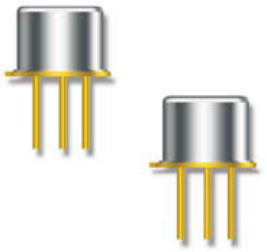
2N3418(S) - 2N3421(S) Series

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 mAdc 2N3418, S, 2N3420, S 2N3419, S, 2N3421, S	$V_{(BR)CEO}$	Vdc	 60 80	 —
Collector - Emitter Cutoff Current	V_{CE} = 80 Vdc, V_{BE} = -0.5 Vdc 2N3418, S, 2N3420, S V_{CE} = 120 Vdc, V_{BE} = -0.5 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 Vdc, I_C = 0 V_{EB} = 8 Vdc, I_C = 0	I_{EBO}	µAdc	—	0.5 10.0
On Characteristics[1]					
Forward Current Transfer Ratio	I_C = 100 mAdc, V_{CE} = 2 Vdc 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S I_C = 1 Adc, V_{CE} = 2 Vd 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S I_C = 2 Adc, V_{CE} = 2 Vdc 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S I_C = 5 Adc, V_{CE} = 5 Vdc 2N3418, S, 2N3419, S 2N3420, S, 2N3421, S	H_{FE}	-	 20 40 20 40 15 30 10 15	 — — 60 120 — — — —
Base - Emitter Voltage	I_C = 1 Adc, I_B = 0.1 Adc I_C = 2 Adc, I_B = 0.2 Adc	$V_{BE(SAT)}$	Vdc	0.6 0.7	1.2 1.4
Collector - Emitter Saturation Voltage	I_C = 1 Adc, I_B = 0.1 Adc I_C = 2 Adc, I_B = 0.2 Adc	$V_{CE(SAT)}$	Vdc	—	0.25 0.50

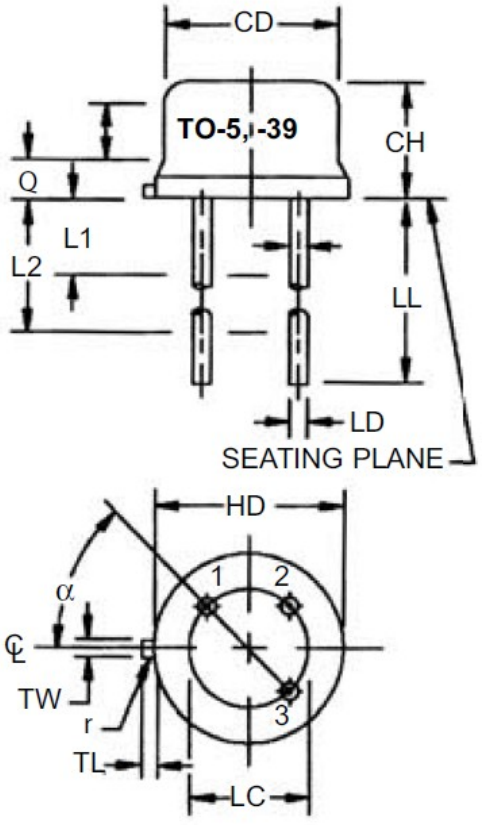
Electrical Characteristics

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 Adc, V_{CE}= 10 Vdc, f = 20 MHz	$\lvert H_{FE} \rvert$	-	1.3	8.0
Output Capacitance	V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1 MHz	C_{OBO}	pF	—	150
Switching Characteristics					
Delay Time Rise Time	$V_{BE\ (OFF)}$ = -3.7 Vdc; I_C = 1 Adc; I_B2 = 100 mAdc	T_D T_R	µs	—	0.08 0.22
Storage Time Fall Time	$V_{BE\ (OFF)}$ = -3.7 Vdc; I_C = 1 Adc; I_B2 = 100 mAdc	T_S T_F	µs	—	1.10 0.20
Safe Operating Area					
DC Tests: Test 1: Test 2: Test 3:	T_C = +100 °C, I Cycle, t = 1.0 s V_{CE} = 5 Vdc, I_C = 3.0 Adc V_{CE} = 37 Vdc, I_C = 0.4 Adc V_{CE} = 60 Vdc, I_C = 0.185 mAdc 2N3418, S; 2N3420, S V_{CE} = 80 Vdc, I_C = 0.120 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 T_P ≤ 1 ms, duty cycle ≤ 50%	I_C	3 Adc 5 Adc	
Total Power Dissipation @ T_A = 25°C @ T_C = 100°C	P_T	1 W 5 W	
Operating & Storage Temperature Range	T_{OP}, T_{STG}	-65°C to +200°C	

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 L, and L,. Dimension LD applies between L, 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 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.