

NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/225

Devices

2N1711

2N1890

Qualified Level

JAN
JANTX

MAXIMUM RATINGS

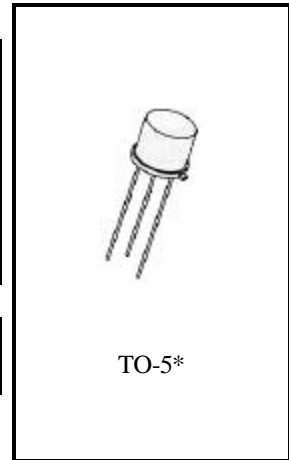
Ratings	Symbol	2N1711	2N1890	Unit
Collector-Base Voltage	V_{CBO}	75	100	Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Collector Current	I_C	500		mAdc
Total Power Dissipation	@ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾	0.8		W
	@ $T_C = +25^{\circ}\text{C}$ ⁽²⁾	3.0		W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Impedance	$Z_{\theta JX}$	58	$^{\circ}\text{C}/\text{W}$

1) Derate linearly 4.57 mW/ $^{\circ}\text{C}$ for $T_A > 25^{\circ}\text{C}$

2) Derate linearly 17.2 mW/ $^{\circ}\text{C}$ for $T_C > 25^{\circ}\text{C}$



*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Base Breakdown Voltage $I_C = 100 \mu\text{Adc}$	2N1711, S 2N1890, S	$V_{(BR)CBO}$	75 100	Vdc
Collector-Emitter Breakdown Voltage $R_{BE} = 10 \Omega, I_C = 100 \text{mAdc}$	2N1711, S 2N1890, S	$V_{(BR)CER}$	50 80	Vdc
Collector-Emitter Breakdown Voltage $I_C = 30 \text{mAdc}$	2N1711, S 2N1890, S	$V_{(BR)CEO}$	30 60	Vdc
Emitter-Base Breakdown Voltage $I_E = 100 \mu\text{Adc}$		$V_{(BR)EBO}$	7.0	Vdc
Collector-Base Cutoff Current $V_{CB} = 60 \text{Vdc}$ $V_{CB} = 80 \text{Vdc}$	2N1711 2N1890	I_{CBO}		10 10 ηAdc
Emitter-Base Cutoff Current $V_{EB} = 5.0 \text{Vdc}$		I_{EBO}		5.0 ηAdc

2N1711, 2N1890 JAN SERIES

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

Forward-Current Transfer Ratio I _C = 10 μAdc, V _{CE} = 10 Vdc I _C = 150 mAdc, V _{CE} = 10 Vdc I _C = 500 mAdc, V _{CE} = 10 Vdc 2N1711, S	h _{FE}	20 100 50	300	
Collector-Emitter Saturation Voltage I _C = 150 mAdc, I _B = 15 mAdc 2N1711, S 2N1890, S I _C = 50 mAdc, I _B = 5.0 mAdc 2N1890, S	V _{CE(sat)}		1.5 5.0 1.2	Vdc
Base-Emitter Saturation Voltage I _C = 150 mAdc, I _B = 15 mAdc I _C = 50 mAdc, I _B = 5.0 mVdc 2N1890, S	V _{BE(sat)}		1.3 0.9	Vdc

DYNAMIC CHARACTERISTICS

Small-Signal Short-Circuit Forward-Current Transfer Ratio I _C = 1.0 mAdc, V _{CE} = 5.0 Vdc I _C = 5.0 mAdc, V _{CE} = 10 Vdc	h _{fe}	80 90	200 270	
Magnitude of Common Emitter Small-Signal Short-Circuit Forward-Current Transfer Ratio I _C = 50 mAdc, V _{CE} = 10 Vdc; f = 20 MHz	h _{fe}	3.5	12	
Small-Signal Short-Circuit Input Impedance I _C = 5.0 mAdc, V _{CB} = 10 Vdc	h _{ib}	4.0	8.0	Ω
Small-Signal Short-Circuit Output Admittance I _C = 5.0 mAdc, V _{CB} = 10 Vdc 2N1711, S 2N1890, S	h _{ob}		1.0 .03	μΩ
Output Capacitance V _{CB} = 10 Vdc, I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz 2N1711, S 2N1890, S	C _{obo}	8.0 5.0	25 15	pF

SWITCHING CHARACTERISTICS

Turn-On Time + Turn-Off Time (See figure 1 of MIL-PRF-19500/225)	t _{on} + t _{off}		30	ηs
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(3) Pulse Test: Pulse Width 250 to 350μs, Duty Cycle ≤ 2.0%.