

PNP LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/485

Devices

2N5415
2N5415S

2N5416
2N5416S

Qualified Level

JAN
JANTX
JANTXV

MAXIMUM RATINGS

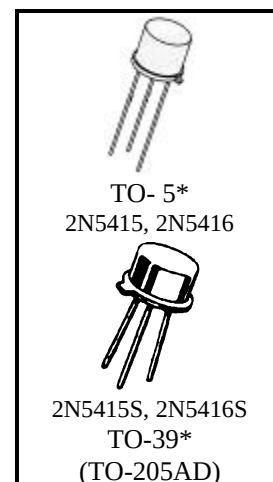
Ratings	Symbol	2N5415	2N5416	Units
Collector-Emitter Voltage	V_{CEO}	200	300	Vdc
Collector-Base Voltage	V_{CBO}	200	350	Vdc
Emitter-Base Voltage	V_{EBO}	6.0		Vdc
Collector Current	I_C	1.0		Adc
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ @ $T_C = +25^{\circ}\text{C}$	P_T	0.75		W
		10		W
Operating & Storage Temperature Range	T_{op}, T_{stg}	-65 to +200		$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	17.5	$^{\circ}\text{C/W}$

1) Derate linearly 4.28 mW/ $^{\circ}\text{C}$ for $T_A > +25^{\circ}\text{C}$

2) Derate linearly 57.1 mW/ $^{\circ}\text{C}$ for $T_C > +25^{\circ}\text{C}$



*See appendix A for package outline

ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Cutoff Current $V_{CE} = 150 \text{ Vdc}$ $V_{CE} = 200 \text{ Vdc}$ $V_{CE} = 250 \text{ Vdc}$ $V_{CE} = 300 \text{ Vdc}$	I_{CEO}		50 1.0 50 1.0	μAdc mAdc μAdc mAdc
Emitter-Base Cutoff Current $V_{EB} = 6.0 \text{ Vdc}$	I_{EBO}		20	μAdc
Collector-Emitter Cutoff Current $V_{CE} = 200 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ $V_{CE} = 300 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	I_{CEX}		50 50	μAdc μAdc
Collector-Base Cutoff Current $V_{CB} = 175 \text{ Vdc}$ $V_{CB} = 280 \text{ Vdc}$	I_{CBO1}		50 50	μAdc
Collector-Base Cutoff Current $V_{CB} = 200 \text{ Vdc}$ $V_{CB} = 350 \text{ Vdc}$	I_{CBO2}		500 500	μAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
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ON CHARACTERISTICS ⁽³⁾

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

SAFE OPERATING AREA

DC Tests $T_C = +25^\circ\text{C}$; 1 Cycle; $t = 0.4 \text{ s}$ Test 1 $V_{CE} = 10 \text{ Vdc}$, $I_C = 1.0 \text{ Adc}$ Test 2 $V_{CE} = 100 \text{ Vdc}$, $I_C = 100 \text{ mAdc}$ Test 3 $V_{CE} = 200 \text{ Vdc}$, $I_C = 24 \text{ mAdc}$ 2N5415 Test 4 $V_{CE} = 300 \text{ Vdc}$, $I_C = 10 \text{ mAdc}$ 2N5416				
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(3) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.