

NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/181

Devices

2N718A

2N1613
2N1613L

Qualified Level

JAN
JANTX
JANTXV

MAXIMUM RATINGS

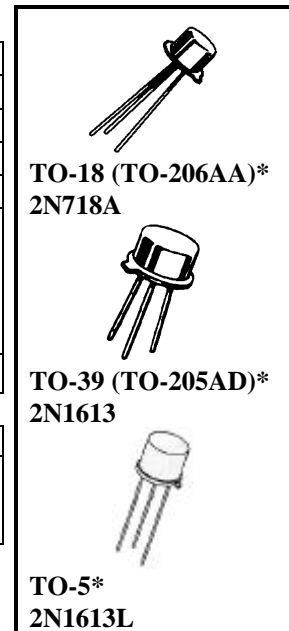
Ratings	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CBO}	75	Vdc
Emitter-Base Voltage	V_{EBO}	7.0	Vdc
Collector Current	I_C	500	mAdc
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾	2N718A	0.5	W
	2N1613, L	0.8	
	2N718A	1.8	
	2N1613, L	3.0	
@ $T_C = +25^{\circ}\text{C}$ ⁽²⁾			
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	ηAdc
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{ Vdc}$	I_{EBO}		10	ηAdc

ELECTRICAL CHARACTERISTICS (con't)

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

Forward-Current Transfer Ratio I _C = 0.1 mA _{dc} , V _{CE} = 10 V _{dc} I _C = 10 mA _{dc} , V _{CE} = 10 V _{dc} I _C = 150 mA _{dc} , V _{CE} = 10 V _{dc} I _C = 500 mA _{dc} , V _{CE} = 10 V _{dc}	h _{FE}	20 35 40 20	120	
Collector-Emitter Saturation Voltage I _C = 150 mA _{dc} , I _B = 15 mA _{dc}	V _{CE(sat)}		1.5	V _{dc}
Base-Emitter Saturation Voltage I _C = 150 mA _{dc} , I _B = 15 mA _{dc}	V _{BE(sat)}		1.3	V _{dc}

DYNAMIC CHARACTERISTICS

Magnitude of Small-Signal Forward Current Transfer Ratio I _C = 50 mA _{dc} , V _{CE} = 10 V _{dc} , f = 20 MHz	h _{fe}	3.0		
Small-Signal Forward Current Transfer Ratio I _C = 1.0 mA _{dc} , V _{CE} = 5.0 V _{dc} , f = 1.0 kHz I _C = 5.0 mA _{dc} , V _{CE} = 10 V _{dc} , f = 1.0 kHz	h _{fe}	30 35	100 150	
Small-Signal Short Circuit Input Impedance I _C = 5.0 mA _{dc} , V _{CB} = 10 V _{dc} , f = 1.0 kHz	h _{ib}	4.0	8.0	Ω
Small-Signal Short Circuit Output Admittance I _C = 5.0 mA _{dc} , V _{CB} = 10 V _{dc} , f = 1.0 kHz	h _{ob}		1.0	ηΩ
Output Capacitance V _{CB} = 10 V _{dc} , I _E = 0, 100 kHz ≤ f ≤ 1.0 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 = 300μs, Duty Cycle ≤ 2.0%.