

PLL frequency synthesizer for tuners

BU2611A / BU2611AF / BU2611AFS

The BU2611 PLL frequency synthesizers work up through the FM band. They feature built-in RF amps with low power dissipation and high sensitivity.

●Applications

Tuners (Mini components, radio cassette players, radio equipment, etc.)

●Features

- 1) Built-in high-speed prescaler can divide 130 MHzVCO.
- 2) In addition to the reference FM and AM, also offers the following 7 frequencies: 100kHz, 50kHz, 25kHz, 10kHz, 9kHz, 5kHz, and 1kHz.
- 3) 3-bit output port (open drain).
- 4) Clock output (400kHz).
- 5) Time base output (8Hz).
- 6) Serial data input (CE, CK, DA).

●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit	Conditions
Power supply voltage		V _{DD}	-0.3~+7.0	V	
Maximum input voltage		V _{IN}	-0.3~V _{DD} +0.3	V	CE, CK, CA, XIN, FMIN, AMIN
Maximum output voltage 1		V _{OUT1}	-0.3~+10.0	V	P1, P2, P3, P4
Maximum output voltage 2		V _{OUT2}	-0.3~V _{DD} +0.3	V	PD1, PD2
Maximum output current		I _{OUT}	0~+4.0	mA	P1, P2, P3, P4
Power dissipation	BU2611A	P _D	1000 *1	mW	
	BU2611AF/BU2611AFS		500 *2		
Operating temperature		T _{opr}	-25~+75	°C	
Storage temperature		T _{stg}	-55~+125	°C	

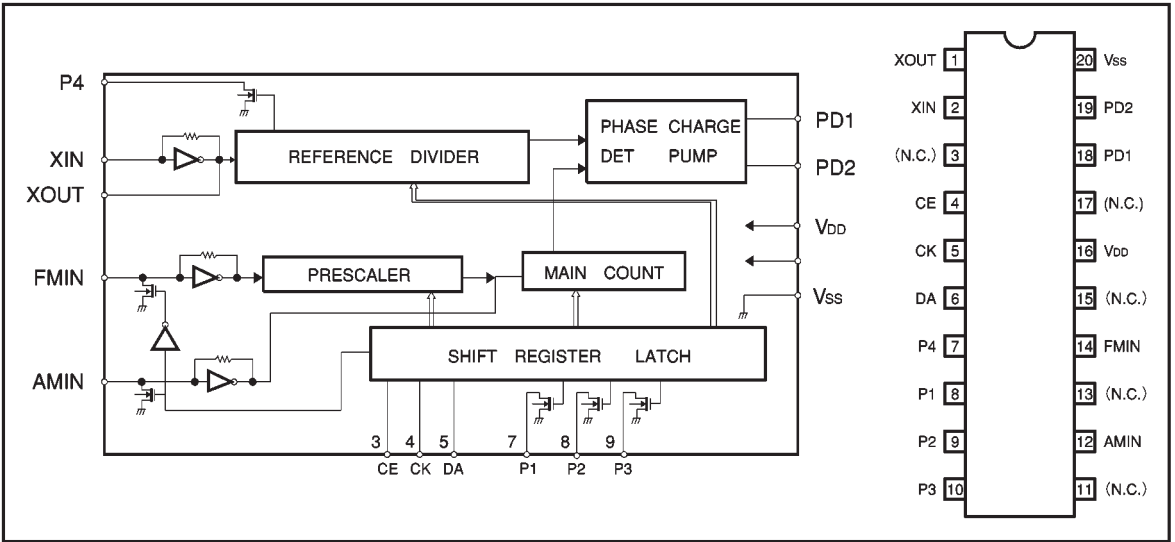
*1 Reduced by 10mW for each increase in Ta of 1°C over 25°C.

*2 Reduced by 5mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{DD}	4.0~6.0	V

● Block diagram



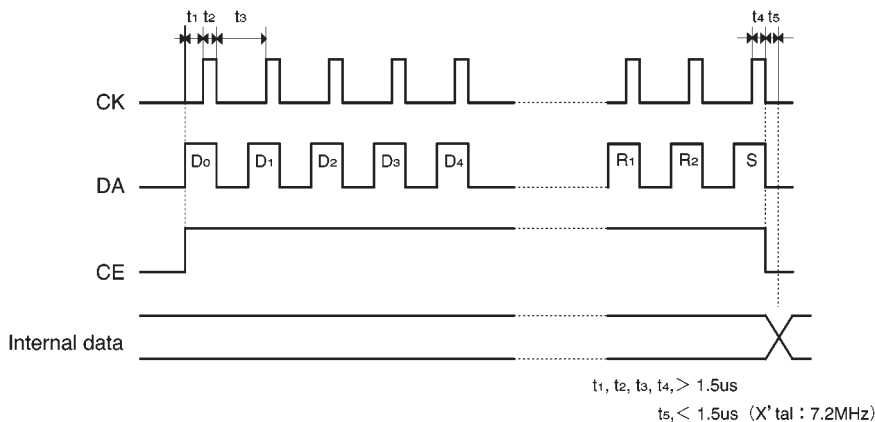
● Pin descriptions

Pin name	Function
P4	Controller clock (400 kHz) output
XIN, XOUT	X ^{tal} oscillation (7.2 MHz)
FMIN, AMIN	Local oscillation signal input
CE, CK, DA	Data input
P1, P2, P3	Output port
V	Power supply
PD1, PD2	Charge pump output

●Electrical characteristics (unless otherwise noted, Ta = 25°C, VDD = 5.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply current	IDD1	—	4.8	—	mA	F _{IN} =130MHz, 100mV _{rms}
Circuit current w/o signal	IDD2	—	300	—	μA	No input, PLL = OFF
Input high level voltage	V _{IH}	3.5	—	—	V	CE, CK, DA terminals
Input low level voltage	V _{IL}	—	—	1.5	V	CE, CK, DA terminals
Output low level voltage 1	V _{OL1}	—	0.4	—	V	P1, P2, P3, P4 I _{OUT} =2.0mA
Off level leakage current 1	I _{OFF1}	—	—	1.0	μA	P1, P2, P3, P4 V _{OUT} =10V
Output high level voltage	V _{OH}	—	0.25	—	V	PD1, PD2 I _{OUT} =-1.0mA
Output low level voltage 2	V _{OL2}	—	0.15	—	V	PD1, PD2 I _{OUT} =1.0mA
Off level leakage current 2	I _{OFF2}	100	—	100	nA	PD1, PD2 V _{OUT} =V _{DD}
Off level leakage current 3	I _{OFF3}	100	—	—	nA	PD1, PD2 V _{OUT} =V _{SS}
Input frequency 1	F _{IN1}	—	7.2	—	MHz	XIN, sine wave, C coupling
Input frequency 2	F _{IN2}	10	—	130	MHz	FMIN, sine wave, C coupling V _{IN} = 80 mV _{rms}
Input frequency 3	F _{IN3}	0.5	—	20	MHz	AMIN, sine wave, C coupling V _{IN} = 80 mV _{rms}
Input amplitude	F _{INmax.}	0.08	—	1.5	V _{rms}	XIN, FMIN, AMIN, sine wave, C coupling

●Data format



D ₀	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃
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← Input done from D₀.

T ₀	T ₁	P ₀	P ₁	P ₂	T _B	R ₀	R ₁	R ₂	S
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(1) Division data: For D₀ through D₁₃ (For AMN, use D₄ through D₁₃.)

D ₀	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃
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1 1 0 0 1 0 1 0 0 0 1 0 0 0 →FMIN frequency = 1107

X X X X 0 1 1 1 1 0 0 1 1 1 →AMIN frequency = 926

(2) Test data: T₀ through T₁ are taken as (0, 0).

●Data format

(3) P₀, P₁, P₂, P₃, TB: port output, time base output

Data				Port output		
P ₀	P ₁	P ₂	TB	P ₁	P ₂	P ₃
0	0	0	0	*	*	*
0	0	1	0	0	0	1
0	1	0	0	0	1	0
0	1	1	0	0	1	1
1	0	0	0	1	0	0
1	0	1	0	1	0	1
1	1	0	0	1	1	0
1	1	1	0	1	1	1
0	0	0	1	TB	*	*
X	1	0	1	TB	1	0
X	0	1	1	TB	0	1
X	1	1	1	TB	1	1
1	0	0	1	TB	0	0

* : Determined on the basis of R₀ - R₂.
 X : Irrelevant
 TB: 8 Hz

(4) R₀, R₁, R₂, standard frequency data

Data			Standard frequency	Port output		
R ₀	R ₁	R ₂	Standard frequency	P ₁	P ₂	P ₃
0	0	0	100kHz	1	1	0
0	0	1	50	1	1	0
0	1	0	25	1	1	0
0	1	1	5	0	0	1
1	0	0	10	1	0	1
1	0	1	9	1	0	1
1	1	0	1	0	1	1
1	1	1	5	0	0	1

(5) S: input selection data 1: FMIN 0: AMIN

●External dimensions (Units: mm)

