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BC212, BC212B, BC213, BC214

Amplifier Transistors

PNP Silicon



ON Semiconductor™

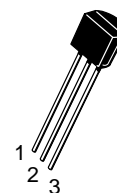
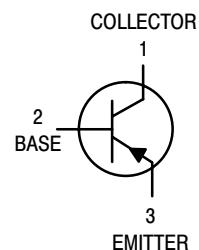
<http://onsemi.com>

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 @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	350 2.8	mW mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ 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

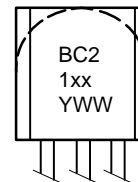
THERMAL CHARACTERISTICS

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



TO-92
CASE 29
STYLE 17

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

BC212, BC212B, BC213, BC214

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

Characteristic		Symbol	Min	Typ	Max	Unit
Collector–Emitter Breakdown Voltage (I _C = –2.0 mA _{dc} , I _B = 0)	BC212	V _{(BR)CEO}	–50	–	–	V _{dc}
	BC213		–30	–	–	
	BC214		–30	–	–	
Collector–Base Breakdown Voltage (I _C = –10 μA, I _E = 0)	BC212	V _{(BR)CBO}	–60	–	–	V _{dc}
	BC213		–45	–	–	
	BC214		–45	–	–	
Emitter–Base Breakdown Voltage (I _E = –10 μA _{dc} , I _C = 0)	BC212	V _{(BR)EBO}	–5	–	–	V _{dc}
	BC213		–5	–	–	
	BC214		–5	–	–	
Collector–Emitter Leakage Current (V _{CB} = –30 V)	BC212	I _{CBO}	–	–	–15	nA _{dc}
	BC213		–	–	–15	
	BC214		–	–	–15	
Emitter–Base Leakage Current (V _{EB} = –4.0 V, I _C = 0)	BC212	I _{EBO}	–	–	–15	nA _{dc}
	BC213		–	–	–15	
	BC214		–	–	–15	

ON CHARACTERISTICS

DC Current Gain (I _C = –10 μA _{dc} , V _{CE} = –5.0 V _{dc})	BC212	h _{FE}	40	–	–	–
	BC213		40	–	–	
	BC214		100	–	–	
(I _C = –2.0 mA _{dc} , V _{CE} = –5.0 V _{dc})	BC212		60	–	–	
	BC213		80	–	–	
	BC214		140	–	600	
(I _C = –100 mA _{dc} , V _{CE} = –5.0 V _{dc}) (Note 1.)	BC212, BC214		–	120	–	
	BC213		–	140	–	
Collector–Emitter Saturation Voltage (I _C = –10 mA _{dc} , I _B = –0.5 mA _{dc}) (I _C = –100 mA _{dc} , I _B = –5.0 mA _{dc}) (Note 1.)		V _{CE(sat)}	–	–0.10	–	V _{dc}
			–	–0.25	–0.6	
Base–Emitter Saturation Voltage (I _C = –100 mA _{dc} , I _B = –5.0 mA _{dc})		V _{BE(sat)}	–	–1.0	–1.4	V _{dc}
Base–Emitter On Voltage (I _C = –2.0 mA _{dc} , 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 _{dc} , V _{CE} = –5.0 V _{dc} , f = 100 MHz)	BC212	f _T	–	280	–	MHz
	BC214		–	320	–	
	BC213		–	360	–	
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 _{dc} , V _{CE} = –5.0 V _{dc} , R _S = 2.0 kΩ, f = 1.0 kHz)	BC214	NF	–	–	2	dB
	BC212, BC213		–	–	10	
Small–Signal Current Gain (I _C = –2.0 mA _{dc} , V _{CE} = –5.0 V _{dc} , f = 1.0 kHz)	BC212	h _{fe}	60	–	–	–
	BC213		80	–	–	
	BC214		140	–	–	
	BC212B		200	–	400	

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

BC212, BC212B, BC213, BC214

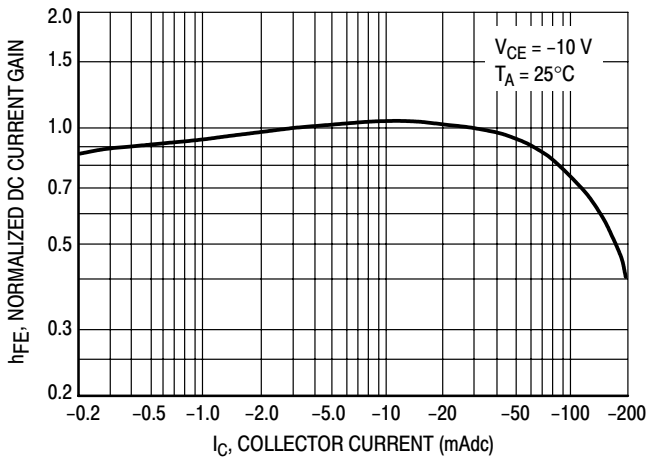


Figure 1. Normalized DC Current Gain

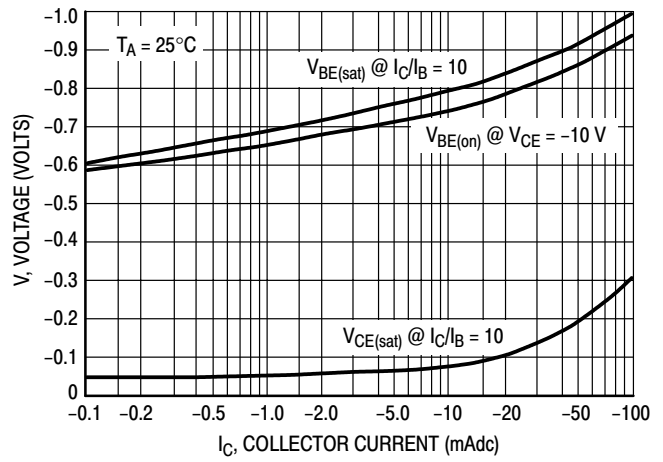


Figure 2. "Saturation" and "On" Voltages

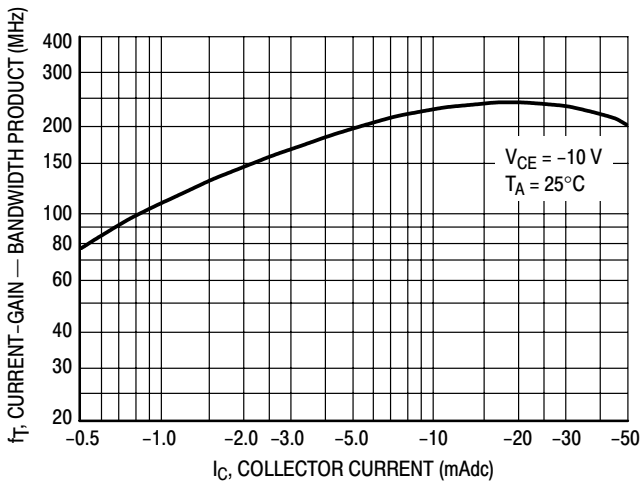


Figure 3. Current-Gain — Bandwidth Product

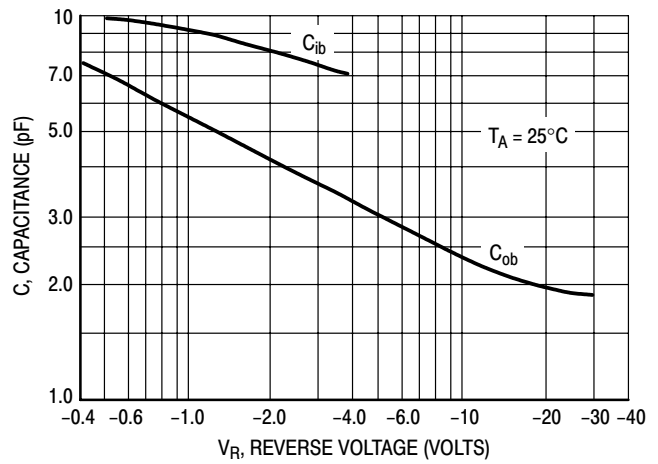


Figure 4. Capacitances

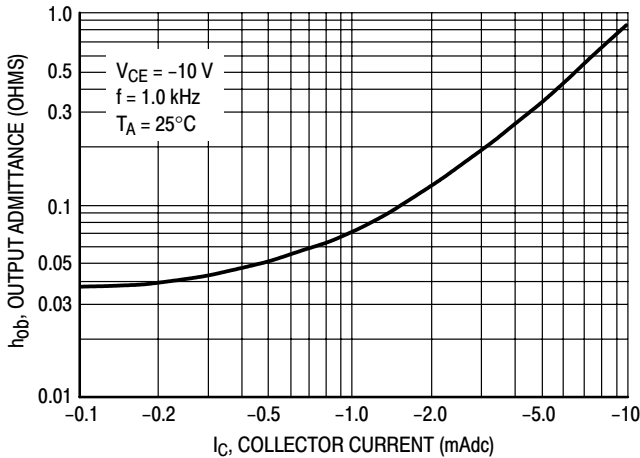


Figure 5. Output Admittance

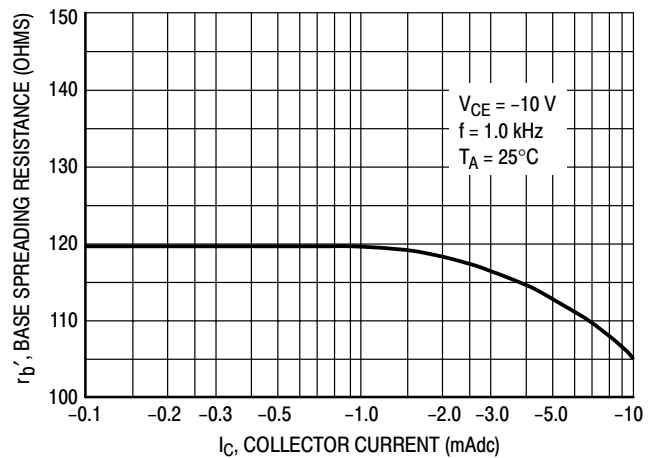
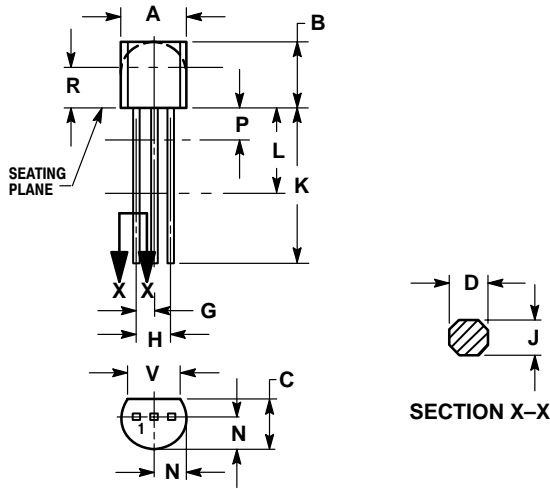


Figure 6. Base Spreading Resistance

BC212, BC212B, BC213, BC214

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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JAPAN: ON Semiconductor, Japan Customer Focus Center

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