Microsemi LAWRENCE

TECHNICAL DATA

NPN LOW POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/225

Devices		*Qualified Level*
2N1711	**2N1890**	**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 @ $T_A = +25^0C$ (1) @ $T_C = +25^0C$ (2)	P_T	0.8 3.0		W W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		^0C

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Impedance	$Z_{\theta JX}$	58	$^0C/W$

1) Derate linearly 4.57 mW/^{0}C for $T_A > 25^0C$
2) Derate linearly 17.2 mW/^{0}C for $T_C > 25^0C$

TO-5*

*See appendix A for package outline

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

Characteristics		Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage I_C = 100 µAdc	2N1711, S 2N1890, S	$V_{(BR)CBO}$	75 100		Vdc
Collector-Emitter Breakdown Voltage R_{BE} = 10 Ω, 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 µAdc		$V_{(BR)EBO}$	7.0		Vdc
Collector-Base Cutoff Current V_{CB} = 60 Vdc V_{CB} = 80 Vdc	 2N1711 2N1890	I_{CBO}		 10 10	ηAdc
Emitter-Base Cutoff Current V_{EB} = 5.0 Vdc		I_{EBO}		5.0	ηAdc

Characteristics		Symbol	Min.	Max.	Unit
ON CHARACTERISTICS (3)					
Forward-Current Transfer Ratio					
I_C = 10 μAdc, V_{CE} = 10 Vdc		h_{FE}	20		
I_C = 150 mAdc, V_{CE} = 10 Vdc			100	300	
I_C = 500 mAdc, V_{CE} = 10 Vdc	2N1711, S		50		
Collector-Emitter Saturation Voltage					
I_C = 150 mAdc, I_B = 15 mAdc	2N1711, S	$V_{CE(sat)}$		1.5	Vdc
	2N1890, S			5.0	
I_C = 50 mAdc, I_B = 5.0 mAdc	2N1890, S			1.2	
Base-Emitter Saturation Voltage					
I_C = 150 mAdc, I_B = 15 mAdc		$V_{BE(sat)}$		1.3	Vdc
I_C = 50 mAdc, I_B = 5.0 mVdc	2N1890, S			0.9	
DYNAMIC CHARACTERISTICS					
Small-Signal Short-Circuit Forward-Current Transfer Ratio					
I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc		h_{fe}	80	200	
I_C = 5.0 mAdc, V_{CE} = 10 Vdc			90	270	
Magnitude of Common Emitter Small-Signal Short-Circuit Forward-Current Transfer Ratio		$\lvert h_{fe} \rvert$			
I_C = 50 mAdc, V_{CE} = 10 Vdc; f = 20 MHz			3.5	12	
Small-Signal Short-Circuit Input Impedance					Ω
I_C = 5.0 mAdc, V_{CB} = 10 Vdc		h_{ib}	4.0	8.0	
Small-Signal Short-Circuit Output Admittance					
I_C = 5.0 mAdc, V_{CB} = 10 Vdc		h_{ob}			μΩ
	2N1711, S			1.0	
	2N1890, S			.03	
Output Capacitance					
V_{CB} = 10 Vdc, I_E = 0, 100 kHz ≤ f ≤ 1.0 MHz	2N1711, S	C_{obo}	8.0	25	pF
	2N1890, S		5.0	15	
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%.