

SEMICONDUCTOR TECHNICAL DATA

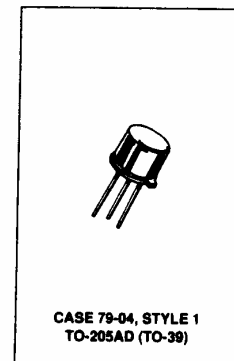
**2N2219,
2N2219A**

NPN Silicon Small-Signal Transistors

... designed for general-purpose switching and amplifier applications.

CRYSTALONCS
2805 Veterans Highway
Suite 14
Ronkonkoma, N.Y. 11776

MAXIMUM RATINGS				
Rating	Symbol	2N2218 2N2219	2N2218A 2N2219A	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	800	mA _{dc}
Device Dissipation @ T _A = 25°C Derate above 25°C @ T _C = 25°C Derate above 25°C	P _T	0.8 4.6 3.0 17		Watts mW/°C Watts mW/°C
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-65 to 200		°C



ELECTRICAL CHARACTERISTICS (T _A = 25°C unless otherwise noted.)					
Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ⁽¹⁾ (I _C = 10 mA _{dc} , I _E = 0)	V _{(BR)CEO}	30 50	— —	Vdc	
Collector-Base Breakdown Voltage (I _C = 10 μA _{dc} , I _E = 0)	V _{(BR)CBO}	60 75	— —	Vdc	
Emitter-Base Breakdown Voltage (I _E = 10 μA _{dc})	V _{(BR)EBO}	5.0 6.0	— —	Vdc	
Collector Cutoff Current (V _{CB} = 30 Vdc) (V _{CB} = 50 Vdc)	I _{CES}	— —	0.01 0.01	μA _{dc}	

⁽¹⁾ Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1.0 to 2.0%.

(continued)

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ELECTRICAL CHARACTERISTICS — continued (T _A = 25 C unless otherwise noted)					
Characteristic	Symbol	Min	Max	Unit	
OFF CHARACTERISTICS (continued)					
Collector Cutoff Current (V _{CB} = 50 Vdc) (V _{CB} = 60 Vdc) @ T _A = 150 C (V _{CB} = 50 Vdc) (V _{CB} = 60 Vdc)	2N2218, 2N2219 2N2218A, 2N2219A 2N2218, 2N2219 2N2218A, 2N2219A	I _{CBO}	— — — —	0.01 0.01 10 10	μAdc
Emitter Cutoff Current (V _{EB} = 4.0 Vdc, I _C = 0)		I _{EBO}	—	0.01	μAdc
ON CHARACTERISTICS					
DC Current Gain ⁽¹⁾ (I _C = 0.1 mAdc, V _{CE} = 10 Vdc)	2N2218 2N2219 2N2218A 2N2219A	h _{FE}	20 35 30 50	— — — —	—
(I _C = 1.0 mAdc, V _{CE} = 10 Vdc)	2N2218 2N2219 2N2218A 2N2219A		25 50 35 75	150 325 150 325	
(I _C = 10 mAdc, V _{CE} = 10 Vdc)	2N2218 2N2219 2N2218A 2N2219A		35 75 40 100	— — — —	
(I _C = 150 mAdc, V _{CE} = 10 Vdc)	2N2218, 2N2218A 2N2219, 2N2219A		40 100	120 300	
(I _C = 500 mAdc, V _{CE} = 10 Vdc) ⁽¹⁾	2N2218, 2N2218A 2N2219, 2N2219A		20 30	— —	
(I _C = 10 mAdc, V _{CE} = 10 Vdc, T _A = -55 C)	2N2218, 2N2218A 2N2219, 2N2219A		15 35	— —	
Collector-Emitter Saturation Voltage ⁽¹⁾ (I _C = 150 mAdc, I _B = 15 mAdc)	2N2218, 2N2219 2N2218A, 2N2219A	V _{CE(sat)}	— —	0.4 0.3	Vdc
(I _C = 500 mAdc, I _B = 50 mAdc)	2N2218, 2N2219 2N2218A, 2N2219A		— —	1.6 1.0	
Base-Emitter Saturation Voltage ⁽¹⁾ (I _C = 150 mAdc, I _B = 15 mAdc)	2N2218, 2N2219 2N2218A, 2N2219A	V _{BE(sat)}	0.6 0.6	1.3 1.2	Vdc
(I _C = 500 mAdc, I _B = 50 mAdc)	2N2218, 2N2219 2N2218A, 2N2219A		— —	2.6 2.0	
SMALL-SIGNAL CHARACTERISTICS					
Output Capacitance (V _{CB} = 10 Vdc, f = 0.1 to 1.0 MHz)		C _{obo}	—	8.0	pF
Input Capacitance (V _{EB} = 0.5 Vdc, f = 0.1 to 1.0 MHz)		C _{ibo}	—	25	pF
Current Gain (I _C = 1.0 mAdc, V _{CE} = 10 Vdc, f = 1.0 kHz)	2N2218 2N2219 2N2218A 2N2219A	h _{fe}	25 50 35 75	— — — —	—
Small-Signal Current Transfer Ratio, Magnitude (I _C = 20 mAdc, V _{CE} = 20 Vdc, f = 100 MHz)		h _{fej}	2.5	12	—

⁽¹⁾ Pulsed Pulse Width: 250 to 350 μs, Duty Cycle: 10 to 20%.

(continued)

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ELECTRICAL CHARACTERISTICS — continued (T _A = 25 °C unless otherwise noted ¹)					
Characteristic		Symbol	Min	Max	Unit
SWITCHING CHARACTERISTICS (See Figure 10) (V _{CC} = 30 Vdc, I _C = 150 mA, I _B = 15 mA)					
Turn-On Time	2N2218, 2N2219	t _{ion}	—	40	ns
	2N2218A, 2N2219A		—	35	
Turn-Off Time	2N2218, 2N2219	t _{off}	—	250	ns
	2N2218A, 2N2219A		—	300	

ASSURANCE TESTING (Pre-Post Burn-In)					
Burn-In Conditions: T _A = 25 ± 3 °C, V _{CB} = 24 Vdc 2N2218, 19, 30 Vdc 2N2218A, 19A, 10 Vdc JANS					
P _T = 800 mW					
Characteristics Tested	Symbol	Initial and End Point Limits		Unit	
		Min	Max		
Collector Cutoff Current (V _{CB} = 50 Vdc) (V _{CB} = 60 Vdc)	2N2218, 2N2219	I _{CBO}	—	10	nAdc
	2N2218A, 2N2219A		—	10	
DC Current Gain ⁽¹⁾ (I _C = 150 mA, V _{CE} = 10 Vdc)	2N2218, 2N2219	h _{FE}	40	120	—
	2N2218A, 2N2219A		100	300	

Delta from Pre-Burn-In Measured Values				
		Min	Max	
Delta Collector Cutoff Current	ΔI _{CBO}	—	±100 or ±5.0 whichever is greater	% of Initial Value nAdc
Delta DC Current Gain ⁽¹⁾	Δh _{FE}	—	±15	% of Initial Value

⁽¹⁾ Pulsed. Pulse Width 250 to 350 μs. Duty Cycle 1:1 to 2:1.

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