

Amplifier Transistors

NPN Silicon

BC546B, BC547A, B, C, BC548B, C

Features

- Pb-Free Packages are Available*

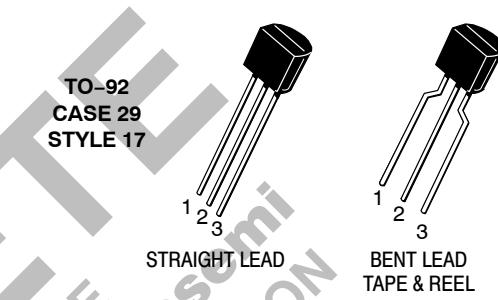
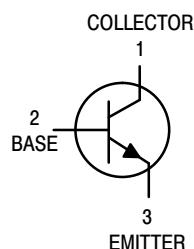
MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector - Emitter Voltage BC546 BC547 BC548	V _{CEO}	65 45 30	Vdc
Collector - Base Voltage BC546 BC547 BC548	V _{CBO}	80 50 30	Vdc
Emitter - Base Voltage	V _{EBO}	6.0	Vdc
Collector Current – Continuous	I _C	100	mAdc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	625 5.0	mW mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

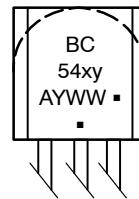
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	R _{θJA}	200	°C/W
Thermal Resistance, Junction-to-Case	R _{θJC}	83.3	°C/W

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.



MARKING DIAGRAM



x = 6, 7, or 8
 y = A, B or C
 A = Assembly Location
 Y = Year
 WW = Work Week
 ■ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

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

BC546B, BC547A, B, C, BC548B, C

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage ($I_C = 1.0 \text{ mA}, I_B = 0$)	$V_{(\text{BR})\text{CEO}}$	BC546 BC547 BC548	65 45 30	– – –	– – –
Collector – Base Breakdown Voltage ($I_C = 100 \mu\text{A}$)	$V_{(\text{BR})\text{CBO}}$	BC546 BC547 BC548	80 50 30	– – –	– – –
Emitter – Base Breakdown Voltage ($I_E = 10 \mu\text{A}, I_C = 0$)	$V_{(\text{BR})\text{EBO}}$	BC546 BC547 BC548	6.0 6.0 6.0	– – –	– – –
Collector Cutoff Current ($V_{CE} = 70 \text{ V}, V_{BE} = 0$) ($V_{CE} = 50 \text{ V}, V_{BE} = 0$) ($V_{CE} = 35 \text{ V}, V_{BE} = 0$) ($V_{CE} = 30 \text{ V}, T_A = 125^\circ\text{C}$)	I_{CES}	BC546 BC547 BC548 BC546/547/548	– – – –	0.2 0.2 0.2 –	15 15 15 4.0
ON CHARACTERISTICS					
DC Current Gain ($I_C = 10 \mu\text{A}, V_{CE} = 5.0 \text{ V}$)	h_{FE}	BC547A BC546B/547B/548B BC548C	– – –	90 150 270	– – –
($I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$)		BC546 BC547 BC548 BC547A BC546B/547B/548B BC547C/BC548C	110 110 110 110 200 420	– – – 180 290 520	450 800 800 220 450 800
($I_C = 100 \text{ mA}, V_{CE} = 5.0 \text{ V}$)		BC547A/548A BC546B/547B/548B BC548C	– – –	120 180 300	– – –
Collector – Emitter Saturation Voltage ($I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$) ($I_C = 100 \text{ mA}, I_B = 5.0 \text{ mA}$) ($I_C = 10 \text{ mA}, I_B = \text{See Note 1}$)	$V_{CE(\text{sat})}$		– – –	0.09 0.2 0.3	0.25 0.6 0.6
Base – Emitter Saturation Voltage ($I_C = 10 \text{ mA}, I_B = 0.5 \text{ mA}$)	$V_{BE(\text{sat})}$		–	0.7	–
Base – Emitter On Voltage ($I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V}$) ($I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}$)	$V_{BE(\text{on})}$		0.55 –	– –	0.7 0.77
SMALL-SIGNAL CHARACTERISTICS					
Current – Gain – Bandwidth Product ($I_C = 10 \text{ mA}, V_{CE} = 5.0 \text{ V}, f = 100 \text{ MHz}$)	f_T	BC546 BC547 BC548	150 150 150	300 300 300	– – –
Output Capacitance ($V_{CB} = 10 \text{ V}, I_C = 0, f = 1.0 \text{ MHz}$)	C_{obo}		–	1.7	4.5
Input Capacitance ($V_{EB} = 0.5 \text{ V}, I_C = 0, f = 1.0 \text{ MHz}$)	C_{ibo}		–	10	–
Small – Signal Current Gain ($I_C = 2.0 \text{ mA}, V_{CE} = 5.0 \text{ V}, f = 1.0 \text{ kHz}$)	h_{fe}	BC546 BC547/548 BC547A BC546B/547B/548B BC547C/548C	125 125 125 240 450	– – 220 330 600	500 900 260 500 900
Noise Figure ($I_C = 0.2 \text{ mA}, V_{CE} = 5.0 \text{ V}, R_S = 2 \text{ k}\Omega, f = 1.0 \text{ kHz}, \Delta f = 200 \text{ Hz}$)	NF	BC546 BC547 BC548	– – –	2.0 2.0 2.0	10 10 10

1. I_B is value for which $I_C = 11 \text{ mA}$ at $V_{CE} = 1.0 \text{ V}$.

BC546B, BC547A, B, C, BC548B, C

BC547/BC548

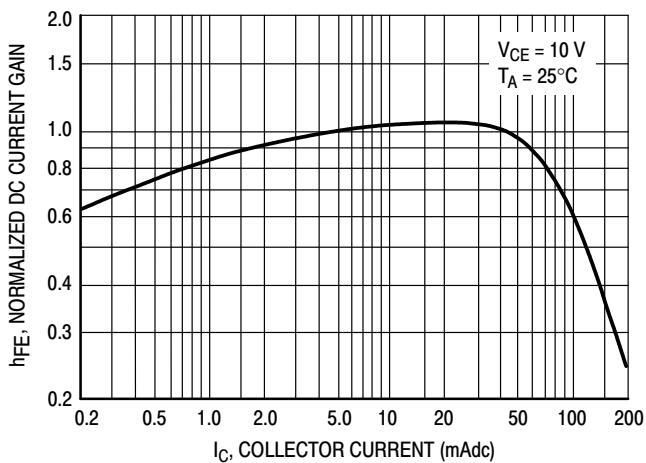


Figure 1. Normalized DC Current Gain

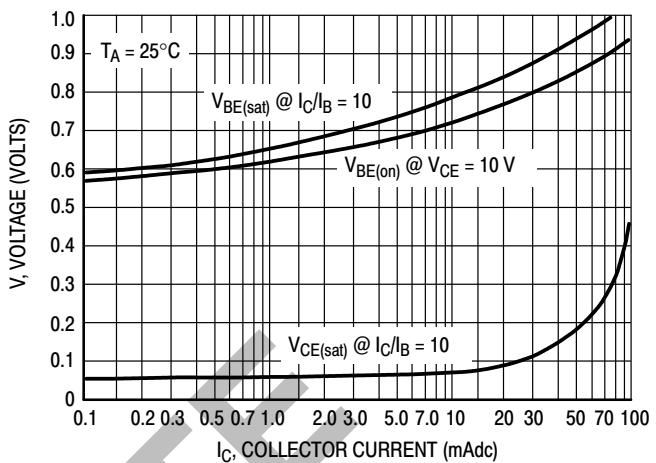


Figure 2. "Saturation" and "On" Voltages

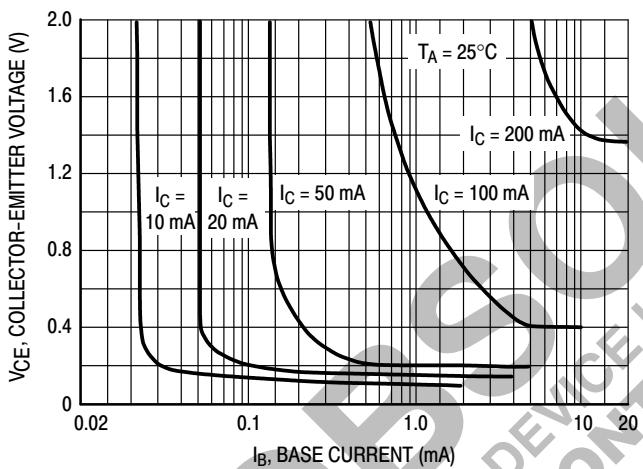


Figure 3. Collector Saturation Region

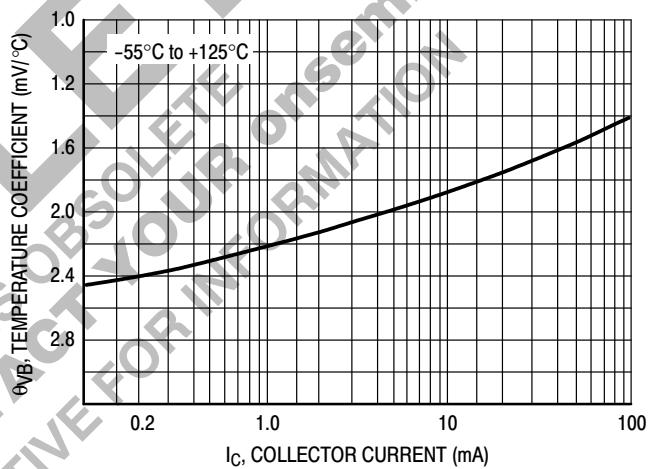


Figure 4. Base-Emitter Temperature Coefficient

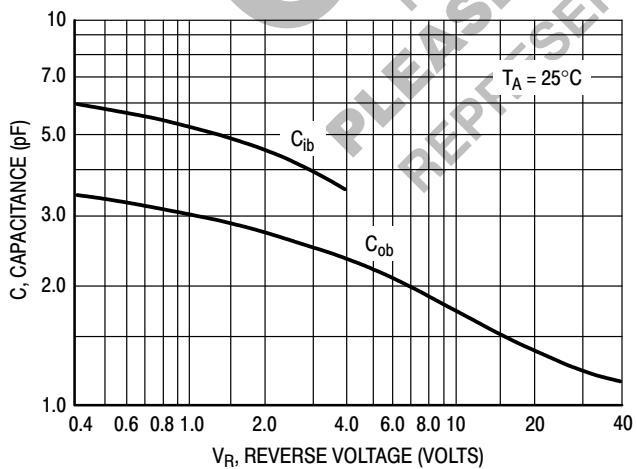


Figure 5. Capacitances

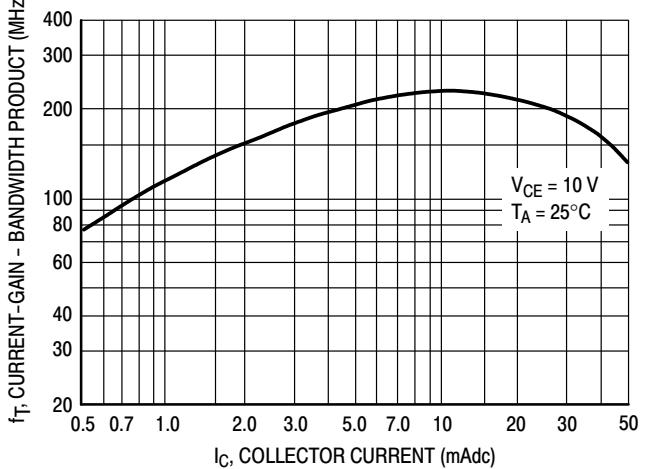


Figure 6. Current-Gain - Bandwidth Product

BC546B, BC547A, B, C, BC548B, C

BC546

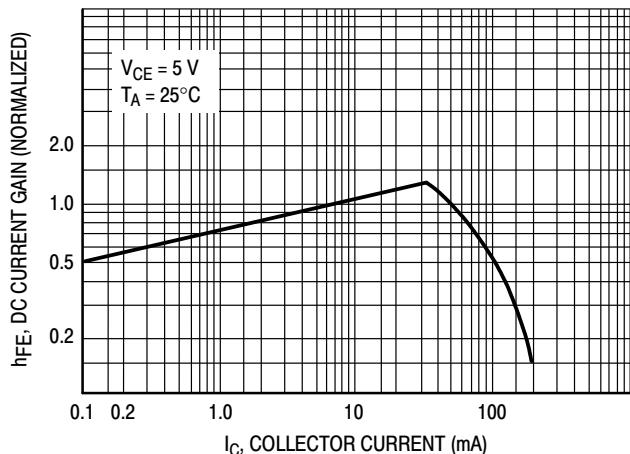


Figure 7. DC Current Gain

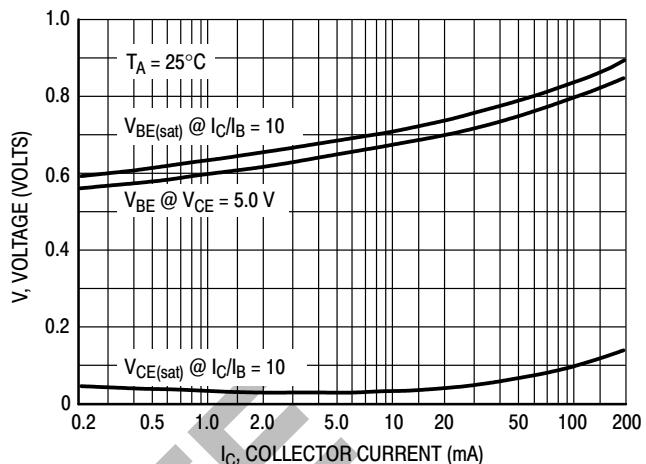


Figure 8. "On" Voltage

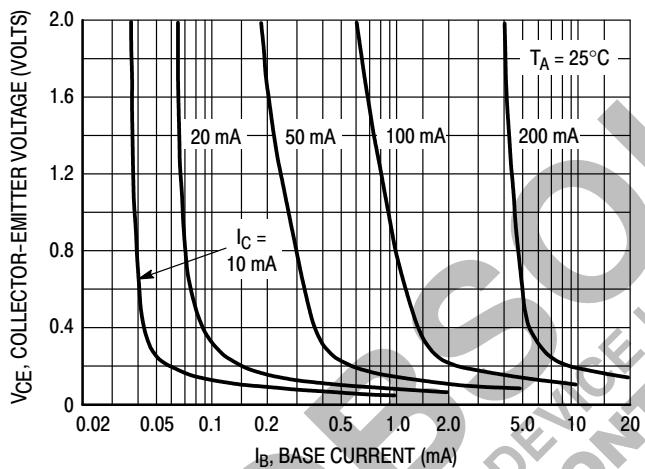


Figure 9. Collector Saturation Region

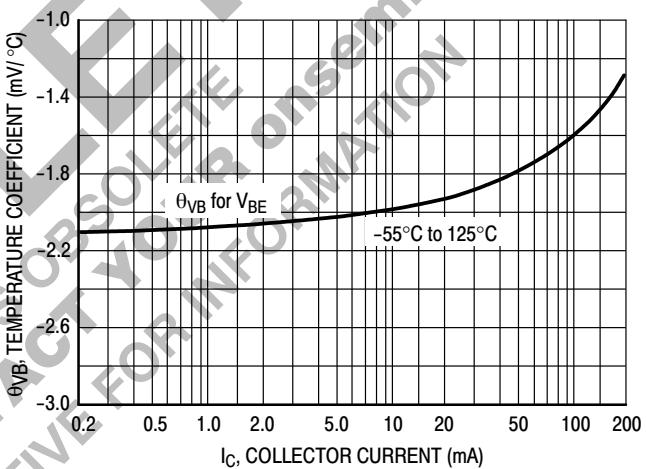


Figure 10. Base-Emitter Temperature Coefficient

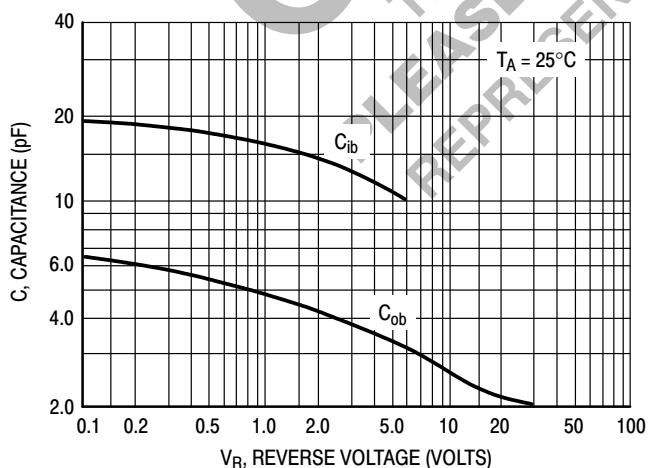


Figure 11. Capacitance

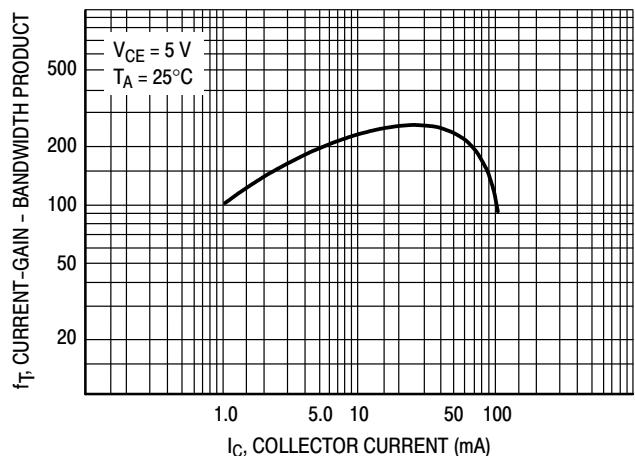


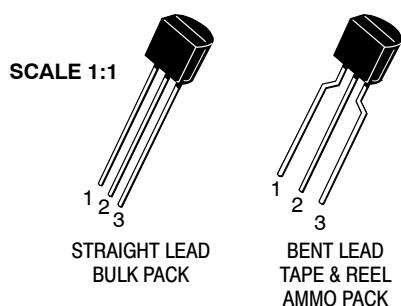
Figure 12. Current-Gain – Bandwidth Product

BC546B, BC547A, B, C, BC548B, C

ORDERING INFORMATION

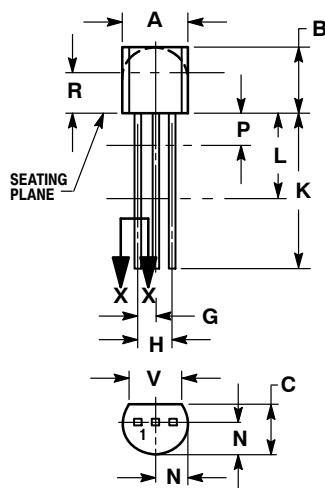
Device	Package	Shipping [†]
BC546B	TO-92	5000 Units / Bulk
BC546BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC546BRL1	TO-92	2000 / Tape & Reel
BC546BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC546BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547ARL	TO-92	2000 / Tape & Reel
BC547ARLG	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547AZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC547BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC547BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC547CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC547CZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC548BG	TO-92 (Pb-Free)	5000 Units / Bulk
BC548BRL1G	TO-92 (Pb-Free)	2000 / Tape & Reel
BC548BZL1G	TO-92 (Pb-Free)	2000 / Ammo Box
BC548CG	TO-92 (Pb-Free)	5000 Units / Bulk
BC548CZL1G	TO-92 (Pb-Free)	2000 / Ammo Box

[†]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.

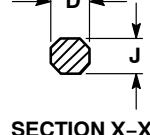


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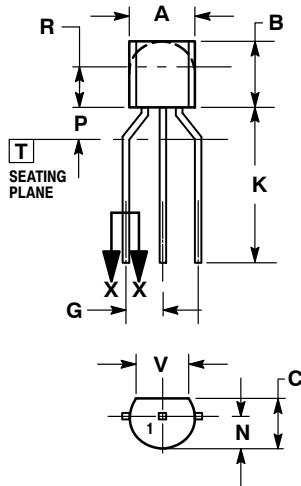


STRAIGHT LEAD
BULK PACK

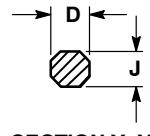


NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
 4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

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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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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