Microsemi LAWRENCE

TECHNICAL DATA

NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/ 182

Devices		*Qualified Level*
2N720A	**2N1893** **2N1893S**	**JAN** **JANTX** **JANTXV**

MAXIMUM RATINGS

Ratings	Symbol	All Devices		Units
Collector-Emitter Voltage	V_{CEO}	80		Vdc
Collector-Base Voltage	V_{CBO}	120		Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Collector-Emitter Voltage (R_{BE} = 10 Ω)	V_{CER}	100		Vdc
Collector Current	I_C	500		mAdc
		2N720A	**2N1893, S**	
Total Power Dissipation @ T_A = +25^{0}C (1) @ T_C = +25^{0}C (2)	P_T	0.5 1.8	0.8 3.0	W
Operating & Storage Junction Temperature Range	T_J, T_{srg}	-65 to +200		^{0}C

THERMAL CHARACTERISTICS

Characteristics	Symbol	2N720A	2N1893, S	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	97	58	^{0}C/W

1) Derate linearly 2.86 mW/^{0}C for 2N720A, 4.57 mW/^{0}C for 2N1893, S $T_A > 25^0$C

2) Derate linearly 10.3 mW/^{0}C for 2N720A, 17.2 mW/^{0}C for 2N1893, S $T_C > 25^0$C

TO-18 (TO-206AA)*
2N720A

TO-5*
2N1893, 2N1893S

*See appendix A for package outline

ELECTRICAL CHARACTERISTICS (T_A = 25^{0}C unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage I_C = 30 mAdc	$V_{(BR)CEO}$	80		Vdc
Collector-Emitter Breakdown Voltage I_C = 10 mAdc, R_{BE} = 10 Ω	$V_{(BR)CER}$	100		Vdc
Collector-Base Cutoff Current V_{CB} = 120 Vdc V_{CB} = 90 Vdc	I_{CBO}		10 10	µAdc ηAdc
Emitter-Base Cutoff Current V_{EB} = 7.0 Vdc V_{EB} = 5.0 Vdc	I_{EBO}		10 10	µAdc ηAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS (3)				
Forward-Current Transfer Ratio I_C = 0.1 mAdc, V_{CE} = 10 Vdc I_C = 10 mAdc, V_{CE} = 10 Vdc I_C = 150 mAdc, V_{CE} = 10 Vdc	h_{FE}	 20 35 40	 120	
Collector-Emitter Saturation Voltage I_C = 150 mAdc, I_B = 15 mAdc	$V_{CE(sat)}$		 5.0	Vdc
Base-Emitter Voltage I_C = 150 mAdc, I_B = 15 mAdc	$V_{BE(sat)}$		 1.3	Vdc
DYNAMIC CHARACTERISTICS				
Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I_C = 50 mAdc, V_{CE} = 10 Vdc, f = 20 MHz	$\lvert h_{fe} \rvert$	 3.0	 10	
Small-Signal Short-Circuit Forward Current Transfer Ratio V_{CE} =5.0 Vdc, I_C = 1.0 mAdc V_{CE} =10 Vdc, I_C = 5.0 mAdc, f = 1.0 kHz	h_{fe}	 35 45	 100	
Small-Signal Short-Circuit Input Impedance V_{CB} = 10 Vdc, I_C = 5.0 mAdc	h_{ib}	 4.0	 8.0	Ω
Small-Signal Short-Circuit Output Admittance V_{CB} = 10 Vdc, I_C = 5.0 mAdc	h_{ob}		 0.5	μΩ
Output Capacitance V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C_{obo}	 2	 15	P^F
SWITCHING CHARACTERISTICS				
Turn-On Time + Turn-Off Time (See Figure 3 of MIL-PRF-19500/182)	^{t}on + ^{t}off		 30	ηs

(3) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.