www.DataSheet4U.com

T-74-09-01

MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

CA2870
CA2870H

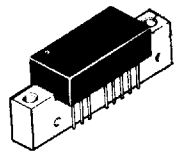
34 dB
20–400 MHz
500 mWATT
WIDEBAND
LINEAR AMPLIFIERS

The RF Line
Wideband Linear Amplifiers

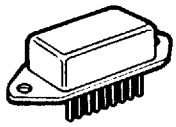
. . . designed for amplifier applications in 50 to 100 ohm systems requiring wide bandwidth, low noise and low distortion. This hybrid provides excellent gain stability with temperature and linear amplification as a result of the push-pull circuit design.

Two B+ inputs, one for the preamplifier and one for the final stage, provide a convenient means of RF leveling by variation of the final stage B+ voltage. Although the uncorrected flatness of this module is superb (±0.5 dB typical), the leveling provisions provide convenient means of correcting for the frequency response of succeeding stages and injection of AM modulation.

- Specified Characteristics at V_{CC} = 24 V, T_C = 25°C:
  - Frequency Range — 20 to 400 MHz
  - Output Power — 500 mW Typ @ 1 dB Compression, f = 400 MHz
  - Power Gain — 34 dB Typ @ f = 100 MHz
  - PEP — 500 mW Typ @ −32 dB IMD
  - Noise Figure — 7.5 dB Typ @ f = 400 MHz
- All Gold Metallization for Improved Reliability
- Amplitude Leveling Provision



CASE 714M-01, STYLE 1
(CA)
CA2870



CASE 826-01, STYLE 3
(SIP)
CA2870H

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
DC Supply Voltage	V_{CC}	28	Vdc
RF Power Input	P_{in}	+5	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	20	—	400	MHz
Gain Flatness (f = 20–400 MHz)	—	—	±0.5	±1	dB
Power Gain (f = 100 MHz)	P_G	32.5	34	35.5	dB
Noise Figure, Broadband f = 30 MHz f = 400 MHz	NF	— —	4.5 7.5	6 8.5	dB
Power Output — 1 dB Compression f = 225 MHz f = 400 MHz	$P_{o1\ dB}$	800 400	850 500	— —	mW
Third Order Intercept (See Figure 11, f_1 = 300 MHz)	ITO	42	45	—	dBm
Input/Output VSWR (f = 20–400 MHz) Input Output	VSWR	— —	1.5:1 1.8:1	2:1 2:1	—
Second Harmonic Distortion (Tone at 100 mW, f_{2H} = 20–400 MHz)	d_{so}	—	−52	−45	dB
Reverse Isolation (f = 20–400 MHz)	—	45	48	—	dB
Peak Envelope Power (Two Tone Distortion Test — See Figure 11) (f = 20–400 MHz @ −32 dB IMD)	PEP	400	500	—	mW
Supply Current	I_{CC}	270	300	330	mA

5

www.DataSheet4U.com

TYPICAL CHARACTERISTICS

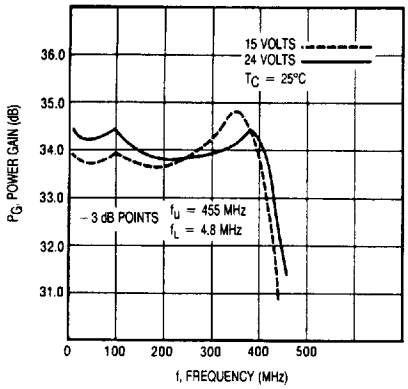


Figure 1. Power Gain versus Frequency

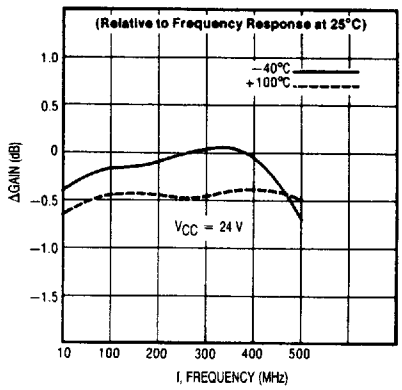


Figure 2. Relative Power Gain versus Temperature

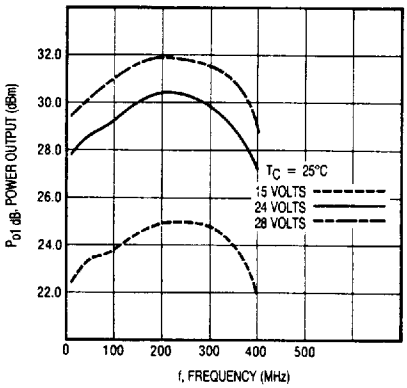


Figure 3. 1 dB Gain Compression versus Voltage

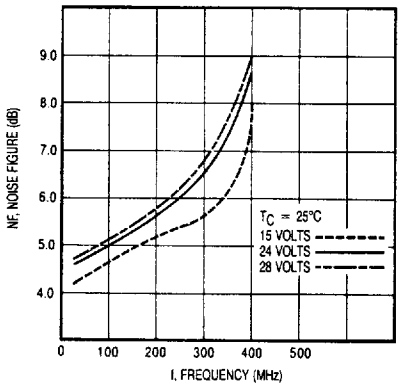


Figure 4. Noise Figure versus Voltage

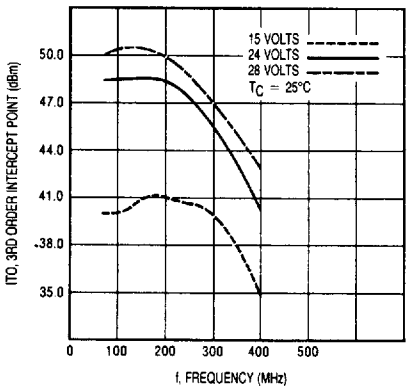


Figure 5. Third Order Intercept versus Voltage

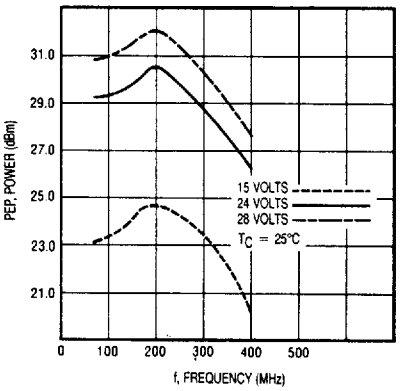


Figure 6. Peak Envelope Power versus Voltage

www.DataSheet4U.com

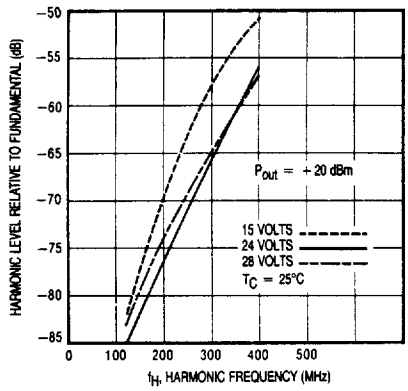


Figure 7. Second Harmonic Distortion versus Voltage

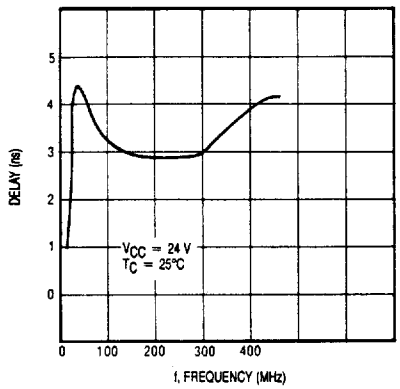


Figure 8. Group Delay versus Frequency

Biased at 24 Volts T = 25°C Zo = 50Ω

Frequency (MHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
20	-29.0	99.8	34.0	-4.3	-47.9	6.0	-14.6	21.3
100	-18.0	76.2	34.3	-107	-47.6	-53.5	-12.3	-5.9
200	-16.1	61.8	33.8	143	-47.9	-115	-11.6	-35.3
300	-13.9	52.3	33.7	27.9	-47.9	172	-13.5	-89.0
400	-20.9	44.6	33.9	-110	-47.2	94.8	-18.5	95.2

Magnitude in dB, Phase Angle in degrees.

Figure 9. S-Parameters

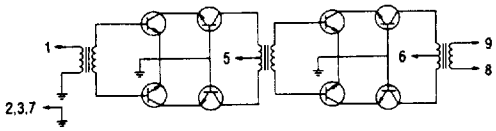
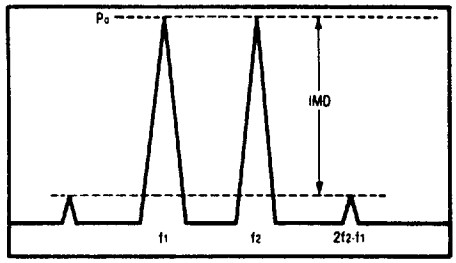


Figure 10. Functional Schematic



$$ITO = Po + \frac{IMD}{2} \text{ @ IMD} > 60dB$$

PEP = 4X Po @ IMD = -32dB

Figure 11. Intermodulation Test

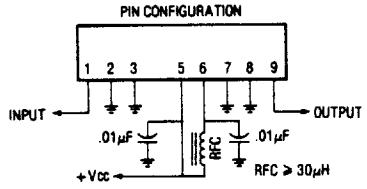


Figure 12. External Connections