MOTOROLA
SEMICONDUCTOR
TECHNICAL DATA

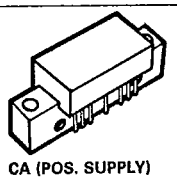
CA2813
CA2813B
CA2813H

34 dB
40–300 MHz
160 mWATT
WIDEBAND
LINEAR AMPLIFIERS

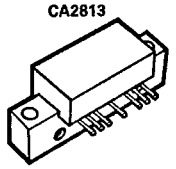
The RF Line
Wideband Linear Amplifiers

. . . 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.

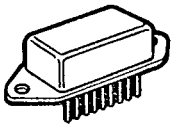
- Specified Characteristics at V_{CC} = 15 V, T_C = 25°C:
  - Frequency Range — 40 to 300 MHz
  - Output Power — 160 mW Typ @ 1 dB Compression, f = 300 MHz
  - Power Gain — 34 dB Typ @ f = 50 MHz
  - PEP — 150 mW Typ @ −32 dB IMD
  - Noise Figure — 5 dB Typ @ f = 300 MHz
- All Gold Metallization for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



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

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	°C
Storage Temperature Range	T_{stg}	−40 to +100	°C

ELECTRICAL CHARACTERISTICS (T_C = 25°C, V_{CC} = 15 V, 75 Ω system unless otherwise noted)

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

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TYPICAL CHARACTERISTICS

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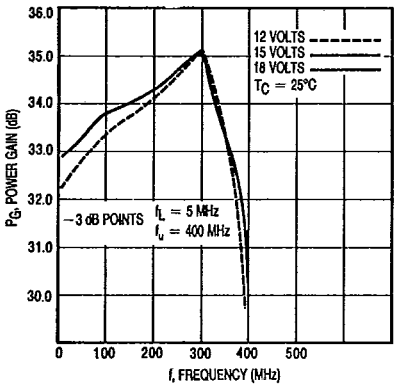

Figure 1. Power Gain versus Frequency

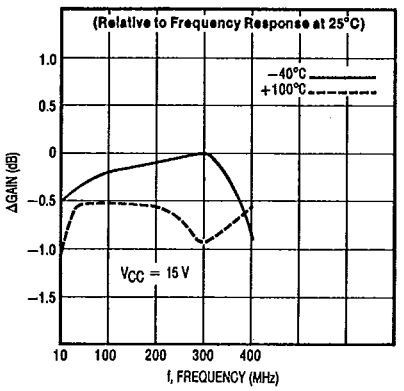

Figure 2. Relative Power Gain versus Temperature

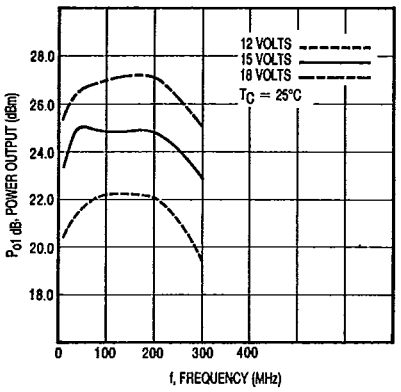

Figure 3. 1 dB Gain Compression versus Voltage

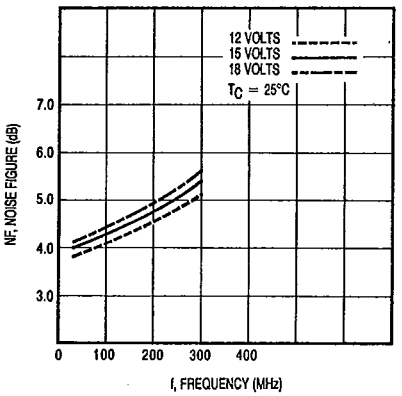

Figure 4. Noise Figure versus Voltage

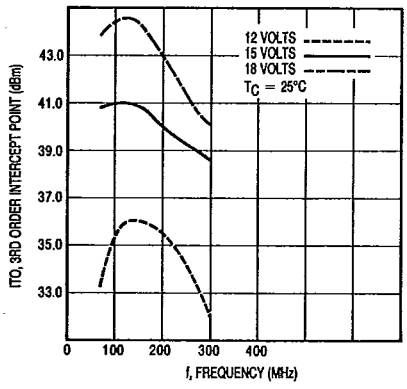

Figure 5. Third Order Intercept versus Voltage

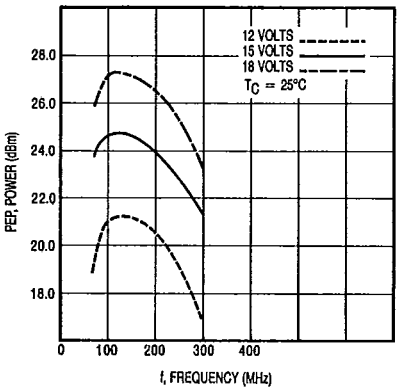

Figure 6. Peak Envelope Power versus Voltage

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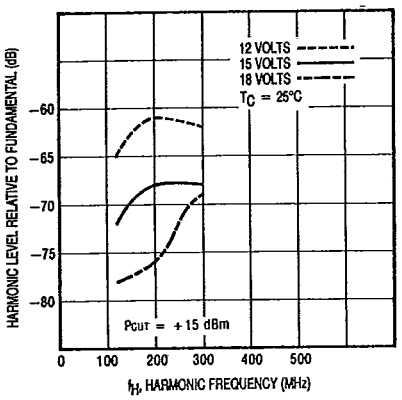


Figure 7. Second Harmonic Distortion versus Voltage

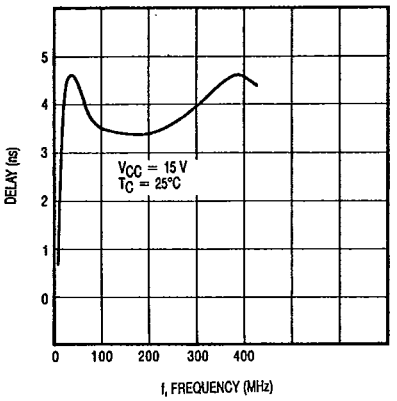


Figure 8. Group Delay versus Frequency

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	22.6
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

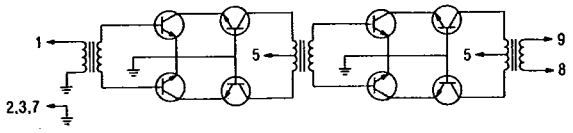
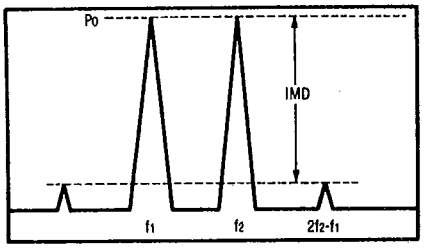


Figure 10. Functional Schematic



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

PEP = 4X P_o @ IMD = -32dB

Figure 11. Intermodulation Test