PLL frequency synthesizer for tuners

BU2611A/BU2611AF/BU2611AFS

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

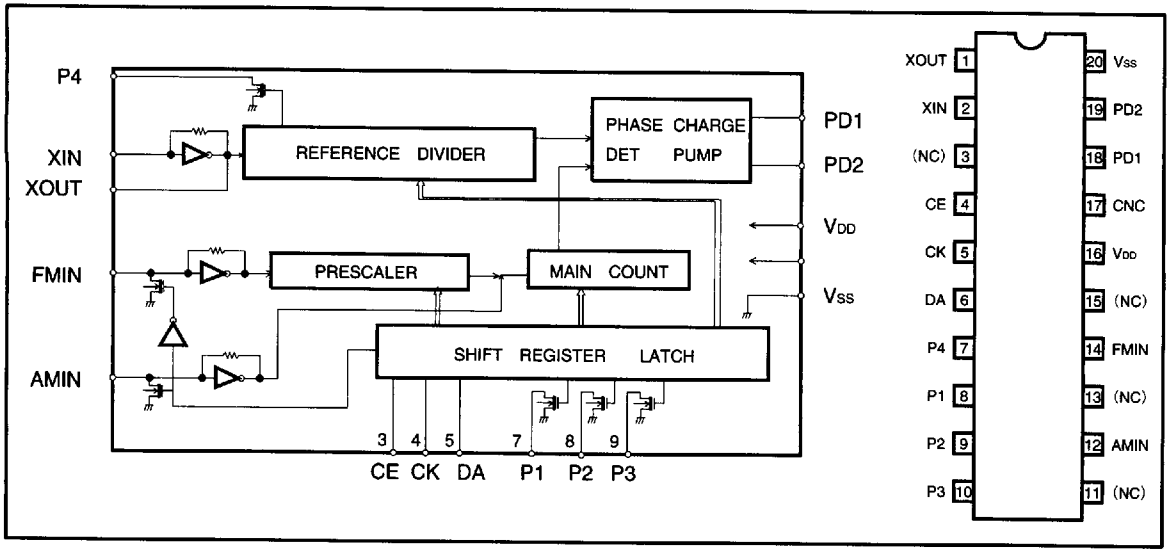
●Applications

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 standard 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)

●Block diagram



●Pin description

Terminal name	Function
P4	Controller clock (400 kHz) output
XIN, XOUT	Xtal 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	Phase comparison charge pump output

●Absolute maximum ratings (Ta = 25℃)

Parameter		Symbol	Limits	Unit	Conditions
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.

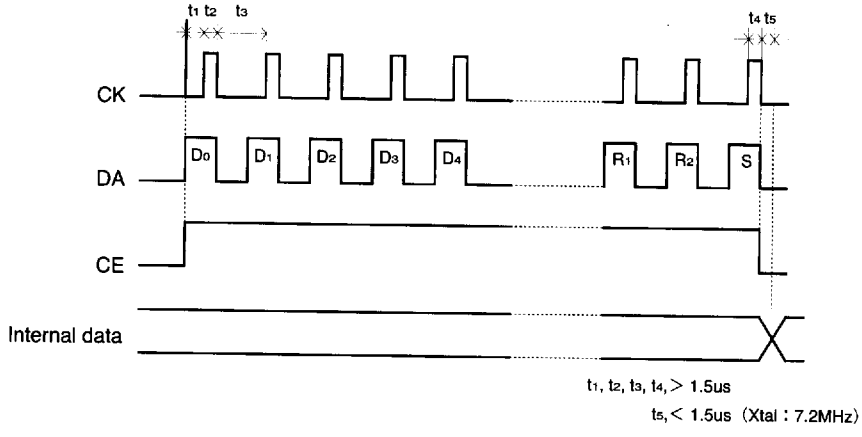
●Recommended operating conditions

Parameter	Symbol	Limits	Unit
Supply voltage	V_{DD}	4.0~6.0	V

●Electrical characteristics (unless other specified, Ta = 25℃, V_{DD} = 5.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply voltage	I_{DD1}		4.8		mA	F_{IN}=130MHz, 100mVrms
Circuit current w/o signal	I_{DD2}		300		μA	No input, PLL = OFF
"H" level input voltage	V_{IH}	3.5			V	CE, CK, DA terminals
"L" level input voltage	V_{IL}			1.5	V	CE, CK, DA terminals
"L" level output 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
"H" level output voltage	V_{OH}		0.25		V	PD1, PD2 I_{OUT}=−1.0mA
"L" level output voltage 2	V_{OL2}		0.15		V	PD1, PD2 I_{OUT}=1.0mA
"OFF" level leakage current 2	I_{OFF2}			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 mVRMS
Input frequency 3	F_{IN3}	0.5		20	MHz	AMIN, sine wave, C coupling V_{IN} = 80 mVRMS
Input amplitude	$F_{INMax.}$	0.08		1.5	Vrms	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}

← Input done from D_0.

T_0	T_1	P_0	P_1	P_2	T_B	R_0	R_1	R_2	S

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

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}	
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 : don't care
TB: 8 Hz

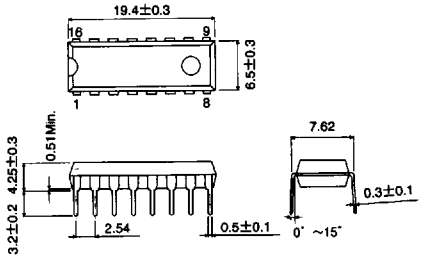
(4) R_0, R_1, R_2, standard frequency data

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

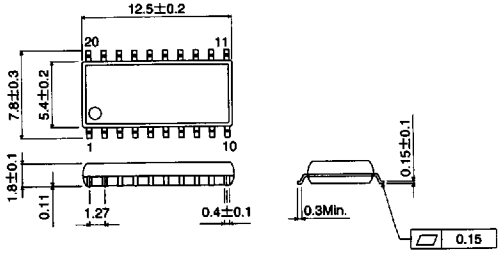
●External dimensions (Unit: mm)

BU2611A



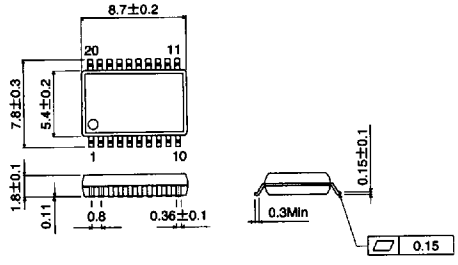
DIP16

BU2611AF



SOP20

BU2611AFS



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