NEC

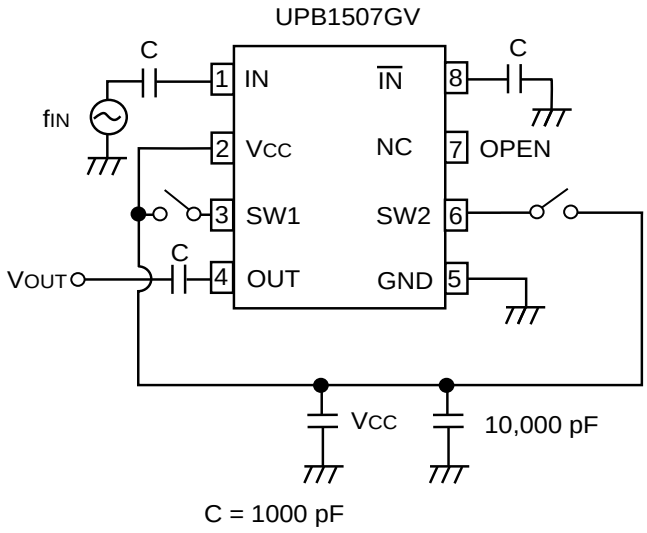
3.0 GHz DIVIDE BY 64/128/256 PRESCALER

UPB1506GV
UPB1507GV

FEATURES

- **HIGH FREQUENCY OPERATION TO 3 GHz**
- **SELECTABLE DIVIDE RATIO:** ÷64, ÷128, ÷256
- **LOW CURRENT CONSUMPTION:** 19 mA @ 5 V
- **SMALL PACKAGE:** 8 pin SSOP
- **AVAILABLE IN TAPE AND REEL**

TEST CIRCUIT



DESCRIPTION

The UPB1506GV and UPB1507GV are Silicon MMIC digital prescalers manufactured with the NESAT™ IV silicon bipolar process. They feature high frequency response to 3 GHz, selectable divide-by-64, 128, or 256 modes, and operate on a 5 volt supply while drawing only 19 mA. The devices are housed in a small 8 pin SSOP package that contributes to system miniaturization. These devices are designed for use in a PLL synthesizer for DBS and CATV settop and WLAN applications.

ELECTRICAL CHARACTERISTICS (T_A = -40 to +85°C, V_{CC} = 4.5 to 5.5 V, Zs = 50Ω)

PART NUMBER PACKAGE OUTLINE			UPB1506GV,UPB1507GV S08		
SYMBOLS	**PARAMETERS AND CONDITIONS**	**UNITS**	**MIN**	**TYP**	**MAX**
I_{CC}	Circuit Current	mA	12.5	19	26.5
$f_{IN(U)}$	Upper Limit Operating Frequency, P_{IN} = -15 to +6 dBm	GHz	3.0		
$f_{IN(L)1}$	Lower Limit Operating Frequency, P_{IN} = -10 to +6 dBm	GHz			0.5
$f_{IN(L)2}$	Lower Limit Operating Frequency, P_{IN} = -15 to +6 dBm	GHz			1.0
P_{IN1}	Input Power, f_{IN} = 1.0 to 3.0 GHz	dBm	-15		+6
P_{IN2}	Input Power, f_{IN} = 0.5 to 1.0 GHz	dBm	-10		+6
V_{OUT}	Output Voltage, C_L = 0.8 pF	V_{P-P}	1.2	1.6	
$V_{IN(H)}$	Division Ratio Control Input High	V		V_{CC}	
$V_{IN(L)}$	Division Ratio Control Input Low	V		OPEN or GND	

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

SYMBOLS	PARAMETERS	UNITS	RATINGS
V_{CC}	Supply Voltage	V	-0.5 to 6.0
V_{IN}	Input Voltage	V	-0.5 to Vcc + 0.5
P_{IN}	Input Power	dBm	+10
P_D	Power Dissipation[2]	mW	250
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 a double-sided copper clad 50x50x1.6 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

PRODUCT LINEUP

Features (Division, Freq.)	Part No.	I_{CC} (mA)	f_{IN} (GHz)	V_{CC} (V)	Package
÷512, ÷256, 2.5GHz	**UPB586G**	28	0.5 to 2.5	4.5 to 5.5	8 pin SOP
÷128, ÷64, 2.5GHz	**UPB588G**	26	0.5 to 2.5	4.5 to 5.5	
÷256, ÷128, ÷64 3.0 GHz	**UPB1505GR**	14	0.5 to 3.0	4.5 to 5.5	
	UPB1506GV	19	0.5 to 3.0	4.5 to 5.5	8 pin SOP
	UPB1507GV	19	0.5 to 3.0	4.5 to 5.5	

PIN DESCRIPTIONS

Pin no.		Pin Name	Applied Voltage (V)	Pin Voltage (V)	Description
UPB1506GV	UPB1507GV				
2	1	IN	–	2.9	Signal input pin. This pin should be coupled to the source with a capacitor (eg 1000 pF).
3	8	$\overline{IN}$	–	2.9	Signal input bypass pin. This pin must be equipped with a bypass capacitor (eg 1000 pF) to ground.
4	5	GND	0	–	Ground pin. Ground pattern on the board should be formed as wide as possible to minimize ground impedance.
1	3	SW1	H/L	–	Divided ratio input pin. The ratio can be controlled by the following input data to these pins.
6	6	SW2			

		SW2	
		H	L
SW1	H	÷64	÷128
	L	÷128	÷256

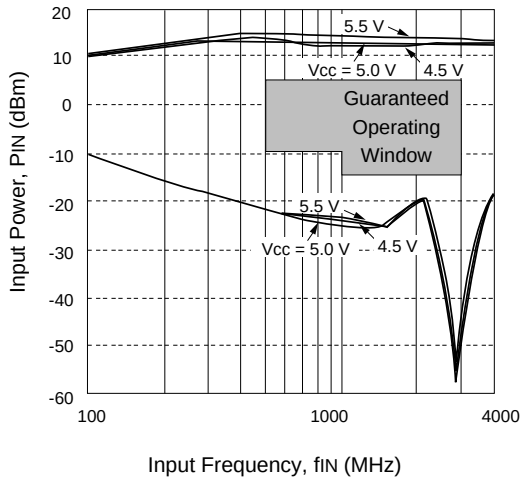
These pins should be equipped with a bypass capacitor (e.g. 1000 pF) to ground.

8	2	V_{CC}	4.5 to 5.5	–	Power supply pin. This pin must be equipped with bypass capacitor (eg 1000 pF) to ground.
7	4	OUT	–	2.6 to 4.7	Divided frequency output pin. This pin is designed as an emitter follower output. This pin can be connected to CMOS input due to 1.2 Vp-p MIN output.
5	7	NC	–	–	No connection. This pin must be opened.

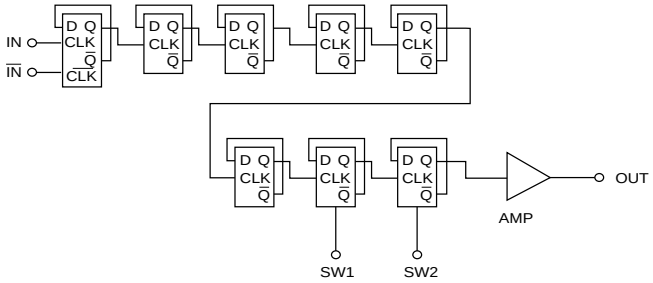
TYPICAL PERFORMANCE CURVES

(TA = +25˚C unless otherwise noted)

INPUT POWER vs. FREQUENCY

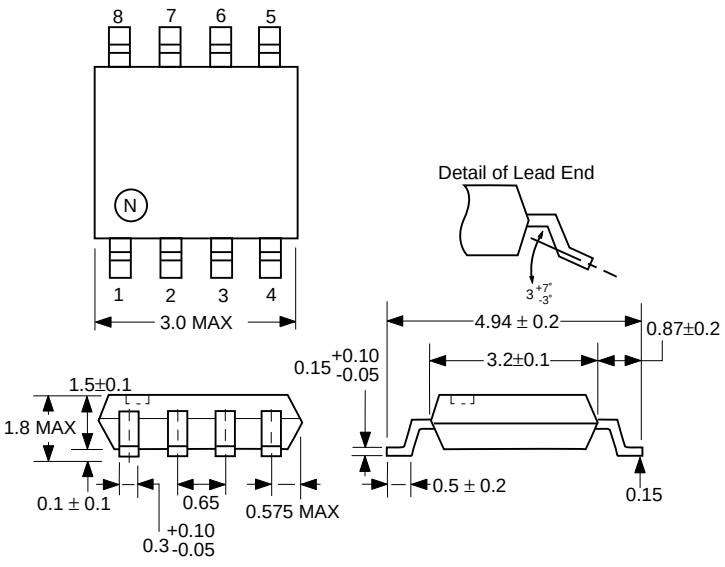


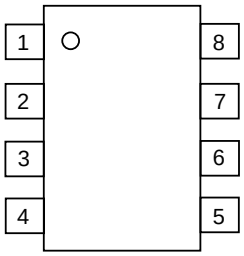
INTERNAL BLOCK DIAGRAM



OUTLINE DIMENSIONS (Units in mm)

PACKAGE OUTLINE S08





PIN CONNECTIONS

Pin No.	UPB1506GV	UPB1507GV
1	SW1	IN
2	IN	Vcc
3	$\overline{IN}$	SW1
4	GND	OUT
5	OPEN	GND
6	SW2	SW2
7	OUT	OPEN
8	Vcc	$\overline{IN}$

ORDERING INFORMATION

PART NUMBER	QUANTITY	MARKING
UPB1506GV-E1	1000/Reel	1506
UPB1507GV-E1	1000/Reel	1507

NOTE:
1. Embossed tape 8 mm wide.
   Pin 1 is in the tape pull-out direction.