

## NPN SILICON SWITCHING TRANSISTOR

Qualified per MIL-PRF-19500/312

### Devices

**2N708**

### Qualified Level

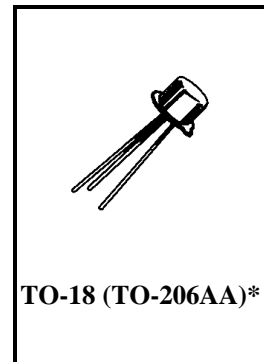
**JAN, JANTX**

### MAXIMUM RATINGS

Ratings	Symbol	Value	Units	
Collector-Emitter Voltage	$V_{CEO}$	15	Vdc	
Collector-Base Voltage	$V_{CBO}$	40	Vdc	
Emitter-Base Voltage	$V_{EBO}$	5.0	Vdc	
Collector-Emitter Voltage	$V_{CER}$	20	Vdc	
Total Power Dissipation	$P_T$	@ $T_A = +25^{\circ}C$ (1)	0.36	W
		@ $T_C = +25^{\circ}C$ (2)	1.2	W
Operating & Storage Junction Temperature Range	$T_{op}, T_{stg}$	-65 to +200	$^{\circ}C$	

1) Derate linearly 2.06 mW/ $^{\circ}C$  for  $T_A > 25^{\circ}C$

2) Derate linearly 6.90 mW/ $^{\circ}C$  for  $T_C > 25^{\circ}C$



\*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Base Breakdown Voltage $I_C = 1.0 \mu A_{dc}$	$V_{(BR)CBO}$	40		Vdc
Emitter-Base Breakdown Voltage $I_E = 10 \mu A_{dc}$	$V_{(BR)EBO}$	5.0		Vdc
Collector-Emitter Breakdown Voltage $I_C = 10 mA_{dc}$	$V_{(BR)CEO}$	15		Vdc
Collector-Emitter Breakdown Voltage $I_C = 10 mA_{dc}, R_{BE} \leq 10 \Omega$	$V_{(BR)CER}$	20		Vdc
Collector-Base Cutoff Current $V_{CB} = 20 V_{dc}$	$I_{CBO}$		25	$\eta A_{dc}$
Emitter-Base Cutoff Current $V_{EB} = 4.0 V_{dc}$	$I_{EBO}$		80	$\eta A_{dc}$

**2N708 JANTX SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
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**ON CHARACTERISTICS <sup>(3)</sup>**

Forward-Current Transfer Ratio $I_C = 0.5 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$ $I_C = 10 \text{ mAdc}, V_{CE} = 1.0 \text{ Vdc}$	$h_{FE}$	15 40	120	
Collector-Emitter Saturation Voltage $I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$	$V_{CE(sat)}$		0.40	Vdc
Base-Emitter Voltage $I_C = 10 \text{ mAdc}, I_B = 1.0 \text{ mAdc}$ $I_C = 1.0 \text{ mAdc}, I_B = 0.1 \text{ mAdc}$	$V_{BE(sat)}$	0.72	0.80 0.72	Vdc

**DYNAMIC CHARACTERISTICS**

Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 100 \text{ MHz}$	$ h_{fe} $	3.0	9.0	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$	$C_{obo}$		6.0	$p^f$
Input Capacitance $V_{EB} = 0.5 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz}$	$C_{ibo}$		9.0	$p^f$

**SWITCHING CHARACTERISTICS**

Charge Storage Time $I_C = I_{B1} = -I_{B2} = 10 \text{ mAdc}$	$t_s$		25	$\eta s$
Turn-On Time $V_{BE} \approx -2.0 \text{ Vdc}; I_C \approx 10 \text{ mAdc}; I_{B1} \approx 3.0 \text{ mAdc}$	$t_{on}$		40	$\eta s$
Turn-Off Time $I_C \approx 10 \text{ mAdc}; I_{B1} \approx 3.0 \text{ mAdc}, I_{B2} \approx -1.0 \text{ mAdc}$	$t_{off}$		75	$\eta s$

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