DIGITRON Semiconductors

High-reliability discrete products
and engineering services since 1977

2N2913-2N2920

NPN SILICON DUAL TRANSISTORS

FEATURES

- Available as "HR" (high reliability) screened per MIL-PRF-19500, JANTX level. Add "HR" suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding "-PBF" suffix.

MAXIMUM RATINGS

Rating	Symbol	2N2913-2N2918	2N2919-2N2920	Unit
Collector emitter sustaining voltage	V_{CEO}	45	60	V
Collector base voltage	V_{CBO}	45	60	V
Emitter base voltage	V_{EBO}	6		V
Collector current	I_C	30		mA
Operating and storage temperature range	T_J, T_{stg}	-65 to +200		°C
		One side	**Both sides**	
Total power dissipation @ T_A = 25°C 2N2913-2N2920 Derate above 25°C	P_D	300 1.7	600 3.4	mW mW/°C
Total power dissipation @ T_C = 25°C 2N2913-2N2920 Derate above 25°C	P_D	750 4.3	1500 8.6	mW mW/°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Characteristics		Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector-emitter sustaining voltage I_C = 10mA, I_B = 0	2N2913-2N2918 2N2919, 2N2920	$BV_{CEO(sus)}$	45 60	- 70	- -	V
Collector-base breakdown voltage I_C = 10µA, I_E = 0	2N2913-2N2918 2N2919, 2N2920	BV_{CBO}	45 60	- 90	- -	V
Emitter-base breakdown voltage I_E = 10µA, I_C = 0		BV_{EBO}	6	7	-	V
Collector cutoff current V_{CE} = 5V, I_B = 0		I_{CEO}	-	-	0.002	µA
Collector cutoff current V_{CB} = 45V, I_E = 0 V_{CB} = 45V, I_E = 0, T_A = 150°C	2N2913-2N2918 2N2919, 2N2920 All types	I_{CBO}	- - -	- - -	0.010 0.002 10	µA
Emitter cutoff current V_{EB} = 5V, I_C = 0		I_{EBO}	-	-	0.002	µA
Collector-emitter saturation voltage I_C = 1.0mA, I_B = 0.1mA		$V_{CE(sat)}$	-	-	0.35	V
Base-emitter on voltage I_C = 100µA, V_{CE} = 5V		$V_{BE(on)}$	-	-	0.7	V

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ELECTRICAL CHARACTERSITICS (T_A = 25°C unless otherwise specified)

Characteristics		Symbol	Min.	Typ.	Max.	Unit
ON-CHARACTERISTICS						
DC current gain *						
I_C = 10µA, V_{CE} = 5V	2N2913, 15, 17, 19		60	-	240	
	2N2914, 16, 18, 20		150	-	600	
I_C = 10µA, V_{CE} = 5V, T_A = -55°C	2N2913, 15, 17, 19		15	-	-	
	2N2914, 16, 18, 20	h_{FE}*	30	-	-	
I_C = 100µA, V_{CE} = 5V	2N2913, 15, 17, 19		100	-	-	
	2N2914, 16, 18, 20		225	-	-	
I_C = 1.0mA, V_{CE} = 5V	2N2913, 15, 17, 19		150	-	-	
	2N2914, 16, 18, 20		300	-	-	
SMALL SIGNAL CHARACTERISTICS						
Output capacitance **V_{CB} = 5.0V, I_E = 0, f = 140kHz**		C_{ob}	-	4.0	6.0	pF
High frequency current gain **I_C = 500µA, V_{CE} = 5.0V, f = 20MHz**		$\lvert h_{fe} \rvert$	3.0	-	-	-
Input impedance **I_C = 1.0mA, V_{CB} =5.0V, f = 1.0kHz**		h_{ib}	25	28	32	Ω
Output admittance **I_C = 1.0mA, V_{CB} =5.0V, f = 1.0kHz**		h_{ob}	-	-	1.0	µmhos
Noise figure						
I_C = 10µA, V_{CE} = 5.0V, R_S = 10kΩ, f = 1.0kHz, BW = 200Hz	2N2914, 16, 18, 20		-	2.0	3.0	
	2N2913, 15, 17, 19	NF	-	3.0	4.0	dB
I_C = 10µA, V_{CE} = 5.0V, R_S = 10kΩ, f = 10Hz – 15.7kHz, BW = 10kHz	2N2914, 16, 18, 20					
	2N2913, 15, 17, 19		-	2.0	3.0	
			-	3.0	4.0	
DC current gain ratio**	2N2917, 18	h_{FE1}/h_{FE2}*	0.8	-	1.0	-
I_C = 100µA, V_{CE} = 5.0V	2N2915, 16, 19, 20	*	0.9	-	1.0	
Base voltage differential						
I_C = 10µA to 1.0mA, V_{CE} = 5.0V	2N2917, 18		-	-	10	
	2N2915, 16, 19, 20	$\lvert V_{BE1}-V_{BE2} \rvert$	-	-	5.0	mV
I_C = 100µA, V_{CE} = 5.0V	2N2917, 18		-	-	5.0	
	2N2915, 16, 19, 20		-	-	3.0	
Base voltage differential gradient						
I_C = 100µA, V_{CE} = 5.0V, T_A = -55 to 25°C	2N2917, 18		-	-	1.6	
	2N2915, 16, 19, 20	$\Delta\lvert V_{BE1}-V_{BE2} \rvert$	-	-	0.8	mV
I_C = 100µA, V_{CE} = 5.0V, T_A = 25 to 125°C	2N2917, 18		-	-	2.0	
	2N2915, 16, 19, 20		-	-	1.0	

*Pulse test: pulse width ≤ 300µs, duty cycle ≤ 2%.
**The lowest h_{FE} reading is taken as h_{FE1} for this ratio.

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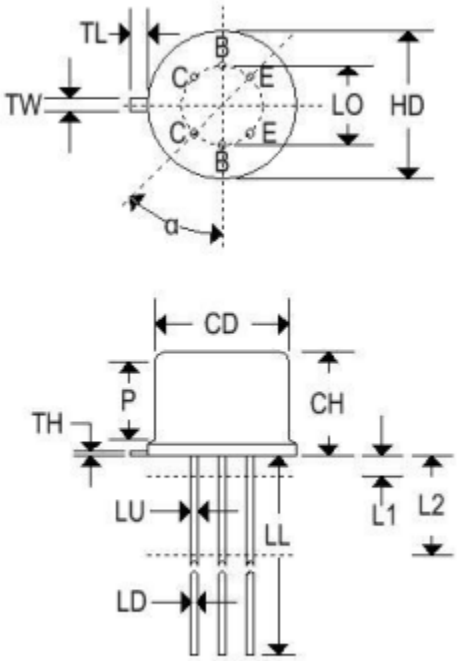
MECHANICAL CHARACTERISTICS

Case	TO-78
Marking	Alpha-numeric
Polarity	See below



Dim	TO-78			
	Inches		Millimeters	
	Min	Max	Min	Max
HD	0.335	0.370	8.510	9.400
CD	0.305	0.335	7.750	8.510
CH	0.150	0.185	3.81	4.70
LL	0.500	-	12.70	-
LD	0.016	0.021	0.410	0.530
LU	0.016	0.019	0.410	0.480
P	N/A	N/A	N/A	N/A
TL	0.029	0.045	0.740	1.140
TW	0.028	0.034	0.710	0.860
TH	0.009	0.125	0.230	3.180
LO	0.200		5.08	
α	45°TP		45°TP	