

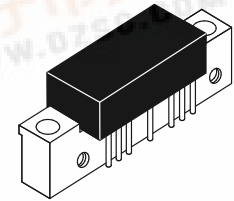
## The RF Line Wideband Linear Amplifier

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 — 0.35 to 400 MHz
  - Output Power — 1000 mW Typ @ 1 dB Compression,  $f = 200\text{ MHz}$
  - Power Gain — 18.5 dB Typ @  $f = 50\text{ MHz}$
  - PEP — 1000 mW Typ @ -32 dB IMD,  $f = 200\text{ MHz}$
  - Noise Figure — 5 dB Typ @  $f = 200\text{ MHz}$
  - ITO — 47 dBm Typ @  $f = 150\text{ MHz}$
- All Gold Metallization for Improved Reliability
- Unconditional Stability Under All Load Conditions

**CA2818C**

**18.5 dB**  
**0.35–400 MHz**  
**1000 mWATT**  
**WIDEBAND**  
**LINEAR AMPLIFIER**



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

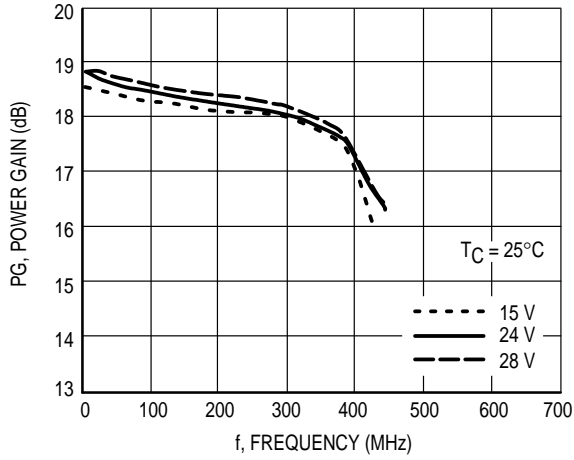
### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
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	$^\circ\text{C}$

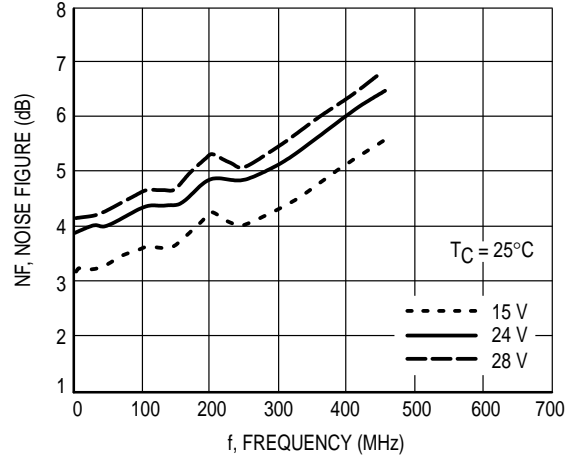
### ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ , $V_{CC} = 24\text{ V}$ , 50 $\Omega$ system unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	0.35	—	400	MHz
Gain Flatness ( $f = 0.35\text{--}400\text{ MHz}$ )	$F_L$	—	$\pm 0.5$	$\pm 1$	dB
Power Gain ( $f = 50\text{ MHz}$ )	$P_G$	17.75	18.5	19.25	dB
Noise Figure, Broadband ( $f = 200\text{ MHz}$ )	NF	—	5	6	dB
Power Output — 1 dB Compression ( $f = 200\text{ MHz}$ )	$P_{O\ 1dB}$	800	1000	—	mW
Third Order Intercept (See Figure 10, $f_1 = 200\text{ MHz}$ )	ITO	43	45	—	dBm
Input/Output VSWR ( $f = 0.35\text{--}400\text{ MHz}$ )	VSWR	—	1.7:1	2:1	—
Second Harmonic Distortion ( $P_O = 100\text{ mW}$ ) $f_{2H} = 0.35\text{--}200\text{ MHz}$ $f_{2H} = 200\text{--}400\text{ MHz}$	$d_{so}$	—	-65 —	-60 -50	dB
Peak Envelope Power (Two Tone Distortion Test — See Figure 10) $f = 0.35\text{--}200\text{ MHz @ -32 dB IMD}$ $f = 200\text{--}400\text{ MHz @ -32 dB IMD}$	PEP	600	800	—	mW
Supply Current	$I_{CC}$	190	205	220	mA

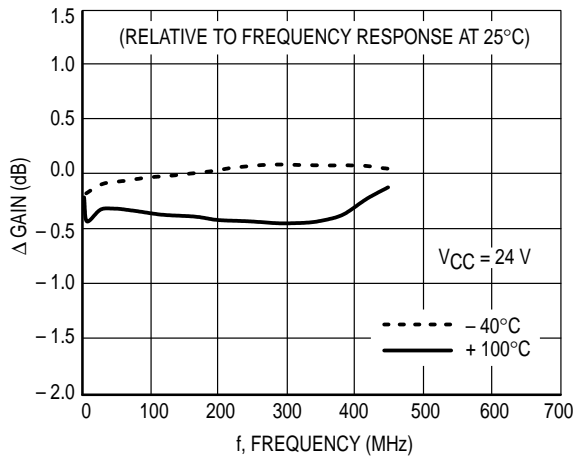
## TYPICAL CHARACTERISTICS



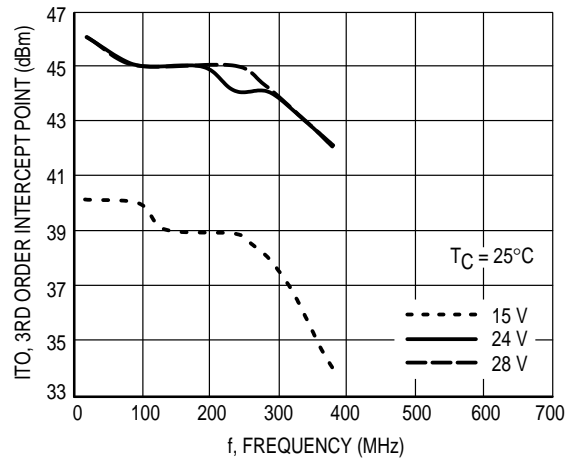
**Figure 1. Power Gain versus Voltage**



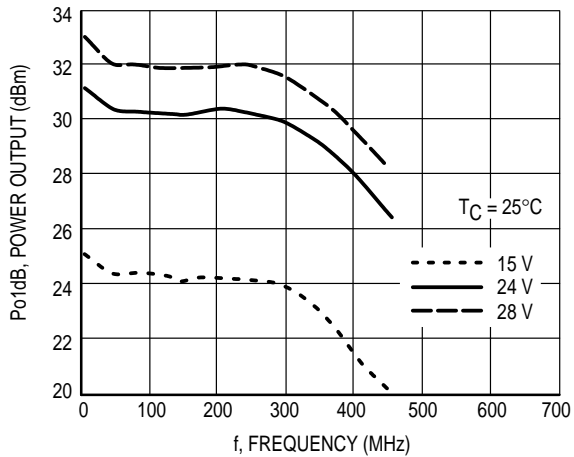
**Figure 4. Noise Figure versus Voltage**



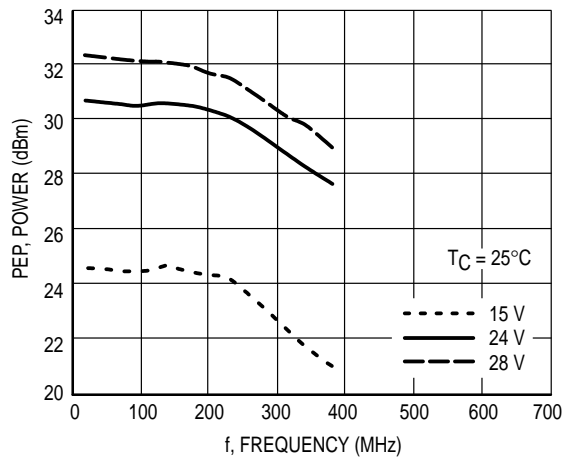
**Figure 2. Relative Power Gain versus Temperature**



**Figure 5. Third Order Intercept versus Voltage**



**Figure 3. 1 dB Compression versus Voltage**



**Figure 6. Peak Envelope Power versus Voltage**

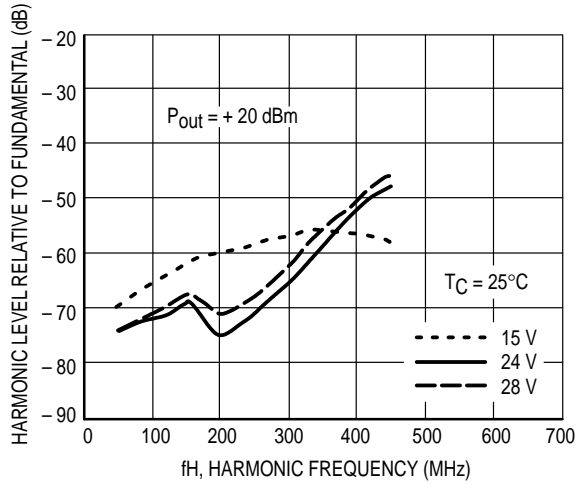


Figure 7. Second Harmonic Distortion versus Voltage

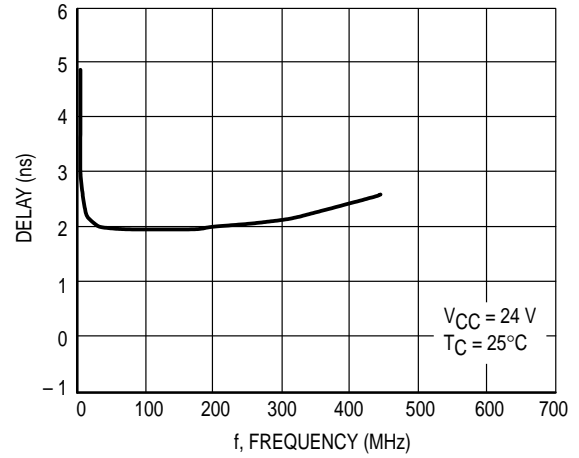


Figure 8. Group Delay versus Frequency

Biased at 24 Volts

T = 25°C Zo = 50Ω

Frequency (MHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
0.35	-17.0	18.7	18.4	7.4	-24.1	-169	-16.4	11.1
1	-17.3	10.7	18.6	3.4	-24.0	-175	-16.7	6.5
50	-16.3	-7.6	18.7	-38.8	-23.9	145	-17.0	-38.8
100	-15.6	-15.1	18.5	-70.1	-24.1	117	-18.4	-65.9
200	-14.0	-47.3	18.3	-149	-24.8	47.9	-20.6	-101
300	-14.1	-85	18.1	135	-25.3	-15	-16.6	-142
400	-18.0	-137	17.4	58	-25.9	-84.3	-14.2	134

Magnitude in dB, Phase Angle in degrees.

Table 1. S-Parameters

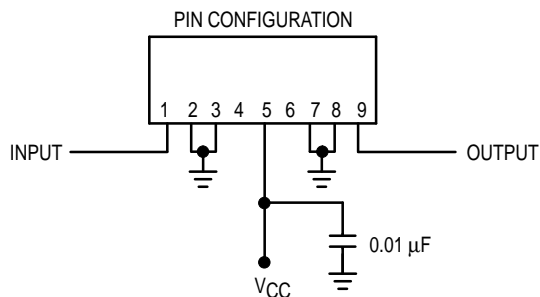
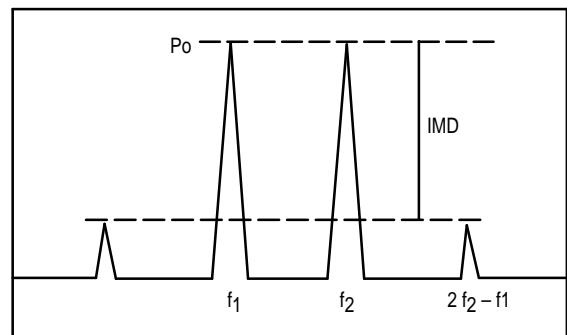


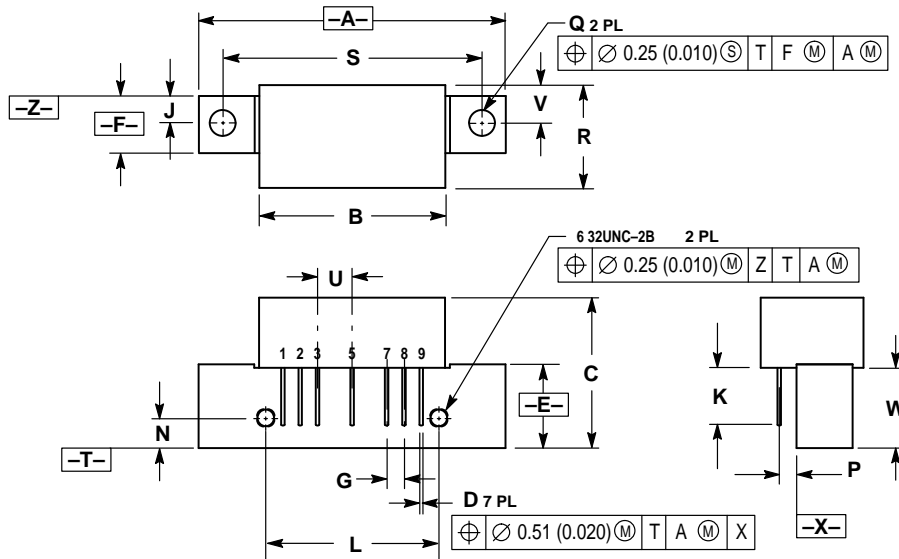
Figure 9. Functional Schematic



ITO =  $P_o + \text{IMD} / 2$  @ IMD > 60 dB  
 PEP =  $4 \times P_o$  @ IMD = -32 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<sub>CC</sub>
7. GROUND
8. GROUND
9. RF OUTPUT

### CASE 714F-03 ISSUE C

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

**How to reach us:**

**USA / EUROPE:** Motorola Literature Distribution;  
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

**JAPAN:** Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,  
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

**MFAX:** RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609  
**INTERNET:** <http://Design-NET.com>

**HONG KONG:** Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298