

## NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/181

### Devices

2N718A

2N1613  
2N1613L

### Qualified Level

JAN  
JANTX  
JANTXV

### MAXIMUM RATINGS

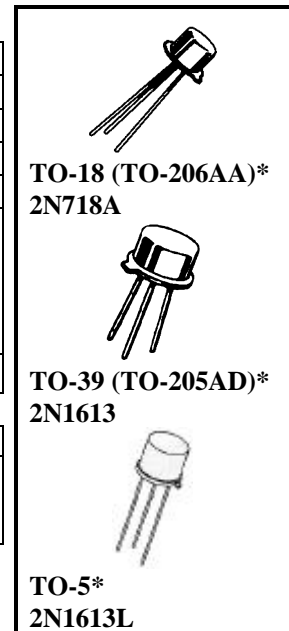
Ratings	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO}$	30	Vdc
Collector-Base Voltage	$V_{CBO}$	75	Vdc
Emitter-Base Voltage	$V_{EBO}$	7.0	Vdc
Collector Current	$I_C$	500	mAdc
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ <sup>(1)</sup>	2N718A	0.5	W
	2N1613, L	0.8	
	2N718A	1.8	
	2N1613, L	3.0	
@ $T_C = +25^{\circ}\text{C}$ <sup>(2)</sup>			
Operating & Storage Junction Temperature Range	$T_J, T_{stg}$	-55 to +175	$^{\circ}\text{C}$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	2N718A	97	$^{\circ}\text{C}/\text{W}$
	2N1613, L	58	

1) Derate linearly 4.57 mW/ $^{\circ}\text{C}$  for 2N1613, L and 2.85 mW/ $^{\circ}\text{C}$  for 2N718A for  $T_A > +25^{\circ}\text{C}$

2) Derate linearly 17.2 mW/ $^{\circ}\text{C}$  for 2N1613, L and 10.3 mW/ $^{\circ}\text{C}$  for 2N718A for  $T_C > +25^{\circ}\text{C}$



\*See appendix A for package outline

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}\text{C}$ unless otherwise noted)

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

Collector-Emitter Breakdown Voltage $I_C = 30 \text{ mAdc}$	$V_{(BR)CEO}$	30		Vdc
Collector-Emitter Breakdown Voltage $I_C = 10 \text{ mAdc}, R_{BE} = 10 \Omega$	$V_{(BR)CER}$	50		Vdc
Collector-Base Cutoff Current $V_{CB} = 60 \text{ Vdc}$	$I_{CBO}$		10	$\eta\text{Adc}$
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$	$I_{EBO}$		10	$\eta\text{Adc}$

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
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**ON CHARACTERISTICS (3)**

Forward-Current Transfer Ratio $I_C = 0.1 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 150 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	$h_{FE}$	20 35 40 20	120	
Collector-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$	$V_{CE(sat)}$		1.5	Vdc
Base-Emitter Saturation Voltage $I_C = 150 \text{ mAdc}, I_B = 15 \text{ mAdc}$	$V_{BE(sat)}$		1.3	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Small-Signal Forward Current Transfer Ratio $I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 20 \text{ MHz}$	$ h_{fe} $	3.0		
Small-Signal Forward Current Transfer Ratio $I_C = 1.0 \text{ mAdc}, V_{CE} = 5.0 \text{ Vdc}, f = 1.0 \text{ kHz}$ $I_C = 5.0 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	$h_{fe}$	30 35	100 150	
Small-Signal Short Circuit Input Impedance $I_C = 5.0 \text{ mAdc}, V_{CB} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	$h_{ib}$	4.0	8.0	$\Omega$
Small-Signal Short Circuit Output Admittance $I_C = 5.0 \text{ mAdc}, V_{CB} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	$h_{ob}$		1.0	$\eta\Omega$
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{obo}$		25	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time + Turn-Off Time (See Figure 1 of MIL-PRF-19500/181)	$t_{on} + t_{off}$		30	$\eta s$
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(3)Pulse Test: Pulse Width = 300 $\mu s$ , Duty Cycle  $\leq 2.0\%$ .