STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT SERIES FM stereo transmitter IC for audio systems.

TYPE **BH1418FV**

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

○ Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit	Conditions
Supply voltage	Vcc	+7.0	V	Pin 8, 13
Data input voltage	V_{IN-D}	-0.3 ～ Vcc+0.3	V	Pin 17, 18, 19, 20
Phase comparator output voltage	V_{OUT-P}	-0.3 ～ Vcc+0.3	V	Pin 7
Power dissipation	Pd	630	mW	(*1)
Storage temperature	Tstg	-55 ～ +125	℃	

(*1) To use at a temperature higher than Ta=25℃, derate 6.3mW per 1℃.

Status of this document
The Japanese version of this document is the formal specification. A customer may use this translation version only for a reference to help reading the formal version. If there are any differences in translation version of this document, formal version takes priority.

Application example
The application circuit is recommended for use. Make sure to confirm the adequacy of the characteristics.
When using the circuit with changes to the external circuit constants, make sure to leave an adequate margin for external components including static and transitional characteristics as well as dispersion of the IC.
Note that ROHM cannot provide adequate confirmation of patents.

The product described in this specification is designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys.)
Should you intend to use this product with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

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○ Operating Range

Parameter	Symbol	Limits	Unit	Conditions
Operating supply voltage	Vcc	2.7 ~ 4.0	V	Pin 8, 13
Operating temperature	Topr	-40 ~ +85	℃	
Audio input level	V_{IN-A}	~ -10	dBV	Pin 1, 24
Audio input frequency band	f_{IN-A}	20 ~ 15k	Hz	Pin 1, 24
Pre-emphasis time constant set up range	τ PRE	~ 155	μsec	Pin 2, 23
Transmission frequency	f_{TX}	70 ~ 120	MHz	Pin 10, 12
Control terminal "H" level input voltage	V_{IH}	0.8Vcc ~ Vcc	V	Pin 17, 18, 19, 20
Control terminal "L" level input voltage	V_{IL}	GND ~ 0.2Vcc	V	Pin 17, 18, 19, 20

○ Electrical Characteristics

Unless otherwise specified Ta=25℃ , V_{CC}=3.3V

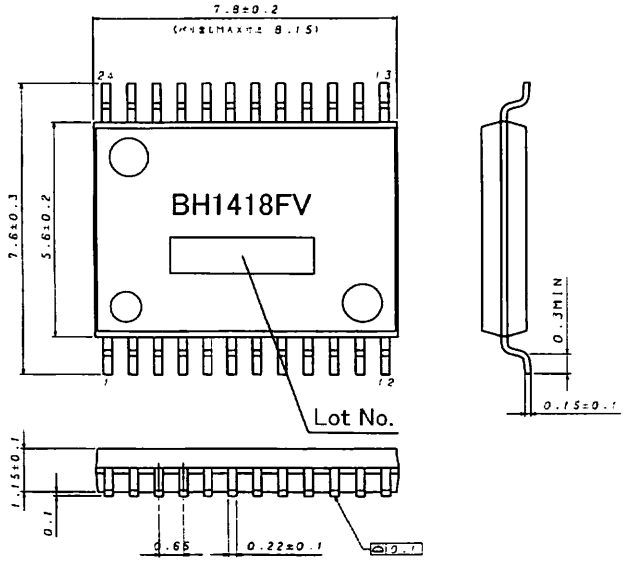
Signal source : f_{IN}=400Hz

Parameter	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
Quiescent current	IQ	13	18.5	28	mA	
Channel separation	Sep	25	40	—	dB	V_{IN}=-20dBV, L→R, R→L
Total harmonic distortion	THD	—	0.1	0.3	%	V_{IN} =-20dBV, L+R
Channel balance	C.B	-2	0	+2	dB	V_{IN} =-20dBV, L+R
Input output gain	G_V	-2	0	+2	dB	V_{IN} =-20dBV, L+R
Pilot modulation rate	M_P	12	15	18	%	V_{IN} =-20dBV, L+R, Pin5
Sub carrier rejection ratio	SCR	—	-30	-20	dB	V_{IN} =-20dBV, L+R
Pre-emphasis time constant	τ PRE	40	50	60	μsec	V_{IN} =-20dBV, L+R
Limiter input level	$V_{IN(LIM)}$	-16	-13	-10	dBV	Output level at 1dB gain compression
LPF cut off frequency	$f_{C(LPF)}$	12	15	18	kHz	V_O=-3dB, Pin2, 23 Open
Mute attenuation volume	$V_{O(MUTE)}$	—	-48	-42	dB	V_{IN}=-20dBV, L+R
Transmission output level	V_{TX}	96	99	102	dBμV	f_{TX}=100MHz
"H" level input current	I_{IH}	—	—	1.0	μA	Pin 17, 18, 19, 20 V_{IN}=3.3V
"L" level input current	I_{IL}	-1.0	—	—	μA	Pin 17, 18, 19, 20 V_{IN}=0V
"H" level output voltage	V_{OH}	Vcc-1.0	Vcc-0.15	—	V	Pin 7 I_{OUT}=-1.0mA
"L" level output voltage	V_{OL}	—	0.15	1.0	V	Pin 7 I_{OUT}=1.0mA
"off" level leak current 1	I_{OFF1}	—	—	100	nA	Pin 7 V_{OUT}=3.3V
"off" level leak current 2	I_{OFF2}	-100	—	—	nA	Pin 7 V_{OUT}=GND

◎ This product is not designed for protection against radioactive rays.

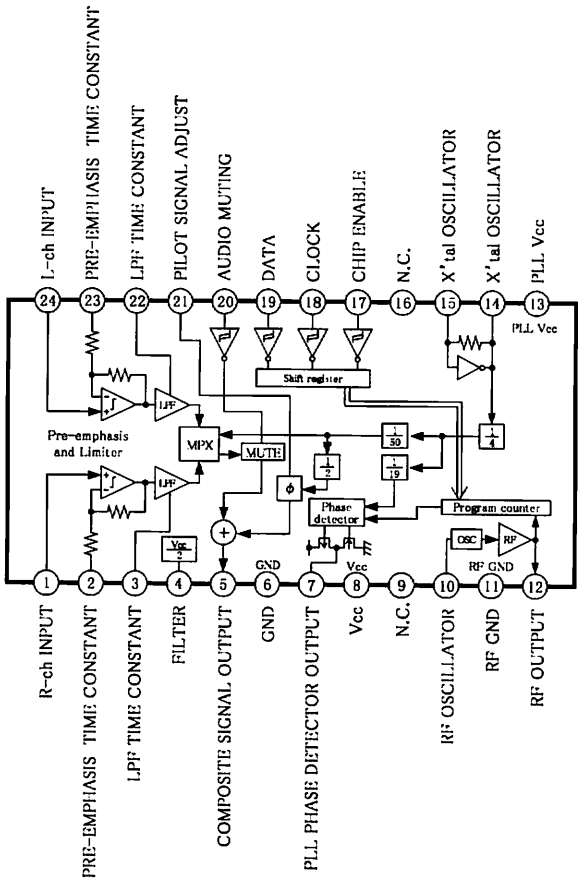
◎ The specification of transmission output level be based on the Radio Law in every country and the area.

○ External Dimension Diagram • Marking Diagram



SSOP-B24 (Unit : mm)

○ Block Diagram



○ Pin No. • Pin Name

No.	Name	No.	Name
1	R-ch INPUT	13	PLL Vcc
2	PRE-EMPHASIS TIME CONSTANT	14	X'tal OSCILLATOR
3	LPF TIME CONSTANT	15	X'tal OSCILLATOR
4	FILTER	16	N.C.
5	COMPOSITE SIGNAL OUTPUT	17	CHIP ENABLE
6	GND	18	CLOCK
7	PLL PHASE DETECTOR OUTPUT	19	DATA
8	Vcc	20	AUDIO MUTING
9	N.C.	21	PILOT SIGNAL ADJUST
10	RF OSCILLATOR	22	LPF TIME CONSTANT
11	RF GND	23	PRE-EMPHASIS TIME CONSTANT
12	RF OUTPUT	24	L-ch INPUT

○ Cautions On Use

(1) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.

(2) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.

(3) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.

(4) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.

(5) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

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