

STRUCTURE	Silicon Monolithic Integrated Circuit
PRODUCT NAME	Monaural Audio Interface LSI for Digital still camera
MODEL NAME	BH6413GUW
FEATURES	<ul style="list-style-type: none"> • Built-in circuit against line output noise • LPF with control variable Q

○ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	DVDD	4.5	V
	AVCC		
	SPVCC	6.0	V
Power dissipation	Pd	875 *	mW
Operating Temperature Range	Topr	-20 to +70	°C
Storage Temperature Range	Tstg	-55 to +150	°C

* Glass epoxy board with a dimension of 70mm * 70mm * 1.6mm
Over Ta=25°C, this value decreases at 7.0mW/°C.

○ Operating Voltage Range

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Operating supply voltage	DVDD	2.7	2.8	3.3	V
	AVCC				
	SPVCC	2.7	2.8	5.5	V

* Not designed against radiation

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.)

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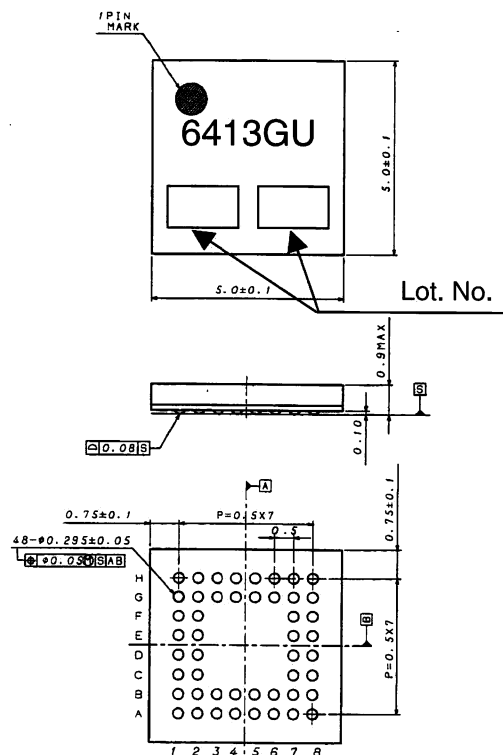
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○ Electrical Characteristics

(Ta=25°C, DVDD=2.8V, AVCC=2.8V, SPVCC=2.8V, unless otherwise noted.)

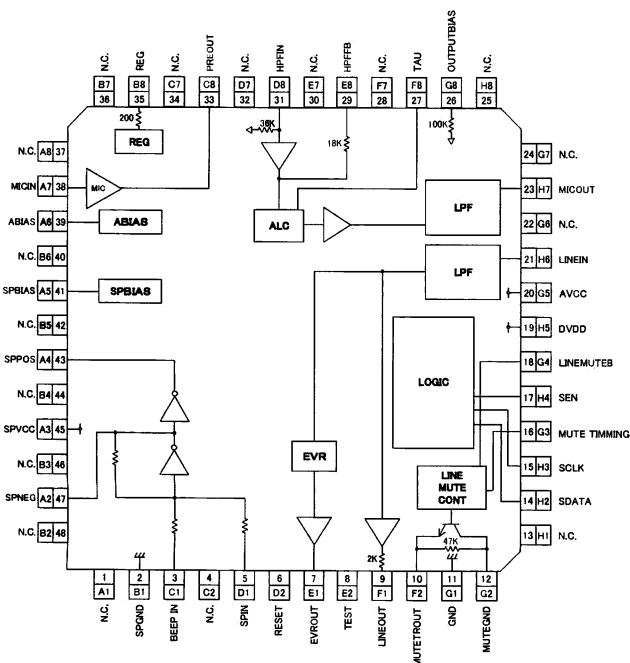
	Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
■ Circuit current							
<<DVDD circuit current>>	Power down mode	IDD	-	30	100	μA	No signal
<<AVCC circuit current>>	Power down mode	ICCA	-	0	100	μA	No signal, LINEMUTE _B : H
	MIC mode	ICCA	-	5.0	8.0	mA	No signal, LINEMUTE _B : H
	LINE+EVR+SP mode	ICCA	-	3.0	6.0	mA	No signal, LINEMUTE _B : H
<<SPVCC circuit current>>	Power down mode	ICCSP	-	0	100	μA	No signal
	LINE+EVR+SP mode	ICCSP	-	3.0	10.0	mA	No signal
	SPBIAS mode	ICCSP	-	200	500	μA	No signal
■ REG Vout:REG	Output voltage	VOREG	1.9	2.1	2.3	V	No signal
	Load variation	VR	1.7	2.0	-	V	Output current 0.5mA
■ MICAMP Vin:MICIN,Vout:PREOUT	Voltage gain	GV	19	20	21	dB	Vin=-42.8dBS,f=1KHz,MICAMP, gain: 20dB
	Input conversion noise voltage	VON	-	-118	-114	dBS	JIS-A
■ ALCAMP Vin:HPFIN,Vout:MICOUT	Reference output level	GV	-11.8	-10.8	-9.8	dBS	Vin=-42.8dBS,f=1KHz
	ALC output level	VOALC	-10.5	-7.5	-4.5	dBS	Vin=-22.8dBS,f=1KHz
■ REC_LPF Vin:HPFIN,Vout:MICOUT	Frequency characteristic1	∠GV1	-1.5	0	+1.5	dB	Vin=-42.8dBS,f=10KHz/1KHz,Q:0dB setting
	Frequency characteristic 2	∠GV2	-	-50	-30	dB	Vin=-42.8dBS,f=32KHz/1KHz,Q:0dB setting
■ PB_LPF Vin:LINEIN,Vout:LINEOUT	Frequency characteristic	∠GV	-7	-3	0	dB	Vin=-12.3dBS,f=20KHz/1KHz
■ LINEAMP Vin:LINEIN,Vout:LINEOUT	Reference output level	VO	-8.5	-7.5	-6.5	dBS	Vin=-12.3dBS,f=1KHz
	Maximum output power	VOM	-2.0	0.5	-	dBS	F=1KHz,THD=1% up to fifth-order
■ EVR Vin:LINEIN,Vout:EVROUT	Voltage gain	GV	-1.0	0	+1.0	dB	Vin=-12.3dBS,f=1KHz,EVR:0dB setting
	Mute attenuation	MUTE	-	-70	-66	dB	Vin=-12.3dBS,f=1KHz,EVR: MUTE setting
■ SPAMP Vin:SPIN,Vout:SPNEG,SPPOS	Voltage gain	GV	10.5	12.0	13.5	dB	Vin=-14.3dBS,f=1KHz,BTL
	Maximum output power	VOM	250	300	-	mW	F=1KHz,BTL, 10% up to THD fifth-order

○ External Dimension Diagram - Marking Diagram



VBGA048W050 (Unit : mm)

- Block Diagram



○ Pin No. - Pin Name

No		Name	No		Name
2	B1	SPGND	19	H5	DVDD
3	C1	BEEPIN	20	G5	AVCC
5	D1	SPIN	21	H6	LINEIN
6	D2	RESET	23	H7	MICOUT
7	E1	EVROUT	26	G8	OUTPUTBIAS
8	E2	TEST	27	F8	TAU
9	F1	LINEOUT	29	E8	HPFFB
10	F2	MUTETROUT	31	D8	HPFIN
11	G1	GND	33	C8	PREOUT
12	G2	MUTEGND	35	B8	REG
14	H2	SDATA	38	A7	MICIN
15	H3	SCLK	39	A6	ABIAS
16	G3	MUTE TIMMING	41	A5	SPBIAS
17	H4	SEN	43	A4	SPPOS
18	G4	LINEMUTEB	45	A3	SPVCC
			47	A2	SPNEG

○ 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.

(6) Switching noise may occur in EVR gain setup.

Measures for noise, like next block AMP mute, must be done in case it becomes a problem in application.

(7) Each BIAS pin should connect capacity over $1.0\ \mu\text{F}$.

(8) Connect the capacity of $4.7\ \mu\text{F}$ and below to the REG pin.

(9) Output pin should connect resistor over $47\ \text{k}\Omega$.

(10) Make RESET and TEST terminal LOW or OPEN usually.

(11) It is possible to turn off MUTETr independently by using LINEMUTEb pin.

When serial command for mute reset is sent and MUTETr is turned off by using LINEMUTEb pin, the LINEOUT pin will be set to mute reset.

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