

MOTOROLA
SEMICONDUCTOR
 TECHNICAL DATA

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.

- Specified Characteristics at $V_{CC} = 15\text{ V}$, $T_C = 25^\circ\text{C}$:
 - Frequency Range — 40 to 300 MHz
 - Output Power — 160 mW Typ @ 1 dB Compression, $f = 300\text{ MHz}$
 - Power Gain — 34 dB Typ @ $f = 50\text{ MHz}$
 - PEP — 150 mW Typ @ -32 dB IMD
 - Noise Figure — 5 dB Typ @ $f = 300\text{ MHz}$
- All Gold Metallization for Improved Reliability
- Designed for 15 V Operation, Low Power Consumption
- Low VSWR for 75 Ohm System

MAXIMUM RATINGS

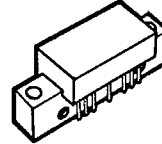
Rating	Symbol	Value	Unit
DC Supply Voltage	V_{CC}	28	Vdc
RF Power Input	P_{in}	+5	dBm
Operating Case Temperature Range	T_C	-20 to +90	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to +100	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$, $V_{CC} = 15\text{ V}$, 75 Ω system unless otherwise noted)

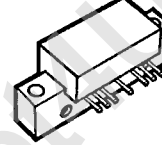
Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	40	—	300	MHz
Gain Flatness ($f = 40\text{--}300\text{ MHz}$)	—	—	± 0.75	± 1.25	dB
Power Gain ($f = 50\text{ MHz}$)	P_G	33	34	35	dB
Noise Figure, Broadband ($f = 50\text{ MHz}$)	NF	—	3.5	4.5	dB
Noise Figure, Broadband ($f = 300\text{ MHz}$)	—	—	5	6	dB
Power Output — 1 dB Compression ($f = 300\text{ MHz}$)	$P_{o1\text{ dB}}$	—	160	—	mW
Third Order Intercept (See Figure 11, $f_1 = 300\text{ MHz}$)	ITO	38	40	—	dBm
Input/Output VSWR ($f = 40\text{--}300\text{ MHz}$)	VSWR	—	1.2:1	1.3:1	—
Second Harmonic Distortion (Tone at 100 mW, $f_{2H} = 300\text{ MHz}$)	d_{so}	—	-50	-47	dB
Reverse Isolation ($f = 40\text{--}300\text{ MHz}$)	—	—	40	—	dB
Peak Envelope Power (Two Tone Distortion Test — See Figure 11) ($f = 40\text{--}300\text{ MHz}$ @ -32 dB IMD)	PEP	125	150	—	mW
Supply Current	I_{CC}	150	170	190	mA

CA2813
CA2813B
CA2813H

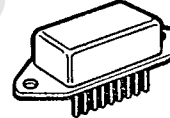
34 dB
 40-300 MHz
 160 mWATT
 WIDEBAND
 LINEAR AMPLIFIERS



CA (POS. SUPPLY)
 CASE 714F-01, STYLE 1
 CA2813



CA (POS. BENT PIN OPTION)
 CASE 714J-01, STYLE 1
 CA2813B



SIP
 CASE 826-01, STYLE 1
 CA2813H



TYPICAL CHARACTERISTICS

T-74-09-01

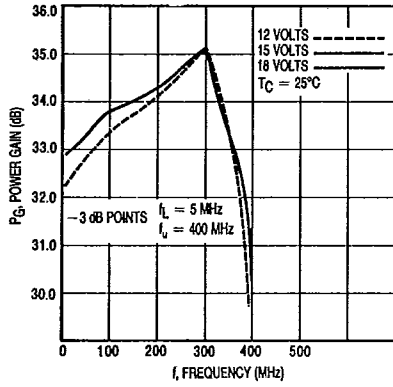


Figure 1. Power Gain versus Frequency

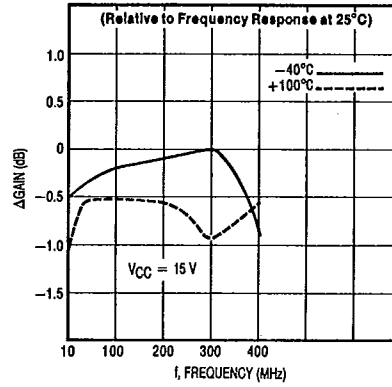


Figure 2. Relative Power Gain versus Temperature

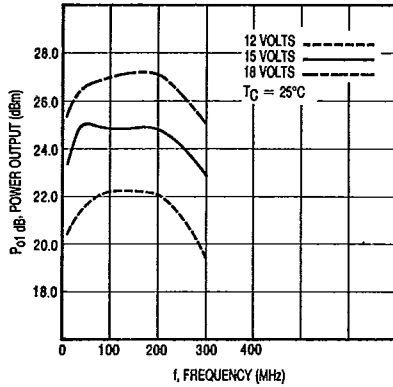


Figure 3. 1 dB Gain Compression versus Voltage

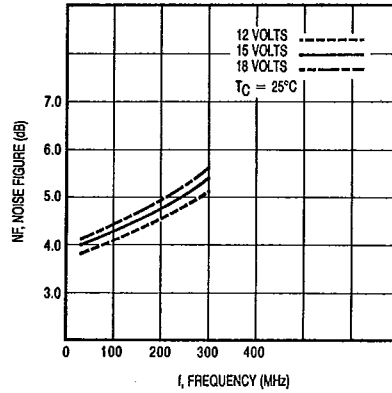


Figure 4. Noise Figure versus Voltage

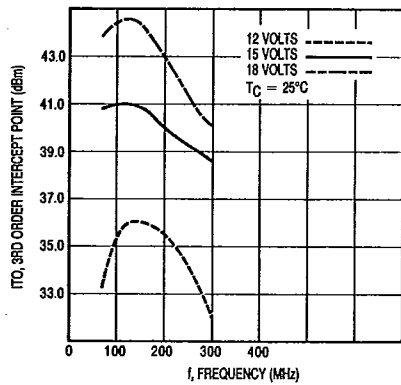


Figure 5. Third Order Intercept versus Voltage

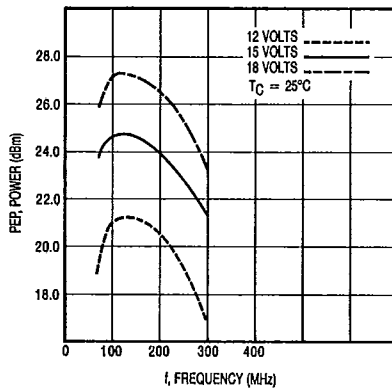


Figure 6. Peak Envelope Power versus Voltage

5

T-74-09-01

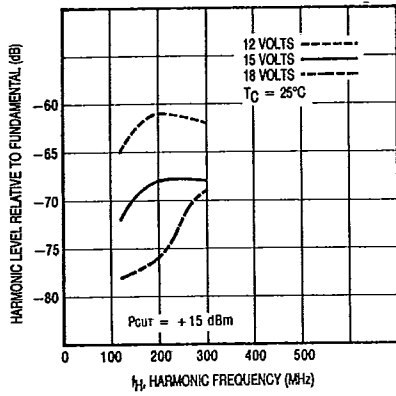


Figure 7. Second Harmonic Distortion versus Voltage

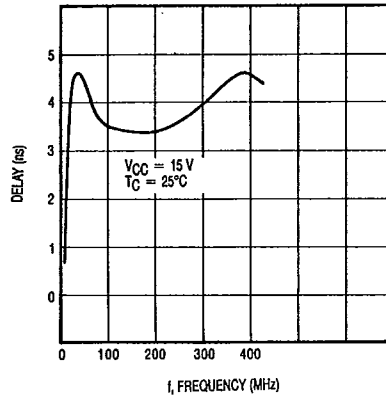


Figure 8. Group Delay versus Frequency

Biased at 15 Volts

T = 25°C Zo = 75Ω

Frequency (MHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
10	-16.6	53.0	33.1	35.0	-48.1	39.1	-21.2	48.7
50	-32.3	-2.0	33.6	-44.9	-47.8	-21.0	-30.9	65.0
100	-41.4	119	34.2	-107	-47.7	-58.0	-30.3	22.8
200	-27.8	62.0	34.5	130	-48.6	-140	-38.5	-105
300	-26.1	-177	35.3	-10.2	-47.1	126	-23.3	84.5

Magnitude in dB, Phase Angle in degrees.

Figure 9. S-Parameters

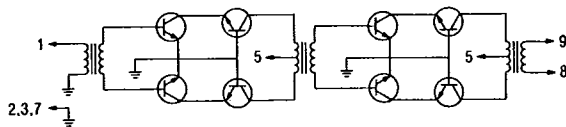
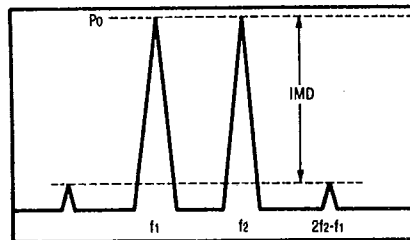


Figure 10. Functional Schematic



$$I_{70} = P_0 + \frac{IMD}{2} @ IMD > 60dB$$

$$PEP = 4X P_0 @ IMD = -32dB$$

Figure 11. Intermodulation Test