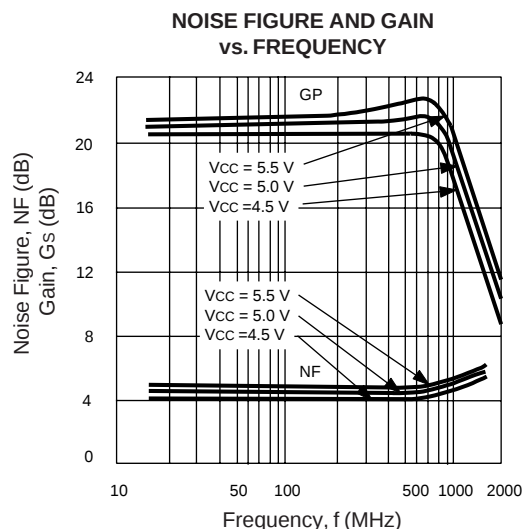


FEATURES

- **FLAT GAIN:** $\Delta G_P = \pm 1$ dB TYP from 100 to 700 MHz
- **1000 MHz FREQUENCY RESPONSE AT 3 dB DOWN**
- **21 dB POWER GAIN AT 500 MHz**
- **SINGLE 5 VOLT SUPPLY**
- **NO EXTERNAL BIAS COMPONENTS REQUIRED**
- **LOW COST PACKAGE**
- **50 Ω GAIN BLOCK**
- **AVAILABLE IN TAPE AND REEL**



DESCRIPTION

The UPC1688G is a silicon monolithic integrated circuit specifically designed as a flat gain, wide band amplifier covering the HF through the UHF band. It is particularly suited for low cost high performance amplifier applications.

NEC's stringent quality assurance and test procedures ensure the highest reliability and performance.

ELECTRICAL CHARACTERISTICS (T_A = 25°C, V_{CC} = 5 V, f = 500 MHz, Z_S = Z_L = 50 Ω)

PART NUMBER PACKAGE OUTLINE			UPC1688G 39		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
I _{CC}	Circuit Current	mA	14	19	24
G _P	Power Gain	dB	18	21	23
P _{SAT}	Saturated Output Power, P _{IN} = -5 dBm	dBm	2	4	
NF	Noise Figure	dB		4	5.5
BW	Bandwidth at 3 dB down below the gain at 100 MHz	MHz	900	1100	
ISOL	Isolation	dB	23	27	
RL _{IN}	Input Return Loss	dB	10	13	
RL _{OUT}	Output Return Loss	dB	10	13	

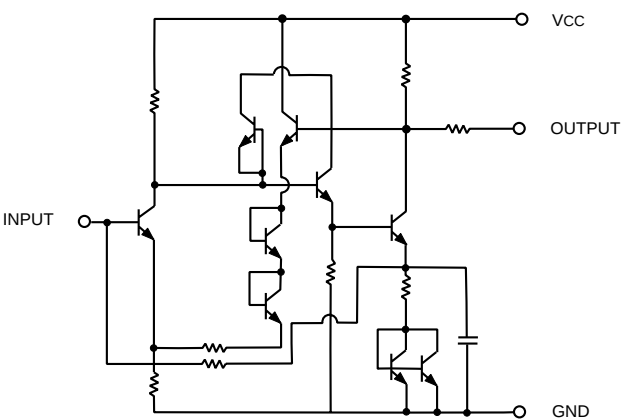
ABSOLUTE MAXIMUM RATINGS¹ (T_A = 25°C)

SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CC}	Supply Voltage	V	6
P _{IN}	Input Power	dBm	+10
P _T	Total Power Dissipation ²	mW	200
T _{OP}	Operating Temperature	°C	-40 to +85
T _{STG}	Storage Temperature	°C	-55 to +150

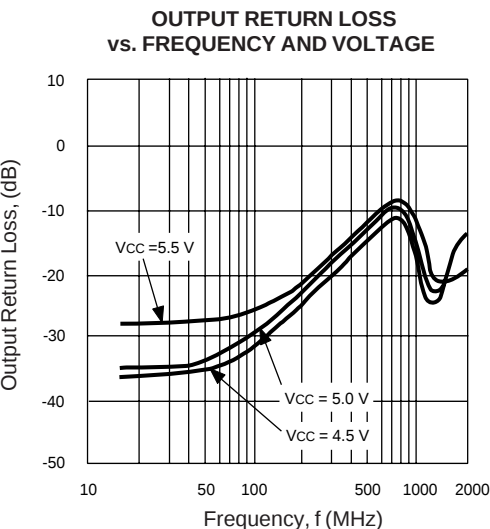
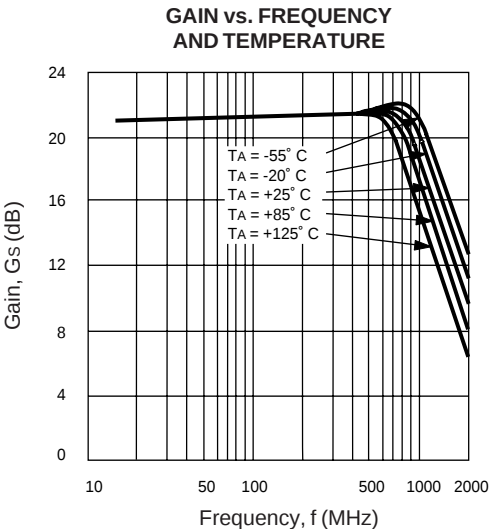
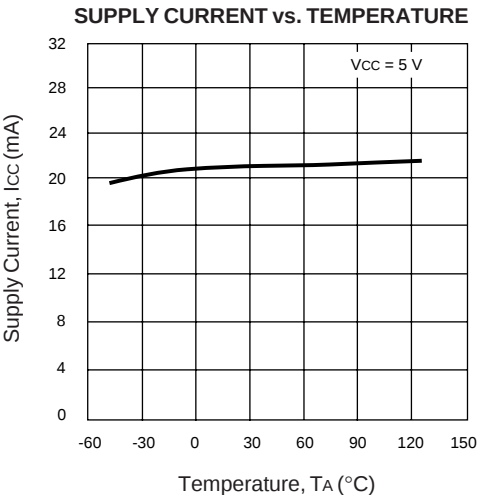
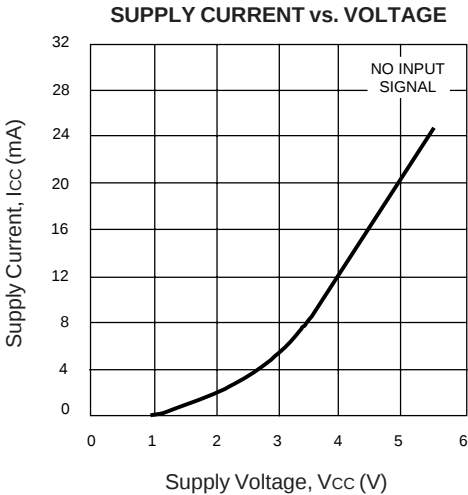
Notes:

1. Operation in excess of any one of these parameters may result in permanent damage.
2. At T_A = +85°C.

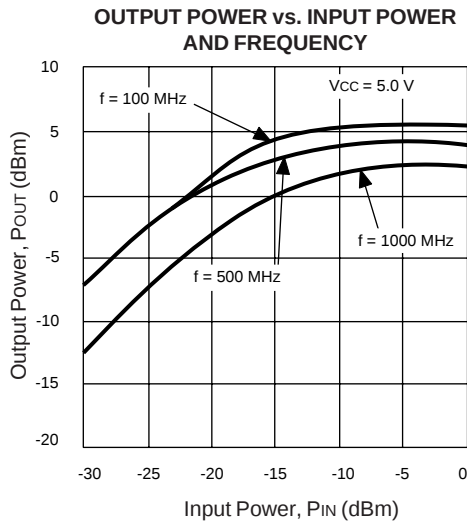
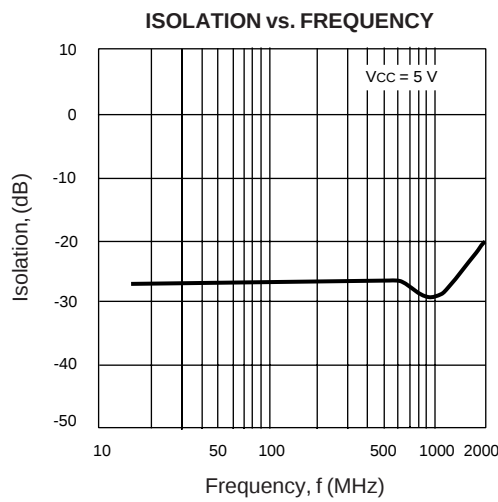
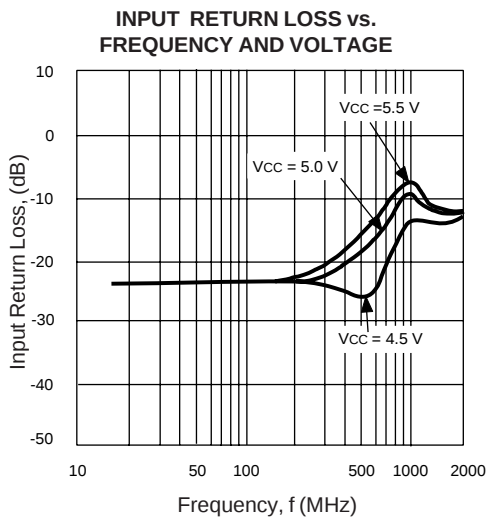
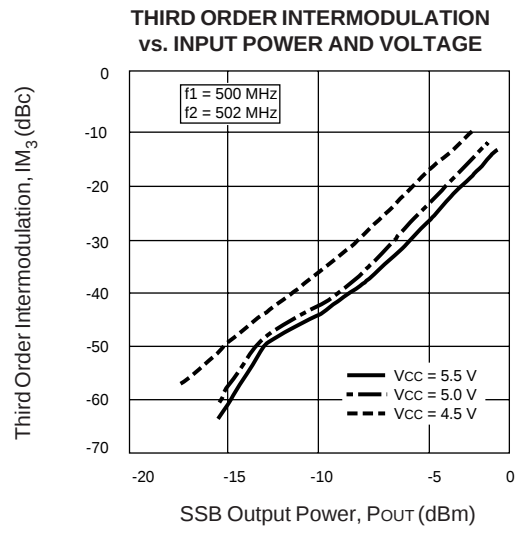
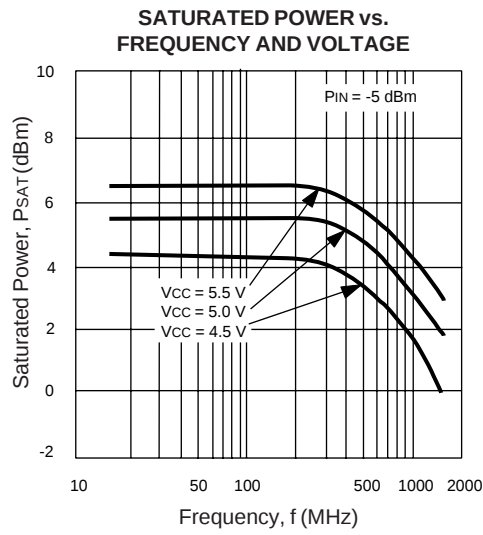
EQUIVALENT CIRCUIT



TYPICAL PERFORMANCE CURVES (T_A = 25°C)



TYPICAL PERFORMANCE CURVES (T_A = 25°C)



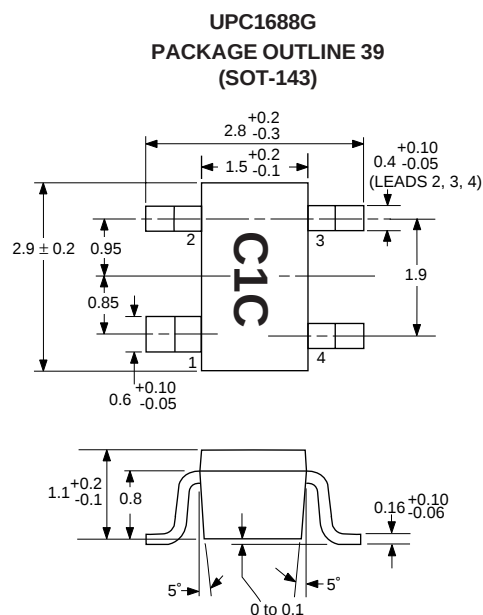
TYPICAL SCATTERING PARAMETERS (T_A = 25°C)

UPC1688G:

V_{CC} = 5.0 V, I_{CC} = 19 mA

FREQUENCY	S ₁₁		S ₂₁		S ₁₂		S ₂₂		k	S ₂₁
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		dB
0.10	0.102	-85.7	11.040	-13.7	0.042	3.2	0.073	-132.3	1.30	20.9
0.20	0.161	-102.3	11.632	-31.0	0.043	-0.3	0.089	-148.8	1.23	21.3
0.30	0.237	-110.4	12.054	-48.4	0.044	-1.1	0.100	-156.0	1.17	21.6
0.40	0.292	-116.9	12.328	-62.8	0.046	-1.0	0.111	174.0	1.10	21.8
0.50	0.344	-123.9	12.515	-80.8	0.048	8.4	0.136	108.1	1.00	21.9
0.60	0.353	-135.4	12.578	-102.2	0.050	2.2	0.153	47.3	0.94	22.0
0.70	0.348	-152.8	12.466	-124.5	0.053	-1.7	0.172	-16.6	0.93	21.9
0.80	0.301	-165.8	11.899	-148.8	0.055	-7.6	0.192	-37.5	0.96	21.5
0.90	0.217	-175.0	10.564	-172.3	0.057	-11.6	0.222	-60.5	1.02	20.5
1.00	0.113	-169.8	8.983	166.8	0.056	-15.9	0.270	-75.8	1.14	19.1
1.10	0.081	-116.2	7.466	147.5	0.056	-18.3	0.318	-90.6	1.25	17.5
1.20	0.139	-87.2	6.170	130.7	0.053	-19.6	0.350	-102.4	1.45	15.8
1.30	0.219	-82.3	5.177	117.2	0.053	-19.6	0.374	-112.9	1.60	14.3
1.40	0.278	-83.6	4.330	104.5	0.053	-23.2	0.385	-121.6	1.80	12.7
1.50	0.327	-86.8	3.684	93.2	0.054	-24.4	0.390	-129.1	1.97	11.3
1.60	0.366	-89.6	3.161	82.5	0.055	-24.2	0.387	-135.1	2.17	10.0
1.70	0.399	-91.6	2.742	73.3	0.055	-27.2	0.380	-141.0	2.44	8.8
1.80	0.436	-94.8	2.423	64.1	0.056	-28.3	0.371	-145.9	2.62	7.7
1.90	0.452	-96.7	2.178	56.3	0.057	-29.0	0.352	-149.8	2.86	6.8
2.00	0.465	-99.0	1.991	47.7	0.058	-30.4	0.339	-153.0	3.06	6.0
2.10	0.486	-99.3	1.814	39.4	0.059	-28.4	0.319	-155.3	3.27	5.2

OUTLINE DIMENSIONS (Units in mm)



PIN
CONFIGURATIONS

1. GND
2. OUTPUT
3. V_{CC}
4. INPUT

Note:
All dimensions are typical unless otherwise specified.

ORDERING INFORMATION

PART NUMBER	QTY
UPC1688G-TI	3000/REEL

EXCLUSIVE NORTH AMERICAN AGENT FOR **NEC** RF, MICROWAVE & OPTOELECTRONIC SEMICONDUCTORS

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