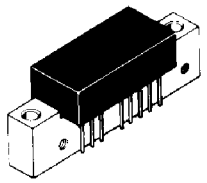
CA2820
CA2820H

The RF Line
Wideband Linear Amplifiers

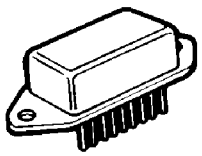
30 dB
1–520 MHz
440 mWATT
WIDEBAND
LINEAR AMPLIFIERS

. . . designed for amplifier applications in 50 to 100 ohm systems requiring wide bandwidth, low noise and low distortion. This hybrid provides excellent gain stability with temperature and linear amplification as a result of the push-pull circuit design.

- Specified Characteristics at V_{CC} = 24 V, T_C = 25°C:
  Frequency Range — 1 to 520 MHz
  Output Power — 440 mW Typ @ 1 dB Compression, f = 1–520 MHz
  Power Gain — 30 dB Typ @ f = 100 MHz
  Noise Figure — 8.3 dB Typ @ f = 50 MHz
- All Gold Metallization for Improved Reliability
- Unconditional Stability Under All Mismatch Conditions



CASE 714M-01, STYLE 2
(CA)
CA2820



CASE 826-01, STYLE 4
(SIP)
CA2820H

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Supply Voltage	V_{CC}	28	Vdc
RF Power Input	P_{in}	+10	dBm
Operating Case Temperature Range	T_C	−40 to +100	°C
Storage Temperature Range	T_{stg}	−55 to +125	°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C, V_{CC} = 24 V, 50 Ω system unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	1	—	520	MHz
Gain Flatness (f = 1–520 MHz)	—	—	±0.8	±1.5	dB
Power Gain (f = 100 MHz)	P_G	29	30	31	dB
Noise Figure, Broadband f = 30 MHz f = 500 MHz	NF	— —	6 8.3	8 10	dB
Power Output — 1 dB Compression (f = 1–520 MHz)	$P_{o\ 1dB}$	400	440	—	mW
Third Order Intercept (See Figure 10, f_1 = 520 MHz)	ITO	35	37	—	dBm
Input/Output VSWR Input Output	VSWR	— —	1.5:1 1.8:1	2:1 2:1	—
Second Harmonic Distortion (Tone at 10 mW, f_{2H} = 1–520 MHz)	d_{so}	—	−55	−45	dB
Reverse Isolation (f = 1–520 MHz)	—	49	52	—	dB
Peak Envelope Power (Two Tone Distortion Test — See Figure 10) (f = 1–520 MHz @ −32 dB IMD)	PEP	300	400	—	mW
Supply Current	I_{CC}	300	330	360	mA

TYPICAL CHARACTERISTICS

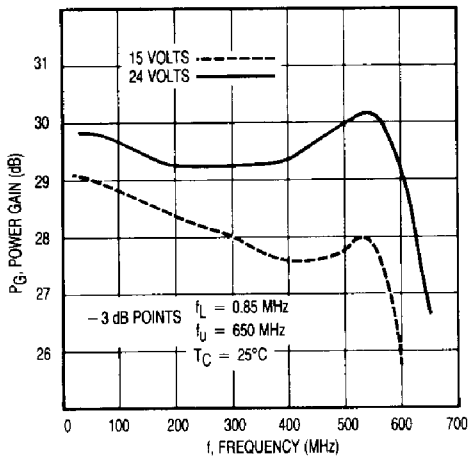


Figure 1. Power Gain versus Frequency

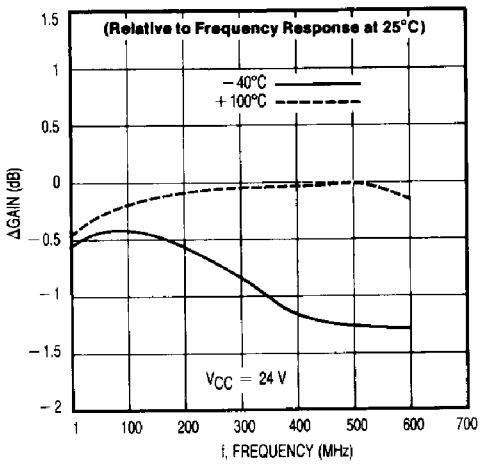


Figure 2. Relative Power Gain versus Temperature

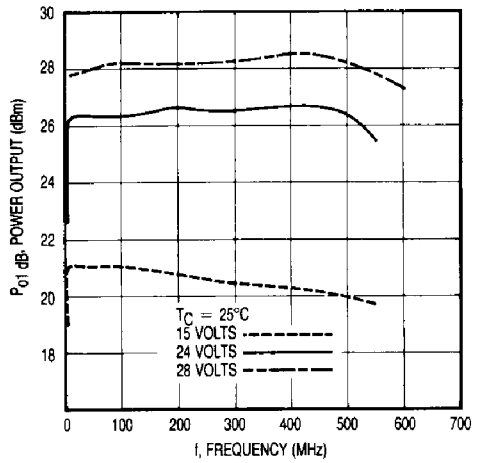


Figure 3. 1 dB Gain Compression versus Voltage

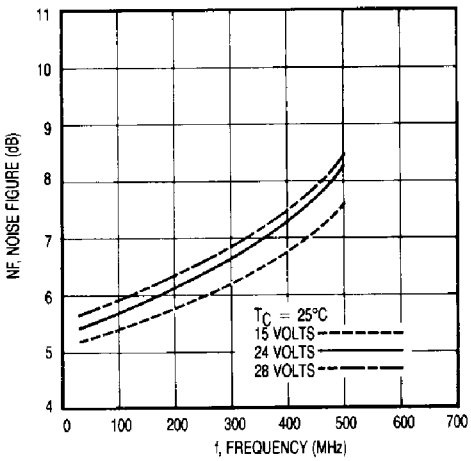


Figure 4. Noise Figure versus Voltage

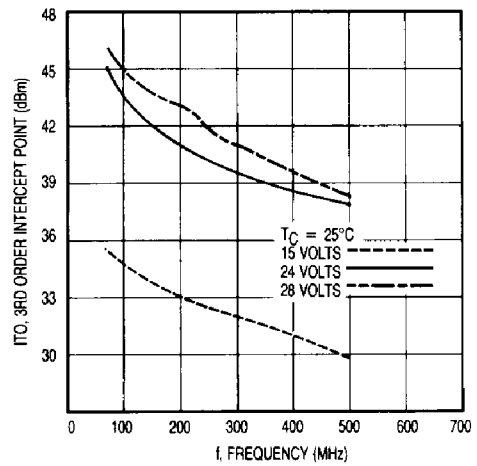


Figure 5. Third Order Intercept versus Voltage

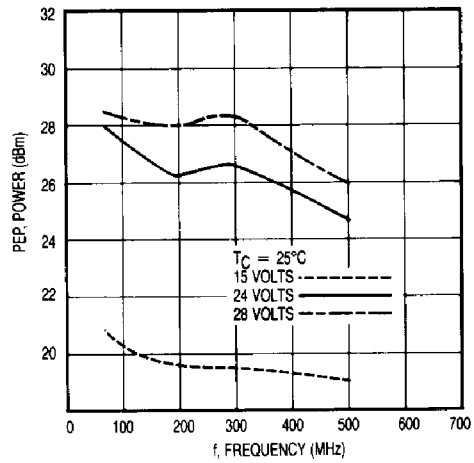


Figure 6. Peak Envelope Power versus Voltage

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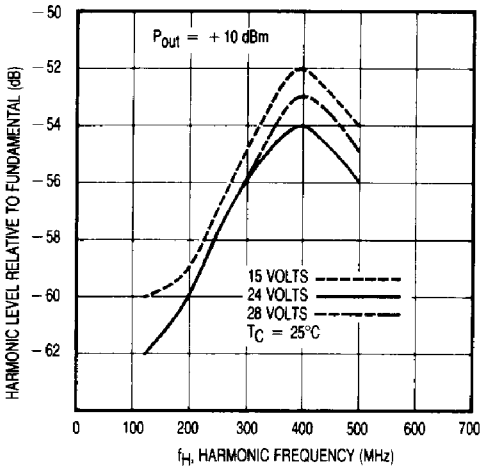


Figure 7. Second Harmonic Distortion versus Voltage

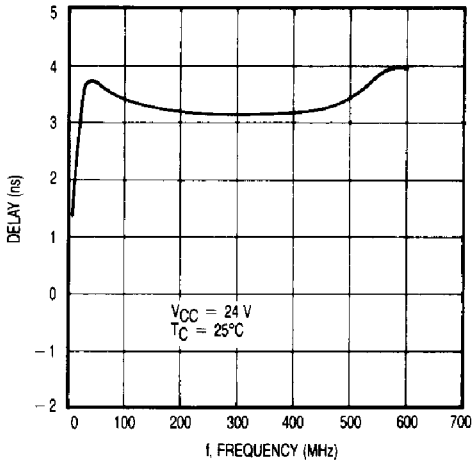


Figure 8. Group Delay versus Frequency

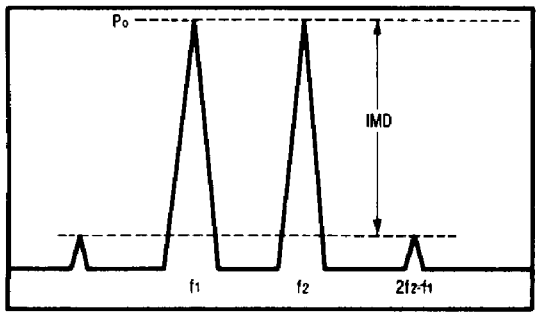
Biased at 24 Volts

T = 25°C Zo = 50Ω

Frequency (MHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
1	-12.5	-41.4	30.1	169	-52.8	150	-6.3	138
10	-25.4	-24.0	29.6	5.0	-53.8	5.0	-24.1	78
100	-27.5	5.6	29.6	-120	-55.3	-51.0	-39.3	-126
200	-21.4	3.6	29.3	120	-59.0	-118	-21.3	15.7
300	-17.1	-43	29.1	-1.6	-58.2	145	-16.0	-30
400	-15.5	-106	29.1	-123	-53.2	89.8	-10.4	-56.6
500	-16.5	-181	29.5	109	-50.3	36.0	-37.7	150
600	-17.3	129	28.7	-41.2	-55.4	14.8	-2.5	-14.2

Magnitude in dB, Phase Angle in degrees.

Figure 9. S-Parameters



$$IT_O = P_o + \frac{IMD}{2} \text{ @ IMD} > 60dB$$

PEP = 4X P_o @ IMD = -32dB

Figure 10. Intermodulation Test

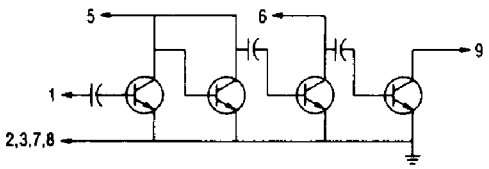


Figure 11. Functional Schematic

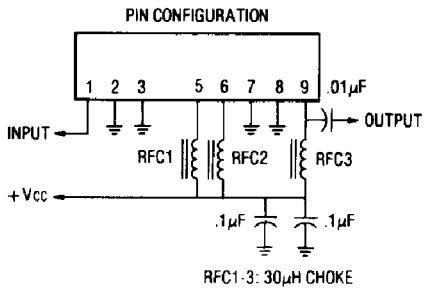


Figure 12. External Connections