C 5121 SERIES

PLL LSI for CB Transceiver

■GENERAL DESCRIPTION

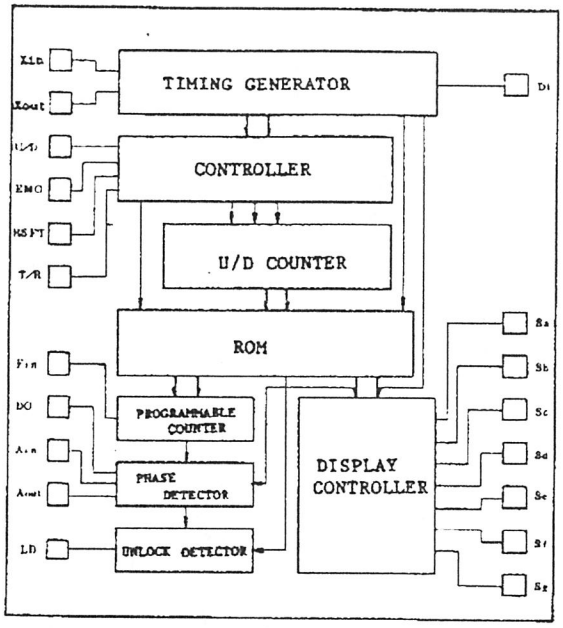
C 5121 is a PLL C-MOS LSI designed for CB transceiver.It can be used for every CB frequency standards in the world by the master-slice.

Since we adopt UP/DOWN method in selecting channel, both detent switch and push switch can be used and simpler system is realized.

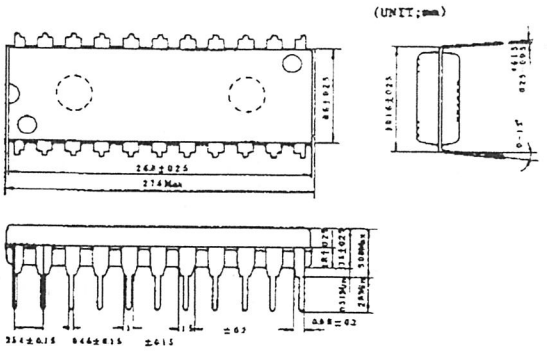
■FEATURES

- Good for every CB frequency standards in the world by the use of master-slice.
- UP/DOWN switch interface available.
- On-chip unlock signal generator circuits.
- Emergency channel function.
- LED or LCD display selectable by the master-slice.
- On-chip decoder for channel display.
- On-chip segment driver (at LED display).
- On-chip amplifier for active LPF.
- Operating voltage: 5.8V±8%
- 22 lead plastic DIP.

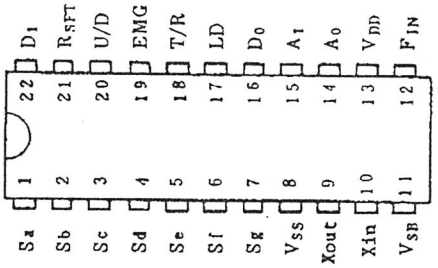
■BLOCK DIAGRAM



■PHYSICAL DIMENSIONS



■CONNECTION DIAGRAM

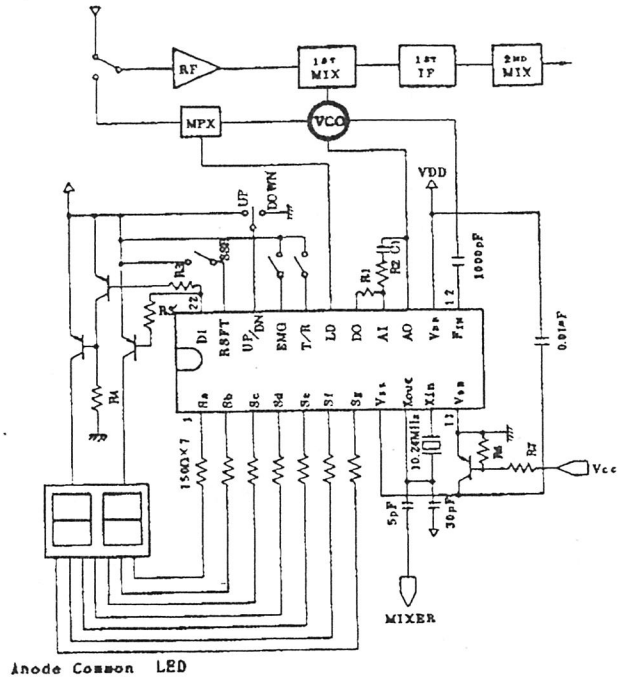


■DESCRIPTION OF PIN FUNCTION

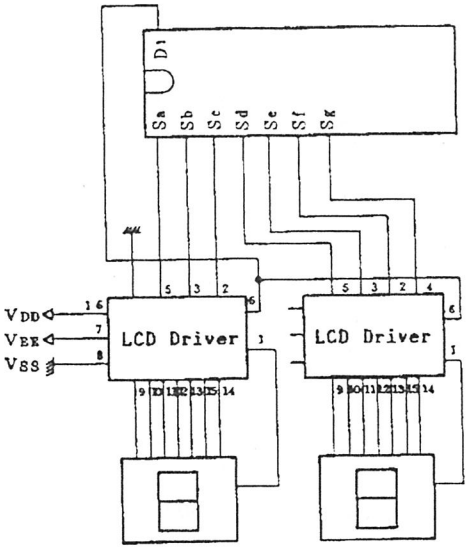
Pin No.	PIN NAME	Function
1 through 7	Sa through Sg	Display Segment Driver or Decoder (LED) (LCD)
8	Vss	Ground
9, 10	Xout ,Xin	Crystal Oscillation Circuit; 10.24MHz
11	VsB	Channel Memory Back Up; Vss level
12	Fin	Input of Programmable Divider
13	Vdd	Power Supply Pin; +5.8V
14	Ao	Amplifier Output for LPF
15	Ai	Amplifier Input for LPF
16	Do	Output of Phase Comparator
17	LD	PLL Lock Detector, "L";Unlock
18	T/R	"H";Transmitter, "L";Receiver
19	EMG	Emergency Channel Call, "H";ON
20	U/D	Channel Up/Down Switch "H";Up, "L";Down, "Open";No Operation
21	Rsft	Receiving Code Shift, "H";N+1 or N-1
22	D1	Display Digit Controll

■TYPICAL APPLICATION

• For LED Display



• For LCD Display



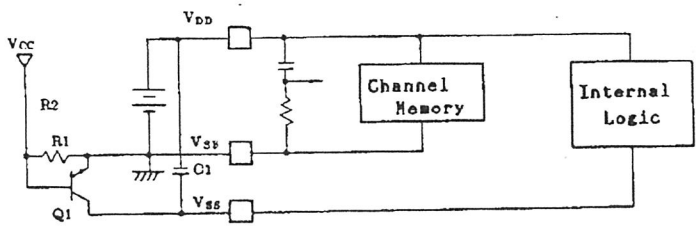
Sa～Sc; Upper Digit Data (BCD)

Sd～Sc; Lower Digit Data (BCD)

D1; Display Drive Clock

78Hz, 50%duty

■CHANNEL MEMORY BACK UP CIRCUIT

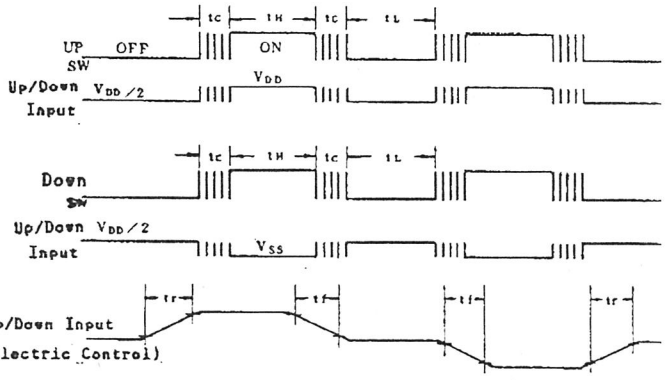


C1=1,000pF

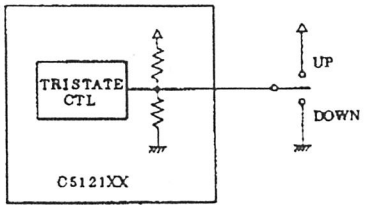
Mechanical switch can be used at Q1.

■TIMING OF UP/DOWN SWITCH

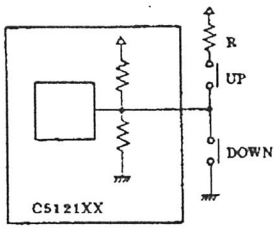
T/R="H"; U/D Function Disenable



■INTERFACE OF UP/DOWN SWITCH



Detent Switch Interface



Push,Up/Down Switch Interface

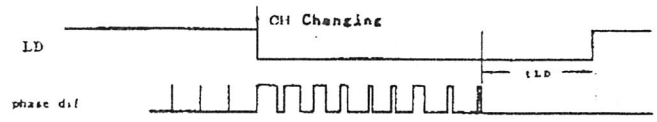
R; Resistance For Current Limit

R≦1kΩ

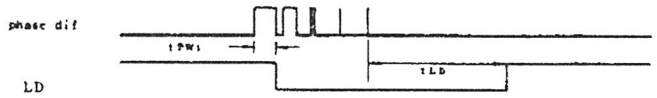
ITEM	Symbol	MIN	TYP	MAX	UNI
Chattering Time	tc		6.45		mS
"H"Level Input Time	tH	5			mS
"L"Level Input Time	tL	5			mS
Rising,Falling Time	tr,tf			1	μS

■TIMING OF UNLOCK SIGNAL

- Changing the channel



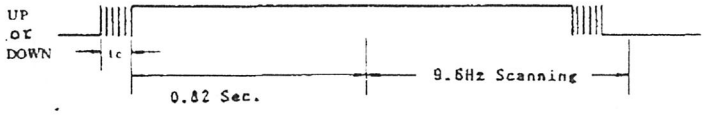
- Unlock by External conditions,such as noise,delay



tpw1: Phase differential time to trigger LD signal. 1.6uSec

tLD: 4.8mS±10%

■CHANNEL SCANNING



On Time of Up/Down switch; 0.82 Sec.

↓

9.6Hz channel scanning begins.

■ELECTRICAL CHARACTERISTICS

Ta =-20～ +70℃ ,VDD= 5.8V, Xin=10.24MHz

ITEM	Symbol	Condition	MIN	TYP	MAX	UNIT
Operating Voltage	Vopr		5.336	5.8	6.264	V
Current Consumption	I DD	Fin=1Vp-p,Qin=2.5Vp-p			15	mA
Input Pull Down Resistance	RDN	T/R,EMG,Rsft	15	20	100	kΩ
Input "L" Voltage	V IL		Vss		0.4	V
Input "H" Voltage	V IH		VDD-0.4		VDD	V
Fin,Qin Bias Voltage	VBS			VDD/2		V
Fin,QinInput voltage	VinAC		1.0			Vp-p
Fin Input Frequency	Finmax	Ta=25 ℃		23		MHz
		Ta=-30℃～ +70℃ VDD=5.34V	18			MHz
Sa～Sg Output"L" Current	I oL1	Vo=2.0V	15			mA
Sa～Sg Output"H" Current	I oH1	Vo=VDD-3.0V	1.0			mA
D1 Output "L"Current	I oL2	Vo=2.0V	1.5			mA
D1 Output "H"Current	I oH2	Vo=VDD-0.4V	0.5			mA
Do Output Current	I o	Vo=Vss or VDD	1.0			mA
LD Output "L"Current	I oL3	Vo=0.4V	1.0			mA
LD Output Off Leak Current	I oH3	Vo=Vss			5	μA
InputBias Resistance	RB	Up/Down Input	25	50		kΩ
Input Open Voltage	V opn	Up/Down Input		VDD/2		

■ABSOLUTE MAXIMUM RATINGS

ITEM	Symbol	Ratings	UNIT
Power Supply Voltage	VDD−Vss	-0.3～+7.0	V
Input Voltage	Vin	Vss≦Vin≦VDD	V
Operating Temperature	Topr	-20 ～ +70	℃
Storage Temperature	Tstg	-40 ～+125	℃
Power Dissipation	Pw	250	mW
Soldering temperature	Tsld	+260± 5	℃
Soldering Time	t sld	$10\pm\frac{1}{0}$	Sec.

■KINDS OF MASTER-SLICE

NAME	STANDARD	Emg. ※ Channel	21Pin Function	Display
C5121-00	USA	9	SSB("H";N+1)	LED
05	FTZ	9	SSB("H";N+1)	LED
06	SWEDEN	11A	SSB("H";N+1)	LED
08	AUSTRALIA MARINE	5	SSB("H";N-1)	LED
09	USA	9	SSB("H";N+1)	LCD
10	ITALY	9	SSB("H";N+1)	LED

※Power on initialize

■ FREQUENCY TABLE (REFERENCE DATA)

(UNIT:MHz)

Channel	USA			UK		
	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)
1	26.965	13.4825	16.27	27.60125	13.800625	16.90625
2	26.975	13.4875	16.28	27.61125	13.805625	16.91625
3	26.985	13.4925	16.29	27.62125	13.810625	16.92625
4	27.005	13.5025	16.31	27.63125	13.815625	16.93625
5	27.015	13.5075	16.32	27.64125	13.820625	16.94625
6	27.025	13.5125	16.33	27.65125	13.825625	16.95625
7	27.035	13.5175	16.34	27.66125	13.830625	16.96625
8	27.055	13.5275	16.36	27.67125	13.835625	16.97625
9	27.065	13.5325	16.37	27.68125	13.840625	16.98625
10	27.075	13.5375	16.38	27.69125	13.845625	16.99625
11	27.085	13.5425	16.39	27.70125	13.850625	17.00625
12	27.105	13.5525	16.41	27.71125	13.855625	17.01625
13	27.115	13.5575	16.42	27.72125	13.860625	17.02625
14	27.125	13.5625	16.43	27.73125	13.865625	17.03625
15	27.135	13.5675	16.44	27.74125	13.870625	17.04625
16	27.155	13.5775	16.46	27.75125	13.875625	17.05625
17	27.165	13.5825	16.47	27.76125	13.880625	17.06625
18	27.175	13.5875	16.48	27.77125	13.885625	17.07625
19	27.185	13.5925	16.49	27.78125	13.890625	17.08625
20	27.205	13.6025	16.51	27.79125	13.895625	17.09625
21	27.215	13.6075	16.52	27.80125	13.900625	17.10625
22	27.225	13.6125	16.53	27.81125	13.905625	17.11625
23	27.235	13.6175	16.54	27.82125	13.910625	17.12625
24	27.245	13.6225	16.55	27.83125	13.915625	17.13625
25	27.255	13.6275	16.56	27.84125	13.920625	17.14625
26	27.265	13.6325	16.57	27.85125	13.925625	17.15625
27	27.275	13.6375	16.58	27.86125	13.930625	17.16625
28	27.285	13.6425	16.59	27.87125	13.935625	17.17625
29	27.295	13.6475	16.60	27.88125	13.940625	17.18625
30	27.305	13.6525	16.61	27.89125	13.945625	17.19625
31	27.315	13.6575	16.62	27.90125	13.950625	17.20625
32	27.325	13.6625	16.63	27.91125	13.955625	17.21625
33	27.335	13.6675	16.64	27.92125	13.960625	17.22625
34	27.345	13.6725	16.65	27.93125	13.965625	17.23625
35	27.355	13.6775	16.66	27.94125	13.970625	17.24625
36	27.365	13.6825	16.67	27.95125	13.975625	17.25625
37	27.375	13.6875	16.68	27.96125	13.980625	17.26625
38	27.385	13.6925	16.69	27.97125	13.985625	17.27625
39	27.395	13.6975	16.70	27.98125	13.990625	17.28625
40	27.405	13.7025	16.71	27.99125	13.995625	17.29625

(UNIT:MHz)

Channel	SWEDEN			DENMARK, NORWAY		
	FREQ	TX VCO FREQ (TX F IN)	FREQ	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)
1	26.965	13.4825	16.27	26.965	13.4825	16.27
2	26.975	13.4875	16.28	26.975	13.4875	16.28
3	26.985	13.4925	16.29	26.985	13.4925	16.29
4	27.005	13.5025	16.31	27.005	13.5025	16.31
5	27.015	13.5075	16.32	27.015	13.5075	16.32
6	27.025	13.5125	16.33	27.025	13.5125	16.33
7	27.035	13.5175	16.34	27.035	13.5175	16.34
8	27.055	13.5275	16.36	27.055	13.5275	16.36
9	27.065	13.5325	16.37	27.065	13.5325	16.37
10	27.075	13.5375	16.38	27.075	13.5375	16.38
11	27.085	13.5425	16.39	27.085	13.5425	16.39
11A	27.095	13.5475	16.40	27.095	13.5475	16.40
12	27.105	13.5525	16.41	27.105	13.5525	16.41
13	27.115	13.5575	16.42	27.115	13.5575	16.42
14	27.125	13.5625	16.43	27.125	13.5625	16.43
15	27.135	13.5675	16.44	27.135	13.5675	16.44
16	27.155	13.5775	16.46	27.155	13.5775	16.46
17	27.165	13.5825	16.47	27.165	13.5825	16.47
18	27.175	13.5875	16.48	27.175	13.5875	16.48
19	27.185	13.5925	16.49	27.185	13.5925	16.49
20	27.205	13.6025	16.51	27.205	13.6025	16.51
21	27.215	13.6075	16.52	27.215	13.6075	16.52
22	27.225	13.6125	16.53	27.225	13.6125	16.53
23	27.255	13.6275	16.56			

(UNIT;MHz)

Channel	NETHERLANDS			ITALY		
	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)
1	26.965	13.4825	16.27	26.875	13.4375	16.18
2	26.975	13.4875	16.28	26.885	13.4425	16.19
3	26.985	13.4925	16.29	26.895	13.4475	16.20
4	27.005	13.5025	16.31	26.905	13.4525	16.21
5	27.015	13.5075	16.32	26.915	13.4575	16.22
6	27.025	13.5125	16.33	26.925	13.4625	16.23
7	27.035	13.5175	16.34	26.935	13.4675	16.24
8	27.055	13.5275	16.36	26.945	13.4725	16.25
9	27.065	13.5325	16.37	26.955	13.4775	16.26
10	27.075	13.5375	16.38	26.965	13.4825	16.27
11	27.085	13.5425	16.39	26.975	13.4875	16.28
12	27.105	13.5525	16.41	26.985	13.4925	16.29
13	27.115	13.5575	16.42	27.005	13.5025	16.31
14	27.125	13.5625	16.43	27.015	13.5075	16.32
15	27.135	13.5675	16.44	27.025	13.5125	16.33
16	27.155	13.5775	16.46	27.035	13.5175	16.34
17	27.165	13.5825	16.47	27.055	13.5275	16.36
18	27.175	13.5875	16.48	27.065	13.5325	16.37
19	27.185	13.5925	16.49	27.075	13.5375	16.38
20	27.205	13.6025	16.51	27.085	13.5425	16.39
21	27.215	13.6075	16.52	27.105	13.5525	16.41
22	27.225	13.6125	16.53	27.115	13.5575	16.42
23	27.235	13.6175	16.54	27.125	13.5625	16.43
24	27.245	13.6225	16.55	27.135	13.5675	16.44
25	27.255	13.6275	16.56	27.155	13.5775	16.46
26	27.265	13.6325	16.57	27.165	13.5825	16.47
27	27.275	13.6375	16.58	27.175	13.5875	16.48
28	27.285	13.6425	16.59	27.185	13.5925	16.49
29	27.295	13.6475	16.60	27.205	13.6025	16.51
30	27.305	13.6525	16.61	27.215	13.6075	16.52
31	27.315	13.6575	16.62	27.225	13.6125	16.53
32	27.325	13.6625	16.63	27.245	13.6225	16.55
33	27.335	13.6675	16.64	27.255	13.6275	16.56
34	27.345	13.6725	16.65	27.265	13.6325	16.57
35	27.355	13.6775	16.66			
36	27.365	13.6825	16.67			
37	27.375	13.6875	16.68			
38	27.385	13.6925	16.69			
39	27.395	13.6975	16.70			
40	27.405	13.7025	16.71			

(UNIT;MHz)

Channel	AUSTRALIA			AUSTRALIA MARINE		
	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)
1	27.015	13.5075	16.32	27.68	13.840	16.985
2	27.025	13.5125	16.33	27.72	13.860	17.025
3	27.035	13.5175	16.34	27.82	13.910	17.125
4	27.055	13.5275	16.36	27.86	13.930	17.165
5	27.065	13.5325	16.37	27.88	13.940	17.185
6	27.085	13.5425	16.39	27.90	13.950	17.205
7	27.095	13.5475	16.40	27.91	13.955	17.215
8	27.105	13.5525	16.41	27.94	13.970	17.245
9	27.115	13.5575	16.42	27.96	13.980	17.265
10	27.125	13.5625	16.43	27.98	13.990	17.285
11	27.135	13.5675	16.44			
12	27.155	13.5775	16.46			
13	27.165	13.5825	16.47			
14	27.175	13.5875	16.48			
15	27.185	13.5925	16.49			
16	27.195	13.5975	16.50			
17	27.205	13.6025	16.51			
18	27.225	13.6125	16.53			

(UNIT;MHz)

Channel	SOUTH AFRICA			ETZI		
	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)	FREQ	TX VCO FREQ (TX F IN)	RX VCO FREQ (RX F IN)
1	27.29	13.645	16.595	26.965	13.4825	16.27
2	27.30	13.650	16.605	26.975	13.4875	16.28
3	27.31	13.655	16.615	26.985	13.4925	16.29
4	27.32	13.660	16.625	27.005	13.5025	16.31
5	27.33	13.665	16.635	27.015	13.5075	16.32
6	27.34	13.670	16.645	27.025	13.5125	16.33
7	27.35	13.675	16.655	27.035	13.5175	16.34
8	27.36	13.680	16.665	27.055	13.5275	16.36
9	27.37	13.685	16.675	27.065	13.5325	16.37
10	27.38	13.690	16.685	27.075	13.5375	16.38
11	27.39	13.695	16.695	27.085	13.5425	16.39
12	27.40	13.700	16.705	27.105	13.5525	16.41
13	27.41	13.705	16.715	27.115	13.5575	16.42
14	27.42	13.710	16.725	27.125	13.5625	16.43
15	27.43	13.715	16.735	27.135	13.5675	16.44
16	27.44	13.720	16.745	27.155	13.5775	16.46
17	27.45	13.725	16.755	27.165	13.5825	16.47
18	27.46	13.730	16.765	27.175	13.5875	16.48
19	27.47	13.735	16.775	27.185	13.5925	16.49
20	27.48	13.740	16.785	27.205	13.6025	16.51
21	27.49	13.745	16.795	27.215	13.6075	16.52
22	27.50	13.750	16.805	27.225	13.6125	16.53

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