

Product Overview

Qualified per MIL-PRF-19500/255.

Devices

2N2906A
2N2907A
2N2906AL
2N2907AL
2N2906AUA
2N2907AUA
2N2906AUB
2N2907AUB
2N2906AUBC
2N2907AUBC

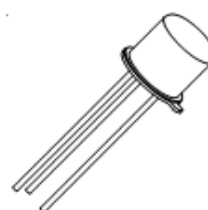
Levels

JANTXVM – 3K Rads (Si)
JANTXVD – 10K Rads (Si)
JANTXVP – 30K Rads (Si)
JANTXVL – 50K Rads (Si)
JANTXVR – 100K Rads (Si)
JANTXVF – 300K Rads (Si)
JANSE – 30K Rads (Si)¹
JANSK – 50K Rads (Si)¹
JANSU – 100K Rads (Si)¹
JANSM – 3K Rads (Si)
JANS D – 10K Rads (Si)
JANSP – 30K Rads (Si)
JANSL – 50K Rads (Si)
JANSR – 100K Rads (Si)
JANSF – 300K Rads (Si)
JANS G – 500K Rads (Si)
JANS H – 1MEG Rads (Si)

Note:

1. Tested to low dose rate

Figure 1. TO-18 (TO-206AA)



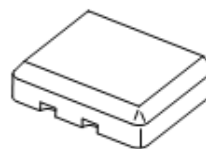
2N2906A, 2N2907A

Figure 2. 4 PIN



2N2906AUA, 2N2907AUA

Figure 3. 3 PIN



2N2906AUB, 2N2907AUB
2N2906AUBC, 2N2907AUBC
(UBC = Ceramic Lid Version)

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1. Maximum Ratings

Table 1-1. Maximum Ratings at 25 °C Unless Otherwise Noted

Parameters / Test Conditions	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	60	Vdc
Collector-base voltage	V_{CBO}	60	Vdc
Emitter-base voltage	V_{EBO}	5.0	Vdc
Collector current	I_C	600	mAdc
Total power dissipation at $T_A = +25\text{ °C}$	P_T ¹	0.5	W
Operating and storage junction temperature range	T_{op}, T_{stg}	–65 to +200	°C

Note:

1. See MIL-PRF-19500/291 for derating curves.

1.1 Thermal Characteristics

Table 1-2. Thermal Characteristics

Parameters / Test Conditions	Symbol	Max.	Unit
Thermal resistance, junction-to-ambient	$R_{\theta JA}$ ¹	325	°C/W

Note:

1. See MIL-PRF-19500/291 for derating curves.

2. Electrical Characteristics

Table 2-1. Electrical Characteristics at 25 °C Unless Otherwise Stated

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Off Characteristics					
Collector-emitter breakdown voltage					
I _C = 10 mAdc		V _{(BR)CEO}	60	—	Vdc
Collector-base cutoff current					
V _{CB} = 60 Vdc V _{CB} = 50 Vdc		I _{CBO}	—	10 10	μAdc ηAdc
Emitter-base cutoff current					
V _{EB} = 5.0 Vdc V _{EB} = 4.0 Vdc		I _{EBO}	—	10 50	μAdc ηAdc
Collector-emitter cutoff current					
V _{CE} = 50 Vdc		I _{CES}	—	50	ηAdc
On Characteristics ¹					
Forward-current transfer ratio					
I _C = 0.1 mAdc, V _{CE} = 10Vdc	2N2906A, L, UA, UB, UBC 2N2907A, L, UA, UB, UBC	h _{FE}	40 75	—	—
I _C = 1.0 mAdc, V _{CE} = 10 Vdc	2N2906A, L, UA, UB, UBC 2N2907A, L, UA, UB, UBC		40 100	175 450	—
I _C = 10 mAdc, V _{CE} = 10 Vdc	2N2906A, L, UA, UB, UBC 2N2907A, L, UA, UB, UBC		40 100	—	—
I _C = 150mAdc, V _{CE} = 10 Vdc	2N2906A, L, UA, UB, UBC 2N2907A, L, UA, UB, UBC		40 100	120 300	—
I _C = 500 mAdc, V _{CE} = 10 Vdc	2N2906A, L, UA, UB, UBC 2N2907A, L, UA, UB, UBC		40 50	—	—
Collector-Emitter saturation voltage					
I _C = 150 mAdc, I _B = 15 mAdc I _C = 500 mAdc, I _B = 50 mAdc		V _{CE(sat)}	—	0.4 1.6	Vdc
Base-Emitter Voltage					
I _C = 150 mAdc, I _B = 15 mAdc I _C = 500 mAdc, I _B = 50 mAdc		V _{BE(sat)}	0.6	1.3 2.6	Vdc

Note:

1. Pulse test: pulse width = 300 μs , duty cycle $\leq 2.0\%$.

3. Dynamic Characteristics

Table 3-1. Dynamic Characteristics

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Small-signal short-circuit forward current transfer ratio				
$I_C = 1.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$ 2N2906A, L, UA, UB, UBC 2N2907A, L, UA, UB, UBC	h_{fe}	40 100	—	—
Magnitude of small-signal short-circuit Forward current transfer ratio				
$I_C = 20 \text{ mAdc}$, $V_{CE} = 20 \text{ Vdc}$, $f = 100 \text{ MHz}$	$ h_{fe} $	2.0	—	—
Output capacitance				
$V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}	—	8.0	pF
Input capacitance				
$V_{EB} = 2.0 \text{ Vdc}$, $I_C = 0$, $100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{ibo}	—	30	pF

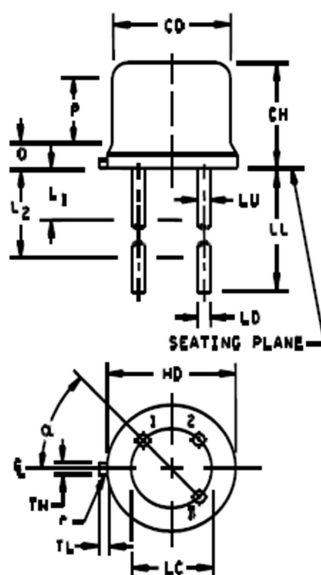
3.1 Switching Characteristics

Table 3-2. Switching Characteristics

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-on time See MIL-PRF-19500/291	t_{on}	—	45	ns
Turn-off time See MIL-PRF-19500/291	t_{off}	—	300	ns

4. Package Dimensions

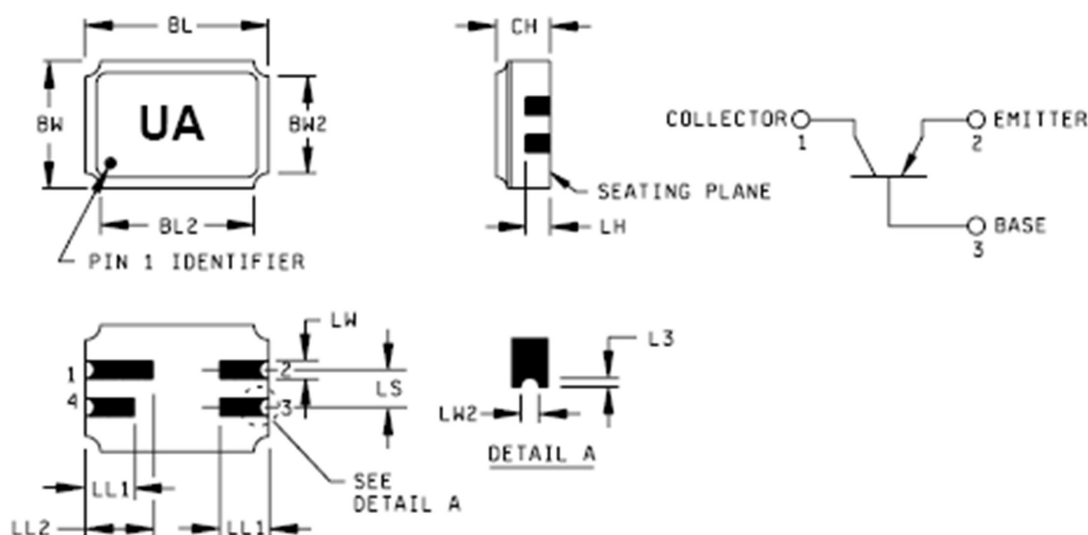
Figure 4-1. Physical dimensions (Similar to TO-18)¹⁻²



Notes:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TW shall be held for a minimum length of 0.011 inch (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. Leads at gauge plane 0.0054 +0.001 -0.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within 0.007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC.
7. Dimension LU applies between L1 and L2. Dimension LD applies between L2 and LL minimum. Diameter is uncontrolled in L1 and beyond LL minimum.
8. All three leads
9. The collector shall be internally connected to the case.
10. Dimension r (radius) applies to both inside corners of tab.
11. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.
12. Lead 1 = emitter, lead 2 = base, lead 3 = collector
13. For L suffix devices, dimension LL = 1.5 inches (38.10 mm) min. and 1.75 inches (44.45 mm) max.

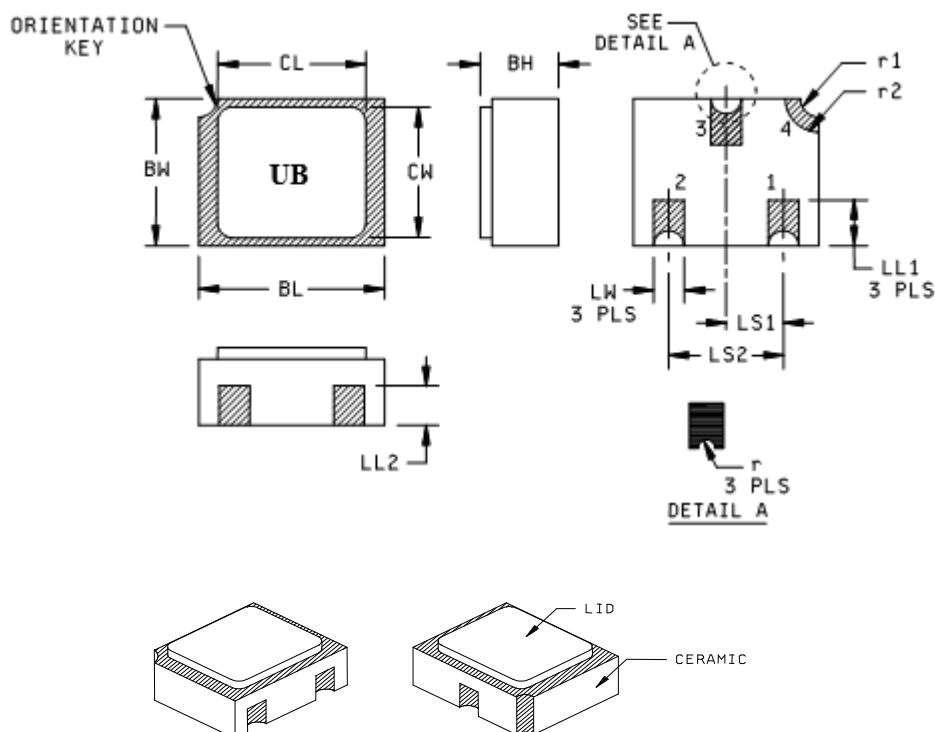
Symbol	Dimensions				Note
	Inches		Millimeters		
	Min.	Max.	Min.	Max.	
CD	0.178	0.195	4.52	4.95	—
CH	0.170	0.210	4.32	5.33	—
HD	0.209	0.230	5.31	5.84	—
LC	0.100 TP		2.54 TP		6
LD	0.016	0.021	0.41	0.53	7, 8
LL	0.500	0.750	12.70	19.05	7, 8, 13
LU	0.016	0.019	0.41	0.48	7, 8
L ₁	—	0.050	—	1.27	7, 8
L ₂	0.250	—	6.35	—	7, 8
P	0.100	—	2.54	—	—
Q	—	0.030	—	0.76	5
TL	0.028	0.048	0.71	1.22	3, 4
TW	0.036	0.046	0.91	1.17	3
r	—	0.010	—	0.25	10
α	45° TP		45° TP		6

Figure 4-2. Physical Dimensions, Surface Mount (UA Version)¹⁻⁷**Notes:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimension CH controls the overall package thickness. When a window lid is used, dimension CH must increase by a minimum of 0.010 inch (0.254 mm) and a maximum of 0.040 inch (1.020 mm).
4. The corner shape (square, notch, radius) may vary at the manufacturer's option, from that shown on the drawing.
5. Dimensions LW2 minimum and L3 minimum and the appropriate castellation length define an unobstructed three-dimensional space traversing all of the ceramic layers in which a castellation was designed. (Castellations are required on the bottom two layers, optional on the top ceramic layer.) Dimension "LW2" maximum and "L3" maximum define the maximum width and depth of the castellation at any point on its surface. Measurement of these dimensions may be made prior to solder dipping.
6. The co-planarity deviation of all terminal contact points, as defined by the device seating plane, shall not exceed 0.006 inch (0.15 mm) for solder dipped leadless chip carriers.
7. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

Symbol	Dimensions				Note
	Inches		Millimeters		
	Min.	Max.	Min.	Max.	
BL	0.215	0.225	5.46	5.71	—
BL2	—	0.225	—	5.71	—
BW	0.145	0.155	3.68	3.93	—
BW2	—	0.155	—	3.93	—
CH	0.061	0.075	1.55	1.90	3
L3	0.003	0.007	0.08	0.18	5
LH	0.029	0.042	0.74	1.07	—
LL1	0.032	0.048	0.81	1.22	—
LL2	0.072	0.088	1.83	2.23	—
LS	0.045	0.055	1.14	1.39	—
LW	0.022	0.028	0.56	0.71	—
LW2	0.006	0.022	0.15	0.56	5

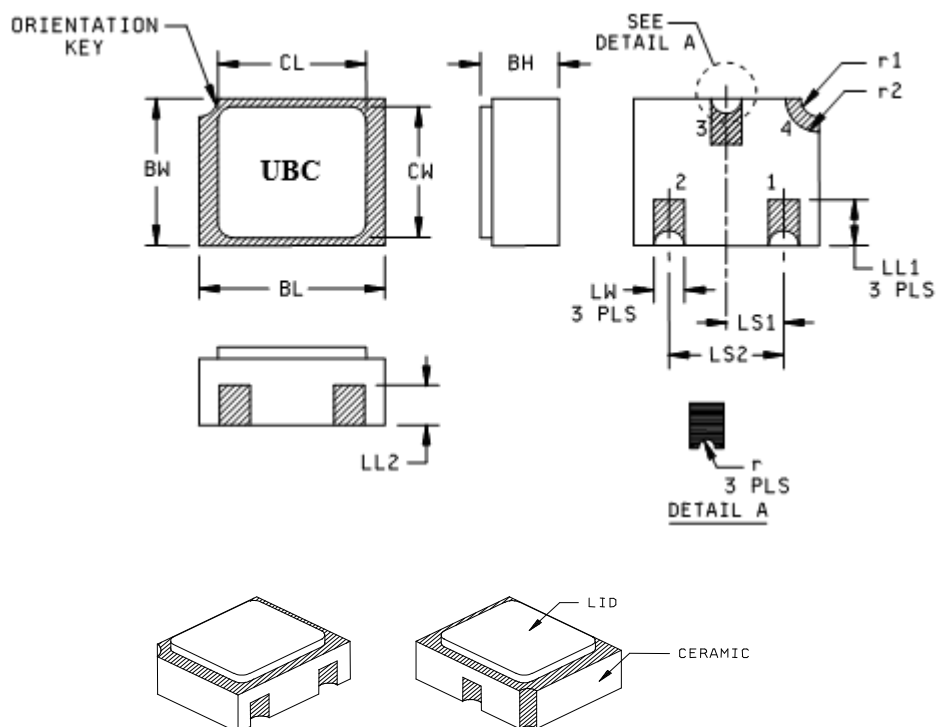
Pin No.	1	2	3	4
Transistor	Collector	Emitter	Base	N/C

Figure 4-3. Physical Dimensions, Surface Mount (UB Version)^{1–4}


Symbol	Dimensions				Symbol	Dimensions			
	Inches		Millimeters			Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
BH	0.046	0.056	1.17	1.42	LS ₁	0.036	0.040	0.91	1.02
BL	0.115	0.128	2.92	3.25	LS ₂	0.071	0.079	1.81	2.01
BW	0.085	0.108	2.16	2.74	LW	0.016	0.024	0.41	0.61
CL	—	0.128	—	3.25	r	—	0.008	—	0.203
CW	—	0.108	—	2.74	r ₁	—	0.012	—	0.305
LL1	0.022	0.038	0.56	0.96	r ₂	—	0.022	—	0.559
LL2	0.017	0.035	0.43	0.89					

Notes:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Pad 1 = base, Pad 2 = emitter, Pad 3 = collector, Pad 4 = shielding connected to the lid.
4. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

Figure 4-4. Physical Dimensions, Surface Mount (UBC Version, Ceramic Lid)¹⁻⁵

Symbol	Dimensions				Symbol	Dimensions			
	Inches		Millimeters			Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
BH	0.046	0.071	1.17	1.80	LS ₁	0.036	0.040	0.91	1.02
BL	0.115	0.128	2.92	3.25	LS ₂	0.071	0.079	1.81	2.01
BW	0.085	0.108	2.16	2.74	LW	0.016	0.024	0.41	0.61
CL	—	0.128	—	3.25	r	—	0.008	—	0.203
CW	—	0.108	—	2.74	r ₁	—	0.012	—	0.305
LL1	0.022	0.038	0.56	0.96	r ₂	—	0.022	—	0.559
LL2	0.017	0.035	0.43	0.89					

Notes:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Hatched areas on package denote metalized areas.
4. Pad 1 = base, Pad 2 = emitter, Pad 3 = collector, Pad 4 = connected to the lid braze ring.
5. In accordance with ASME Y14.5M, diameters are equivalent to Φ x symbology.

5. Revision History

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

Revision	Date	Description
A	02/2024	Microsemi T4-LDS-0055 Rev. 5 document was converted to Microchip template.

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