

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 @ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾	P_T	2N718A 0.5	W
		2N1613, L 0.8	
@ $T_C = +25^{\circ}\text{C}$ ⁽²⁾		2N718A 1.8	
		2N1613, L 3.0	
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-55 to +175	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

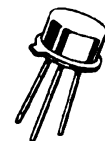
Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2N718A 97	$^{\circ}\text{C}/\text{W}$
		2N1613, L 58	

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 $T_C > +25^{\circ}\text{C}$



TO-18 (TO-206AA)*
2N718A



TO-39 (TO-205AD)*
2N1613



TO-5*
2N1613L

*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	ηAdc
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$	I_{EBO}		10	ηAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
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	Ω
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	ηs
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(3)Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.