

# BU406, BU407

## NPN Power Transistors

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

### Features

- 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
- Pb-Free Packages are Available\*

### MAXIMUM RATINGS

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

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.08	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	70	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes 1/8" from Case for 5 Seconds	$T_L$	260	$^\circ\text{C}$

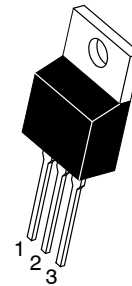
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



**ON Semiconductor®**

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



**TO-220AB  
CASE 221A-09  
STYLE 1**

### MARKING DIAGRAM



BU40x = Specific Device Code  
x = 6 or 7  
A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package

### ORDERING INFORMATION

Device	Package	Shipping
BU406	TO-220AB	50 Units / Rail
BU406G	TO-220AB (Pb-Free)	50 Units / Rail
BU407	TO-220AB	50 Units / Rail
BU407G	TO-220AB (Pb-Free)	50 Units / Rail

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# BU406, BU407

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

Characteristic	Symbol	Min	Typ	Max	Unit	
<b>OFF CHARACTERISTICS</b>						
Collector-Emitter Sustaining Voltage (Note 1) ( $I_C = 100\text{ mA}$ , $I_B = 0$ )	BU406 BU407	$V_{CE(sus)}$	200 150	- -	- -	Vdc
Collector Cutoff Current ( $V_{CE} = \text{Rated } V_{CEV}$ , $V_{BE} = 0$ ) ( $V_{CE} = \text{Rated } V_{CEO} + 50\text{ Vdc}$ , $V_{BE} = 0$ ) ( $V_{CE} = \text{Rated } V_{CEO} + 50\text{ Vdc}$ , $V_{BE} = 0$ , $T_C = 150^\circ\text{C}$ )		$I_{CES}$	- - -	- - -	5 0.1 1	mAdc
Emitter Cutoff Current ( $V_{EB} = 6\text{ Vdc}$ , $I_C = 0$ )	BU406, BU407	$I_{EBO}$	-	-	1	mAdc
<b>ON CHARACTERISTICS (Note 1)</b>						
Collector-Emitter Saturation Voltage ( $I_C = 5\text{ Adc}$ , $I_B = 0.5\text{ Adc}$ )		$V_{CE(sat)}$	-	-	1	Vdc
Base-Emitter Saturation Voltage ( $I_C = 5\text{ Adc}$ , $I_B = 0.5\text{ Adc}$ )		$V_{BE(sat)}$	-	-	1.2	Vdc
Forward Diode Voltage ( $I_{EC} = 5\text{ Adc}$ ) "D" only		$V_{EC}$	-	-	2	Volts
<b>DYNAMIC CHARACTERISTICS</b>						
Current-Gain - Bandwidth Product ( $I_C = 0.5\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f_{test} = 20\text{ MHz}$ )		$f_T$	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 ( $V_{CC} = 40\text{ Vdc}$ , $I_C = 5\text{ Adc}$ , $I_{B1} = I_{B2} = 0.5\text{ Adc}$ , $L = 150\text{ }\mu\text{H}$ )		$t_c$	-	-	0.75	$\mu\text{s}$

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

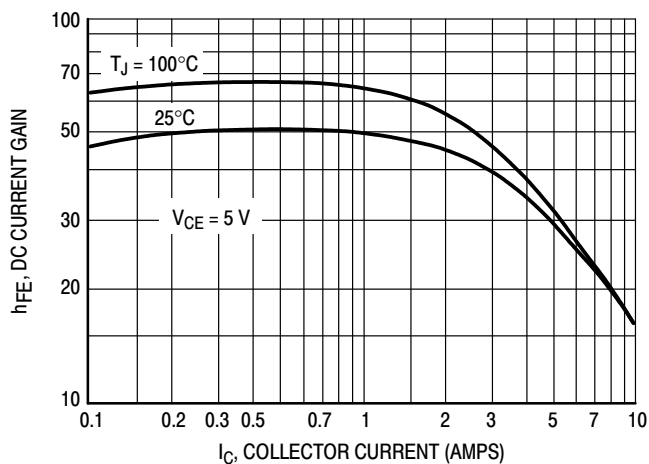


Figure 1. DC Current Gain

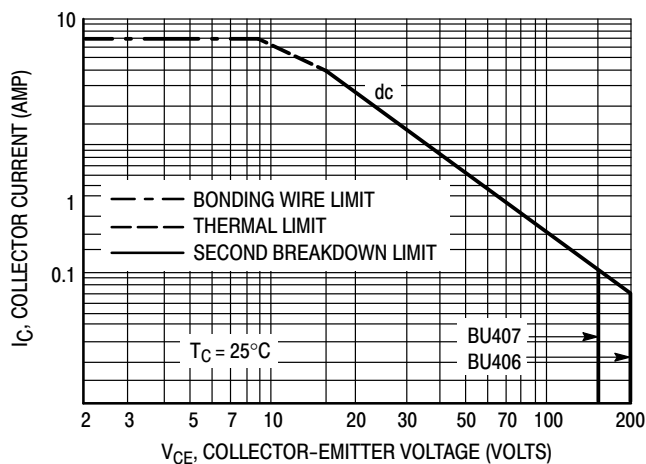
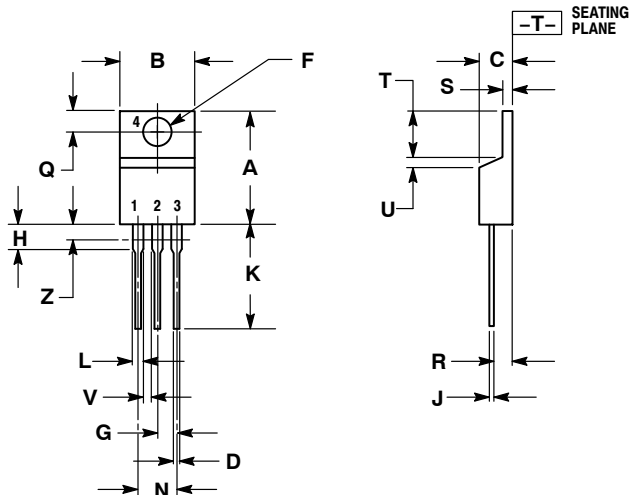


Figure 2. Maximum Rated Forward Bias Safe Operating Area

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## PACKAGE DIMENSIONS

### TO-220 CASE 221A-09 ISSUE AG



- 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	0.036	0.64	0.91
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.161	2.80	4.10
J	0.014	0.025	0.36	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:

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

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