Technical Description

This circuit is a typical low-power FM transmitter circuits. The audio signals input from R1 and R4 separately, after a series of Resistance and Capacitance Coupled Circuit which formed by C7, C22,C24,C25, R12 and R15, then go to the Transmit **U5** IC BH1415F.(This transmitter frequency : 88.1~107.9MHZ)

The MCU IC **U2** 74N4 control the transmit frequency by ‘down’ and ‘up’ key and drive the LCD display. The IC **U6** EEPROM 24C02 remember the transmit frequency the last time with MCU IC.

The IC **U4** 8354A50 is a power IC, it supply all power source for this set.

Audio signal is input the limiter of IC U5 through Pre-emphasis net, after being dealed with by the built-in limiter, it is sent to the mpx Compound Unit, simultaneity, the signal produced by CRYSTAL（7.6M） gets stereo transmitting signal after being divided channel, then is sent to the mpx Compound Unit and gets compound signal which is dealed with mpx, the compound signal is sent into “osc modulater” to modulate the carrier wave signal produced by osc, after magnified by RF, then is sent to the in-built antenna to transmit signal.

The PLL circuit is made up of “mcu”、”shift register”、“program counter”、phase detecter”, through locking the user`s selected channel, the “key button” produce touched-pulse data to turn on or off power and adapt channel, “LCD” is used to indicate the channel, FM, MHz, power ect., the button “power” refers to supplying stable power to MCU and transmitter.

Frequency Table (MHz):

88.1	92.1	96.1	100.1	104.1
88.2	92.2	96.2	100.2	104.2
88.3	92.3	96.3	100.3	104.3
88.4	92.4	96.4	100.4	104.4
88.5	92.5	96.5	100.5	104.5
88.6	92.6	96.6	100.6	104.6
88.7	92.7	96.7	100.7	104.7
88.8	92.8	96.8	100.8	104.8
88.9	92.9	96.9	100.9	104.9
89	93	97	101	105
89.1	93.1	97.1	101.1	105.1
89.2	93.2	97.2	101.2	105.2
89.3	93.3	97.3	101.3	105.3
89.4	93.4	97.4	101.4	105.4
89.5	93.5	97.5	101.5	105.5
89.6	93.6	97.6	101.6	105.6
89.7	93.7	97.7	101.7	105.7
89.8	93.8	97.8	101.8	105.8
89.9	93.9	97.9	101.9	105.9
90	94	98	102	106
90.1	94.1	98.1	102.1	106.1
90.2	94.2	98.2	102.2	106.2
90.3	94.3	98.3	102.3	106.3
90.4	94.4	98.4	102.4	106.4
90.5	94.5	98.5	102.5	106.5
90.6	94.6	98.6	102.6	106.6
90.7	94.7	98.7	102.7	106.7
90.8	94.8	98.8	102.8	106.8
90.9	94.9	98.9	102.9	106.9
91	95	99	103	107
91.1	95.1	99.1	103.1	107.1
91.2	95.2	99.2	103.2	107.2
91.3	95.3	99.3	103.3	107.3
91.4	95.4	99.4	103.4	107.4
91.5	95.5	99.5	103.5	107.5
91.6	95.6	99.6	103.6	107.6
91.7	95.7	99.7	103.7	107.7
91.8	95.8	99.8	103.8	107.8
91.9	95.9	99.9	103.9	107.9
92	96	100	104	

Wireless Audio Link IC

BH1415F

The BH1415F is a FM stereo transmitter IC that transmits simple configuration. The IC consists of a stereo modulator for generating stereo composite signals and a FM transmitter for broadcasting a FM signal on the air. The stereo modulator generates a composite signal which consists of the MAIN, SUB, and pilot signal from a 38kHz oscillator.
The FM transmitter radiates FM wave on the air by modulating the carrier signal with a composite signal.

●Applications

CD changer, Car TV, Car navigation, Wireless speakers, Personal computer (sound board), Game machine

●Features

1) It is possible to improve the timbre because it has the pre-emphasis circuit, limiter circuit, and the low-pass filter circuit.
2) Built-in pilot-tone system FM stereo modulator circuit.
3) The transmission frequency is stable because it has a PLL system FM transmitter circuit.
4) PLL data input (CE, CK, DA) by serial input.

●Absolute maximum ratings (Ta = 25°C, In measurement circuit.)

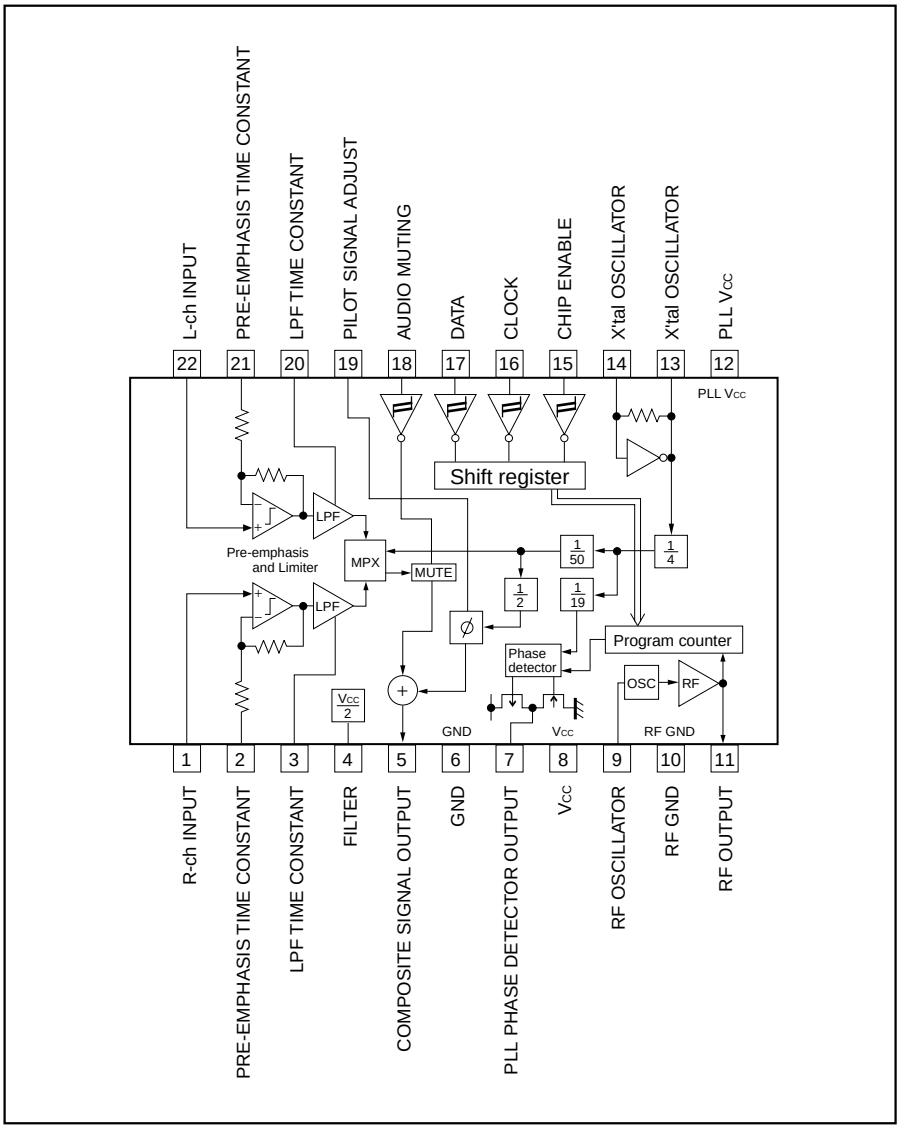
Parameter	Symbol	Limits	Unit	Conditions
Supply voltage	V_{CC}	+7.0	V	Pin8,12
Data input voltage	V_{IN-D}	–0.3 to V_{CC}+0.3	V	Pin15,16,17,18
Phase comparator output voltage	V_{OUT-P}	–0.3 to V_{CC}+0.3	V	Pin7
Power dissipation	Pd	450*	mW	
Storage temperature	Tstg	–55 to +125	°C	

* Derating : 4.5mW/°C for operation above Ta=25°C.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating supply voltage	V_{CC}	4.0	–	6.0	V	Pin8,12
Operating temperature	Topr	–40	–	+85	°C	
Audio input level	V_{IN-A}	–	–	–10	dBV	Pin1,22
Audio input frequency band	f_{IN-A}	20	–	15k	Hz	Pin1,22
Pre-emphasis time constant set up range	t_{PRE}	–	–	155	µsec	Pin2,21
Transmission frequency	f_{TX}	70	–	120	MHz	Pin9,11
Control terminal "H" level input voltage	V_{IH}	0.8V_{CC}	–	V_{CC}	V	Pin15,16,17,18
Control terminal "L" level input voltage	V_{IL}	GND	–	0.2V_{CC}	V	Pin15,16,17,18

●**Block diagram**



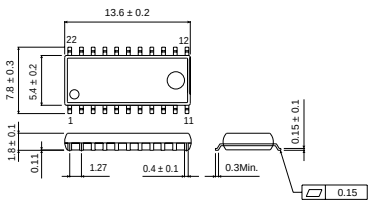
<table>
<tr><th>No.</th><th>Control unit / Data</th><th>Contents</th></tr>
<tr><td>(2)</td><td>MULTIPLEXER

MONO</td><td>• It changes a stereo and monaural operation.
<table>
<tr><th>MONO</th><th>Condition of the composite signal</th></tr>
<tr><td>0</td><td>Monaural operation L+R , Pilot OFF</td></tr>
<tr><td>1</td><td>Stereo operation L+R+(L-R),sinω_st+Psin $\frac{\omega_s}{2}$ t</td></tr>
</table></td></tr>
<tr><td>(2)</td><td>PHASE DETECTOR

PD_0, PD_1</td><td>• It controls charge pump output by the phase comparator compulsorily.
<table>
<tr><th>PD_0</th><th>PD_1</th><th>Charge pump output</th></tr>
<tr><td>0</td><td>0</td><td>Usual operation</td></tr>
<tr><td>0</td><td>1</td><td>Compulsion by Low</td></tr>
<tr><td>1</td><td>0</td><td>Compulsion by High</td></tr>
<tr><td>1</td><td>1</td><td>High impedance</td></tr>
</table></td></tr>
<tr><td>(3)</td><td>TEST MODE

T_0, T_1</td><td>• It is data for the LSI test.
• Always in T_0 Input "1".
• Always in T_1 Input "0".</td></tr>
</table>

●**External dimensions** (Units : mm)



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