CEL

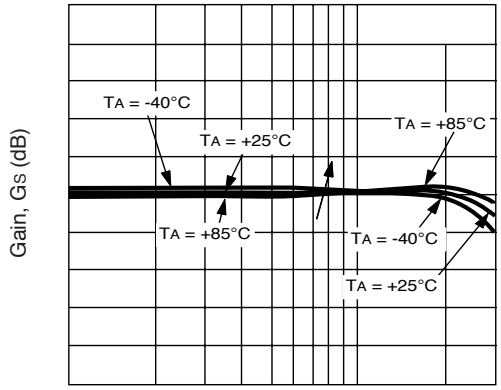
BIPOLAR ANALOG INTEGRATED CIRCUIT
UPC2708TB

5 V, SUPER MINIMOLD WIDEBAND SI RFIC AMPLIFIER

FEATURES

- **HIGH DENSITY SURFACE MOUNTING:** 6 pin super minimold or SOT-363 package
- **HIGH GAIN:** 15 dB TYP
- **SATURATED OUTPUT POWER:** +10 dBm
- **WIDEBAND RESPONSE:** f_U = 2.9 GHz TYP
- **SUPPLY VOLTAGE:** V_{CC} = 4.5 to 5.5 V

GAIN vs.
FREQUENCYand TEMPERATURE



DESCRIPTION

The UPC2708TB is a Silicon RFIC manufactured using the NESAT III process. This device is suitable as buffer amplifier for DBS, PCS and other communication receivers. The UPC2708TB is pin compatible and has comparable performance as the larger UPC2708T, so it is suitable for use as a replacement to help reduce system size. The IC is housed in a 6 pin super minimold or SOT-363 package.

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

ELECTRICAL CHARACTERISTICS (T_A = 25 °C, f = 1 GHz, V_{CC} = 5 V)

PART NUMBER PACKAGE OUTLINE			UPC2708TB S06		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**
I_{CC}	Circuit Current (no signal)	mA	20	26	33
G_S	Small Signal Gain	dB	13	15	18.5
f_U	Upper Limit Operating Frequency (The gain at f_U is 3 dB down from the gain at 0.1 GHz)	GHz	2.7	2.9	
ΔG_S	Gain Flatness, f = 0.1 - 2.6 GHz	dB		±0.8	
P_{SAT}	Saturated Output Power	dBm	+7.5	+10	
P_{1dB}	Output Power at 1 dB Compression Point	dBm		+7.5	
NF	Noise Figure	dB		6.5	8
RL_{IN}	Input Return Loss	dB	8	11	
RL_{OUT}	Output Return Loss	dB	16	20	
ISOL	Isolation	dB	18	23	
ΔG_T	Gain-Temperature Coefficient	dB/°C		+0.002	
R_{TH}	Thermal Resistance (Junction to Ambient)	°C/W			325

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	Power Dissipation[2]	mW	200
T_{OP}	Operating Temperature	°C	-40 to +85
T_{STG}	Storage Temperature	°C	-55 to +150

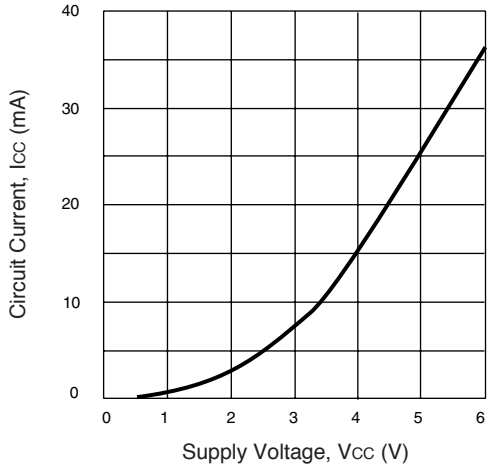
Notes:
1. Operation in excess of any one of these parameters may result in permanent damage.
2. Mounted on 50 x 50 x 1.6 mm epoxy glass PWB (T_A = +85°C).

RECOMMENDED OPERATING CONDITIONS

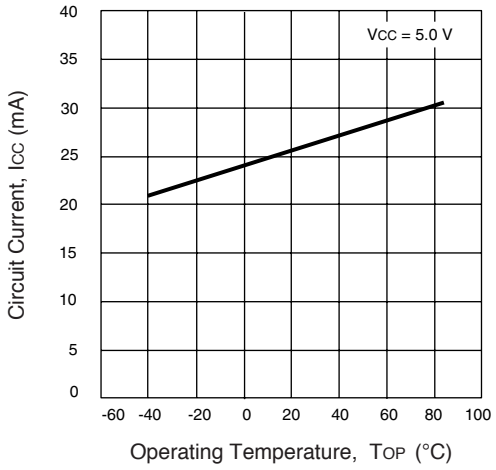
SYMBOL	PARAMETER	UNITS	MIN	TYP	MAX
V_{CC}	Supply Voltage	V	4.5	5.0	5.5

TYPICAL PERFORMANCE CURVES (TA = 25°C)

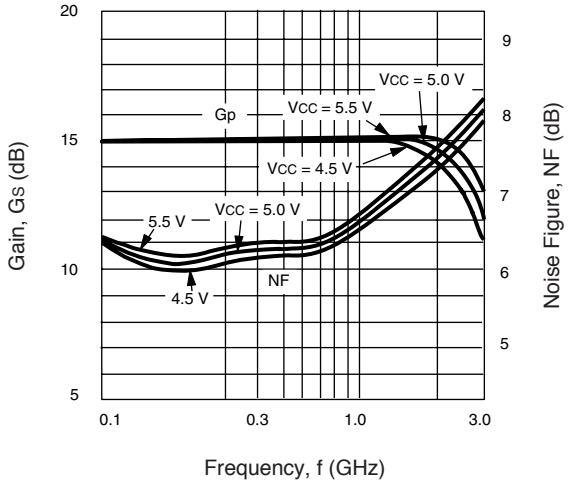
CIRCUIT CURRENT vs. VOLTAGE



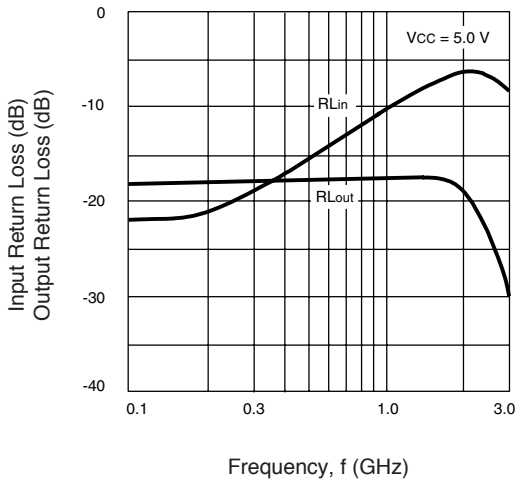
CIRCUIT CURRENT vs. TEMPERATURE



GAIN AND NOISE FIGURE vs. FREQUENCY AND VOLTAGE

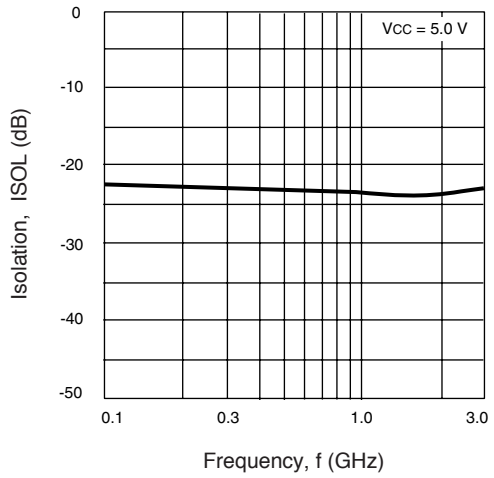


INPUT RETURN LOSS, OUTPUT RETURN LOSS vs. FREQUENCY

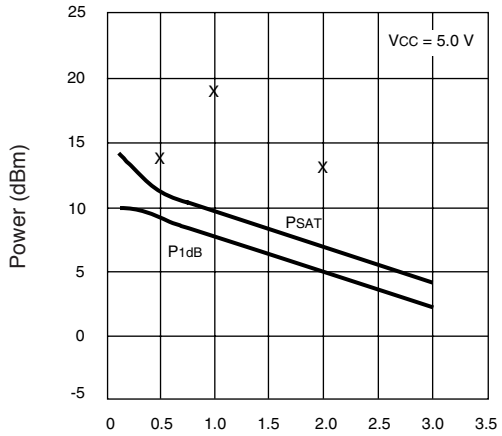


TYPICAL PERFORMANCE CURVES (T_A = 25°C)

ISOLATION vs. FREQUENCY

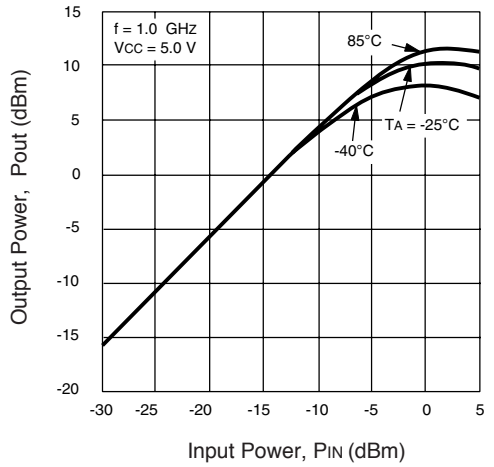


POWER vs. FREQUENCY

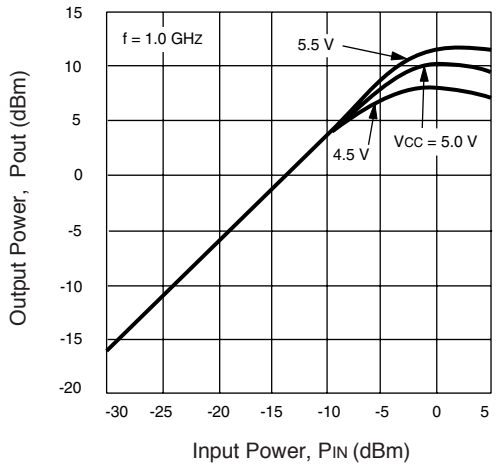


X: Typical SSB Third Order intercept Point

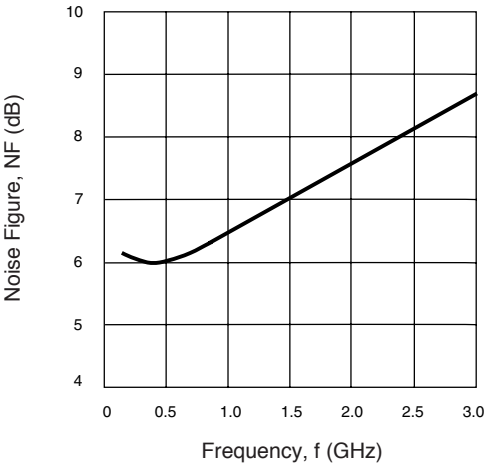
OUTPUT POWER vs. INPUT POWER AND TEMPERATURE



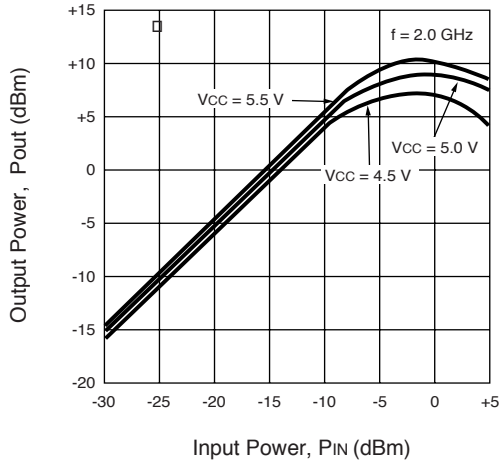
OUTPUT POWER vs. INPUT POWER AND VOLTAGE



NOISE FIGURE vs. FREQUENCY

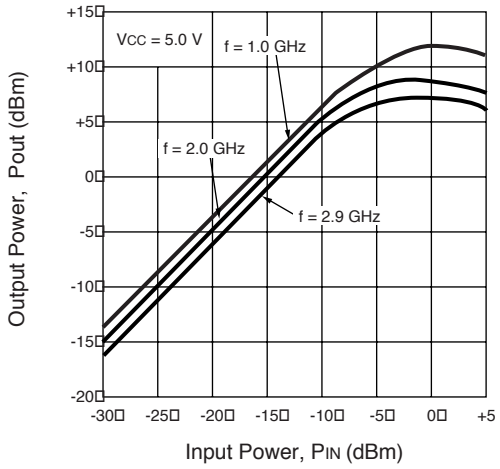


OUTPUT POWER vs. INPUT POWER AND VOLTAGE

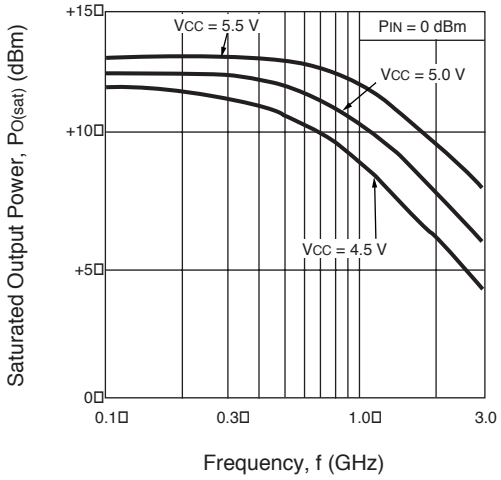


TYPICAL PERFORMANCE CURVES (T_A = 25°C)

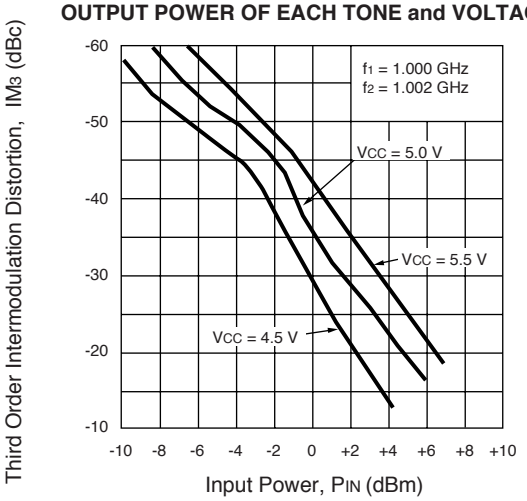
OUTPUT POWER vs. INPUT POWER AND FREQUENCY



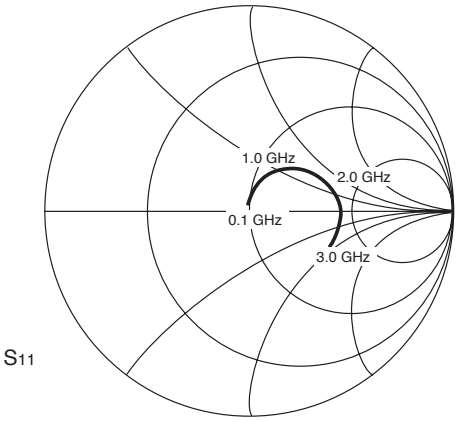
SATURATED OUTPUT POWER vs. FREQUENCY and VOLTAGE



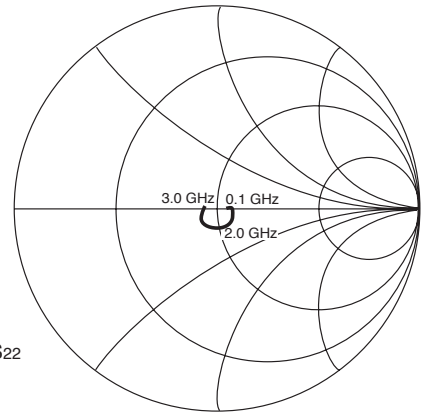
THIRD ORDER INTERMODULATION DISTORTION vs. OUTPUT POWER OF EACH TONE and VOLTAGE



TYPICAL SCATTERING PARAMETERS (T_A = 25°C, V_{CC} = V_{OUT} = 5.0 V)



S_{11}



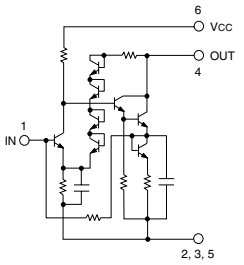
S_{22}

UPC2708TB

V_{CC} = V_{OUT} = 5 V, I_{CC} = 27 mA

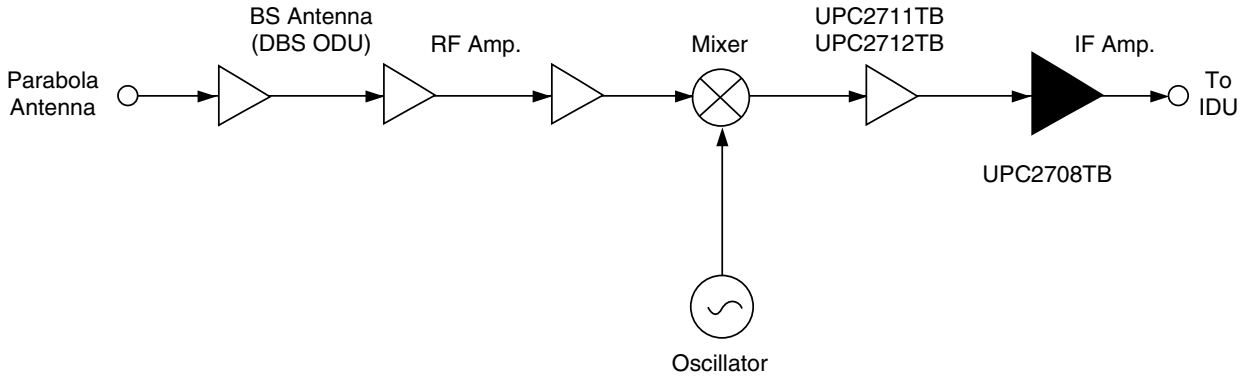
FREQUENCY	S_{11}		S_{21}		S_{12}		S_{22}		K
GHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG	
0.1	0.039	138.9	5.815	-4.8	0.077	-0.8	0.051	0.9	1.34
0.2	0.053	119.7	5.822	-9.8	0.075	-1.5	0.048	1.4	1.36
0.3	0.069	106.7	5.815	-14.3	0.074	-0.6	0.049	5.9	1.38
0.4	0.088	97.2	5.813	-18.8	0.074	-0.5	0.054	8.9	1.36
0.5	0.105	91.6	5.794	-23.8	0.072	-1.1	0.054	8.8	1.39
0.6	0.123	84.9	5.823	-28.4	0.071	-0.6	0.056	10.4	1.40
0.7	0.144	79.7	5.871	-33.0	0.070	0.1	0.060	11.5	1.40
0.8	0.164	74.7	5.890	-38.2	0.071	0.5	0.065	11.6	1.37
0.9	0.186	70.7	5.938	-42.8	0.073	2.3	0.072	11.1	1.34
1.0	0.205	66.1	5.960	-47.6	0.070	4.4	0.082	5.6	1.31
1.1	0.226	61.7	6.072	-52.7	0.069	5.0	0.091	-4.6	1.28
1.2	0.245	57.7	6.097	-57.5	0.070	4.4	0.082	5.6	1.31
1.3	0.263	53.7	6.174	-63.0	0.067	2.5	0.085	0.6	1.33
1.4	0.286	48.6	6.275	-68.4	0.069	5.0	0.091	-4.6	1.28
1.5	0.308	44.3	6.371	-74.3	0.070	5.4	0.092	-8.2	1.24
1.6	0.328	40.7	6.419	-79.8	0.066	7.1	0.097	-12.6	1.26
1.7	0.344	36.2	6.470	-85.9	0.067	5.6	0.096	-19.6	1.23
1.8	0.364	31.0	6.555	-92.1	0.069	8.2	0.100	-23.9	1.18
1.9	0.382	26.0	6.542	-98.3	0.070	8.4	0.092	-8.2	1.24
2.0	0.395	21.2	6.570	-104.7	0.070	8.7	0.101	-38.9	1.13
2.1	0.405	16.8	6.528	-111.3	0.070	10.1	0.100	-47.2	1.12
2.2	0.417	11.8	6.527	-118.5	0.071	9.4	0.096	-57.2	1.09
2.3	0.427	6.6	6.438	-124.7	0.072	9.5	0.098	-66.1	1.09
2.4	0.431	2.2	6.336	-131.3	0.071	10.7	0.095	-76.5	1.09
2.5	0.431	-3.0	6.247	-138.1	0.072	12.8	0.098	-86.1	1.09
2.6	0.434	-8.2	6.127	-145.0	0.071	15.4	0.094	-99.9	1.10
2.7	0.423	-12.3	5.952	-151.7	0.071	14.5	0.088	-116.7	1.14
2.8	0.419	-17.1	5.816	-158.2	0.070	16.1	0.081	-134.4	1.18
2.9	0.408	-21.5	5.619	-165.0	0.073	15.3	0.074	-149.7	1.19
3.0	0.400	-26.2	5.354	-171.5	0.074	17.1	0.065	-170.3	1.24
3.1	0.386	-29.3	5.134	-177.4	0.075	17.1	0.053	172.8	1.28

PIN DESCRIPTIONS

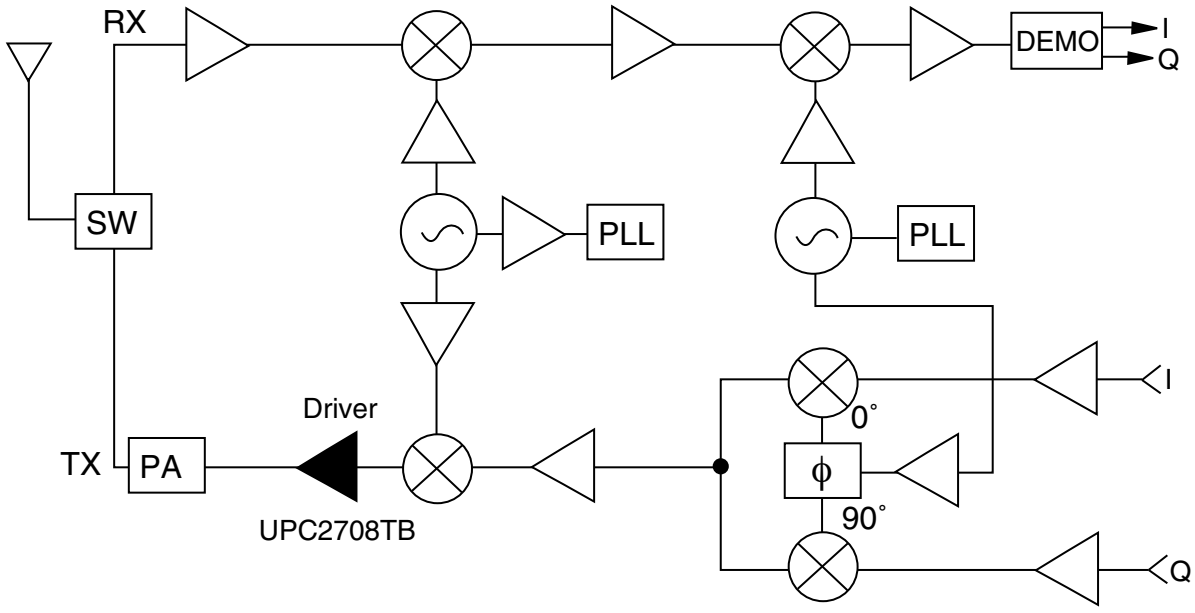
Pin No.	Symbol	Applied Voltage (V)	Pin Voltage (V)	Description	Internal Equivalent Circuit
1	Input	–	1.16	Signal input pin. An internal matching circuit, configured with resistors, enables 50 Ω connection over a wide bandwidth. A multi-feedback circuit is designed to cancel the deviations of h_{FE} and resistance. This pin must be coupled to the signal source with a blocking capacitor.	
4	Output	4.5 to 5.5	–	Signal output pin. Connect an inductor between this pin and V_{CC} to supply current to the internal output transistors.	
6	V_{CC}		–	Power supply pin. This pin should be externally equipped with a bypass capacitor to minimize ground impedance.	
2 3 5	GND	0	–	Ground pins. These pins 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.	

SYSTEM APPLICATION EXAMPLE

EXAMPLE OF DBS CONVERTERS

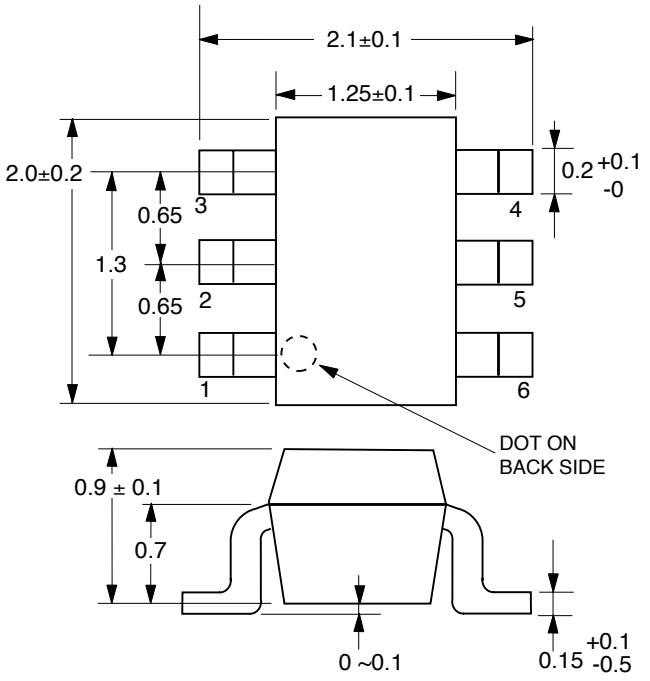


EXAMPLE OF 2.4 GHz BAND RECEIVER



OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S06
(Top View)

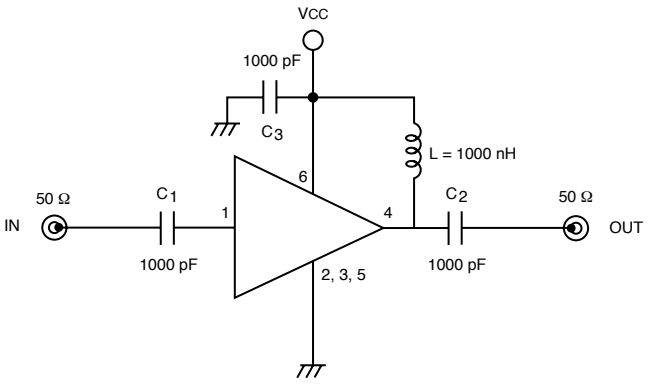


ORDERING INFORMATION

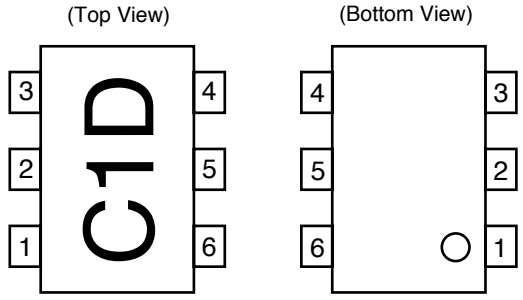
PART NUMBER	MARKING	QTY
UPC2708TB-E3-A	C1D	3K/Reel

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

TEST CIRCUIT



PIN CONNECTIONS



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

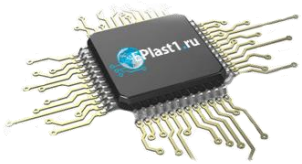
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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