Microsemi LAWRENCE

TECHNICAL DATA

PNP LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/485

Devices		*Qualified Level*
2N5415	**2N5416**	**JAN**
2N5415S	**2N5416S**	**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 @ $T_A = +25^0C$ @ $T_C = +25^0C$	P_T	0.75 10		W W
Operating & Storage Temperature Range	T_{op}, T_{stg}	-65 to +200		^0C

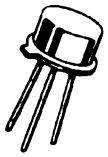
THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	17.5	$^0C/W$

1) Derate linearly 4.28 mW/^{0}C for $T_A > +25^0C$
2) Derate linearly 57.1 mW/^{0}C for $T_C > +25^0C$



TO- 5*
2N5415, 2N5416



2N5415S, 2N5416S
TO-39*
(TO-205AD)

*See appendix A for package outline

ELECTRICAL CHARACTERISTICS ($T_A = 25^0C$ unless otherwise noted)

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Cutoff Current					
V_{CE} = 150 Vdc	2N5415	I_{CEO}		50	µAdc
V_{CE} = 200 Vdc	2N5415			1.0	mAdc
V_{CE} = 250 Vdc	2N5416			50	µAdc
V_{CE} = 300 Vdc	2N5416			1.0	mAdc
Emitter-Base Cutoff Current		I_{EBO}			µAdc
V_{EB} = 6.0 Vdc				20	
Collector-Emitter Cutoff Current					
V_{CE} = 200 Vdc, V_{BE} = 1.5 Vdc	2N5415	I_{CEX}		50	µAdc
V_{CE} = 300 Vdc, V_{BE} = 1.5 Vdc	2N5416			50	µAdc
Collector-Base Cutoff Current					
V_{CB} = 175 Vdc	2N5415	I_{CBO1}		50	µAdc
V_{CB} = 280 Vdc	2N5416			50	
Collector-Base Cutoff Current					
V_{CB} = 200 Vdc	2N5415	I_{CBO2}		500	µAdc
V_{CB} = 350 Vdc	2N5416			500	

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS (3)				
Forward-Current Transfer Ratio I_C = 50 mAdc, V_{CE} = 10 Vdc I_C = 1.0 mAdc, V_{CE} = 10 Vdc	h_{FE}	30 15	120	
Collector-Emitter Saturation Voltage I_C = 50 mAdc, I_B = 5.0 mAdc	$V_{CE(sat)}$		2.0	Vdc
Base-Emitter Voltage I_C = 50 mAdc, V_{CE} = 10 Vdc	V_{BE}		1.5	Vdc
DYNAMIC CHARACTERISTICS				
Magnitude of Common Emitter Small-Signal Short Circuit Forward Current Transfer Ratio I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 5.0 MHz	$\lvert h_{fe} \rvert$	3.0	15	
Forward Current Transfer Ratio I_C = 5.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz	h_{fe}	25		
Output Capacitance V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C_{obo}		15	pF
Input Capacitance V_{EB} = 5.0 Vdc, I_C = 0, 100 kHz ≤ f ≤ 1.0 MHz	C_{ibo}		75	pF
SWITCHING CHARACTERISTICS				
Turn-On Time V_{CC} =200 Vdc, I_C = 50 mAdc, I_{B1}= 5.0 mAdc	t_{on}		1.0	µs
Turn-Off Time V_{CC} = 200 Vdc, I_C = 50 mAdc, I_{B1} = I_{B2} = 5.0 mAdc	t_{off}		10	µs

SAFE OPERATING AREA

DC Tests

T_C = +25^{0}C; 1 Cycle; t = 0.4 s

Test 1

V_{CE} = 10 Vdc, I_C = 1.0 Adc

Test 2

V_{CE} = 100 Vdc, I_C = 100 mAdc

Test 3

V_{CE} = 200 Vdc, I_C = 24 mAdc 2N5415

Test 4

V_{CE} = 300 Vdc, I_C = 10 mAdc 2N5416

(3) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤ 2.0%.