

2N3418(S) - 2N3421(S) Series

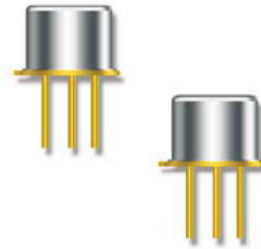


NPN Medium Power Silicon Transistor

Rev. V1

Features

- Available in JAN, JANTX, JANTXV, JANS and JANSR 100K rads(Si) per MIL-PRF-19500/393
- TO-5 & TO-39 (TO-205AD) Package



Electrical Characteristics

Parameter	Test Conditions	Symbol	Units	Min.	Max.
Off Characteristics					
Collector - Emitter Breakdown Voltage	$I_C = 50 \text{ mAdc}$ 2N3418, S, 2N3420, S 2N3419, S, 2N3421, S	$V_{(BR)CEO}$	Vdc	60 80	—
Collector - Emitter Cutoff Current	$V_{CE} = 80 \text{ Vdc}, V_{BE} = -0.5 \text{ Vdc}$ 2N3418, S, 2N3420, S $V_{CE} = 120 \text{ Vdc}, V_{BE} = -0.5 \text{ Vdc}$ 2N3419, S, 2N3421, S	I_{CEX}	μAdc	—	0.3 0.3
Collector - Emitter Cutoff Current	$V_{CE} = 45$ 2N3418, S, 2N3420, S $V_{CE} = 60$ 2N3419, S, 2N3421, S	I_{CEO}	μAdc	—	5.0 5.0
Emitter - Base Cutoff Current	$V_{EB} = 6 \text{ Vdc}, I_C = 0$ $V_{EB} = 8 \text{ Vdc}, I_C = 0$	I_{EBO}	μAdc	—	0.5 10.0
On Characteristics¹					
Forward Current Transfer Ratio	$I_C = 100 \text{ mAdc}, V_{CE} = 2 \text{ Vdc}$ 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S	H_{FE}	-	20 40	— —
	$I_C = 1 \text{ Adc}, V_{CE} = 2 \text{ Vd}$ 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S			20 40	60 120
	$I_C = 2 \text{ Adc}, V_{CE} = 2 \text{ Vdc}$ 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S			15 30	— —
	$I_C = 5 \text{ Adc}, V_{CE} = 5 \text{ Vdc}$ 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S			10 15	— —
	Base - Emitter Voltage			$I_C = 1 \text{ Adc}, I_B = 0.1 \text{ Adc}$ $I_C = 2 \text{ Adc}, I_B = 0.2 \text{ Adc}$	$V_{BE(SAT)}$
Collector - Emitter Saturation Voltage	$I_C = 1 \text{ Adc}, I_B = 0.1 \text{ Adc}$ $I_C = 2 \text{ Adc}, I_B = 0.2 \text{ Adc}$	$V_{CE(SAT)}$	Vdc	—	0.25 0.50

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Parameter	Test Conditions	Symbol	Units	Min.	Max.
Dynamic Characteristics					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio	$I_C = 0.1 \text{ Adc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 20 \text{ MHz}$	$ H_{FE} $	-	1.3	8.0
Output Capacitance	$V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $100 \text{ kHz} \leq f \leq 1 \text{ MHz}$	C_{OBO}	pF	—	150
Switching Characteristics					
Delay Time	$V_{BE(OFF)} = -3.7 \text{ Vdc}$; $I_C = 1 \text{ Adc}$; $I_{B2} = 100 \text{ mAdc}$	T_D	μs	—	0.08
Rise Time		T_R			0.22
Storage Time	$V_{BE(OFF)} = -3.7 \text{ Vdc}$; $I_C = 1 \text{ Adc}$; $I_{B2} = 100 \text{ mAdc}$	T_S	μs	—	1.10
Fall Time		T_F			0.20
Safe Operating Area					
DC Tests:	$T_C = +100 \text{ }^\circ\text{C}$, 1 Cycle, $t = 1.0 \text{ s}$				
Test 1:	$V_{CE} = 5 \text{ Vdc}$, $I_C = 3.0 \text{ Adc}$				
Test 2:	$V_{CE} = 37 \text{ Vdc}$, $I_C = 0.4 \text{ Adc}$				
Test 3:	$V_{CE} = 60 \text{ Vdc}$, $I_C = 0.185 \text{ mAdc}$ 2N3418, S; 2N3420, S				
	$V_{CE} = 80 \text{ Vdc}$, $I_C = 0.120 \text{ mAdc}$ 2N3419, S; 2N3421, S				

Absolute Maximum Ratings

Ratings	Symbol	Value 2N3418, S 2N3420, S	Value 2N3419, S 2N3421, S
Collector - Emitter Voltage	V_{CEO}	60 Vdc	80 Vdc
Collector - Base Voltage	V_{CBO}	85 Vdc	125 Vdc
Emitter - Base Voltage	V_{EBO}	8 Vdc	
Collector Current	I_C	3 Adc	
$T_P \leq 1 \text{ ms}$, duty cycle $\leq 50\%$		5 Adc	
Total Power Dissipation	P_T	1 W	
@ $T_A = 25^\circ\text{C}$		5 W	
@ $T_C = 100^\circ\text{C}$			
Operating & Storage Temperature Range	T_{OP} , T_{STG}	-65°C to +200°C	

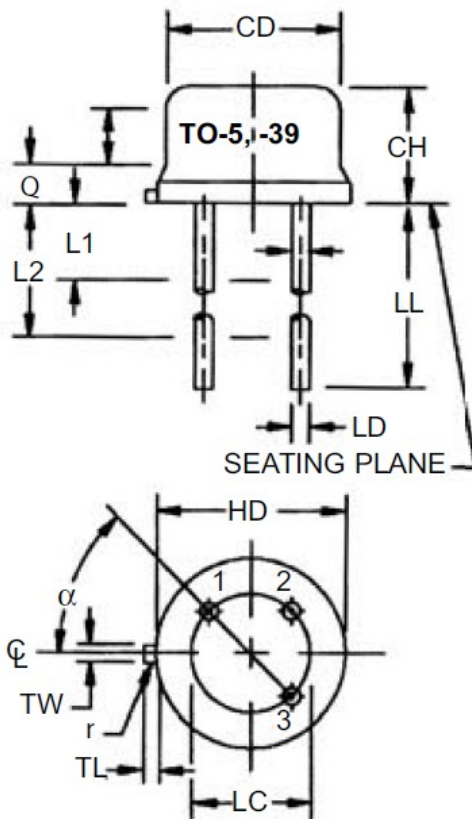
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Outline Drawing (TO-5 & TO-39)



LTR	Dimensions				Note
	Inches		Millimeters		
	MIN	MAX	MIN	MAX	
CD	0.305	0.335	7.75	8.51	—
CH	0.240	0.260	6.10	6.60	—
HD	0.335	0.370	8.51	9.40	—
LC	0.200 TP		5.08 TP		7
LD	0.016	0.019	0.041	0.048	8, 9
LL	0.500	0.750	12.7	19.05	—
LU	0.016	0.019	0.041	0.048	8, 9
L1	—	0.050	—	1.27	8, 9
L2	0.250	—	6.35	—	8, 9
P	0.100	—	2.54	—	7
Q	—	0.030	—	0.76	5
TL	0.029	0.045	0.74	1.14	—
TW	0.028	0.034	0.71	0.86	—
r	—	0.010	—	0.25	10
a	45° TP		45° TP		7
1, 2, 10, 12, 13, 14					

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 (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 0.007 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 L₁ and L₂. Dimension LD applies between L₁ 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 Φ x symbology.
13. Lead 1 = emitter, lead 2 = base, lead 3 = collector.
14. For non-S-suffix devices (T0-5), dimension LL = 1.5 inches (38.10 mm) min. and 1.75 inches (44.45 mm) max. For S-suffix types (T0-39), dimension LL = 0.5 inch (12.70 mm) min. and 750 inch (19.05 mm) max.

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