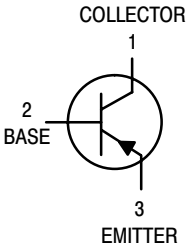
BC212, BC212B, BC213

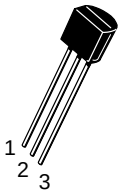
Amplifier Transistors

PNP Silicon

ON Semiconductor™

http://onsemi.com





TO–92
CASE 29
STYLE 17

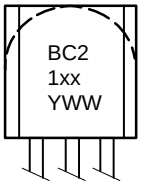
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC212 BC213	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°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, 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

October, 2001 – Rev. 2
Publication Order Number:
BC212/D

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

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

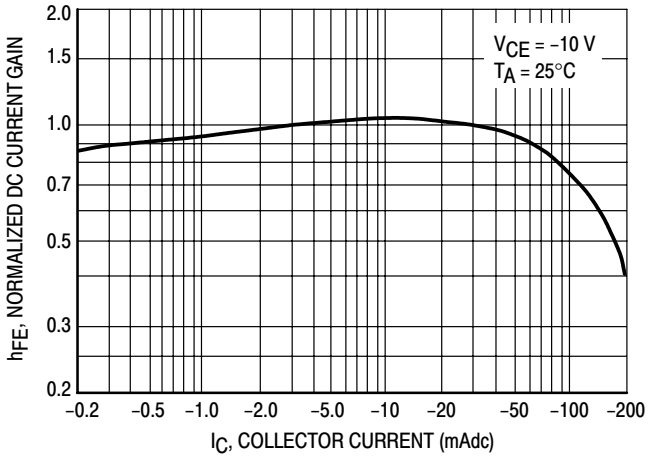


Figure 1. Normalized DC Current Gain

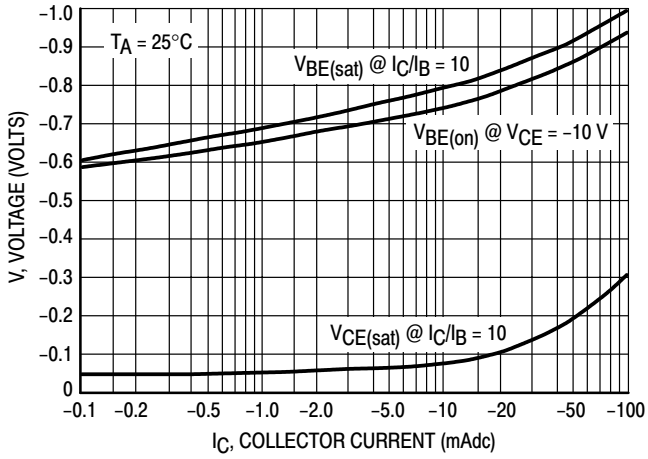


Figure 2. “Saturation” and “On” Voltages

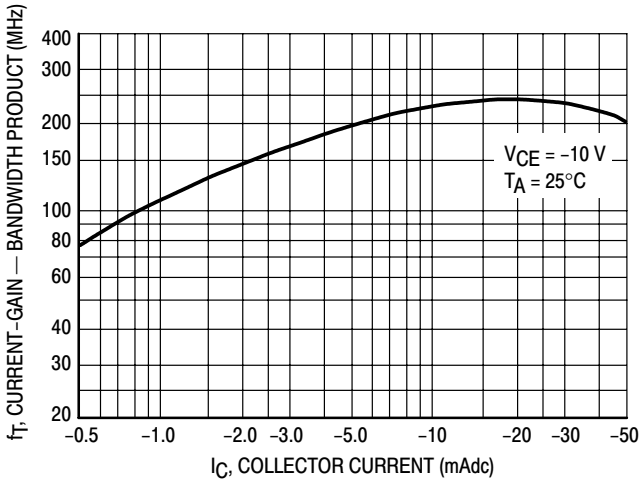


Figure 3. Current−Gain − Bandwidth Product

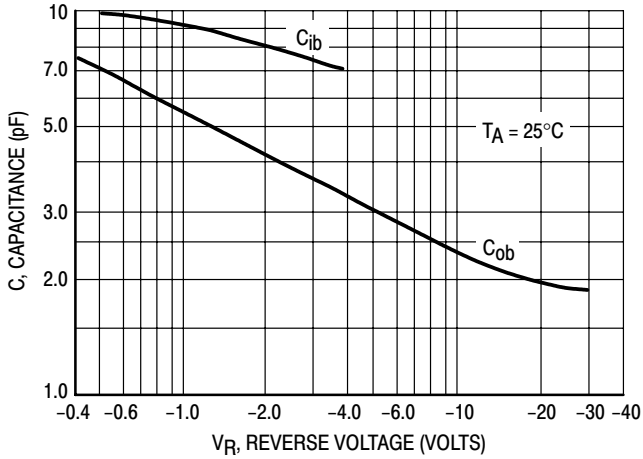


Figure 4. Capacitances

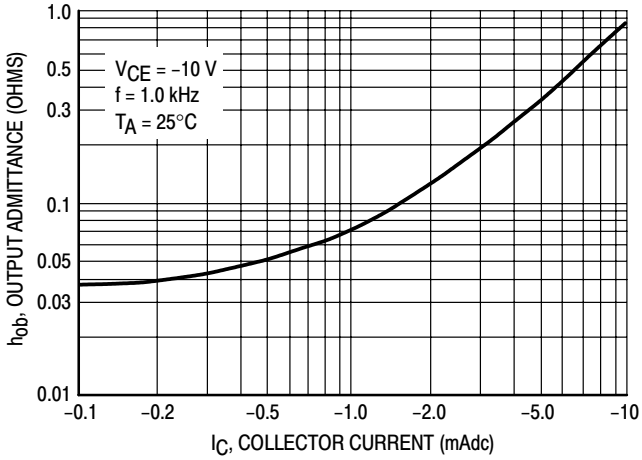


Figure 5. Output Admittance

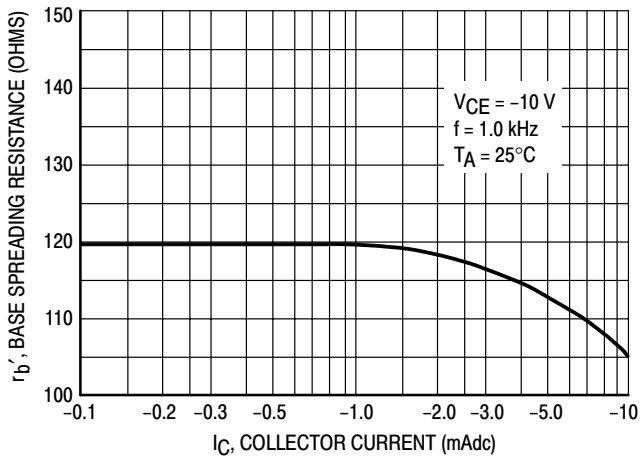
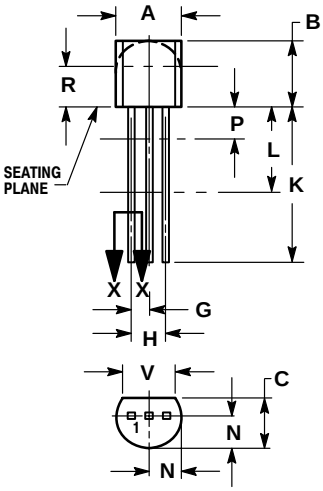
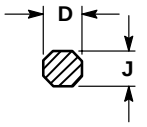


Figure 6. Base Spreading Resistance

PACKAGE DIMENSIONS

TO–92 (TO–226)
CASE 29–11
ISSUE AL





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.

	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:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

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: ONlit@hibbertco.com

N. American Technical Support: 800–282–9855 Toll Free USA/Canada

JAPAN: ON Semiconductor, Japan Customer Focus Center
4–32–1 Nishi–Gotanda, Shinagawa–ku, Tokyo, Japan 141–0031
Phone: 81–3–5740–2700
Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local Sales Representative.