

BF421, BF423

High Voltage Transistors

PNP Silicon

Features

- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

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 | -500 | | mAdc |
| 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 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction–to–Lead | $R_{\theta JL}$ | 68 | $^\circ\text{C}/\text{W}$ |

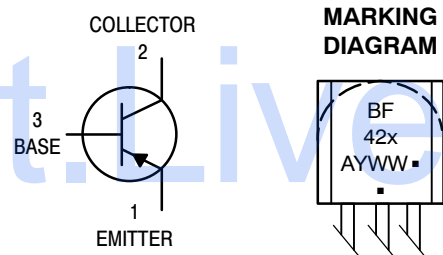
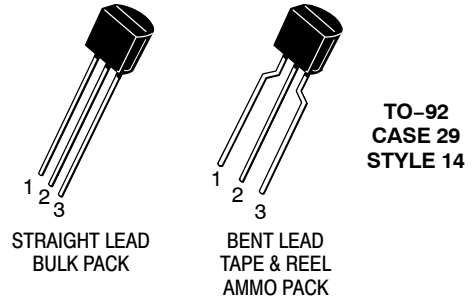
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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



ON Semiconductor®

<http://onsemi.com>



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 |
|-----------|--------------------|----------------|
| BF421ZL1G | TO-92 (Pb-Free) | 2000/Ammo Pack |
| BF423G | TO-92 (Pb-Free) | 5000 Units/Box |
| 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.

BF421, BF423

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

| Characteristic | | Symbol | Min | Max | Unit |
|--------------------------------------------------------------------------------------------------|----------------|----------------------|--------------|------------|------|
| OFF CHARACTERISTICS | | | | | |
| Collector – Emitter Breakdown Voltage (Note 1) (I _C = -1.0 mA, I _B = 0) | BF421 BF423 | V _{(BR)CEO} | -300 -250 | - | Vdc |
| Collector – Base Breakdown Voltage (I _C = -100 μA, I _E = 0) | BF421 BF423 | V _{(BR)CBO} | -300 -250 | - | Vdc |
| Emitter – Base Breakdown Voltage (I _E = -100 μA, I _C = 0) | BF421 BF423 | V _{(BR)EBO} | -5.0 -5.0 | - | Vdc |
| Collector Cutoff Current (V _{CB} = -200 Vdc, I _E = 0) | BF421 BF423 | I _{CBO} | - | -0.01 - | μA |
| Emitter Cutoff Current (V _{EB} = -5.0 Vdc, I _C = 0) | BF421 BF423 | I _{EBO} | - | -100 - | nA |

ON CHARACTERISTICS

| | | | | | |
|-----------------------------------------------------------------------------------------------|----------------|----------------------|----------|------|-----|
| DC Current Gain (I _C = -25 mA, V _{CE} = -20 Vdc) | BF421 BF423 | h _{FE} | 50 50 | - | - |
| Collector – Emitter Saturation Voltage (I _C = -20 mA, I _B = -2.0 mA) | | V _{CE(sat)} | - | -0.5 | Vdc |
| Base – Emitter Saturation Voltage (I _C = -20 mA, I _B = -2.0 mA) | | V _{BE(sat)} | - | -2.0 | Vdc |

SMALL-SIGNAL CHARACTERISTICS

| | | | | | |
|--------------------------------------------------------------------------------------------------------|--|-----------------|----|-----|-----|
| Current – Gain – Bandwidth Product (I _C = -10 mA, V _{CE} = -10 Vdc, f = 20 MHz) | | f _T | 60 | - | MHz |
| Common Emitter Feedback Capacitance (V _{CB} = -30 Vdc, I _E = 0, f = 1.0 MHz) | | C _{re} | - | 2.8 | pF |

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

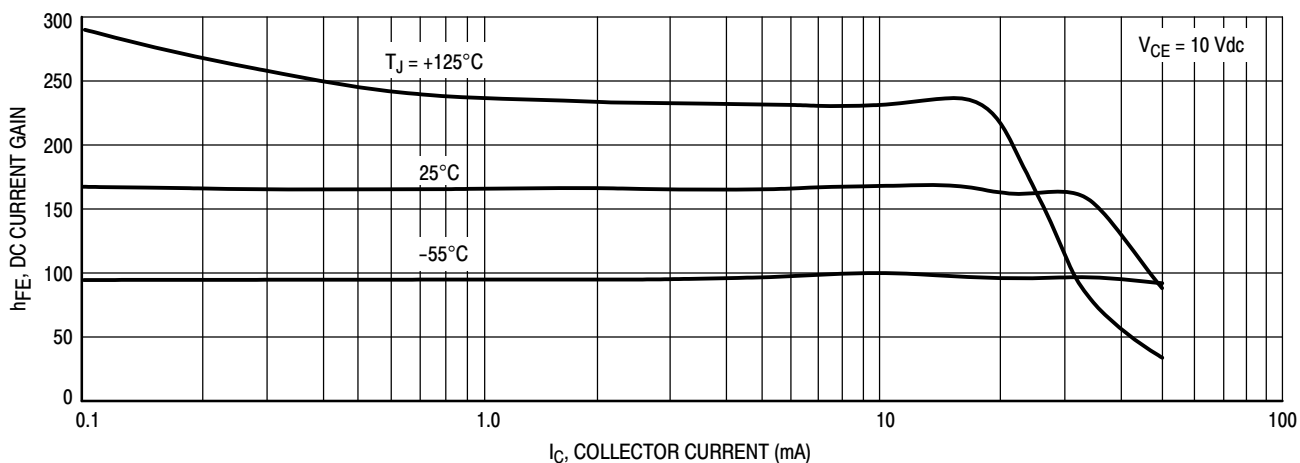


Figure 1. DC Current Gain

BF421, BF423

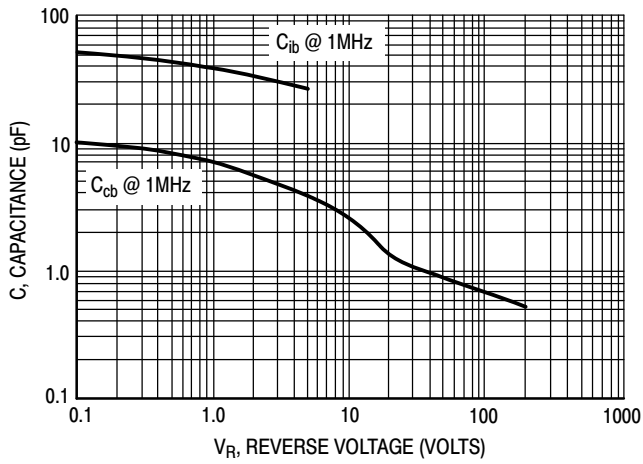


Figure 2. Capacitance

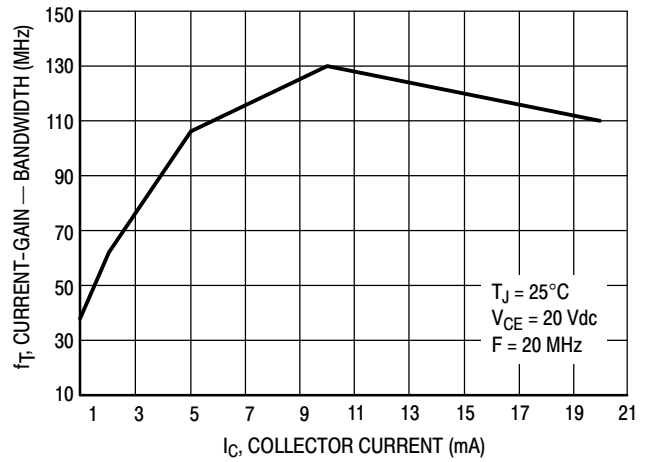


Figure 3. Current-Gain - Bandwidth

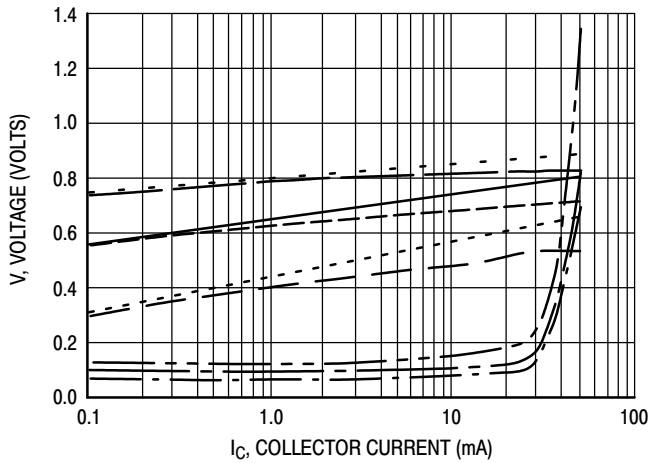


Figure 4. "ON" Voltages

- 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

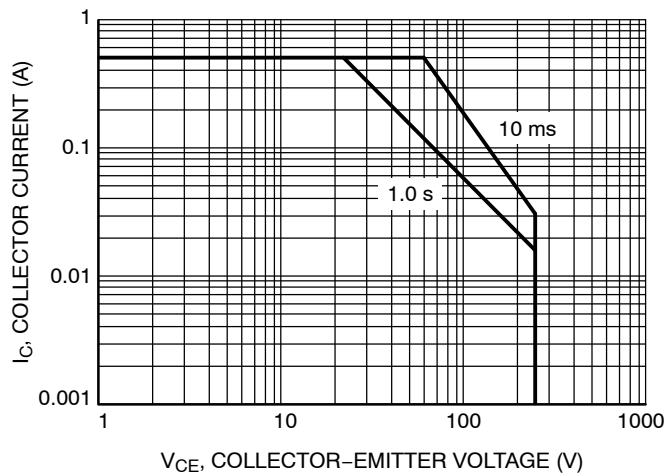
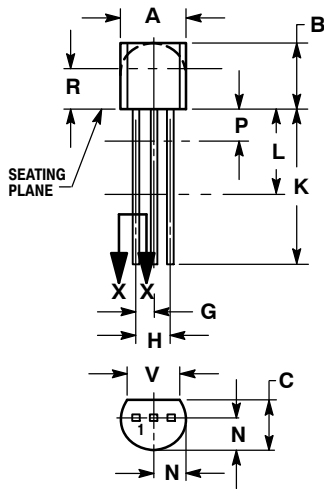


Figure 5. Safe Operating Area

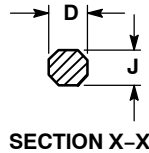
BF421, BF423

PACKAGE DIMENSIONS

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



STRAIGHT LEAD
BULK PACK



SECTION X-X

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 | --- |

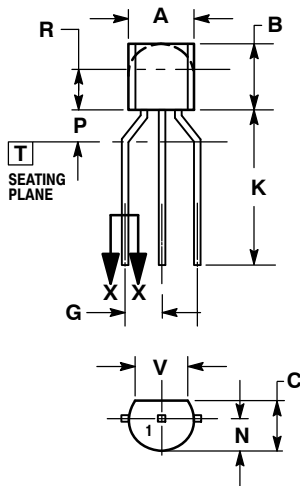
STYLE 14:

1. EMITTER
2. COLLECTOR
3. BASE

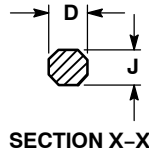
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| DIM | MILLIMETERS | |
|-----|-------------|------|
| | MIN | MAX |
| A | 4.45 | 5.20 |
| B | 4.32 | 5.33 |
| C | 3.18 | 4.19 |
| D | 0.40 | 0.54 |
| G | 2.40 | 2.80 |
| J | 0.39 | 0.50 |
| K | 12.70 | --- |
| N | 2.04 | 2.66 |
| P | 1.50 | 4.00 |
| R | 2.93 | --- |
| V | 3.43 | --- |



BENT LEAD
TAPE & REEL
AMMO PACK



SECTION X-X

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5773-3850

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative