DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N2218(A)-2N2219(A)

NPN SILICON LOW POWER TRANSISTORS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	2N2218 2N2219	2N2218A 2N2219A	Units
Collector-Emitter Voltage	V_{CEO}	30	50	V
Collector-Base Voltage	V_{CBO}	60	75	V
Emitter-Base Voltage	V_{EBO}	5.0	6.0	V
Collector Current	I_C	800		mA
Total device dissipation T_A = +25°C(1) T_C = +25°(2)	P_D	0.8 3.0		W
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +200		°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	59		°C/W

Note 1: Derate linearly 4.6mW/°C above T_A >+25°C
Note 3: Derate linearly 17mW/°C above T_C >+25°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter		Symbol	Min	Max	Unit
Collector-emitter breakdown voltage I_E = 10mA	2N2218, 2N2219 2N2218A, 2N2219A	$V_{(BR)CEO}$	30 50	- -	V
Emitter-Base Cutoff Current V_{EB} = 5.0V V_{EB} = 6.0V V_{EB} = 4.0V	2N2218, 2N2219 2N2218A, 2N2219A All Types	I_{EBO}	- - -	10 10 10	µA ŋA
Collector-Base Cutoff Current V_{CE} = 30V V_{CE} = 50V	2N2218, 2N2219 2N2218A, 2N2219A	I_{ces}	- -	10 10	ŋA
Collector-Base Cutoff Current V_{CB} = 50V V_{CB} = 60V V_{CB} = 60V V_{CB} = 75V	2N2218, 2N2219 2N2218, 2N2219 2N2218A, 2N2219A 2N2218A, 2N2219A	I_{CBO}	- - - -	10 10 10 10	ŋA µA ŋA µA
ON CHARACTERISTICS(3)					
Forward Current Transfer Ratio					
I_C = 0.1mA, V_{CE} = 10V	2N2218 2N2219 2N2218A 2N2219A	h_{FE}	20 35 30 50	- - - -	-
I_C = 1.0mA, V_{CE} = 10V	2N2218 2N2219 2N2218A 2N2219A		25 50 35 75	150 325 150 325	

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter		Symbol	Min	Max	Unit
Forward Current Transfer Ratio					
I_C = 10mA, V_{CE} = 10V	2N2218	h_{FE}	35	-	-
	2N2219		75	-	
	2N2218A		40	-	
	2N2219A		100	-	
I_C = 150mA, V_{CE} = 10V	2N2218(A)		40	120	-
	2N2219(A)		100	300	
I_C = 500mA, V_{CE} = 10V	2N2218(A)		20	-	-
	2N2219(A)		30	-	
Collector-Emitter Saturation Voltage					
I_C = 150mA, I_B = 15mA	2N2218(A)	$V_{CE(sat)}$	-	0.4	Vdc
	2N2219(A)		-	0.3	
I_C = 500mA, I_B = 50mA	2N2218(A)		-	1.6	
	2N2219(A)		-	1.0	
Base-Emitter Saturation Voltage					
I_C = 150mA, I_B = 15mA	2N2218(A)	$V_{BE(sat)}$	0.6	1.3	Vdc
	2N2219(A)		0.6	1.2	
I_C = 500mA, I_B = 50mA	2N2218(A)		-	2.6	
	2N2219(A)		-	2.0	
Magnitude of Small-Signal Forward Current Transfer Ratio I_C = 20mA, V_{CE} = 20V, f = 100MHz		$\|h_{fe}\|$	2.5	12	-
Small-Signal Forward Current Transfer Ratio I_C = 1.0mA, V_{CE} = 10V, f = 1.0kHz	2N2218	h_{fe}	25	-	-
	2N2219		50	-	
	2N2218A		35	-	
	2N2219A		75	-	
Output Capacitance V_{CB} = 10V, I_E = 0, 100kHz ≤ f ≤ 1.0MHz		C_{obo}	-	8.0	pF
Output Capacitance V_{EB} = 0.5V, I_C = 0, 100kHz ≤ f ≤ 1.0MHz		C_{ibo}	-	25	pF
SWITCHING CHARACTERISTICS					
V_{CC} = 30V, $_C$ = 150mA, I_{B1} = 15mA					
Turn-On Time **See Figure 1**	2N2218, 2N2219	t_{on}	-	40	ŋs
	2N2218(A), 2N2219(A)		-	35	
Turn-Off Time **See Figure 2**	2N2218, 2N2219	t_{off}	-	250	ŋs
	2N2218(A), 2N2219(A)		-	300	

Note 3: PW = 300µs, duty cycle ≤ 2%.

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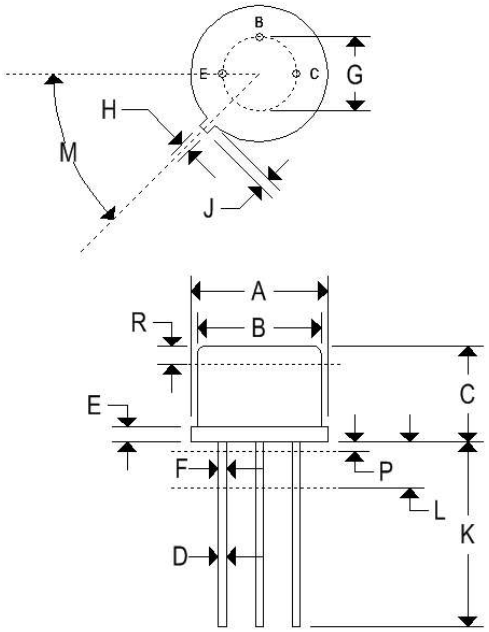
MECHANICAL CHARACTERISTICS

Case	TO-39
Marking	Alpha-numeric
Pin out	See below



	TO-39			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.350	0.370	8.890	9.400
B	0.315	0.335	8.000	8.510
C	0.240	0.260	6.10	6.60
D	0.016	0.021	0.406	0.533
E	0.009	0.125	0.2269	3.180
F	0.016	0.019	0.406	0.533
G	0.190	0.210	4.830	5.33
H	0.028	0.034	0.711	0.864
J	0.029	0.040	0.737	1.020
K	0.500	-	12.700	-
L	0.250	-	6.350	-
M	45° NOM		45° NOM	
P	-	0.050	-	1.270
Q	90° NOM		90° NOM	
R	0.100	-	2.540	-

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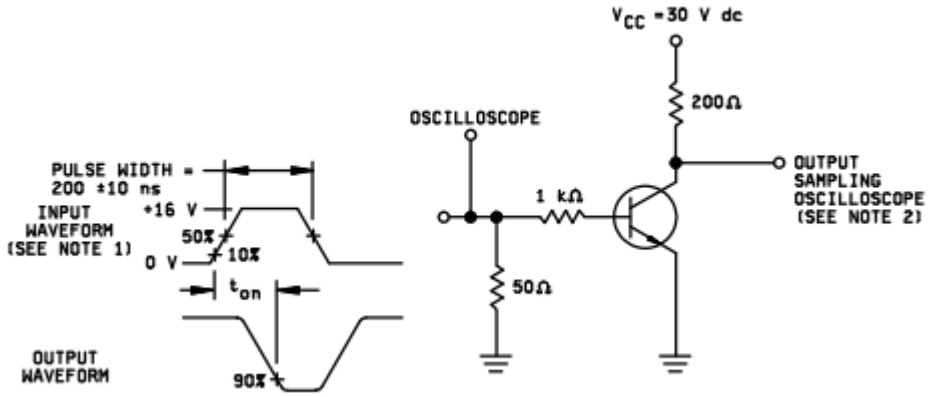

Figure 1

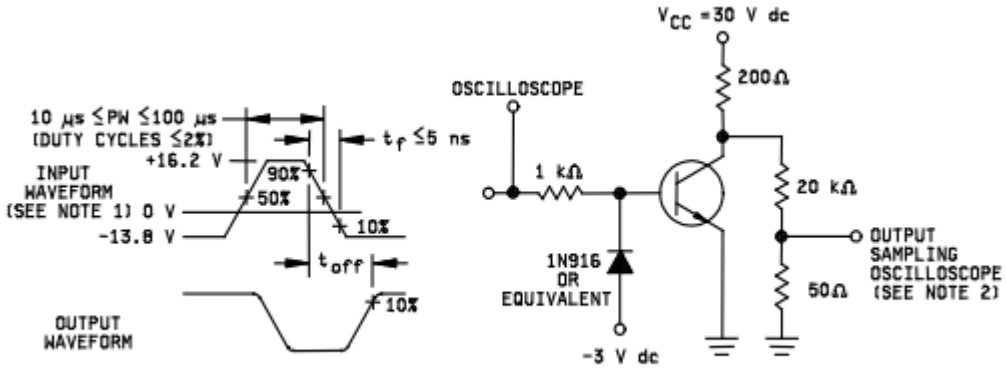

Figure 2