

2N4410



NPN General Purpose Amplifier

This device is designed for use as general purpose amplifiers and switches requiring collector currents to 50 mA. Sourced from Process 16. See 2N5551 for characteristics.

Absolute Maximum Ratings*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V _{CEO}	Collector-Emitter Voltage	80	V
V _{CB0}	Collector-Base Voltage	120	V
V _{EB0}	Emitter-Base Voltage	5.0	V
I _C	Collector Current - Continuous	200	mA
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
		2N4410	
P _D	Total Device Dissipation Derate above 25°C	625	mW
		5.0	mW/°C
R _{θJC}	Thermal Resistance, Junction to Case	83.3	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	200	°C/W

NPN General Purpose Amplifier

(continued)

2N4410

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
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OFF CHARACTERISTICS

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 1.0 \text{ mA}, I_B = 0$	80		V
$V_{(BR)CEX}$	Collector-Emitter Breakdown Voltage	$I_C = 500 \mu\text{A}, V_{BB} = 5.0 \text{ V}$ $R_{BE} = 8.2 \text{ k}\Omega$	120		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 10 \mu\text{A}, I_E = 0$	120		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu\text{A}, I_C = 0$	5.0		V
I_{CBO}	Collector Cutoff Current	$V_{CB} = 100 \text{ V}, I_E = 0$ $V_{CB} = 100 \text{ V}, I_E = 0, T_A = 100 \text{ }^\circ\text{C}$	10		nA
I_{EBO}	Emitter Cutoff Current	$V_{EB} = 4.0 \text{ V}, I_C = 0$	100		nA

ON CHARACTERISTICS*

h_{FE}	DC Current Gain	$V_{CE} = 1.0 \text{ V}, I_C = 1.0 \text{ mA}$ $V_{CE} = 1.0 \text{ V}, I_C = 10 \text{ mA}$	60 60	400	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 1.0 \text{ mA}, I_B = 0.1 \text{ mA}$		0.2	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	$I_C = 1.0 \text{ mA}, I_B = 0.1 \text{ mA}$		0.8	V
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = 5.0 \text{ V}, I_C = 1.0 \text{ mA}$		0.8	V

SMALL SIGNAL CHARACTERISTICS

C_{ob}	Output Capacitance	$V_{CB} = 10 \text{ V}, f = 100 \text{ kHz}$		12	pF
C_{ib}	Input Capacitance	$V_{EB} = 0.5 \text{ V}, f = 100 \text{ kHz}$		50	pF
h_{fe}	Small-Signal Current Gain	$I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V},$ $f = 30 \text{ MHz}$	2.0	10	

*Pulse Test: Pulse Width

FSCINT Label sample



F63TNR Label sample

LOT: CBVK741B019	QTY: 2000
FSD: P4222N	SPEC:
D/C1: D9842	QTY1:
D/C2:	QTY2:
SPEC REV: CPN:	N/F: F (F63TNR)3

TO-92 TNR/AMMO PACKING INFORMATION

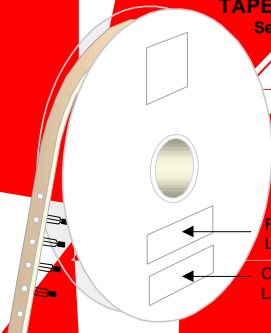
Packing	Style	Quantity	EOL
Reel	A	2,000	
	E	2,000	
Ammo	M	2,000	
	P	2,000	

Unit weight
Reel weight with component
Ammo weight with component
Max quantity per intermediate box

PACKING INFORMATION

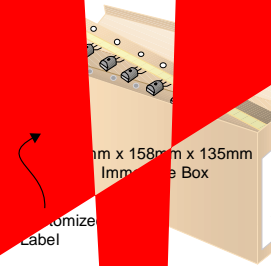
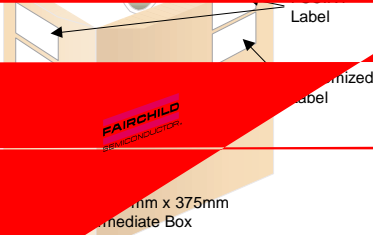
	DESCRIPTION	LEADCLIP DIMENSION	QUANTITY
	TO-18 OPTION STD	NO LEAD CLIP	2.0 K / BOX
	TO-5 OPTION STD	NO LEAD CLIP	1.5 K / BOX
NO EOL CODE	TO-92 STANDARD STRAIGHT FOR: PKG 92, 94 (NON PROELECTRON SERIES), 96	NO LEADCLIP	2.0 K / BOX
L34Z	TO-92 STANDARD STRAIGHT FOR: PKG 94 (PROELECTRON SERIES BCXXX, BFXXX, BSRXXX), 97, 98	NO LEADCLIP	2.0 K / BOX

TAPE and REEL OPTION
See Fig 2.0 for various Reeling Styles



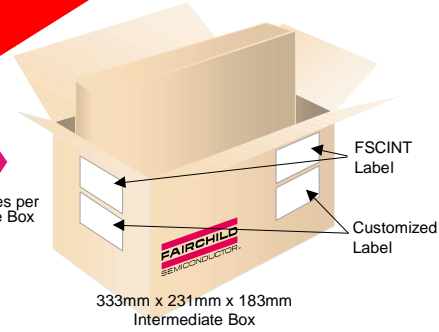
5 Reels per Intermediate Box

F63TNR Label
Customized Label

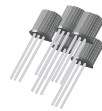


5 Ammo boxes per Intermediate Box

F63TNR Label

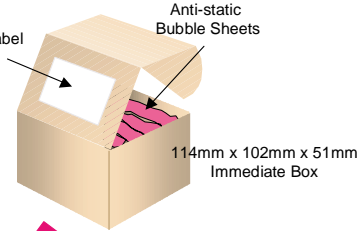


BULK OPTION
See Bulk Packing Information table

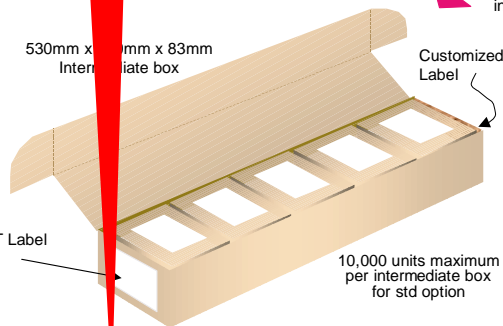


FSCINT Label

2000 units per EO70 box for std option



5 EO70 boxes per intermediate Box



FSCINT Label

10,000 units maximum per intermediate box for std option

TO-92 Tape and Reel Data, continued

TO-92 Reeling Style
Configuration: Figure 2.0

Machine Option "A" (H)

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

TO-92 Tape and Reel Data, continued

**TO-92 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	Ha	0.928 (+/- 0.025)
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)
Cut 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 (+0.020, -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-92 Reel
Configuration: Figure 5.0**



ITEM DESCRIPTION	SYMBOL	MINIMUM	MAXIMUM
Reel Diameter	D1	13.975	14.025
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-92 Package Dimensions



TO-92 (FS PKG Code 92, 94, 96)



Scale 1:1 on letter size paper

Dimensions shown below are in:
inches [millimeters]

Part Weight per unit (gram): 0.1977

TO-92 (92,94,96)

PIN	92		94		96	
	B	F	B	F	B	F
1	E	D	E	D	B	S
2	B	S	C	G	E	D
3	C	G	B	S	C	G



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DOME™	ISOPLANAR™	Quiet Series™	
E ² CMOS™	MICROWIRE™	SILENT SWITCHER®	
EnSigna™	OPTOLOGIC™	SMART START™	
FACT™	OPTOPLANAR™	SuperSOT™-3	
FACT Quiet Series™	PACMAN™	SuperSOT™-6	
FAST®	POP™	SuperSOT™-8	

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