



# NPN Medium Power Silicon Transistor

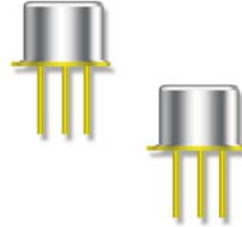
2N3418, 2N3419, 2N3420 & 2N3421

2N3418S, 2N3419S, 2N3420S & 2N3421S



## Features

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



## Maximum Ratings

Ratings	Symbol	2N3418, S 2N3420, S	2N3419, S 2N3421, S	Units
Collector - Emitter Voltage	$V_{CEO}$	60	80	Vdc
Collector - Base Voltage	$V_{CBO}$	85	125	Vdc
Emitter - Base Voltage	$V_{EBO}$	8.0		Vdc
Collector Current $T_p \leq 1.0$ ms, duty cycle $\leq 50\%$	$I_C$	3.0 5.0		Adc
Total Power Dissipation @ $T_A = +25$ °C @ $T_C = +100$ °C	$P_T$	1.0 5.0		W W
Operating & Storage Temperature Range	$T_{Op}, T_{Stg}$	-65 to +200		°C

## Electrical Characteristics

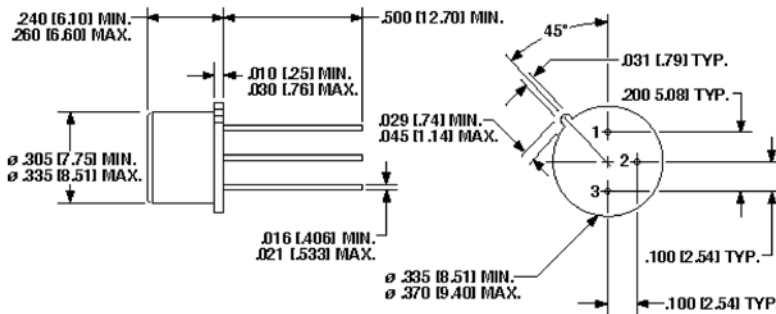
OFF Characteristics	Symbol	Mimimum	Maximum	Units
Collector - Emitter Breakdown Voltage $I_C = 50$ mAdc 2N3418, S, 2N3420, S 2N3419, S, 2N3421, S	$V_{(BR)CEO}$	60 80	---	Vdc
Collector - Emitter Cutoff Current $V_{CE} = 80$ Vdc, $V_{BE} = -0.5$ Vdc $V_{CE} = 120$ Vdc, $V_{BE} = -0.5$ Vdc 2N3418, S, 2N3420, S 2N3419, S, 2N3421, S	$I_{CEX}$	---	0.3 0.3	$\mu$ Adc
Collector - Emitter Cutoff Current $V_{CE} = 45$ Vdc $V_{CE} = 60$ Vdc 2N3418, S, 2N3420, S 2N3419, S, 2N3421, S	$I_{CEO}$	---	5.0 5.0	$\mu$ Adc
Emitter - Base Cutoff Current $V_{EB} = 6.0$ Vdc, $I_C = 0$ $V_{EB} = 8.0$ Vdc, $I_C = 0$	$I_{EBO}$	---	0.5 10.0	$\mu$ Adc



## Electrical Characteristics -con't

ON Characteristics (1)		Symbol	Minimum	Maximum	Unit
Forward Current Transfer Ratio					
$I_C = 100 \text{ mAdc}, V_{CE} = 2.0 \text{ Vdc}$	2N3418, S, 2N3419, S	$H_{FE}$	20	60	
	2N3420, S, 2N3421, S		40		
$I_C = 1.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$	2N3418, S, 2N3419, S		20		
	2N3420, S, 2N3421, S		40		
$I_C = 2.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$	2N3418, S, 2N3419, S		15		
	2N3420, S, 2N3421, S		30		
$I_C = 5.0 \text{ Adc}, V_{CE} = 5.0 \text{ Vdc}$	2N3418, S, 2N3419, S		10		
	2N3420, S, 2N3421, S		15		
Base - Emitter Voltage		$V_{BE(sat)}$			Vdc
$I_C = 1.0 \text{ Adc}, I_B = 0.1 \text{ Adc}$			0.6	1.2	
$I_C = 2.0 \text{ Adc}, I_B = 0.2 \text{ Adc}$			0.7	1.4	
Collector - Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
$I_C = 1.0 \text{ Adc}, I_B = 0.1 \text{ Adc}$			---	0.25	
$I_C = 2.0 \text{ Adc}, I_B = 0.2 \text{ Adc}$			---	0.5	
<b>DYNAMIC Characteristics</b>					
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio					
$I_C = 0.1 \text{ Adc}, V_{CE} = 10.0 \text{ Vdc}, f = 20 \text{ MHz}$		$ h_{fe} $	1.3	8.0	
Output Capacitance					pF
$V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$		$C_{obo}$	---	150	
<b>Switching Characteristics</b>					
Delay Time	$V_{BE(off)} = -3.7 \text{ Vdc}$	$t_d$	---	0.08	$\mu\text{s}$
Rise Time	$I_C = 1.0 \text{ Adc}, I_{B2} = 100 \text{ mAdc}$	$t_r$	---	0.22	$\mu\text{s}$
Storage Time	$V_{BE(off)} = -3.7 \text{ Vdc}$	$t_s$	---	1.10	$\mu\text{s}$
Fall Time	$I_C = 1.0 \text{ Adc}, I_{B2} = -100 \text{ mAdc}$	$t_f$	---	0.20	$\mu\text{s}$
<b>SAFE OPERATING AREA</b>					
<b>DC Tests:</b>	$T_C = 100 \text{ }^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s s}$				
<b>Test 1:</b>	$V_{CE} = 5.0 \text{ Vdc}, I_C = 3.0 \text{ Adc}$				
<b>Test 2:</b>	$V_{CE} = 37 \text{ Vdc}, I_C = 0.4 \text{ Adc}$				
<b>Test 3:</b>	$V_{CE} = 60 \text{ Vdc}, I_C = 0.185 \text{ mAdc}$	2N3418, S;	2N3420, S		
	$V_{CE} = 80 \text{ Vdc}, I_C = 0.12 \text{ mAdc}$	2N3419, S;	2N3421, S		

Outline Drawing



NOTE: Dimensions in Inches [mm]

**Aeroflex / Metelics, Inc.**

975 Stewart Drive,  
Sunnyvale, CA 94085  
Tel: (408) 737-8181  
Fax: (408) 733-7645

Sales: 888-641-SEMI (7364)

**Hi-Rel Components**

9 Hampshire Street,  
Lawrence, MA 01840  
Tel: (603) 641-3800  
Fax: (978) 683-3264

[www.aeroflex.com/metelicsHRC](http://www.aeroflex.com/metelicsHRC)

54 Grenier Field Road,  
Londonderry, NH 03053  
Tel: (603) 641-3800  
Fax: (603)-641-3500

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[www.aeroflex.com/metelics](http://www.aeroflex.com/metelics)      [metelics-sales@aeroflex.com](mailto:metelics-sales@aeroflex.com)

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