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TECHNICAL DATA SHEET

LOW POWER PNP SILICON TRANSISTOR

Qualified per MIL-PRF-19500/177

DEVICES

2N1131 **2N1132**
2N1131L **2N1132L**

LEVELS

JAN
JANTX
JANTXV

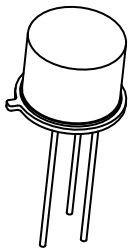
ABSOLUTE MAXIMUM RATINGS ***(T_C = +25°C unless otherwise noted)***

Parameters / Test Conditions	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	40	Vdc
Collector-Base Voltage	V_{CBO}	50	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current	I_C	600	mAdc
Total Power Dissipation @ T_A = +25°C (1) @ T_C = +25°C (2)	P_T	0.6 2.0	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	°C

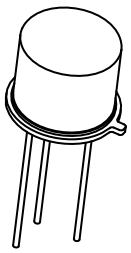
NOTES:
1/ Derate linearly 3.43mW/°C for T_A > +25°C
2/ Derate linearly 11.4mW/°C for T_C > +25°C

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	$V_{(BR)CEO}$	40		Vdc
Collector- Base Breakdown Voltage I_C = 10µAdc	$V_{(BR)CBO}$	50		Vdc
Emitter-Base Cutoff Current V_{EB} = 5.0Vdc	I_{EBO}		100	µAdc
Collector-Emitter Cutoff Current V_{CE} = 50Vdc, R_{BE} ≤ 10 ohms	I_{CER}		10	mAdc
Collector-Base Cutoff Current V_{CB} = 50Vdc V_{CB} = 30Vdc	I_{CBO}		10 1.0	µAdc



TO-39
2N1131, 2N1132



TO-5
2N1131L, 2N1132L

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

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
ON CHARACTERTICS (3)					
Forward-Current Transfer Ratio					
I_C = 150mAdc, V_{CE} = 10Vdc	2N1131, L	h_{FE}	20	45	
	2N1132, L		30	90	
I_C = 5.0mAdc, V_{CE} = 10Vdc	2N1131, L		15		
	2N1132, L		25		
Collector-Emitter Saturation Voltage I_C = 150mAdc, I_B = 15mAdc		$V_{CE(sat)}$		1.3	Vdc
Base-Emitter Saturation Voltage I_C = 150mAdc, I_B = 15mAdc		$V_{BE(sat)}$		1.5	Vdc

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Small-Signal Short-Circuit Forward-Current Transfer Ratio					
I_C = 1.0mAdc, V_{CE} = 5.0Vdc, f = 1.0kHz	2N1131, L	h_{fe}	15	50	
	2N1132, L		30	90	
I_C = 5.0mAdc, V_{CE} = 10Vdc, f = 1.0kHz	2N1131, L		20		
	2N1132, L		30		
Small-Signal Open-Circuit Output Admittance I_C = 1.0mAdc, V_{CE} = 5.0Vdc, f = 1.0kHz I_C = 5.0mAdc, V_{CE} = 10Vdc, f = 1.0kHz		h_{ob}		1.0 5.0	µmho
Small-Signal Short-Circuit Input Impedance I_C = 1.0mAdc, V_{CE} = 5.0Vdc, f = 1.0kHz I_C = 5.0mAdc, V_{CE} = 10Vdc, f = 1.0kHz		h_{ib}	25	35 10	Ω
Magnitude of Common Emitter Small-Signal Short Circuit Forward-Current Transfer Ratio		$\|h_{fe}\|$			
I_C = 50mAdc, V_{CE} = 10Vdc, f = 20MHz	2N1131, L		2.5	20	
	2N1132, L		3.0	20	
Output Capacitance V_{CB} = 10Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0MHz		C_{obo}		4.5	pF
Iutput Capacitance V_{EB} = 0.5Vdc, I_C = 0, 100 kHz ≤ f ≤ 1.0MHz		C_{ibo}		80	pF

SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-On Time + Turn-Off Time (See figure 2 of MIL-PRF-177)	$^{t}on + {}^{t}off$		50	ηs

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

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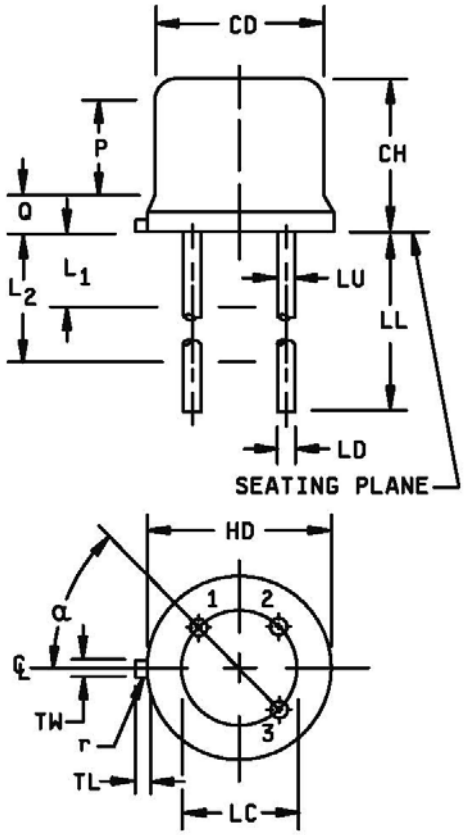
PACKAGE DIMENSIONS



Symbol	Dimensions				Note
	Inches		Millimeters		
	Min	Max	Min	Max	
CD	.305	.335	7.75	8.51	
CH	.240	.260	6.10	6.60	
HD	.335	.370	8.51	9.40	
LC	.200 TP		5.08 TP		6
LD	.016	.021	0.41	0.53	7, 8
LL	.500	.750	12.70	19.05	7, 8, 12
LU	.016	.019	0.41	0.48	7, 8
L_1		.050		1.27	7, 8
L_2	.250		6.35		7, 8
P	.100		2.54		
Q		.050		1.27	5
TL	.029	.045	0.74	1.14	4
TW	.028	.034	0.71	0.86	3
r		.010		0.25	10
α	45° TP		45° TP		6

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 .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. CD shall not vary more than .010 inch (0.25 mm) in zone P. This zone is controlled for automatic handling.
7. 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 gauging procedure.
8. Dimension LU applies between L_1 and L_2. Dimension LD applies between L_2 and LL minimum. Diameter is uncontrolled in and beyond LL minimum.
9. All three leads.
10. The collector shall be internally connected to the case.
11. Dimension r (radius) applies to both inside corners of tab.
12. In accordance with ASME Y14.5M, diameters are equivalent to φx symbology.
13. Lead 1 = emitter, lead 2 = base, lead 3 = collector.
14. * For L-suffix or non-S-suffix devices (TO-5), dimension LL = 1.5 inches (38.10 mm) min. and 1.75 inches (44.45 mm) max. For non-L suffix types (TO-39), dimension LL = .5 inch (12.70 mm) min. and .750 inch (19.05 mm) max..

*** FIGURE 1.** Physical dimensions 2N1131 and 2N1132 (TO-39), 2N1131L and 2N1132L (TO-5).