

SANYO

No.2365B

LC7151

C MOS Si Gate LSI
Meeting FCC 10-Channel Standard
PLL FOR CORDLESS TELEPHONE

Functions :

- . On-chip PLL for transmission/reception
- . On-chip digital unlock detector (only PLL for transmission)
- . 5.0kHz/4.4kHz output pins for guard tone
- . Standby function
- . Pull-down resistance at CH select pins (D1 to D4)
LC7150: With (for mechanical SW)
LC7151: Without (for μ COM)

Absolute Maximum Ratings at $T_a=25^\circ\text{C}, V_{SS}=0\text{V}$

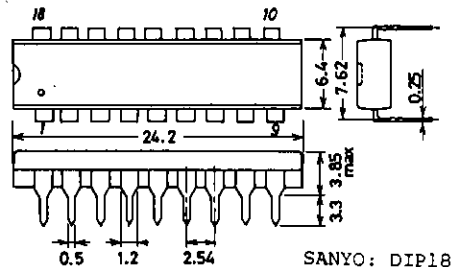
			unit
Maximum Supply Voltage	V_{DDmax}	-0.3 to 6.5	V
Maximum Input Voltage	$V_{I,max}$	All input pins -0.3 to $V_{DD}+0.3$	V
Maximum Output Voltage	V_{O1max}	F1, F2 output OFF	-0.3 to +6.5
	V_{O2max}	Output pins other than V_{O1}	-0.3 to $V_{DD}+0.3$
Output Current	I_{OUT}	F1, F2, LDT	0 to 3.0
Allowable Power Dissipation	P_{dmax}	$T_a=75^\circ\text{C}$	350
			mW
Operating Temperature	T_{opr}	-30 to +75	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$

Allowable Operating Conditions at $T_a=25^\circ\text{C}, V_{SS}=0\text{V}$

			min	typ	max	unit
Supply Voltage	V_{DD}		3.0		5.5	V
"H"-Level Input Voltage	V_{IH1}	D1 to D4, \overline{SB}	$0.7V_{DD}$		V_{DD}	V
"L"-Level Input Voltage	V_{IL1}	"	0	$0.3V_{DD}$		V
"H"-Level Input Voltage	V_{IH2}	$\overline{R/B}$	$0.9V_{DD}$		V_{DD}	V
"L"-Level Input Voltage	V_{IL2}	"	0	$0.1V_{DD}$		V
Input Frequency	f_{IN1}	PIT; $V_{IN}=0.15V_{rms}$	10		27	MHz
	f_{IN2}	PIR; "	30		42	MHz
	f_{IN3}	XIN; $V_{IN}=0.3V_{rms}$	5.0	10.24	11.0	MHz
Input Amplitude	V_{IN1}	PIT; $f_{IN}=27\text{MHz}$	0.15	$0.3V_{DD}$		Vrms
	V_{IN2}	PIR; $f_{IN}=42\text{MHz}$	0.15	$0.3V_{DD}$		Vrms
	V_{IN3}	XIN; $f_{IN}=11\text{MHz}$	0.3	$0.3V_{DD}$		Vrms

Package Dimensions

unit:mm
3007A-DIP18



Electrical Characteristics at Ta=25°C, under Allowable Operating Conditions

			min	typ	max	unit
"H"-Level Input Current	I_{IH1}	XIN; $V_I = V_{DD}$			20	μA
"L"-Level Input Current	I_{IL1}	XIN; $V_I = V_{SS}$			20	μA
"H"-Level Input Current	I_{IH2}	PIT, PIR; $V_I = V_{DD}$			40	μA
"L"-Level Input Current	I_{IL2}	PIT, PIR; $V_I = V_{SS}$			40	μA
"H"-Level Input Current	I_{IH3}	\overline{SB} , R/B, D1 to D4; $V_I = V_{DD}$			10	μA
"L"-Level Input Current	I_{IL3}	\overline{SB} , R/B, D1 to D4; $V_I = V_{SS}$			10	μA
Feedback Resistance	R_{f1}	XIN; $V_{DD} = 4.3V$		1.0		Mohm
	R_{f2}	PIT, PIR; "		0.5		Mohm
"H"-Level Output Voltage	V_{OH1}	PDT, PDR; $I_o = 0.5mA$	$V_{DD} - 1.0$			V
"L"-Level Output Voltage	V_{OL1}	PDT, PDR; $I_o = 0.5mA$			1.0	V
Output OFF Leak Current	I_{off1}	PDT, PDR; $V_o = V_{DD}/V_{SS}$		0.01	1.0	nA
"H"-Level Output Voltage	V_{OH2}	LDT; $I_o = 1mA$	$V_{DD} - 1.0$			V
Output OFF Leak Current	I_{off2}	LDT; Output OFF $V_o = V_{SS}$			5.0	μA
"L"-Level Output Voltage	V_{OL2}	F1, F2; $I_o = 1mA$			1.0	V
Output OFF Leak Current	I_{off3}	F1, F2; output OFF $V_o = 5.5V$			5.0	μA
Current Dissipation	I_{DD1}	(C3) $V_{DD} = 3.0V$		4		mA
	I_{DD2}	(C3) $V_{DD} = 4.5V$		7		mA
	I_{DD3}	(C3) $V_{DD} = 5.5V$		13		mA
	I_{DD4}	(C2) $V_{DD} = 3.0V$		3		mA
	I_{DD5}	(C2) $V_{DD} = 4.5V$		5		mA
	I_{DD6}	(C2) $V_{DD} = 5.5V$		10		mA

(C3): XIN=10.24MHz, Xtal connected

PIT=27MHz 150mVrms

PIR=42MHz 150mVrms

R/B= V_{DD} , SB= V_{DD} , Other pin open

(C2): XIN=10.24MHz, Xtal connected

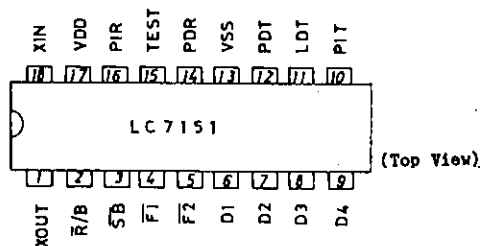
PIR=42MHz, 150mVrms

R/B= V_{DD} , SB= V_{SS} , Other pin open

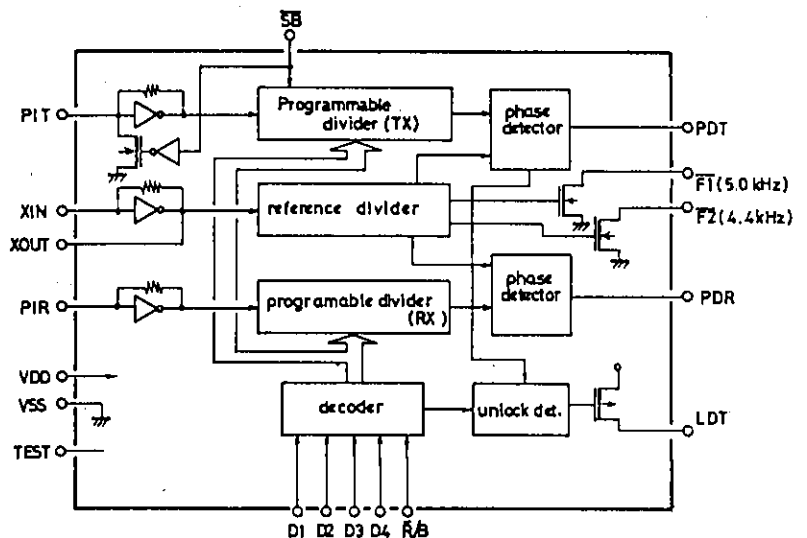
(Note)

Power $V_{DD} - V_{SS}$: Insert a capacitor of 2000pF or greater.

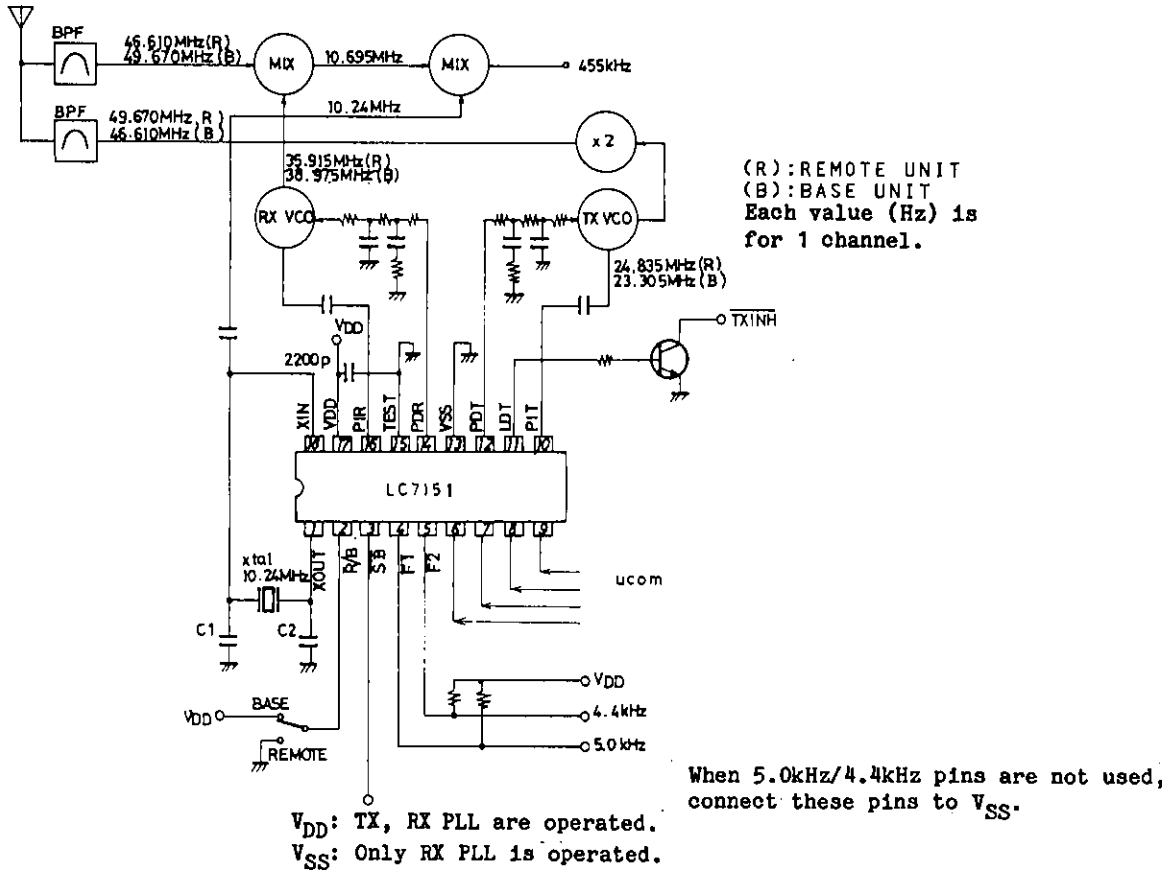
Pin Assignment



Equivalent Circuit Block Diagram



Sample Application Circuit



Pin Description

- F1: 5.0kHz output. When not used, connect to V_{SS}.
- F2: 4.4kHz output (10.24MHz ÷ 2304). When not used, connect to V_{SS}.
- V_{DD}, V_{SS}: Power supply.
- XIN, XOUT: Crystal resonator (10.24MHz).
- D1 to D4: Channel select pin.
- R/B: Base unit/remore unit select pin.
R/B="0" (V_{SS}).....Remote unit
R/B="1" (V_{DD}).....Base unit
- SB: Used to stop the TX PLL at the standby mode to minimize current dissipation.
SB="0" (V_{SS}).....The charge pump enters a high-impedance mode. Standby mode. Only the RX PLL is operated.
SB="1" (V_{DD})..... The TX, RX PLL are operated.
- PIT: TX programmable divider input pin.
- PIR: RX programmable divider input pin.
- PDT: TX charge pump output pin.
- PDR: RX charge pump output pin.
- TEST: LSI test input pin. Connected to V_{SS}.
- LDT: TX PLL unlock signal output pin.

When the phase difference becomes $t_D (=6.25\mu s)$ or more, 5.6ms output pulse is delivered at the LDT pin.

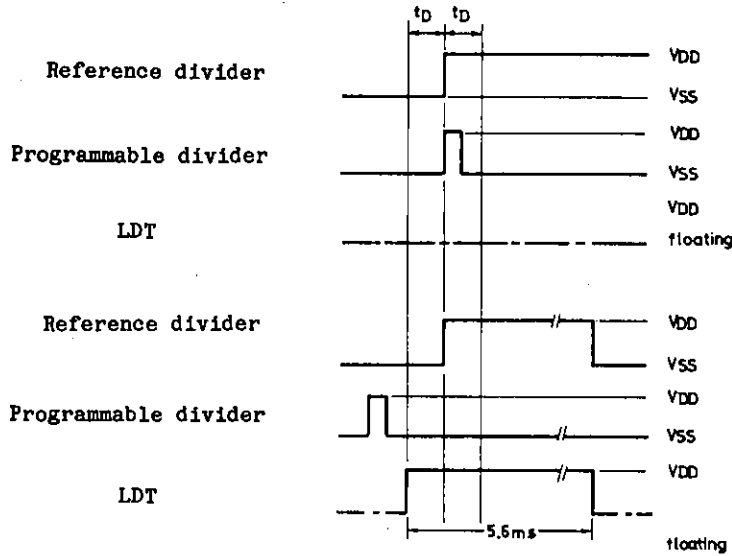


Table of Frequency Division

INPUT D1D2D3D4	C H	REMOTE (R/B='0')					BASE (R/B='1')				
		TX (fref=2.5kHz)		RX (fref=5kHz)			TX (fref=2.5kHz)		RX (fref=5kHz)		
		fTX (MHz)	fVCO (MHz)	N	fVCO (MHz)	N	fTX (MHz)	fVCO (MHz)	N	fVCO (MHz)	N
1 0 0 0	1	49.670	24.8350	9934	35.915	7183	46.610	23.305	9322	38.975	7795
0 1 0 0	2	49.845	24.9225	9969	35.935	7187	46.630	23.315	9326	39.150	7830
1 1 0 0	3	49.860	24.9330	9972	35.975	7195	46.670	23.335	9334	39.165	7833
0 0 1 0	4	49.770	24.8850	9954	36.015	7203	46.710	23.355	9342	39.075	7815
1 0 1 0	5	49.875	24.9375	9975	36.035	7207	46.730	23.365	9346	39.180	7836
0 1 1 0	6	49.830	24.9150	9966	36.075	7215	46.770	23.385	9354	39.135	7827
1 1 1 0	7	49.890	24.9450	9978	36.135	7227	46.830	23.415	9366	39.195	7839
0 0 0 1	8	49.930	24.9650	9986	36.175	7235	46.870	23.435	9374	39.235	7847
1 0 0 1	9	49.990	24.9950	9998	36.235	7247	46.930	23.465	9386	39.295	7859
0 1 0 1	10	49.970	24.9850	9994	36.275	7255	46.970	23.485	9394	39.275	7855
1 1 0 1	10	49.970	24.9850	9994	36.275	7255	46.970	23.485	9394	39.275	7855
0 0 1 1	10	49.970	24.9850	9994	36.275	7255	46.970	23.485	9394	39.275	7855
1 0 1 1	10	49.970	24.9850	9994	36.275	7255	46.970	23.485	9394	39.275	7855
0 1 1 1	10	49.970	24.9850	9994	36.275	7255	46.970	23.485	9394	39.275	7855
1 1 1 1	10	49.970	24.9850	9994	36.275	7255	46.970	23.485	9394	39.275	7855
0 0 0 0	10	49.970	24.9850	9994	36.275	7255	46.970	23.485	9394	39.275	7855

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