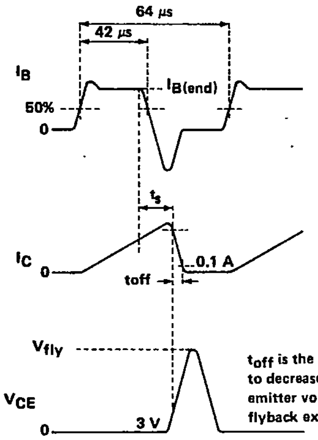
PARAMETER MEASUREMENT INFORMATION



TEST CIRCUIT



t_{off} is the time for the collector current I_C to decrease to 0.1 A after the collector to emitter voltage V_{CE} has risen 3 V into its flyback excursion.

VOLTAGE AND CURRENT WAVEFORMS

NOTE A: Adjust resistance to set $I_{B(end)}$.

FIGURE 1. RESISTIVE-LOAD SWITCHING

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TYPICAL CHARACTERISTICS

STATIC FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

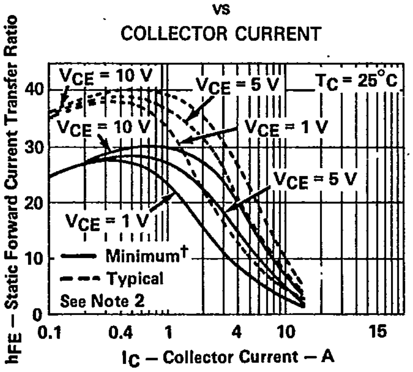

FIGURE 2

STATIC FORWARD CURRENT TRANSFER RATIO
vs
COLLECTOR CURRENT

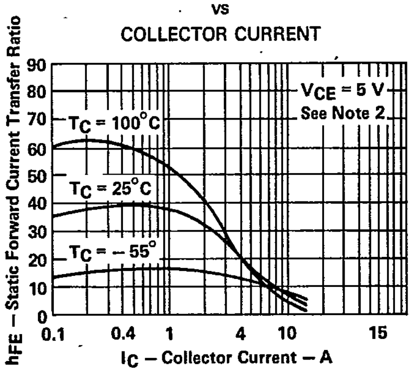

FIGURE 3

COLLECTOR-EMITTER SATURATION VOLTAGE
vs
CASE TEMPERATURE

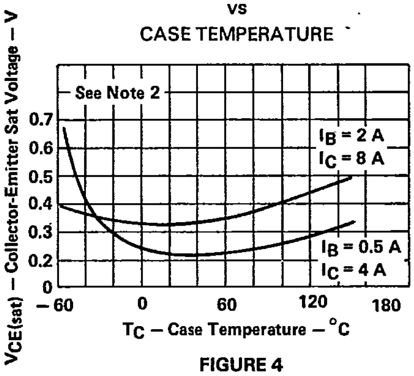

FIGURE 4

† This value is given with 95% confidence.

NOTE 2: These parameters must be measured using pulse techniques, $t_w \leq 300\ \mu s$, duty cycle ≤ 2%.

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MAXIMUM SAFE OPERATING AREA

FORWARD-BIAS SAFE OPERATING AREA

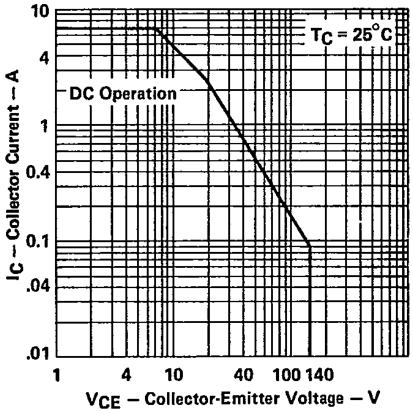

FIGURE 5