

STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT SERIES Wireless Audio Link LSI for Mobile Phone (FM Stereo Transmitter)

TYPE **BH1425KN**

FEATURE

- Low voltage Fast Mode I²C-BUS interface.
- Adjustment free wideband PLL frequency synthesizer (76MHz~108MHz).
- Possible to select reference clock frequency freely.
- Possible to select transmission power by serial control.
- Possible to select pre-emphasis time constant by serial control.
- Built-in high performance Low-pass Filter.
- Built-in pilot-tone system FM stereo modulator circuit.
- The transmission frequency is stable because it has PLL system FM transmitter circuit.
- Possible to operate in monaural mode.
- Built-in the sound muting circuit.

○ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit	Condition
Supply voltage	VCC	-0.3 to +5.5	V	Pin 2, 6, 11, 13, 23, 25
Data input voltage 1	V _{IN-D1}	-0.3 to V _{DDIO} +0.3	V	Pin 16, 19, 20
Data input voltage 2	V _{IN-D2}	-0.3 to +5.5	V	Pin 17, 18
Power dissipation	Pd	370	mW	(Note 1)
Storage temperature	Tstg	-55 to +125	°C	


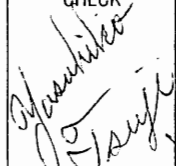
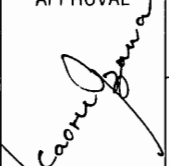
(Note 1) To use at a temperature higher than Ta=25°C, derate 3.7mW per 1°C.

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

- 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.
- ROHM assumes no responsibility for use of any circuits described herein, conveys no license under any patent or other right, and makes no representations that the circuits are free from patent infringement.

DESIGN 	CHECK 	APPROVAL 	DATE : 2006/05/08	SPECIFICATION No. : TSZ02201-BH1425KN-1-2
			REV. A	ROHM CO., LTD.

○ Operating Supply Voltage Range

Parameter	Symbol	Limits	Unit	Conditions
Operating supply voltage 1	V_{CC}	2.7 to 4.0	V	Pin 2, 6, 11, 23, 25
Operating supply voltage 2	V_{DDIO}	1.7 to 4.0	V	Pin 13
Operating temperature	T_{por}	-20 to +85	°C	
Audio input level	V_{IN-A}	to -10	dBV	Pin 26, 27
Audio input frequency	f_{IN-A}	20 to 15k	Hz	Pin 26, 27
Transmission frequency	f_{TX}	76.0 to 108.0	MHz	100kHz step
Control terminal "H" level input voltage 1	V_{IH1}	$0.7V_{DDIO}$ to V_{DDIO}	V	Pin 16, 19, 20
Control terminal "H" level input voltage 2	V_{IH2}	$0.7V_{DDIO}$ to +5.5	V	Pin 17, 18
Control terminal "L" level input voltage	V_{IL}	GND to $0.3V_{DDIO}$	V	Pin 16, 17, 18, 19, 20

○ Electrical Characteristics

 Unless otherwise specified $T_a=25^{\circ}\text{C}$, $V_{CC}=3.0\text{V}$, $V_{DDIO}=1.8\text{V}$

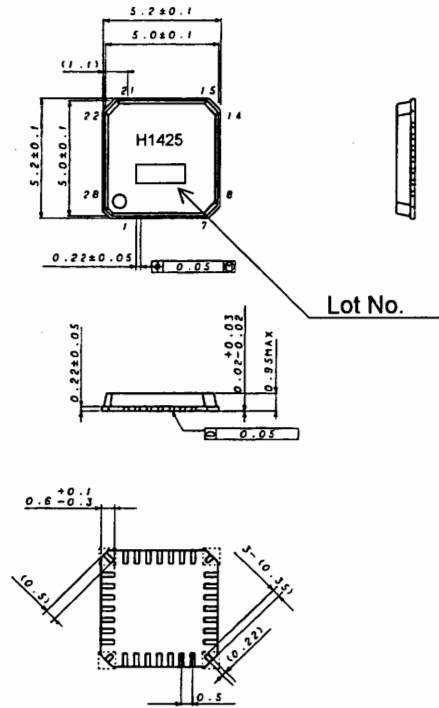
 Signal source : $f_{IN}=1\text{kHz}$, $V_{IN}=-20\text{dBV}$ Common condition : $f_{TX}=90\text{MHz}$, $\Delta f=\pm 75\text{kHz}$, $\tau=50\mu\text{s}$

Parameter	Symbol	Limits			Unit	Condition
		Min.	Typ.	Max.		
Quiescent current	I_Q	14	20	28	mA	Tx power control is 0dB setting.
Power down current	I_{PWD}	—	0	1	μA	BUSEN="L"
Channel separation	Sep	25	40	—	dB	L→R, R→L
Signal to noise ratio	SNR	53	61	—	dB	L+R
		54	62	—	dB	MONO
Total harmonic distortion	THD	—	0.1	0.3	%	L+R
		—	0.1	0.3	%	MONO
Transmission power level	P_{TX}	-9	-6	-3	dBm	Tx power control is 0dB setting.
Pilot modulation rate	M_P	7	11	15	%	L+R
"H" level input current	I_{IH}	—	—	1.0	μA	Pin 16, 19, 20 $V_{IN}=3\text{V}$
"L" level input current	I_{IL}	-1.0	—	—	μA	Pin 16, 19, 20 $V_{IN}=0\text{V}$
"L" level output voltage	V_{OL}	—	—	$0.2V_{DDIO}$	V	Pin 18 $I_O=3\text{mA}$

◎ 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.

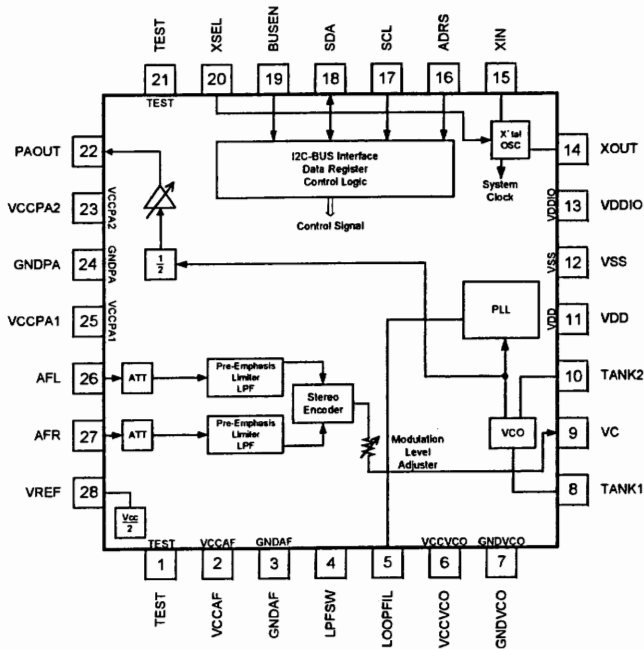
○ PACKAGE OUTLINE



VQFN28

No recommend to solder the areas enclosed by dotted line.

○ BLOCK DIAGRAM



○ Pin number · Pin name

No.	Name	No.	Name
1	TEST	15	XIN
2	VCCAF	16	ADRS
3	GNDAF	17	SCL
4	LPFSW	18	SDA
5	LOOPFIL	19	BUSEN
6	VCCVCO	20	XSEL
7	GNDVCO	21	TEST
8	TANK1	22	PAOUT
9	VC	23	VCCPA2
10	TANK2	24	GNDPA
11	VDD	25	VCCPA1
12	VSS	26	AFL
13	VDDIO	27	AFR
14	XOUT	28	VREF

○ 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.