Fairchild Semiconductor

1965 CONDENSED CATALOG OF HIGH-PERFORMANCE SEMICONDUCTOR DEVICES

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Military Applications

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NPN General Purpose Types

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C	V_{CE}	Maximum Voltages V_{CER}[3]	V_{CBO}	V_{EBO}	V_{BE} SAT Conditions Max.	I_C	I_B	V_{CE} SAT Conditions Max.	I_C	I_B	I_{CBO}[5] Maximum @ 25°C	@ 150°C
				mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA		
2N497	For medium power, fast switching applications	X		50	0.8	12	36	200	10	60[4]	60	8	—	—	—	5	200	40	—	10 μA[8]
2N498	For medium power, fast switching applications	X		50	0.8	12	36	200	10	100[4]	100	8	—	—	—	5	200	40	—	10 μA[8]
2N656*	For medium power, fast switching applications	X		70	0.8	30	90	200	10	60[4]	60	8	1.1	200	40	5	200	40	10 μA[9]	—
2N657*	For medium power, fast switching applications	X		70	0.8	30	90	200	10	100[4]	100	8	1.1	200	40	5	200	40	10 μA[9]	—
2N696*	For RF and DC switching applications	X		60	0.6	20 40	60 120	150 150	10 10	40	60	5	1.3	150	15	1.5	150	15	1 μA	100 μA

Type	Description	JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions				Maximum Voltages				V_{BE} SAT Conditions			V_{CE} SAT Conditions			I_{CBO}[5] Maximum	
						Min.	Max.	I_C	V_{CE}	V_{CER}[3]	V_{CBO}	V_{EBO}		Max.	I_C	I_B	Max.	I_C	I_B	@ 25°C	@ 150°C
		TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts		Volts	mA	mA	Volts	mA	mA		
2N697*	For RF and DC switching applications	X		80	0.6	20 40	60 120	150 150	10 10	40	60	5		1.3	150	15	1.5	150	15	1 μA	100 μA
2N698	High voltage type, particularly suited for video amplifiers and oscillators	X		70	0.8	20	60	150	10	80	120	7		0.9	50	5	1.2	50	5	0.005 μA[9]	15 μA[9]
2N699	High voltage type, particularly suited for video amplifiers and oscillators	X		80	0.6	40	120	150	10	80	120	5		1.3	150	15	5	150	15	2 μA	200 μA
2N699B	High voltage type, particularly suited for video amplifiers and oscillators	X		70	0.87	40 35 20[2] 20	120 — — —	150 10 10 0.1	10 10 10 10	100	120	7		1.0	50	5	1.2	50	5	0.01 μA[10]	15 μA[10]
2N703	High speed, high current switch		X	70[17]	0.3	40	100	10	5.0	—	25	5.0		—	—	—	0.5	10	0.5	0.5 μA	50 μA
2N717	For RF and DC switching applications over a wide current range		X	60	0.4	20	60	150	10	40	60	5		1.3	150	15	1.5	150	15	1 μA	100 μA
2N718	For RF and DC switching applications over a wide current range		X	80	0.4	40	120	150	10	40	60	5		1.3	150	15	1.5	150	15	1 μA	100 μA
2N718A*	For amplifier and high speed switching		X	80	0.5	40 20 35 20[2] 20	120 — — — —	150 500 10 10 0.1	10 10 10 10 10	50	75	7		1.3	150	15	1.5	150	15	10 nA[7]	10 μA[7]
2N719	High voltage type, particularly suited to video amplifiers (small package)		X	70	0.4	20	60	150	10	80	120	5		1.3	150	15	5	150	15	2 μA	200 μA
2N719A	For amplifiers and high speed switching		X	70	0.5	20	60	150	10	80	120	7		0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]
2N720	High voltage type, particularly suited to video amplifiers (small package)		X	80	0.4	40	120	150	10	80	120	5		1.3	150	15	5	150	15	2 μA	200 μA
2N720A	For amplifiers and high speed switching		X	50[17]	0.5	40 35 20[2] 20	120 — — —	150 10 10 0.1	10 10 10 10	100	120	7		0.9	50	5	1.2	50	5	10 nA[10]	15 μA[10]
2N870	High performance amplifiers, oscillators, and switching circuits		X	80	0.5	40 35 20[2] 20	120 — — —	150 10 10 0.1	10 10 10 10	80	100	7		0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]
FM870	For high performance amplifier, oscillator, and switching circuits	TO-46		80	0.375	40 35 20[2] 20	120 — — —	150 10 10 0.1	10 10 10 10	80	100	7		0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]
2N871	For high gain for high performance amplifier oscillator and switching circuits		X	100	0.5	100	300	150	10	80	100	7		0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]
FM871	For high gain for high performance amplifier, oscillator and switching circuit	TO-46		100	0.375	100	300	150	10	80	100	7		0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]
2N915	High frequency amplifier, oscillator		X	360	0.36	50	200	10	5	50[4]	70	5		0.9	10	1	1	10	1	10 nA[7]	30 μA[7]
2N916*	High frequency amplifier, oscillator		X	400	0.36	50	200	10	1	25[4]	45	5		0.9	10	1	0.5	10	1	10 nA[8]	10 μA[8]
2N917	1 KMC very high speed switching and RF applications		X	800	0.2	20	—	3	1	15[4]	30[18]	3[8]		0.87	3	0.15	0.5	3	0.15	1 nA	100 μA
2N956	Very high beta universal type: similar to 2N1711		X	100	0.5	100 75 35 40 20 35[2]	300 — — — — —	150 10 0.1 500 0.01 10	10 10 10 10 10 10	— — 50 — — —	75	7		1.3	150	15	1.5	150	15	10 nA[7]	10 nA[7]
2N1420	High gain RF and DC switching applications	X		100	0.6	100	300	150	10	30	60	5		1.3	150	15	1.5	150	15	1 μA	100 μA[7]
2N1613*	Fast switching amplifiers (logic and high current, wide band VHF power)	X		80	0.8	40 35 20 20 20	120 — — — —	150 10 0.1 500 10	10 10 10 10 10	— — 50 — —	75	7		1.3	150	15	1.5	150	15	10 nA[7]	10 μA
2N1711*	Very high beta universal type: similar to 2N1613	X		100	0.8	100 75 35 40 20 35[2]	300 — — — — —	150 10 0.1 500 0.01 10	10 10 10 10 10 10	— — 50 — — —	75	7		1.3	150	15	1.5	150	15	10 nA[7]	10 μA[7]
2N1889	High performance amplifier, oscillator and switching circuits	X		80	0.8	40 35 20[2] 20	120 — — —	150 10 10 0.1	10 10 10 10	80	100	7		0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	Pd@25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	Maximum Voltages V_{CER}[3] Volts	V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	I_{CBO}[5] Maximum @ 25°C	@ 150C°
2N1890*	High gain for high performance amplifier, oscillator and switching circuits	X		100	0.8	100	300	15	10	80	100	7	0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]
2N1893*	High voltage for amplifier, switching circuits. PLANAR performance and reliability in 2N699 type applications	X		70	0.8	40 35 20[2] 20	120 — — —	150 10 10 0.1	10 10 10 10	100	120	7	0.9	50	5	1.2	50	5	10 nA[9]	15 μA[9]
2N1972	For universal amplifier, oscillator and switching types	X		50[17]	0.8	110	350	50	10	30	60	7	1.1	50	5	2.0	50	5	1 μA	100 μA
2N2049	Low noise, similar to 2N1711	X		86	0.8	100	300	150	10	50	75	7	0.8	10	1.0	0.4	10	1.0	10 nA[7]	10 μA[7]
2N2192	For high speed high current switching applications	X		50[17]	0.8	100 75 70 35 35[2] 15 15	300 — — — — — —	150 10 150 500 10 1.0 0.1	10 10 1.0 10 10 10 10	40[4]	60	5.0	1.3	150	15	.35	150	15	10 nA	15 μA
2N2192A	For high speed high current switching applications	X		50[17]	0.8	40 30 30 20[2] 20 15 15	120 — — — — — —	150 10 150 500 10 1.0 0.1	10 10 1.0 10 10 10 10	40[4]	60	5.0	1.3	150	15	.25	150	15	10 nA	15 μA
2N2192B	For high speed high current switching applications	X		50[17]	0.8	40 30 30 20[2] 20 15 15	120 — — — — — —	150 10 150 500 10 10 0.1	10 10 1.0 10 10 10 10	40[4]	60	5.0	1.3	150	15	.18	150	15	10 nA	10 μA
2N2193	For high speed high current switches		X	50	0.8	40 30 30 20[2] 20 15 15	120 — — — — — —	150 10 150 10 500 1000 0.1	10 10 10 10 10 10 10	50[4]	80	8	1.3	150	15	.35	150	15	10 nA	10 μA
2N2193A	For high speed high current switching applications		X	50	0.8	40 30 30 20[2] 20 15 15	120 — — — — — —	150 50 150 10 500 0.1 0.1	10 10 10 10 10 10 10	50[4]	80	8	1.3	150	15	.25	150	15	10 nA	25 μA
2N2193B	For high speed high current switching applications		X	50	0.8	40 30 30 20[2] 20 15 15	120 — — — — — —	150 50 150 10 500 1.0 0.1	10 10 10 10 10 10 10	50[4]	80	8	1.3	150	15	.18	150	15	10 nA	25 μA
2N2194	For high speed high current switching applications	X		50	0.8	20 15 (@ 25°C) 15 12	60 — — —	150 150 10 500	10 1 10 10	40[4]	60	5	1.3	150	15	.35	150	15	10 nA	25 μA
2N2194A	For high speed high current switching applications	X		50	0.8	20 15 (@ 25°C) 15 12	60 — — —	150 150 10 500	10 1 10 10	40[4]	60	5	1.3	150	15	.25	150	15	10 nA	25 μA
2N2194B	For high speed high current switching applications	X		50	0.8	20 15 (@ 25°C) 15 12	60 — — —	150 150 10 500	10 1 10 10	40[4]	60	5	1.3	150	15	.18	150	15	10 nA	25 μA
2N2195	For high speed, high current switching applications	X		50	0.6	20 10	— —	150 150	10 1	25[4]	45	5	1.3	150	15	.35	150	15	100 nA	50 μA
2N2195A	For high speed, high current switching applications	X		50	0.6	20 10	— —	150 150	10 1	25[4]	45	5	1.3	150	15	.25	150	15	100 nA	50 μA
2N2195B	For high speed, high current switching applications	X		50	0.6	20 10	— —	150 150	10 1	25[4]	45	5	1.3	150	15	.18	150	15	100 nA	50 μA
2N2297	For high current type	X		95	0.8	40 15	120 —	150 1000	10 10	35[4]	80	7	1.6	1000	100	1.0 0.2	1000 150	100 15	10 nA[7]	10 μA[7]
2N2351	For high speed, high current switching applications		TO-46	50[17]	0.4	40 30 30 20 20[2] 15 15	120 — — — — — —	150 150 10 500 10 1000 0.1 mils	10 1 10 10 10 10 10	50[4]	80	8	1.3	150	15	.35	150	15	10 nA	25 μA
2N2351A	For high speed, high current switching applications		TO-46	50[17]	.04	40 30 30 20 20[2] 15 15	120 — — — — — —	150 150 10 500 10 1000 0.1	10 1 10 10 10 10 10	50[4]	80	8	1.3	150	15	.25	150	15	10 nA	25 μA

		JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions				Maximum Voltages			V_{BE} SAT Conditions			V_{CE} SAT Conditions			I_{CBO}[5] Maximum	
						Min.	Max.	I_C	V_{CE}	V_{CER}[3]	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	@ 25°C	@ 150°C
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA		
2N2352	For high voltage, high current, saturated switch		TO-46	50[17]	0.4	15	—	10	10	40[4]	60	5	1.3	150	15	0.35	150	15	10 nA	25 μA
2N2352A	High current, high voltage saturated switch		TO-46	50[17]	0.4	15	—	10	10	40[4]	60	5	1.3	150	15	0.25	150	15	10 nA	25 μA
2N2353	High voltage, high current saturated switch		TO-46	50[17]	0.4	20	—	150	10	25[4]	45	5	1.3	150	15	0.35	150	15	100 nA	50 μA[8]
2N2353A	High voltage, high current saturated switch		TO-46	50[17]	0.4	20	—	150	10	25[4]	45	5	1.3	150	15	0.25	150	15	100 nA	50 μA[8]
2N2443	High voltage type	X		80	0.8	50	150	50	10	100[4]	120	7	0.8	10	1	0.4	10	1	10 nA[10]	15 μA[10]
2N2645	TO-18 versions of 2N2049		X	86	0.5	100	300	150	10	50	75	7	0.8	10	1	0.4	10	1	10 nA[19]	10 μA[19]
2N3108	High current amplifier and saturated switch	X		86	0.8	40	120	150	1	60[4]	100	7	2	1000	100	1.0	1000	100	—	10 μA[7]
2N3110	High current amplifier and saturated switch	X		86	0.8	40	120	150	1	40[4]	80	7	2	1000	100	1.0	1000	100	—	10 μA[7]

NPN Logic Switches

		JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions				C_{ob}	Maximum Voltages		V_{BE} SAT Conditions			V_{CE} SAT Conditions			Switching (Max.)		
						Min.	Max.	I_C	V_{CE}	Max.	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	τ_s	t_{on}	t_{off}
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	pf	Volts	Volts	Volts	mA	mA	Volts	mA	mA	nsec	nsec	nsec
2N706*	High speed switching in low saturated currents		X	400	0.3	20	—	10	1	6	25	3	0.9	10	1	0.6	10	1	60	—	—
2N706B	RF and digital switching circuits		X	200[17]	0.3	20	60	10	1	5	—	—	0.9	10	1	0.4	0.9	1	25	40	75
2N708	High speed saturated logic switch and high frequency amplifier		X	450	0.36	30	120	10	1	6	40	5	0.80	10	1	0.4	10	1	25	40	70
2N709	Ultra fast switching applications		X	800	0.3	20	120	10	0.5	3	15	4	0.85	3	.15	0.3	3	0.15	6	15	15
FT709	PLANAR epitaxial, high speed saturated switching in 50–100 mc range		X	800	0.3	30	125	10	0.4	3	15	4	0.85	1	0.1	0.25	10	1	6	12	12
2N743	PLANAR epitaxial: similar to 2N708		X	400	0.3	20	60	10	0.35	5	20	5	0.85	10	1	0.35	10	1	14	12	24
2N744	PLANAR epitaxial: similar to 2N708		X	400	0.3	40	120	10	0.35	5	20	5	0.85	10	1	0.35	10	1	18	12	24
2N753	RF and digital switching circuits		X	200	0.3	40	120	10	1	—	25	5	0.9 max 0.7 min.	10	1	0.6	10	1	35	40	75
2N783	RF and digital switching circuits		X	200	0.3	20	60	10	1	3.5	40	5	0.9 0.7	10	1	0.25	10	1	10	16	30
2N784	RF and digital switching circuits		X	200[17]	0.3	25	—	10	1	3.5	30	5	0.9	10	1	0.16	9	1	15	20	40
2N834	PLANAR epitaxial: similar to 2N708		X	500	0.3	25	—	10	1	4	40	5	0.9	10	1	0.25	10	1	25	35	75
2N835	RF and digital switching circuits		X	300	0.3	20	—	10	1	4	25	3	0.9	10	1	0.3	10	1	35	20	35
2N914	PLANAR epitaxial: similar to 2N708		X	370	0.36	30	120	10	1	6	40	5	0.8	10	1	0.25	10[16]	1	20	40	40
2N1708	PLANAR epitaxial for high speed, low power switching	TO-46		250	0.3	20	—	10	1	6	25	3	0.9	10	1	0.22 0.35	10 50	1 5	25	40	75
2N2205	High speed switch and VHF amplifier		X	200	.03	20	—	10	—	6	25	3	0.9	10	1	0.22	10	1	25	40	75

LOGIC SWITCHES CONTINUED

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	P_d@25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	C_{ob} Max. pf	Maximum Voltages V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	Switching (Max.) t_s nsec	t_{on} nsec	t_{off} nsec
2N2206	High speed switch and VHF amplifier	TO-46		200	0.3	40	120	10	1	6	25	3	0.9	10	1	0.35 0.22	50 10	5 1	35	40	75
2N2368	Low power high speed saturated switch		X	550	0.36	20	60	10	1	4	40	4.5	0.85	10	1	0.25	10	1	10	12	15
2N2369	For high speed saturated switching. Also small signal, RF circuits		X	650	0.36	40	120	10	1	4	40	4.5	0.85	10	1	0.25	10	1	13	12	18
2N2369A	For high speed saturated switching. Also small signal, RF circuits		X	675	0.36	40	120	10	1	4	40	4.5	0.85	10	1	0.2	10	1	13	12	18
2N2475	Ultra fast switching applications		X	600[17]	0.30	20 30 15[2] 20	— 150 — —	50 20 20 1.0	0.5 0.4 0.4 0.3	3	15	4	1	20	0.66	0.4	20	0.66	6	20	15
2N2481*	RF and digital switching circuits		X	300[17]	0.36	25	—	1	1	5	30	5	1.25	100	10	0.4	100	10	20	40	55
2N2651	High current, high voltage core drives		X	—	0.36	25	—	10	1	4	40	5	0.9	10	1	0.25	10	1	25	35	75
2N3014	For very fast, high voltage, high current logic applications	TO-52		550	0.36	30	120	30	0.4	5	40	5	0.95	30	3.0	0.15	30	3	18	16	25

NPN Audio Frequency Amplifiers

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	P_d@25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	Maximum Voltages V_{CER}[3] Volts	V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	I_{CBO}[5] Maximum @ 25°C	@ 150°C
2N760	High speed, low power, low noise high gain types		X	—	0.36	175	—	5	—	45[4]	45	8	—	—	—	1	1 mil	10 mils	0.2 μA[8]	10 μA[8]
2N910*	Small signal amplifier		X	80	0.5	76	200	1.0	5.0	80	100	7	0.8	10	1	0.4	10	1	25 nA[9]	15 μA[9]
2N911*	Small signal amplifier		X	70	0.5	36	90	1.0	5.0	80	100	7	0.8	10	1	0.4	10	1	25 nA[9]	15 μA[9]
2N912*	Small signal amplifier		X	60	0.5	18	50	1.0	5.0	80	100	7	0.8	10	1	0.4	10	1	25 nA[9]	15 μA[9]
2N929*	Low noise amplifier (audio through high frequency ranges)		X	30[17]	0.3	40	120	10	5.0	45[4]	45	5	1	10	0.5	1.0	10	0.5	0.01 μA[20]	10 μA[20]
2N930*	Low noise amplifier, very high beta type		X	30	0.3	100	300	10	5.0	45[4]	45	5	1	10	0.5	1.0	10	0.5	0.01 μA[20]	10 μA[20]
2N1973	Small signal amplifier	X		80	0.8	76	200	1	5.0	80	100	7	0.8	10	1	0.4	10	1	25 nA[9]	15 μA[9]
2N1974	Small signal amplifier	X		70	0.8	36	90	1	5.0	80	100	7	0.8	10	1	0.4	10	1	25 nAμ[9]	15 μA[9]
2N1975	Small signal amplifier	X		60	0.8	18	50	1.0	5.0	80	100	7.0	0.8	10	1	0.4	10	1	25 μA[9]	15 μA[9]
2N2008	High voltage, medium speed switch	X		40	0.8	40 30 20	120 90 —	50 mils 10 mils 1 mil	10 10 10	110	175	8.0	1.0	25	5	2.5	25	5	50 nA	50 μA
2N2483	Low noise amplifier (audio through high frequency ranges)		X	69	0.36	40	120	10	5.0	60[4]	60	60	0.7[12]	0.1	5 V[18]	0.35	1	0.1	10 nA[19]	10 μA[19]
2N2484	Low noise amplifier, low noise, high beta type		X	78	0.03	100	500	10	5.0	60[4]	60	6.0	0.7[12]	0.1	5[18]	0.35	1	0.1	10 nA[19]	10 μA[19]
2N2509	Low power, low noise, high gain types		X	45	0.36	40 25 20[2]	— — —	10 mils 10 μA 10 mils	5 5 5	80[4]	125	7.0	0.9	5 mil	0.5 mil	1.0	5	0.5	5 nA	10 μA

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	P_d @ 25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	Maximum Voltages V_{CER}[3] Volts	V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	I_{CBO}[5] Maximum @ 25°C	@ 150°C
2N2510	Low power, low noise, high gain types		X	45	0.36	150 75 60[2] 25[2]	500 — — —	10 mils 10 μA 10 mils 10 μA	5 5 5 5	65[4]	100	7.0	0.9	5 mil	0.5 mil	1	5	0.5	5 nA	10 μA
2N2511	Low power, low noise high gain types		X	45	0.36	240 120 100[2] 80 40[2]	750 — — — —	10 mils 10 μA 10 mils 1 μA 10 μA	5 5 5 5 5	50[4]	80	7.0	0.9	5	0.5	1	5	0.5	5 nA	10 μA
2N3114	Low power video amplifier	X		57	0.8	30	120	30 μA	10.0	150[4]	150	50	0.9	50	5.0	1.0	50	5.0	10 nA[26]	10 μA[26]
2N3117	For high performance, low level, low noise amplifiers		X	60[17]	0.36	250	500	10	5	60[4]	6	6.0	0.7[12]	0.1 mA	5[18]	0.35	1.0	0.1	10 nA[19]	10 μA[19]

NPN Radio Frequency Amplifiers

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	P_d @ 25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	Maximum Voltages V_{CER}[3] Volts	V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	I_{CBO}[5] Maximum @ 25°C	@ 150°C
2N707	VHF oscillator type		X	33% @ 100 mc[1]	0.3	9	—	10	1	28	56	4	0.9	10	1	0.6	10	1	0.05 μA[11]	—
2N918	IKMC, very high speed switching and RF applications	Spec.		900	0.2	20	—	3.0	1	15[4]	30	3.0	1.0	10	1	0.4	10	1	10 nA	2 μA
2N2616	VHF, UHF oscillator and amplifier		X	600	0.3	20	—	3.0	1.0	15[4]	30	3	1.0	10	1.0	0.4	10	1	10 nA	1 μA
2N2729	VHF, UHF oscillator and amplifier	TO-46		600[17]	0.3	20	200	3.0	1.0	15[4]	30	3	1.0	10	1.0	0.4	10	1	10 nA	1 μA
2N2883	High frequency amplifier, oscillator type	X		500	0.8	20	—	100	−10	20[4]	40	4	1.2	100	10	0.5	100	10	0.5 μA	50 μA
2N2884	High frequency amplifier, oscillator type	X		500	0.8	20	—	100	−10	20[4]	40	4	1.2	100	10	0.5	100	10	0.5 μA	50 μA
3N3137	Class-C, RF power amplifier	X		750	0.6	20	120	50	10	20[4]	40	4	—	—	—	0.3	50	5	50 nA	50 μA

Type	Description	JEDEC Outline	f_T (Typ.)	Forward AGC	Noise Figure I_C = 4.0 mA V_{CE} = 10 V	P_d @ 25°C FA	Power Gain db @ I_C = 4 mA V_{CE} = 10 V	h_{FE} Min.	I_C	V_{CE}	V_{CEO}	V_{CBO}	V_{EBO}	I_{CBO} Max. @ 25°C[5]
2N3337	Triode for low power, small signal, tuned RF and IF amplifier applications	TO-18	400[17]	Power gain decreases 30 db when I_C changes from 8 to 12 mA @ 60 mc	—	0.3 Watt	24 (min.)	30	4.0 mA	10 V	40 V	40 V	4.0 V	25 nA
2N3338	Triode for low power, small signal, tuned RF and IF amplifier applications	TO-18	400[17]	Power gain decreases 30 db when I_C changes from 8 to 12 mA @ 60 mc	5.5 db f = 60 mc	0.3 Watt	24 (min.)	30	4.0 mA	10 V	40 V	40 V	4.0 V	25 nA
2N3339	Triode for low power, small signal, tuned RF and IF amplifier applications	TO-18	400[17]	Power gain decreases 30 db when I_C changes from 8 to 12 mA @ 60 mc	5.5 db f = 200 mc	0.3 Watt	24 (min.)	30	4.0 mA	10 V	40 V	40 V	4.0 V	25 nA

NPN Core Drivers

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	P_d @ 25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	C_{ob} Max. pf	Maximum Voltages V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	Switching (Max.) τ_s nsec	t_{on} nsec	t_{off} nsec
2N1252	Diffused silicon low storage		X	80	0.6	15	45	150	10	45	30	5	1.3	150	15	1.5	150	15	—	—	150
2N1253	Diffused silicon low storage		X	110	0.6	30	90	150	10	45	30	5	1.3	150	15	1.5	150	15	—	—	150
2N2217	For high speed switching		X	300	0.8	20	60	150	10	8	60	5	1.3	150	15	1.6	500	50	—	—	—
2N2218*	For high speed switching		X	300	0.8	40	120	150	10	8	60	5	1.3	150	15	0.4	150	15	—	—	—
2N2219*	For high speed switching		X	300	0.8	100	300	150	10	8	60	5	1.3	150	15	0.4	150	15	—	—	—
2N3722	High voltage, high speed core driver		X	300[17]	0.8	15	—	500 mA	2.0	10	100 μA — 80	6	1.2	500	50	0.5	500	50	—	50	100

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	P_d @ 25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	C_{ob} Max. Pf	Maximum Voltages V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	Switching τ_s nsec	t_{on} nsec	t_{off} nsec
2N3723	High voltage, high speed core driver	X		300[17]	0.8	15	—	500 mA	3.0	9	100 μA 100	— 6	1.2	500	50	0.75	500	50	—	70	130
2N3724	High voltage, high speed core driver	X		300[17]	0.8	30	—	500 mA	1.0	12	10 μA 50	— 6	1.2	500	50	0.42	500	50	—	35	60
2N3725	High voltage, high speed core driver	X		300[17]	0.8	20	—	500 mA	1.0	10	10 μA 80	— 6	1.2	500	50	0.52	500	500	—	35	80
2N2220	For high speed switching		X	300	0.5	20	60	150	10	8	60	5	2.6	500	50	1.6	500	50	—	—	—
2N2221*	For high speed switching		X	300	0.5	40	120	150	10	8	60	5	1.3	150	15	1.6	500	50	—	—	—
2N2222*	For high speed switching		X	300	0.5	100	300	150	10	8	60	5	1.3	150	15	1.6	500	50	—	—	—
2N2410	Diffused high speed switch	X		200[17]	0.8	30 30 25 15	120 120 100 —	10 150 500 150	10 10 10 1	11	60	5	1.2 1.6	150 500	15 50	0.45 1.3	150 500	15 50	—	65	55
2N2476	Diffused high speed switch	X		250[17]	0.6	20	—	150	0.4	10	60	5.0	1.0	150	7.5	0.4 0.75	150 500	7.5 50	—	25	45
2N2477	Diffused high speed switch	X		250[17]	0.6	40	—	150	0.4	10	60	5.0	.95	150	3.75	0.4 0.75	150 500	3.75 50	—	25	45
2N2845	High voltage high speed saturated logic switch an memory driver		X	350	0.36	30 20	120 —	150 500	10 10	8	60	5	1.2 1.6	150 500	15 50	0.4 1.0	150 500	15 50	—	40	40
2N2846	High voltage high speed saturated logic switch and memory driver		X	350	0.8	30 20	120 —	150 500	10 10	8	60	5	1.2 1.6	150 500	15 50	0.4 1.0	150 500	15 50	—	40	40
2N2847	High voltage high speed saturated logic switch and memory driver		X	350	0.36	40 30	140 —	150 500	10 10	8	60	5	1.2 1.6	150 500	15 50	0.4 0.75	150 500	15 50	—	25	40
2N2848	High voltage high speed saturated logic switch and memory driver	X		350	0.8	40 30	140 —	150 500	10	8	60	5	1.2	150 500	15 50	0.4 0.75	150 500	15 50	—	25	40
2N2868	High speed, high current switch	X		50[17]	0.8	40 30 30 20 20[2]	120 — — — —	150 150 10 500 10	10 1 10 10 10	20	60	7	1.3	150	15	0.25	150	15	—	—	—
2N3013	For memory applications to 500 milliamperes ultra high speed	TO-52		550	0.36	30	120	30	0.4	—	40	5	.95	30	3	.25	30	3	—	15	25
2N3299	Low power triode for high speed, saturated and non-saturated switching	X		400	0.8(FA)	40	120	150	10	—	60	5	1.1	150	15	.22	150	15	—	60	150
2N3300	Low power triode for high speed, saturated and non-saturated switching	X		400	0.8	40	120	150	10	—	60	5	1.1	150	15	.22	150	15	—	60	150
2N3301	Low power triode for high speed, saturated and non-saturated switching		X	400	0.36	100	300	150	10	—	60	5	1.1	150	15	.22	150	15	—	60	150
2N3302	Low power triode for high speed, saturated and non-saturated switching		X	400	0.36	100	300	150	10	—	60	5	1.1	150	15	.22	150	15	—	60	150

NPN Power Transistors

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	f_T Typical mC	P_d @ 25°C Ambient Watts	Beta Ranges h_{FE} @ Conditions Min.	Max.	I_C mA	V_{CE} Volts	Maximum Voltages V_{CER}[3] Volts	V_{CBO} Volts	V_{EBO} Volts	V_{BE} SAT Conditions Max. Volts	I_C mA	I_B mA	V_{CE} SAT Conditions Max. Volts	I_C mA	I_B mA	I_{CBO}[5] Maximum @ 25°C	@ 150°C
2N2890	High power, high voltage type	X		46(typ.)	0.8	30 25 20	90 — —	1.0 A 2.0 A 100	2.0 5.0 2.0	80[4]	100	5.0	1.2 1.3	1.0 2.0	0.1 0.2	0.5 0.75	1.0 2.0	0.1 0.2	100 nA	100 μA
2N2891	High power, high voltage type	X		50(typ.)	0.8	50 40 35	150 — —	1.0 A 2.0 A 100	2.0 5.0 2.0	80[4]	100	5.0	1.2 1.3	1.0 2.0	0.1 0.2	0.5 0.75	1.0 2.0	0.1 0.2	100 nA	100 μA
2N2892	High power, high voltage type	7/16 Stud		46(typ.)	—	30 25 20	90 — —	1.0 A 2.0 A 100	2.0 5.0 2.0	80[4]	100	5.0	1.2 1.3	1.0 2.0	0.1 0.2	0.5 0.75	1.0 2.0	0.1 0.2	100 nA	100 μA
2N2893	High power, high voltage type	7/16 Stud		50(typ.)	—	50 40 35	150 — —	1.0 A 2.0 A 100	2.0 5.0 2.0	80[4]	100	5.0	1.2 1.3	1.0 2.0	0.1 0.2	0.5 0.75	1.0 2.0	0.1 0.2	100 nA	100 μA

NPN Film Drivers

		JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions			Maximum Voltages				V_{BE} SAT Conditions			V_{CE} SAT Conditions			Switching		
						Min.	Max.	I_C	V_{CE}	V_{CEO}	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	τ_s	t_{on}	t_{off}
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA	nsec	nsec	nsec
2N3303	Low power for high speed saturated switching applications	Similar to TO-5		650	0.6	30	120	300	0.5	12	25	4	1.3	300	30	0.33	300	30	15	15	25

PNP General Purpose Types

		JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions			Maximum Voltages				V_{BE} SAT Conditions			V_{CE} SAT Conditions			I_{CBO}[5] Maximum	
						Min.	Max.	I_C	V_{CE}	V_{CER}[3]	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	@ 25°C	@ 150°C
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA		
2N721	PNP complement to 2N717		X	70	0.4	20	45	150	−10	−50	−50	−5	−1.3	150	15	−1.5	150	15	1 μA[8]	100 μA[8]
2N722	PNP complement to 2N718		X	90	0.4	30	90	150	−50	−50	−50	−5	−1.3	150	15	−1.5	150	15	1 μA[8]	1 μA[8]
2N869	Silicon high speed switching type		X	100[17]	.36	20	—	10	−5	−25	−25	−5	−1	10	1	−1	10	1	10 μA[10]	25 μA[10]
2N869A	High speed switch and RF amplifier		X	550	.36	40	120	30	−0.5	−18[4]	−25	−5	−1.2	30	3	−0.2	30	3	10 μA	25 μA[11]
2N1131*	PNP complements 2N696 suitable for identical uses in opposite polarity	X		70	0.6	20	45	150	−10	−50	−50	−5	−1.3	150	15	−1.5	150	15	1 μA[8]	100 μA[8]
2N1132*	PNP complements 2N697 suitable for identical uses in opposite polarity	X		90	0.6	30	90	150	−10	−50	−50	−5	−1.3	150	15	−1.5	150	15	1 μA[8]	100 μA[8]
2N2303	Medium frequency amplifier	X		90	0.6	75	200	150	−10	−50	−50	−5	1.3	150	15	−1.5	150	15	1 μA[8]	100 μA[8]

PNP Logic Switches

		JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions			Maximum Voltages				V_{BE} SAT Conditions			V_{CE} SAT Conditions			Switching		
						Min.	Max.	I_C	V_{CE}	V_{CER}[3]	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	τ_s	t_{on}	t_{off}
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA	nsec	nsec	nsec
2N995	High frequency, low noise transistor		X	150	0.36	35	140	20	−1	−15[4]	−20	−4	−0.95	20	2	−0.2	20	2	—	65	125
2N996	High speed switch and low noise amplifier		X	230	.36	35	—	20	−1	−12[4]	−15	−4	−.95	20	2	−0.3	60	2	—	—	—
2N2894	High speed switch and RF amplifier		X	550	.36	40	50	30	−0.5	−12[4]	−12	−4	−0.98	10	1	−0.15	10	1	—	60	90
2N3209	Very high speed switch		X	400[17]	.36	30 15 15	120 — —	30 10 100	−0.5 −0.3 −1.0	−20[4]	−20	−4	−.78 −1.2 −1.7	10 30 100	1 3 10	−0.15 −0.20 −0.60	10 30 100	1 3 10	—	60	90
2N3304	Low power for high speed, saturated switching applications		X	700	0.3	30	120	10	−0.3	−6[4]	−6	−4	−1.5	50	5	−0.23	10	1	30	60	90

PNP Core Drivers

		JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions			Maximum Voltages				V_{BE} SAT Conditions			V_{CE} SAT Conditions			Switching		
						Min.	Max.	I_C	V_{CE}	V_{CER}[3]	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	τ_s	t_{on}	t_{off}
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA	nsec	nsec	nsec
2N3503	Diffused high current switch	X		250	0.7	80 120 135 140 100 50 115	— — — — 300 — 300	10 μA 100 μA 1 10 150 500 50	−10 −10 −10 −10 −10 −10 −1	−60[4]	−60	−5	−1 −1.3	50 150	2.5 15	−0.25 −0.4	50 150	2.5 15	—	40	100
2N3504	Diffused high current switch		X	250	0.4	80 120 135 140 100 50 115	— — — — 300 — 300	10 μA 100 μA 1 10 150 500 50	−10 −10 −10 −10 −10 −10 −1	−45[4]	−45	−5	−1 −1.3	50 150	2.5 15	−0.25 −0.4	50 150	2.5 15	—	40	100
2N3505	Diffused high current switch		X	250	0.4	80 120 135 140 100 50 115	— — — — 300 — 300	10 μA 100 μA 1 10 150 500 50	−10 −10 −10 −10 −10 −10 −1	−60[4]	−60	−5	−1 −1.3	50 150	2.5 15	−0.25 −0.4	50 150	2.5 15	—	40	100

PNP Low Level

		JEDEC Outline		f_T Typical	P_d@25°C Ambient	Beta Ranges h_{FE} @ Conditions				Maximum Voltages			V_{BE} SAT Conditions			V_{CE} SAT Conditions			I_{CBO}[5] Maximum	
						Min.	Max.	I_C	V_{CE}	V_{CER}[3]	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	@ 25°C	@ 15°C
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA		
FT0019H	PLANAR II type for high performance, low-level, low noise amplifiers		X	90	0.36	100	300	10 μA	−5	−80[4]	−100	−6	−0.9	10	0.5	−0.3	10	0.5	10 nA	10 μA
FT0019M	PLANAR II type for high performance, low-level, low noise amplifiers		X	90	0.36	100	300	10 μA	−5	−60[4]	−80	−6	−0.9	10	0.5	−0.3	10	0.5	10 nA	10 μA

PNP Switches

		JEDEC Outline		f_T Typical	P_d@25°C Ambient	Beta Ranges h_{FE} @ Conditions				C_{ob}	Maximum Voltages		V_{BE} SAT Conditions			V_{CE} SAT Conditions			Switching		
						Min.	Max.	I_C	V_{CE}	Max.	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	r_s	t_{on}	t_{off}
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	pf	Volts	Volts	Volts	mA	mA	Volts	mA	mA	nsec	nsec	nsec
2N2695	Non-saturated medium speed switch		X	100[17]	0.36	30	130	50	−1	—	−25	−4	−1.1[12]	50	2.5	−2.5	50	2.5	—	75	170
2N2696	Non-saturated medium speed switch	TO-46		100[17]	0.36	30	130	50	−1	—	−25	−4	−1.1[12]	50	2.5	−2.5	50	2.5	—	75	170
2N2904	Epitaxial high speed switches and core drivers	X		200[17]	0.6	40 35 25 20 20	120 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 500	15 50	−0.4 −1.6	150 500	15 50	—	—	—
2N2904A	High speed switches and core drivers	X		200[17]	0.6	40 40 40 40 40	120 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 500	15 50	−0.4 −1.6	150 500	15 50	—	45	100
2N2905	High speed switches and core drivers	X		200[17]	0.6	100 75 50 35 30	300 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 500	15 50	−0.4 −1.6	150 500	15 50	—	—	—
2N2905A	High speed switches and core drivers	X		200[17]	0.6	100 100 100 75 50	300 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 500	15 50	−0.4 −1.6	150 500	15 50	—	45	100
2N2906	High speed switches and core drivers		X	200[17]	0.4	40 35 25 20 20	120 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 500	15 50	−0.4 −1.6	150 500	15 50	—	—	—
2N2906A	High speed switches and core drivers		X	200[17]	0.4	40 40 40 40 40	120 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 150	15 50	−0.4 −1.6	150 500	15 50	—	45	100
2N2907	High speed switches and core drivers		X	200[17]	0.4	100 75 50 35 30	300 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 500	15 50	−0.4 −1.6	150 500	15 50	—	—	—
2N2907A	High speed switches and core drivers		X	200[17]	0.4	100 100 100 75 50	300 — — — —	150 10 1 0.1 500	−10 −10 −10 −10 −10	8	−60	−5	−1.3 −2.6	150 500	15 50	−0.4 −1.6	150 500	15 50	—	45	100
2N2927	Non-saturated medium speed switch	X		100[17]	0.8	30	130	50	−1	—	−25	−4	−1.1	50	2.5	−0.25	50	2.5	—	75	170
2N3072	VHF amplifier and high current switch	X		150	0.8	30	130	50	−1.0	—	−60	−4	−2.0	300	30	−1.0	300	30	—	40	100
2N3073	VHF amplifier and high current switch		X	150	0.36	30	130	50	−1.0	—	−60	−4	−2.0	300	30	−1.0	300	30	—	40	100
2N3120	VHF amplifier and high current switch	X		200	0.36	30	130	50	−1.0	—	−45	−4	−2.0	500	50	−1.0	500	50	—	40	100
2N3121	VHF amplifier and high current switch		X	150	0.8	30	130	50	−1.0	—	−45	−4	−2.0	500	50	−1.0	500	50	—	40	100
2N3502	Diffused high current switch	X		250	0.7	80 120 135 140 100 50 115	— — — — 300 — 300	10 μA 100 μA 1 10 150 500 50	−10 −10 −10 −10 −10 −10 −1	8	−45	−5	−1 −1.3	50 150	2.5 15	−0.25 −0.4	50 150	2.5 15	—	40	100

P-CHANNEL FIELD EFFECT

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	P_d @ 25°C Case Watts	P_d @ 25°C$_{FA}$ Watts	V_{DSS}	V_{GSS}	I_{GSS} nA	I_{DSS} mA	V_P Min. Volts	V_P Max. Volts	g_{mDS} Min. μohms	E_N	C_{DS} pf	Maximum Capacitance C_{GS} pf	Maximum Capacitance C_{DG} pf	C_{ISS} pf
2N2606	P-Channel PLANAR FET designed for high performance, low level circuits		X	—	0.3	—	30	1.0	0.5	1.0	4.0	110	$N_F = 3$ db	—	—	—	6.0
2N3277	P-Channel field effect transistor for low power audio-frequency applications	TO-33		—	22.5 mW[30]	−25[31]	−25[32]	0.4	0.15 (min.) 0.5 (max.)	—	5.0	100	0.18 $mV/\sqrt{cps}$ (max.)	1.0	3.0	1.5	4.5
2N3278	P-Channel field effect transistor for low power audio-frequency applications	TO-33		—	22.5 mW[30]	−25[31]	−25[32]	0.4	0.4 (min.) 0.9 (max.)	—	8.0	150	0.18 $mV/\sqrt{cps}$ (max.)	1.0	3.0	1.5	4.5
FI100	Silicon PLANAR II MOS FET designed for the enhancement mode		X	1.(	0.35	−30	±40	1.5 pA	0.5 nA	2.5	6.0	300	—	3.0	3.5	1.0	—

DOUBLE EMITTER CHOPPERS

Type	Double Emitter Choppers Description	JEDEC Outline TO-5	JEDEC Outline TO-18	I_{E1E2O} @ V_{E1E2} = ± 5 V pA (max.)	$\triangle V_O$ @ I_B = 500 μA μV (max.)	R_d @ I_B = 500 μA $I_{E1} = I_{E2}$ = 50 μA Ω (max.)	$V_{E1\,E2O}$ Volts	I_{CBO} @ 25°C (Max.) nA	V_{CB} Volts	C_{ob} @ V_{CB} = 5.0 V $I_{E1} = I_{E2} = 0$ pf	f kc
3N87	A double emitter, NPN Silicon single chip tetrode, for dc-ac chopper service in the inverted connection in low power, saturated switching applications		X	20	50	100	±10	1.0	20	3.5	140
3N88	A double emitter, NPN Silicon single chip tetrode, for dc-ac chopper service in the inverted connection in low power, saturated switching applications		X	20	100	150	±10	1.0	20	3.5	140

SILICON CONTROLLED RECTIFIERS

Type	Description	JEDEC Outline TO-5	JEDEC Outline TO-18	V_{FX} & V_{RD} −65°C to +150°C Volts	I_F @ 85°C A	Gate Dissipation @ 85°C Watts	I_{FX} & I_{RD} @ 25°C (Typ.) μA	V_{on} @ 25°C (Max.) Volts	V_{GT} @ 25°C (Max.) Volts	I_{GT} @ 25°C (Max.)
2N1595	PNPN Low Leakage SCR	X		50	1.0	0.1	0.03	2.0[33]	3.0[36]	10 μA[36]
2N1595A	PNPN Low Leakage SCR	X		50	1.0	0.1	0.03	2.0[33]	3.0[36]	2 μA[36]
2N1596	PNPN Low Leakage SCR	X		100	1.0	0.1	0.03	2.0[33]	3.0[36]	10 μA[36]
2N1596A	PNPN Low Leakage SCR	X		100	1.0	0.1	0.03	2.0[33]	3.0 [36]	2 μA[36]
2N1597	PNPN Low Leakage SCR	X		200	1.0	0.1	0.03	2.0[33]	3.0[36]	10 μA[36]
2N1597A	PNPN Low Leakage SCR	X		200	1.0	0.1	0.03	2.0[33]	3.0[36]	2 μA[36]
2N1598	PNPN Low Leakage SCR	X		300	1.0	0.1	0.03	2.0[33]	3.0[36]	10 μA[36]
2N1598A	PNPN Low Leakage SCR	X		300	1.0	0.1	0.03	2.0[33]	3.0[36]	2 μA[36]
2N1599	PNPN Low Leakage SCR	X		400	1.0	0.1	0.03	2.0[33]	3.0[36]	10 μA[36]
2N1599A	PNPN Low Leakage SCR	X		400	1.0	0.1	0.03	2.0[33]	3.0[36]	2μ A[36]
2N3269	High Speed Time Switch, for Pulse and DC Applications	Hexagonal Stud		100	8.0	0.5	0.03	1.2[33] 2.2[34]	0.8[37]	0.2 mA[37]
2N3270	High Speed Time Switch, for Pulse and DC Applications	Hexagonal Stud		200	8.0	0.5	0.03	1.2[33] 2.2[34]	0.8[37]	0.2 mA[37]
2N3271	High Speed Time Switch, for Pulse and DC Applications	Hexagonal Stud		300	8.0	0.5	0.03	1.2[33] 2.2[34]	0.8[37]	0.2 mA[37]
2N3272	High Speed Time Switch, for Pulse and DC Applications	Hexagonal Stud		400	8.0	0.5	0.03	1.2[33] 2.2[34]	0.8[37]	0.2 mA[37]
2N3273	High Speed Time Switch, for Pulse and DC Applications	X		100	2.2	0.1	0.03	1.4[33] 2.4[35]	0.8[37]	0.2 mA[37]
2N3274	High Speed Time Switch, for Pulse and DC Applications	X		200	2.2	0.1	0.03	1.4[33] 2.4[35]	0.8[37]	0.2 mA[37]
2N3275	High Speed Time Switch, for Pulse and DC Applications	X		300	2.2	0.1	0.03	1.4[33] 2.4[35]	0.8[37]	0.2 mA[37]
2N3276	High Speed Time Switch, for Pulse and DC Applications	X		400	2.2	0.1	0.03	1.4[33] 2.4[35]	0.8[37]	0.2 mA[37]

Fairchild diodes with EIA registered specifications, as well as the "FD" types, are available in the Standard DO-7 glass diode package. Several groups of Fairchild diodes are available in the microminiature epoxy package. This package is ideal for applications where miniaturization and economy are essential.
The following Silicon PLANAR zener and reference types are also available: general purpose Zeners; 100-microamp and Multi-Current Range reference diodes; and reference multi-chip assemblies.
Ask your Fairchild representatives for complete details on these.

General Purpose Types

Type	Minimum Forward Current @ 1.0 V	Reverse Current (Max. @ 25°C)	Breakdown Voltage (Min.)
	mA	μA	Volts
1N456	40	0.025 @ −25 V	30
1N456A	100	0.025 @ −25 V	30
1N457*	20	0.025 @ −60 V	70
1N457A	100	0.025 @ −60 V	70
1N458*	7	0.025 @ −125 V	150
1N458A	100	0.025 @ −125 V	150
1N459*	3	0.025 @ −175 V	200
1N459A	100	0.025 @ −175 V	200
1N461	15	0.5 @ −25 V	30
1N461A	100	0.5 @ −25 V	30
1N462	5	0.5 @ −60 V	70
1N462A	100	0.5 @ −60 V	70
1N463	1	0.5 @ −175 V	200
1N463A	100	0.5 @ −175 V	200
1N464	3	0.5 @ −125 V	150
1N464A	100	0.5 @ −125 V	150
1N482	100	0.25 @ −30 V	40
1N482A	100	0.025 @ −30 V	40
1N482B	100	0.025 @ −30 V	40
1N483	100	0.25 @ −60 V	80
1N483A	100	0.025 @ −60 V	80
1N483B*	100	0.025 @ −60 V	—

*MIL device

Type	Minimum Forward Current @ 1.0 V	Reverse Current (Max. @ 25°C)	Breakdown Voltage (Min.)
	mA	μA	Volts
1N484A	100	0.025 @ −125 V	150
1N484B	100	0.025 @ −125 V	150
1N485	100	0.25 @ −175 V	200
1N485A	100	0.025 @ −175 V	200
1N485B	100	0.025 @ −175 V	200
1N486	100	0.25 @ −225 V	250
1N486A	100	0.025 @ −225 V	250
1N486B	100	0.025 @ −225 V	250
1N619	3	8.0 @ −20 V	30
1N622	6.5	0.2 @ −150 V	180
1N890	20	0.025 @ −60 V	80
1N4244	20	0.25 @ −15 V	20
1N3066	10	100 nA @ −50 V	75 @ 5 μA
1N3067	5	100 nA @ −20 V	30 @ 5 μA
1N3068	20	100 nA @ −20 V	30 @ 5 μA
1N3069	50	100 nA @ −60 V	65 @ 5 μA
1N3595	20	1.0 nA @ 125 V	150 @ 100 μA
1N484	100	0.25 @ −125 V	150
FD311	100	0.005 @ −25 V	30
FD312	100	0.005 @ −60 V	70
FD313	100	0.005 @ −125 V	150
FD314	100	0.005 @ −175 V	200
FD315	100	0.025 @ −30 V	40
FD316	100	0.025 @ −60 V	80
FD317	100	0.025 @ −125 V	150
FD318	100	0.025 @ −175 V	200
FD319	100	0.05 @ −225 V	250
FD320	100	0.1 @ −150 V	200
FD321	100	0.1 @ −200 V	250

Type	Minimum Forward Current @ 1.0 V	Reverse Current (Max. @ 25°C)	Breakdown Voltage (Min)
	mA	μA	Volts
FD322	15	0.5 @ −25 V	30
FD323	5	0.5 @ −60 V	70
FD324	1	0.5 @ −175 V	200
FD325	40	0.025 @ −25 V	30
FD326	20	0.025 @ − 60 V	70
FD327	7	0.025 @ −125 V	150
FD328	3	0.025 @ −175 V	200
FD329	3	0.5 @ −125 V	150
FD381	100	0.001 @ −60 V	70
FD382	100	0.001 @ −125 V	150
FD383	100	0.001 @ −175 V	200
FDS600	200	100 nA @ −50 V	75 @ 5 μA
1N676	200	1.0 @ −100 V	115
1N678	200	1.0 @ −200 V	230
FDA600	200	100 nA @ −50 V	75 @ 5 μA
FD338	200	0.25 @ −30 V	40
FD339	200	0.025 @ −30 V	40
FD340	200	0.025 @ −30 V	40
FD341	200	0.25 @ −60 V	80
FD342	200	0.025 @ −60 V	80
FD343	200	0.025 @ −60 V	80
FD344	200	0.25 @ −125 V	150
FD345	200	0.025 @ −125 V	150
FD346	200	0.025 @ −125 V	150
FD347	200	0.25 @ −175 V	200
FD348	200	0.025 @ −175 V	200
FD349	200	0.025 @ −175 V	200
FD350	200	0.25 @ −225 V	250
FD351	200	0.05 @ −225V	250

GENERAL PURPOSE DIODES CONTINUED

Type	Minimum Forward Current @ 1.0 V	Reverse Current (Max. @ 25°C)	Breakdown Voltage (Min.)
	mA	μA	Volts
FD352	200	0.05 @ −225 V	250
FD357	250	0.005 @ −35 V	60
FD358	250	0.005 @ −70 V	100
FD359	250	0.005 @ −130 V	160
FD360	250	0.005 @ −180 V	210
FD361	250	0.005 @ −225 V	260

General Purpose Zeners

Type	V_Z (Nom.) ±5% (Volts)	I_Z Test Current (mA)	Max. Z @ I_Z (Ohms)	V_R (Volts)	Max. I_R @ V_R (μA)(25°C)	Z_{ZK} I_{AD} = 0.25 mA I_{AD} = 25 μA (Ohms)
1N753A*	6.2	20	7.0	4.0	5	—
1N754A*	6.8	20	5.0	5.0	2	—
1N755A*	7.5	20	6.0	6.0	2	—
1N756A*	8.2	20	8.0	6.5	2	—
1N757A*	9.1	20	10	7.0	2	—
1N758A*	10	20	17	8.0	1	—
1N759A*	12	20	30	9.0	1	—
1N957B	6.8	18.5	5	4.0	1.0	—
1N958B	7.5	16.5	6	4.0	1.0	—
1N959B	8.2	15.0	6.5	5.0	1.0	—
1N960B	9.1	14.0	7.5	6.0	1.0	700
1N961B	10.0	12.5	8.5	8.0	1.0	—
1N962B*	11	11.5	9.5	8.4	0.1	—
1N963B*	12	10.5	11.5	9.1	0.1	700
1N964B*	13	9.5	13	9.9	0.1	700
1N965B*	15	8.5	16	11.0	0.1	700
1N966B*	16	7.8	17	12.0	0.1	700
1N967B*	18	7.0	21	14.0	0.1	750
1N968B*	20	6.2	25	15.0	0.1	750
1N969B*	22	5.6	29	17.0	0.1	750
1N970B*	24	5.2	33	18.0	0.1	750
1N971B*	27	4.6	41	21.0	0.1	750
1N972B*	30	4.2	49	23.0	0.1	1000
1N973B*	33	3.8	58	25.0	0.1	1000

Temperature Compensated Reference Diodes

Type	Test Current (mA)	Zener Impedance I_{DC} = 1.0 mA (Ohms) I_{AC} = 1.0 mA	Zener V @ I_{DC} = 10 mA (Volts)	TC (%/°C)
FA8001	10	20	8.0 (Min.)	0.0005
FA8002	10	20	8.0 (Min.)	0.001
FA8003	10	20	8.0 (Min.)	0.002
FA8004	10	20	8.8 (Max.)	0.005
FA8005	10	25	10.8 (Min.)	0.0005
FA8006	10	25	10.8 (Min.)	0.001
FA8007	10	25	10.8 (Min.)	0.002
FA8008	10	25	12 (Max.)	0.005
FA8009	10	30	14.3 (Min.)	0.0005
FA8010	10	30	14.3 (Min.)	0.001
FA8011	10	30	14.3 (Min.)	0.002
FA8012	10	30	15.7 (Max.)	0.005

Multicurrent Range Reference Diodes

Type	Reverse Voltage (Nom.) (Volts)	Voltage Tolerance	Reverse Leakage @ 3.0 V 25°C (nA)	Temperature Range (°C)	Operating Current (mA)	Impedance (Ohms)	TC (%/°C)
M-CR2021	6.6	±5%	200	−55 to +100	10(7-15)	15	0.001
M-CR2022	6.6	±5%	200	−55 to +100	10(7-15)	15	0.002
M-CR2025	6.6	±5%	200	−55 to +100	10(7-15)	15	0.005
M-CR2035	6.6	±5%	200	−55 to +100	10(7-15)	15	0.0005
M-CR2221	6.6	±5%	200	−55 to +100	2(1-3)	75	0.001
M-CR2222	6.6	±5%	200	−55 to +100	2(1-3)	75	0.002

*MIL device

Type	Reverse Voltage (Nom.) (Volts)	Voltage Tolerance	Reverse Leakage @ 3.0 V 25°C (nA)	Temperature Range (°C)	Operating Current (mA)	Impedance (Ohms)	TC (%/°C)
M-CR2225	6.6	±5%	200	−55 to +100	2(1-3)	75	0.005
M-CR2235	6.6	±5%	200	−55 to +100	2(1-3)	75	0.0005
M-CR2521	6.6	±5%	200	−55 to +100	5(3-7)	25	0.001
M-CR2522	6.6	±5%	200	−55 to +100	5(3-7)	25	0.002
M-CR2525	6.6	±5%	200	−55 to +100	5(3-7)	25	0.005
M-CR2535	6.6	±5%	200	−55 to +100	5(3-7)	25	0.0005

Reference

Type	Reference Voltage (Nominal) (Volts)	Voltage Tolerance	Reverse Leakage @ 5.0 V ,25°C (Max.)(nA)	Temperature Range (°C)	Dynamic Impedance (Max.) (Ohms)	Temperature Coefficient @ 100 μA (%/°C)
FCT1021	6.7	±5%	100	0 to +100	750	±0.001
FCT1022	6.7	±5%	100	0 to +100	750	±0.002
FCT1025	6.7	±5%	100	0 to +100	750	±0.005
FCT1035	6.7	±5%	100	0 to +100	750	±0.0005
FCT1121	6.7	±5%	100	−55 to +100	750	±0.001
FCT1122	6.7	±5%	100	−55 to +100	750	±0.002
FCT1125	6.7	±5%	100	−55 to +100	750	±0.005
FCT1135	6.7	±5%	100	−55 to +100	750	±0.0005

Matched Pairs

Type	Forward Current Matching Range	Maximum Forward Voltage Difference Between Diodes (ΔV_F) (mV)
FA2000	500 μAdc to 2 mAdc	10
FA2001	2 mAdc to 5 mAdc	15
FA2002	5 mAdc to 10 mAdc	20
FA2003	500 μAdc to 2 mAdc	10
FA2004	2 Adc to 5 mAdc	15
FA2005	5 mAdc to 10 mAdc	20
FA2006	10 mAdc to 25 mAdc	30
FA2007	25 mAdc to 50 mAdc	50
FA2008	10 μAdc to 150 μAdc	10
FA2009	150 μAdc to 500 μAdc	10

Type	Forward Current Matching Range	Maximum Forward Voltage Difference Between Diodes (ΔV_F) (mV)
FA2010	10 μAdc to 150 μAdc	10
FA2011	150 μAdc to 500 μAdc	10
FA2310E/U	10 μA to 1.0 mA	3.0
FA2311E/U	10 μA to 1.0 mA	10
FA2312E/U	1.0 mA to 10 mA	5.0
FA2313E/U	1.0 mA to 10 mA	15
FA2320E/U	10 μA to 1.0 mA	3.0
FA2321E/U	10 μA to 1.0 mA	10
FA2322E/U	1.0 mA to 10 mA	5.0
FA2323E/U	1.0 mA to 10 mA	15
FA2324E/U	10 mA to 100 mA (pulse only)	10
FA2325E/U	10 mA to 100 mA (pulse only)	20
FA2330E/U	10 μA to 1.0 mA	10
FA2331E/U	1.0 mA to 10 mA	15
FA2332E/U	10 mA to 100 mA (pulse only)	20
FA2333E/U	10 μA to 1.0 mA	10
FA2334E/U	1.0 mA to 10 mA	15
FA2335E/U	10 mA to 100 mA (pulse only)	20
FA2360E/U	10 mA to 100 mA (pulse only)	10
FA2361E/U	10 mA to 100 mA (pulse only)	20

Bridges

Type	Forward Current Matching Range	Maximum Forward Voltage Dfference Between Diodes (ΔV_F) (mV)
FA3310	10 μA to 1.0 mA	3.0
FA3311	10 μA to 1.0 mA	10
FA3312	1.0 mA to 10 mA	5.0
FA3313	1.0 mA to 10 mA	15
FA3320	10 μA to 1.0 mA	3.0
FA3321	10 μA to 1.0 mA	10
FA3322	1.0 mA to 10 mA	5.0
FA3323	1.0 mA to 10 mA	15

Type	Forward Current Matching Range	Maximum Forward Voltage Dfference Between Diodes (ΔV_F) (mV)
FA3324	10 mA to 100 mA (pulse only)	10
FA3325	10 mA to 100 mA (pulse only)	20
FA3330	10 μA to 1.0 mA	10
FA3331	1.0 mA to 10 mA	15
FA3332	10 mA to 100 mA (pulse only)	20
FA3333	10 μA to 1.0 mA	10
FA3334	1.0 mA to 10 mA	15
FA3335	10 mA to 100 mA (pulse only)	20
FA3360	10 mA to 100 mA (pulse only)	10
FA3361	10 mA to 100 mA (pulse only)	20

Matched Quads

Type	Forward Current Matching Range	Maximum Forward Voltage Difference Between Diodes (ΔV_f) (mV)
FA4000	500 μAdc to 2 mAdc	10
FA4001	2 mAdc to 5 mAdc	15
FA4002	5 mAdc to 10 mAdc	20
FA4003	500 μAdc to 2 mAdc	10
FA4004	2 mAdc to 5 mAdc	15
FA4005	5 mAdc to 10 mAdc	20
FA4006	10 mAdc to 25 mAdc	30
FA4007	25 mAdc to 50 mAdc	50
FA4008	10 μAdc to 150 μAdc	10
FA4009	150 μAdc to 500 μAdc	10
FA4010	10 μAdc to 150 μAdc	10
FA4011	150 μAdc to 500 μAdc	10
FA4310E/U	10 μA to 1.0 mA	3.0
FA4311E/U	10 μA to 1.0 mA	10
FA4312E/U	1.0 mA to 10 mA	5.0
FA4313E/U	1.0 mA to 10 mA	15
FA4320E/U	10 μA to 1.0 mA	3.0
FA4321E/U	10 μA to 1.0 mA	10
FA4322E/U	1.0 mA to 10 mA	5.0
FA4323E/U	1.0 mA to 10 mA	15
FA4324E/U	10 mA to 100 mA (pulse only)	10
FA4325E/U	10 mA to 100 mA (pulse only)	20
FA4330E/U	10 μA to 1.0 mA	10
FA4331E/U	1.0 mA to 10 mA	15
FA4332E/U	10 mA to 100 mA (pulse only)	20
FA4333E/U	10 μA to 1.0 mA	10
FA4334E/U	1.0 mA to 10 mA	15
FA4335E/U	10 mA to 100 mA (pulse only)	20
FA4360E/U	10 mA to 100 mA (pulse only)	10
FA4361E/U	10 mA to 100 mA (pulse only)	20

Low Leakage

Type	I_f @ V_f = 1.0 V (mA)	BV (min.) (Volts)	I_R (max.) (nA)	C_O (max) (pf)	t_{rr} (max.) (μsec)
FD300	200	150	1.0	6.0	—

High Conductance

Type	I_f @ V_f = 1.0 V (mA)	BV (min.) (Volts)	I_R (max.) (nA)	C_O (max.) (pf)	t_{rr} (max.) (nsec)
1N3070*	100	200	100	5.0	50
1N3071	100	200	100	5.0	50
1N3600*	200	75	100	2.5	4.0
FD200	100	200	100	5.0	50
FD600	200	75	100	3.0	4.0

Switching

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N625	4.0 @ 1.5 V	1.0(1)	30
1N626	4.0 @ 1.5 V	1.0(1)	50
1N627	4.0 @ 1.5 V	1.0(1)	100

*MIL device

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N628	4.0 @ 1.5 V	1.0(1)	150
1N629	4.0 @ 1.5 V	1.0(1)	200
1N934	30.0 @ 1.0 V	1.0(2)	80
FD112	5.0 @ 1.5 V	1.0(3)	40
FD113	5.0 @ 1.5 V	1.0(3)	80
FD212	5.0 @ 1.5 V	1.0(3)	150
FD213	5.0 @ 1.5 V	1.0(3)	200
FD214	100.0 @ 1.5 V	1.0(4)	40
FD215	100.0 @ 1.5 V	1.0(4)	80
FD216	100.0 @ 1.5 V	1.0(4)	150
FD217	100.0 @ 1.5 V	1.0(4)	200
FD218	100.0 @ 1.0 V	1.0(1)	50
FD219	100.0 @ 1.0 V	1.0(1)	100
FD220	100.0 @ 1.0 V	1.0(1)	150
FD221	100.0 @ 1.0 V	1.0(1)	200
FD222	100.0 @ 1.0 V	1.0(6)	150
FD227	6.0 @ 1.5 V	1.0(3)	150
FD228	15.0 @ 1.5 V	1.0(1)	50
FD229	15.0 @ 1.5 V	1.0(1)	150
FD230	6.0 @ 1.5 V	1.0(1)	50
FD231	6.0 @ 1.5 V	1.0(1)	35
FD232	6.0 @ 1.5 V	1.0(1)	100
FD233	6.0 @ 1.5 V	1.0(1)	200
FD234	15.0 @ 1.5 V	1.0(1)	100
FD235	15.0 @ 1.5 V	1.0(6)	200
FD236	15.0 @ 1.5 V	1.0(1)	50
FD266	100.0 @ 1.0 V	1.0(6)	30
FD267	75.0 @ 1.0 V	1.0(7)	100

(1) Recovery to 400 K, switching from 30 mA forward to −35 V (IBμY circuit).
(2) Recovery to 400 K, switching from 30 mA circuit to −20 V (IBμY circuit).
(3) Recovery to 400 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
(4) Recovery to 80 K, switching from 20 mA forward to −40 V (JAN 256 circuit).
(6) Recovery from 1 megohm, switching from 500 mA forward to −50 V.
(6) Recovery to 100 K, switching from 5 mA to −10 K (JAN 256 circuit).
(7) Recovery to 200 K, switching from 5 mA forward to −40 K (JAN 256 circuit).

Fast Switching

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N643*	10.0 @ 1.0 V	0.3(1)	200
1N643A	100.0 @ 1.0 V	0.3(1)	200
1N658*	100.0 @ 1.0 V	0.3(2)	120
1N659	6.0 @ 1.0 V	0.3(3)	60
1N659A	6.0 @ 1.0 V	0.3(3)	75
1N660	6.0 @ 1.0 V	0.3(3)	120
1N661	6.0 @ 1.0 V	0.3(3)	240
1N662*	10.0 @ 1.0 V	0.5(4)	100
1N662A	100.0 @ 1.0 V	0.5(4)	100
1N663*	100.0 @ 1.0 V	0.5(1)	100
1N663A	100.0 @ 1.0 V	0.3(1)	100
1N778	10.0 @ 1.0 V	0.3(8)	125
1N779	10.0 @ 1.0 V	0.3(8)	200
1N789	10.0 @ 1.0 V	0.5(1)	30
1N790	10.0 @ 1.0 V	0.25(1)	30
1N791	50.0 @ 1.0 V	0.5(1)	30
1N792	100.0 @ 1.0 V	0.5(4)	30
1N793	10.0 @ 1.0 V	0.5(1)	60
1N794	10.0 @ 1.0 V	0.25(1)	60
1N795	50.0 @ 1.0 V	0.5(1)	60
1N796	100.0 @ 1.0 V	0.5(4)	60
1N797	10.0 @ 1.0 V	0.5(1)	120
1N798	10.0 @ 1.0 V	0.25(1)	120
1N799	50.0 @ 1.0 V	0.5(1)	120
1N800	100.0 @ 1.0 V	0.5(4)	120
1N801	10.0 @ 1.0 V	0.5(1)	150
1N802	50.0 @ 1.0 V	0.5(1)	150
1N803	10.0 @ 1.0 V	0.5(1)	200

*MIL device

FAST SWITCHING DIODES CONTINUED

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N804	50.0 @ 1.0 V	0.5[1]	200
1N806	4.0 @ 1.0 V	0.3[8]	110
1N807	4.0 @ 1.0 V	0.3[8]	200
1N808	100.0 @ 1.0 V	0.3[5]	110
1N809	100.0 @ 1.0 V	0.3[5]	220
1N811	1.0 @ 1.0 V	0.25[9]	30
1N812	2.0 @ 1.0 V	0.25[9]	40
1N813	5.0 @ 1.0 V	0.25[9]	20
1N814	2.0 @ 1.0 V	0.25[9]	50
1N815	100.0 @ 1.5 V	0.25[9]	20
1N818	30.0 @ 1.5 V	0.5[7]	80
1N837	150.0 @ 1.0 V	0.5[3]	100
1N837A	150.0 @ 1.0 V	0.3[3]	100
1N838	150.0 @ 1.0 V	0.5[3]	150
1N839	150.0 @ 1.0 V	0.5[3]	200
1N840	150.0 @ 1.0 V	0.3[3]	50
1N841	150.0 @ 1.0 V	0.3[3]	150
1N842	150.0 @ 1.0 V	0.3[3]	200
1N843	150.0 @ 1.0 V	0.3[3]	250
1N844	200.0 @ 1.0 V	0.5[3]	100
1N845	200.0 @ 1.0 V	0.5[3]	200
1N891	50.0 @ 1.0 V	0.3[2]	60
1N892	50.0 @ 1.0 V	0.3[2]	120
1N893	50.0 @ 1.0 V	0.3[2]	240
FD241	30.0 @ 1.5 V	0.5[7]	150
FD243	3.0 @ 1.0 V	0.5[10]	30
FD244	5.0 @ 1.0 V	0.3[4]	60
FD245	5.0 @ 1.0 V	0.3[4]	100
FD246	3.0 @ 1.0 V	0.3[4]	200
FD247	4.0 @ 1.0 V	0.3[4]	150
FD248	50.0 @ 1.0 V	0.2[1]	60
FD249	50.0 @ 1.0 V	0.2[1]	120
FD250	50.0 @ 1.0 V	0.2[1]	175
FD251	50.0 @ 1.0 V	0.2[1]	225
FD252	5.0 @ 1.5 V	0.3[8]	80
FD253	5.0 @ 1.5 V	0.8[8]	150
FD254	5.0 @ 1.5 V	0.3[8]	200
FD255	30.0 @ 1.5 V	0.5[7]	200
FD256	100.0 @ 1.5 V	0.5[7]	40
FD257	30.0 @ 1.5 V	0.5[7]	80
FD258	100.0 @ 1.0 V	0.3[1]	150
FD259	10.0 @ 1.0 V	0.3[7]	50
FD260	10.0 @ 1.0 V	0.3[7]	175
FD262	50.0 @ 1.0 V	0.5[4]	60
FD263	50.0 @ 1.0 V	0.5[4]	100
FD264	50.0 @ 1.0 V	0.5[4]	150
FD265	50.0 @ 1.0 V	0.5[4]	200
FD2055			

[1] Recovery to 200 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[2] Recovery to 80 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[3] Recovery to 400 K, switching from 30 mA to −30 V (JAN 256 circuit).
[4] Recovery to 100 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[5] Recovery to 100 K, switching from 30 mA forward to −35 V (JAN 256 circuit).
[6] Recovery to 200 K, switching from 5 mA forward to −10 V (JAN 256 circuit).
[7] Recovery to 80 K, switching from 20 mA forward to −40 V (JAN 256 circuit).
[8] Recovery to 400 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[9] Recovery to 20 K, switching from 5 mA forward to −10 V (JAN 256 circuit).
[10] Recovery to 100 K, switching from 5 mA forward to −10 V (JAN 256 circuit).

Very Fast Switching

Type	Forward Current (75 mμsec to 150 nsec) (Min.)	Reverse Recovery (75 mμsec to 150 nsec) (Max.)	Breakdown Voltage Sat. (Min.)
	mA	μsec	Volts
1N251*	5.0 @ 1.0 V	0.15[1]	40
1N252	10.0 @ 1.0 V	0.15[2]	30
1N925	5.0 @ 1.0 V	0.15[3]	40
1N926	5.0 @ 1.0 V	0.15[3]	40
1N927	10.0 @ 1.0 V	0.15[3]	65
1N928	10.0 @ 1.0 V	0.15[3]	120

Type	Forward Current (75 mμsec to 150 nsec) (Min.)	Reverse Recovery (75 mμsec to 150 nsec) (Max.)	Breakdown Voltage Sat. (Min.)
	mA	μsec	Volts
FD237	100.0 @ 1.0 V	0.15[1]	30

[1] Recovery to 20 K, switching from 5 mA to −10 V (JAN 256 circuit).
[2] Recovery to 40 K, switching from 5 mA forward to −10 V (JAN 256 circuit).
[3] Recovery to 20 K, switching from 5 mA to −10 V (JAN 256 circuit).

Ultra Fast Switching

Type	Capacitances (Max.)	I_F Forward Current (Min.)	Reverse Recovery (2.0 mμsec to 50 mμsec)	Breakdown Voltage (Min.)
	μμf	mA	Max.—nsec	Volts
1N903	1.0 @ 6.0 V	10.0 @ 1.0 V	4[1]	50
1N903A	1.0 @ 6.0 V	20.0 @ 1.0 V	4[1]	50
1N904	1.0 @ 6.0 V	10.0 @ 1.0 V	4[1]	40
1N904A	1.0 @ 6.0 V	20.0 @ 1.0 V	4[1]	40
1N905	1.0 @ 6.0 V	10.0 @ 1.0 V	4[1]	30
1N905A	1.0 @ 6.0 V	20.0 @ 1.0 V	4[1]	30
1N906	2.5 @ −6.0 V	10.0 @ 1.0 V	4[1]	30
1N906A	2.5 @ −6.0 V	20.0 @ 1.0 V	4[1]	30
1N907	2.5 @ −6.0 V	10.0 @ 1.0 V	4[1]	40
1N907A	2.5 @ −6.0 V	20.0 @ 1.0 V	4[1]	40
1N908	2.5 @ −6.0 V	10.0 @ 1.0 V	4[1]	50
1N908A	2.5 @ −6.0 V	20.0 @ 1.0 V	4[1]	50
1N914*	4.0 @ 0.0 V	10.0 @ 1.0 V	4[2]	100
1N914A	4.0 @ 0.0 V	20.0 @ 1.0 V	4[2]	100
1N914B	4.0 @ 0.0 V	5.0 @ 0.62 V	4[2]	75 V @ 5 mA
1N916	2.0 @ 0.0 V	10.0 @ 1.0 V	4[2]	100
1N916A	2.0 @ 0.0 V	20.0 @ 1.0 V	4[2]	100
FD100	2.0 @ 0.0 V	10.0 @ 1.0 V	2[2]	75
FD101	2.0 @ 0.0 V	20.0 @ 1.0 V	2[2]	75
FD114	—	10.0 @ 1.5 V	4[3]	10
FD115	—	10.0 @ 1.5 V	4[3]	20
FD116	0.8 @ −6.0 V	10.0 @ 1.5 V	4[1]	50
FD117	2.0 @ −6.0 V	20.0 @ 1.0 V	4[1]	50
FD192	1.0 @ 0.0 V	10.0 @ 1.0 V	2[2]	30

Type	Capacitances (Max.)	I_F Forward Current (Min.)	Reverse Recovery (2.0 mμsec to 50 mμsec)	Breakdown Voltage (Min.)
	μμf	mA	Max.—nsec	Volts
FD200	5.0 @ 0.0 V	100.0 @ 1.0 V	50[4]	200
1N3064*	2.0	10.0 @ 1.0 V	4[5]	75

[1] Recovery to 1.0 mA reverse, switching from 10 mA from and to −5.0 V (R_L = 100 ohms).
[2] Recovery to 1.0 mA reverse, switching from 10 mA from and to −6.0 V (R_L = 100 ohms).
[3] Recovery to 3.0 mA reverse, switching from 10 mA forward to −6.0 V (R_L = 120 ohms).
[4] Recovery to 1.0 mA reverse, switching from 30 mA from and to 30 mA reverse (R_L = 150 ohms).
[5] Recovery to 1 mA reverse, switching from 10 mA forward to 10 mA reverse.

Pico Second Computer

Type	I_F @ V_F = 1.0 V (mA)	BV (Min.) (Volts)	I_R (Max.) (nA)	C_O (Max.) (pf)	t_{rr} (Max.) (psec)
FD700	50 @ 1.1 V	30	50	0.75	700

Microwave Varactor Diode

Type	Description	E_{rr} (Min.) (%)	C_O (Max.) (pf)	R_S (Typ.) (Ohms)	F_{CO} (Typ.) (Gc)
MD100	Silicon Planar Epitaxial Varactor Diode	60	3.0	1.25	70

Diode Assemblies in Transistor Packages

MAXIMUM RATINGS (25°C)

V_R	Reverse Voltage	50 V
I_O	Average Rectified Current	200 mA
I_F	Forward Current, DC	300 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	1 second pulse width	1 A
i_f(surge)	1 microsecond pulse width	4 A
P	Power Dissipation	500 mW
T_A	Operating Temperature	−65°C to +175°C
T_{stg}	Storage Temperature, Ambient	−65°C to +200°C

ELECTRICAL SPECIFICATION (25°C UNLESS NOTED)

BV(min.)	Breakdown Voltage @ 100 μA(V)	75
I_R(max.)	Reverse Leakage @ V_R(nA)	100
	@ V_R, 150°C(μA)	100
C(Max.)	Capacitance @ OV(pf)	3
V_F(Max.)	Forward Voltage @ 200 mA(V)	1.0
	@ 100 mA(V)	.920
	@ 50 mA(V)	.860
	@ 20 mA(V)	.790
	@ 10 mA(V)	.750
	@ 5 mA(V)	.710
	@ 2 mA(V)	.670
	@ 1 mA(V)	.630
t_{rr}(Max.)	I_F = I_R = 10 mA, Recover to 1 mA (nsec)	4
t_{rr}(Max.)	I_F = I_R = 200 mA, Recover to 20 mA (nsec)	4

COMMON ANODE ASSEMBLIES			FSA1177 FSA1178 FSA1179	FSA1181 FSA1182
COMMON CATHODE ASSEMBLIES	FSA1169 FSA1171 FSA1172	FSA1173 FSA1174 FSA1175	FSA1176 FSA1202	FSA1203 FSA1204
MATRIX ASSEMBLIES			FSA1184 FSA1185 FSA1186	FSA1187 FSA1188 FSA1189
BRIDGE AND TRANSMISSION GATES	FSA1197 FSA1198 FSA1191	FSA1192 FSA1193 FSA1194	FSA1195 FSA1196	FSA1199 FSA1201

*MIL device

Special Products

STEEL TAB

TO-50

FLAT PAK

TO-18

TO 46

TO-5

Fairchild Special Products include transistors and diodes mounted in special packages, multiple device assemblies and devices for special applications. Fairchild dual transistors and differential amplifiers are designed to reduce users' testing and assembly costs. They feature good tracking between devices, matched electrical characteristics (because devices are taken from same wafer), reduced size, and the reliability resulting from PLANAR devices using fewer interconnections.

The designer may designate custom combinations of devices, choosing from any standard Fairchild transistor or diode types.

The stock items in the table below are available nationally through franchised distributors and stocking representatives.

Single Transistors

REFER TO TRANSISTOR SECTION FOR SPECIFICATIONS

STEEL TAB	TO-50	TO 46	SIMILAR TO TYPE:
FSP162	SP8986	FM708	2N708
FSP164	SP8980	FM709	2N709
FSP166-1	SP8981	FM910	2N910
FSP166	SP8982	FM911	2N911
FSP165	SP8983	FM914	2N914
FSP289-1	SP8984	FM915	2N915
FSP242-1	SP8985	FM916	2N916
FSP411-1	SP8839	FM918	2N918
FSP2[illegible]-1	SP8987	FM995	2N995
SP8347	SP8988	FM996	2N996
—	SP8989	FM1132	2N1132
FSP42	SP8990	FM1613	2N1613
FSP42-1	SP8991	FM1711	2N1711
SP8895	SP8992	FM1893	2N1893
SP8896	SP8993	FM2297	2N2297
SP8898	SP8994	FM2369	2N2369
FSP504-1	SP8995	FM2483	2N2483
SP8487	SP8996	FM2484	2N2484
SP8884	SP8997	FM2696	2N2696
SP8886	SP8998	FM2846	2N2846
SP8865	SP8999	FM2894	2N2894

Dual Transistors

REFER TO TRANSISTOR SECTION FOR SPECIFICATIONS

TO-5	TO-18	FLAT PAK	SIMILAR TO TYPE:
SP8300	SP8700	SP8500	2N708
SP8301	SP8701	SP8501	2N709
SP8302	SP8702	SP8502	2N910
SP8303	SP8703	SP8503	2N911
SP8304	SP8704	SP8504	2N914
SP8305	SP8705	SP8505	2N915
SP8306	SP8706	SP8506	2N916
SP8891	SP8892	SP8893	2N918
SP8307	SP8707	SP8507	2N995
SP8410	SP8513	SP8508	2N996
SP8308	SP8708	—	2N1132
SP8309	SP8709	SP8509	2N1613
SP8310	SP8715	SP8510	2N1711
SP8311	SP8716	SP8511	2N1893
SP8312	SP8717	SP8512	2N2297
SP8314	SP8718	SP8514	2N2369
2N2913	2N2972	SP8888	2N2483
2N2914	2N2973	SP8888A	2N2484
SP8688	SP8690	SP8890	2N2696
SP8689	SP8691	SP8889	2N2846
SP8868	SP8869	SP8870	2N2894

Differential Amplifiers

TO-5	TO-18	Similar Type	NPN/ PNP	h_{FE} Ratio Range	$\lvert V_{BE1}-V_{BE2}\rvert$ (mV) Max.	$\lvert\triangle(V_{BE1}-V_{BE2})\rvert$ (μV/°C) Max.
2N2060	2N2980	2N1893	NPN	.90-1.00	5.0	10
2N2223	2N2981	2N1973	NPN	.80-1.00	15	25
2N2223A		2N1973	NPN	.90-1.00	5.0	25
	2N2982	2N1972	NPN	.90-1.00	5.0	15
2N2915	2N2974	2N2484	NPN	.90-1.00	3.0	10
2N2916 (Low Noise)	2N2975	2N2484	NPN	.90-1.00	3.0	10
2N2917	2N2976	2N2484	NPN	.80-1.00	5.0	20
2N2918 (Low Noise)	2N2977	2N2484	NPN	.80-1.00	5.0	20
2N3423		2N918	NPN	.80-1.00	10	40
2N3424		2N918	NPN	.90-1.00	5.0	20
2N3726*		2N3502	PNP	.90-1.00	5.0	20
2N3727*		2N3502	PNP	.90-1.00	2.5	10
2N3728*		2N3302	NPN	.80-1.00	5.0	20
2N2729*		2N3302	NPN	.90-1.00	3.0	10

*TO-5—Low Profile

Photo Devices

TO-18 Lens	Light Sensitivity (μA/mw/cm²) Min.	Light Sensitivity (μA/mw/cm²) Max.	Dark Current (nA) Max.	t_r (μs) Max.	t_f (μs) Max.
PHOTOTRANSISTORS (NPN)					
2N986	20	60	10	1.0	10
2N2452	50	200	10	1.0	10
PHOTODIODE					
1N3734	1.0	1.0	50	0.2	0.2

TO-18 Lens	TO-5 Lens	t_r (light emitted) (ns)	BV (typ.) (Volts)
LIGHT PULSERS			
FSP-105	FSP-103	<1.0	8.0

Darlington Amplifiers

TO-18	NPN/ PNP	BV_{CBO} (Volts)	$h_{FE}@I_C=100\mu A$ Min.	$h_{FE}@I_C=1.0mA$ Min.	$h_{FE}@I_C=10mA$ Min.	$h_{FE}@I_C=10mA$ Max.	$h_{FE}@I_C=100mA$ Min.	$h_{FE}@I_C=100mA$ Max.
2N997	NPN	75	1,000	—	4,000	—	7,000	70,000
2N998	NPN	100	—	800	1,600	8,000	2,000	—
2N999	NPN	60	1.000	—	4,000	—	7,000	70,000

Type	Reverse Voltage (Nom.) (Volts)	Voltage Tolerance	Reverse Leakage @ 3.0 V 25°C (nA)	Temperature Range (°C)	Operating Current (mA)	Impedance (Ohms)	TC (%/°C)
M-CR2225	6.6	±5%	200	−55 to +100	2(1-3)	75	0.005
M-CR2235	6.6	±5%	200	−55 to +100	2(1-3)	75	0.0005
M-CR2521	6.6	±5%	200	−55 to +100	5(3-7)	25	0.001
M-CR2522	6.6	±5%	200	−55 to +100	5(3-7)	25	0.002
M-CR2525	6.6	±5%	200	−55 to +100	5(3-7)	25	0.005
M-CR2535	6.6	±5%	200	−55 to +100	5(3-7)	25	0.0005

Reference

Type	Reference Voltage (Nominal) (Volts)	Voltage Tolerance	Reverse Leakage @ 5.0 V ,25°C (Max.)(nA)	Temperature Range (°C)	Dynamic Impedance (Max.) (Ohms)	Temperature Coefficient @ 100 μA (% /°C)
FCT1021	6.7	±5%	100	0 to +100	750	±0.001
FCT1022	6.7	±5%	100	0 to +100	750	±0.002
FCT1025	6.7	±5%	100	0 to +100	750	±0.005
FCT1035	6.7	±5%	100	0 to +100	750	±0.0005
FCT1121	6.7	±5%	100	−55 to +100	750	±0.001
FCT1122	6.7	±5%	100	−55 to +100	750	±0.002
FCT1125	6.7	±5%	100	−55 to +100	750	±0.005
FCT1135	6.7	±5%	100	−55 to +100	750	±0.0005

Matched Pairs

Type	Forward Current Matching Range	Maximum Forward Voltage Difference Between Diodes (ΔV_F) (mV)
FA2000	500 μAdc to 2 mAdc	10
FA2001	2 mAdc to 5 mAdc	15
FA2002	5 mAdc to 10 mAdc	20
FA2003	500 μAdc to 2 mAdc	10
FA2004	2 Adc to 5 mAdc	15
FA2005	5 mAdc to 10 mAdc	20
FA2006	10 mAdc to 25 mAdc	30
FA2007	25 mAdc to 50 mAdc	50
FA2008	10 μAdc to 150 μAdc	10
FA2009	150 μAdc to 500 μAdc	10
FA2010	10 μAdc to 150 μAdc	10
FA2011	150 μAdc to 500 μAdc	10
FA2310E/U	10 μA to 1.0 mA	3.0
FA2311E/U	10 μA to 1.0 mA	10
FA2312E/U	1.0 mA to 10 mA	5.0
FA2313E/U	1.0 mA to 10 mA	15
FA2320E/U	10 μA to 1.0 mA	3.0
FA2321E/U	10 μA to 1.0 mA	10
FA2322E/U	1.0 mA to 10 mA	5.0
FA2323E/U	1.0 mA to 10 mA	15
FA2324E/U	10 mA to 100 mA (pulse only)	10
FA2325E/U	10 mA to 100 mA (pulse only)	20
FA2330E/U	10 μA to 1.0 mA	10
FA2331E/U	1.0 mA to 10 mA	15
FA2332E/U	10 mA to 100 mA (pulse only)	20
FA2333E/U	10 μA to 1.0 mA	10
FA2334E/U	1.0 mA to 10 mA	15
FA2335E/U	10 mA to 100 mA (pulse only)	20
FA2360E/U	10 mA to 100 mA (pulse only)	10
FA2361E/U	10 mA to 100 mA (pulse only)	20

Bridges

Type	Forward Current Matching Range	Maximum Forward Voltage Difference Between Diodes (ΔV_F) (mV)
FA3310	10 μA to 1.0 mA	3.0
FA3311	10 μA to 1.0 mA	10
FA3312	1.0 mA to 10 mA	5.0
FA3313	1.0 mA to 10 mA	15
FA3320	10 μA to 1.0 mA	3.0
FA3321	10 μA to 1.0 mA	10
FA3322	1.0 mA to 10 mA	5.0
FA3323	1.0 mA to 10 mA	15

Type	Forward Current Matching Range	Maximum Forward Voltage Difference Between Diodes (ΔV_F) (mV)
FA3324	10 mA to 100 mA (pulse only)	10
FA3325	10 mA to 100 mA (pulse only)	20
FA3330	10 μA to 1.0 mA	10
FA3331	1.0 mA to 10 mA	15
FA3332	10 mA to 100 mA (pulse only)	20
FA3333	10 μA to 1.0 mA	10
FA3334	1.0 mA to 10 mA	15
FA3335	10 mA to 100 mA (pulse only)	20
FA3360	10 mA to 100 mA (pulse only)	10
FA3361	10 mA to 100 mA (pulse only)	20

Matched Quads

Type	Forward Current Matching Range	Maximum Forward Voltage Difference Between Diodes (ΔV_f) (mV)
FA4000	500 μAdc to 2 mAdc	10
FA4001	2 mAdc to 5 mAdc	15
FA4002	5 mAdc to 10 mAdc	20
FA4003	500 μAdc to 2 mAdc	10
FA4004	2 mAdc to 5 mAdc	15
FA4005	5 mAdc to 10 mAdc	20
FA4006	10 mAdc to 25 mAdc	30
FA4007	25 mAdc to 50 mAdc	50
FA4008	10 μAdc to 150 μAdc	10
FA4009	150 μAdc to 500 μAdc	10
FA4010	10 μAdc to 150 μAdc	10
FA4011	150 μAdc to 500 μAdc	10
FA4310E/U	10 μA to 1.0 mA	3.0
FA4311E/U	10 μA to 1.0 mA	10
FA4312E/U	1.0 mA to 10 mA	5.0
FA4313E/U	1.0 mA to 10 mA	15
FA4320E/U	10 μA to 1.0 mA	3.0
FA4321E/U	10 μA to 1.0 mA	10
FA4322E/U	1.0 mA to 10 mA	5.0
FA4323E/U	1.0 mA to 10 mA	15
FA4324E/U	10 mA to 100 mA (pulse only)	10
FA4325E/U	10 mA to 100 mA (pulse only)	20
FA4330E/U	10 μA to 1.0 mA	10
FA4331E/U	1.0 mA to 10 mA	15
FA4332E/U	10 mA to 100 mA (pulse only)	20
FA4333E/U	10 μA to 1.0 mA	10
FA4334E/U	1.0 mA to 10 mA	15
FA4335E/U	10 mA to 100 mA (pulse only)	20
FA4360E/U	10 mA to 100 mA (pulse only)	10
FA4361E/U	10 mA to 100 mA (pulse only)	20

Low Leakage

Type	I_f @ V_f = 1.0 V (mA)	BV (min.) (Volts)	I_R (max.) (nA)	C_O (max.) (pf)	t_{rr} (max.) (μsec)
FD300	200	150	1.0	6.0	—

High Conductance

Type	I_f @ V_f = 1.0 V (mA)	BV (min.) (Volts)	I_R (max.) (nA)	C_O (max.) (pf)	t_{rr} (max.) (nsec)
1N3070*	100	200	100	5.0	50
1N3071	100	200	100	5.0	50
1N3600*	200	75	100	2.5	4.0
FD200	100	200	100	5.0	50
FD600	200	75	100	3.0	4.0

Switching

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N625	4.0 @ 1.5 V	1.0[1]	30
1N626	4.0 @ 1.5 V	1.0[1]	50
1N627	4.0 @ 1.5 V	1.0[1]	100

*MIL device

Fast Switching

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N628	4.0 @ 1.5 V	1.0(1)	150
1N629	4.0 @ 1.5 V	1.0(1)	200
1N934	30.0 @ 1.0 V	1.0(2)	80
FD112	5.0 @ 1.5 V	1.0(3)	40
FD113	5.0 @ 1.5 V	1.0(3)	80
FD212	5.0 @ 1.5 V	1.0(3)	150
FD213	5.0 @ 1.5 V	1.0(3)	200
FD214	100.0 @ 1.5 V	1.0(4)	40
FD215	100.0 @ 1.5 V	1.0(4)	80
FD216	100.0 @ 1.5 V	1.0(4)	150
FD217	100.0 @ 1.5 V	1.0(4)	200
FD218	100.0 @ 1.0 V	1.0(1)	50
FD219	100.0 @ 1.0 V	1.0(1)	100
FD220	100.0 @ 1.0 V	1.0(1)	150
FD221	100.0 @ 1.0 V	1.0(1)	200
FD222	100.0 @ 1.0 V	1.0(5)	150
FD227	6.0 @ 1.5 V	1.0(3)	150
FD228	15.0 @ 1.5 V	1.0(1)	50
FD229	15.0 @ 1.5 V	1.0(1)	150
FD230	6.0 @ 1.5 V	1.0(1)	50
FD231	6.0 @ 1.5 V	1.0(1)	35
FD232	6.0 @ 1.5 V	1.0(1)	100
FD233	6.0 @ 1.5 V	1.0(1)	200
FD234	15.0 @ 1.5 V	1.0(1)	100
FD235	15.0 @ 1.5 V	1.0(6)	200
FD236	15.0 @ 1.5 V	1.0(1)	50
FD266	100.0 @ 1.0 V	1.0(6)	30
FD267	75.0 @ 1.0 V	1.0(7)	100

(1) Recovery to 400 K, switching from 30 mA forward to −35 V (IBμY circuit).
(2) Recovery to 400 K, switching from 30 mA circuit to −20 V (IBμY circuit).
(3) Recovery to 400 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
(4) Recovery to 80 K, switching from 20 mA forward to −40 V (JAN 256 circuit).
(5) Recovery from 1 megohm, switching from 500 mA forward to −50 V.
(6) Recovery to 100 K, switching from 5 mA to −10 K (JAN 256 circuit).
(7) Recovery to 200 K, switching from 5 mA forward to −40 K (JAN 256 circuit).

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N643*	10.0 @ 1.0 V	0.3(1)	200
1N643A	100.0 @ 1.0 V	0.3(1)	200
1N658*	100.0 @ 1.0 V	0.3(2)	120
1N659	6.0 @ 1.0 V	0.3(3)	60
1N659A	6.0 @ 1.0 V	0.3(3)	75
1N660	6.0 @ 1.0 V	0.3(3)	120
1N661	6.0 @ 1.0 V	0.3(3)	240
1N662*	10.0 @ 1.0 V	0.5(4)	100
1N662A	100.0 @ 1.0 V	0.5(4)	100
1N663*	100.0 @ 1.0 V	0.5(1)	100
1N663A	100.0 @ 1.0 V	0.3(1)	100
1N778	10.0 @ 1.0 V	0.3(8)	125
1N779	10.0 @ 1.0 V	0.3(8)	200
1N789	10.0 @ 1.0 V	0.5(1)	30
1N790	10.0 @ 1.0 V	0.25(1)	30
1N791	50.0 @ 1.0 V	0.5(1)	30
1N792	100.0 @ 1.0 V	0.5(4)	30
1N793	10.0 @ 1.0 V	0.5(1)	60
1N794	10.0 @ 1.0 V	0.25(1)	60
1N795	50.0 @ 1.0 V	0.5(1)	60
1N796	100.0 @ 1.0 V	0.5(4)	60
1N797	10.0 @ 1.0 V	0.5(1)	120
1N798	10.0 @ 1.0 V	0.25(1)	120
1N799	50.0 @ 1.0 V	0.5(1)	120
1N800	100.0 @ 1.0 V	0.5(4)	120
1N801	10.0 @ 1.0 V	0.5(1)	150
1N802	50.0 @ 1.0 V	0.5(1)	150
1N803	10.0 @ 1.0 V	0.5(1)	200

*MIL device

Type	Forward Current (Min.)	Reverse Recovery (Max.)	Sat. Voltage (Min.)
	mA	μsec	Volts
1N804	50.0 @ 1.0 V	0.5[1]	200
1N806	4.0 @ 1.0 V	0.3[8]	110
1N807	4.0 @ 1.0 V	0.3[8]	200
1N808	100.0 @ 1.0 V	0.3[5]	110
1N809	100.0 @ 1.0 V	0.3[5]	220
1N811	1.0 @ 1.0 V	0.25[9]	30
1N812	2.0 @ 1.0 V	0.25[9]	40
1N813	5.0 @ 1.0 V	0.25[9]	20
1N814	2.0 @ 1.0 V	0.25[9]	50
1N815	100.0 @ 1.5 V	0.25[9]	20
1N818	30.0 @ 1.5 V	0.5[7]	80
1N837	150.0 @ 1.0 V	0.5[3]	100
1N837A	150.0 @ 1.0 V	0.3[3]	100
1N838	150.0 @ 1.0 V	0.5[3]	150
1N839	150.0 @ 1.0 V	0.5[3]	200
1N840	150.0 @ 1.0 V	0.3[3]	50
1N841	150.0 @ 1.0 V	0.3[3]	150
1N842	150.0 @ 1.0 V	0.3[3]	200
1N843	150.0 @ 1.0 V	0.3[3]	250
1N844	200.0 @ 1.0 V	0.5[3]	100
1N845	200.0 @ 1.0 V	0.5[3]	200
1N891	50.0 @ 1.0 V	0.3[2]	60
1N892	50.0 @ 1.0 V	0.3[2]	120
1N893	50.0 @ 1.0 V	0.3[2]	240
FD241	30.0 @ 1.5 V	0.5[7]	150
FD243	3.0 @ 1.0 V	0.5[10]	30
FD244	5.0 @ 1.0 V	0.3[4]	60
FD245	5.0 @ 1.0 V	0.3[4]	100
FD246	3.0 @ 1.0 V	0.3[4]	200
FD247	4.0 @ 1.0 V	0.3[4]	150
FD248	50.0 @ 1.0 V	0.2[1]	60
FD249	50.0 @ 1.0 V	0.2[1]	120
FD250	50.0 @ 1.0 V	0.2[1]	175
FD251	50.0 @ 1.0 V	0.2[1]	225
FD252	5.0 @ 1.5 V	0.3[8]	80
FD253	5.0 @ 1.5 V	0.8[8]	150
FD254	5.0 @ 1.5 V	0.3[8]	200
FD255	30.0 @ 1.5 V	0.5[7]	200
FD256	100.0 @ 1.5 V	0.5[7]	40
FD257	30.0 @ 1.5 V	0.5[7]	80
FD258	100.0 @ 1.0 V	0.3[1]	150
FD259	10.0 @ 1.0 V	0.3[7]	50
FD260	10.0 @ 1.0 V	0.3[7]	175
FD262	50.0 @ 1.0 V	0.5[4]	60
FD263	50.0 @ 1.0 V	0.5[4]	100
FD264	50.0 @ 1.0 V	0.5[4]	150
FD265	50.0 @ 1.0 V	0.5[4]	200
FD2055			

[1] Recovery to 200 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[2] Recovery to 80 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[3] Recovery to 400 K, switching from 30 mA to −30 V (JAN 256 circuit).
[4] Recovery to 100 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[5] Recovery to 100 K, switching from 30 mA forward to −35 V (JAN 256 circuit).
[6] Recovery to 200 K, switching from 5 mA forward to −10 V (JAN 256 circuit).
[7] Recovery to 80 K, switching from 20 mA forward to −40 V (JAN 256 circuit).
[8] Recovery to 400 K, switching from 5 mA forward to −40 V (JAN 256 circuit).
[9] Recovery to 20 K, switching from 5 mA forward to −10 V (JAN 256 circuit).
[10] Recovery to 100 K, switching from 5 mA forward to −10 V (JAN 256 circuit).

Very Fast Switching

Type	Forward Current (75 mμsec to 150 nsec) (Min.)	Reverse Recovery (75 mμsec to 150 nsec) (Max.)	Breakdown Voltage Sat. (Min.)
	mA	μsec	Volts
1N251*	5.0 @ 1.0 V	0.15[1]	40
1N252	10.0 @ 1.0 V	0.15[2]	30
1N925	5.0 @ 1.0 V	0.15[3]	40
1N926	5.0 @ 1.0 V	0.15[3]	40
1N927	10.0 @ 1.0 V	0.15[3]	65
1N928	10.0 @ 1.0 V	0.15[3]	120

Type	Forward Current (75 mμsec to 150 nsec) (Min.)	Reverse Recovery (75 mμsec to 150 nsec) (Max.)	Breakdown Voltage Sat. (Min.)
	mA	μsec	Volts
FD237	100.0 @ 1.0 V	0.15[1]	30

[1] Recovery to 20 K, switching from 5 mA to −10 V (JAN 256 circuit).
[2] Recovery to 40 K, switching from 5 mA forward to −10 V (JAN 256 circuit).
[3] Recovery to 20 K, switching from 5 mA to −10 V (JAN 256 circuit).

Ultra Fast Switching

Type	Capacitances (Max.)	I_F Forward Current (Min.)	Reverse Recovery (2.0 mμsec to 50 mμsec)	Breakdown Voltage (Min.)
	μμf	mA	Max.—nsec	Volts
1N903	1.0 @ 6.0 V	10.0 @ 1.0 V	4[1]	50
1N903A	1.0 @ 6.0 V	20.0 @ 1.0 V	4[1]	50
1N904	1.0 @ 6.0 V	10.0 @ 1.0 V	4[1]	40
1N904A	1.0 @ 6.0 V	20.0 @ 1.0 V	4[1]	40
1N905	1.0 @ 6.0 V	10.0 @ 1.0 V	4[1]	30
1N905A	1.0 @ 6.0 V	20.0 @ 1.0 V	4[1]	30
1N906	2.5 @ −6.0 V	10.0 @ 1.0 V	4[1]	30
1N906A	2.5 @ −6.0 V	20.0 @ 1.0 V	4[1]	30
1N907	2.5 @ −6.0 V	10.0 @ 1.0 V	4[1]	40
1N907A	2.5 @ −6.0 V	20.0 @ 1.0 V	4[1]	40
1N908	2.5 @ −6.0 V	10.0 @ 1.0 V	4[1]	50
1N908A	2.5 @ −6.0 V	20.0 @ 1.0 V	4[1]	50
1N914*	4.0 @ 0.0 V	10.0 @ 1.0 V	4[2]	100
1N914A	4.0 @ 0.0 V	20.0 @ 1.0 V	4[2]	100
1N914B	4.0 @ 0.0 V	5.0 @ 0.62 V	4[2]	75 V @ 5 mA
1N916	2.0 @ 0.0 V	10.0 @ 1.0 V	4[2]	100
1N916A	2.0 @ 0.0 V	20.0 @ 1.0 V	4[2]	100
FD100	2.0 @ 0.0 V	10.0 @ 1.0 V	2[2]	75
FD101	2.0 @ 0.0 V	20.0 @ 1.0 V	2[2]	75
FD114	—	10.0 @ 1.5 V	4[3]	10
FD115	—	10.0 @ 1.5 V	4[3]	20
FD116	0.8 @ −6.0 V	10.0 @ 1.5 V	4[1]	50
FD117	2.0 @ −6.0 V	20.0 @ 1.0 V	4[1]	50
FD192	1.0 @ 0.0 V	10.0 @ 1.0 V	2[2]	30

Type	Capacitances (Max.)	I_F Forward Current (Min.)	Reverse Recovery (2.0 mμsec to 50 mμsec)	Breakdown Voltage (Min.)
	μμf	mA	Max.—nsec	Volts
FD200	5.0 @ 0.0 V	100.0 @ 1.0 V	50[4]	200
1N3064*	2.0	10.0 @ 1.0 V	4[5]	75

[1] Recovery to 1.0 mA reverse, switching from 10 mA from and to −5.0 V (R_L = 100 ohms).
[2] Recovery to 1.0 mA reverse, switching from 10 mA from and to −6.0 V (R_L = 100 ohms).
[3] Recovery to 3.0 mA reverse, switching from 10 mA forward to −6.0 V (R_L = 120 ohms).
[4] Recovery to 1.0 mA reverse, switching from 30 mA from and to 30 mA reverse (R_L = 150 ohms).
[5] Recovery to 1 mA reverse, switching from 10 mA forward to 10 mA reverse.

Pico Second Computer

Type	I_F @ V_F = 1.0 V (mA)	BV (Min.) (Volts)	I_R (Max.) (nA)	C_O (Max.) (pf)	t_{rr} (Max.) (psec)
FD700	50 @ 1.1 V	30	50	0.75	700

Microwave Varactor Diode

Type	Description	E_{rr} (Min.) (%)	C_O (Max.) (pf)	R_S (Typ.) (Ohms)	F_{CO} (Typ.) (Gc)
MD100	Silicon Planar Epitaxial Varactor Diode	60	3.0	1.25	70

Diode Assemblies in Transistor Packages

MAXIMUM RATINGS (25°C)

V_R	Reverse Voltage	50 V
I_O	Average Rectified Current	200 mA
I_F	Forward Current, DC	300 mA
i_f	Recurrent Peak Forward Current	600 mA
i_f(surge)	1 second pulse width	1 A
i_f(surge)	1 microsecond pulse width	4 A
P	Power Dissipation	500 mW
T_A	Operating Temperature	−65°C to +175°C
T_{stg}	Storage Temperature, Ambient	−65°C to +200°C

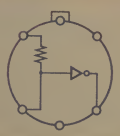
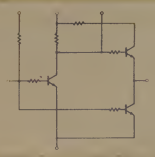
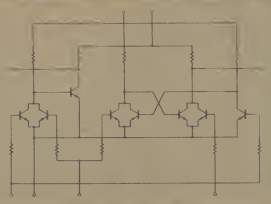
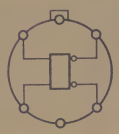
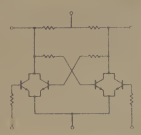
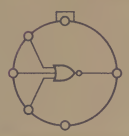
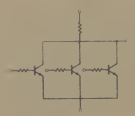
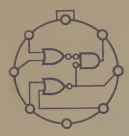
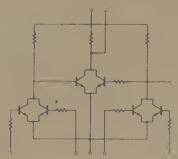
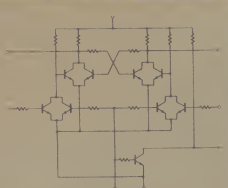
ELECTRICAL SPECIFICATION (25°C UNLESS NOTED)

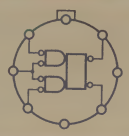
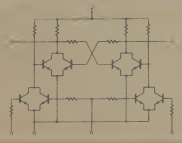
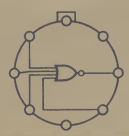
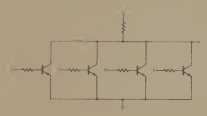
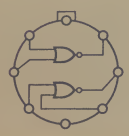
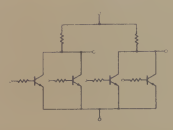
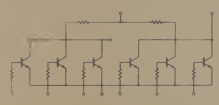
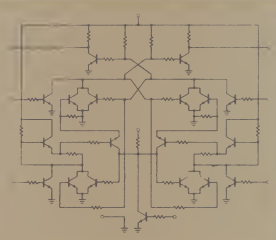
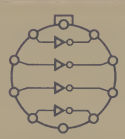
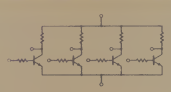
BV(min.)	Breakdown Voltage @ 100 μA(V)	75
I_R(max.)	Reverse Leakage @ V_R(nA)	100
	@ V_R, 150°C(μA)	100
C(Max.)	Capacitance @ OV(pf)	3
V_F(Max.)	Forward Voltage @ 200 mA(V)	1.0
	@ 100 mA(V)	.920
	@ 50 mA(V)	.860
	@ 20 mA(V)	.790
	@ 10 mA(V)	.750
	@ 5 mA(V)	.710
	@ 2 mA(V)	.670
	@ 1 mA(V)	.630
t_{rr}(Max.)	I_F = I_R = 10 mA, Recover to 1 mA (nsec)	4
t_{rr}(Max.)	I_F = I_R = 200 mA, Recover to 20 mA (nsec)	4

COMMON ANODE ASSEMBLIES			FSA1177 FSA1178 FSA1179	FSA1181 FSA1182
COMMON CATHODE ASSEMBLIES	FSA1169 FSA1171 FSA1172	FSA1173 FSA1174 FSA1175	FSA1176 FSA1202	FSA1203 FSA1204
MATRIX ASSEMBLIES			FSA1184 FSA1185 FSA1186	FSA1187 FSA1188 FSA1189
BRIDGE AND TRANSMISSION GATES	FSA1197 FSA1198 FSA1191	FSA1192 FSA1193 FSA1194	FSA1195 FSA1196	FSA1199 FSA1201

Micrologic

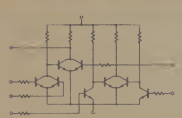
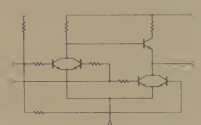
OPERATING TEMPERATURE RANGE: −55°C to +125°C

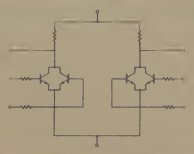
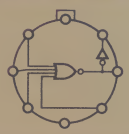
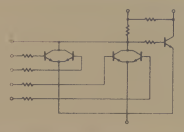
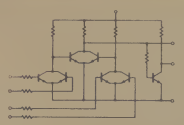
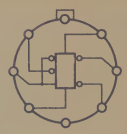
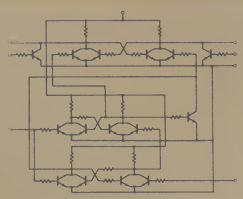
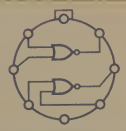
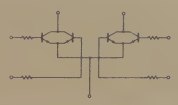
Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-Out	TO-5 Logic Diagram	Circuit Schematic
μL900	Buffer	Low-impedance inverting driver circuit for use as a line driver, in multivibrators, or for pulse differentiation	250 mV	16 nsec	30 mW	25		
μL901	Counter Adapter	Noninverting gating circuit that gives complementary outputs from a single-valued input	250 mV	24 nsec	55 mW	5		
μL902	Flip-Flop	Bistable flip-flop for storage functions	250 mV	14 n sec	22 mW	4		
μL903	Three-Input Gate	Three-input gate for NAND/NOR functions	250 mV	12 nsec	12 mW	5		
μL904	Half-Adder	Two-level AND/OR gate suitable for half-adder, exclusive OR, or other similar logic functions	250 mV	16 nsec	34 mW	5		
μL905	Half-Shift Register	Gated-input storage circuit with inverter	250 mV	18 nsec	53 mW	4		

Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-Out	TO-5 Logic Diagram	Circuit Schematic
μL906	Half-Shift Register	Gated-input storage circuit without inverter (reduces power dissipation)	250 mV	22 nsec	36 mW	4		
μL907	Four-Input Gate	Four-input gate for NAND/NOR functions	250 mV	12 nsec	12 mW	5		
μL914	Dual Two-Input Gate	Dual 2-input gate capable of forming flip-flop, noninverting gate, or gate plus inverter	250 mV	12 nsec	24 mW	5		
μL915	Dual Three-Input Gate	Dual 3-input gate capable of forming flip-flop and noninverting gate functions	250 mV	12 nsec	24 mW	5		
μL926	J-K Flip-Flop	Complete, general purpose storage element with preset and preclear inputs, suitable for shift registers, counters, and control circuitry	250 mV	40 nsec	55 mW	5		
μL927	Quad Inverter	Quad single-input inverter for multi-inversion functions	250 mV	12 nsec	48 mW	5		

Milliwatt Micrologic

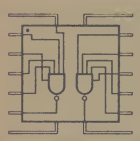
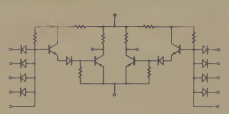
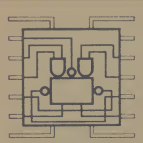
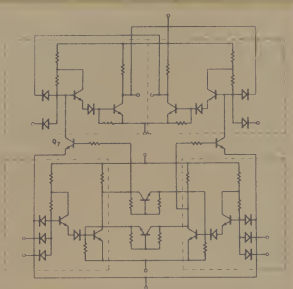
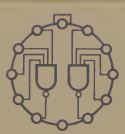
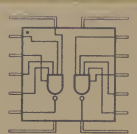
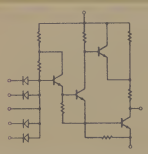
OPERATING TEMPERATURE RANGE: −55°C to +125°C

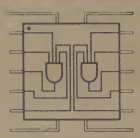
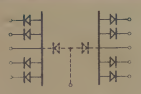
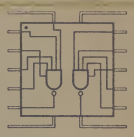
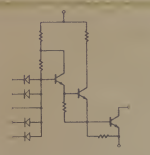
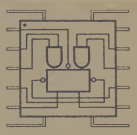
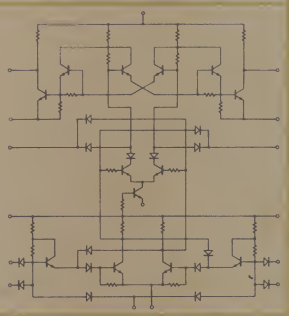
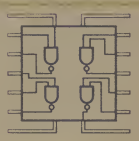
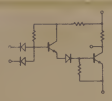
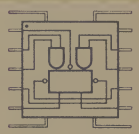
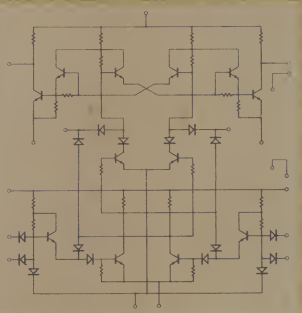
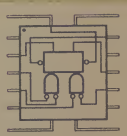
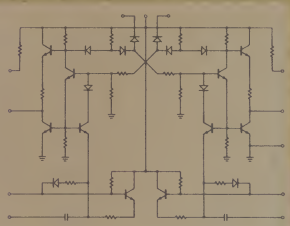
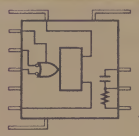
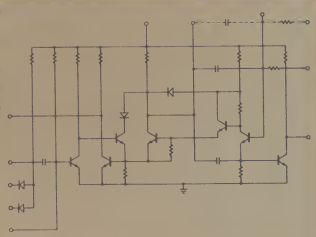
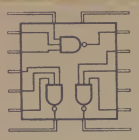
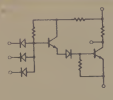
Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-Out	TO-5 Logic Diagram	Circuit Schematic
MWμL908	Adder	Generates Mod 2 addition, exclusive OR function, and used to control two data streams	200 mV	90 nsec	10 mW	4		
MWμL909	Buffer	Two-input, low-impedance, inverting driver circuit. Used as a line driver, in multivibrators, and for pulse differentiation	200 mV	80 nsec	10 mW	30		

Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-Out	TO-5 Logic Diagram	Circuit Schematic
MWμL910	Dual Gate	Dual 2-input gate used as pair of NAND-NOR gates, R-S flip-flop, pair of inverters, or double inverter	200 mV	45 nsec	4 mW	4		
MWμL911	Gate	Four-input gate for OR, NOR, AND or NAND gate functions	200 mV	80 nsec	4 mW	4		
MWμL912	Half Adder	Two-level AND-OR gate with added output inverter for use as complete half adder, exclusive OR gate, or any similar logic function	200 mV	90 nsec	8 mW	4		
MWμL913	Type D Flip-Flop	General purpose, gated storage element suitable for shift registers, counters, and control circuitry	200 mV	100 nsec	12 mW	3		
MWμL921	Gate Expander	Dual 2-input gate without node resistors, used to increase fan-in capability	—	40 nsec	n.a.	n.a. (NO NODE RESISTORS)		

Diode-Transistor Micrologic

OPERATING TEMPERATURE RANGE: −55°C TO +125°C

Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-Out	TO-5 Logic Diagram	Flatpack Logic Diagram	Circuit Schematic
DTμL930	Dual Gate	Dual 4-input gate for high fan-in gating	1 V	25 nsec	5 mW	8			
DTμL931	Flip-Flop	R-S or J-K clock-gated flip-flop for storage functions	0.6 V	50 nsec	20 mW	7			
DTμL932	Dual Buffer	Dual 4-input buffer with an emitter-follower for high-speed, high-capacitance loading	1 V	35 nsec	25 mW	25			 (one side only)

Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-Out	TO-5 Logic Diagram	Flatpack Logic Diagram	Circuit Schematic
DTμL933	Dual-Input Extender	Dual 4-input, high-speed diode array, used to increase fan-in capability	n.a.	n.a.	n.a.	n.a.			
DTμL944	Dual Power Gate	Dual 4-input power gate for use as interface driver, high fan-out gate with ORing capability, and low-power lamp driver	1 V	40 nsec	20 mW	27			 (one side only)
DTμL945	Flip-Flop	R-S or J-K clock-gated flip-flop suitable for ripple-through counters	0.6 V	50 nsec	42 mW	9			
DTμL946	Quad Gate	Quad 2-input gate for inversion, exclusive OR, and fan-in functions	1 V	25 nsec	5 mW	8			 (one gate only)
DTμL948	Flip-Flop	R-S or J-K clock-gated flip-flop for storage and ripple-through counters	0.6 V	40 nsec	48 mW	8			
DTμL950	AC Binary	R-S flip-flop with capacitor-coupled trigger input, cascade output for high-speed drive into capacitive loads	0.6 V	20 nsec	50 mW	10			
DTμL951	Monostable Multivibrator	Two-input monostable multivibrator suitable for variable delay pulse generation, and as stable multivibrator	1 V	25 nsec	35 mW	10			
DTμL962	Triple Gate	Triple 3-input gate for inversion, exclusive OR, and fan-in functions	1 V	25 nsec	5 mW	8			 (one gate only)

LINEAR MICROCIRCUITS

Fairchild offers a versatile line of linear microcircuits that can be used alone or with external adapting elements in a wide range of applications. These standard microcircuits are extremely useful in reducing the cost, complexity, and size of analog equipment. All devices feature single-chip construction, using the patented PLANAR epitaxial process, and all possess the same high reliability as Fairchild Micrologic. They are available in standard TO-5 and flat packages.

μA702A DC AMPLIFIER—The μA702A is a high-gain, wideband DC amplifier with a differential input, single-ended output. Designed to operate over a wide range of supply voltages, it features a low input offset voltage, low thermal drift, and large output swing. The μA702A is useful as an operational amplifier in high-speed analog computers, as a precision instrumentation amplifier, in the formation of special transfer functions, or in other applications requiring a feedback amplifier capable of operation from DC to 30 mc. Typical characteristics at 25°C:

Offset Voltage	2 mV
Voltage Gain	2,800
Thermal Drift	5 μV/°C
Output Swing	±5.5 V
Bandwidth	1.1 mc

μA710 DIFFERENTIAL COMPARATOR—The μA710 is a high-speed, differential voltage comparator designed for applications requiring high accuracy and fast response times. It is useful as a variable-threshold Schmitt trigger, pulse-height discriminator, voltage comparator in high-speed A-D converters, memory sense amplifier, or high-speed line receiver. The output of the comparator is compatible with all integrated logic forms. Typical characteristics at 25°C:

Offset Voltage	3 mV
Response Time	50 nsec
Input Voltage Range	±5 V
Gain	1,500
Output Voltage Swing	+3.5 V to −0.5 V

CUSTOM MICROCIRCUITS

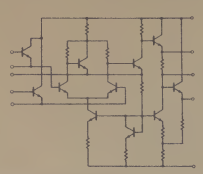
Fairchild's capability in producing special microcircuits to customer specifications is a natural outgrowth of its success in producing high reliability off-the-shelf PLANAR Micrologic elements. Customers who choose to incorporate their own digital or linear design into an integrated microcircuit can first experiment using custom design components from Fairchild. These special parts are breadboarded as discrete components to form a functional prototype of the microcircuit, prior to a production commitment. Using these discrete parts a designer has an almost infinite number of combinations to investigate.

After performance is proven and the schematic is accepted, Fairchild will design diffusion masks and special test equipment for the custom circuit, and then proceed with volume production. The circuit elements are diffused into a single chip of silicon using the patented PLANAR process and intraconnected using a patented evaporated Metal-Over-Oxide process in exactly the same manner used to produce standard expitaxial Micrologic elements. Custom hybrid devices are also available. Delivery is within 90 days following acceptance of the schematic. Under special circumstances, delivery time can be shortened to 35 days. The finished microcircuit product possesses the same reliability proven in over 77 million hours of operating life tests on Fairchild Micrologic units. The following are examples of custom microcircuits.

Hybrid Circuits

SH2000 OPERATIONAL AMPLIFIER. The SH2000 is a high-gain, wideband DC operational amplifier featuring a high-input impedance, and a hybrid construction in which a transistor is placed at each input terminal of the amplifier. The SH2000 is suitable for use in high-speed analog computers, in precision instrumentation, in the formation of special transfer functions, and in other applications requiring a feedback amplifier capable of operation from DC to 30 mc. Typical characteristics at 25°C:

Input Offset	6 mV
Input Bias Current	100 nA
Input Impedance	2 megohms
Open-loop Gain	1,800
Open-loop Bandwidth	1.1 mc

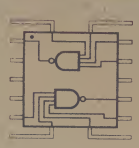


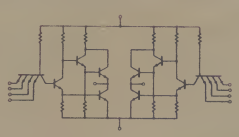
Diodes

Monolithic Circuits

103 TTL GATE

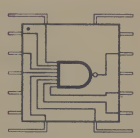
Power Dissipation	22 mW
Noise Immunity	400 mV
Fan-Out	10
Propagation Delay	25 ns

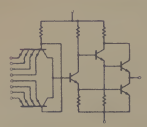




104 TTL GATE

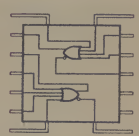
Power Dissipation	22 mW
Noise Immunity	400 mV
Fan-Out	10
Propagation Delay	25 ns

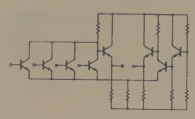




116 CML DUAL GATE

Power Dissipation	110 mW
Fan-Out	7
Propagation Delay	4 nsec

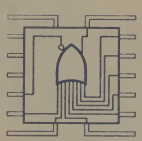


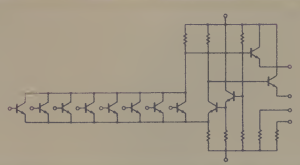


(one gate only)

117 CML DUAL GATE

Power Dissipation	125 mW
Fan-Out	7
Propagation Delay	4 nsec



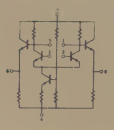


118 FET ANALOG SWITCH

Ron	500 Ω
tpd_{AVG}	500 ns

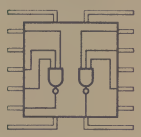
120 DIFFERENTIAL AMPLIFIER

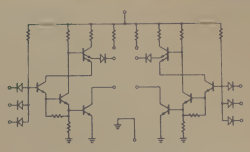
Voltage Gain	130
Input Impedance	2.5 KΩ
Bandwidth	900 kc
Output Impedance	500 Ω



121 LOW POWER DTL GATE

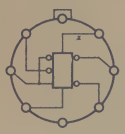
Power Dissipation	2 mW
Noise Immunity	300 mV
Fan-Out	5
Propagation Delay	50 ns

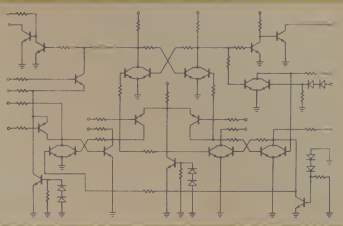




130 DTL DELAY FLIP-FLOP

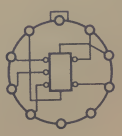
Power Dissipation	100 mW
Noise Immunity	350 mV
Fan-Out	40
Propagation Delay	80 ns

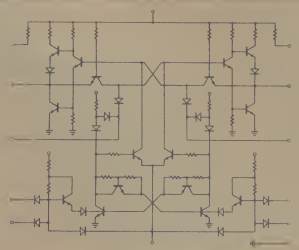




131 DTL LOW POWER BINARY

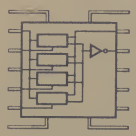
Power Dissipation	6 mW
Noise Immunity	350 mV
Fan-Out	8
Propagation Delay	120 ns

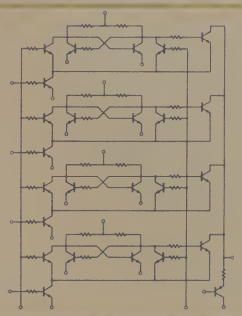




134 RTL ACTIVE MEMORY

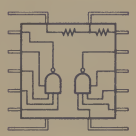
Power Dissipation	40 mW
Noise Immunity	100 mV
Fan-Out	5
Propagation Delay	30 ns

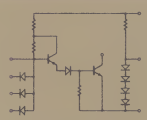




136 DTL HIGH SPEED GATE

Power Dissipation	40 mW
Noise Immunity	400 mV
Fan-Out	10
Propagation Delay	16 ns

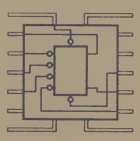


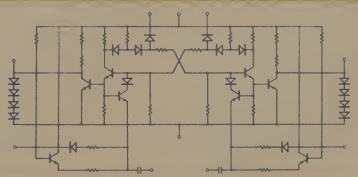


(one gate only)

138 DTL AC FLIP-FLOP

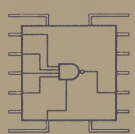
Power Dissipation	16 mW
Noise Immunity	400 mV
Fan-Out	10
Propagation Delay	50 ns

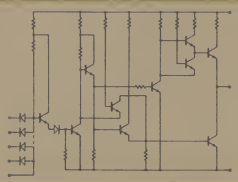




141 DTL LINE DRIVER

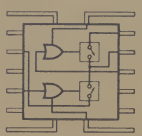
Power Dissipation	50 mW
Noise Immunity	400 mV
Fan-Out	40
Propagation Delay	50 ns

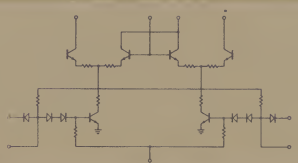




115 ANALOG GATE

Switching Time	150 msec
Transfer Offset	±25 mV





Transistors

General Purpose Types

Part No.	Description	Package	f_T (min.)	Power Diss. Pc @ 25°C	Power Diss. Pa @ 25°C	h_{FE} Min.	h_{FE} Max.	h_{FE} I_C	h_{FE} V_{CE}	Maximum Voltages V_{CEO}	Maximum Voltages V_{CBO}	Maximum Voltages V_{EBO}	C_{ob} I_E	C_{ob} V_{CB}	C_{ob} Max.	V_{CE} SAT I_C	V_{CE} SAT I_B	V_{CE} SAT Max.	V_{BE} SAT I_C	V_{BE} SAT I_B	V_{BE} SAT Max.	I_{CBO} Max. @25°C
2N3567	NPN For Amplifier and Switching Applications	EPOXY TO-5	60 mc	0.8 Watt	0.3 Watt	40	120	150 mA	1.0 V	40 V	80 V	5.0 V	0	10 V	20 pf	150 mA	15 mA	0.25 V	150 mA	15 mA	1.1 V	50 nA
2N3568	NPN For Amplifier and Switching Applications	EPOXY TO-5	60 mc	0.8 Watt	0.3 Watt	40	120	150 mA	1.0 V	60 V	80 V	5.0 V	0	10 V	20 pf	150 mA	15 mA	0.25 V	150 mA	15 mA	1.1 V	50 nA
2N3569	NPN For Amplifier and Switching Applications	EPOXY TO-5	60 mc	0.8 Watt	0.3 Watt	100	300	150 mA	1.0 V	40 V	80 V	5.0 V	0	10 V	20 pf	150 mA	15 mA	0.25 V	150 mA	15 mA	1.1 V	50 nA
2N3641	NPN Class-C RF Amplifier or High Current Switch	EPOXY TO-5	250 mc	0.7 Watt	0.35 Watt	40	120	150 mA	10 V	30 V	60 V	5.0 V	0	10 V	8.0 pf	150 mA	15 mA	0.22 V	—	—	—	—
2N3642	NPN Class-C RF Amplifier or High Current Switch	EPOXY TO-5	250 mc	0.7 Watt	0.35 Watt	40	120	150 mA	10 V	45 V	60 V	5.0 V	0	10 V	8.0 pf	150 mA	15 mA	0.22 V	—	—	—	—
2N3643	NPN Class-C RF Amplifier or High Current Switch	EPOXY TO-5	250 mc	0.7 Watt	0.35 Watt	100	300	150 mA	10 V	30 V	60 V	5.0 V	0	10 V	8.0 pf	150 mA	15 mA	0.22 V	—	—	—	—

Switches

Part No.	Description	Package	f_T (typ.)	Power Diss. Pc @ 25°C	Power Diss. Pa @ 25°C	h_{FE} Min.	h_{FE} Max.	h_{FE} I_C	h_{FE} V_{CE}	Maximum Voltages V_{CEO}	Maximum Voltages V_{CBO}	Maximum Voltages V_{EBO}	V_{BE} SAT I_C	V_{BE} SAT I_B	V_{BE} SAT Max.	V_{CE} SAT I_C	V_{CE} SAT I_B	V_{CE} SAT Max.
2N3009	NPN For memory applications to 500 mA	TO-52	550 mc	1.2 Watts	0.66 Watt	30	120	30 mA	0.4 V	15 V	40 V	4.0 V	30 mA	3.0 mA	0.95 V	30 mA	3.0 mA	0.18 V
2N3010	NPN For high speed saturated switching	TO-18	800 mc	—	0.3 Watt	25	125	10 mA	0.4 V	6.0 V	15 V	4.0 V	1.0 mA	0.1 mA	0.85 V	1.0 mA	0.1 mA	0.25 V
2N3011	NPN For high speed saturated switching in the 50-100 mc range	TO-18 or TO-52	650 mc	1.2 Watts	0.36 Watt	30	120	10 mA	0.35 V	12 V	30 V	5.0 V	10 mA	1.0 mA	0.87 V	10 mA	1.0 mA	0.2 V
2N3012	PNP For saturated and non-saturated switching	TO-18	550 mc	1.2 Watts	0.36 Watt	30	120	30 mA	−0.5 V	−12 V	−12 V	−4.0 V	10 mA	1.0 mA	−0.98 V	10 mA	1.0 mA	−0.15 V
2N3015	NPN For high speed switching	TO-5	330 mc	3.0 Watts	0.8 Watt	30	120	150 mA	10 V	30 V	60 V	5.0 V	150 mA	15 mA	0.4 V	150 mA	15 mA	1.2 V
2N3426	NPN For very high speed switchingat high currents	low profile TO-5	650 mc	3.0 Watts	0.6 Watt	30	120	300 mA	—	12 V	25 V	4.0 V	10 mA	1.0 mA	0.78 V	10 mA	1.0 mA	0.25 V
2N3638	PNP High Current Switches	EPOXY TO-5	150 mc	0.7 Watt	0.3 Watt	30	130	50 mA	−1.0 V	−25 V	−25 V	−4.0 V	50 mA	2.5 mA	−1.1 V	50 mA	2.5 mA	−0.25 V
2N3638A			200 mc	0.7 Watt	0.3 Watt	100	—	50 mA	−1.0 V	−25 V	−25 V	−4.0 V	50 mA	2.5 mA	−1.1 V	300 mA	30 mA	−1.0 V
2N3639	PNP Very high speed logic switch	EPOXY TO-18	600 mc	0.5 Watt	—	30	120	10 mA	−0.3 V	−6.0 V	−6.0 V	−4.0 V	10 mA	0.5 mA	−0.95 V	10 m.	0.5 mA	−0.25 V
2N3640	PNP Very high speed logic switch	EPOXY TO-18	600 mc	0.5 Watt	—	30	120	10 mA	−0.3 V	−12 V	−12 V	−4.0 V	10 mA	0.5 mA	−0.95 V	10 mA	0.5 mA	−0.15 V
2N3646	NPN High speed saturated switch—to 500 mA	EPOXY TO-18	550 mc	0.5 Watt	0.2 Watt	30	120	30 mA	0.4 V	15 V	40 V	5.0 V	30 mA	3.0 mA	0.95 V	30 mA	3.0 mA	0.2 V

Amplifiers

Part No.	Description	Package	f_T (typ.)	Power Diss. Pc @ 25°C	Power Diss. Pa @ 25°C	h_{FE} Min.	h_{FE} Max.	h_{FE} I_C	Maximum Voltages V_{CE}	V_{CEO}	V_{CBO}	V_{EBO}	C_{ob} I_E	V_{CB}	C_{ob} Max.	V_{CE} SAT I_C	I_B	V_{CE} SAT Max.	I_{CBO} Max. @25°C
2N3563	NPN For Low Level RF Applications	EPOXY TO-18	900 mc	0.5 Watt	0.2 Watt	20	200	8.0 mA	10 V	12 V	30 V	2.0 V	0	10 V	1.7 pf	10 mA	1.0 mA	0.1 V (typ.)	50 nA
2N3564	NPN For Low Power, Small Signal RG & IF Applications	EPOXY TO-18	750 mc	0.5 Watt	0.2 Watt	20	70 (typ.)	15 mA	10 V	15 V	30 V	4.0 V	0	10 V	3.5 pf	20 mA	2.0 mA	0.3 V	50 nA
2N3565	NPN For High Gain Applications	EPOXY TO-18	40 mc (min.)	0.5 Watt	0.2 Watt	150	600	1.0 mA	10 V	25 V	30 V	6.0 V	0	5.0 V	4.0 pf	1.0 mA	0.1 mA	0.35 V	50 nA
2N3566	NPN For Very High Gain Applications	EPOXY TO-5	40 mc (min.)	0.8 Watt	0.3 Watt	150	600	10 mA	10 V	30 V	40 V	5.0 V	0	10 V	25 pf	100 mA	10 mA	1.0 V	50 nA
2N3688(38)	NPN for RF Applications	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	—	4 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	50 nA
2N3689(38)	NPN for RF Applications	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	—	4 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	50 nA
2N3690(39)	NPN for RF Applications	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	—	4 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	50 nA
2N3691	NPN for General Purpose	EPOXY TO-18	200 mc	0.5 Watt	0.2 Watt	40	160	10 mA	1 V	25 V	35 V	4.0 V	0	10 V	6.0 pf	10 mA	1.0 mA	0.7 V	50 nA
2N3692	NPN for General Purpose	EPOXY TO-18	200 mc	0.5 Watt	0.2 Watt	100	400	10 mA	1 V	25 V	35 V	4.0 V	0	10 V	6.0 pf	10 mA	1.0 mA	0.7 V	50 nA
2N3693	NPN Power Gain for AM/FM receivers	EPOXY TO-18	350 mc	0.5 Watt	0.2 Watt	40	160	10 mA	10 V	45 V	45 V	4.0 V	0	10 V	3.5 pf	—	—	—	50 nA
2N3694	NPN Power Gain for AM/FM receivers	EPOXY TO-18	350 mc	0.5 Watt	0.2 Watt	100	400	10 mA	10 V	45 V	45 V	4.0 V	0	10 V	3.5 pf	—	—	—	50 nA

Diodes

Computer Types

Part No.	Description	Package	Reverse Recovery Time Max.	I_F	I_R	R_L	Power Diss.	Capacitance Max.	VR	f	Breakdown Voltage Min.	IR	Reverse Current Max.	VR	Temp.	Forward Voltage Drop Max.	I_F
FD 111	Ultra Fast Type	DO-7 Glass	5 nsec	10 mA	10 mA	100 Ω	250 mW	2.5 pf	0 V	1 mc	75 V	5 μA	100 nA 6 μA	−55 V −55 V	25°C 100°C	1.0 V	10 mA
FD 222	High Speed, High Conductance	DO-7 Glass	60 nsec	10 mA	10 mA	100 Ω	500 mW	6.0 pf	0 V	1 mc	150 V	5 μA	50 nA 10 μA	−100 V −100 V	25°C 100°C	1.05 V	100 mA
FD 333	High Conductance, Low Leakage	DO-7 Glass	—	—	—	—	500 mW	10 pf	0 V	1 mc	150 V	5 μA	3 nA 500 nA	−125 V −125 V	25°C 100°C	1.05 V	200 mA
FD 6666	Ultra Fast, High Conductance	DO-7 Glass	5 nsec	10 mA	10 mA	100 Ω	500 mW	5.0 pf	0 V	1 mc	75 V	5 μA	100 nA 20 μA	−55 V −55 V	25°C 100°C	.75 V	10 mA
FD 777	Pico-Second Computer	DO-7 Glass	750 psec	10 mA	10 mA	100 Ω	250 mW	1.3 pf	0 V	1 mc	15 V	5 μA	100 nA 50 μA	8 V 8 V	25°C 100°C	1.35 V	50 mA

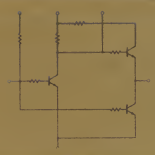
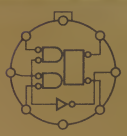
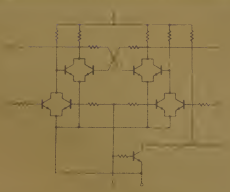
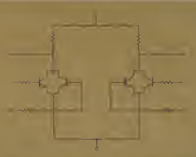
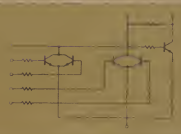
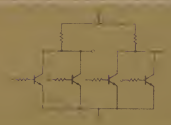
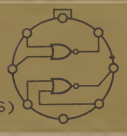
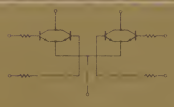
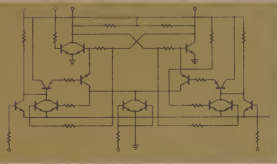
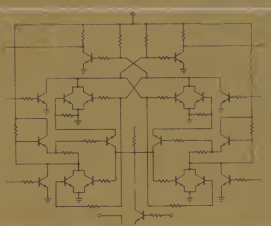
Epoxy Encapsulated

Type	Description	Capacitances (Max.)	If Forward Current (Min.)	t_{rr} Reverse Recovery (Max.)	Breakdown Voltage (Min.)
FDM1000	Low capacitance, fast recovery PLANAR diode	2.0 μμf	115 mA	4.0 mμ sec (note 1)	75 V
FDM6000	Low capacitance, high conductance fast-recovery PLANAR/epitaxial diode	2.5 μμf	200 mA	4.0 mμ sec (note 2)	75 V

NOTES: Packages are elipsoidal, nominal 0.105 x 0.065 with 0.020 diam. axial leads.
(1) recovery to 1.0 mA
(2) recovery to 0.1 I_F
(3) Power dissipation (both units) 200 mW @ 25°C
(4) Operating temperature (both units) − 65°C to + 100°C

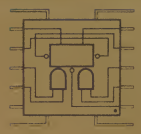
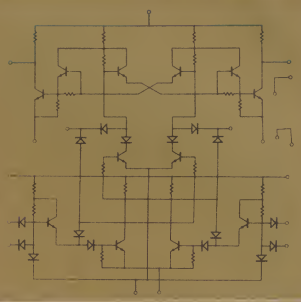
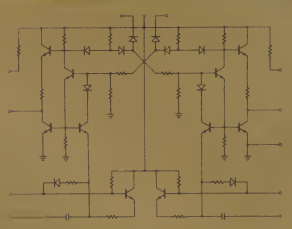
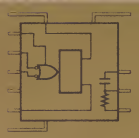
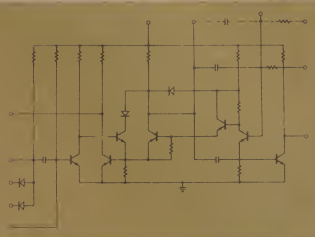
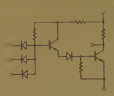
Resistor-Transistor Logic

OPERATING TEMPERATURE RANGE: +15°C to +55°C; 3.6 V ± 10% V_{CC}

Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-In Load	Fan-Out	Logic Symbol	Circuit Schematic
FμL 90029	Buffer	Low Impedance inverting driver circuit for use as a line driver in multivibrators, or for pulse differentiation	300 mV	15 nsec	30 mW	6	80		
FμL 90329	Three-Input Gate	Three-Input NAND/NOR Circuit	300 mV	10 nsec	20 mW	3	16		
FμL 90529	Half-Shift Register	Gated-Input Storage Element with Inverter	300 mV	20 nsec	80 mW	3, 9	13		
FμL 91029	Dual Two-Input Gate	Used as a pair of NOR, NAND Gates, R-S Flip-Flop, Pair of Inverters	300 mV	25 nsec	6 mW	1	4		
FμL 91129	Four-Input Gate	Used as an OR, NOR, AND, or NAND Gate	300 mV	25 nsec	6 mW	1	4		
FμL 91429	Dual Two-Input Gate	Dual NAND/NOR Gates capable of forming Flip-Flop, Noninverting Gate	300 mV	10 nsec	40 mW	3	16		
FμL 91529	Dual Three-Input Gate	A Dual Combination of Three-Input NAND/NOR Gates	300 mV	10 nsec	40 mW	3	16		
FμL 92129	Gate Expander	Dual Two-Input Gate without NODE Resistors, used to increase Fan-In capability for 91029 and 91129.	300 mV	25 nsec	NA	1	NA		
					(NO NODE RESISTORS)				
FμL 92329	J-K Flip-Flop	Complete general purpose storage element for use in shift registers, counters, or any type control function	300 mV	40 nsec	54 mW	3, 5	10		
FμL 92328	J-K Flip-Flop Epoxy		300 mV	40 nsec	54 mW	3, 5	8		
FμL 92629	J-K Flip-Flop	Complete general purpose, storage element with preset and preclear inputs, suitable for use in shift registers, counters, or any type of control function	300 mV	≈ 40 nsec	55 mW	3, 5	16		

NPN General Purpose Types

		JEDEC Outline		f_T Typical	P_d @ 25°C Ambient	Beta Ranges h_{FE} @ Conditions				Maximum Voltages			V_{BE} SAT Conditions			V_{CE} SAT Conditions			I_{CBO}[5] Maximum	
						Min.	Max.	I_C	V_{CE}	V_{CER}[3]	V_{CBO}	V_{EBO}	Max.	I_C	I_B	Max.	I_C	I_B	@ 25°C	@ 150°C
Type	Description	TO-5	TO-18	mC	Watts			mA	Volts	Volts	Volts	Volts	Volts	mA	mA	Volts	mA	mA		
2N497	For medium power, fast switching applications	X		50	0.8	12	36	200	10	60[4]	60	8	—	—	—	5	200	40	—	10 μA[8]
2N498	For medium power, fast switching applications	X		50	0.8	12	36	200	10	100[4]	100	8	—	—	—	5	200	40	—	10 μA[8]
2N656*	For medium power, fast switching applications	X		70	0.8	30	90	200	10	60[4]	60	8	1.1	200	40	5	200	40	10 μA[9]	—
2N657*	For medium power, fast switching applications	X		70	0.8	30	90	200	10	100[4]	100	8	1.1	200	40	5	200	40	10 μA[9]	—
2N696*	For RF and DC switching applications	X		60	0.6	20 40	60 120	150 150	10 10	40	60	5	1.3	150	15	1.5	150	15	1 μA	100 μA

Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Fan-Out	TO-5 Logic Diagram	Flatpack Logic Diagram	Circuit Schematic
FμL94829	Flip-Flop	R-S or J-K clock-gated flip-flop for storage and ripple-through counters	0.6 V	40 nsec	48 mW	8			
FμL95029	AC Binary	R-S flip-flop with capacitor-coupled trigger input, cascade output for high-speed drive into capacitive loads	0.6 V	20 nsec	50 mW	10			
FμL95129	Monostable Multivibrator	Two-input monostable multivibrator suitable for variable delay pulse generation, and as stable multivibrator	1 V	25 nsec	35 mW	10			
FμL96229	Triple Gate	Triple 3-input gate for inversion, exclusive OR, and fan-in functions	1 V	25 nsec	5 mW	8		 (one gate only)	

Linear

μA702C DC AMPLIFIER—The μA702C is a high-gain, wideband DC amplifier with a differential input, single-ended output. Designed to operate over a wide range of supply voltages, it features a low input offset voltage, low thermal drift, and large output swing. The μA702C is useful as an operational amplifier in high-speed analog computers, as a precision instrumentation amplifier, in the formation of special transfer functions, or in other applications requiring a feedback amplifier capable of operation from DC to 10 mc. Typical characteristics at 25°C:

Offset Voltage	2 mV
Voltage Gain	2,800
Thermal Drift	5 μV/°C
Output Swing	±5.5 V
Bandwidth	1.1 mc

μA710C DIFFERENTIAL COMPARATOR—The μA710C is a high-speed, differential voltage comparator designed for applications requiring high accuracy and fast response times. It is useful as a variable-threshold Schmitt trigger, pulse-height discriminator, voltage comparator in high-speed A-D comparators, memory sense amplifier, or high noise immunity line receiver. The output of the comparator is compatible with all integrated logic forms. Typical characteristics at 25°C:

Offset Voltage	3 mV
Response Time	50 nsec
Input Voltage Range	±5 V
Gain	1,500
Output Voltage Swing	+3.5 V to −0.5 V

Hybrid

NIXIE®—Registered Trade Mark Burroughs Corp.

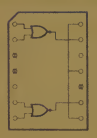
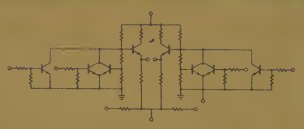
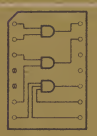
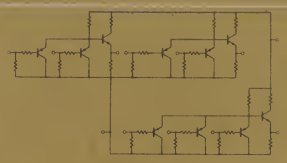
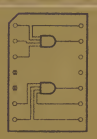
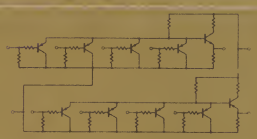
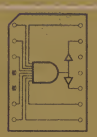
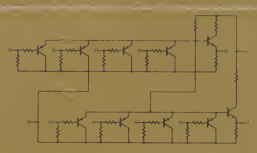
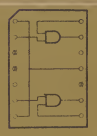
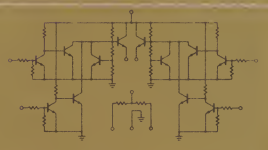
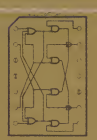
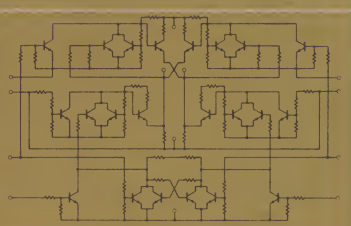
SH0062 HIGH-VOLTAGE DRIVER—Four-input gate driving a high-voltage transistor. Compatible with FμL elements. Useful as NIXIE® and neon tube driver and for other high-voltage, low-current applications. Operating temperature range is 15°C to 55°C.

Noise Immunity (typ., 25 C)	250 mV
Propagation Delay (typ., 25 C)	15 nsec
Power Dissipation (typ., 25 C)	20 mW
Max. Output Voltage	100 V

COMMERCIAL COMPUTER MICROCIRCUITS

Complementary Transistor Logic

OPERATING TEMPERATURE RANGE: +15°C to +55°C

Part No.	Element Type	Description	Noise Immunity (Typ., 25°C)	Propagation Delay (Typ., 25°C)	Power Dissipation (Typ., 25°C)	Maximum Fan-Out	Logic Symbol	Circuit Schematic
CTμL 952	Dual Inverter Gate	Dual 2-input inverter gate for voltage level setting and logic inversion	0.5 V	12 nsec	55 mW	12		
CTμL 953	Triple AND Gate	Dual 2-input, single 3-input AND gate, OR by tying outputs together	0.5 V	5 nsec	55 mW	15		
CTμL 954	Dual AND Gate	Dual 4-input AND Gate, OR by tying outputs together	0.5 V	5 nsec	55 mW	15		
CTμL 955	Single AND Gate	Single 8-input AND gate with 2 outputs, useful for isolating output logic signal, OR by tying outputs together	0.5 V	5 nsec	55 mW	15		
CTμL 956	Dual Buffer	Dual 2-input, noninverting level setting circuit used to drive high fanout loads and as linedriver	0.5 V	15 nsec	150 mW	25		
CTμL 957	Dual-Rank Flip-Flop	Multipurpose, direct-coupled, dual-rank flip-flop suitable for counters, registers, and other storage applications	0.5 V	20 nsec	200 mW	9		

Transistors

General Purpose

Part No.	Description	Package	f_T(Min.)	Power Diss. Pc @25°C	Power Diss. Pa @25°C	h_{FE} Min.	h_{FE} Max.	h_{FE} I_C	h_{FE} V_{CE}	Maximum Voltages V_{CEO}	Maximum Voltages V_{CBO}	Maximum Voltages V_{EBO}	C_{ob} I_E	C_{ob} V_{CB}	C_{ob} Max.	V_{CE} SAT I_C	V_{CE} SAT I_B	V_{CE} SAT Max.	V_{BE} SAT I_C	V_{BE} SAT I_B	V_{BE} SAT Max.	I_{CBO} (Max.) @ 25°C
2N3567	NPN Amplifier	EPOXY TO-5	60 mc	0.8 Watt	0.3 Watt	40	120	150 mA	1.0 V	40 V	80 V	5.0 V	0	10 V	20 pf	150 mA	15 mA	0.25 V	150 mA	15 mA	1.1 V	50 nA
2N3568	NPN Amplifier	EPOXY TO-5	60 mc	0.8 Watt	0.3 Watt	40	120	150 mA	1.0 V	60 V	80 V	5.0 V	0	10 V	20 pf	150 mA	15 mA	0.25 V	150 mA	15 mA	1.1 V	50 nA
2N3569	NPN Amplifier	EPOXY TO-5	60 mc	0.8 Watt	0.3 Watt	100	300	150 mA	1.0 V	40 V	80 V	5.0 V	0	10 V	20 pf	150 mA	15 mA	0.25 V	150 mA	15 mA	1.1 V	50 nA
2N3638	PNP High Current Switches	EPOXY TO-5	150 mc	0.7 Watt	0.3 Watt	30	130	50 mA	−1.0 V	−25 V	−25 V	−4.0 V	—	—	—	50 mA	2.5 mA	−0.25 V	50 mA	2.5 mA	−1.1 V	—
2N3638A			200 mc	0.7 Watt	0.3 Watt	100	—	50 mA	−1.0 V	−25 V	−25 V	−4.0 V	—	—	—	300 mA	30 mA	−1.0 V	50 mA	2.5 mA	−1.1 V	—
2N3641	NPN Class-C RF Amplifier	EPOXY TO-5	250 mc	0.7 Watt	0.35 Watt	40	120	150 mA	10 V	30 V	60 V	5.0 V	0	10 V	8.0 pf	150 mA	15 mA	0.22 V	—	—	—	—
2N3642	NPN Class-C RF Amplifier	EPOXY TO-5	250 mc	0.7 Watt	0.35 Watt	40	120	150 mA	10 V	45 V	60 V	5.0 V	0	10 V	8.0 pf	150 mA	15 mA	0.22 V	—	—	—	—
2N3643	NPN Class-C RF Amplifier	EPOXY TO-5	250 mc	0.7 Watt	0.35 Watt	100	300	150 mA	10 V	30 V	60 V	5.0 V	0	10 V	8.0 pf	150 mA	15 mA	0.22 V	—	—	—	—
2N3691	NPN Audio-Video Amps, Sync Circuits	EPOXY TO-18	200 mc	0.5 Watt	0.2 Watt	40	160	10 mA	1.0 V	25 V	35 V	4.0 V	0	10 V	6.0 pf	10 mA	1.0 mA	0.7 V	10 mA	1.0 mA	0.9 V	50 nA
2N3692	NPN Audio-Video Amps, Sync Circuits	EPOXY TO-18	200 mc	0.5 Watt	0.2 Watt	100	400	10 mA	1.0 V	25 V	35 V	4.0 V	0	10 V	6.0 pf	10 mA	1.0 mA	0.7 V	10 mA	1.0 mA	0.9 V	50 nA

Amplifiers

Part No.	Description	Package	f_T (typ.)	Power Diss. Pc @ 25°C	Power Diss. Pa @ 25°C	h_{FE} Min.	h_{FE} Max.	h_{FE} I_C	Maximum Voltages V_{CE}	Maximum Voltages V_{CEO}	Maximum Voltages V_{CBO}	Maximum Voltages V_{EBO}	C_{ob} I_E	C_{ob} V_{CB}	C_{ob} Max.	V_{CE} SAT I_C	V_{CE} SAT I_B	V_{CE} SAT Max.	I_{CBO} (Max.) @ 25°C
2N3563	NPN for low level RF applications	EPOXY TO-18	900 mc	0.5 Watt	0.2 Watt	20	200	8.0 mA	10 V	12 V	30 V	2.0 V	0	10 V	1.7 pf	10 mA	1.0 mA	0.1 V (typ.)	50 nA
2N3564	NPN for low power, small signal RF & IF Applications	EPOXY TO-18	750 mc	0.5 Watt	0.2 Watt	20	70 (typ.)	15 mA	10 V	15 V	30 V	4.0 V	0	10 V	3.5 pf	20 mA	2.0 mA	0.3 V	50 nA
2N3565	NPN for high gain Applications	EPOXY TO-18	100 mc	0.5 Watt	0.2 Watt	150	600	1.0 mA	10 V	25 V	30 V	6.0 V	0	5.0 V	4.0 pf	1.0 mA	0.1 mA	0.35 V	50 nA
2N3566	NPN for very high gain Applications	EPOXY TO-5	100 mc	0.8 Watt	0.3 Watt	150	600	10 mA	10 V	30 V	40 V	5.0 V	0	10 V	25 pf	100 mA	10 mA	1.0 V	50 nA
2N3688*	NPN RF-AGC type	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	70 (typ.)	4.0 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	50 nA
2N3689*	NPN RF-AGC type	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	70 (typ.)	4.0 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	50 nA
2N3690*	NPN RF-AGC type	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	70 (typ.)	4.0 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	50 nA
2N3693	NPN AM/FM receiver type	EPOXY TO-18	350 mc	0.5 Watt	0.2 Watt	40	160	10 mA	10 V	45 V	45 V	4.0 V	0	10 V	3.5 pf	10 mA	1 mA	2 V	50 nA
2N3694	NPN AM/FM receiver type	EPOXY TO-18	350 mc	0.5 Watt	0.2 Watt	100	400	10 mA	10 V	45 V	45 V	4.0 V	0	10 V	3.5 pf	10 mA	1 mA	2 V	50 nA

*Note: AGC_1 (f = 45 mc): 2N3688—Min 8.0 mA, Max 10.5 mA
2N3689—Min 9.5 mA, Max 12.0 mA 45 mc P_G is 29 db min.
AGC_2 (f=200 mc): 2N3690—Min 9.0 mA, Max 14.0 mA

Entertainment Types

Part No.	Description	Package	(typ.) f_T	Power Diss. Pc @ 25°C	Power Diss. Pa @ 25°C	h_{FE} Min.	h_{FE} Max.	h_{FE} I_C	h_{FE} V_{CE}	Maximum Voltage V_{CEO}	Maximum Voltage V_{CBO}	Maximum Voltage V_{EBO}	C_{ob} I_E	C_{ob} V_{CB}	C_{ob} Max.	V_{CE} SAT I_C	V_{CE} SAT I_B	V_{CE} SAT Max.	V_{BE} SAT I_C	V_{BE} SAT I_B	V_{BE} SAT Max.	I_{CBO} (Max.) @ 25°C
SE1001	NPN AM/FM Receiver Type	EPOXY TO-18	350 mc	0.5 Watt	0.2 Watt	40	160	10 mA	10 V	45 V	45 V	4.0 V	0	10 V	3.5 pf	10 mA	1 mA	2 V	10 mA	1 mA	0.9 V	50 nA
SE1002	NPN AM/FM Receiver Type	EPOXY TO-18	350 mc	0.5 Watt	0.2 Watt	100	400	10 mA	10 V	45 V	45 V	4.0 V	0	10 V	3.5 pf	10 mA	1 mA	2 V	10 mA	1 mA	0.9 V	50 nA

Part No.	Description	Package	(typ.) f_T	Power Diss. Pc @ 25°C	Power Diss. Pa @ 25°C	h_{FE} Min.	h_{FE} Max.	h_{FE} I_C	h_{FE} V_{CE}	Maximum Voltage V_{CEO}	Maximum Voltage V_{CBO}	Maximum Voltage V_{EBO}	C_{ob} I_E	C_{ob} V_{CB}	C_{ob} Max.	V_{CE} SAT I_C	V_{CE} SAT I_B	V_{CE} SAT Max.	V_{BE} SAT I_C	V_{BE} SAT I_B	V_{BE} SAT Max.	I_{CBO} (Max.) @25°C
SE1010 ****	NPN Low Noise AM Receiver Type	EPOXY TO-18	450 mc	0.5 Watt	0.25 Watt	20	45 (typ.)	2.0 mA	10 V	15 V	30 V	4.0 V	0	10 V	3.5 pf	10 mA	1.0 mA	0.3 V	10 mA	1.0 mA	0.97 V	50 nA
SE2001	NPN General Purpose Amplifier	EPOXY TO-18	450 mc	0.5 Watt	0.2 Watt	40	160	10 mA	1.0 V	25 V	35 V	4.0 V	0	10 V	6.0 pf	10 mA	1.0 mA	0.7 V	10 mA	1.0 mA	0.9 V	50 nA
SE2002	NPN General Purpose Amplifier	EPOXY TO-18	450 mc	0.5 Watt	0.2 Watt	100	400	10 mA	1.0 V	25 V	35 V	4.0 V	0	10 V	6.0 pf	10 mA	1.0 mA	0.7 V	10 mA	1.0 mA	0.9 V	50 nA
SE2020	See Specifications Below																					
SE3001*	NPN TV/FM Receiver Type	EPOXY TO-18	900 mc	0.5 Watt	0.2 Watt	20	60 (typ.)	8.0 mA	10 V	12 V	30 V	2.0 V	0	10 V	1.7 pf	10 mA	1.0 mA	0.6 V	10 mA	1.0 mA	1.0 V	50 nA
SE3002*	NP TV/FM Receiver Type UHF Oscillator	EPOXY TO-18	900 mc	0.5 Watt	0.2 Watt	20	60 (typ.)	8.0 mA	10 V	12 V	30 V	2.0 V	0	10 V	1.7 pf	10 mA	1.0 mA	0.6 V	10 mA	1.0 mA	1.0 V	50 nA
SE4001	NPN High Gain, Low Noise Type	EPOXY TO-18	100 mc	0.5 Watt	0.2 Watt	60	300	1.0 mA	10 V	25 V	30 V	6.0 V	0	5.0 V	4.0 pf	1.0 mA	0.1 mA	0.35 V	—	—	—	50 nA
SE4002	NPN High Gain, Low Noise Type	EPOXY TO-18	100 mc	0.5 Watt	0.2 Watt	200	1000	1.0 mA	10 V	25 V	30 V	6.0 V	0	5.0 V	4.0 pf	1.0 mA	0.1 mA	0.35 V	—	—	—	50 nA
SE4010**	NPN High Gain, Low Noise Type	EPOXY TO-18	100 mc	0.5 Watt	0.2 Watt	200	1000	1.0 mA	10 V	25 V	30 V	6.0 V	0	5.0 V	4.0 pf	1.0 mA	0.1 mA	0.35 V	—	—	—	50 nA
SE5001***	NPN RF-AGC Amplifier	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	70 (typ.)	4.0 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	—	—	—	50 nA
SE5002***	RF-AGC Amplifier	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	70 (typ.)	4.0 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	—	—	—	50 nA
SE5003***	RF-AGC Amplifier	EPOXY TO-18	600 mc	0.5 Watt	0.2 Watt	30	70 (typ.)	4.0 mA	10 V	40 V	40 V	4.0 V	0	10 V	1.6 pf	—	—	—	—	—	—	50 nA
SE6001	NPN High Gain Type	EPOXY TO-5	100 mc	0.8 Watt	0.3 Watt	50	200	10 mA	10 V	30 V	40 V	5.0 V	0	10 V	25 pf	100 mA	10 mA	1.0 V	100 mA	10 mA	0.5 V	50 nA
SE6002	NPN High Gain Type	EPOXY TO-5	100 mc	0.8 Watt	0.3 Watt	150	600	10 mA	10 V	30 V	40 V	5.0 V	0	10 V	25 pf	100 mA	10 mA	1.0 V	100 mA	10 mA	0.5 V	50 nA
SE7001	NPN High Voltage Audio/Video Amplifier	TO-5	60 mc	5.0 Watts	0.8 Watt	30	60 (typ.)	30 mA	10 V	150 V	150 V	5.0 V	0	20 V	9.0 pf	50 mA	5.0 mA	2.0 V	50 mA	5.0 mA	0.9 V	100 nA
SE7002	NPN High Voltage Audio/Video Amplifier	TO-5	60 mc	5.0 Watts	0.8 Watt	30	60 (typ.)	30 mA	10 V	120 V	120 V	5.0 V	0	20 V	12 pf	50 mA	5.0 mA	2.0 V	50 mA	5.0 mA	0.9 V	100 nA
SE7010	NPN High Voltage Video Output Type	TO-5	80 mc	3.0 Watts	0.8 Watt	30	90 (typ.)	25 mA	10 V	150 V	150 V	6.0 V	0	20 V	3.5 pf	25 mA	2.5 mA	1.0 V	25 mA	2.5 mA	0.9 V	10 nA
SE8001	NPN Medium Power General Purpose Type	TO-5	90 mc	5.0 Watts	0.87 Watt	20	—	150 mA	1.0 V	30 V	60 V	5.0 V	0	10 V	25 pf	1.0 A	0.1 A	1.5 V	1.0 A	0.1 A	2.0 V	100 nA
SE8002	NPN Medium Power General Purpose Type	TO-5	90 mc	5.0 Watts	0.87 Watt	40	120	150 mA	1.0 V	40 V	80 V	5.0 V	0	10 V	25 pf	1.0 A	0.1 A	1.2 V	1.0 A	0.1 A	2.0 V	10 nA

Part No.	Description	Package	t_f	Power Diss. Pc	I_{GT} Min.	I_{GT} Max.	I_{GT} V_{AK}	I_{GT} R_L	I_{FX}	I_{HO}	Forward Blocking Voltage
SE2020	PNPN Gate Controlled Switch for TV Horizontal Output Applications	TO-3	1.0 μsec (max.)	6.0 Watts @ 70°C	10 mA	200 mA	5.0 V	2.0 Ω	0.2 mA (max.)	0.75 amps (max.)	400 V (max.)

*Note: Power Output on 3001 is 2.0 mW (typ.) at 930 mc. 200 mc P_G min. of 12 db
Power Output on 3002 is 8.0 mW (typ.) and 3.0 mW min. at 930 mc. 200 mc P_G min. of 12 db
**Note: SE 4010 has narrow band NF of 1.5 db (typ.) and 3 db max.
***Note: AGC_1 (f = 45 mc) SE 5001—Min. 8.0 mA, Max. 10.5 mA; SE 5002—Min. 9.5 mA, Max. 12.0 mA. 45 mc P_G is 29 db min.
AGC_2 (f = 200 mc) SE 5003—Min. 9.0 mA, Max. 14.0 mA. 200 mc P_G is 15 db min.
****Note: SE 1010 has 1 mc NF of 5.5 db max.

Microcircuits

μA70839 HEARING AID AMPLIFIER—The μA70839 is a high-gain, low-drain amplifier designed especially for the hearing aid industry. It will operate with either silver oxide or mercury cells or at higher voltages for special applications. The circuit is designed to function with a minimum number of external components. Typical characteristics at 25°C:

Input Impedance	200 K
Voltage Gain	78 db
Battery Current	1.8 mA
Output Power	0.7 mW

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