Microsemi LAWRENCE

TECHNICAL DATA

NPN SWITCHING SILICON TRANSISTOR

Qualified per MIL-PRF-19500/251

Devices		*Qualified Level*
2N2218	**2N2219**	**JAN**
2N2218A	**2N2219A**	**JANTX**
2N2218AL	**2N2219AL**	**JANTXV**
		JANS

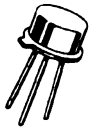
MAXIMUM RATINGS

Ratings	Symbol	2N2218 2N2219	2N2218A; L 2N2219A; L	Unit
Collector-Emitter Voltage	V_{CEO}	30	50	Vdc
Collector-Base Voltage	V_{CBO}	60	75	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	6.0	Vdc
Collector Current	I_C	800		mAdc
Total Power Dissipation @ $T_A = +25^0C$[1]	P_T	0.8		W
@ $T_C = +25^0C$[2]		3.0		W
Operating & Storage Junction Temp. Range	T_{op}, T_{stg}	-55 to +200		^0C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	59	$^0C/W$

1) Derate linearly 4.6 mW/^{0}C above $T_A > +25^0C$
2) Derate linearly 17.0 mW/^{0}C above $T_C > +25^0C$



TO- 39* (TO-205AD)
2N2218, 2N2218A
2N2219, 2N2219A

TO-5*
2N2218AL,
2N2219AL

*See appendix A for package outline

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

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage					
I_E = 10 mAdc	2N2218; 2N2219	$V_{(BR)CEO}$	30		Vdc
	2N2218A; L; 2N2219A; L		50		
Emitter-Base Cutoff Current					
V_{EB} = 5.0 Vdc	2N2218; 2N2219	I_{EBO}		10	μAdc
V_{EB} = 6.0 Vdc	2N2218A; L; 2N2219A; L			10	ηAdc
V_{EB} = 4.0 Vdc	All Types			10	
Collector-Base Cutoff Current					
V_{CE} = 30 Vdc	2N2218; 2N2219	I_{CES}		10	ηAdc
V_{CE} = 50 Vdc	2N2218A; L; 2N2219A; L			10	

ELECTRICAL CHARACTERISTICS (con't)

Characteristics		Symbol	Min.	Max.	Unit
Collector-Base Cutoff Current					
V_{CB} = 50 Vdc	2N2218; 2N2219	I_{CBO}		10	ηAdc
V_{CB} = 60 Vdc	2N2218A; L; 2N2219A; L			10	ηAdc
V_{CB} = 60 Vdc	2N2218; 2N2219			10	μAdc
V_{CB} = 75 Vdc	2N2218A; L, 2N2219A; L			10	μAdc
ON CHARACTERISTICS (3)					
Forward-Current Transfer Ratio					
I_C = 0.1 mAdc, V_{CE} = 10Vdc	2N2218	h_{FE}	20		
	2N2219		35		
	2N2218A; 2N2218AL		30		
	2N2219A; 2N2219AL		50		
I_C = 1.0 mAdc, V_{CE} = 10 Vdc	2N2218		25	150	
	2N2219		50	325	
	2N2218A; 2N2218AL		35	150	
	2N2219A; 2N2219AL		75	325	
I_C = 10 mAdc, V_{CE} = 10 Vdc	2N2218		35		
	2N2219		75		
	2N2218A; 2N2218AL		40		
	2N2219A; 2N2219AL		100		
I_C = 150 mAdc, V_{CE} = 10 Vdc	2N2218; A; 2N2218AL		40	120	
	2N2219; A; 2N2219AL		100	300	
I_C = 500 mAdc, V_{CE} =10 Vdc	2N2218; A; 2N2218AL		20		
	2N2219; A; 2N2219AL		30		
Collector-Emitter Saturation Voltage					
I_C = 150 mAdc, I_B = 15 mAdc	2N2218; 2N2219	$V_{CE(sat)}$		0.4	Vdc
	2N2218A; L; 2N2219A; L			0.3	Vdc
I_C = 500 mAdc, I_B = 50 mAdc	2N2218; 2N2219			1.6	Vdc
	2N2218; L; 2N2219A; L			1.0	Vdc
Base-Emitter Saturation Voltage					
I_C = 150 mAdc, I_B = 15 mAdc	2N2218; 2N2219	$V_{BE(sat)}$	0.6	1.3	Vdc
	2N2218A; L, 2N2219A, L		0.6	1.2	Vdc
I_C = 500 mAdc, I_B = 50 mAdc	2N2218; 2N2219			2.6	Vdc
	2N2218A; L; 2N2219A; L			2.0	Vdc
DYNAMIC CHARACTERISTICS					
Magnitude of Small-Signal Forward Current Transfer Ratio I_C = 20 mAdc, V_{CE} = 20 Vdc, f = 100 MHz		$\lvert h_{fe} \rvert$	2.5	12	
Small-Signal Forward Current Transfer Ratio					
I_C = 1.0 mAdc, V_{CE} = 10 Vdc, f = 1.0 kHz	2N2218	h_{fe}	25		
	2N2219		50		
	2N2218A, L		35		
	2N2219A, L		75		
Output Capacitance V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz		C_{obo}		8.0	pF
Input Capacitance V_{EB} = 0.5 Vdc, I_C = 0, 100 kHz ≤ f ≤ 1.0 MHz		C_{ibo}		25	pF
SWITCHING CHARACTERISTICS V_{CC} = 30 Vdc; I_C = 150 mAdc; I_{B1}= 15 mAdc					
Turn-On Time	2N2218, 2N2219	t_{on}		40	ηs
(See Figure 3 of MIL-PRF-19500/251)	2N2218A, L, 2N2219A, L			35	ηs
Turn-Off Time	2N2218, 2N2219	t_{off}		250	ηs
(See Figure 4 of MIL-PRF-19500/251)	2N2218A, L, 2N2219A, L			300	ηs

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