

FPN330 FPN330A



NPN Low Saturation Transistor

These devices are designed for high current gain and low saturation voltage with collector currents up to 3.0 A continuous. Sourced from Process NB.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|-----------------------------------|--|-------------|-------|
| V _{CEO} | Collector-Emitter Voltage | 30 | V |
| V _{CB0} | Collector-Base Voltage | 50 | V |
| V _{EBO} | Emitter-Base Voltage | 5.0 | V |
| I _C | Collector Current - Continuous | 3.0 | A |
| T _J , T _{stg} | Operating and Storage Junction Temperature Range | -55 to +150 | °C |

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

| Symbol | Characteristic | Max | Units |
|------------------|---|------------------|-------|
| | | FPN330 / FPN330A | |
| P _D | Total Device Dissipation | 1.0 | W |
| R _{θJC} | Thermal Resistance, Junction to Case | 50 | °C/W |
| R _{θJA} | Thermal Resistance, Junction to Ambient | 125 | °C/W |

NPN Low Saturation Transistor

(continued)

Electrical Characteristics

TA = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Max | Units |
|--------|-----------|-----------------|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-------|

OFF CHARACTERISTICS*

| | | | | | |
|-------------------|-------------------------------------|--|-----|-----|----|
| BV _{CEO} | Collector-Emitter Breakdown Voltage | I _C = 10 mA, I _B = 0 | 30 | | V |
| BV _{CBO} | Collector-Base Breakdown Voltage | I _C = 100 μA, I _E = 0 | 50 | | V |
| BV _{EBO} | Emitter-Base Breakdown Voltage | I _E = 100 μA, I _C = 0 | 5.0 | | V |
| I _{CB0} | Collector Cutoff Current | V _{CB} = 30 V, I _E = 0 | | 100 | nA |
| | | V _{CB} = 30 V, I _E = 0, T _A = 100°C | | 10 | μA |
| I _{EBO} | Emitter Cutoff Current | V _{EB} = 4.0 V, I _C = 0 | | 100 | nA |

ON CHARACTERISTICS*

| | | | | | |
|----------------------|--------------------------------------|--|-------------|-----|--------|
| h _{FE} | DC Current Gain | I _C = 100 mA, V _{CE} = 2.0 V | 330 | 100 | |
| | | I _C = 1.0 A, V _{CE} = 2.0 V | 330A | 250 | |
| | | I _C = 2.0 A, V _{CE} = 2.0 V | | 120 | |
| | | | | 50 | |
| V _{CE(sat)} | Collector-Emitter Saturation Voltage | I _C = 1.0 A, I _B = 100 mA | 330 | | 500 mV |
| | | I _C = 2.0 A, I _B = 200 mA | 330A | | 450 mV |
| | | | | | 1.0 V |
| V _{BE(sat)} | Base-Emitter Saturation Voltage | I _C = 1.0 A, I _B = 100 mA | | | 1.25 V |
| V _{BE(on)} | Base-Emitter Saturation Voltage | I _C = 1.0 A, V _{CE} = 2.0 V | | | 1.0 V |

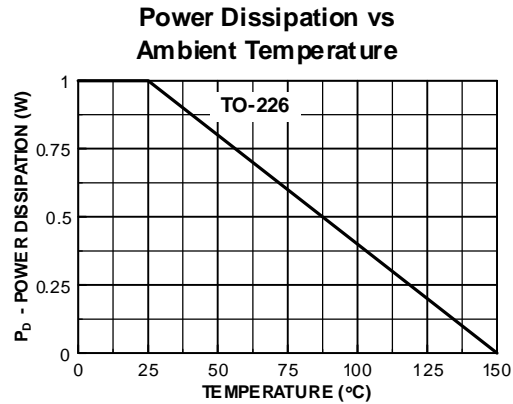
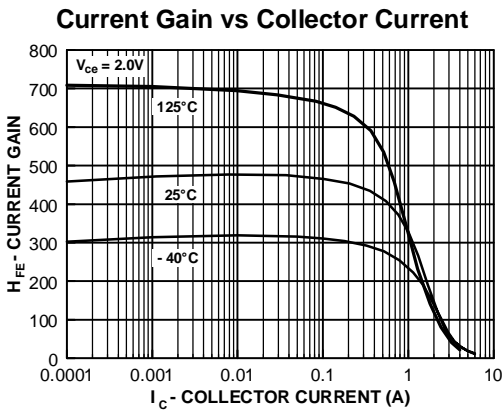
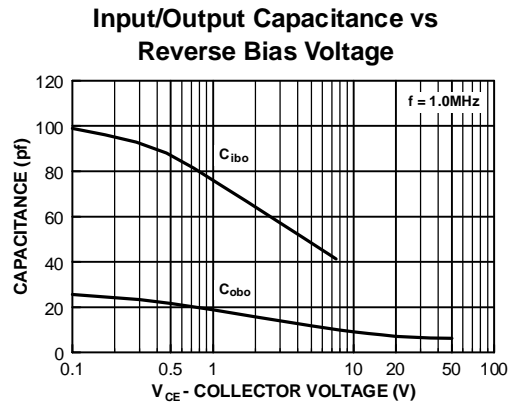
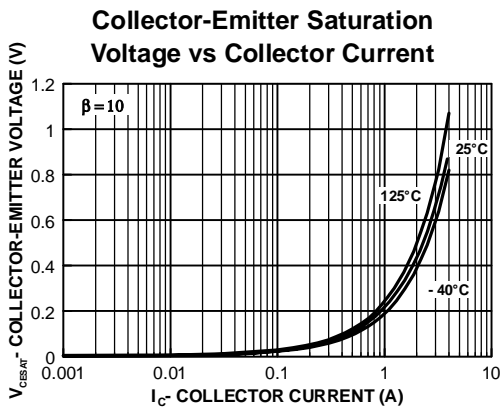
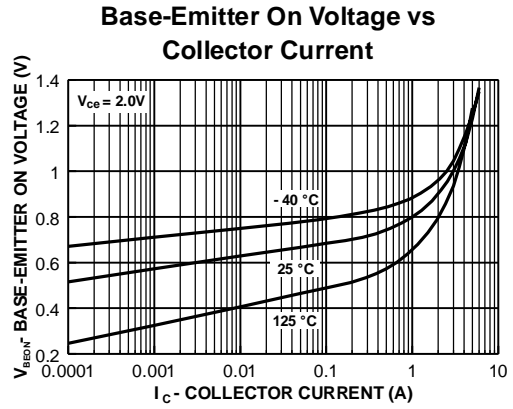
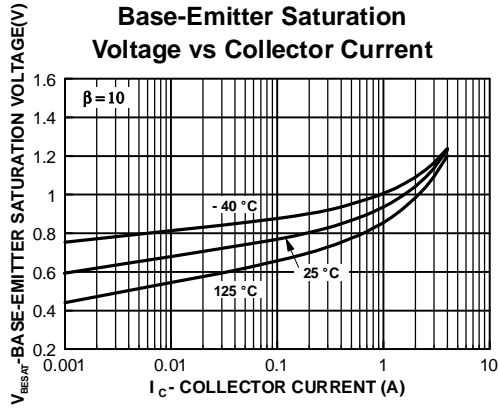
SMALL SIGNAL CHARACTERISTICS

| | | | | | |
|------------------|----------------------|---|-----|----|-----|
| C _{obo} | Output Capacitance | V _{CB} = 10 V, I _E = 0, f = 1.0 MHz | | 30 | pF |
| F _T | Transition Frequency | I _C = 100 mA, V _{CE} = 5.0 V, f = 100 MHz | 100 | | MHz |

*Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

FPN330 / FPN330A

Typical Characteristics

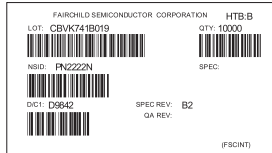


TO-226AE Tape and Reel Data



TO-226AE Packaging
Configuration: Figure 1.0

FSCINT Label sample

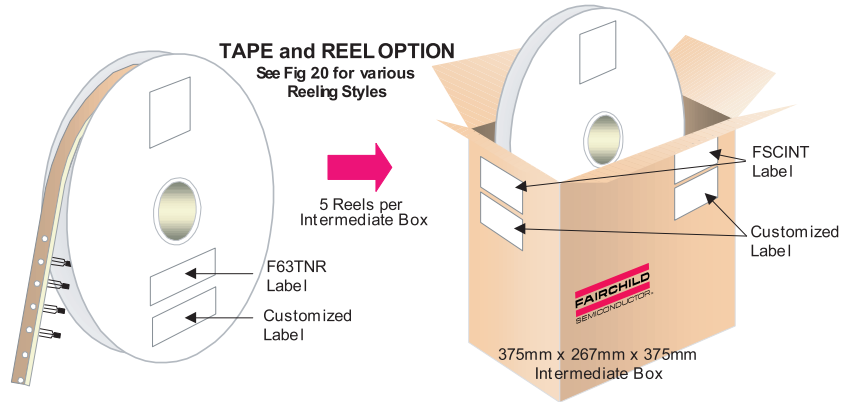


F63TNR Label sample



TAPE and REEL OPTION

See Fig 20 for various Reeling Styles



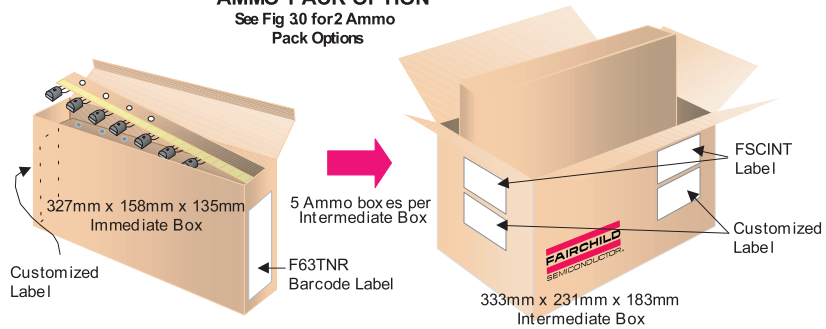
AMMO PACK OPTION

See Fig 30 for 2 Ammo Pack Options

TO-226AE TNR/AMMO PACKING INFORMATION

| Packing | Style | Quantity | EOL code |
|---------|-------|----------|----------|
| Reel | A | 2,000 | D26Z |
| | E | 2,000 | D27Z |
| Ammo | M | 2,000 | D74Z |
| | P | 2,000 | D75Z |

Unit weight = 0.300gm
Reel weight with components = 0.868 kg
Ammo weight with components = 0.880 kg
Max quantity per intermediate box = 10,000 units

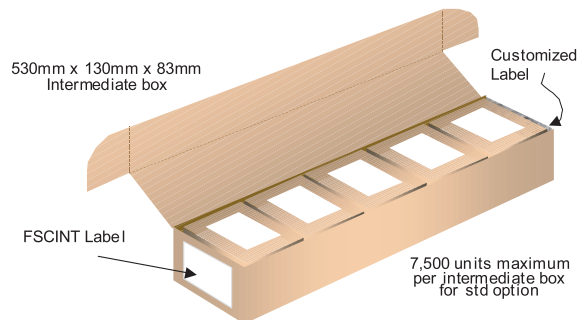
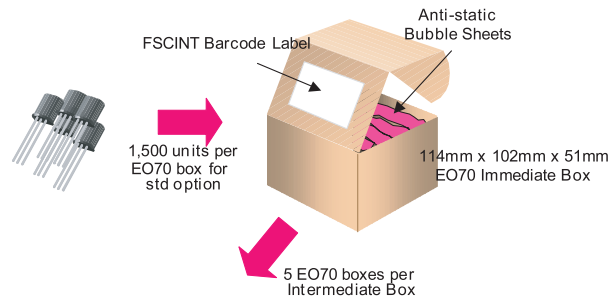


BULK OPTION

See Bulk Packing Information table

(TO-226AE) BULK PACKING INFORMATION

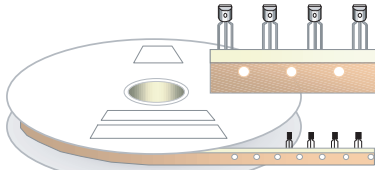
| EOL CODE | DESCRIPTION | LEADCLIP DIMENSION | QUANTITY |
|-------------|--------------------------|--------------------|-------------|
| J18Z | TO-18 OPTION STD | NO LEAD CLIP | 1.0 K / BOX |
| J05Z | TO-5 OPTION STD | NO LEAD CLIP | 1.0 K / BOX |
| NO EOL CODE | TO-226 STANDARD STRAIGHT | NO LEADCLIP | 1.5 K / BOX |



TO-226AE Tape and Reel Data, continued

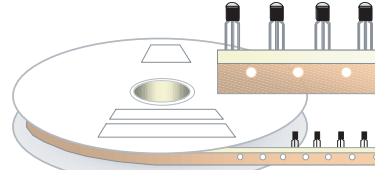
TO-226AE Reeling Style Configuration: Figure 2.0

Machine Option "A"(H)



Style "A" D26Z, D70Z (s/h)

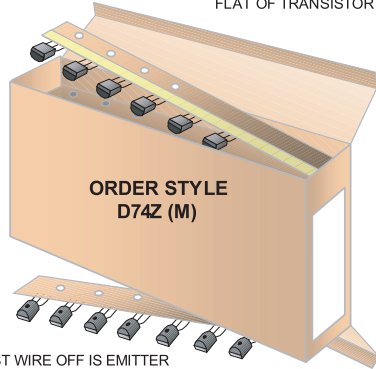
Machine Option "E"(J)



Style "E" D27Z, D71Z (s/h)

TO-226AE Radial Ammo Packaging Configuration: Figure 3.0

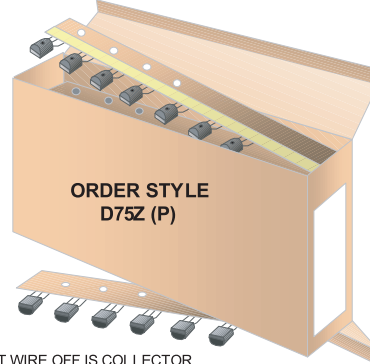
FIRST WIRE OFF IS COLLECTOR (ON PKG. 92)
ADHESIVE TAPE IS ON THE TOP SIDE
FLAT OF TRANSISTOR IS ON TOP



ORDER STYLE
D74Z (M)

FIRST WIRE OFF IS EMITTER
ADHESIVE TAPE IS ON BOTTOM SIDE
FLAT OF TRANSISTOR IS ON BOTTOM

FIRST WIRE OFF IS EMITTER (ON PKG. 92)
ADHESIVE TAPE IS ON THE TOP SIDE
FLAT OF TRANSISTOR IS ON BOTTOM

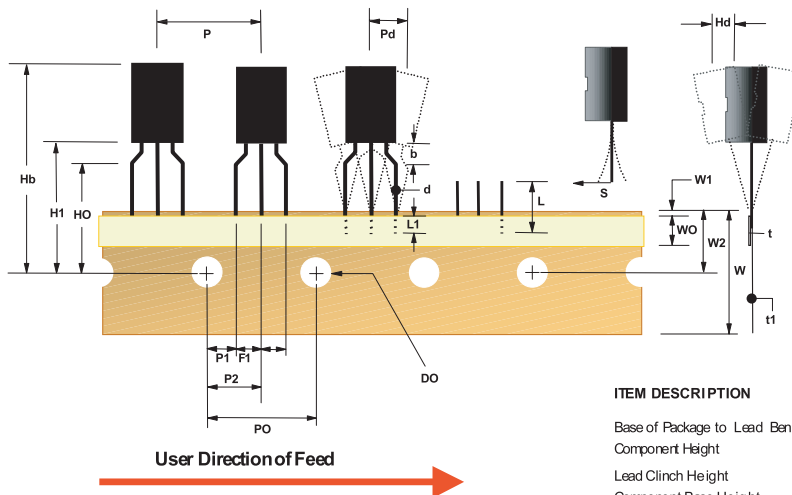


ORDER STYLE
D75Z (P)

FIRST WIRE OFF IS COLLECTOR
ADHESIVE TAPE IS ON BOTTOM SIDE
FLAT OF TRANSISTOR IS ON TOP

TO-226AE Tape and Reel Data, continued

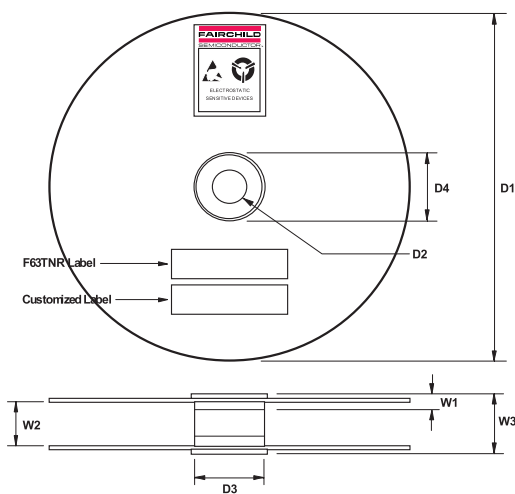
TO-226AE Tape and Reel Taping
Dimension Configuration: Figure 4.0



| ITEM DESCRIPTION | SYMBOL | DIMENSION |
|----------------------------------|--------|------------------------|
| Base of Package to Lead Bend | b | 0.098 (max) |
| Component Height | Hb | 1.078 (+/- 0.050) |
| Lead Clinch Height | HO | 0.630 (+/- 0.020) |
| Component Base Height | H1 | 0.748 (+/- 0.020) |
| Component Alignment (side/side) | Pd | 0.040 (max) |
| Component Alignment (front/back) | Hd | 0.031 (max) |
| Component Pitch | P | 0.500 (+/- 0.020) |
| Feed Hole Pitch | PO | 0.500 (+/- 0.008) |
| Hole Center to First Lead | P1 | 0.150 (+0.009, -0.010) |
| Hole Center to Component Center | P2 | 0.247 (+/- 0.007) |
| Lead Spread | F1/F2 | 0.104 (+/- 0.010) |
| Lead Thickness | d | 0.018 (+0.002, -0.003) |
| Out Lead Length | L | 0.429 (max) |
| Taped Lead Length | L1 | 0.209 (+0.051, -0.052) |
| Taped Lead Thickness | t | 0.032 (+/- 0.006) |
| Carrier Tape Thickness | t1 | 0.021 (+/- 0.006) |
| Carrier Tape Width | W | 0.708 (+0.02, -0.019) |
| Hold-down Tape Width | WO | 0.236 (+/- 0.012) |
| Hold-down Tape Position | W1 | 0.035 (max) |
| Feed Hole Position | W2 | 0.360 (+/- 0.025) |
| Sprocket Hole Diameter | DO | 0.157 (+0.008, -0.007) |
| Lead Spring Out | S | 0.004 (max) |

Note: All dimensions are in inches.

TO-226AE Reel
Configuration: Figure 5.0



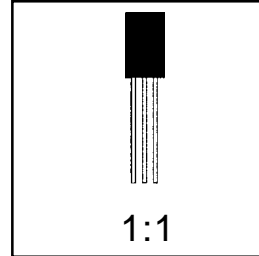
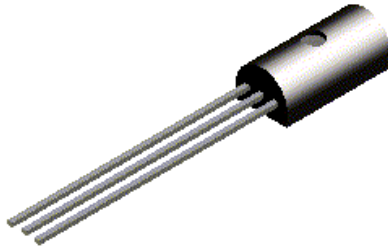
| ITEM DESCRIPTION | SYMBOL | MINIMUM | MAXIMUM |
|--------------------------------|--------|---------|---------|
| Reel Diameter | D1 | 13975 | 14025 |
| Arbor Hole Diameter (Standard) | D2 | 1.160 | 1.200 |
| (Small Hole) | D2 | 0.650 | 0.700 |
| Core Diameter | D3 | 3.100 | 3.300 |
| Hub Recess Inner Diameter | D4 | 2.700 | 3.100 |
| Hub Recess Depth | W1 | 0.370 | 0.570 |
| Flange to Flange Inner Width | W2 | 1.630 | 1.690 |
| Hub to Hub Center Width | W3 | | 2.090 |

Note: All dimensions are in inches

TO-226AE Package Dimensions



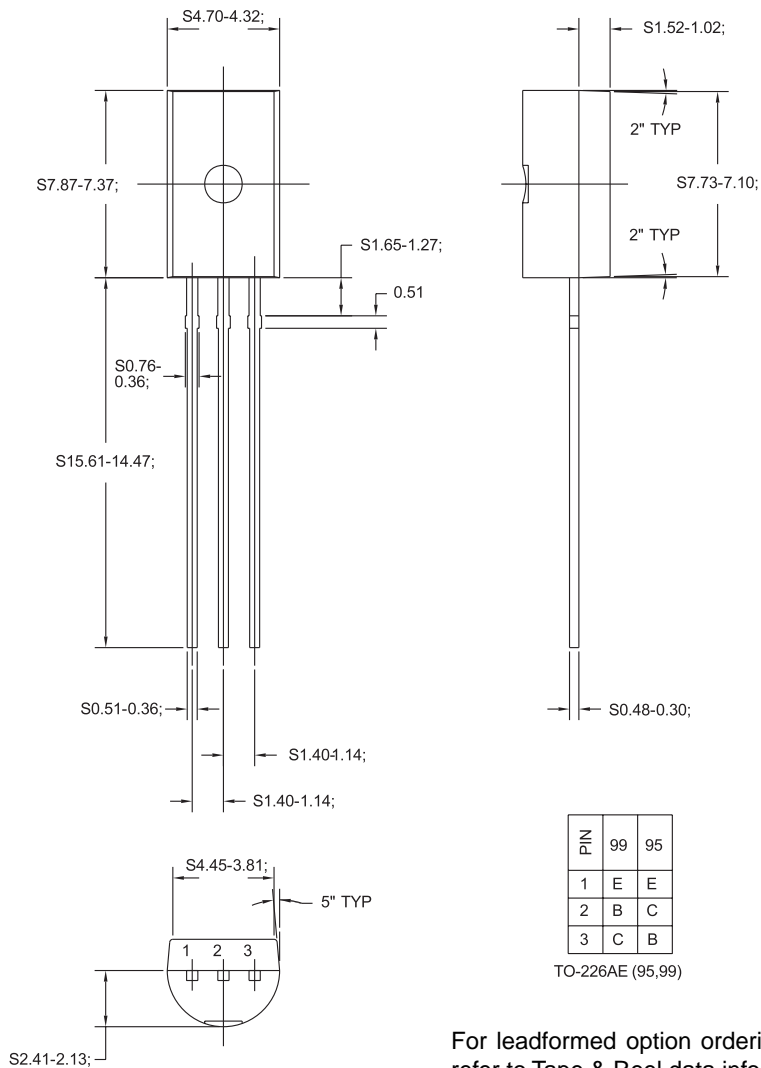
TO-226AE (FS PKG Code 95, 99)



Scale 1:1 on letter size paper

Dimensions shown below are in:
inches [millimeters]

Part Weight per unit (gram): 0.300



For leadformed option ordering,
refer to Tape & Reel data information.

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|--------------------------|------------------------|---|
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