

The RF Line

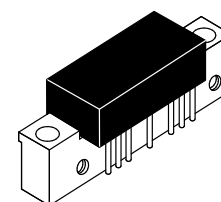
Wideband Linear Amplifier

... 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 $V_{CC} = 24\text{ V}$, $T_C = 25^\circ\text{C}$:
 - Frequency Range — 10–400 MHz
 - Output Power — 1580 mW Typ @ 1 dB Compression, $f = 200\text{ MHz}$, $V_{CC} = 28\text{ V}$
 - Power Gain — 22 dB Typ @ $f = 100\text{ MHz}$
 - PEP — 650 mW Min @ -32 dB IMD
 - Noise Figure — 4 dB Typ @ $f = 100\text{ MHz}$
 - ITO — 46 dBm @ $f = 300\text{ MHz}$
- All Gold Metallization for Improved Reliability
- Unconditional Stability Under All Load Conditions

CA2842C

22 dB
10–400 MHz
1.2 WATTS
WIDEBAND
LINEAR AMPLIFIER



CASE 714F-03, STYLE 1
[CA (POS. SUPPLY)]

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|----------------------------------|-----------|-------------|------------------|
| DC Supply Voltage | V_{CC} | 28 | Vdc |
| RF Power Input | P_{in} | +14 | dBm |
| Operating Case Temperature Range | T_C | -20 to +100 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -40 to +100 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, $V_{CC} = 24\text{ V}$, 50 Ω system unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|---|--------------------|------|-----------|---------|------|
| Frequency Range | BW | 10 | — | 400 | MHz |
| Gain Flatness ($f = 10\text{--}400\text{ MHz}$) | — | — | ± 0.5 | ± 1 | dB |
| Power Gain ($f = 100\text{ MHz}$) | P_G | 21 | 22 | 23 | dB |
| Noise Figure, Broadband ($f = 100\text{ MHz}$) | NF | — | 4 | 5 | dB |
| Power Output — 1 dB Compression ($f = 10\text{--}200\text{ MHz}$, $V_{CC} = 28\text{ V}$) | $P_{o1\text{ dB}}$ | 1260 | 1580 | — | mW |
| Power Output — 1 dB Compression ($f = 200\text{--}400\text{ MHz}$, $V_{CC} = 28\text{ V}$) | $P_{o1\text{ dB}}$ | 630 | — | — | mW |
| Third Order Intercept (See Figure 10, $f_1 = 10\text{--}400\text{ MHz}$, See Fig. 10) | ITO | 42 | 44 | — | dBm |
| Input/Output VSWR ($f = 10\text{--}400\text{ MHz}$) | VSWR | — | 1.3:1 | 1.5:1 | — |
| Second Harmonic Distortion ($P_o = 100\text{ mW}$, $f_{2H} = 300\text{ MHz}$) | d_{so} | — | — | -50 | dB |
| Peak Envelope Power (Two Tone Distortion Test — See Figure 10) ($f = 200\text{ MHz}$ @ -32 dB IMD) | PEP | 650 | 1000 | — | mW |
| Supply Current | I_{CC} | 200 | 230 | 250 | mA |



TYPICAL CHARACTERISTICS

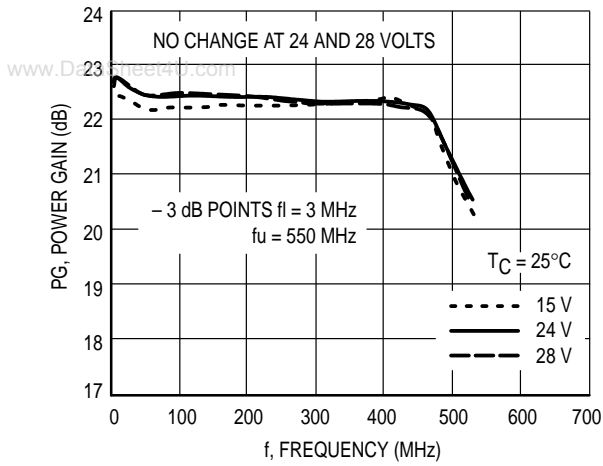


Figure 1. Power Gain versus Voltage

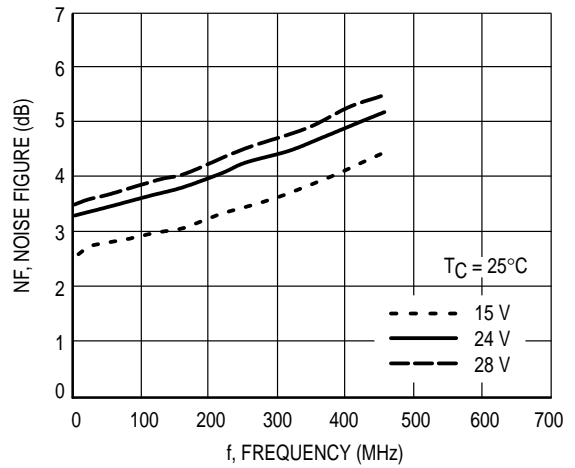


Figure 4. Noise Figure versus Voltage

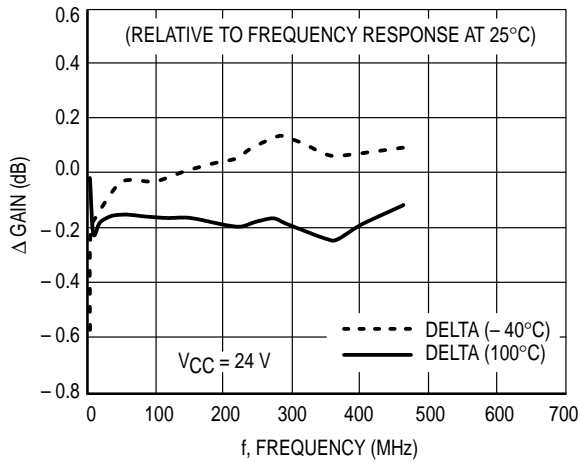


Figure 2. Relative Power Gain versus Temperature

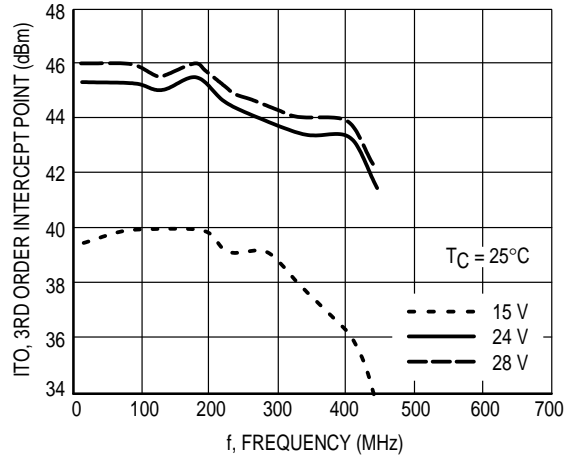


Figure 5. Third Order Intercept versus Voltage

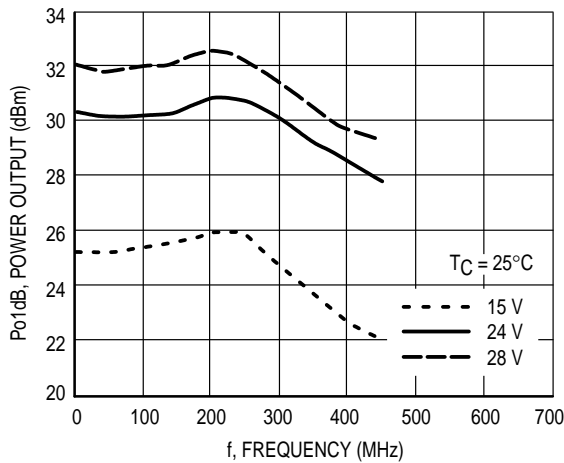


Figure 3. 1 dB Compression versus Voltage

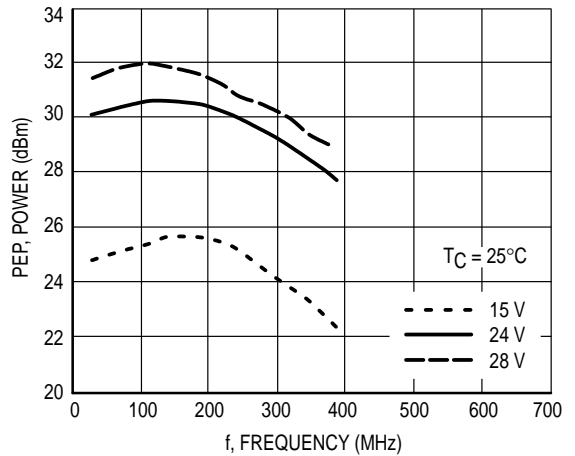


Figure 6. Peak Envelope Power versus Voltage

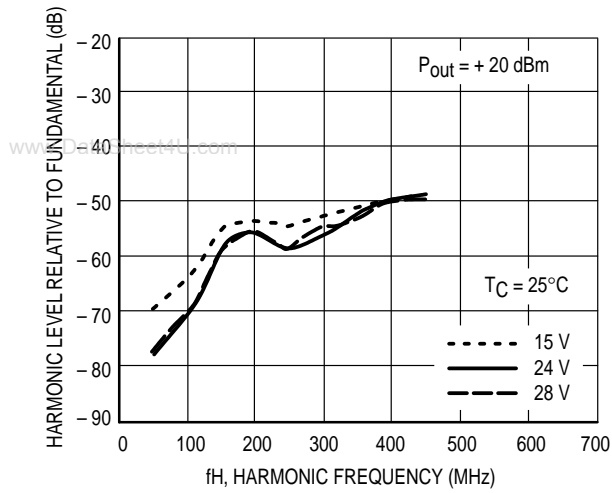


Figure 7. Second Harmonic Distortion versus Voltage

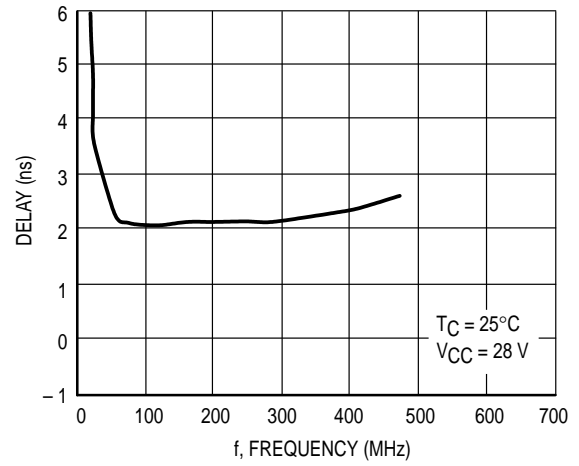


Figure 8. Group Delay versus Frequency

Biased at 24 Volts

$T_C = 25^\circ\text{C}$ $Z_o = 50\Omega$

| Frequency (MHz) | S11 | | S21 | | S12 | | S22 | |
|-----------------|-------|------|------|------|-------|------|-------|------|
| | Mag | Ang | Mag | Ang | Mag | Ang | Mag | Ang |
| 10 | -15.8 | 62 | 22.8 | -168 | -27 | 15 | -20.2 | 29 |
| 50 | -26.5 | 20 | 22.5 | 146 | -27 | -25 | -24 | 15 |
| 100 | -25.5 | 25 | 22.5 | 111 | -27.5 | -56 | -22.5 | -16 |
| 200 | -20.5 | -7 | 22.5 | 26 | -27.9 | -117 | -18.1 | -73 |
| 300 | -17.2 | -48 | 22.5 | -51 | -28.5 | -170 | -16.5 | -125 |
| 400 | -18.8 | -129 | 22.4 | -126 | -28.3 | 114 | -22.5 | 156 |

Magnitude in dB, Phase Angle in degrees.

Table 1. S-Parameters

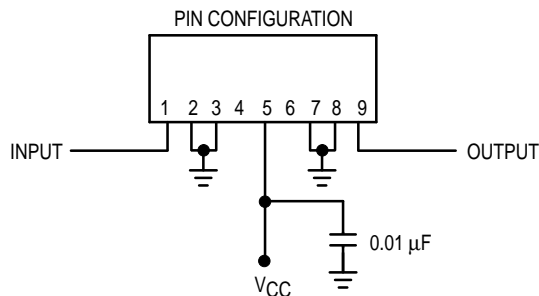
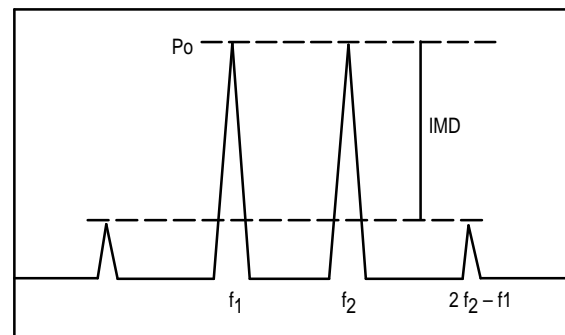


Figure 9. External Connections

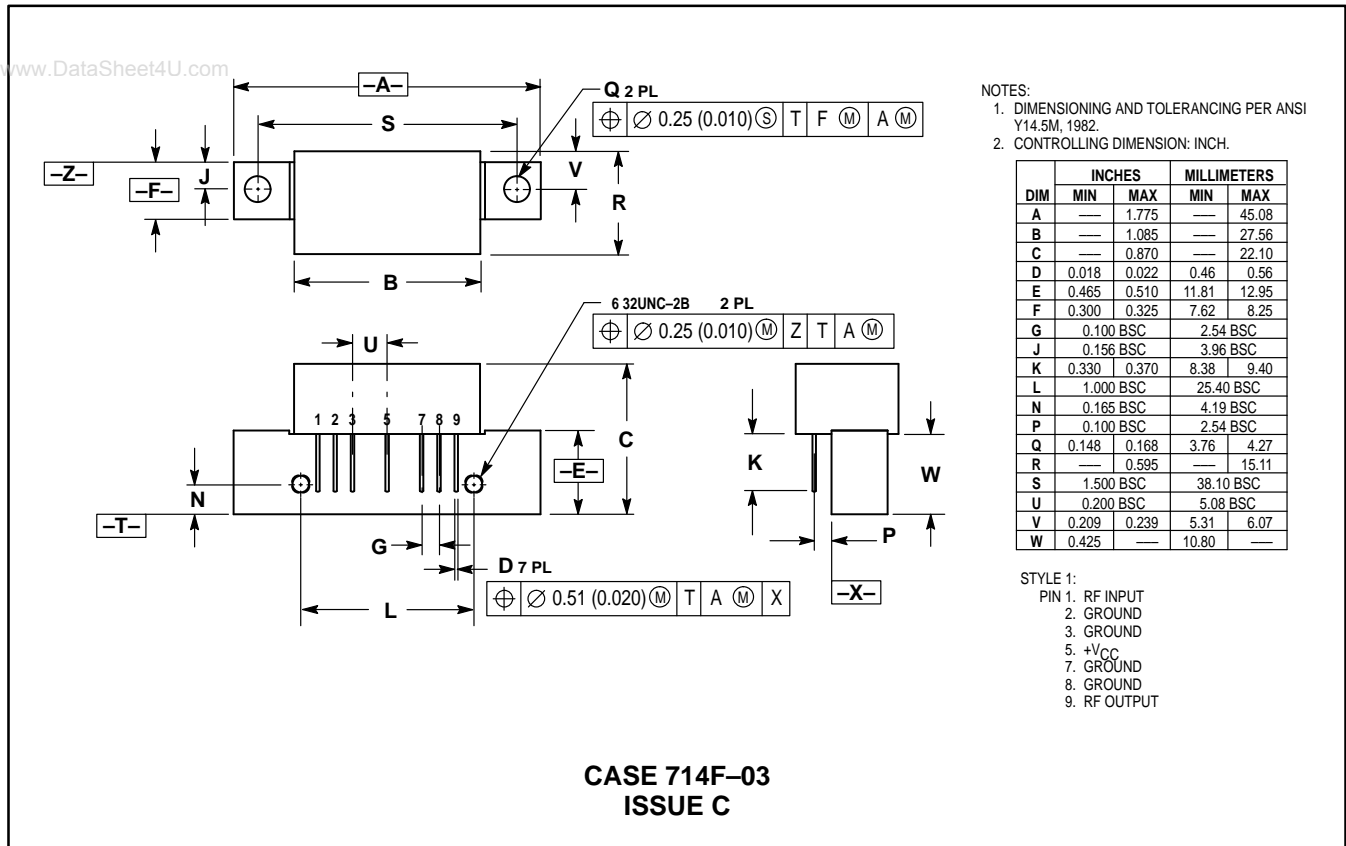


$$ITO = P_o + \text{IMD} / 2 \text{ @ } \text{IMD} > 60 \text{ dB}$$

$$PEP = 4 \times P_o \text{ @ } \text{IMD} = -32 \text{ dB}$$

Figure 10. Intermodulation Test

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-----------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | — | 1.775 | — | 45.08 |
| B | — | 1.085 | — | 27.56 |
| C | — | 0.870 | — | 22.10 |
| D | 0.018 | 0.022 | 0.46 | 0.56 |
| E | 0.465 | 0.510 | 11.81 | 12.95 |
| F | 0.300 | 0.325 | 7.62 | 8.25 |
| G | 0.100 BSC | 2.54 BSC | | |
| J | 0.156 BSC | 3.96 BSC | | |
| K | 0.330 | 0.370 | 8.38 | 9.40 |
| L | 1.000 BSC | 25.40 BSC | | |
| N | 0.165 BSC | 4.19 BSC | | |
| P | 0.100 BSC | 2.54 BSC | | |
| Q | 0.148 | 0.168 | 3.76 | 4.27 |
| R | — | 0.595 | — | 15.11 |
| S | 1.500 BSC | 38.10 BSC | | |
| U | 0.200 BSC | 5.08 BSC | | |
| V | 0.209 | 0.239 | 5.31 | 6.07 |
| W | 0.425 | — | 10.80 | — |

STYLE 1:

- PIN 1. RF INPUT
2. GROUND
3. GROUND
5. +V_{CC}
7. GROUND
8. GROUND
9. RF OUTPUT

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