

# 2N3440

## Product Preview Low Power Transistor

### NPN Silicon

#### Features

- MIL-PRF-19500/368 Qualified
- Available as JAN, JANTX, and JANTXV
- Hermetically Sealed Commercial Product with Option for Military Temperature Range Screening

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

Characteristic	Symbol	Value	Unit
Collector - Emitter Voltage	$V_{CEO}$	250	Vdc
Collector - Base Voltage	$V_{CBO}$	300	Vdc
Emitter - Base Voltage	$V_{EBO}$	7.0	Vdc
Collector Current - Continuous	$I_C$	1.0	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$	$P_T$	800	mW
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

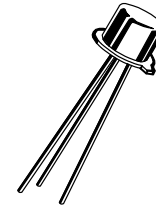
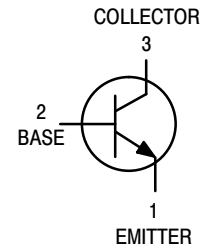
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	175	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	30	$^\circ\text{C}/\text{W}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.



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TO-39  
CASE 205AB  
STYLE 1

#### ORDERING INFORMATION

Device	Package	Shipping
2N3440	TO-39	Bulk

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

## 2N3440

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

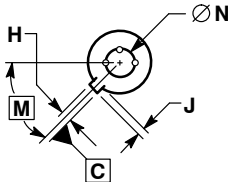
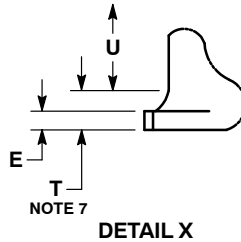
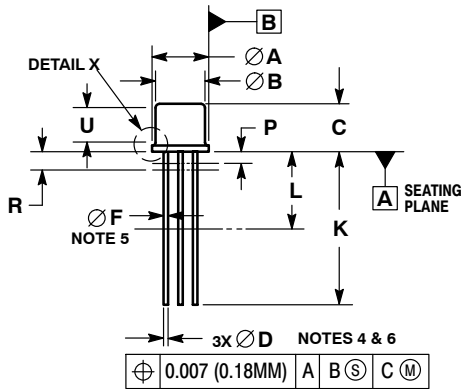
Characteristic	Symbol	Min	Max	Unit
<b>ON CHARACTERISTICS</b>				
Emitter-Base Cutoff Current ( $V_{EB} = 7.0\text{ Vdc}$ )	$I_{EBO}$	-	10	$\mu\text{Adc}$
Collector-Emitter Cutoff Current ( $V_{CE} = 200\text{ Vdc}$ )	$I_{CEO}$	-	2.0	$\mu\text{Adc}$
Collector-Emitter Cutoff Current ( $V_{CE} = 300\text{ Vdc}$ , $V_{BE} = -1.5\text{ Vdc}$ )	$I_{CEX}$	-	5.0	$\mu\text{Adc}$
Collector-Base Cutoff Current ( $V_{CE} = 250\text{ Vdc}$ ) ( $V_{CE} = 300\text{ Vdc}$ ) ( $V_{CE} = 250\text{ Vdc}$ , $T_A = 150^\circ\text{C}$ )	$I_{CBO}$	- - -	2.0 5.0 6.0	$\mu\text{Adc}$
DC Current Gain (Note 1) ( $I_C = 0.2\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 2.0\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 20\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ ) ( $I_C = 20\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $T_A = -55^\circ\text{C}$ )	$h_{FE}$	10 30 40 15	- - 160 -	-
Collector-Emitter Saturation Voltage (Note 1) ( $I_C = 50\text{ mAdc}$ , $I_B = 4.0\text{ mAdc}$ )	$V_{CE(sat)}$	-	0.5	Vdc
Base-Emitter Saturation Voltage (Note 1) ( $I_C = 50\text{ mAdc}$ , $I_B = 4.0\text{ mAdc}$ )	$V_{BE(sat)}$	-	1.3	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $100\text{ kHz} \leq f \leq 1.0\text{ MHz}$ )	$C_{obo}$	-	10	pF
Input Capacitance ( $V_{CB} = 5.0\text{ Vdc}$ , $I_E = 0$ , $100\text{ kHz} \leq f \leq 1.0\text{ MHz}$ )	$C_{ibo}$	-	75	pF
Small-Signal Short-Circuit Forward Current Transfer Ratio ( $I_C = 5.0\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{fe}$	25	-	-
Small-Signal Current Gain ( $I_C = 10\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 5.0\text{ MHz}$ )	$ h_{fe} $	3.0	15	-
<b>SWITCHING CHARACTERISTICS</b>				
Turn-on Time (Note 2) ( $V_{CC} = 200\text{ Vdc}$ , $I_C = 20\text{ mAdc}$ , $I_{B1} = 2.0\text{ mAdc}$ )	$t_{on}$	-	1.0	$\mu\text{s}$
Turn-off Time (Note 2) ( $V_{CC} = 200\text{ Vdc}$ , $I_C = 20\text{ mAdc}$ , $I_{B1} = -I_{B2} = 2.0\text{ mAdc}$ )	$t_{off}$	-	10	$\mu\text{s}$

1. Pulse Test: See section 4 of MIL-STD-750.
2. See Figure 14 in MIL-PRF-19500/368.

# 2N3440

## PACKAGE DIMENSIONS

### TO-39 3-Lead CASE 205AB-01 ISSUE O



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	0.48	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:

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

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