

# BF421, BF423

## High Voltage Transistors

### PNP Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	BF421	BF423	Unit
Collector–Emitter Voltage	$V_{CEO}$	-300	-250	Vdc
Collector–Base Voltage	$V_{CBO}$	-300	-250	Vdc
Emitter–Base Voltage	$V_{EBO}$	-5.0		Vdc
Collector Current – Continuous	$I_C$	-50		mAdc
Collector Current – Peak	$I_{CM}$	100		mA
Total Device Dissipation (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	830	6.6	mW mW/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +150		°C

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction–to–Ambient	$R_{\theta JA}$	150	°C/W
Thermal Resistance, Junction–to–Lead	$R_{\theta JL}$	68	°C/W

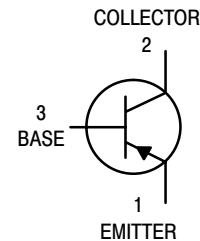
Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

- Mounted on a FR4 board with 200 mm<sup>2</sup> of 1 oz copper and lead length of 5 mm.

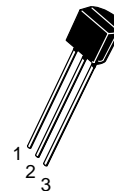


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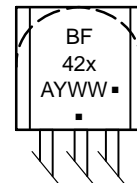
<http://onsemi.com>



#### MARKING DIAGRAM



TO-92  
CASE 29  
STYLE 14



BF42x = Device Code  
x = 1 or 3

A = Assembly Location

Y = Year

WW = Work Week

▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

Device	Package	Shipping
BF421ZL1	TO-92	2000/Ammo Pack
BF421ZL1G	TO-92 (Pb-Free)	2000/Ammo Pack
BF423	TO-92	5000 Units/Box
BF423G	TO-92 (Pb-Free)	5000 Units/Box
BF423ZL1	TO-92	2000/Ammo Pack
BF423ZL1G	TO-92 (Pb-Free)	2000/Ammo Pack

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

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## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit	
<b>OFF CHARACTERISTICS</b>					
Collector–Emitter Breakdown Voltage (Note 1) (I <sub>C</sub> = -1.0 mA, I <sub>B</sub> = 0)	BF421 BF423	V <sub>(BR)CEO</sub>	-300 -250	- -	Vdc
Collector–Base Breakdown Voltage (I <sub>C</sub> = -100 μA, I <sub>E</sub> = 0)	BF421 BF423	V <sub>(BR)CBO</sub>	-300 -250	- -	Vdc
Emitter–Base Breakdown Voltage (I <sub>E</sub> = -100 μA, I <sub>C</sub> = 0)	BF421 BF423	V <sub>(BR)EBO</sub>	-5.0 -5.0	- -	Vdc
Collector Cutoff Current (V <sub>CB</sub> = -200 Vdc, I <sub>E</sub> = 0)	BF421 BF423	I <sub>CBO</sub>	- -	-0.01 -	μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = -5.0 Vdc, I <sub>C</sub> = 0)	BF421 BF423	I <sub>EBO</sub>	- -	-100 -	nA <sub>dc</sub>
<b>ON CHARACTERISTICS</b>					
DC Current Gain (I <sub>C</sub> = -25 mA, V <sub>CE</sub> = -20 Vdc)	BF421 BF423	h <sub>FE</sub>	50 50	- -	-
Collector–Emitter Saturation Voltage (I <sub>C</sub> = -20 mA, I <sub>B</sub> = -2.0 mA)		V <sub>CE(sat)</sub>	-	-0.5	Vdc
Base–Emitter Saturation Voltage (I <sub>C</sub> = -20 mA, I <sub>B</sub> = -2.0 mA)		V <sub>BE(sat)</sub>	-	-2.0	Vdc
<b>SMALL–SIGNAL CHARACTERISTICS</b>					
Current–Gain – Bandwidth Product (I <sub>C</sub> = -10 mA, V <sub>CE</sub> = -10 Vdc, f = 20 MHz)		f <sub>T</sub>	60	-	MHz
Common Emitter Feedback Capacitance (V <sub>CB</sub> = -30 Vdc, I <sub>E</sub> = 0, f = 1.0 MHz)		C <sub>re</sub>	-	2.8	pF

1. Pulse Test: Pulse Width ≤ 300 μs; Duty Cycle ≤ 2.0%.

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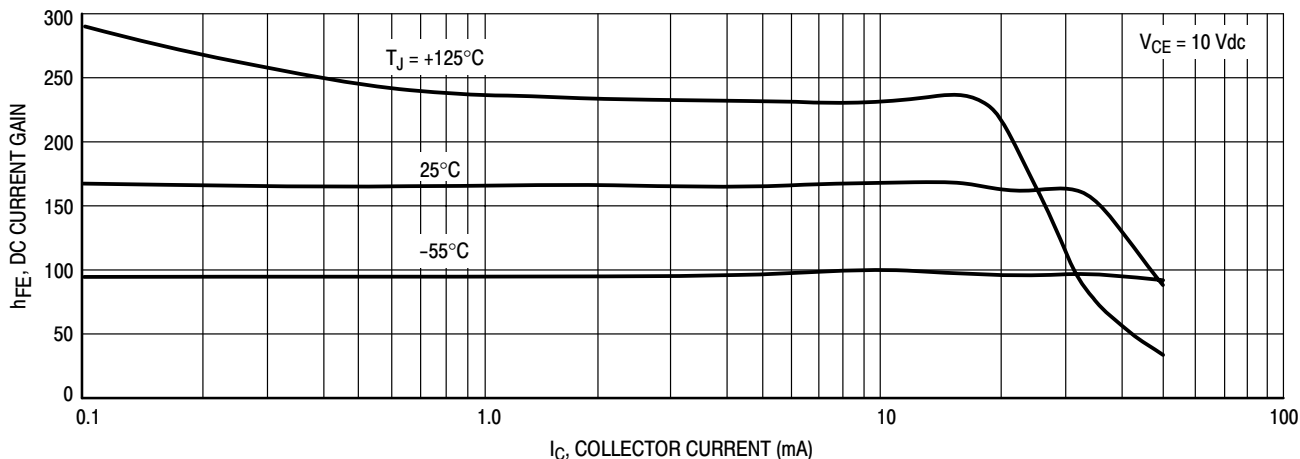


Figure 1. DC Current Gain

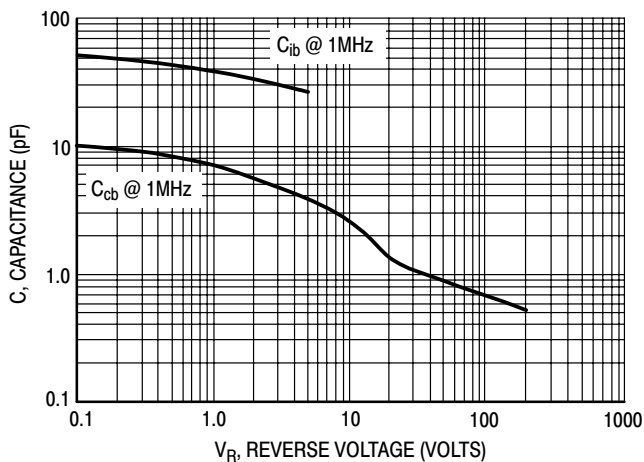


Figure 2. Capacitance

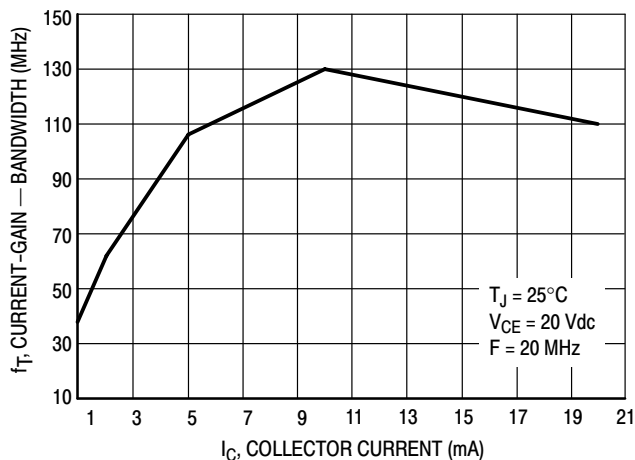


Figure 3. Current-Gain - Bandwidth

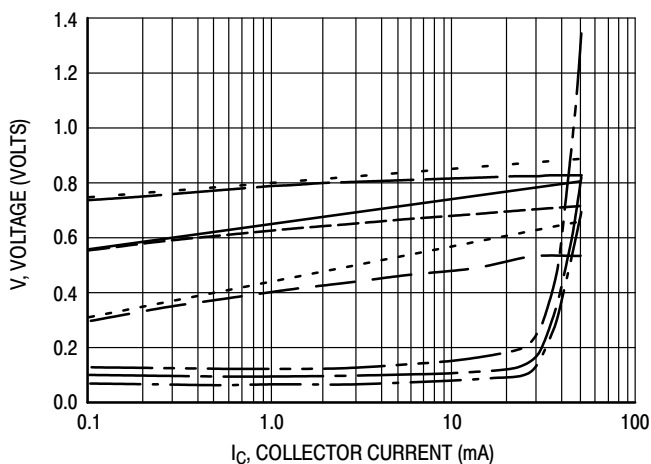


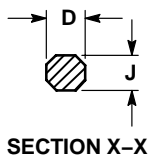
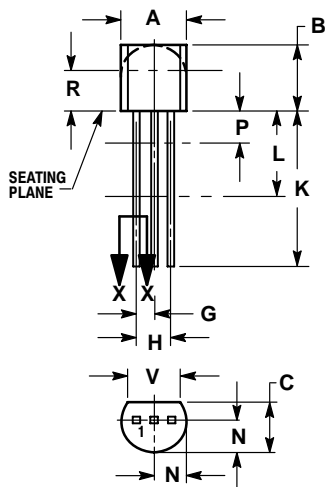
Figure 4. "ON" Voltages

- $V_{CE(sat)}$  @ 25°C,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @ 125°C,  $I_C/I_B = 10$
- $V_{CE(sat)}$  @ -55°C,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @ 25°C,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @ 125°C,  $I_C/I_B = 10$
- $V_{BE(sat)}$  @ -55°C,  $I_C/I_B = 10$
- $V_{BE(on)}$  @ 25°C,  $V_{CE} = 10$  V
- $V_{BE(on)}$  @ 125°C,  $V_{CE} = 10$  V
- $V_{BE(on)}$  @ -55°C,  $V_{CE} = 10$  V

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## PACKAGE DIMENSIONS

TO-92  
(TO-226)  
CASE 029-11  
ISSUE AL



**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

**STYLE 14:**

1. EMITTER
2. COLLECTOR
3. BASE

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