



**PNP LOW POWER SILICON TRANSISTOR**

Qualified per MIL-PRF-19500/485

*Devices*

**2N5415  
2N5415S**

**2N5416  
2N5416S**

*Qualified Level*

**JAN  
JANTX  
JANTXV**

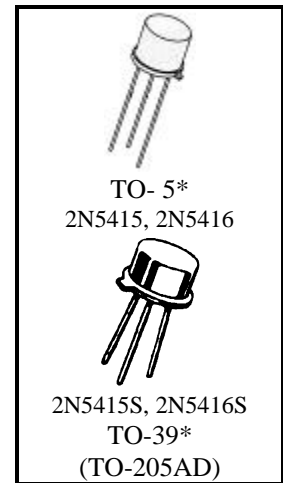
**MAXIMUM RATINGS**

Ratings	Symbol	2N5415	2N5416	Units	
Collector-Emitter Voltage	V <sub>CEO</sub>	200	300	Vdc	
Collector-Base Voltage	V <sub>CB0</sub>	200	350	Vdc	
Emitter-Base Voltage	V <sub>EBO</sub>	6.0		Vdc	
Collector Current	I <sub>C</sub>	1.0		Adc	
Total Power Dissipation	P <sub>T</sub>	@ T <sub>A</sub> = +25 <sup>0</sup> C		0.75	W
		@ T <sub>C</sub> = +25 <sup>0</sup> C		10	W
Operating & Storage Temperature Range	T <sub>op</sub> , T <sub>stg</sub>	-65 to +200		<sup>0</sup> C	

**THERMAL CHARACTERISTICS**

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	17.5	<sup>0</sup> C/W

- 1) Derate linearly 4.28 mW/<sup>0</sup>C for T<sub>A</sub> > +25<sup>0</sup>C
- 2) Derate linearly 57.1 mW/<sup>0</sup>C for T<sub>C</sub> > +25<sup>0</sup>C



\*See appendix A for package outline

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25<sup>0</sup>C unless otherwise noted)**

Characteristics	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Cutoff Current	I <sub>CEO</sub>			
V <sub>CE</sub> = 150 Vdc		2N5415	50	μAdc
V <sub>CE</sub> = 200 Vdc		2N5415	1.0	mAdc
V <sub>CE</sub> = 250 Vdc		2N5416	50	μAdc
V <sub>CE</sub> = 300 Vdc	2N5416	1.0	mAdc	
Emitter-Base Cutoff Current	I <sub>EBO</sub>		20	μAdc
V <sub>EB</sub> = 6.0 Vdc				
Collector-Emitter Cutoff Current	I <sub>CEX</sub>			
V <sub>CE</sub> = 200 Vdc, V <sub>BE</sub> = 1.5 Vdc		2N5415	50	μAdc
V <sub>CE</sub> = 300 Vdc, V <sub>BE</sub> = 1.5 Vdc	2N5416	50	μAdc	
Collector-Base Cutoff Current	I <sub>CB01</sub>			
V <sub>CB</sub> = 175 Vdc		2N5415	50	μAdc
V <sub>CB</sub> = 280 Vdc	2N5416	50	μAdc	
Collector-Base Cutoff Current	I <sub>CB02</sub>			
V <sub>CB</sub> = 200 Vdc		2N5415	500	μAdc
V <sub>CB</sub> = 350 Vdc	2N5416	500	μAdc	

**2N5415, 2N5416 JAN, SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
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**ON CHARACTERISTICS <sup>(3)</sup>**

Forward-Current Transfer Ratio $I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 1.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	$h_{FE}$	30 15	120	
Collector-Emitter Saturation Voltage $I_C = 50 \text{ mAdc}, I_B = 5.0 \text{ mAdc}$	$V_{CE(sat)}$		2.0	Vdc
Base-Emitter Voltage $I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	$V_{BE}$		1.5	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Common Emitter Small-Signal Short Circuit Forward Current Transfer Ratio $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 5.0 \text{ MHz}$	$ h_{fe} $	3.0	15	
Forward Current Transfer Ratio $I_C = 5.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	$h_{fe}$	25		
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{obo}$		15	pF
Input Capacitance $V_{EB} = 5.0 \text{ Vdc}, I_C = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{ibo}$		75	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time $V_{CC} = 200 \text{ Vdc}, I_C = 50 \text{ mAdc}, I_{B1} = 5.0 \text{ mAdc}$	$t_{on}$		1.0	$\mu\text{s}$
Turn-Off Time $V_{CC} = 200 \text{ Vdc}, I_C = 50 \text{ mAdc}, I_{B1} = I_{B2} = 5.0 \text{ mAdc}$	$t_{off}$		10	$\mu\text{s}$

**SAFE OPERATING AREA**

<b>DC Tests</b>				
$T_C = +25^\circ\text{C}; 1 \text{ Cycle}; t = 0.4 \text{ s}$				
<b>Test 1</b>				
$V_{CE} = 10 \text{ Vdc}, I_C = 1.0 \text{ Adc}$				
<b>Test 2</b>				
$V_{CE} = 100 \text{ Vdc}, I_C = 100 \text{ mAdc}$				
<b>Test 3</b>				
$V_{CE} = 200 \text{ Vdc}, I_C = 24 \text{ mAdc} \quad 2N5415$				
<b>Test 4</b>				
$V_{CE} = 300 \text{ Vdc}, I_C = 10 \text{ mAdc} \quad 2N5416$				

(3) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

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