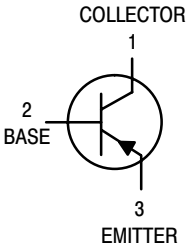
BC212, BC212B, BC213, BC214

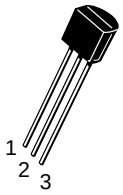
Amplifier Transistors

PNP Silicon

ON Semiconductor™

http://onsemi.com





TO–92
CASE 29
STYLE 17

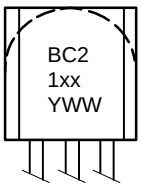
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC212 BC213 BC214	V_{CEO}	 –50 –30 –30	Vdc
Collector-Base Voltage BC212 BC213 BC214	V_{CBO}	 –60 –45 –45	Vdc
Emitter-Base Voltage	V_{EBO}	–5.0	Vdc
Collector Current – Continuous	I_C	–100	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	 350 2.8	 mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	 1.0 8.0	 Watts 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	$R_{\theta JA}$	357	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	°C/W

MARKING DIAGRAMS



BC21xx = Specific Device Code
xx = 2, 2B, 3 or 4
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
BC214	TO–92	5000 Units/Box
BC214RL1	TO–92	2000/Tape & Reel

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

Characteristic		Symbol	Min	Typ	Max	Unit
Collector–Emitter Breakdown Voltage (I_C = –2.0 mAdc, I_B = 0)	BC212 BC213 BC214	$V_{(BR)CEO}$	–50 –30 –30	– – –	– – –	Vdc
Collector–Base Breakdown Voltage (I_C = –10 μA, I_E = 0)	BC212 BC213 BC214	$V_{(BR)CBO}$	–60 –45 –45	– – –	– – –	Vdc
Emitter–Base Breakdown Voltage (I_E = –10 μAdc, I_C = 0)	BC212 BC213 BC214	$V_{(BR)EBO}$	–5 –5 –5	– – –	– – –	Vdc
Collector–Emitter Leakage Current (V_{CB} = –30 V)	BC212 BC213 BC214	I_{CBO}	– – –	– – –	–15 –15 –15	nAdc
Emitter–Base Leakage Current (V_{EB} = –4.0 V, I_C = 0)	BC212 BC213 BC214	I_{EBO}	– – –	– – –	–15 –15 –15	nAdc
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				–
(I_C = –10 μAdc, V_{CE} = –5.0 Vdc)	BC212 BC213 BC214		40 40 100	– – –	– – –	
(I_C = –2.0 mAdc, V_{CE} = –5.0 Vdc)	BC212 BC213 BC214		60 80 140	– – –	– – 600	
(I_C = –100 mAdc, V_{CE} = –5.0 Vdc) (Note 1.)	BC212, BC214 BC213		– –	120 140	– –	
Collector–Emitter Saturation Voltage (I_C = –10 mAdc, I_B = –0.5 mAdc) (I_C = –100 mAdc, I_B = –5.0 mAdc) (Note 1.)		$V_{CE(sat)}$	 – –	 –0.10 –0.25	 – –0.6	Vdc
Base–Emitter Saturation Voltage (I_C = –100 mAdc, I_B = –5.0 mAdc)		$V_{BE(sat)}$	–	–1.0	–1.4	Vdc
Base–Emitter On Voltage (I_C = –2.0 mAdc, V_{CE} = –5.0 Vdc)		$V_{BE(on)}$	–0.6	–0.62	–0.72	Vdc
DYNAMIC CHARACTERISTICS						
Current–Gain – Bandwidth Product (I_C = –10 mAdc, V_{CE} = –5.0 Vdc, f = 100 MHz)	BC212 BC214 BC213	f_T	– – –	280 320 360	– – –	MHz
Common–Base Output Capacitance (V_{CB} = –10 Vdc, I_C = 0, f = 1.0 MHz)		C_{ob}	–	–	6.0	pF
Noise Figure (I_C = –0.2 mAdc, V_{CE} = –5.0 Vdc, R_S = 2.0 kΩ , f = 1.0 kHz) (I_C = –0.2 mAdc, V_{CE} = –5.0 Vdc, R_S = 2.0 kΩ, f = 1.0 kHz, f = 200 Hz)	 BC214 BC212, BC213	NF	 – –	 – –	 2 10	dB
Small–Signal Current Gain (I_C = –2.0 mAdc, V_{CE} = –5.0 Vdc, f = 1.0 kHz)	BC212 BC213 BC214 BC212B	h_{fe}	60 80 140 200	– – – –	– – – 400	–

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

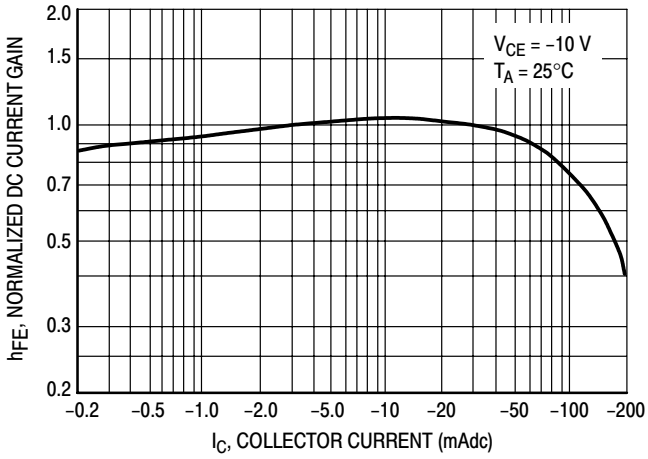


Figure 1. Normalized DC Current Gain

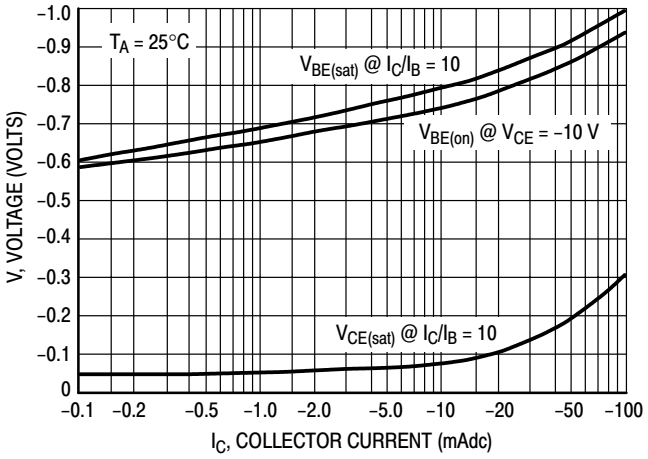


Figure 2. “Saturation” and “On” Voltages

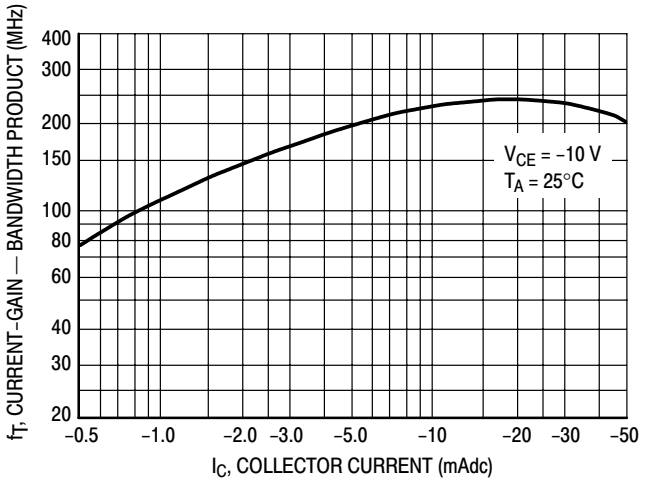


Figure 3. Current–Gain — Bandwidth Product

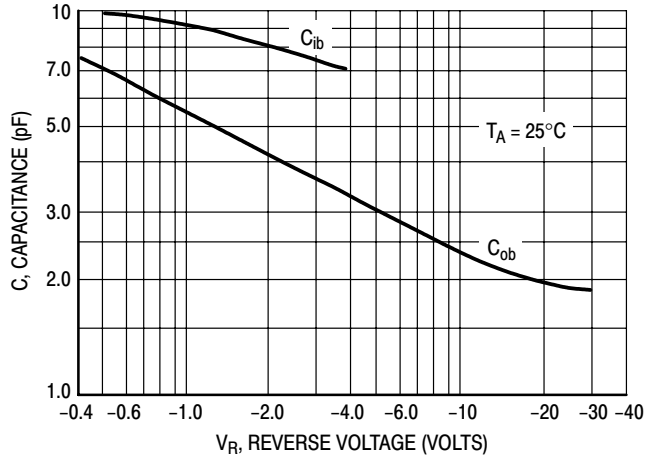


Figure 4. Capacitances

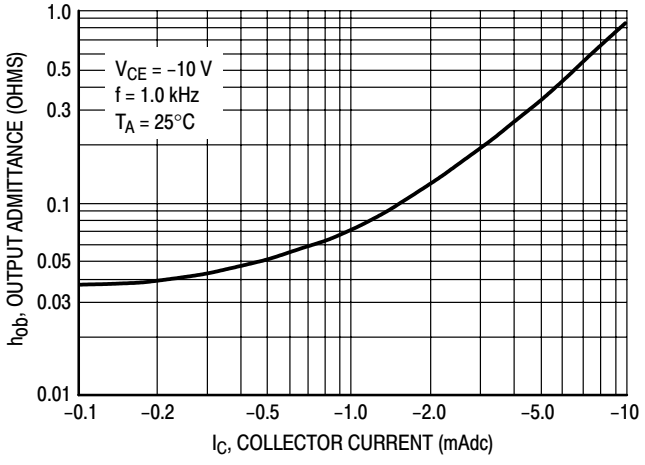


Figure 5. Output Admittance

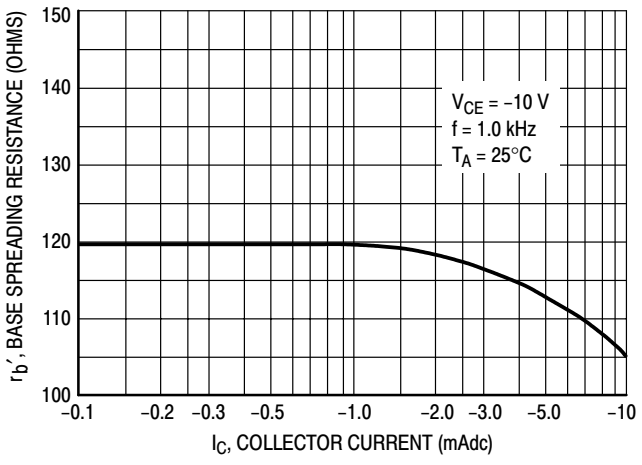
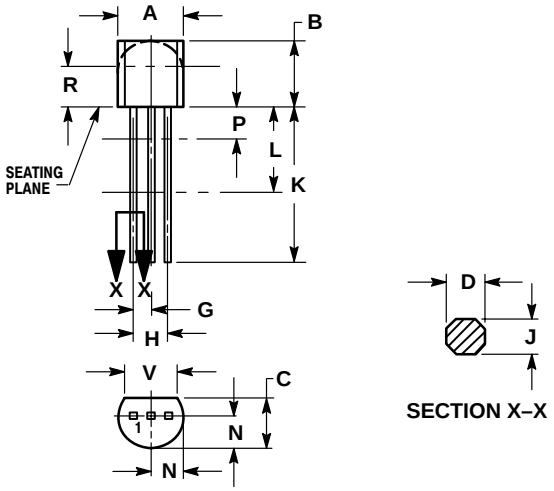


Figure 6. Base Spreading Resistance

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.

	INCHES		MILLIMETERS	
DIM	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:
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2. BASE
3. EMITTER

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