

# 2N2218, A, AL JAN, JTX, JTXV, JANS 2N2219, A, AL JAN, JTX, JTXV, JANS



Processed per MIL-PRF-19500/251

## NPN SWITCHING SILICON TRANSISTOR

### MAXIMUM RATINGS

Ratings	Symbol	2N2218 2N2219	2N2218A; AL 2N2219A; AL	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	@ $T_A = +25^{\circ}\text{C}^{(1)}$	0.8		W
	@ $T_C = +25^{\circ}\text{C}^{(2)}$	3.0		W
Operating & Storage Junction Temp. Range	$T_{op}, T_{stg}$	-55 to +200		$^{\circ}\text{C}$

### THERMAL CHARACTERISTICS

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

 1) Derate linearly 4.6 mW/ $^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$ 

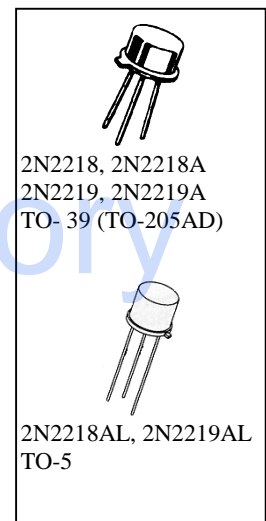
 2) Derate linearly 17.0 mW/ $^{\circ}\text{C}$  for  $T_C > +25^{\circ}\text{C}$ 

### ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_E = 10 \text{ mAdc}$	2N2218, 2N2219 2N2218A, AL, 2N2219A, AL	$V_{(BR)CEO}$	30 50	Vdc
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$ $V_{EB} = 6.0 \text{ Vdc}$	2N2218, 2N2219 2N2218A, AL, 2N2219A, AL	$I_{EBO}$	10 10 10	$\mu\text{Adc}$ $\eta\text{Adc}$
$V_{EB} = 4.0 \text{ Vdc}$	All Types			
Collector-Base Cutoff Current $V_{CE} = 30 \text{ Vdc}$ $V_{CE} = 50 \text{ Vdc}$	2N2218, 2N2219 2N2218A, AL, 2N2219A, AL	$I_{CES}$	10 10	$\eta\text{Adc}$



**2N2218, A, AL; 2N2219, A, AL JAN SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
Collector-Base Cutoff Current $V_{CB} = 50 \text{ Vdc}$ $V_{CB} = 60 \text{ Vdc}$ AL $V_{CB} = 60 \text{ Vdc}$ $V_{CB} = 75 \text{ Vdc}$ AL	$I_{CBO}$	2N2218, 2N2219	10	$\eta_{Adc}$ $\mu_{Adc}$
2N2218A, AL, 2N2219A,		10		
2N2218, 2N2219		10		
2N2218A, AL, 2N2219A,		10		
2N2218, 2N2219				
2N2218A, AL, 2N2219A,				

**ON CHARACTERISTICS (3)**

Forward-Current Transfer Ratio $I_C = 0.1 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ 2N2218 2N2219 2N2218A, 2N2218AL 2N2219A, 2N2219AL $I_C = 1.0 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ 2N2218 2N2219 2N2218A, 2N2218AL 2N2219A, 2N2219AL $I_C = 10 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ 2N2218 2N2219 2N2218A, 2N2218AL 2N2219A, 2N2219AL $I_C = 150 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ 2N2218, A, 2N2218AL 2N2219, A, 2N2219AL $I_C = 500 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ 2N2218, A, 2N2218AL 2N2219, A, 2N2219AL	$h_{FE}$	20		
2N2218A, 2N2218AL		35		
2N2219A, 2N2219AL		30		
		50		
		25	150	
		50	325	
		35	150	
		75	325	
		35		
		75		
		40		
		100		
	40	120		
	100	300		
	20			
	30			

Collector-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}$ , $I_B = 15 \text{ mAdc}$ 2N2218, 2N2219 2N2218A, AL, 2N2219A, AL $I_C = 500 \text{ mAdc}$ , $I_B = 50 \text{ mAdc}$ 2N2218, 2N2219 2N2218A, AL, 2N2219A, AL	$V_{CE(sat)}$		0.4 0.3 1.6 1.0	Vdc
Base-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}$ , $I_B = 15 \text{ mAdc}$ 2N2218, 2N2219 2N2218A, AL, 2N2219A, AL $I_C = 500 \text{ mAdc}$ , $I_B = 50 \text{ mAdc}$ 2N2218, 2N2219 2N2218A, AL, 2N2219A, AL	$V_{BE(sat)}$	0.6 0.6	1.3 1.2 2.6 2.0	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Small-Signal Forward Current Transfer Ratio $I_C = 20 \text{ mAdc}$ , $V_{CE} = 20 \text{ Vdc}$ , $f = 100 \text{ MHz}$	$ h_{fe} $	2.5	12	
Small-Signal Forward Current Transfer Ratio $I_C = 1.0 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ 2N2218 2N2219 2N2218A, AL 2N2219A, AL	$h_{fe}$	25		
		50		
		35		
		75		
Output Capacitance $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{obo}$		8.0	pF
Input Capacitance $V_{EB} = 0.5 \text{ Vdc}$ , $I_C = 0$ , $100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{ibo}$		25	pF

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