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TECHNICAL DATA SHEET

PNP SILICON
LOW POWER TRANSISTOR

Qualified per MIL-PRF-19500/323

DEVICES

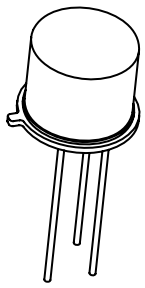
2N3250A **2N3251A**
2N3250AUB **2N3251AUB**

LEVELS

JAN
JANTX
JANTXV

ABSOLUTE MAXIMUM RATINGS (T_C = +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	200	mAdc
Total Power Dissipation @ T_A = +25°C (1) @ T_C = +25°C (1)	P_T	0.36 1.2	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C

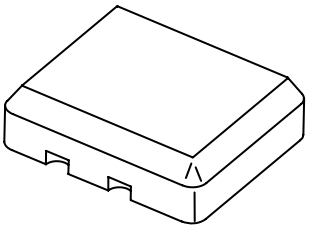


TO-39 (TO-205AD)

THERMAL CHARACTERISTICS

Parameters / Test Conditions	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$ (1)	150	°C/W

Note:
1/ Consult 19500/323 for thermal curves



UB Package

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERTICS				
Collector-Emitter Breakdown Voltage I_C = 10mAdc	$V_{(BR)CEO}$	60		Vdc
Collector-Emitter Cutoff Voltage V_{BE} = 3.0Vdc, V_{CE} = 40Vdc V_{BE} = 3.0Vdc, V_{CE} = 40Vdc T_A = 150°C	I_{CEX}		20 20	ηAdc μAdc
Collector-Base Cutoff Current V_{CB} = 60Vdc V_{CB} = 40Vdc	I_{CBO}		10 20	μAdc ηAdc
Emitter-Base Cutoff Current V_{EB} = 5.0Vdc	I_{EBO}		10	μAdc
Collector-Emitter Cutoff Voltage V_{BE} = 3.0Vdc, V_{CE} = 40Vdc	I_{BEX}		50	ηAdc

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ELECTRICAL CHARACTERISTICS *(T_A = +25°C, unless otherwise noted) (CONT.)*

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
ON CHARACTERTICS (2)					
Forward-Current Transfer Ratio					
I_C = 0.1mAdc, V_{CE} = 1.0Vdc	2N3250A, AUB	h_{FE}	40		
	2N3251A, AUB		80		
I_C = 1.0mAdc, V_{CE} = 1.0Vdc	2N3250A, AUB		45		
	2N3251A, AUB		90		
I_C = 10mAdc, V_{CE} = 1.0Vdc	2N3250A, AUB		50	150	
	2N3251A, AUB		100	300	
I_C = 50mAdc, V_{CE} = 1.0Vdc	2N3250A, AUB		15		
	2N3251A, AUB		30		
I_C = 1.0mAdc, V_{CE} = 1.0Vdc	2N3250A, AUB		20		
T_A = -55°C	2N3251A, AUB		40		
Collector-Emitter Saturation Voltage					
I_C = 10mAdc, I_B = 1.0mAdc		$V_{CE(sat)}$		0.25	Vdc
I_C = 50mAdc, I_B = 5.0mAdc				0.50	
Base-Emitter Saturation Voltage					
I_C = 10mA, I_B = 1.0mAdc		$V_{BE(sat)}$	0.60	0.90	Vdc
I_C = 50mA, I_B = 5.0mAdc				1.20	

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Small-Signal Short-Circuit Forward Current Transfer Ratio					
I_C = 1.0mAdc, V_{CE} = 10Vdc, f = 1.0kHz	2N3250A, AUB	h_{fe}	50	200	
	2N3251A, AUB		100	400	
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio					
I_C = 10mAdc, V_{CE} = 20Vdc, f = 100kHz	2N3250A, AUB	$\|h_{fe}\|$	2.5	9.0	
	2N3251A, AUB		3.0	9.0	
Output Capacitance					
V_{CB} = 10Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0MHz		C_{obo}		6.0	pF
Input Capacitance					
V_{EB} = 1.0Vdc, I_C = 0, 100 kHz ≤ f ≤ 1.0MHz		C_{ibo}		8.0	pF

SWITCHING CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Turn-On Time					
V_{CC} = 3.0Vdc; I_C = 10mAdc; I_{B1} = 1.0mAdc		t_{on}		70	ηs
Turn-Off Time					
V_{CC} = 3.0Vdc; IC = 10mAdc; I_{B1} = I_{B2} =	2N3250A, AUB	t_{off}		250	ηs
1.0mAdc	2N3251A, AUB			300	

(2) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%

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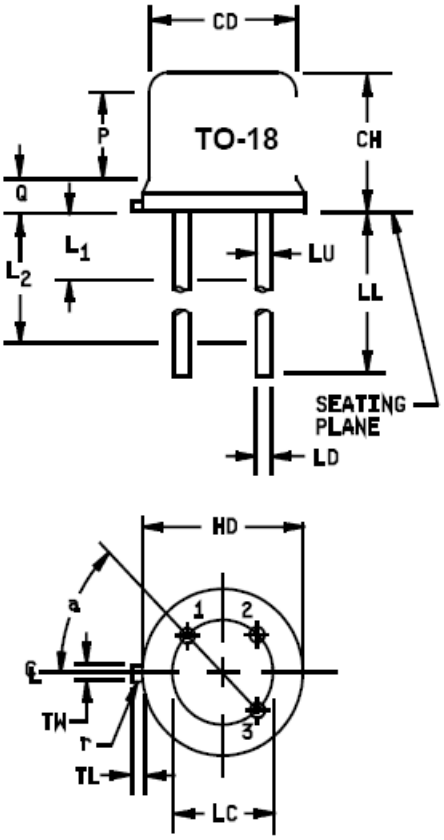
PACKAGE DIMENSIONS



Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.178	.195	4.52	4.95	
CH	.170	.210	4.32	5.33	
HD	.209	.230	5.31	5.74	
LC	.100TP		2.54 TP		6
LD	.016	.021	0.41	0.53	7, 8
LL	.500	.750	12.70	19.05	7, 8
LU	.016	.019	0.41	0.48	7, 8
L1		.050		1.27	7, 8
L2	.250		6.35		7, 8
P	.100		2.54		
Q		.040		1.02	5
TL	.028	.048	0.71	1.22	3, 4
TW	.036	.046	0.91	1.17	3
r		.010		0.25	10
α	45° TP		45° TP		6

NOTES:
1. Dimension are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TH shall be held for a minimum length of .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 .054 +.001 -.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within .007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC. The device may be measured by direct methods or by the gauge and gauging procedure shown in figure 2.
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 φx symbology.
12. Lead 1 = emitter, lead 2 = base, lead 3 = collector.

FIGURE 1. Physical dimensions (similar to TO-18).

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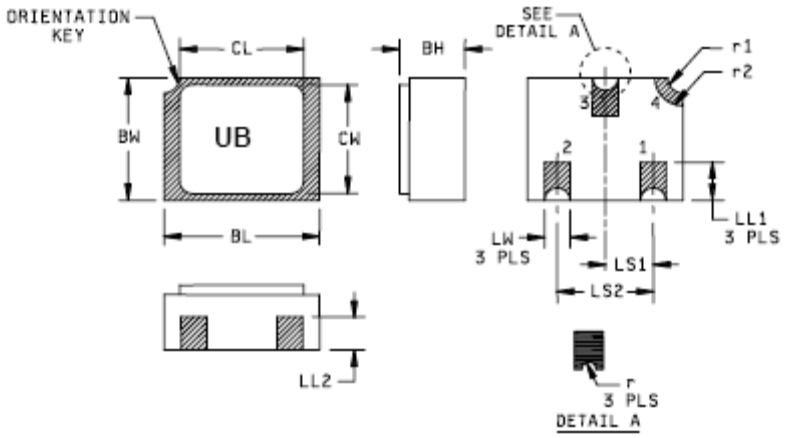

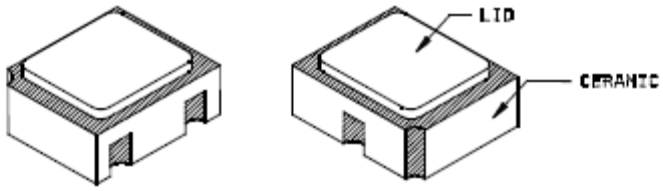

Ltr.	Dimensions				Note	Ltr.	Dimensions				Note
	Inches		Millimeters				Inches		Millimeters		
	Min	Max	Min	Max			Min	Max	Min	Max	
BH	.046	.056	1.17	1.42		LS_1	.035	.039	0.89	0.99	
BL	.115	.128	2.92	3.25		LS_2	0.71	.079	1.80	2.01	
BW	.085	.108	2.16	2.74		LW	.016	.024	0.41	0.61	
CL		.128		3.25		r		.008		0.20	
CW		.108		2.74		r_1		.012		0.31	
LL_1	.022	.038	0.56	0.96		r_2		.022		0.56	
LL_2	.017	.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 metallized areas
4. Pad 1 = Base, Pad 2 = Emitter, Pad 3 = Collector, Pad 4 = Shielding connected to the lid.
5. In accordance with ASME Y14.5M, diameters are equivalent to φx symbology.

FIGURE 2. Physical dimensions, surface mount (UB version).