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		Topr	−25～+75	℃	
Storage temperature		Tstg	−55～+125	℃	

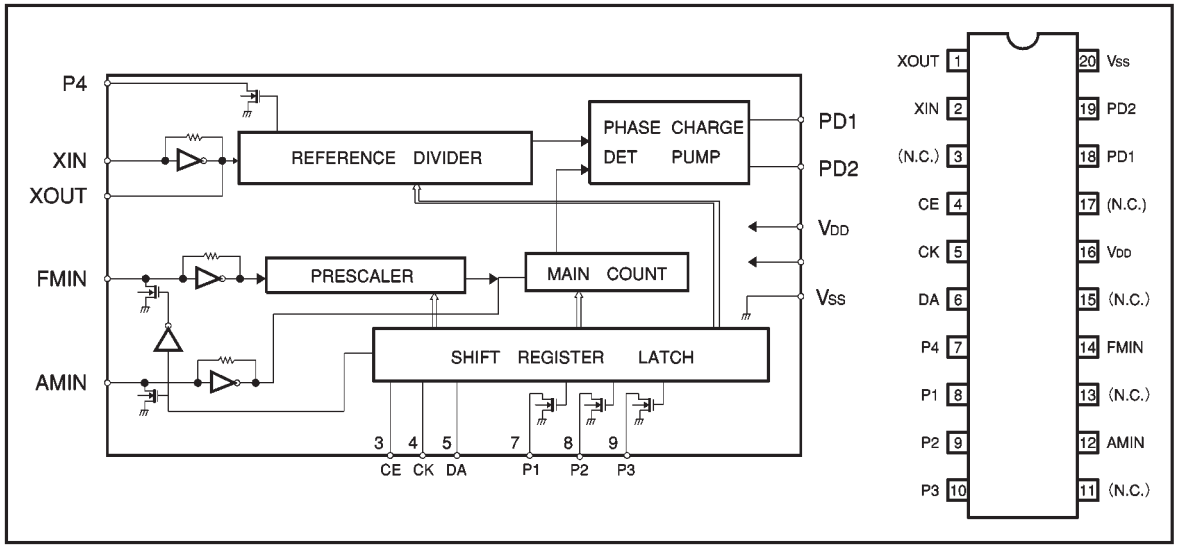
*1 Reduced by 10mW for each increase in Ta of 1°C over 25°C.

*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



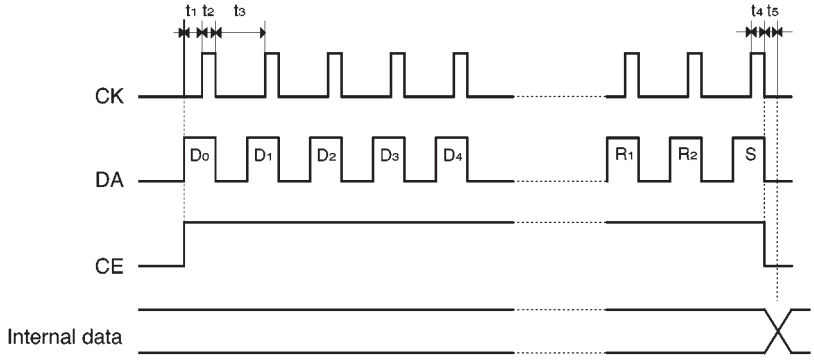
●Pin descriptions

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, V_{DD} = 5.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply current	I_{DD1}	—	4.8	—	mA	F_{IN}=130MHz, 100mV_{rms}
Circuit current w/o signal	I_{DD2}	—	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



D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13

Input done from D_0.

T0	T1	P0	P1	P2	TB	R0	R1	R2	S

(1) Division data: For D_0 through D_{13} (For AMN, use D_4 through D_{13}.)

D0	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	
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: T_0 through T_1 are taken as (0, 0).

●Data format

(3) P_0, P_1, P_2, P_3, 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 R_0 - R_2.
X : Irrelevant
TB: 8 Hz

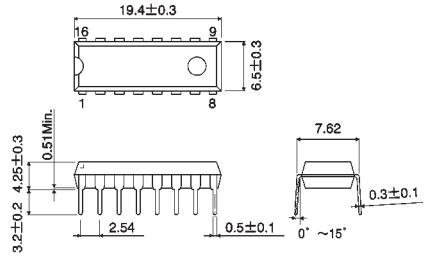
(4) R_0, R_1, R_2, standard frequency data

Data				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

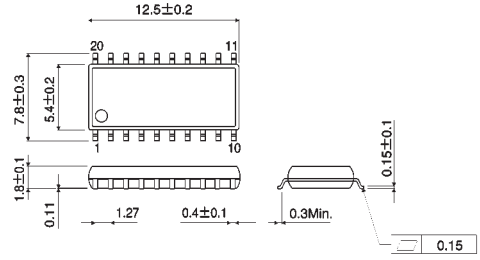
●External dimensions (Units: mm)

BU2611A



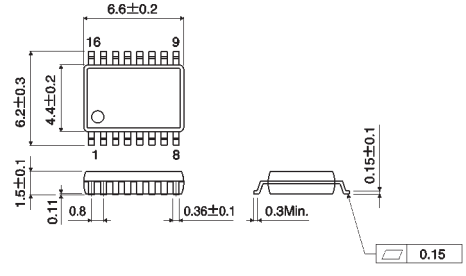
DIP16

BU2611AF



SOP20

BU2611AFS



SSOP-A16