



EM92600/1A DUAL PLL FOR 46/49 MHZ CORDLESS PHONE

GENERAL DESCRIPTION

The EM92600/1A series are developed for 46/49 MHz of 10 channels band frequency of cordless telephone which is used in U.S.A.. These devices are dual phase-locked loop frequency synthesizers contained ROM counters for receive and transmit loops with two independent phase detect circuits. A common reference oscillator and reference divider are share by the receive and transmit circuits.

Other features include a lock detect circuit for the transmit loop, illegal code default, a buffered oscillator output for mixing purposes in the system, 5KHz tone output . The EM92601A is designed for easy MPU interface. It provides the same features as the EM92600A , but accepts channel programming via a clocked, serial input instead of parallel BCD inputs. The EM92600A is selected channels via mechanical switches of parallel BCD input.

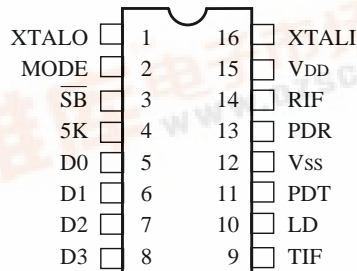
FEATURES

- Include oscillation circuit with external X-TAL (10.240 MHz).
- Unlock detector.
- 5KHz output for guard tone.
- Standby mode for power saving.
- 2.5 to 5.5V supply range.
- Basetset/Handset changeable.
- Available in 16 pin DIP or SOP.
- SERIES

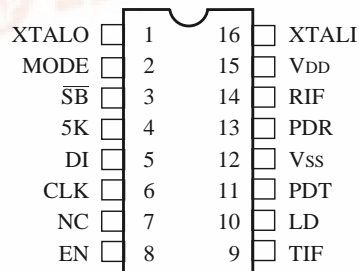
Part Number	Package	Channel Selection
EM92600AP	DIP	parallel
EM92600AM	SOP	parallel
EM92601AP	DIP	serial
EM92601AM	SOP	serial

PIN ASSIGNMENTS

EM92600A

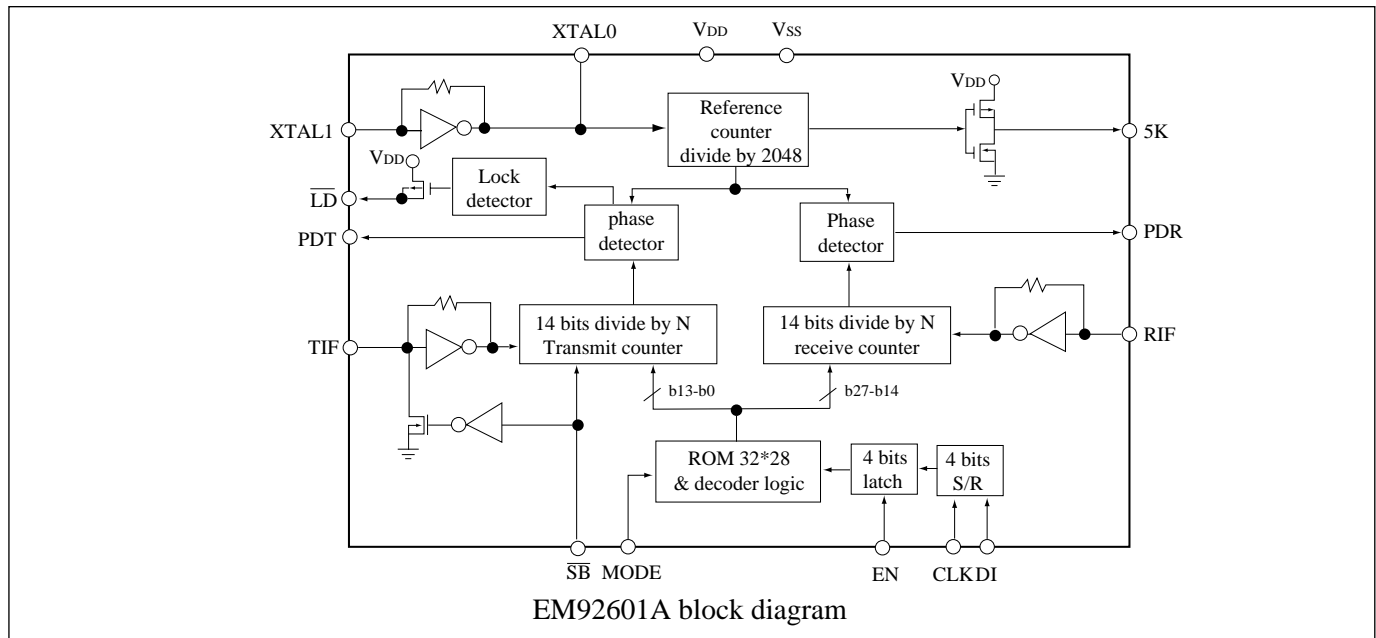
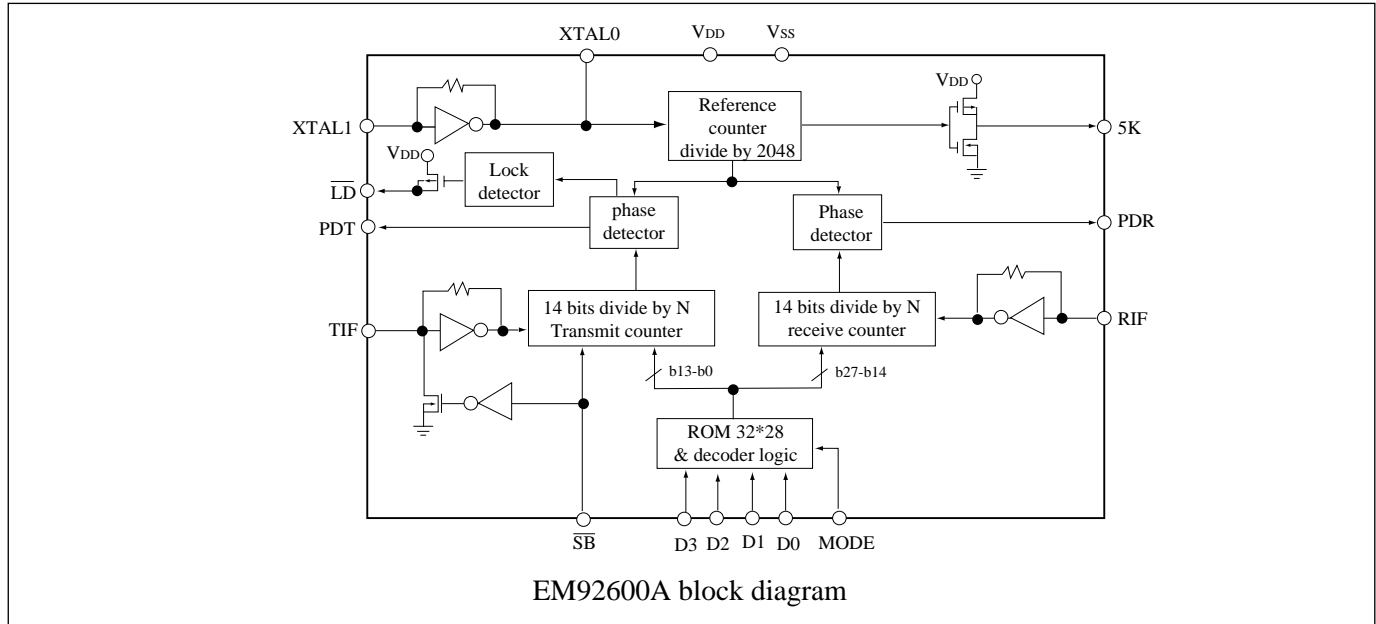


EM92601A





FUNCTIONAL BLOCK DIAGRAM



PIN DESCRIPTIONS

Symbol	Pin No.	Function
XTALO	O	This output generates reference frequency when it is connected to pin 16 with external OSC of which frequency is 10.240MHz
MODE	I	Base/remote changing. Internal pull down. V_{DD} =base, V_{SS} =remote.
\overline{SB}	I	The standby pin is used to save power when no transmit. Internal pull down. High: transmit and receive active Low: receive acts only
5K	O	The signal derived from the reference oscillator. 5KHz output.



Symbol	I/O	Function
D0	I	The channel selected pin. LSB.(intenal pull down)
D1	I	The channel selected pin. (internal pull down)
D2	I	The channel selected pin. (internal pull down)
D3	I	The channel selected pin. MSB.(internal pull down)
Di	I	The serial input data pin.
CLK	I	Clock input. Each low to high transition of the clock shifts one bit of data into the on-chip shift register.
NC	-	Not connect.
EN	I	The enable pin controls the data transfer from the shift register to the 4-bit latch. A low to high transition latches the data.
TIF	I	Input to programmable divider of Tx. AC coupling with VCO. Min input voltage is 200mVpp.
$\overline{\text{LD}}$	O	Unlock detector output. V_{DD} level: unlock.
PDT	O	Phase detector output for Tx. PDT detects the phase error from Tx PLL and its output is connected to external low pass filter.
V_{SS}	-	Ground.
PDR	O	Phase detector output for Rx. PDR detects the phase error from Rx PLL and its output is connected to external low pass filter.
RIF	I	Input of programmable divider for Rx.AC coupling with VCO. Min input voltage is 200mVpp.
V_{DD}	-	Power supply.
XTAL1	I	To connect crystal (10.240MHz) and capacitor.

ABSOLUTE MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V_{DD}	DC supply voltage	-0.5 to +6	V
V_{IN}	Input voltage	-0.5 to $V_{DD}+0.5$	V
I_{IN}, I_{OUT}	DC current drain per pin	10.0	mA
I_{DD}, I_{SS}	DC current drain V_{DD} or V_{SS} pins	30.0	mA
T_A	Operating temperature range	-30 to +75	°C
T_{STG}	Storage temperature range	-65 to +150	°C



DC ELECTRICAL CHARACTERISTICS

($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Sym.	Min.	Typ.	Max.	Unit	Condition
Operating voltage	V_{DD}	2.5	-	5.5	V	
Input voltage	V_{IL} V_{IH}	2.2	-	0.8	V	$V_{DD}=3\text{V}$
Output voltage	V_{OL} V_{OH}	2.95	-	0.05	V	$V_{DD}=3\text{V}$
Input low current	I_{IL}	-36 -0.06	- -		μA	$v_{IL}=0$ pin 16,14,9 pin 2~8
Input high current	I_{IH}		- -	36 120	μA	$v_{IH}=V_{DD}-0.5\text{V}$ pin 16,14,9 pin 2~8
Output current	I_{OH} I_{OL}	-0.2 0.2	- -		mA	$V_{OH}=2.6\text{V}$ $V_{OL}=0.4\text{V}$
Standby current	I_{DS}		-	1.5	mA	$V_{DD}=3\text{V}$, note1
Operating current (0.2Vp-p input at RIF,TIF)	I_{DO}		-	3.0	mA	$V_{DD}=3\text{V}$, note2
3-state leakage current	I_{OZ}		-	± 1	μA	$V_{DD}=5\text{V}$

Note 1: XTALin: 10.24MHz ; MODE: V_{DD} ; $\overline{\text{SB}}$: V_{SS} ; TIF=20MHz(200 mVp-p); RIF=40MHz(200 mVp-p); others are open.

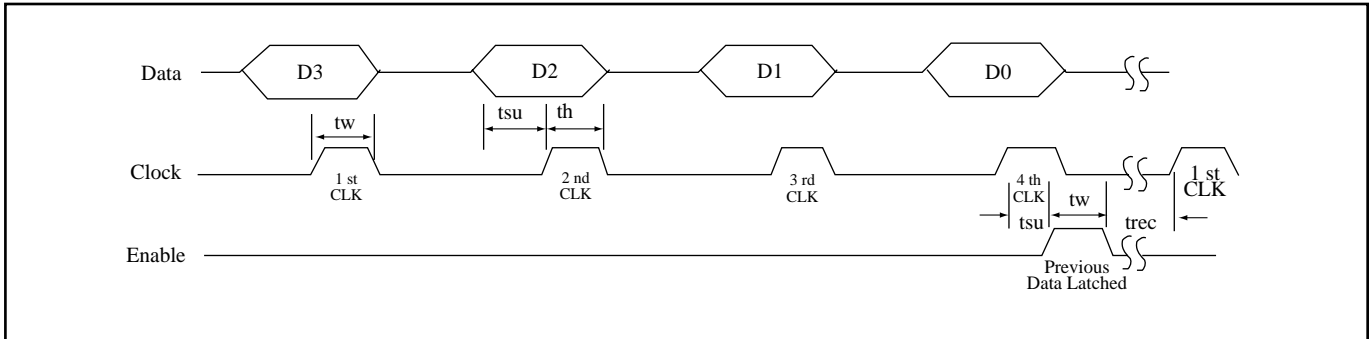
Note 2: XTALin: 10.24MHz ; MODE: V_{DD} ; $\overline{\text{SB}}$: V_{DD} ; TIF=20MHz(200 mVp-p); RIF=40MHz(200 mVp-p); others are open.

AC ELECTRICAL CHARACTERISTICS

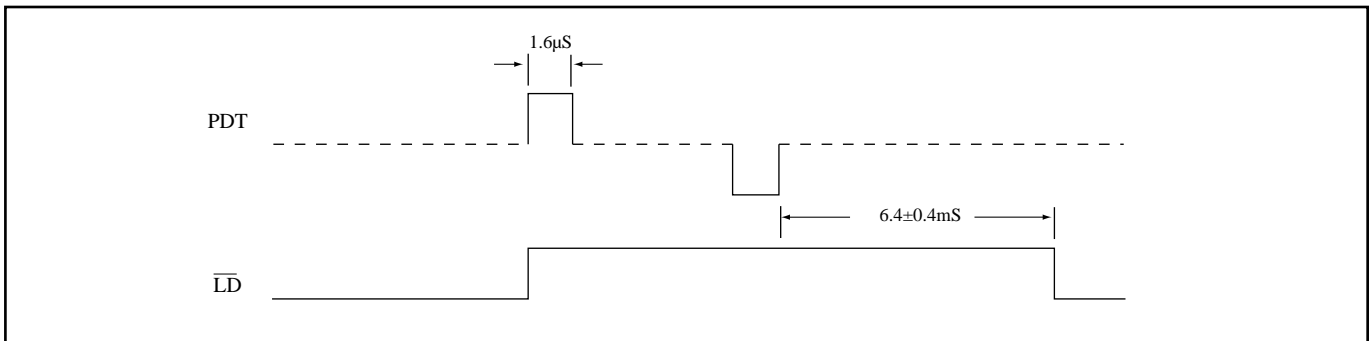
Parameter	Sym.	Min.	Typ.	Max.	Unit	Condition
Output rise time	T_R			200	nS	$V_{DD}=3\text{V}$
Output fall time	T_F			200	nS	$V_{DD}=3\text{V}$
Input rise and fall time OSC in	T_R T_F			5	μS	XTAL1 $V_{DD}=3\text{V}$
Maximum frequency input =sine wave 0.2Vp-p	F_{MAX}			12 50 50	MHz	XTAL1 RIF ($V_{DD}=3\text{V}$) TIF
Setup time data to clock Enable to clock	T_{SU}	100 200			nS	EM92601A only
Hold time clock to data	T_H	80			nS	EM92601A only
Recovery time Enable to clock	T_{REC}	80			nS	EM92601A only
Input pulse width clock and Enable	T_W	80			nS	EM92601A only



TIMING DIAGRAM

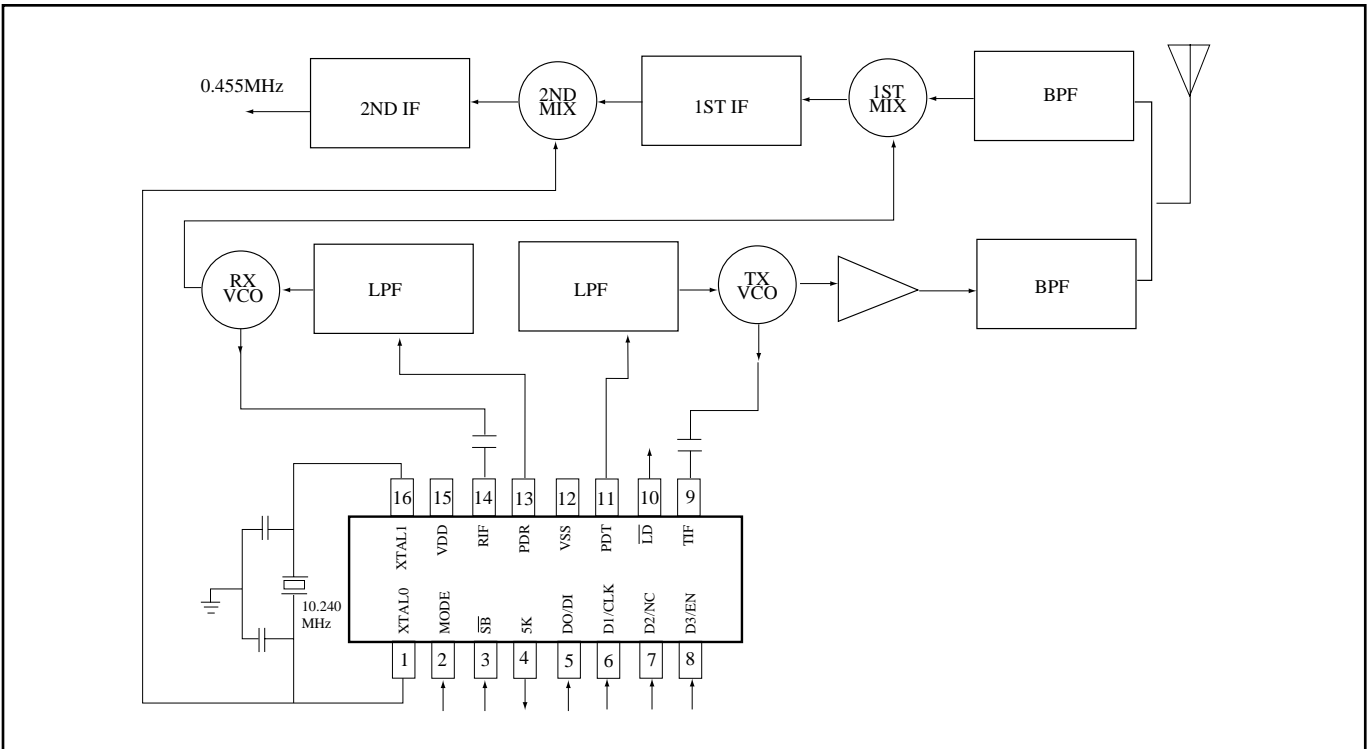


EM92601A Timing



Unlock Timing

APPLICATION CIRCUIT





DIVIDE RATIO AND VCO FREQUENCIES

Base (MODE=1)	Input				CH	Rx (Fref=5KHz)			Tx=(Fref=5KHz)		
	D3	D2	D1	D0		FRx (MHz)	FVCO(MHz)	N	FTx(MHz)	FVCO(MHz)	N
0	0	1	0	2	49.845	39.150	7830	46.630	46.630	9326	
0	0	1	1	3	49.860	39.165	7833	46.670	46.670	9334	
0	1	0	0	4	49.770	39.075	7815	46.710	46.710	9342	
0	1	0	1	5	49.875	39.180	7836	46.730	46.730	9346	
0	1	1	0	6	49.830	39.135	7827	46.770	46.770	9354	
0	1	1	1	7	49.890	39.195	7839	46.830	46.830	9366	
1	0	0	0	8	49.930	39.235	7847	46.870	46.870	9374	
1	0	0	1	9	49.990	39.295	7859	46.930	46.930	9386	
1	0	1	0	10	49.770	39.275	7855	46.970	46.970	9394	
1	0	1	1		49.970	39.275	7855	46.970	46.970	9394	
1	1	0	0		49.970	39.275	7855	46.970	46.970	9394	
1	1	0	1		49.970	39.275	7855	46.970	46.970	9394	
1	1	1	0		49.970	39.275	7855	46.970	46.970	9394	
1	1	1	1		49.970	39.275	7855	46.970	46.970	9394	
0	0	0	0		49.970	39.275	7855	46.970	46.970	9394	

REMOTE (MODE=0)	Input				CH	Rx (Fref=5KHz)			Tx=(Fref=5KHz)		
	D3	D2	D1	D0		FRx (MHz)	FVCO(MHz)	N	FTx(MHz)	FVCO(MHz)	N
0	0	1	0	2	46.630	35.935	7187	49.845	49.845	9969	
0	0	1	1	3	46.670	35.975	7195	49.860	49.860	9972	
0	1	0	0	4	46.710	36.015	7203	49.770	49.770	9954	
0	1	0	1	5	46.730	36.035	7207	49.875	49.875	9975	
0	1	1	0	6	46.770	36.075	7215	49.830	49.830	9966	
0	1	1	1	7	46.830	36.135	7227	49.890	49.890	9978	
1	0	0	0	8	46.870	36.175	7235	49.930	49.930	9986	
1	0	0	1	9	46.930	36.235	7247	49.990	49.990	9998	
1	0	1	0	10	46.970	36.275	7255	49.970	49.970	9994	
1	0	1	1		46.970	36.275	7255	49.970	49.970	9994	
1	1	0	0		46.970	36.275	7255	49.970	49.970	9994	
1	1	0	1		46.970	36.275	7255	49.970	49.970	9994	
1	1	1	0		46.970	36.275	7255	49.970	49.970	9994	
1	1	1	1		46.970	36.275	7255	49.970	49.970	9994	
0	0	0	0		46.970	36.275	7255	49.970	49.970	9994	