

RF Devices Division
TRW Electronic Components Group

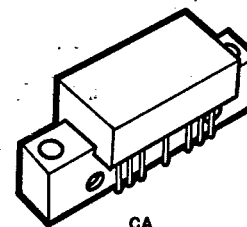


T-74-09-01

CA2870

CA2870 Wide Bandwidth Linear Hybrid Amplifier

- Amplitude Leveling Provision
- Instantaneous Bandwidth, 20-400MHz
- 34dB Gain
- Power Output, 400mW Minimum
- Low Noise Figure, 4.5dB



CA

The CA2870 is a high-reliability thin-film hybrid amplifier utilizing an all gold metallization system with built-in provisions for amplitude leveling. The circuit covers the 20-400MHz frequency range. 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. Load variations on the preceding stage are kept to a minimum by this provision. Although the uncorrected flatness of this module is superb (± 0.5 dB typical), the leveling provisions pro-

vide convenient means of correcting for the frequency response of succeeding stages and injection of AM modulation. This module finds wide application in military and industrial service as gain blocks in RF amplifiers for VHF and UHF transmitters.

Absolute Maximum Ratings

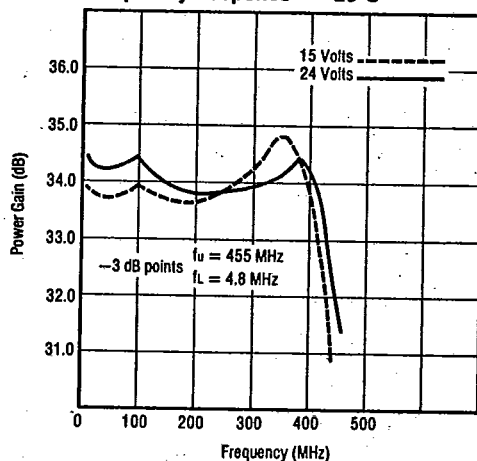
Vcc	RF Power Input	Storage Temperature	Operating Temperature (Case)
28 Volts	+5dBm	-55°C to +125°C	-40°C to +100°C

Electrical Characteristics for 50Ω Systems (Tcase = 25°C and 24V)

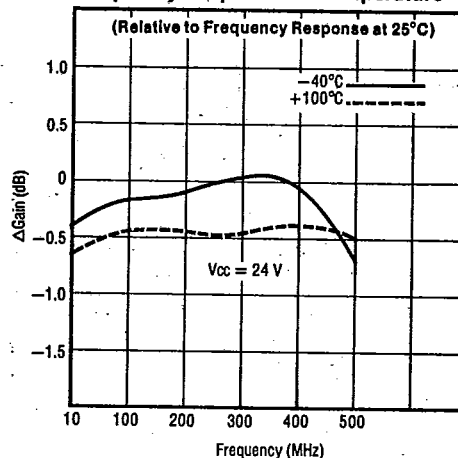
Symbol	Characteristic	Conditions	Min.	Typ.	Max.	Units
Pg	Power Gain	f = 100MHz	32.5	34	35.5	dB
NF	Noise Figure, Broadband	f = 30MHz f = 400MHz	— —	4.5 7.5	6.0 8.5	dB
Ito	Third Order Intercept, See Figure 1	f = 300MHz	+42	+45	—	dBm
VSWR	Input VSWR for 50 Ohm Systems Output VSWR for 50 Ohm Systems	f = 20-400MHz	— —	1.5:1 1.8:1	2.0:1 2.0:1	N/A
Icc	Supply Current	24V	270	300	330	mA
Po	Power Output — 1dB Compression	f = 225MHz f = 400MHz	800 400	850 500	— —	mW
PII	Reverse Isolation	f = 20-400MHz	45	48	—	dB
FR	Frequency Response	f = 20-400MHz	—	± 0.5	± 1.0	dB
dso	Second Harmonic Distortion	Po = 100mW f2H = 20-400MHz	-45	-52	—	dB
PEP	Peak Envelope Power for Two Tone Distortion Test, See Figure 1	f = 20-400MHz @ -32dB	400	500	—	mW

T-74-09.01

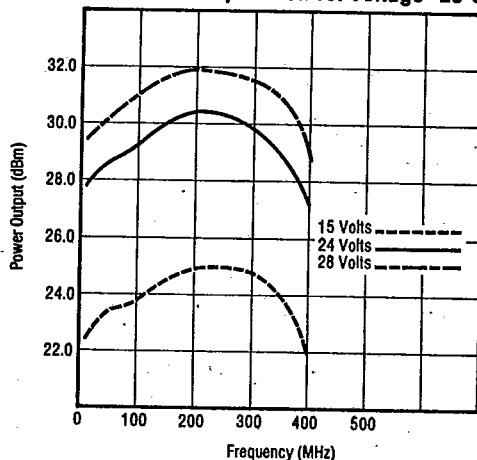
Frequency Response 25°C



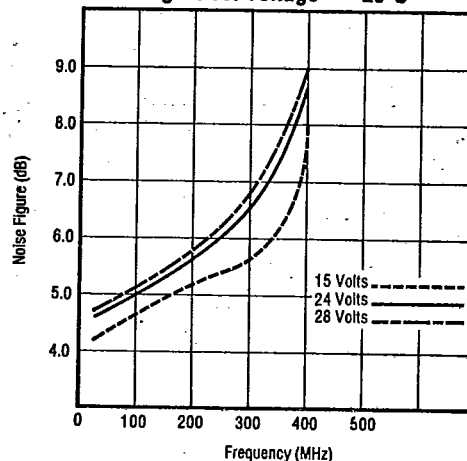
Frequency Response vs. Temperature



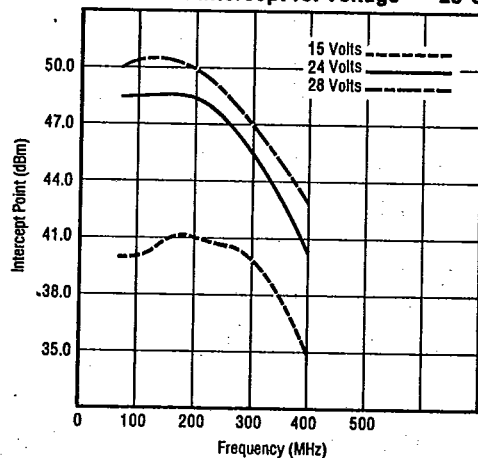
1 dB Gain Compression vs. Voltage 25°C



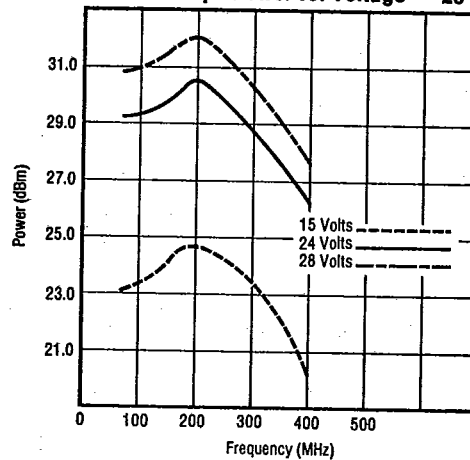
Noise Figure vs. Voltage 25°C



Third Order Intercept vs. Voltage 25°C

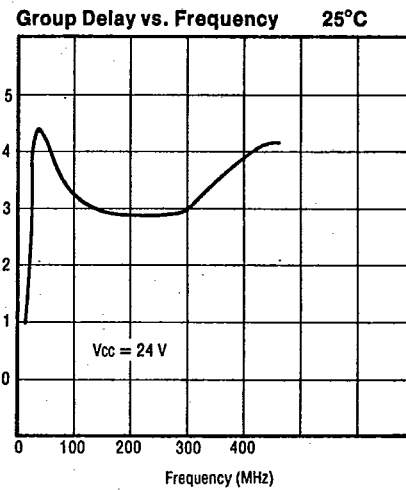
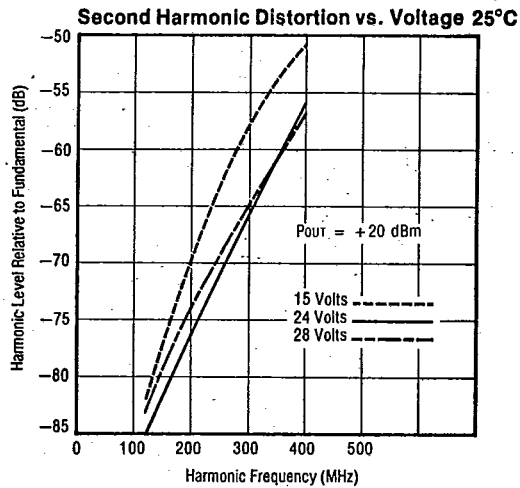


Peak Envelope Power vs. Voltage 25°C



CA2870

T-74-09-01

**S-Parameters**

Biased at 24 Volts

 $T = 25^\circ\text{C}$ $Z_0 = 50\Omega$

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.

CA2870

T-74-09.01

PACKAGE OUTLINE

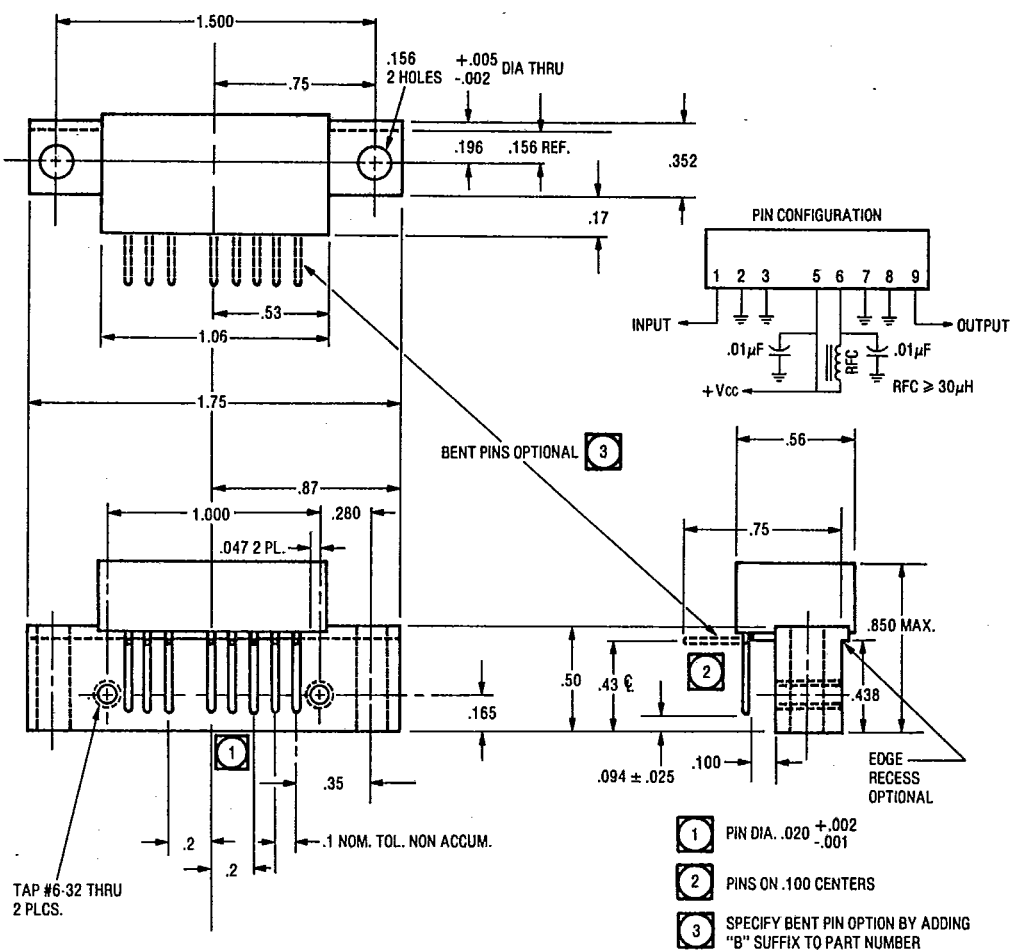
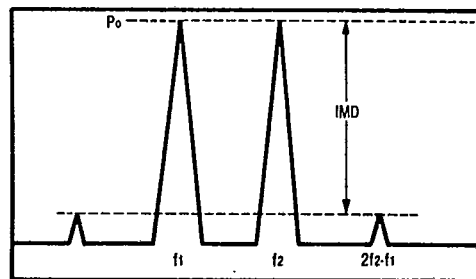


FIGURE 1. INTERMODULATION TEST



$$I_{T0} = P_0 + \frac{IMD}{2} @ IMD > 60dB$$

$$PEP = 4 \times P_0 @ IMD = -32dB$$