

## NPN Power Transistors

These devices are high voltage, high speed transistors for horizontal deflection output stages of TV's and CRT's.

- High Voltage:  $V_{CEV} = 330$  or  $400$  V
- Fast Switching Speed:  $t_f = 750$  ns (max)
- Low Saturation Voltage:  $V_{CE(sat)} = 1$  V (max) @ 5 A
- Packaged in Compact JEDEC TO-220AB

**BU406**  
**BU407**

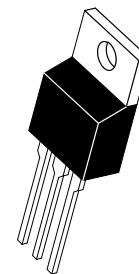
**7 AMPERES**  
**NPN SILICON**  
**POWER TRANSISTORS**  
**60 WATTS**  
**150 and 200 VOLTS**

### MAXIMUM RATINGS

Rating	Symbol	BU406	BU407	Unit
Collector-Emitter Voltage	$V_{CEO}$	200	150	Vdc
Collector-Emitter Voltage	$V_{CEV}$	400	330	Vdc
Collector-Base Voltage	$V_{CBO}$	400	330	Vdc
Emitter Base Voltage	$V_{EBO}$	6		Vdc
Collector Current — Continuous	$I_C$	7		Adc
Peak Repetitive		10		
Peak (10 ms)		15		
Base Current	$I_B$	4		Adc
Total Device Dissipation, $T_C = 25^\circ\text{C}$	$P_D$	60		Watts
Derate above $T_C = 25^\circ\text{C}$		0.48		
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to 150		$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.08	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	70	$^\circ\text{C/W}$
Lead Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds	$T_L$	275	$^\circ\text{C}$



**CASE 221A-06**  
**TO-220AB**

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage <sup>(1)</sup> ( $I_C = 100$ mAdc, $I_B = 0$ )	BU406 BU407	$V_{CEO(sus)}$	200 150	— —	— —	Vdc
Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CEV}, V_{BE} = 0$ ) ( $V_{CE} = \text{Rated } V_{CEO} + 50$ Vdc, $V_{BE} = 0$ ) ( $V_{CE} = \text{Rated } V_{CEO} + 50$ Vdc, $V_{BE} = 0, T_C = 150^\circ\text{C}$ )		$I_{CES}$	— — —	— — —	5 0.1 1	mAdc
Emitter Cutoff Current ( $V_{EB} = 6$ Vdc, $I_C = 0$ )	BU406, BU407	$I_{EBO}$	—	—	1	mAdc

### ON CHARACTERISTICS (1)

Collector-Emitter Saturation Voltage ( $I_C = 5$ Adc, $I_B = 0.5$ Adc)	$V_{CE(sat)}$	—	—	1	Vdc
Base-Emitter Saturation Voltage ( $I_C = 5$ Adc, $I_B = 0.5$ Adc)	$V_{BE(sat)}$	—	—	1.2	Vdc
Forward Diode Voltage ( $I_{EC} = 5$ Adc) "D" only	$V_{EC}$	—	—	2	Volts

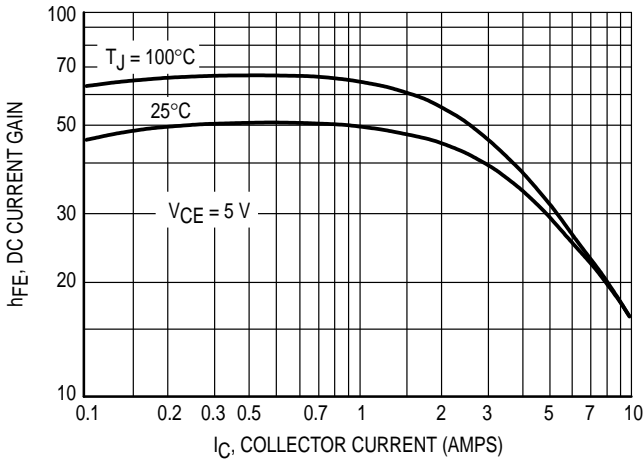
(1) Pulse Test: Pulse Width  $\leq 300$   $\mu\text{s}$ , Duty Cycle  $\leq 1\%$ .

(continued)

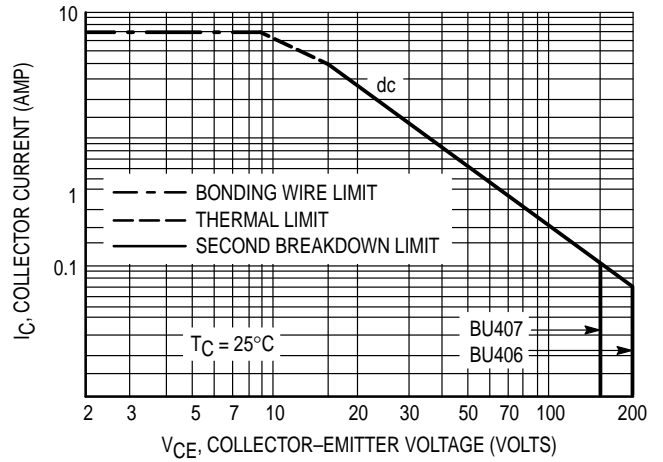
**BU406 BU407**

**ELECTRICAL CHARACTERISTICS — continued** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>DYNAMIC CHARACTERISTICS</b>					
Current-Gain — Bandwidth Product ( $I_C = 0.5 \text{ Adc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f_{\text{test}} = 20 \text{ MHz}$ )	$f_T$	10	—	—	MHz
Output Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 1 \text{ MHz}$ )	$C_{ob}$	—	80	—	pF
<b>SWITCHING CHARACTERISTICS</b>					
Inductive Load Crossover Time ( $V_{CC} = 40 \text{ Vdc}$ , $I_C = 5 \text{ Adc}$ , $I_{B1} = I_{B2} = 0.5 \text{ Adc}$ , $L = 150 \mu\text{H}$ )	$t_c$	—	—	0.75	$\mu\text{s}$

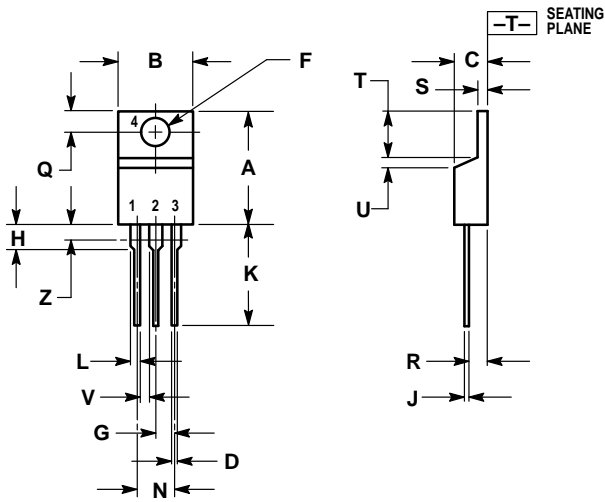


**Figure 1. DC Current Gain**



**Figure 2. Maximum Rated Forward Bias Safe Operating Area**

PACKAGE DIMENSIONS




- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	—	1.15	—
Z	—	0.080	—	2.04

- STYLE 1:
1. BASE
  2. COLLECTOR
  3. EMITTER
  4. COLLECTOR

CASE 221A-06  
TO-220AB  
ISSUE Y

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