

# 2N3634, 2N3634L, 2N3635, 2N3635L, 2N3636, 2N3636L, 2N3637, 2N3637L



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## Low Power Transistors

### PNP Silicon

#### Features

- MIL-PRF-19500/357 Qualified
- Available as JAN, JANTX, JANTXV and JANHC

#### MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	2N3634/L 2N3635/L	2N3636/L 2N3637/L	Unit
Collector-Emitter Voltage	$V_{CEO}$	-140	-175	Vdc
Collector-Base Voltage	$V_{CBO}$	-140	-175	Vdc
Emitter-Base Voltage	$V_{EBO}$	-5.0		Vdc
Collector Current - Continuous	$I_C$	1.0		Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$	$P_T$	1.0		W
Total Device Dissipation @ $T_C = 25^\circ\text{C}$	$P_T$	5.0		W
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$

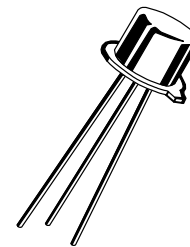
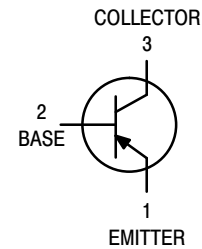
#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	175	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	35	$^\circ\text{C/W}$

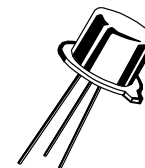
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

#### ORDERING INFORMATION

Level	Device	Package	Shipping
JAN JANTX JANTXV JANHC	2N3634	TO-39	Bulk
	2N3635		
	2N3636		
	2N3637		
	2N3634L	TO-5	Bulk
	2N3635L		
	2N3636L		
	2N3637L		



TO-5  
CASE 205AA  
STYLE 1  
2N3634L  
2N3635L  
2N3636L  
2N3637L



TO-39  
CASE 205AB  
STYLE 1  
2N3634  
2N3635  
2N3636  
2N3637

# 2N3634, 2N3634L, 2N3635, 2N3635L, 2N3636, 2N3636L, 2N3637, 2N3637L

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Breakdown Voltage (I <sub>C</sub> = –10 mA)	V <sub>(BR)CEO</sub>	–140 –175	– –	V
Emitter–Base Cutoff Current (V <sub>EB</sub> = –3.0 V) (V <sub>EB</sub> = –5.0 V)	I <sub>EBO</sub>	– –	–50 –10	nA μA
Collector–Emitter Cutoff Current (V <sub>CE</sub> = –100 V)	I <sub>CEO</sub>	–	–10	μA
Collector–Base Cutoff Current (V <sub>CB</sub> = –100 V) (V <sub>CB</sub> = –140 V) (V <sub>CB</sub> = –175 V)	I <sub>CBO</sub>	– – –	–100 –10 –10	nA μA μA

## ON CHARACTERISTICS (Note 1)

DC Current Gain (I <sub>C</sub> = –0.1 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –1.0 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –10 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –50 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –150 mA, V <sub>CE</sub> = –10 V)	2N3634, 2N3636	h <sub>FE</sub>	25 45 50 50 30	– – – 150 –	–
DC Current Gain (I <sub>C</sub> = –0.1 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –1.0 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –10 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –50 mA, V <sub>CE</sub> = –10 V) (I <sub>C</sub> = –150 mA, V <sub>CE</sub> = –10 V)	2N3635, 2N3637	h <sub>FE</sub>	55 90 100 100 60	– – – 300 –	–
Collector–Emitter Saturation Voltage (I <sub>C</sub> = –10 mA, I <sub>B</sub> = –1.0 mA) (I <sub>C</sub> = –50 mA, I <sub>B</sub> = –5.0 mA)	V <sub>CE(sat)</sub>	– –	–0.3 –0.6		V
Base–Emitter Saturation Voltage (I <sub>C</sub> = –10 mA, I <sub>B</sub> = –1.0 mA) (I <sub>C</sub> = –50 mA, I <sub>B</sub> = –5.0 mA)	V <sub>BE(sat)</sub>	– –0.65	–0.8 –0.9		V

## SMALL-SIGNAL CHARACTERISTICS

Magnitude of Small–Signal Current Gain (I <sub>C</sub> = –30 mA, V <sub>CE</sub> = –30 V, f = 100 MHz)	2N3634, 2N3636 2N3635, 2N3637	h <sub>fe</sub>	1.5 2.0	8.0 8.5	–
Small–Signal Current Gain (I <sub>C</sub> = –10 mA, V <sub>CE</sub> = –10 V, f = 1 kHz)	2N3634, 2N3636 2N3635, 2N3637	h <sub>fe</sub>	40 80	160 320	–
Output Capacitance (V <sub>CB</sub> = –20 V, I <sub>E</sub> = 0 A, 100 kHz ≤ f ≤ 1.0 MHz)		C <sub>obo</sub>	–	10	pF
Input Capacitance (V <sub>EB</sub> = –1.0 V, I <sub>C</sub> = 0 A, 100 kHz ≤ f ≤ 1.0 MHz)		C <sub>ibo</sub>	–	75	pF
Noise Figure (V <sub>CE</sub> = –10 V, I <sub>C</sub> = –0.5 mA, R <sub>g</sub> = 1 kΩ, f = 100 Hz) (V <sub>CE</sub> = –10 V, I <sub>C</sub> = –0.5 mA, R <sub>g</sub> = 1 kΩ, f = 1.0 kHz) (V <sub>CE</sub> = –10 V, I <sub>C</sub> = –0.5 mA, R <sub>g</sub> = 1 kΩ, f = 10 kHz)		NF	– – –	5.0 3.0 3.0	dB

## SWITCHING CHARACTERISTICS

Delay Time (Reference Figure 11 in MIL–PRF–19500/357)	t <sub>d</sub>	–	100	ns
Rise Time (Reference Figure 11 in MIL–PRF–19500/357)	t <sub>r</sub>	–	100	ns
Storage Time (Reference Figure 11 in MIL–PRF–19500/357)	t <sub>s</sub>	–	500	ns
Fall Time (Reference Figure 11 in MIL–PRF–19500/357)	t <sub>f</sub>	–	150	ns
Turn–Off Time (Reference Figure 11 in MIL–PRF–19500/357)	t <sub>off</sub>	–	600	ns

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

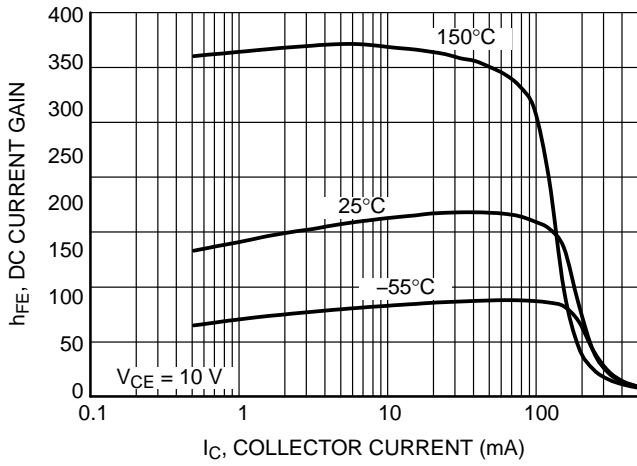


Figure 1. DC Current Gain

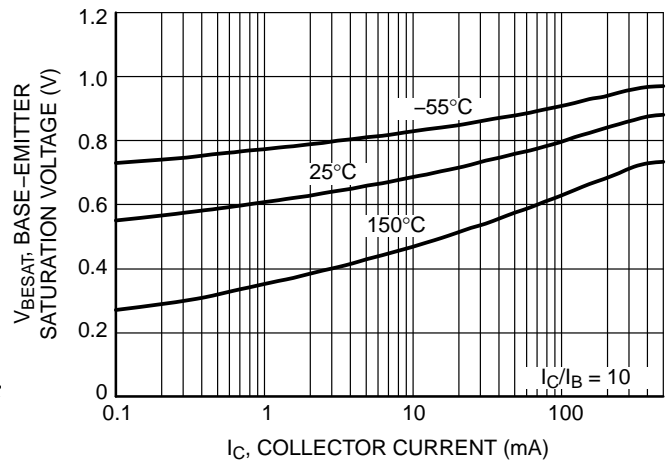


Figure 2. Base-Emitter Saturation Voltage

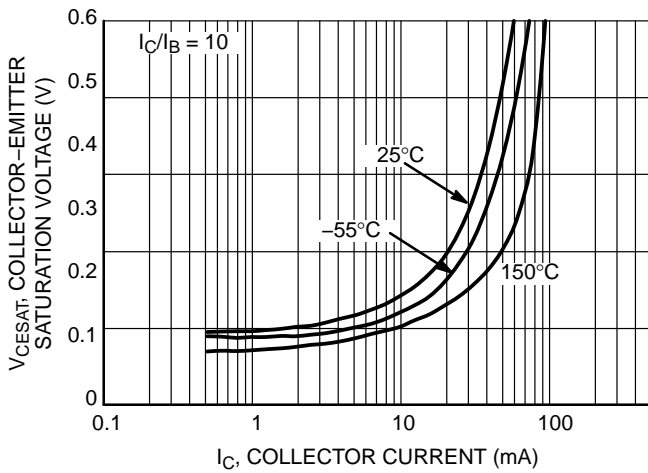


Figure 3. Collector-Emitter Saturation Voltage

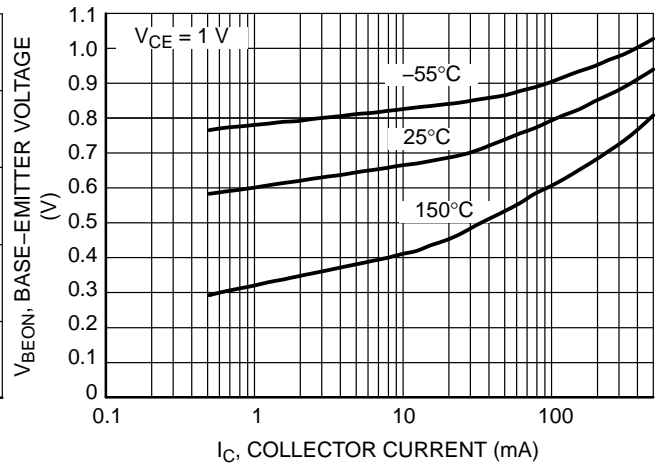


Figure 4. Base-Emitter Voltage

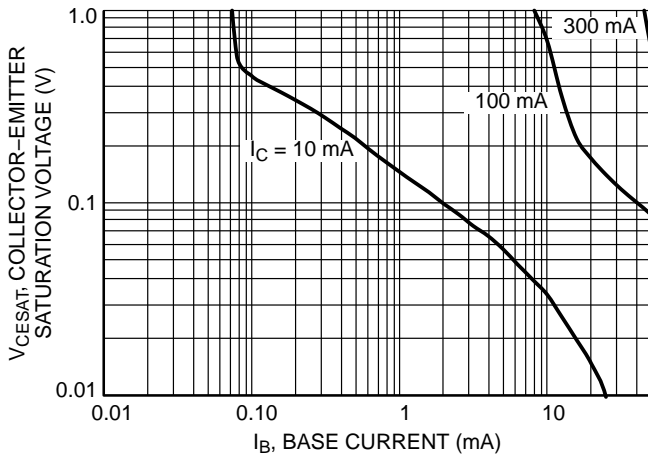


Figure 5. Collector Saturation Region

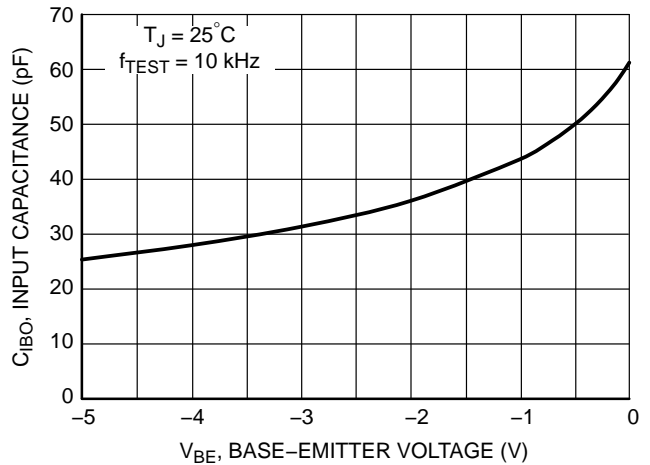
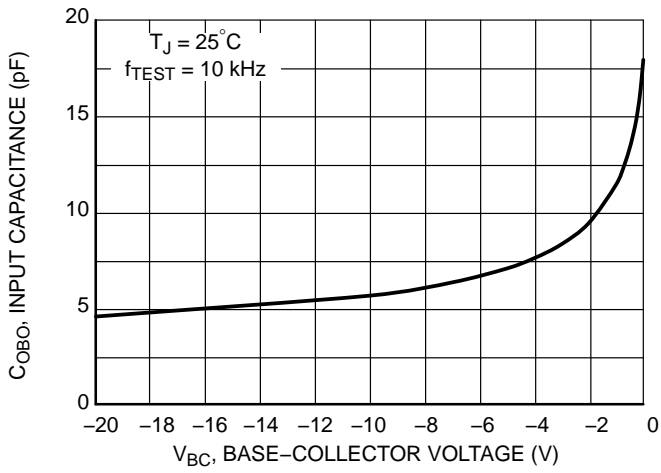
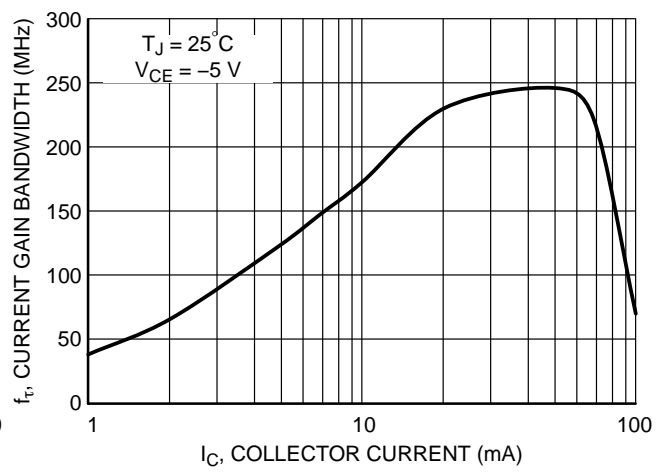


Figure 6. Input Capacitance

**2N3634, 2N3634L, 2N3635, 2N3635L, 2N3636, 2N3636L, 2N3637, 2N3637L**



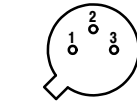
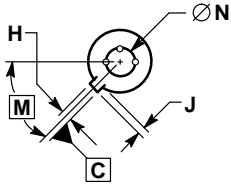
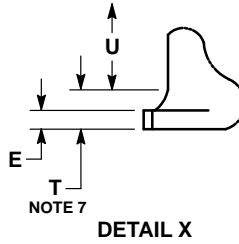
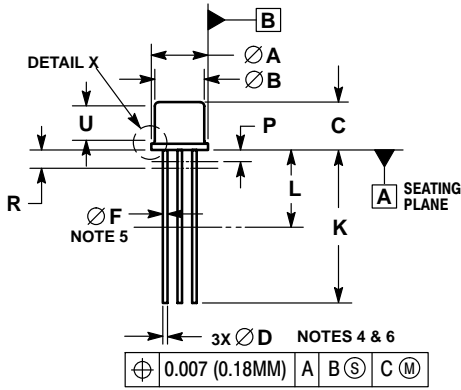
**Figure 7. Output Capacitance**



**Figure 8. Current Gain Bandwidth Product**

PACKAGE DIMENSIONS

TO-5 3-Lead  
CASE 205AA  
ISSUE B



LEAD IDENTIFICATION  
DETAIL

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION J MEASURED FROM DIAMETER A TO EDGE.
4. LEAD TRUE POSITION TO BE DETERMINED AT THE GAUGE PLANE DEFINED BY DIMENSION R.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L.
6. DIMENSION D APPLIES BETWEEN DIMENSION L AND K.
7. BODY CONTOUR OPTIONAL WITHIN ZONE DEFINED BY DIMENSIONS A, B, AND T.
8. DIMENSION B SHALL NOT VARY MORE THAN 0.010 IN ZONE P.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.89	9.40	0.350	0.370
B	8.00	8.51	0.315	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.53	0.016	0.021
E	0.23	3.18	0.009	0.125
F	0.41	0.48	0.016	0.019
H	0.71	0.86	0.028	0.034
J	0.73	1.02	0.029	0.040
K	38.10	44.45	1.500	1.750
L	6.35	---	0.250	---
M	45° BSC		45° BSC	
N	5.08 BSC		0.200 BSC	
P	---	1.27	---	0.050
R	1.37 BSC		0.054 BSC	
T	---	0.76	---	0.030
U	2.54	---	0.100	---

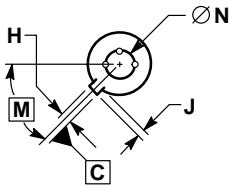
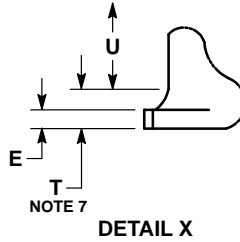
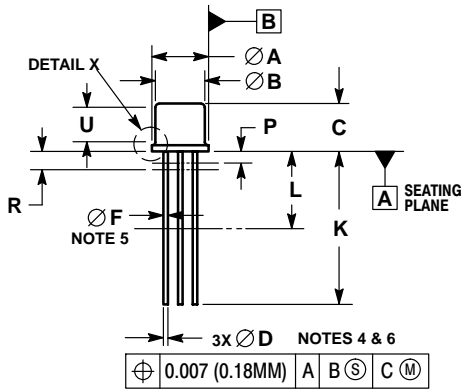
STYLE 1:

1. PIN 1. EMITTER
2. BASE
3. COLLECTOR

# 2N3634, 2N3634L, 2N3635, 2N3635L, 2N3636, 2N3636L, 2N3637, 2N3637L

## PACKAGE DIMENSIONS

### TO-39 3-Lead CASE 205AB ISSUE A



#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSION J MEASURED FROM DIAMETER A TO EDGE.
4. LEAD TRUE POSITION TO BE DETERMINED AT THE GAUGE PLANE DEFINED BY DIMENSION R.
5. DIMENSION F APPLIES BETWEEN DIMENSION P AND L.
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8. DIMENSION B SHALL NOT VARY MORE THAN 0.010 IN ZONE P.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.89	9.40	0.350	0.370
B	8.00	8.51	0.315	0.335
C	6.10	6.60	0.240	0.260
D	0.41	0.48	0.016	0.019
E	0.23	3.18	0.009	0.125
F	0.41	0.48	0.016	0.019
H	0.71	0.86	0.028	0.034
J	0.73	1.02	0.029	0.040
K	12.70	14.73	0.500	0.580
L	6.35	---	0.250	---
M	45° BSC		45° BSC	
N	5.08 BSC		0.200 BSC	
P	---	1.27	---	0.050
R	1.37 BSC		0.054 BSC	
T	---	0.76	---	0.030
U	2.54	---	0.100	---

#### STYLE 1:

- PIN 1. EMITTER
2. BASE
3. COLLECTOR

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