

BF420, BF422

High Voltage Transistors

NPN Silicon

- Pb-Free Package is Available*

MAXIMUM RATINGS

Rating	Symbol	BF420	BF422	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		mA dc
Collector Current – Peak	I_{CM}	100		mA
Total Device Dissipation (Note 1) @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	830 6.6		mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150		$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

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.

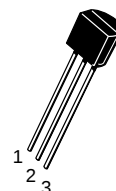
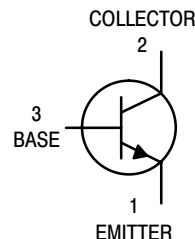
- Mounted on a FR4 board with 200 mm² of 1 oz copper and lead length of 5 mm.

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



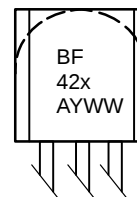
ON Semiconductor®

<http://onsemi.com>



TO-92 (TO-226AA)
CASE 29-11,
STYLE 14

MARKING DIAGRAM



x = 0 or 2
A = Assembly Location
Y = Year
WW = Work Week

ORDERING INFORMATION

Device	Package	Shipping [†]
BF420ZL1	TO-92	2000 Ammo Pack
BF422	TO-92	5000 Units/Box
BF422G	TO-92 (Pb-Free)	5000 Units/Box
BF422RL1	TO-92	2000 Tape & Reel
BF422ZL1	TO-92	2000 Ammo Pack

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage (Note 220) ($I_C = 1.0\text{ mAdc}$, $I_B = 0$)	BF420 BF422	$V_{(BR)CEO}$	300 250	— —	Vdc
Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{Adc}$, $I_E = 0$)	BF420 BF422	$V_{(BR)CBO}$	300 250	— —	Vdc
Emitter–Base Breakdown Voltage ($I_E = 100\text{ }\mu\text{Adc}$, $I_C = 0$)	BF420 BF422	$V_{(BR)EBO}$	5.0 5.0	— —	Vdc
Collector Cutoff Current ($V_{CB} = 200\text{ Vdc}$, $I_E = 0$)	BF420 BF422	I_{CBO}	— —	0.01 —	μAdc
Emitter Cutoff Current ($V_{EB} = 5.0\text{ Vdc}$, $I_C = 0$)	BF420 BF422	I_{EBO}	— —	100 —	nAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 25\text{ mAdc}$, $V_{CE} = 20\text{ Vdc}$)	BF420 BF422	h_{FE}	50 50	— —	—
Collector–Emitter Saturation Voltage ($I_C = 20\text{ mAdc}$, $I_B = 2.0\text{ mAdc}$)		$V_{CE(sat)}$	—	0.5	Vdc
Base–Emitter Saturation Voltage ($I_C = 20\text{ mAdc}$, $I_B = 2.0\text{ mAdc}$)		$V_{BE(sat)}$	—	2.0	Vdc

SMALL–SIGNAL CHARACTERISTICS

Current Gain — Bandwidth Product ($I_C = 10\text{ mAdc}$, $V_{CE} = 10\text{ Vdc}$, $f = 20\text{ MHz}$)		f_T	60	—	MHz
Common Emitter Feedback Capacitance ($V_{CB} = 30\text{ Vdc}$, $I_E = 0$, $f = 1.0\text{ MHz}$)		C_{re}	—	1.6	pF

2. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$; Duty Cycle $\leq 2.0\%$.

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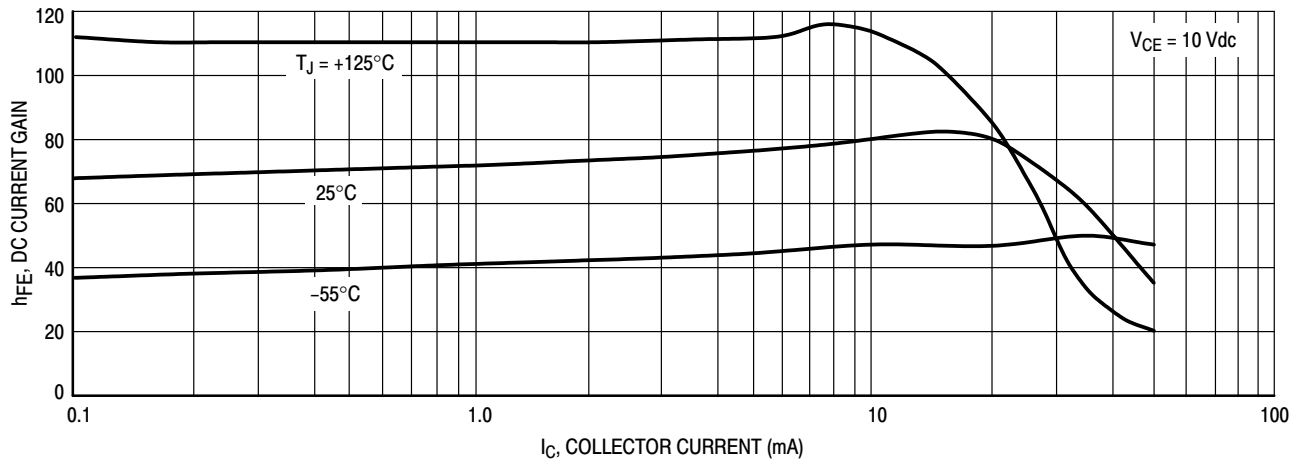


Figure 1. DC Current Gain

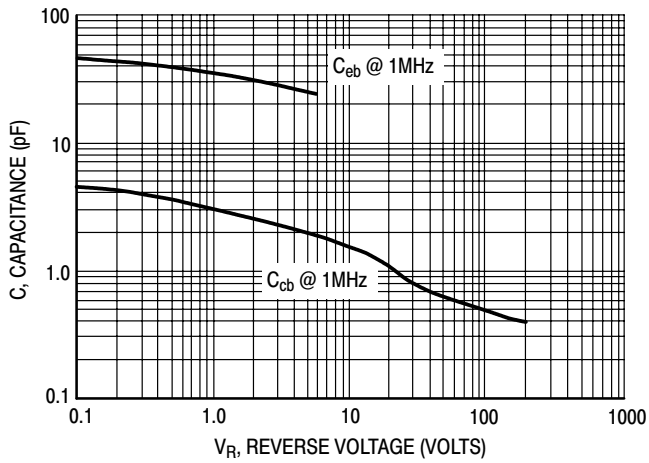


Figure 2. Capacitance

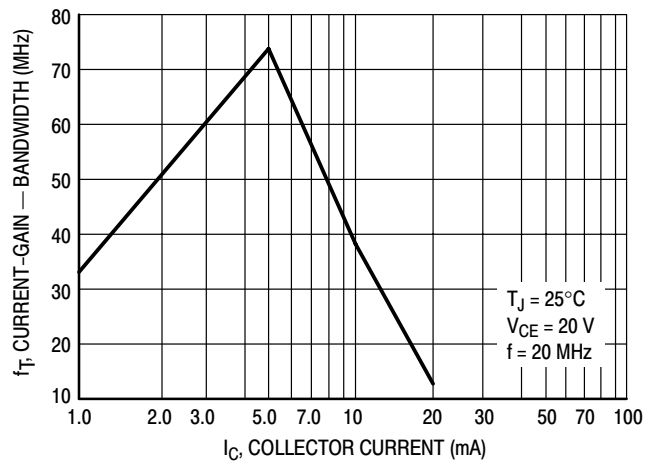


Figure 3. Current-Gain - Bandwidth

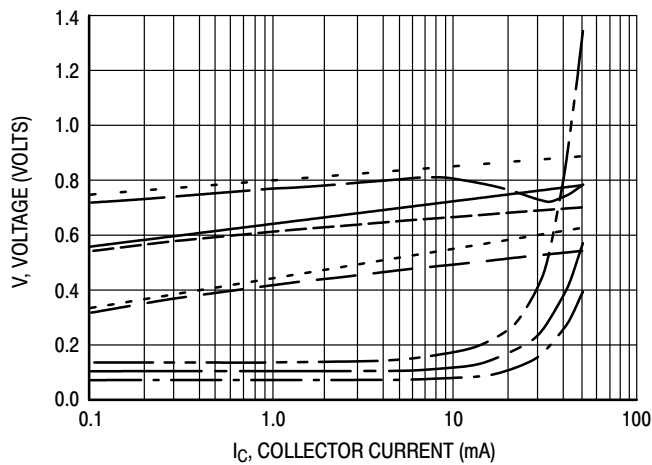


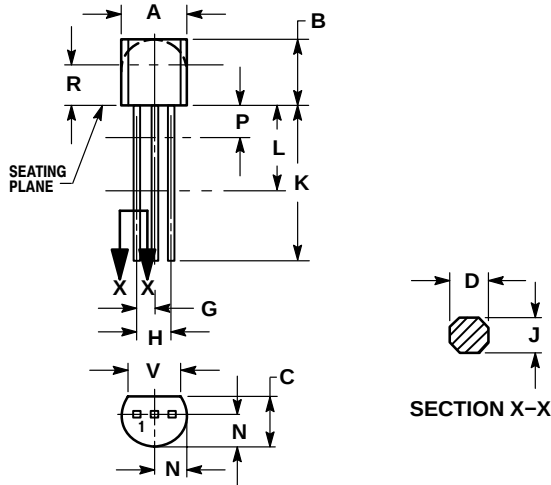
Figure 4. "ON" Voltages

- $V_{CE(sat)}$ @ 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 , $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$ @ 125°C , $V_{CE} = 10 \text{ V}$
- $V_{BE(on)}$ @ -55°C , $V_{CE} = 10 \text{ V}$

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PACKAGE DIMENSIONS

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



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
E	0.045	0.055	1.15	1.39
F	0.095	0.105	2.42	2.66
G	0.015	0.020	0.39	0.50
H	0.500	---	12.70	---
I	0.250	---	6.35	---
J	0.080	0.105	2.04	2.66
K	---	0.100	---	2.54
L	0.115	---	2.93	---
M	0.135	---	3.43	---

STYLE 14:

1. EMITTER
2. COLLECTOR
3. BASE

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