

NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/225

Devices

2N1711

2N1890

Qualified Level

JAN
JANTX

MAXIMUM RATINGS

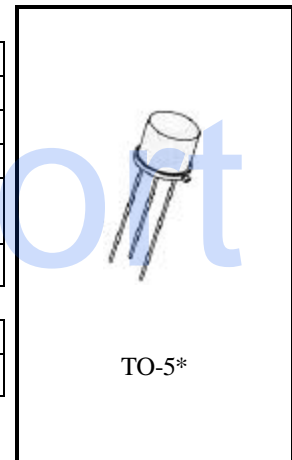
Ratings	Symbol	2N1711	2N1890	Unit
Collector-Base Voltage	V_{CBO}	75	100	Vdc
Emitter-Base Voltage	V_{EBO}	7.0		Vdc
Collector Current	I_C	500		mAdc
Total Power Dissipation	P_T	@ $T_A = +25^{\circ}C$ ⁽¹⁾	0.8	W
		@ $T_C = +25^{\circ}C$ ⁽²⁾	3.0	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}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

THERMAL CHARACTERISTICS

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

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

2) Derate linearly 17.2 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
-----------------	--------	------	------	------

OFF CHARACTERISTICS

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

2N1711, 2N1890 JAN SERIES

Characteristics	Symbol	Min.	Max.	Unit
-----------------	--------	------	------	------

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
---	------------------------------------	--	----	----

(3) Pulse Test: Pulse Width 250 to 350μs, Duty Cycle ≤ 2.0%.