2N2219, 2N2219A, 2N2219AL

Small Signal Switching Transistor

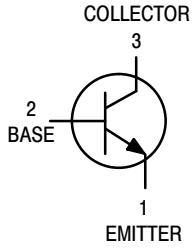
NPN Silicon

ON Semiconductor®

http://onsemi.com

Features

- MIL−PRF−19500/251 Qualified
- Available as JAN, JANTX, and JANTXV



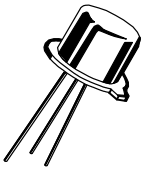
MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Value	Unit
Collector − Emitter Voltage	V_{CEO}	50	Vdc
Collector − Base Voltage	V_{CBO}	75	Vdc
Emitter − Base Voltage	V_{EBO}	6.0	Vdc
Collector Current − Continuous	I_C	800	mAdc
Total Power Dissipation @ T_A = 25°C	P_T	0.8	W
Total Power Dissipation @ T_C = 25°C	P_T	3.0	W
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200	°C

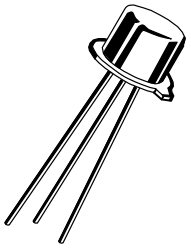
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	50	°C/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.



TO−39
CASE 205AB
(2N2219, 2N2219A)



TO−5
CASE 205AA
(2N2219AL)

ORDERING INFORMATION

Device	Package	Shipping
JAN2N2219/A	TO−39	Bulk
JANTX2N2219/A		
JANTXV2N2219/A		
JAN2N2219AL	TO−5	Bulk
JANTX2N2219AL		
JANTXV2N2219AL		

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector−Emitter Breakdown Voltage		$V_{(BR)CEO}$			Vdc
(I_E = 10 mAdc)	2N2219		30	–	
	2N2219A/AL		50	–	
Emitter−Base Cutoff Current		I_{EBO}			
(V_{EB} = 5.0 Vdc)	2N2219		–	10	μAdc
(V_{EB} = 6.0 Vdc)	2N2219A/AL		–	10	μAdc
(V_{EB} = 4.0 Vdc)	All		–	10	nAdc
Collector−Emitter Cutoff Current		I_{CES}			
(V_{CE} = 30 Vdc)	2N2219		–	10	nAdc
(V_{CE} = 50 Vdc)	2N2219A/AL		–	10	nAdc
Collector−Base Cutoff Current		I_{CBO}			
(V_{CB} = 50 Vdc)	2N2219		–	10	nAdc
(V_{CB} = 60 Vdc)	2N2219		–	10	μAdc
(V_{CB} = 60 Vdc)	2N2219A/AL		–	10	nAdc
(V_{CB} = 75 Vdc)	2N2219A/AL		–	10	μAdc
ON CHARACTERISTICS (Note 1)					
DC Current Gain		h_{FE}			–
(I_C = 0.1 mAdc, V_{CE} = 10 Vdc)	2N2219		35	–	
	2N2219A/AL		50	–	
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc)	2N2219		50	325	
	2N2219A/AL		75	325	
(I_C = 10 mAdc, V_{CE} = 10 Vdc)	2N2219		75	–	
	2N2219A/AL		100	–	
(I_C = 150 mAdc, V_{CE} = 10 Vdc)	2N2219/A/AL		100	300	
(I_C = 500 mAdc, V_{CE} = 10 Vdc)	2N2219/A/AL		30	–	
Collector−Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)	2N2219		–	0.4	
	2N2219A/AL		–	0.3	
(I_C = 500 mAdc, I_B = 50 mAdc)	2N2219		–	1.6	
	2N2219A/AL		–	1.0	
Base−Emitter Saturation Voltage		$V_{BE(sat)}$			Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)	2N2219		0.6	1.3	
	2N2219A/AL		0.6	1.2	
(I_C = 500 mAdc, I_B = 50 mAdc)	2N2219		–	2.6	
	2N2219A/AL		–	2.0	
SMALL−SIGNAL CHARACTERISTICS					
Magnitude of Small−Signal Current Gain		$\|h_{fe}\|$			–
(I_C = 20 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)			2.5	12	
Small−Signal Current Gain		h_{fe}			–
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1 kHz)	2N2219		50	–	
	2N2219A/AL		75	–	
Output Capacitance		C_{obo}			pF
(V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz)			–	8.0	
Input Capacitance		C_{ibo}			pF
(V_{EB} = 0.5 Vdc, I_C = 0, 100 kHz ≤ f ≤ 1.0 MHz)			–	25	
SWITCHING CHARACTERISTICS					
Turn−On Time		t_{on}			ns
(Reference Figure in MIL−PRF−19500/251)	2N2219		–	40	
	2N2219A/AL		–	35	
Turn−Off Time		t_{off}			ns
(Reference Figure in MIL−PRF−19500/251)	2N2219		–	250	
	2N2219A/AL		–	300	

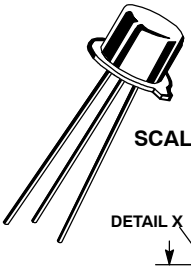
1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

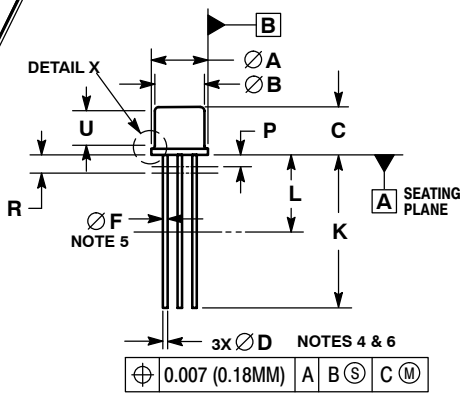
ON Semiconductor®

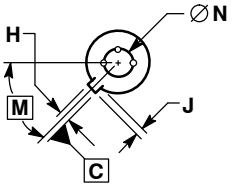
TO–5 3–Lead
CASE 205AA
ISSUE B

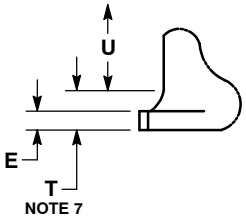
DATE 06 JUL 2012



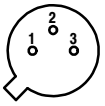
SCALE 1:1







DETAIL X



LEAD IDENTIFICATION DETAIL

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

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 GUAGE 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.

	MILLIMETERS		INCHES	
DIM	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	---

DOCUMENT NUMBER:	**98AON49138E**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
STATUS:	**ON SEMICONDUCTOR STANDARD**	
NEW STANDARD:		
DESCRIPTION:	**TO–5 3–LEAD**	**PAGE 1 OF 2**

ISSUE	REVISION	DATE
O	RELEASED FOR PRODUCTION. REQ. BY B. JENSEN.	18 MAR 2010
A	CHANGED DIMENSION “D” MAX TO 0.53 MM (0.021 IN). REQ. BY B. JENSEN.	10 AUG 2010
B	MADE ISOMETRIC IMAGE LARGER TO REFLECT ACTUAL SIZE. REQ. BY J. FULTON.	06 JUL 2012

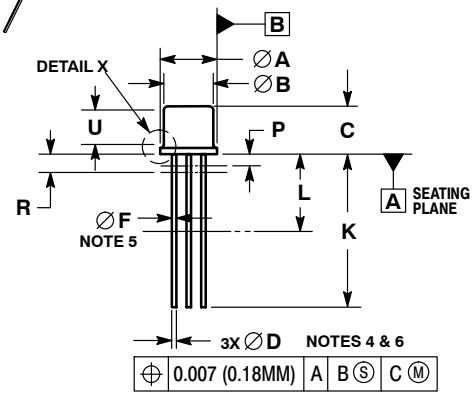
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

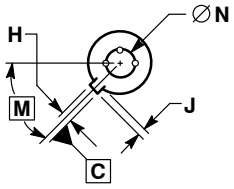
ON Semiconductor®

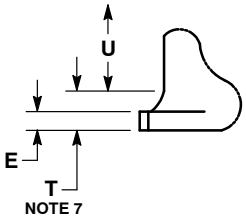
TO−39 3−Lead
CASE 205AB
ISSUE A

DATE 25 JUN 2012

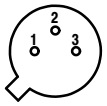
SCALE 1:1







DETAIL X



LEAD IDENTIFICATION DETAIL

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

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 GUAGE 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.

	MILLIMETERS		INCHES	
DIM	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	---

DOCUMENT NUMBER:	98AON49134E	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
STATUS:	ON SEMICONDUCTOR STANDARD	
NEW STANDARD:		
DESCRIPTION:	TO−39 3−LEAD	PAGE 1 OF 2

ISSUE	REVISION	DATE
O	RELEASED FOR PRODUCTION. REQ. BY B. JENSEN.	18 MAR 2010
A	MADE ISOMETRIC IMAGE LARGER TO REFLECT ACTUAL SIZE. REQ. BY J. FULTON.	25 JUN 2012

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Email Requests to: orderlit@onsemi.com

ON Semiconductor Website: www.onsemi.com

TECHNICAL SUPPORT
North American Technical Support:
Voice Mail: 1 800−282−9855 Toll Free USA/Canada
Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support:
Phone: 00421 33 790 2910
For additional information, please contact your local Sales Representative

◊