

BC212, BC212B, BC213

Amplifier Transistors

PNP Silicon



ON Semiconductor™

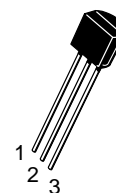
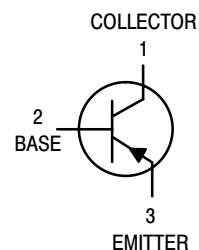
<http://onsemi.com>

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|---|----------------|----------------|-------------------------------|
| Collector-Emitter Voltage BC212 BC213 | V_{CEO} | -50 -30 | Vdc |
| Collector-Base Voltage BC212 BC213 | V_{CBO} | -60 -45 | Vdc |
| Emitter-Base Voltage | V_{EBO} | -5.0 | Vdc |
| Collector Current – Continuous | I_C | -100 | mAdc |
| Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C | P_D | 350 2.8 | mW mW/ $^\circ\text{C}$ |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C | P_D | 1.0 8.0 | Watts mW/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -55 to +150 | $^\circ\text{C}$ |

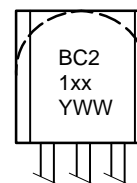
THERMAL CHARACTERISTICS

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



TO-92
CASE 29
STYLE 17

MARKING DIAGRAMS



BC21xx = Specific Device Code
xx = 2, 2B, or 3
Y = Year
WW = Work Week

ORDERING INFORMATION

| Device | Package | Shipping |
|-----------|---------|------------------|
| BC212 | TO-92 | 5000 Units/Box |
| BC212B | TO-92 | 5000 Units/Box |
| BC212BRL1 | TO-92 | 2000/Tape & Reel |
| BC212BZL1 | TO-92 | 2000/Ammo Pack |
| BC213 | TO-92 | 5000 Units/Box |

BC212, BC212B, BC213

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

| Characteristic | | Symbol | Min | Typ | Max | Unit |
|---|----------------|----------------------|------------|--------|------------|------------------|
| Collector–Emitter Breakdown Voltage (I _C = –2.0 mA, I _B = 0) | BC212 BC213 | V _{(BR)CEO} | –50 –30 | – – | – – | V _{dc} |
| Collector–Base Breakdown Voltage (I _C = –10 μA, I _E = 0) | BC212 BC213 | V _{(BR)CBO} | –60 –45 | – – | – – | V _{dc} |
| Emitter–Base Breakdown Voltage (I _E = –10 μA, I _C = 0) | BC212 BC213 | V _{(BR)EBO} | –5 –5 | – – | – – | V _{dc} |
| Collector–Emitter Leakage Current (V _{CB} = –30 V) | BC212 BC213 | I _{CBO} | – – | – – | –15 –15 | nA _{dc} |
| Emitter–Base Leakage Current (V _{EB} = –4.0 V, I _C = 0) | BC212 BC213 | I _{EBO} | – – | – – | –15 –15 | nA _{dc} |

ON CHARACTERISTICS

| | | | | | | |
|---|----------------|----------------------|----------|----------------|-----------|-----------------|
| DC Current Gain (I _C = –10 μA, V _{CE} = –5.0 V _{dc}) | BC212 BC213 | h _{FE} | 40 40 | – – | – – | – |
| (I _C = –2.0 mA, V _{CE} = –5.0 V _{dc}) | BC212 BC213 | | 60 80 | – – | – – | |
| (I _C = –100 mA, V _{CE} = –5.0 V _{dc}) (Note 1.) | BC212 BC213 | | – – | 120 140 | – – | |
| Collector–Emitter Saturation Voltage (I _C = –10 mA, I _B = –0.5 mA) (I _C = –100 mA, I _B = –5.0 mA) (Note 1.) | | V _{CE(sat)} | – – | –0.10 –0.25 | – –0.6 | V _{dc} |
| Base–Emitter Saturation Voltage (I _C = –100 mA, I _B = –5.0 mA) | | V _{BE(sat)} | – | –1.0 | –1.4 | V _{dc} |
| Base–Emitter On Voltage (I _C = –2.0 mA, V _{CE} = –5.0 V _{dc}) | | V _{BE(on)} | –0.6 | –0.62 | –0.72 | V _{dc} |

DYNAMIC CHARACTERISTICS

| | | | | | | |
|--|--------------------------|-----------------|-----------------|-------------|---------------|-----|
| Current–Gain – Bandwidth Product (I _C = –10 mA, V _{CE} = –5.0 V _{dc} , f = 100 MHz) | BC212 BC213 | f _T | – – | 280 360 | – – | MHz |
| Common–Base Output Capacitance (V _{CB} = –10 V _{dc} , I _C = 0, f = 1.0 MHz) | | C _{ob} | – | – | 6.0 | pF |
| Noise Figure (I _C = –0.2 mA, V _{CE} = –5.0 V _{dc} , R _S = 2.0 kΩ, f = 1.0 kHz, f = 200 Hz) | BC212, BC213 | NF | – | – | 10 | dB |
| Small–Signal Current Gain (I _C = –2.0 mA, V _{CE} = –5.0 V _{dc} , f = 1.0 kHz) | BC212 BC213 BC212B | h _{fe} | 60 80 200 | – – – | – – 400 | – |

1. Pulse Test: T_p 300 s, Duty Cycle 2.0%.

BC212, BC212B, BC213

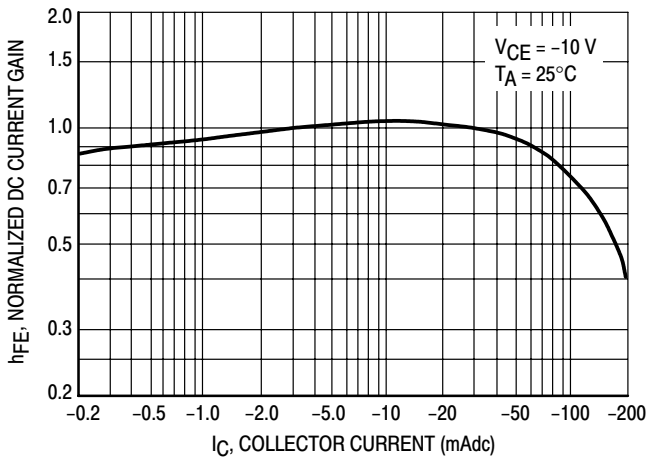


Figure 1. Normalized DC Current Gain

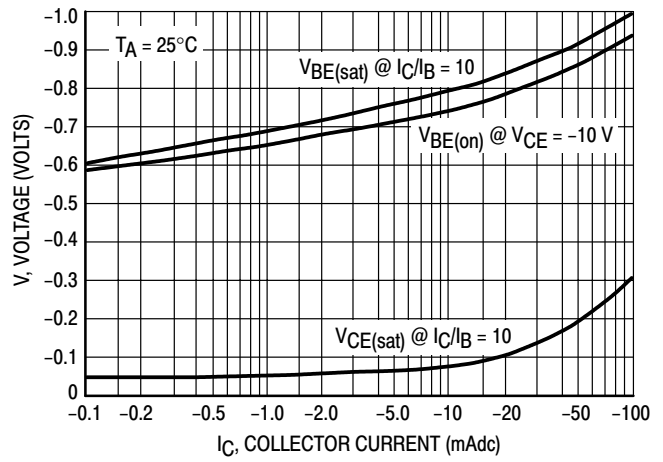


Figure 2. "Saturation" and "On" Voltages

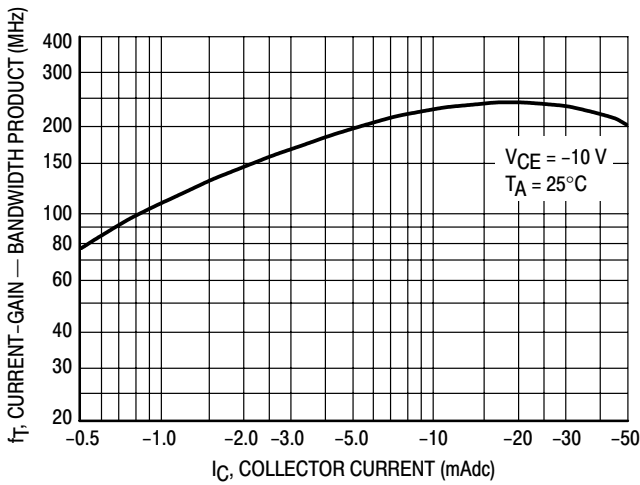


Figure 3. Current-Gain - Bandwidth Product

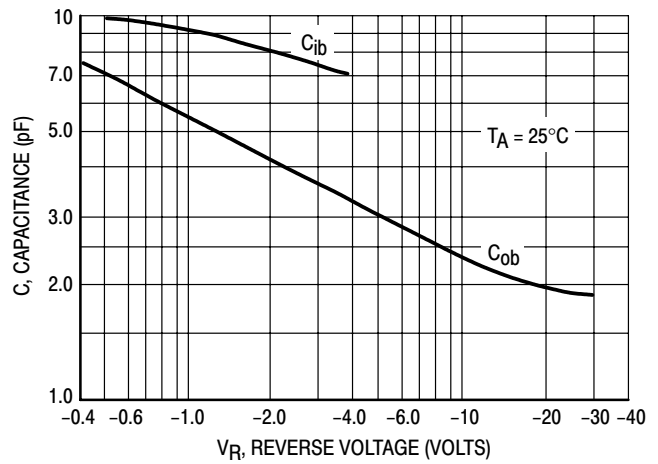


Figure 4. Capacitances

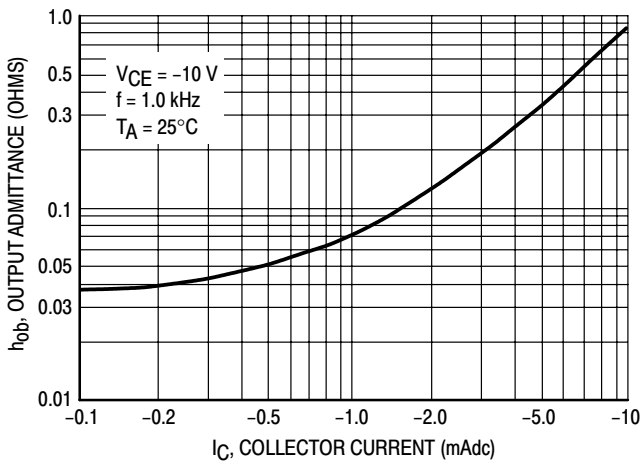


Figure 5. Output Admittance

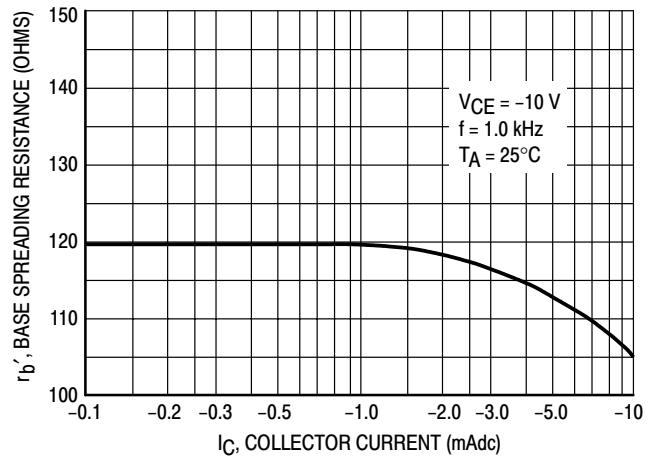
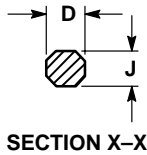
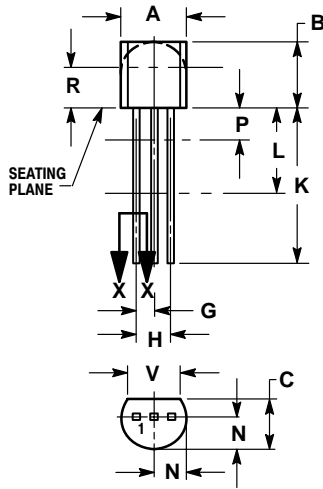


Figure 6. Base Spreading Resistance

BC212, BC212B, BC213

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-11
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 17:

1. COLLECTOR
2. BASE
3. EMITTER

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