

NPN-SWITCHIN SILICON TRANSISTOR

Qualified per MIL-PRF-19500/251

DEVICES

2N2218	2N2219
2N2218A	2N2219A
2N2218AL	2N2219AL

LEVELS

JAN
JANTX
JANTXV
JANS *

* Also available in Radiation Hardened versions. See datasheet for JANSR2N2218 & JANSR2N2219

ABSOLUTE MAXIMUM RATINGS ($T_C = +25^\circ\text{C}$ unless otherwise noted)

Parameters / Test Conditions	Symbol	2N2218 2N2219	2N221A; 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		mA
Total Power Dissipation @ $T_A = +25^\circ\text{C}$	P_T	0.8		W
@ $T_C = +25^\circ\text{C}$		3.0		W
Operating & Storage Junction Temp. Range	T_{op}, T_{stg}	-55 to +200		$^\circ\text{C}$

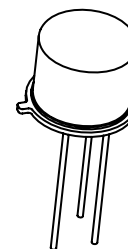
THERMAL CHARACTERISTICS

Parameters / Test Conditions	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	59	$^\circ\text{C/W}$

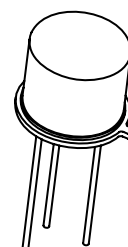
Note: (1) Derate linearly 4.6mW/ $^\circ\text{C}$ above $T_A > +25^\circ\text{C}$
(2) Derate linearly 17.0mW/ $^\circ\text{C}$ above $T_C > +25^\circ\text{C}$

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

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



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



TO-5
2N2218AL
2N2219AL



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 Website: <http://www.microsemi.com>

TECHNICAL DATA SHEET

NPN-SWITCHIN SILICON TRANSISTOR

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ELECTRICAL CHARACTERISTICS ($T_A = +25^\circ\text{C}$, unless otherwise noted) (Con't)

Parameters / Test Conditions	Symbol	Min.	Max.	Unit	
Collector-Base Cutoff Current	I _{CBO}				
V _{CB} = 50Vdc 2N2218; 2N2219			10	ηAdc μAdc	
V _{CB} = 60Vdc 2N2218A; 2N2219A; L			10		
V _{CB} = 60Vdc 2N2218; 2N2219			10		
V _{CB} = 75Vdc 2N2218A; 2N2219A; L			10		
ON CHARACTERTICS (3)					
Forward-Current Transfer Ratio	h _{FE}				
I _C = 0.1mAdc, V _{CE} = 10Vdc		2N2218	20		
		2N2219	35		
		2N2218A; 2N2218AL	30		
		2N2219A; 2N2219AL	50		
I _C = 1.0mAdc, V _{CE} = 10Vdc		2N2218	25		
		2N2219	50		150
		2N2218A; 2N2218AL	35		150
		2N2219A; 2N2219AL	75		325
I _C = 10mAdc, V _{CE} = 10Vdc		2N2218	35		
		2N2219	75		
		2N2218A; 2N2218AL	40		
		2N2219A; 2N2219AL	100		
I _C = 150mAdc, V _{CE} = 10Vdc		2N2218; A; AL	40		120
		2N2219; A; AL	100		300
I _C = 500mAdc, V _{CE} = 10Vdc	2N2218; A; AL	20			
	2N2219; A; AL	30			
Collector-Emitter Saturation Voltage	V _{CE(sat)}				
I _C = 150mAdc, I _B = 15mAdc		2N2218; 2N2219		0.4	Vdc
		2N2218A; 2N2219A; L		0.3	
I _C = 500mAdc, I _B = 50mAdc		2N2218; 2N2219		1.6	
	2N2218A; 2N2219A; L		1.0		
Base-Emitter Saturation Voltage	V _{BE(sat)}				
I _C = 150mAdc, I _B = 15mAdc		2N2218; 2N2219	0.6	1.3	Vdc
		2N2218A; 2N2219A; L	0.6	1.2	
I _C = 500mAdc, I _B = 50mAdc		2N2218; 2N2219		2.6	
		2N2218A; 2N2219A; L		2.0	



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DYNAMIC CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Magnitude of Small-Signal Forward Current Transfer Ratio $I_C = 20\text{mA}$, $V_{CE} = 20\text{Vdc}$, $f = 100\text{MHz}$	$ h_{fe} $	2.5	12	
Small-Signal Forward Current Transfer Ratio $I_C = 1.0\text{mA}$, $V_{CE} = 10\text{Vdc}$, $f = 1.0\text{kHz}$ 2N2218 2N2219 2N2218A, L 2N2219A, L	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

SWITCHING CHARACTERISTICS

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
$V_{CC} = 30\text{Vdc}$; $I_C = 150\text{mA}$; $I_{B1} = 15\text{mA}$				
Turn-On Time (See Figure 3 of MIL-PRF-19500/251) 2N2218, 2N2219 2N2218A, L, 2N2219A, L	t_{on}		40 35	ηs
Turn-Off Time (See Figure 4 of MIL-PRF-19500/251) 2N2218, 2N2219 2N2218A, L, 2N2219A, L	t_{off}		250 300	ηs

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