

BC237B

Amplifier Transistors

NPN Silicon

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|----------------|-------------|----------------------------|
| Collector-Emitter Voltage | V_{CEO} | 45 | Vdc |
| Collector-Emitter Voltage | V_{CES} | 50 | Vdc |
| Collector-Emitter Voltage | V_{EBO} | 6.0 | Vdc |
| Collector Current - Continuous | I_C | 100 | mA dc |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $T_A = 25^\circ\text{C}$ | P_D | 350 2.8 | mW mW/ $^\circ\text{C}$ |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $T_A = 25^\circ\text{C}$ | P_D | 1.0 8.0 | W mW/ $^\circ\text{C}$ |
| Operating and Storage Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

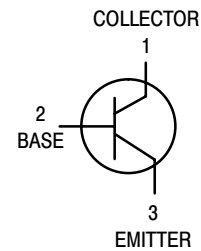
| Characteristic | Symbol | Max | Unit |
|---|-----------------|-----|--------------------|
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 357 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 125 | $^\circ\text{C/W}$ |

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.

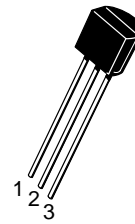


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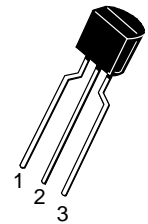
<http://onsemi.com>



TO-92
CASE 29
STYLE 17

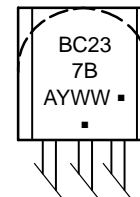


STRAIGHT LEAD
BULK PACK



BENT LEAD
TAPE & REEL
AMMO PACK

MARKING DIAGRAM



- A = Assembly Location
- Y = Year
- WW = Work Week
- = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

| Device | Package | Shipping† |
|------------|--------------------|--------------------|
| BC237B | TO-92 | 5000 Units / Bulk |
| BC237BG | TO-92 (Pb-Free) | 5000 Units / Bulk |
| BC237BRL1G | TO-92 (Pb-Free) | 2000 / Tape & Reel |

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

†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.

BC237B

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|----------------------|----------------|---------------------|---------------|----------|
| OFF CHARACTERISTICS | | | | | |
| Collector–Emitter Breakdown Voltage (I _C = 2.0 mA, I _B = 0) | V _{(BR)CEO} | 45 | – | – | V |
| Emitter–Base Breakdown Voltage (I _E = 100 μA, I _C = 0) | V _{(BR)EBO} | 6.0 | – | – | V |
| Collector Cutoff Current (V _{CE} = 50 V, V _{BE} = 0) (V _{CE} = 50 V, V _{BE} = 0) T _A = 125°C | I _{CES} | – – | 0.2 0.2 | 15 4.0 | nA μA |
| ON CHARACTERISTICS | | | | | |
| DC Current Gain (I _C = 10 μA, V _{CE} = 5.0 V) (I _C = 2.0 mA, V _{CE} = 5.0 V) (I _C = 100 mA, V _{CE} = 5.0 V) | h _{FE} | – 200 – | 150 290 180 | – 460 – | – |
| Collector–Emitter On Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) | V _{CE(sat)} | – – | 0.07 0.2 | 0.2 0.6 | V |
| Base–Emitter Saturation Voltage (I _C = 10 mA, I _B = 0.5 mA) (I _C = 100 mA, I _B = 5.0 mA) | V _{BE(sat)} | – – | 0.6 – | 0.83 1.05 | V |
| Base–Emitter On Voltage (I _C = 100 μA, V _{CE} = 5.0 V) (I _C = 2.0 mA, V _{CE} = 5.0 V) (I _C = 100 mA, V _{CE} = 5.0 V) | V _{BE(on)} | – 0.55 – | 0.5 0.62 0.83 | – 0.7 – | V |
| DYNAMIC CHARACTERISTICS | | | | | |
| Current–Gain — Bandwidth Product (I _C = 0.5 mA, V _{CE} = 3.0 V, f = 100 MHz) (I _C = 10 mA, V _{CE} = 5.0 V, f = 100 MHz) | f _T | – 150 | 100 200 | – – | MHz |
| Collector–Base Capacitance (V _{CB} = 10 V, I _C = 0, f = 1.0 MHz) | C _{obo} | – | – | 4.5 | pF |
| Emitter–Base Capacitance (V _{EB} = 0.5 V, I _C = 0, f = 1.0 MHz) | C _{ibo} | – | 8.0 | – | pF |
| Noise Figure (I _C = 0.2 mA, V _{CE} = 5.0 V, R _S = 2.0 kΩ, f = 1.0 kHz, Δf = 200 Hz) | NF | – | 2.0 | 10 | dB |

BC237B

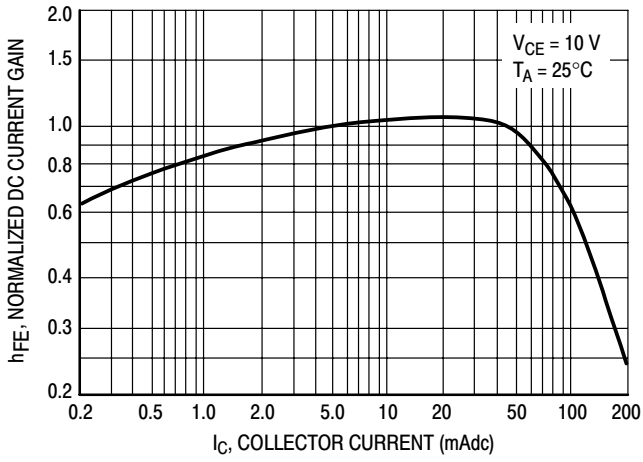


Figure 1. Normalized DC Current Gain

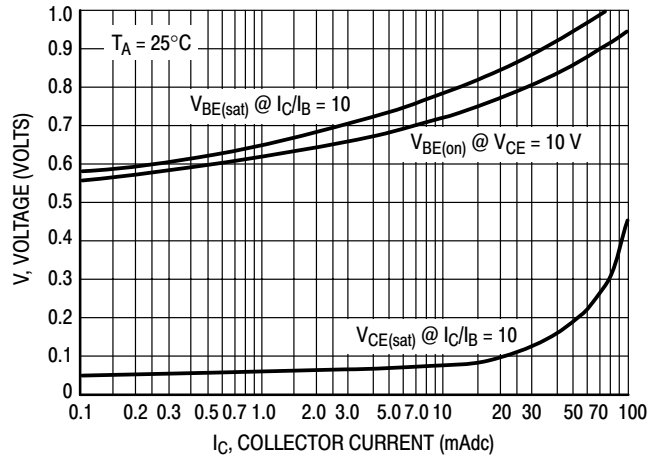


Figure 2. "Saturation" and "On" Voltages

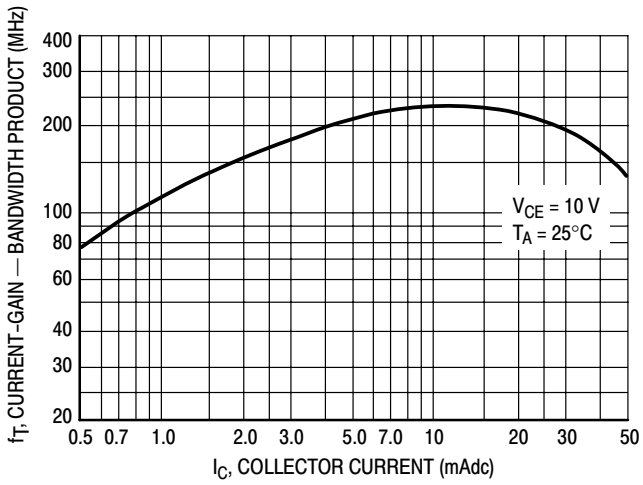


Figure 3. Current-Gain — Bandwidth Product

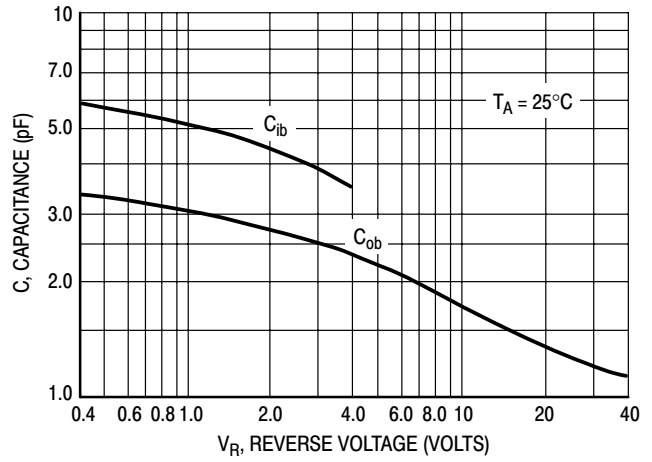


Figure 4. Capacitances

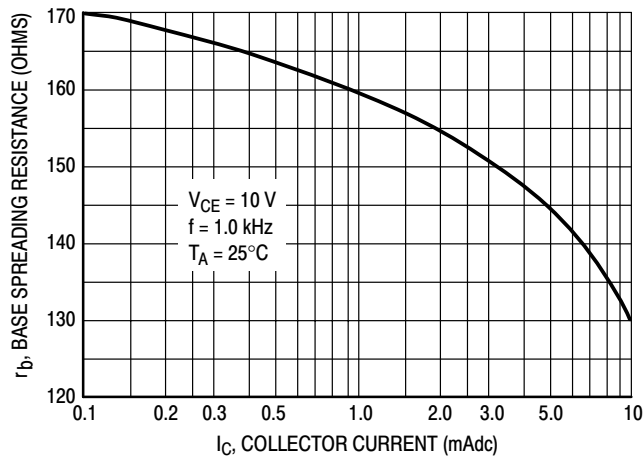


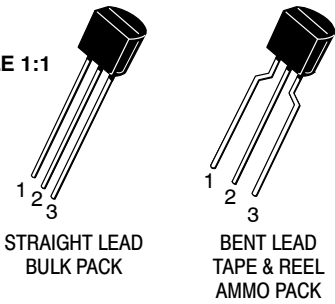
Figure 5. Base Spreading Resistance

MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

ON Semiconductor®

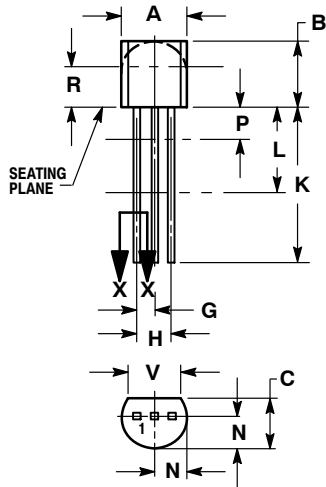


SCALE 1:1

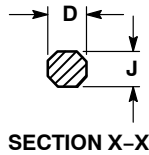


TO-92 (TO-226)
CASE 29-11
ISSUE AM

DATE 09 MAR 2007



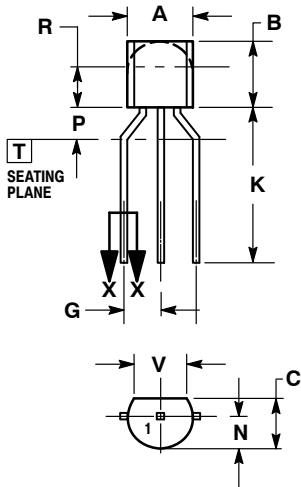
STRAIGHT LEAD
BULK PACK



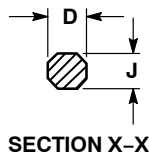
NOTES:

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 | --- |



BENT LEAD
TAPE & REEL
AMMO PACK



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 | --- |

STYLES ON PAGE 2

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|------------------|---------------------------|--|
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| STATUS: | ON SEMICONDUCTOR STANDARD | |
| NEW STANDARD: | | |
| DESCRIPTION: | TO-92 (TO-226) | PAGE 1 OF 3 |

TO-92 (TO-226)
CASE 29-11
ISSUE AM

DATE 09 MAR 2007

STYLE 1:
 PIN 1. EMITTER
 2. BASE
 3. COLLECTOR

STYLE 2:
 PIN 1. BASE
 2. EMITTER
 3. COLLECTOR

STYLE 3:
 PIN 1. ANODE
 2. ANODE
 3. CATHODE

STYLE 4:
 PIN 1. CATHODE
 2. CATHODE
 3. ANODE

STYLE 5:
 PIN 1. DRAIN
 2. SOURCE
 3. GATE

STYLE 6:
 PIN 1. GATE
 2. SOURCE & SUBSTRATE
 3. DRAIN

STYLE 7:
 PIN 1. SOURCE
 2. DRAIN
 3. GATE

STYLE 8:
 PIN 1. DRAIN
 2. GATE
 3. SOURCE & SUBSTRATE

STYLE 9:
 PIN 1. BASE 1
 2. EMITTER
 3. BASE 2

STYLE 10:
 PIN 1. CATHODE
 2. GATE
 3. ANODE

STYLE 11:
 PIN 1. ANODE
 2. CATHODE & ANODE
 3. CATHODE

STYLE 12:
 PIN 1. MAIN TERMINAL 1
 2. GATE
 3. MAIN TERMINAL 2

STYLE 13:
 PIN 1. ANODE 1
 2. GATE
 3. CATHODE 2

STYLE 14:
 PIN 1. EMITTER
 2. COLLECTOR
 3. BASE

STYLE 15:
 PIN 1. ANODE 1
 2. CATHODE
 3. ANODE 2

STYLE 16:
 PIN 1. ANODE
 2. GATE
 3. CATHODE

STYLE 17:
 PIN 1. COLLECTOR
 2. BASE
 3. EMITTER

STYLE 18:
 PIN 1. ANODE
 2. CATHODE
 3. NOT CONNECTED

STYLE 19:
 PIN 1. GATE
 2. ANODE
 3. CATHODE

STYLE 20:
 PIN 1. NOT CONNECTED
 2. CATHODE
 3. ANODE

STYLE 21:
 PIN 1. COLLECTOR
 2. EMITTER
 3. BASE

STYLE 22:
 PIN 1. SOURCE
 2. GATE
 3. DRAIN

STYLE 23:
 PIN 1. GATE
 2. SOURCE
 3. DRAIN

STYLE 24:
 PIN 1. EMITTER
 2. COLLECTOR/ANODE
 3. CATHODE

STYLE 25:
 PIN 1. MT 1
 2. GATE
 3. MT 2

STYLE 26:
 PIN 1. V_{CC}
 2. GROUND 2
 3. OUTPUT

STYLE 27:
 PIN 1. MT
 2. SUBSTRATE
 3. MT

STYLE 28:
 PIN 1. CATHODE
 2. ANODE
 3. GATE

STYLE 29:
 PIN 1. NOT CONNECTED
 2. ANODE
 3. CATHODE

STYLE 30:
 PIN 1. DRAIN
 2. GATE
 3. SOURCE

STYLE 31:
 PIN 1. GATE
 2. DRAIN
 3. SOURCE

STYLE 32:
 PIN 1. BASE
 2. COLLECTOR
 3. EMITTER

STYLE 33:
 PIN 1. RETURN
 2. INPUT
 3. OUTPUT


STYLE 34:
 PIN 1. INPUT
 2. GROUND
 3. LOGIC

STYLE 35:
 PIN 1. GATE
 2. COLLECTOR
 3. EMITTER

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| NEW STANDARD: | | |
| DESCRIPTION: | TO-92 (TO-226) | PAGE 2 OF 3 |



| ISSUE | REVISION | DATE |
|-------|---|-------------|
| AM | ADDED BENT-LEAD TAPE & REEL VERSION. REQ. BY J. SUPINA. | 09 MAR 2007 |
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