CEL

BIPOLAR ANALOG INTEGRATED CIRCUITS

UPC2711TB, UPC2712TB

5 V, SUPER MINIMOLD SILICON MMIC WIDEBAND AMPLIFIER

FEATURES

- **HIGH DENSITY SURFACE MOUNTING:** 6 pin super minimold or SOT- 363 package
- **SUPPLY VOLTAGE:** V_{CC} = 4.5 to 5.5 V
- **WIDEBAND RESPONSE:**
  UPC2711TB: fu = 2.9 GHz TYP
  UPC2712TB: fu = 2.6 GHz TYP
- **POWER GAIN:**
  UPC2711TB: G_P = 13 dB TYP
  UPC2712TB: G_P = 20 dB TYP

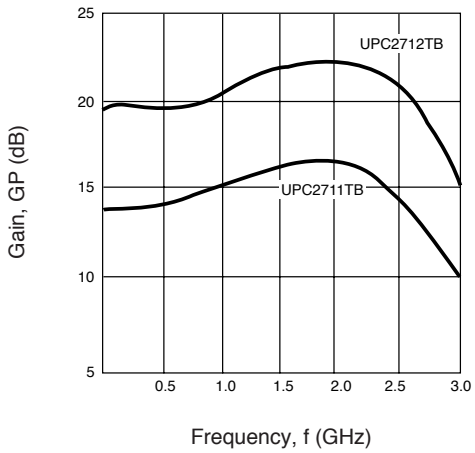
DESCRIPTION

The UPC2711TB and UPC2712TB are Silicon MMIC Wideband Amplifiers manufactured using NEC's 20 GHz f_T NESAT™ III silicon bipolar process. These devices are designed for use as buffer amps in DBS tuners. The UPC2711/12TB are pin compatible and have comparable performance as the larger UPC2711/12T, so they are suitable for use as a replacement to help reduce system size. These IC's are housed in a 6 pin super minimold or SOT-363 package.

Stringent quality assurance and test procedure ensure the highest reliability and performance.

TYPICAL PERFORMANCE CURVES

GAIN vs. FREQUENCY



ELECTRICAL CHARACTERISTICS (T_A = +25 °C, V_{CC} = 5.0 V, Z_L = Z_S = 50 W)

PART NUMBER PACKAGE OUTLINE			UPC2711TB S06			UPC2712TB S06		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**	**MIN**	**TYP**	**MAX**
I_{CC}	Circuit Current (no signal)	mA	9	12	15	9	12	15
G_P	Power Gain, f = 1 GHz	dB	11	13	16.5	18	20	23.5
fU	Upper Limit Operating Frequency (The gain at fU is 3 dB down from the gain at 100 MHz)	GHz	2.7	2.9		2.2	2.6	
ΔG_P	Gain Flatness, f = 0.1 GHz to 2.5 GHz	dB		±0.8			±0.8	
$P_{O(SAT)}$	Maximum Output Level, f = 1 GHz, P_{IN} = 0 dBm	dBm	-2	+1		0	+3	
NF	Noise Figure, f = 1 GHz	dB		5	6.5		4.5	6
RL_{IN}	Input Return Loss, f = 1 GHz	dB	20	25		9	12	
RL_{OUT}	Output Return Loss, f = 1 GHz	dB	9	12		10	13	
ISOL	Isolation, f = 1 GHz	dB	25	30		28	33	

Date Published: June 22, 2005

ABSOLUTE MAXIMUM RATINGS[1] (T_A = 25°C)

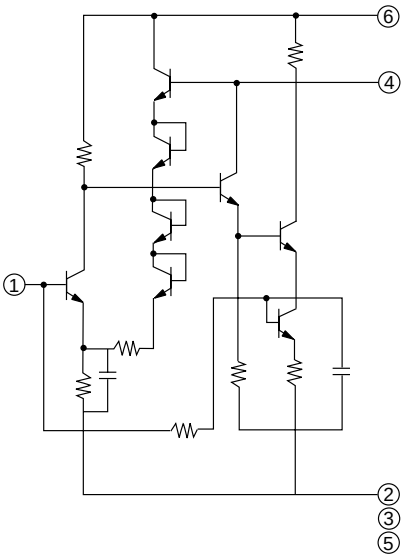
SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CC}	Supply Voltage	V	6
P_{IN}	Input Power	dBm	+10
P_T	Total Power Dissipation[2]	mW	200
T_{OP}	Operating Temperature	°C	-45 to +85
T_{STG}	Storage Temperature	°C	-55 to +150

Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on double sided copper clad 50 x 50 x 1.6 mm epoxy glass PWB (T_A = +85°C).

RECOMMENDED OPERATING CONDITIONS

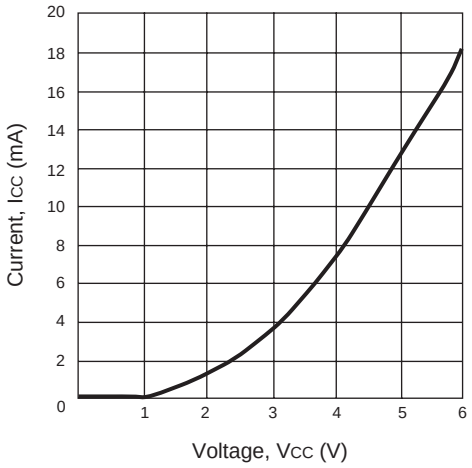
SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX
V_{CC}	Supply Voltage	V	4.5	5.0	5.5
T_{OP}	Operating Temperature	˚C	-40	+25	+85

PIN DESCRIPTION

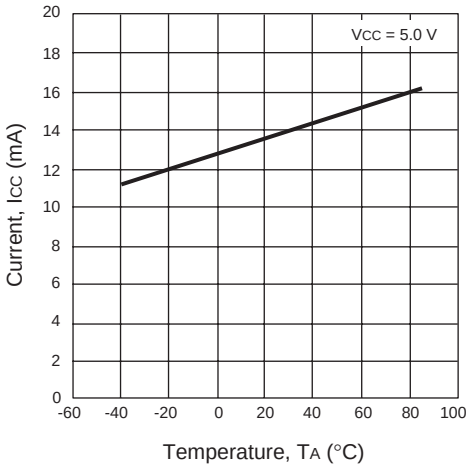
Pin No.	Pin Name	Applied Voltage (V)	Description	Internal Equivalent Circuit
1	Input		Signal input pin. An internal matching circuit, configured with resistors, enables 50 Ω connection over a wide bandwidth. A multi-feedback circuit is designed to cancel the deviations of h_{FE} and resistance. This pin must be coupled to the signal source with a blocking capacitor.	
4	Output		Signal output pin. An internal matching circuit, configured with resistors, enables 50 Ω connection over a wide bandwidth. This pin must be coupled to the output load with a blocking capacitor.	
6	V_{CC}	4.5 to 5.5	Power supply pin. This pin should be externally equipped with a bypass capacitor to minimize ground impedance.	
2 3 5	GND	0	Ground pin. This pin should be connected to system ground with minimum inductance. Ground pattern on the board should be formed as wide as possible. All the ground pins must be connected together with wide ground pattern to minimize impedance difference.	

TYPICAL PERFORMANCE CURVES (T_A = 25°C)

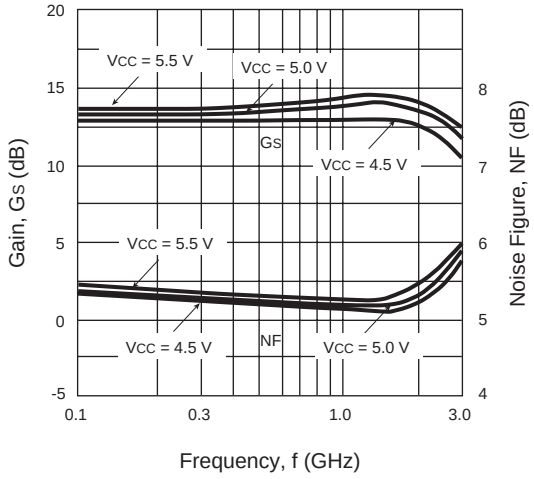
UPC2711TB
CURRENT vs. VOLTAGE



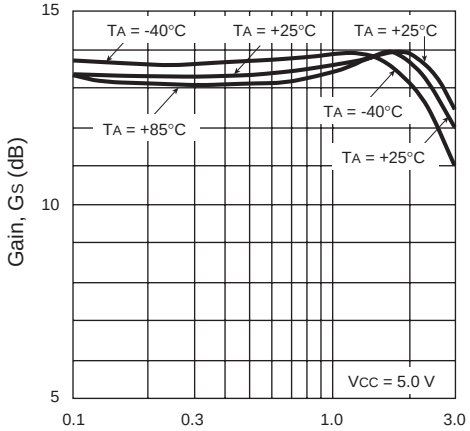
UPC2711TB
CURRENT vs. TEMPERATURE



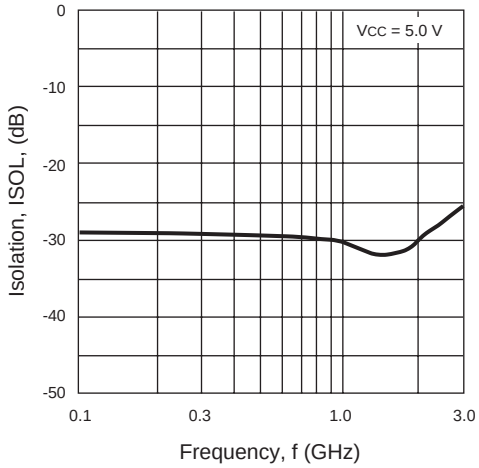
UPC2711TB
GAIN AND NOISE FIGURE vs.
FREQUENCY AND VOLTAGE



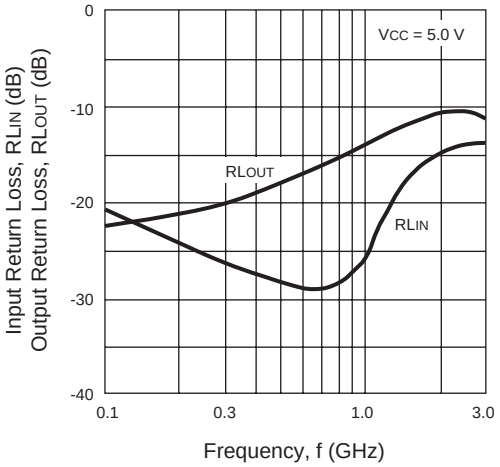
UPC2711TB
GAIN vs. FREQUENCY AND
TEMPERATURE



UPC2711TB
ISOLATION vs. FREQUENCY

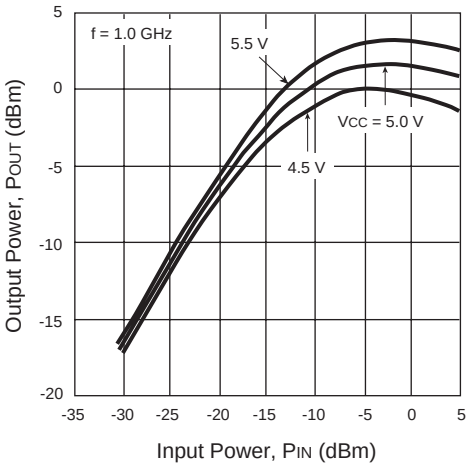


UPC2711TB
INPUT RETURN LOSS AND
OUTPUT RETURN LOSS vs. FREQUENCY

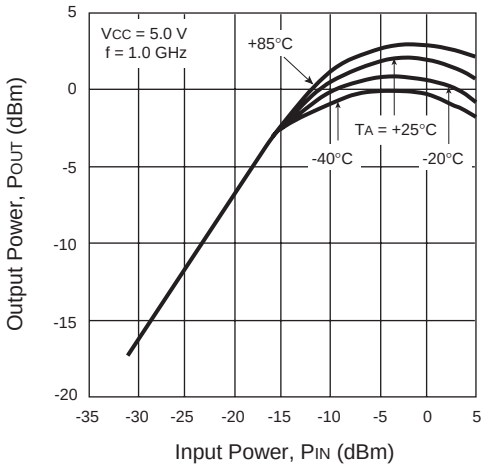


TYPICAL PERFORMANCE CURVES (T_A = 25°C)

UPC2711TB
OUTPUT POWER vs.
INPUT POWER VOLTAGE



UPC2711TB
OUTPUT POWER vs.
INPUT POWER AND TEMPERATURE



UPC2711TB
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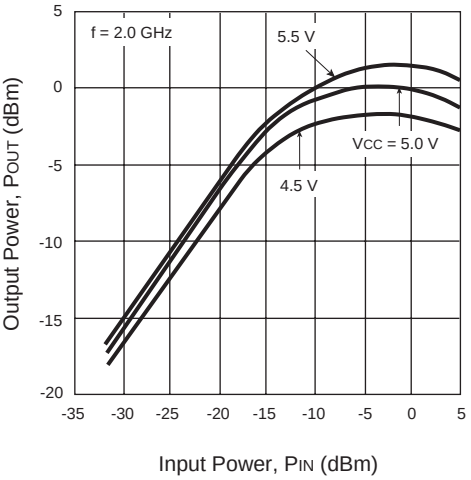
INPUT POWER AND VOLTAGE



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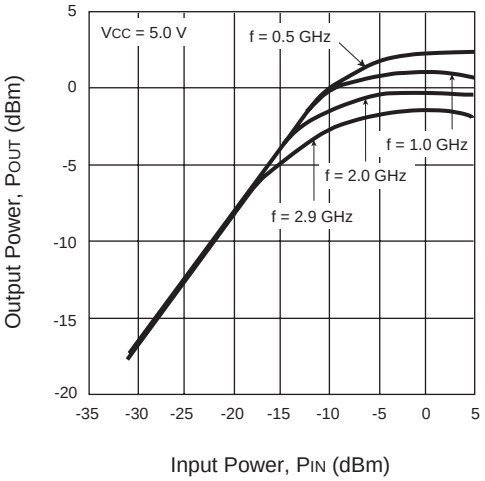
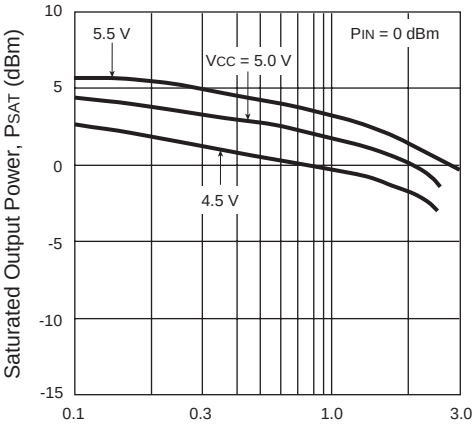
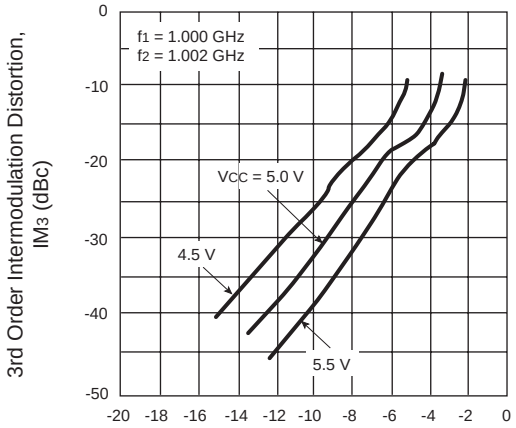
OUTPUT POWER vs.
INPUT POWER AND FREQUENCY



UPC2711TB
SATURATED OUTPUT POWER vs.
FREQUENCY AND VOLTAGE

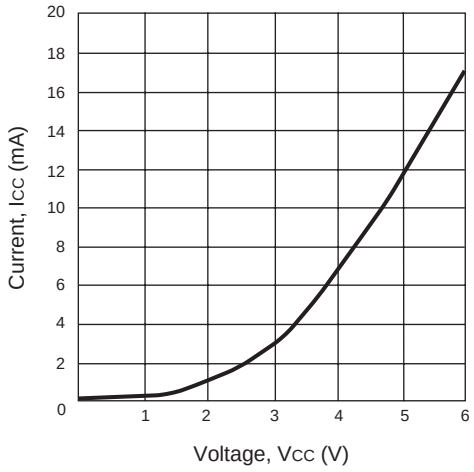


UPC2711TB
3RD ORDER INTERMODULATION
DISTORTION vs. OUTPUT POWER
AND VOLTAGE

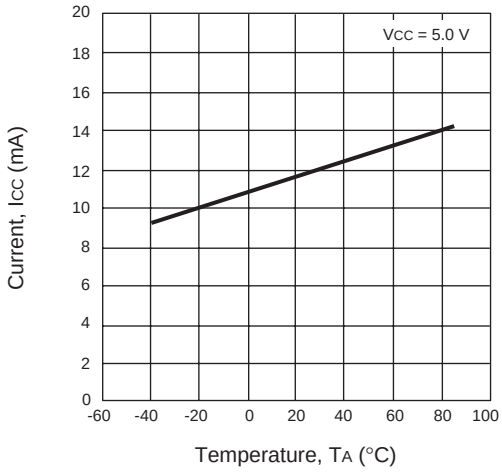


TYPICAL PERFORMANCE CURVES (T_A = 25°C)

UPC2712TB
CURRENT vs. VOLTAGE



UPC2712TB
CURRENT vs. TEMPERATURE



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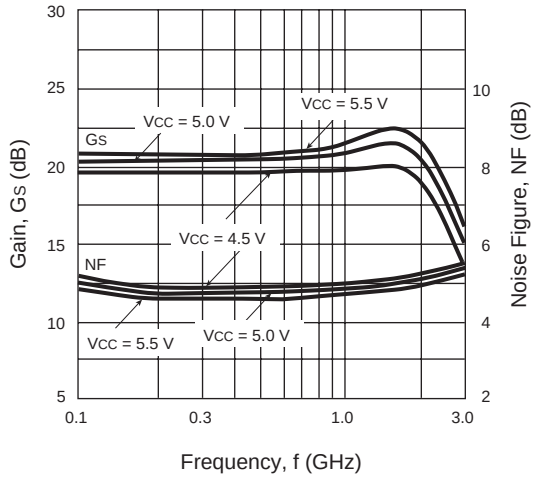
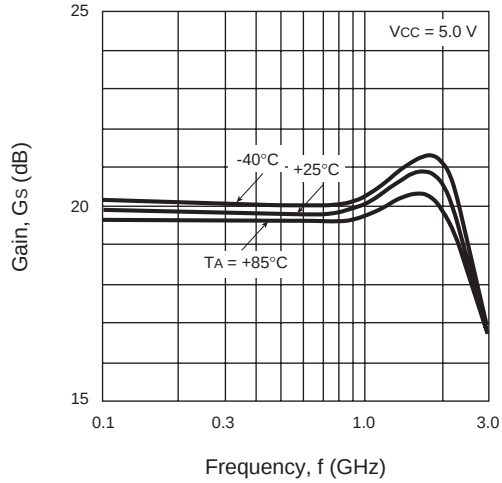
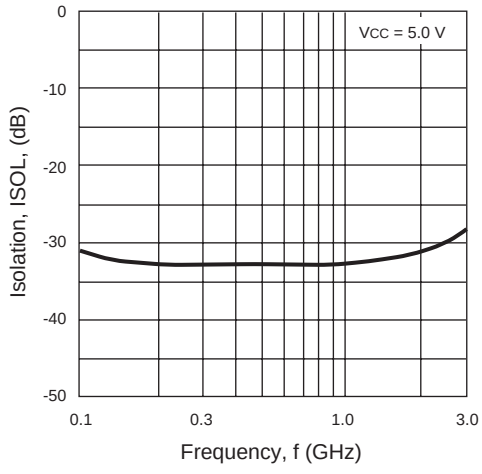
GAIN AND NOISE FIGURE vs.
FREQUENCY AND VOLTAGE



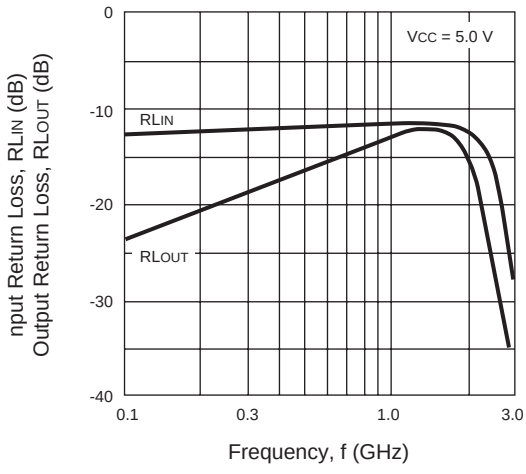
UPC2712TB
GAIN vs.
FREQUENCY AND TEMPERATURE



UPC2712TB
ISOLATION vs. FREQUENCY

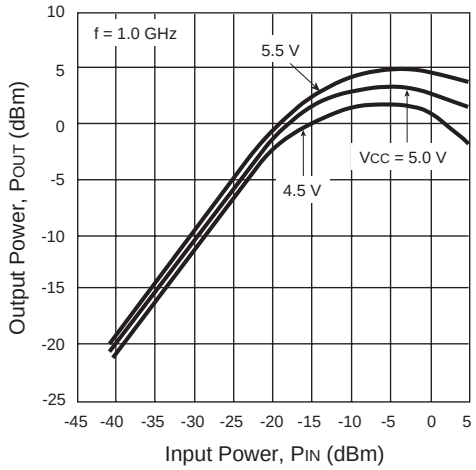


UPC2712TB
INPUT RETURN LOSS AND OUTPUT
RETURN LOSS vs. FREQUENCY



TYPICAL PERFORMANCE CURVES (T_A = 25°C)

UPC2712TB
OUTPUT POWER vs.
INPUT POWER VOLTAGE



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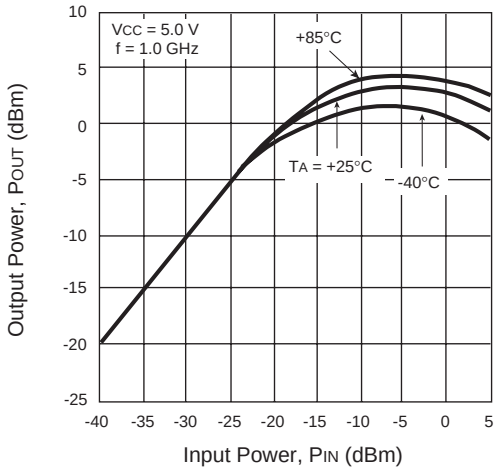

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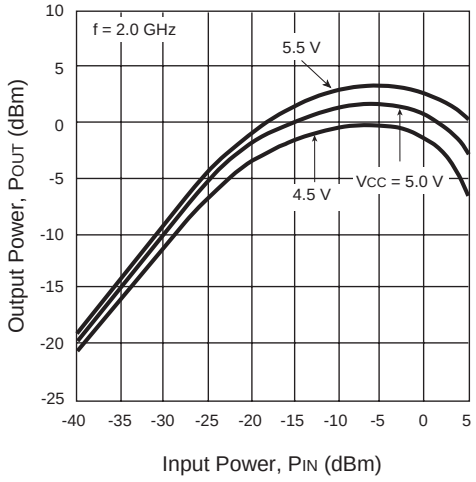

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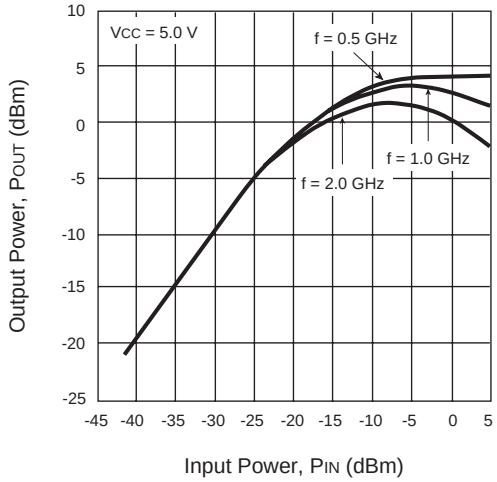
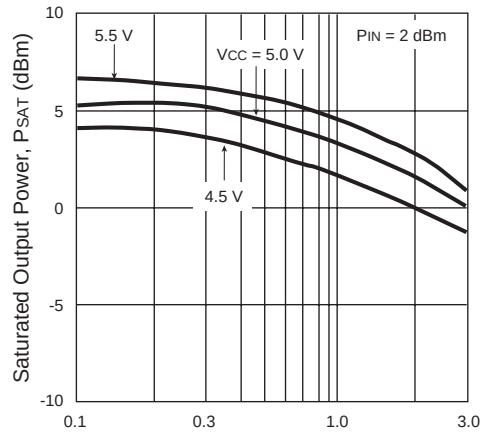


UPC2712TB
SATURATED OUTPUT POWER vs.
FREQUENCY AND VOLTAGE



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DISTORTION vs. OUTPUT POWER
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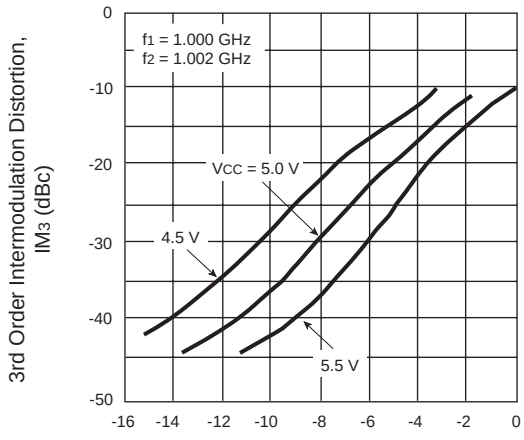


TYPICAL SCATTERING PARAMETERS (T_A = 25°C)

UPC2711TB
V_{CC} = 5 V, I_{CC} = 13.8 mA

FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}		K
(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
100.00	0.085	-22.40	4.447	-14.90	0.035	-12.70	0.113	-3.10	3.18
200.00	0.086	-25.00	4.468	-30.10	0.035	-23.00	0.119	1.20	3.21
300.00	0.098	-29.20	4.491	-44.90	0.034	-32.10	0.136	1.60	3.23
400.00	0.081	-29.40	4.510	-60.30	0.033	-42.50	0.142	6.50	3.34
500.00	0.066	-33.90	4.540	-74.90	0.033	-50.10	0.156	10.10	3.32
600.00	0.041	-54.50	4.572	-90.20	0.033	-59.60	0.161	12.70	3.34
700.00	0.053	-104.30	4.624	-105.30	0.032	-69.30	0.161	8.80	3.33
800.00	0.070	-119.70	4.664	-120.70	0.031	-78.40	0.176	6.20	3.36
900.00	0.098	-121.90	4.729	-136.10	0.032	-86.60	0.192	1.90	3.27
1000.00	0.101	-112.50	4.781	-152.00	0.031	-94.90	0.228	0.10	3.29
1100.00	0.090	-108.50	4.843	-167.90	0.031	-103.90	0.256	-0.60	3.15
1200.00	0.060	-95.60	4.945	175.80	0.029	-111.00	0.290	-1.10	3.24
1300.00	0.019	-79.20	4.999	159.50	0.029	-120.20	0.308	-0.30	3.16
1400.00	0.023	54.80	5.062	143.00	0.028	-128.90	0.322	-1.40	3.18
1500.00	0.062	80.70	5.114	126.40	0.029	-133.10	0.327	-2.20	3.08
1600.00	0.087	80.40	5.142	109.50	0.029	-140.90	0.333	-4.80	3.07
1700.00	0.113	78.70	5.160	92.70	0.029	-146.20	0.344	-7.00	3.02
1800.00	0.126	72.00	5.146	75.40	0.030	-151.40	0.356	-9.70	2.88
1900.00	0.154	63.50	5.123	58.00	0.032	-159.70	0.371	-11.10	2.70
2000.00	0.178	59.00	5.113	41.30	0.035	-168.30	0.378	-12.00	2.51
2100.00	0.212	54.20	5.063	24.00	0.036	-175.70	0.383	-12.80	2.39
2200.00	0.232	55.20	5.006	6.90	0.038	175.20	0.378	-13.60	2.27
2300.00	0.246	53.80	4.954	-10.40	0.041	165.20	0.367	-16.10	2.13
2400.00	0.248	53.60	4.865	-27.70	0.045	155.30	0.359	-18.00	1.99
2500.00	0.240	49.20	4.783	-45.00	0.048	143.60	0.356	-21.10	1.88
2600.00	0.238	43.70	4.664	-62.30	0.049	131.20	0.359	-23.60	1.85
2700.00	0.240	36.20	4.529	-79.60	0.052	119.80	0.366	-26.20	1.76
2800.00	0.262	31.70	4.384	-96.60	0.054	108.70	0.374	-28.60	1.72
2900.00	0.285	28.80	4.255	-113.10	0.056	95.50	0.372	-31.10	1.68
3000.00	0.316	29.70	4.117	-129.60	0.057	83.60	0.361	-35.00	1.69

TYPICAL SCATTERING PARAMETERS (T_A = 25°C)

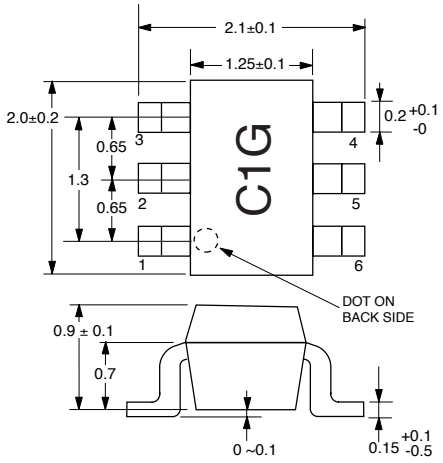
UPC2712TB

V_{CC} = 5 V, I_{CC} = 13.9 mA

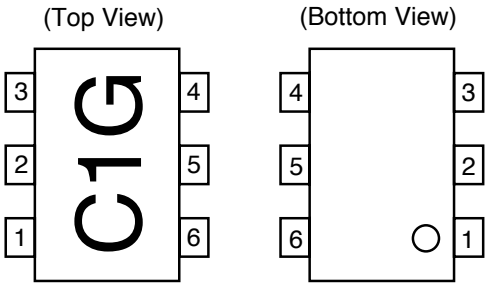
FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}		K
(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
100.00	0.303	-8.10	8.864	-16.70	0.023	-11.40	0.043	2.30	2.32
200.00	0.291	-10.10	8.827	-33.50	0.023	-19.20	0.055	11.50	2.35
300.00	0.295	-11.80	8.936	-49.50	0.022	-25.50	0.078	8.50	2.38
400.00	0.276	-11.30	9.044	-67.60	0.023	-34.60	0.095	13.40	2.33
500.00	0.265	-11.00	9.051	-82.20	0.023	-42.80	0.112	13.60	2.37
600.00	0.243	-12.30	9.096	-98.80	0.023	-50.00	0.120	11.10	2.35
700.00	0.222	-20.30	9.089	-115.20	0.023	-59.80	0.120	1.70	2.37
800.00	0.219	-25.40	9.080	-131.50	0.023	-66.20	0.136	-6.00	2.38
900.00	0.230	-33.90	9.096	-147.60	0.023	-73.00	0.155	-14.40	2.39
1000.00	0.267	-35.50	9.044	-164.20	0.024	-82.90	0.189	-17.50	2.26
1100.00	0.290	-35.50	9.197	179.50	0.024	-89.50	0.212	-19.90	2.12
1200.00	0.316	-33.20	9.421	162.40	0.024	-98.40	0.240	-21.40	2.02
1300.00	0.317	-30.60	9.524	144.90	0.024	-107.00	0.245	-23.20	1.94
1400.00	0.314	-29.40	9.512	126.60	0.026	-115.70	0.248	-27.10	1.82
1500.00	0.296	-28.10	9.574	109.10	0.026	-122.30	0.236	-31.80	1.78
1600.00	0.290	-29.40	9.598	91.10	0.027	-133.20	0.231	-38.00	1.74
1700.00	0.278	-31.10	9.480	72.90	0.028	-139.40	0.221	-43.80	1.72
1800.00	0.282	-34.90	9.372	54.30	0.029	-148.10	0.215	-49.80	1.69
1900.00	0.284	-35.50	9.193	35.60	0.030	-157.60	0.199	-53.00	1.70
2000.00	0.280	-36.60	9.198	18.40	0.031	-167.40	0.170	-55.30	1.69
2100.00	0.273	-36.00	9.011	0.10	0.033	-175.10	0.134	-56.20	1.68
2200.00	0.244	-38.20	8.784	-17.90	0.033	176.50	0.090	-55.20	1.74
2300.00	0.222	-40.00	8.717	-35.10	0.034	164.80	0.050	-53.70	1.74
2400.00	0.189	-45.70	8.388	-52.90	0.036	154.80	0.025	1.80	1.75
2500.00	0.177	-52.90	8.217	-70.10	0.037	143.50	0.039	33.40	1.74
2600.00	0.164	-57.40	7.890	-87.40	0.039	133.30	0.071	39.30	1.72
2700.00	0.158	-59.60	7.597	-104.60	0.041	123.80	0.099	34.30	1.70
2800.00	0.143	-53.90	7.313	-121.40	0.041	114.00	0.131	26.00	1.72
2900.00	0.128	-44.30	7.078	-138.40	0.043	101.40	0.149	22.80	1.70
3000.00	0.111	-22.20	6.086	-154.90	0.046	90.20	0.157	19.40	1.70

OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S06



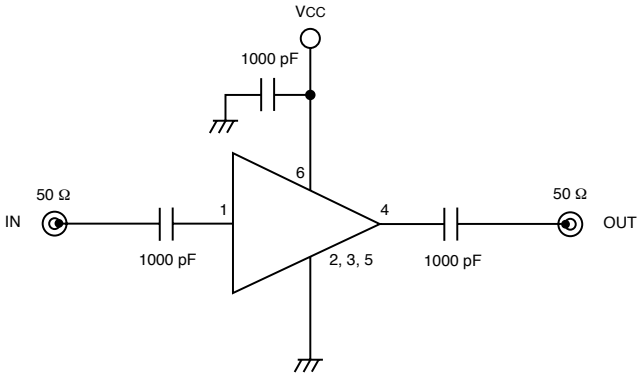
PIN CONNECTIONS



Marking is an example of UPC2711TB

1. Input
2. GND
3. GND
4. Output
5. GND
6. V_{CC}

TEST CIRCUIT



ORDERING INFORMATION (Solder Contains Lead)

PART NUMBER	MARKING	QTY
UPC2711TB-E3	C1G	3K/reel
UPC2712TB-E3	C1H	3K/reel

Note: Embossed tape, 8 mm wide. Pins 1, 2, and 3 face perforated side of tape.

ORDERING INFORMATION (Pb-Free)

PART NUMBER	MARKING	QTY
UPC2711TB-E3-A	C1G	3K/reel
UPC2712TB-E3-A	C1H	3K/reel

Note: Embossed tape, 8 mm wide. Pins 1, 2, and 3 face perforated side of tape.

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
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Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

http://moschip.ru/get-element

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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