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November 2014



# D44H8 / NZT44H8 NPN Power Amplifier

## Features

- This device is designed for power amplifier, regulator and switching circuits where speed is important.
- Sourced from process 4Q.

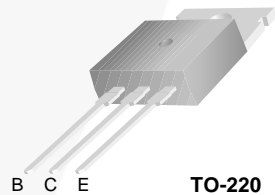


Figure 1. D44H8 Device Package

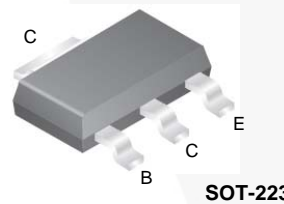


Figure 2. NZT44H8 Device Package

## Ordering Information

Part Number	Marking	Package	Packing Method
D44H8	D44H8	TO-220 3L	Rail
NZT44H8	44H8	SOT-223 4L	Tape and Reel

## Absolute Maximum Ratings<sup>(1),(2)</sup>

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CEO}$	Collector-Emitter Voltage	60	V
$I_C$	Collector Current - Continuous	8.0	A
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

### Notes:

1. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .
2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

**Thermal Characteristics<sup>(3)</sup>**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Max.		Unit
		D44H8	NZT44H8	
$P_D$	Total Device Dissipation	60	1.5	W
	Derate Above $25^\circ\text{C}$	480	12	mW/ $^\circ\text{C}$
$R_{\theta\text{JC}}$	Thermal Resistance, Junction-to-Case	2.1		$^\circ\text{C}/\text{W}$
$R_{\theta\text{JA}}$	Thermal Resistance, Junction-to-Ambient	62.5	83.3	$^\circ\text{C}/\text{W}$

**Note:**

3. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

**Electrical Characteristics**

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
$V_{(\text{BR})\text{CEO}}$	Collector-Emitter Breakdown Voltage	$I_C = 100 \text{ mA}, I_B = 0$	60		V
$I_{\text{CBO}}$	Collector-Base Cut-Off Current	$V_{\text{CB}} = 60 \text{ V}, I_E = 0$		10	$\mu\text{A}$
$I_{\text{EBO}}$	Emitter-Base Cut-Off Current	$V_{\text{EB}} = 5 \text{ V}, I_C = 0$		100	$\mu\text{A}$
$h_{\text{FE}}$	DC Current Gain	$V_{\text{CE}} = 1 \text{ V}, I_C = 2 \text{ A}$	60		
		$V_{\text{CE}} = 1 \text{ V}, I_C = 4 \text{ A}$	40		
$V_{\text{CE(sat)}}$	Collector-Emitter Saturation Voltage	$I_C = 8 \text{ A}, I_B = 0.4 \text{ A}$		1.0	V
$V_{\text{BE(sat)}}$	Base-Emitter Saturation Voltage	$I_C = 8 \text{ A}, I_B = 0.8 \text{ A}$		1.5	V
$V_{\text{BE(on)}}$	Base-Emitter On Voltage	$V_{\text{CE}} = 2 \text{ V}, I_C = 10 \text{ mA}$	0.52	0.65	V
$f_T$	Current Gain-Bandwidth Product	$I_C = 500 \text{ mA}, V_{\text{CE}} = 10 \text{ V}$	50		MHz

## Typical Performance Characteristics

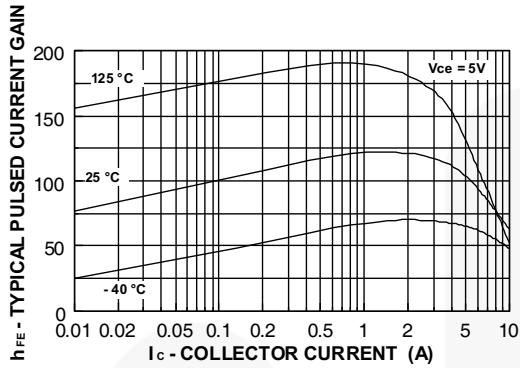


Figure 3. Typical Pulsed Current Gain vs. Collector Current

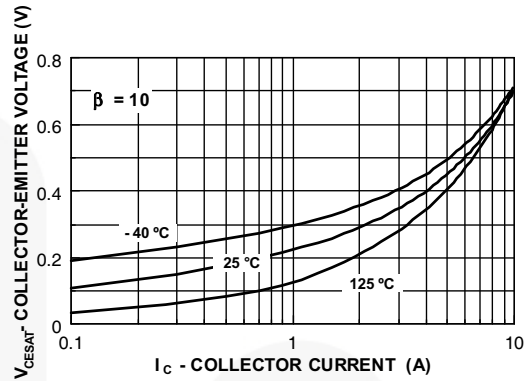


Figure 4. Collector-Emitter Saturation Voltage vs. Collector Current

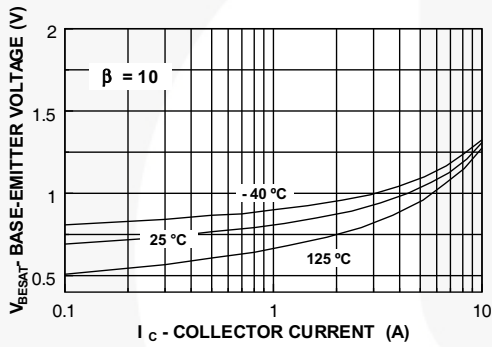


Figure 5. Base-Emitter Saturation Voltage vs. Collector Current

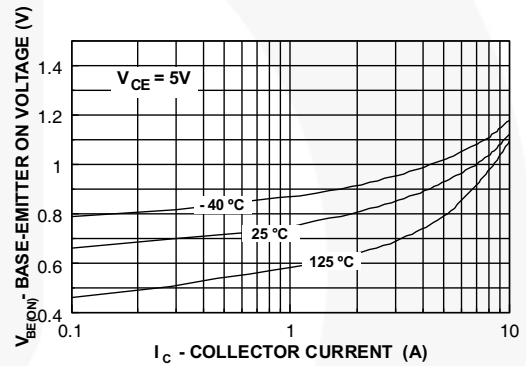


Figure 6. Base-Emitter On Voltage vs. Collector Current

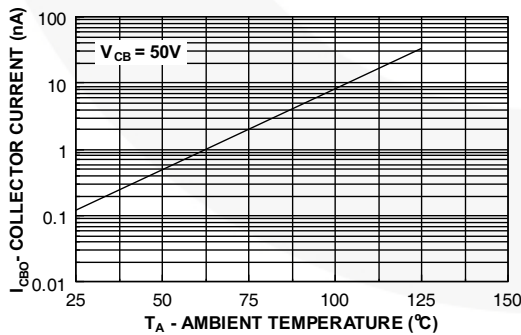


Figure 7. Current Cut-Off Current vs. Ambient Temperature

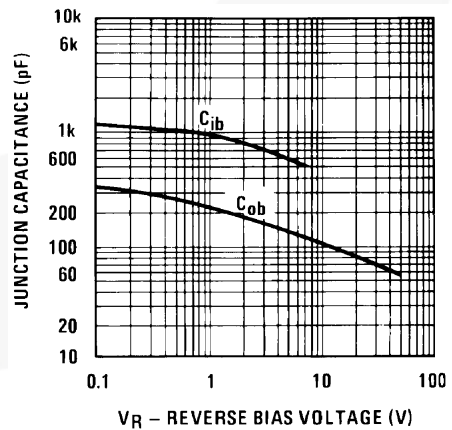


Figure 8. Junction Capacitance vs. Reverse Bias Voltage

Typical Performance Characteristics (Continued)

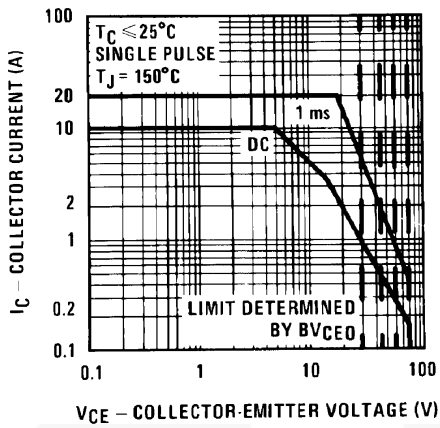


Figure 9. Safe Operating Area TO-220

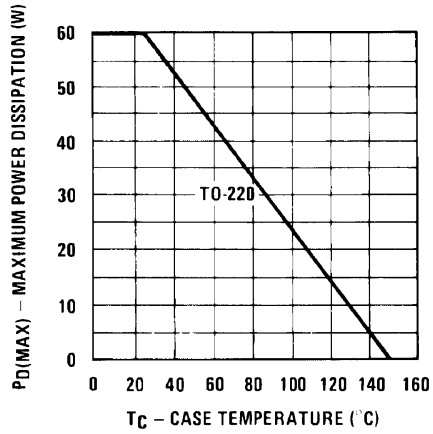


Figure 10. Maximum Power Dissipation vs. Case Temperature

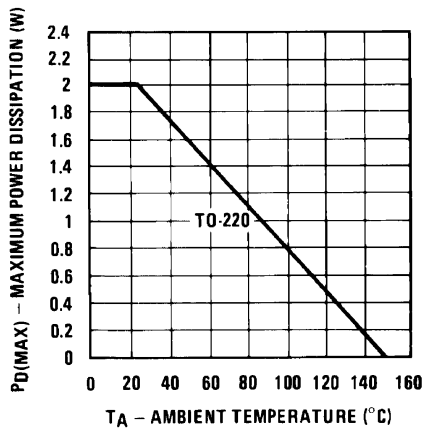


Figure 11. Maximum Power Dissipation vs. Ambient Temperature

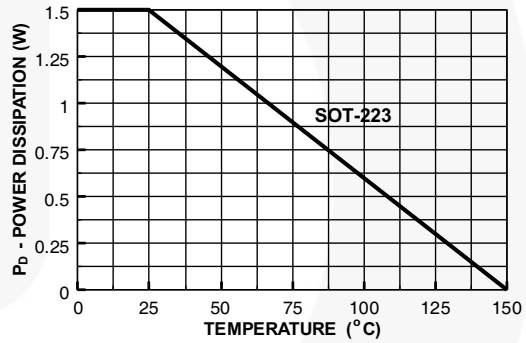


Figure 12. Power Dissipation vs. Ambient Temperature

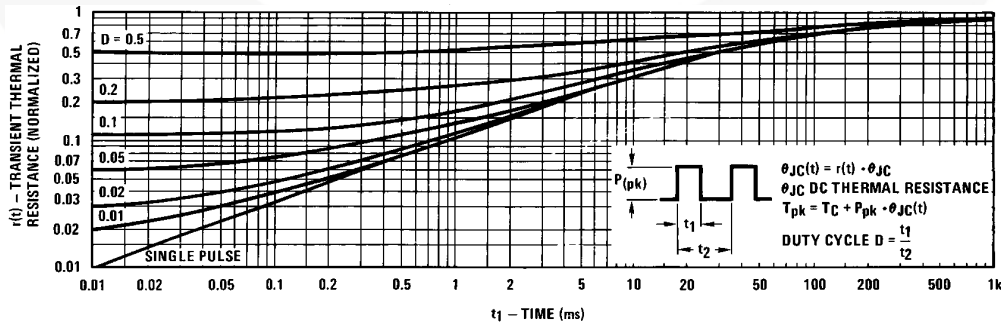


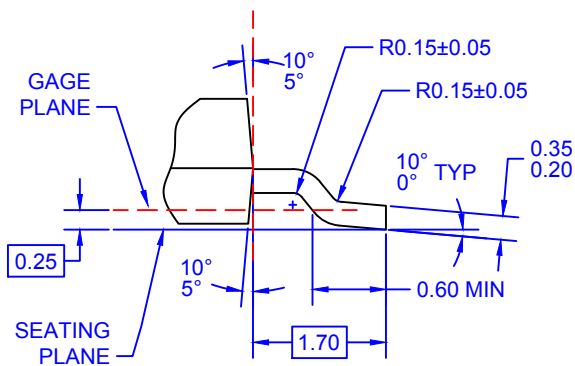
Figure 13. Thermal Response in TO-220 Package



LAND PATTERN RECOMMENDATION



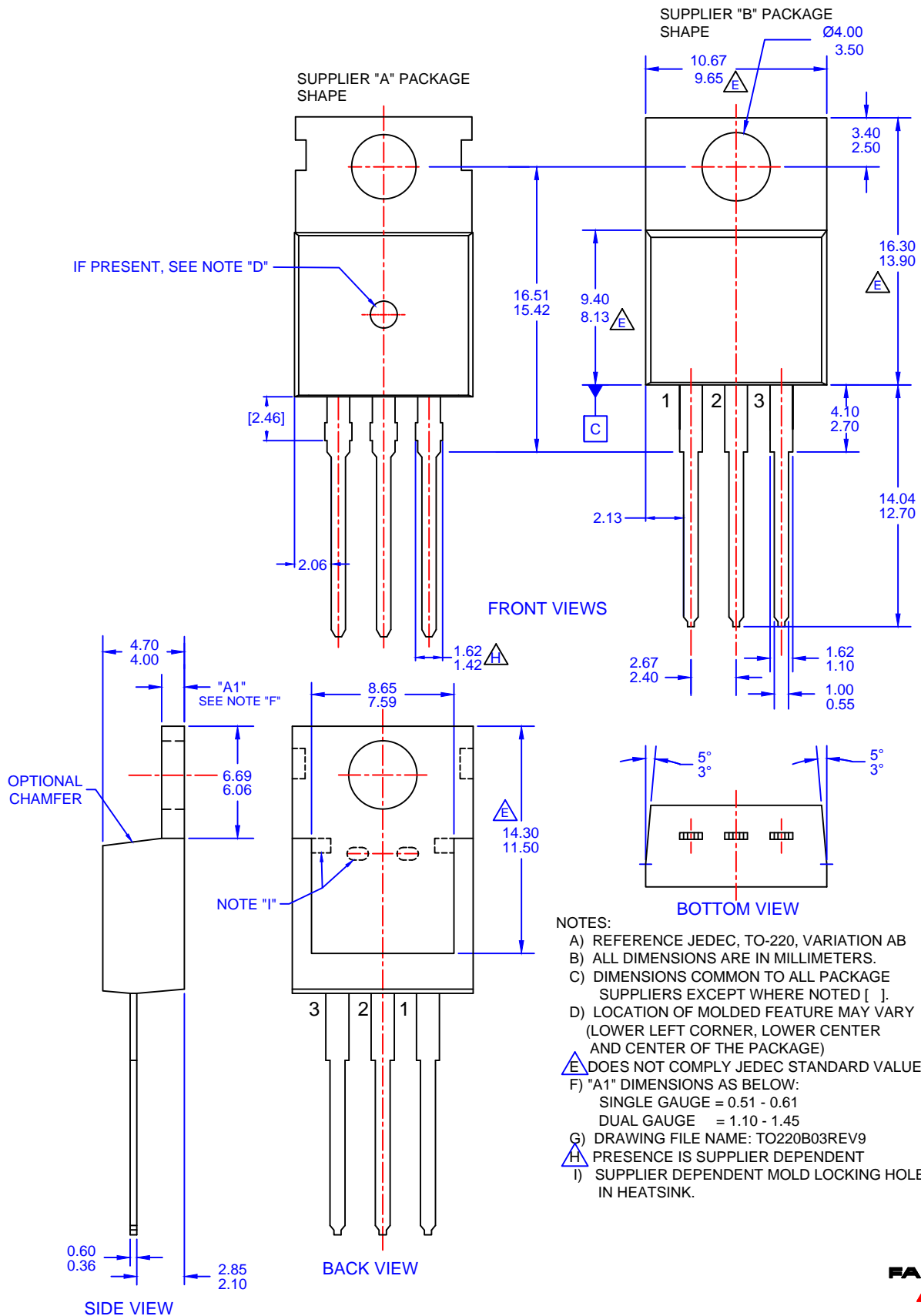
SEE DETAIL A



DETAIL A  
SCALE: 2:1

- NOTES: UNLESS OTHERWISE SPECIFIED  
 A) DRAWING BASED ON JEDEC REGISTRATION TO-261C, VARIATION AA.  
 B) ALL DIMENSIONS ARE IN MILLIMETERS.  
 C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.  
 D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.  
 E) LANDPATTERN NAME: SOT230P700X180-4BN  
 F) DRAWING FILENAME: MKT-MA04AREV3





- NOTES:
- A) REFERENCE JEDEC, TO-220, VARIATION AB
  - B) ALL DIMENSIONS ARE IN MILLIMETERS.
  - C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
  - D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
  - E) DOES NOT COMPLY JEDEC STANDARD VALUE.
  - F) "A1" DIMENSIONS AS BELOW:  
 SINGLE GAUGE = 0.51 - 0.61  
 DUAL GAUGE = 1.10 - 1.45
  - G) DRAWING FILE NAME: TO220B03REV9
  - H) PRESENCE IS SUPPLIER DEPENDENT
  - I) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

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