

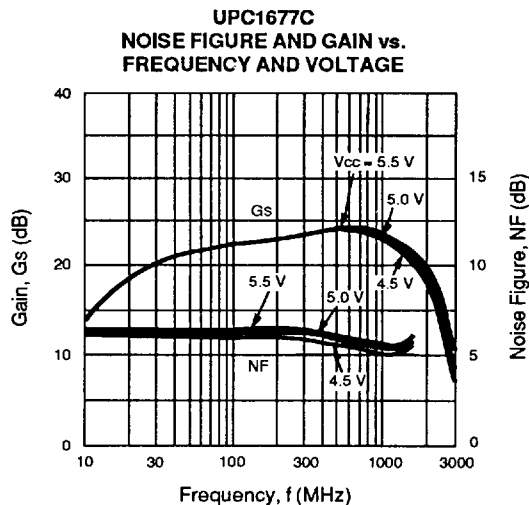
FEATURES

- **HIGH POWER OUTPUT:** +19.5 dBm
- **EXCELLENT FREQUENCY RESPONSE:**
1.7 GHz Typ at 3 dB Down
- **HIGH POWER GAIN:** 24 dB Typ at 500 MHz
- **SINGLE SUPPLY VOLTAGE:** 5 V

DESCRIPTION

The UPC1677 is a silicon monolithic integrated circuit designed as a wide-band amplifier covering the HF to UHF bands. The device features high output power, 19.5 dBm typical, high gain, 24 dB typical and operates from a single 5 volt supply. The UPC1677 is available in two package styles: an 8 lead ceramic flat package (UPC1677B) and an 8 pin DIP (UPC1677C).

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



ELECTRICAL CHARACTERISTICS (TA = 25°C, Vcc = 5 V, f = 500 MHz)

PART NUMBER PACKAGE OUTLINE			UPC1677B, UPC1677C B08, C08		
SYMBOLS	PARAMETERS AND CONDITIONS	UNITS	MIN	TYP	MAX
Icc	Circuit Current (No Input)	mA	63	77	93
Gs	Small Signal Gain	dB	22	24	26
PsAT	Saturated Power	dBm	17.5	19.5	
BW	Bandwidth at 3 dB down below the gain at 100 MHz	MHz	1500	1800	
NF	Noise Figure	dB		6	8
RLIN	Input Return Loss (UPC1677B)	dB		18	
RLOUT	Output Return Loss (UPC1677B)	dB		3	
RLIN	Input Return Loss (UPC1677C)	dB	10	13	
RLOUT	Output Return Loss at (UPC1677C)	dB	1	4	
ISOL	Isolation	dB	29	34	
ΔGt	Gain Temperature Coefficient	dB/°C		-0.003	
RTH (J-A) ¹	Thermal Resistance (Junction to Ambient) UPC1677B UPC1677C	°C/W °C/W			200 65
RTH (J-C)	Thermal Resistance (Junction to Case) UPC1677B	°C/W			50

Note:

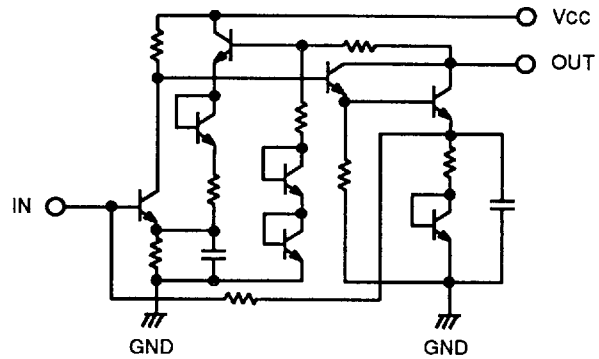
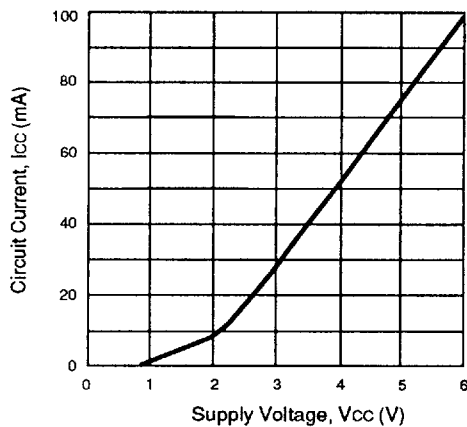
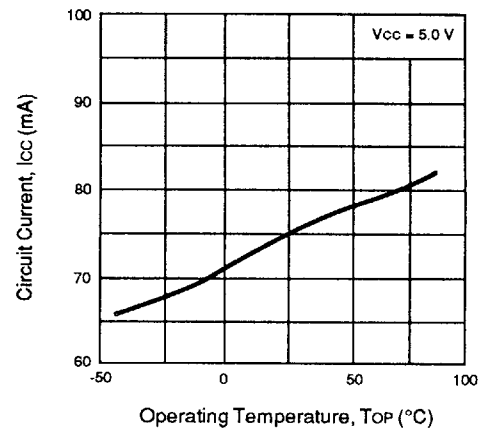
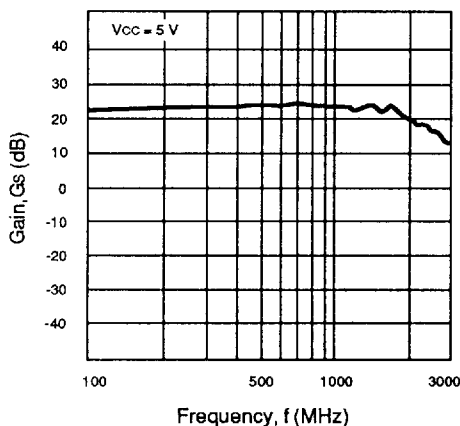
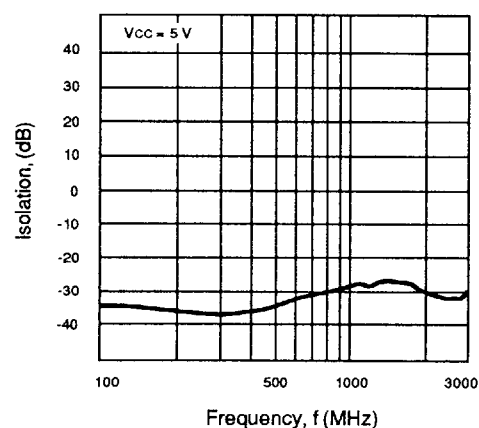
1. Mounted on a 5 cm X 5 cm X .16 mm circuit board.

ABSOLUTE MAXIMUM RATINGS¹ ($T_A = 25^\circ\text{C}$)

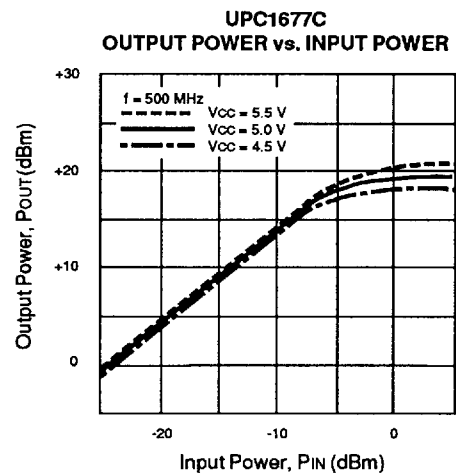
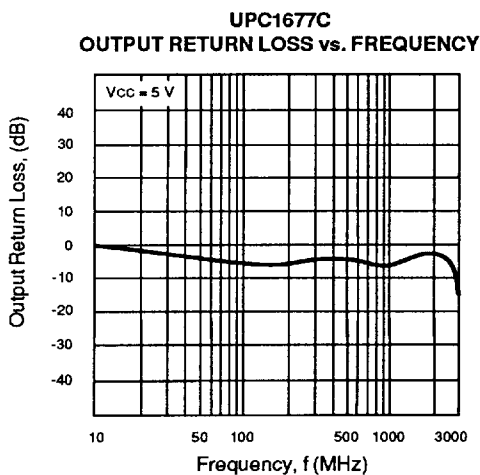
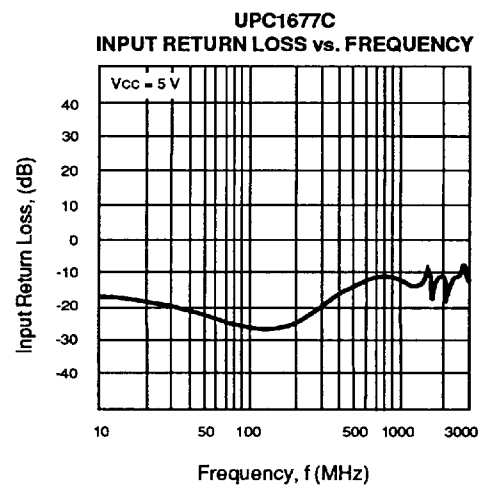
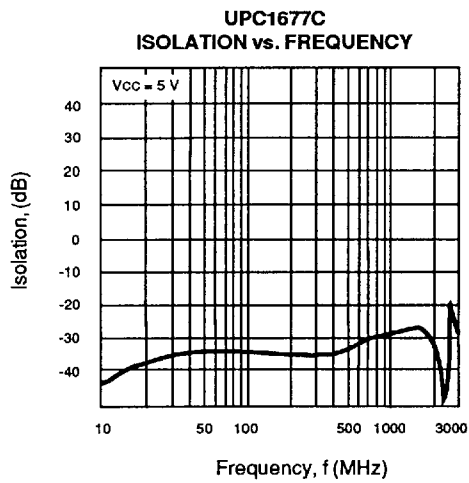
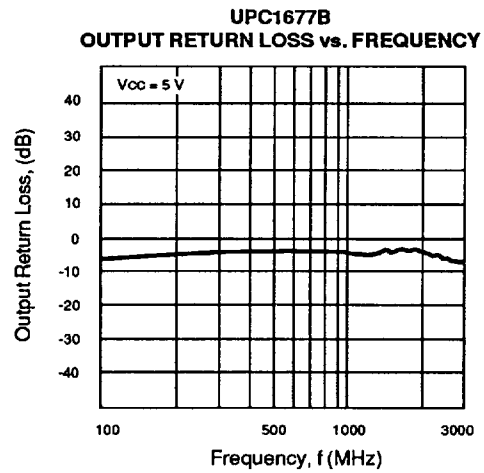
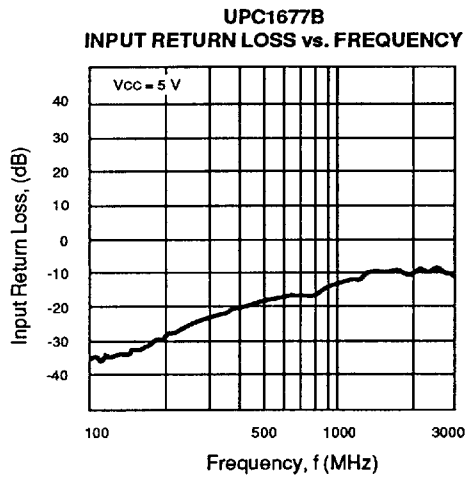
SYMBOLS	PARAMETERS	UNITS	RATINGS
V _{CC}	Power Supply Voltage	V	6
I _{CC}	Supply Current	mA	110
P _T	Total Power Dissipation ² UPC1677B UPC1677C	W mW	1.5 750
P _{IN}	Input Power	dBm	+10
T _{OP}	Operating Temperature UPC1677B UPC1677C	$^\circ\text{C}$ $^\circ\text{C}$	-55 to +150 -45 to +85
T _{STG}	Storage Temperature UPC1677B UPC1677C	$^\circ\text{C}$ $^\circ\text{C}$	-65 to +200 -55 to +150

Notes:

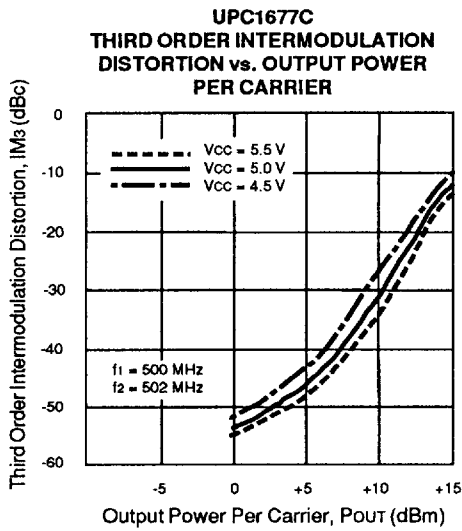
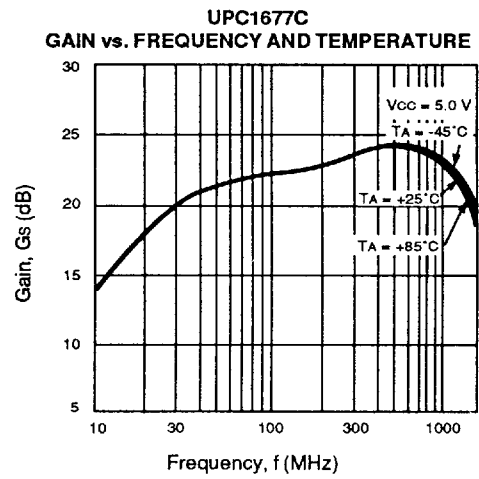
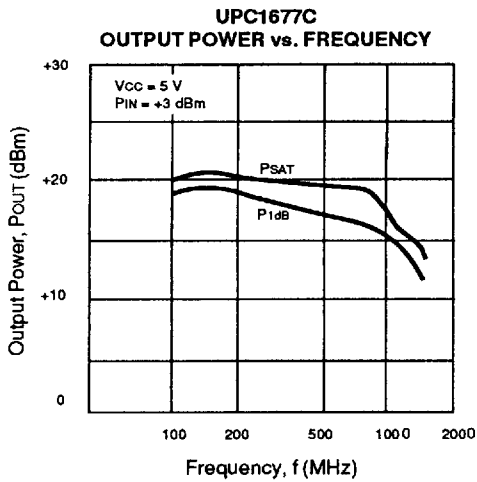
- Operation in excess of any one of these parameters may result in permanent damage.
- Mounted on 5 cm x 5 cm x 1.6 mm glass epoxy circuit board at T_A = maximum operating temperature.

EQUIVALENT CIRCUIT**TYPICAL PERFORMANCE CURVES** ($T_A = 25^\circ\text{C}$)**CIRCUIT CURRENT vs. SUPPLY VOLTAGE****CIRCUIT CURRENT vs. OPERATING TEMPERATURE****UPC1677B
INSERTION GAIN vs. FREQUENCY****UPC1677B
ISOLATION vs. FREQUENCY**

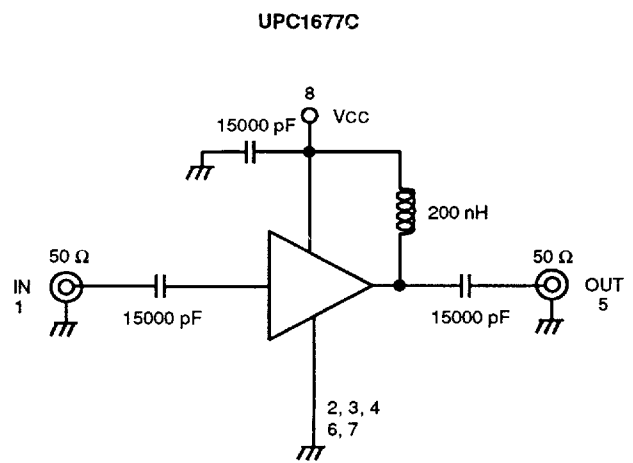
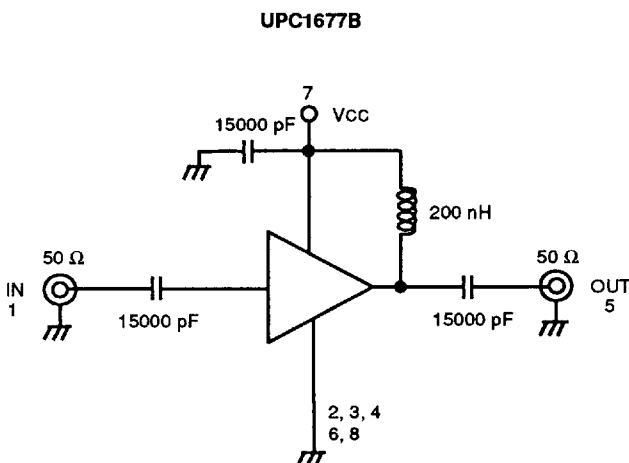
TYPICAL PERFORMANCE CURVES ($T_A = 25^\circ\text{C}$)



TYPICAL PERFORMANCE CURVES (TA = 25°C)



TEST CIRCUIT



UPC1677B, UPC1677C

TYPICAL SCATTERING PARAMETERS (TA = 25°C)

UPC1677B

Vcc = 5 V, Icc = 77 mA

FREQUENCY MHz	S11		S21		S12		S22		K	S21 dB
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		
50	0.093	121.9	10.68	35.8	0.016	33.1	0.721	95.2	1.54	20.6
100	0.044	95.4	13.01	13.1	0.018	18.3	0.577	51.2	1.55	22.3
200	0.034	85.5	14.22	-6.9	0.017	3.7	0.564	13.5	1.53	23.1
400	0.054	75.5	15.61	-37.3	0.014	12.4	0.668	-31.0	1.36	23.9
600	0.095	41.7	15.47	-67.0	0.020	24.3	0.712	-68.1	0.88	23.8
800	0.138	-7.9	14.55	-92.8	0.027	18.7	0.702	-97.3	0.75	23.3
1000	0.181	-47.5	13.79	-116.4	0.033	5.7	0.689	-120.4	0.72	22.8
1200	0.220	-79.1	13.22	-140.4	0.035	-0.8	0.700	-140.9	0.73	22.4
1400	0.272	-107.7	12.91	-163.0	0.039	-13.9	0.707	-159.0	0.71	22.2
1600	0.310	-135.9	12.45	171.8	0.04	-26.5	0.727	-179.9	0.71	21.9
1800	0.339	-158.7	11.12	144.0	0.040	-39.9	0.736	157.4	0.74	21.0
2000	0.369	165.1	10.68	118.8	0.040	-51.2	0.684	134.0	0.91	20.6
2200	0.346	137.6	9.00	93.0	0.038	-65.0	0.615	108.5	1.14	19.1
2400	0.317	112.0	7.58	68.3	0.033	-74.2	0.512	82.3	1.60	17.6

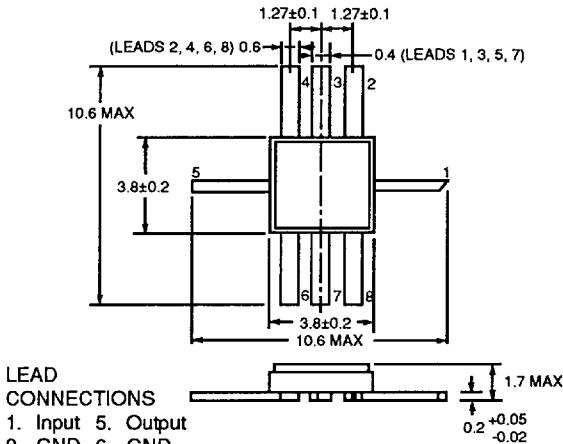
UPC1677C

Vcc = 5 V, Icc = 77 mA

FREQUENCY MHz	S11		S21		S12		S22		K	S21 dB
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG		
100	0.035	77	13.34	2	0.019	6	0.560	42	1.49	22.5
200	0.037	93	14.69	-29	0.015	-17	0.590	0	1.60	23.3
400	0.130	53	15.87	-84	0.014	-13	0.660	-60	1.36	24.0
600	0.203	2	15.35	-135	0.023	-29	0.630	-111	0.92	23.7
800	0.235	-43	14.25	176	0.028	-58	0.566	-155	0.91	23.1
1000	0.241	-83	13.33	131	0.032	-88	0.524	165	0.92	22.5
1200	0.227	-118	12.21	82	0.036	-119	0.558	123	0.87	21.7
1400	0.188	-167	12.38	39	0.040	-144	0.535	83	0.85	21.9
1600	0.131	147	11.52	-9	0.042	-178	0.567	33	0.86	21.2
1800	0.126	115	9.96	-60	0.043	145	0.569	-21	0.92	20.0
2000	0.174	-26	8.85	-105	0.037	125	0.557	-78	1.24	18.9
2200	0.304	-77	7.38	-154	0.032	76	0.627	-129	1.40	17.4
2400	0.402	-123	5.76	156	0.022	55	0.653	177	2.20	15.2

OUTLINE DIMENSIONS (Units in mm)

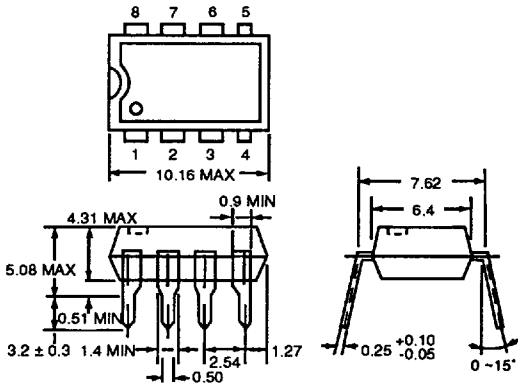
UPC1677B
PACKAGE OUTLINE B08



Note:
All dimensions are typical unless otherwise specified.

5-78

UPC1677C
PACKAGE OUTLINE C08



PIN
CONNECTIONS
1. Input 5. Output
2. GND 6. GND
3. GND 7. GND
4. GND 8. Vcc

6427525 0065874 50T