2N2913 thru 2N2920

JAN, JTX, JTXV, JANS AVAILABLE
CASE 654-07, STYLE 1

DUAL AMPLIFIER TRANSISTOR

NPN SILICON

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MAXIMUM RATINGS

Rating	Symbol	2N2913 thru 2N2918	2N2919 2N2920	Unit
Collector-Emitter Voltage	V_{CEO}	45	60	Vdc
Collector-Base Voltage	V_{CBO}	45	60	Vdc
Emitter-Base Voltage	V_{EBO}	6.0		Vdc
Collector Current — Continuous	I_C	30		mAdc
		One Die	**Both Die**	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	300 1.7	500 2.86	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	750 4.3	1500 8.6	mW mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, I_B = 0)	2N2913 thru 18, 2N2919, 2N2920	$V_{(BR)CEO(sus)}$	45 60	— —	— —	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	2N2913 thru 18, 2N2919, 2N2920	$V_{(BR)CBO}$	45 60	— —	— —	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	6.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 5.0 Vdc, I_B = 0)		I_{CEO}	—	—	0.002	μAdc
Collector Cutoff Current (V_{CB} = 45 Vdc, I_E = 0)	2N2913 thru 18, 2N2919, 2N2920	I_{CBO}	— —	— —	0.010 0.002	μAdc
(V_{CB} = 45 Vdc, I_E = 0, T_A = 150°C)	All Types		—	—	10	
Emitter Cutoff Current (V_{EB} = 5.0 Vdc, I_C = 0)		I_{EBO}	—	—	0.002	μAdc
ON CHARACTERISTICS						
DC Current Gain(1) (I_C = 10 μAdc, V_{CE} = 5.0 Vdc)	2N2913,15,17,19, 2N2914,16,18,20	h_{FE}	60 150	— —	240 600	—
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C)	2N2913,15,17,19, 2N2914,16,18, 2N2920		15 30 40	— — —	— — —	
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N2913,15,17,19, 2N2914,16,18,20		100 225	— —	— —	
(I_C = 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N2913,15,17,19, 2N2914,16,18,20		150 300	— —	— —	
Collector-Emitter Saturation Voltage (I_C = 1.0 mAdc, I_B = 0.1 mAdc)		$V_{CE(sat)}$	—	—	0.35	Vdc
Base-Emitter On Voltage (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)		$V_{BE(on)}$	—	—	0.7	Vdc
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product (I_C = 500 μAdc, V_{CE} = 5.0 Vdc, f = 20 MHz)		f_T	60	—	—	MHz

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
Output Capacitance (V_{CB} = 5.0 Vdc, I_E = 0, f = 140 kHz)		C_{obo}	—	4.0	6.0	pF
Input Impedance (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		h_{ib}	25	28	32	ohms
Output Admittance (I_C = 1.0 mAdc, V_{CB} = 5.0 Vdc, f = 1.0 kHz)		h_{ob}	—	—	1.0	μmhos
Noise Figure		NF				dB
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc, R_S = 10 kΩ, f = 1.0 kHz, BW = 200 Hz)	2N2914,16,18,20, 2N2913,15,17,19		— —	2.0 3.0	3.0 4.0	
(I_C = 10 μAdc, V_{CE} = 5.0 Vdc, R_S = 10 kΩ, f = 10 Hz to 15.7 kHz, BW = 10 kHz)	2N2914,16,18,20, 2N2913,15,17,19		— —	2.0 3.0	3.0 4.0	
MATCHING CHARACTERISTICS						
DC Current Gain Ratio(2) (I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N2917,18, 2N2915,16,19,20	h_{FE1}/h_{FE2}	0.8 0.9	— —	1.0 1.0	—
Base-Emitter Voltage Differential (I_C = 10 μAdc to 1.0 mAdc, V_{CE} = 5.0 Vdc)	2N2917,18, 2N2915,16,19,20	$\lvert V_{BE1}-V_{BE2}\rvert$	— —	— —	10 5.0	mVdc
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc)	2N2917,18, 2N2915,16,19,20		— —	— —	5.0 3.0	
Base-Emitter Voltage Differential Change Due to Temperature (I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = −55°C to +25°C)	2N2917,18, 2N2915,16,19,20	$\Delta(V_{BE1}-V_{BE2})$	— —	— —	1.6 0.8	mVdc
(I_C = 100 μAdc, V_{CE} = 5.0 Vdc, T_A = +25°C to +125°C)	2N2917,18 2N2915,16,19,20		— —	— —	2.0 1.0	

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
(2) The lowest h_{FE} reading is taken as h_{FE1} for this ratio.

FIGURE 1 — DC CURRENT GAIN versus COLLECTOR CURRENT

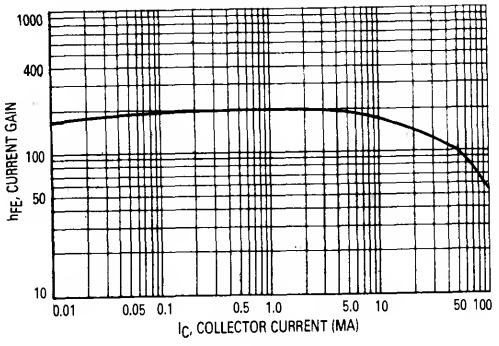

FIGURE 2 — DC CURRENT GAIN versus COLLECTOR CURRENT

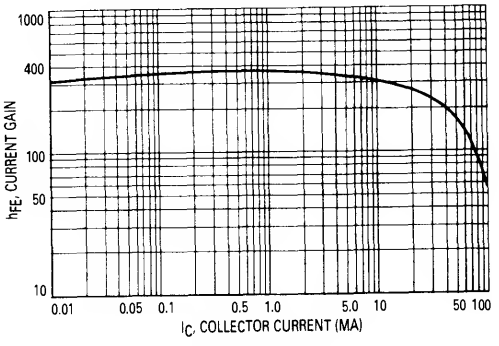

FIGURE 3 — "ON" VOLTAGES

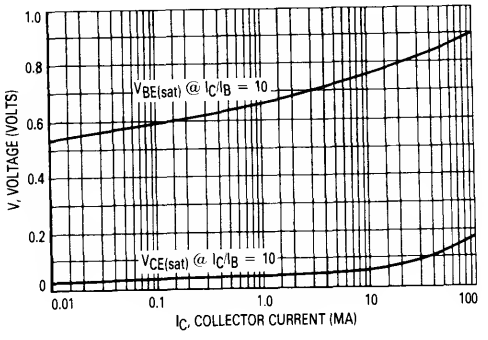

FIGURE 4 — "ON" VOLTAGES