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| STRUCTURE | Silicon Monolithic Integrated Circuit |
| PROCUCTS | Video-Audio Interface for LCD TV |

TYPE   B D 7 6 2 0 K S 2

ABSOLUTE MAXIMUM RATING （T a ＝ 2 5 ℃）

Item	Symbol	Rating	Unit
Power Supply Voltage 1	V	6．0	V
Power Supply Voltage 2	V	−8．0	V
Power Dissipation	Pd	※1 1500	mW
Operating Temperature Range	Topr	−25 ～ ＋75	℃
Storage Temperature Range	Tstg	−55 ～ ＋150	℃

※1　When absolute temperature exceeds Ta=25℃, rated value is reduced by12mW/℃

OPERATING RANGE

Item	Symbol	Limit	Unit
Supply Voltage 1	DVVCC, AVCC	4．75 ～ 5．25	V
Supply Voltage 2	DVGND, AGND	−6．5 ～ −7．5	V

※　This product is not designed for protection against radioactive rays.
※　DVVCC・AVCC should use the same power source.
※　Improper operation will result if the input and/or output terminal is connected either to the supply
　　Lines or the surface connection terminal and also when insufficient power is supplied to the IC.
※　I²C BUS is compatible Version2.0 （first mode 400kbit/s）.

FUNCTION

- Built-in 6 input Video switch, 3-input Y switch and 3-input C switch
- Input terminal (3ch) of the S1/S2 standard suitability
- Optional 75Ω driver output using external Tr
- Built-in path selector outside LPF
- Attaching HiZ control of video output (YVOUT2)
- Built-in gain adjuster of Video/Audio (0dB/6dB)
- I2C-BUS controlled
  （Protection diode is included on both sides of VCC, GND to the SCL, SDA terminal.）
- Optional Slave address modification (90H/92H)
- Internal MUTE function
- Built-in 7-input Audio selector (Lch, Rch)
- Internal changeable circuit (Audio input and output)
- Internal reversible circuit (Audio Lch⇔Rch)
- Internal 2 outputs for external control port (open collector)

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 the 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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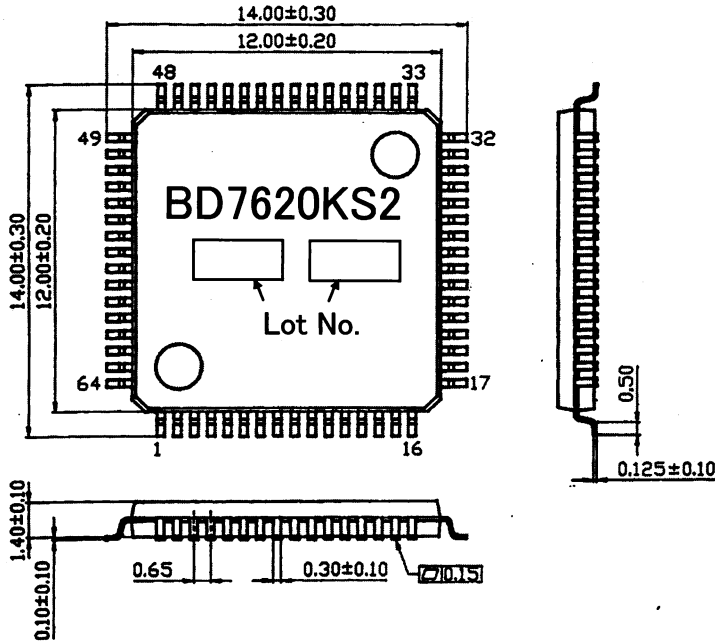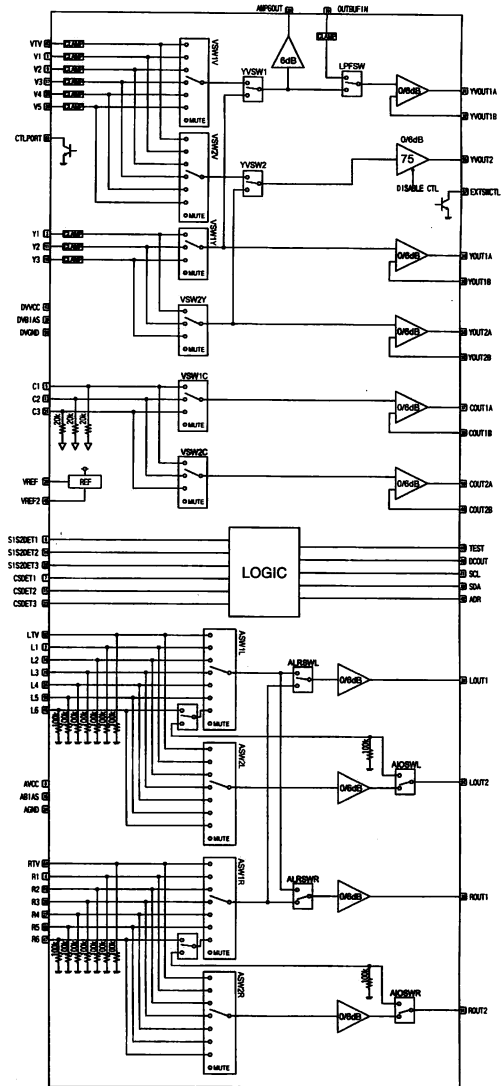
Fig—1   PACKAGE
(S Q F P — T 6 4)

BD7620KS2

Lot No.

(UNIT : mm)

Fig— 2   BLOCK DIAGRAM

PIN ASSINGNMENT

PIN NO.	PIN NAME	PIN NO.	PIN NAME	PIN NO.	PIN NAME	PIN NO.	PIN NAME
1	V1	17	V3	33	LOUT1	49	COUT2B
2	L1	18	L3	34	YOUT1A	50	COUT2A
3	Y1	19	Y3	35	YOUT1B	51	ROUT2
4	R1	20	R3	36	ROUT1	52	YOUT2B
5	C1	21	C3	37	COUT1A	53	YOUT2A
6	S1S2DET1	22	S1S2DET3	38	COUT1B	54	LOUT2
7	CSDET1	23	CSDET3	39	DVBIAS	55	YVOUT2
8	AVCC	24	AGND	40	SDA	56	DVGND
9	V2	25	L4	41	SCL	57	EXTSWCTL
10	L2	26	V4	42	ADR	58	L5
11	Y2	27	R4	43	DVVCC	59	V5
12	R2	28	VREF	44	TEST	60	R5
13	C2	29	AMP6OUT	45	L6	61	CTLPORT
14	S1S2DET2	30	OUTBUF IN	46	VREF2	62	LTV
15	CSDET2	31	YVOUT1A	47	R6	63	VTV
16	ABIAS	32	YVOUT1B	48	DCOUT	64	RTV

REV. B

ELECTRICAL CHARACTERISTICS　　(Ta=25℃, DVVCC, AVCC=5.0V, DVGND, AGND=-7.0V unless otherwise specified)

Item	Symbol	Limit MIN.	Limit TYP.	Limit MAX.	Unit	Conditions
<All Circuits>						
VCC Circuit Current	I_{VCC}	38	63	88	mA	No Signal
VEE Circuit Current	I_{VEE}	-88	-63	-38	mA	No Signal
<VIDEO Part>						
Y/V OUT1 0dB Voltage Gain	G_{032}	-0.7	-0.2	0.3	dB	Vin=1.0Vpp , f=100kHz
Y/V OUT1 6dB Voltage Gain	G_{632}	5.5	6.0	6.5	dB	Vin=1.0Vpp , f=100kHz
Y/V OUT2 0dB Voltage Gain	G_{055}	-0.7	-0.2	0.3	dB	Vin=1.0Vpp , f=100kHz
Y/V OUT2 6dB Voltage Gain	G_{655}	5.5	6.0	6.5	dB	Vin=1.0Vpp , f=100kHz
Y OUT1 0dB Voltage Gain	G_{035}	-0.7	-0.2	0.3	dB	Vin=1.0Vpp , f=100kHz
Y OUT1 6dB Voltage Gain	G_{635}	5.5	6.0	6.5	dB	Vin=1.0Vpp , f=100kHz
Y OUT2 0dB Voltage Gain	G_{052}	-0.7	-0.2	0.3	dB	Vin=1.0Vpp , f=100kHz
Y OUT2 6dB Voltage Gain	G_{652}	5.5	6.0	6.5	dB	Vin=1.0Vpp , f=100kHz
C OUT1 0dB Voltage Gain	G_{038}	-0.7	-0.2	0.3	dB	Vin=1.0Vpp , f=100kHz
C OUT1 6dB Voltage Gain	G_{638}	5.5	6.0	6.5	dB	Vin=1.0Vpp , f=100kHz
C OUT2 0dB Voltage Gain	G_{049}	-0.7	-0.2	0.3	dB	Vin=1.0Vpp , f=100kHz
C OUT2 6dB Voltage Gain	G_{649}	5.5	6.0	6.5	dB	Vin=1.0Vpp , f=100kHz
Channel Differential Gain	G_D	-0.5	0.0	0.5	dB	Vin=1.0Vpp , f=100kHz
Y/V OUT1 0dB Maximum Output Level	V_{O032}	2.6	2.8	—	Vp-p	Vin: THD=1.0% f=10kHz
Y/V OUT1 6dB Maximum Output Level	V_{O632}	2.6	2.8	—	Vp-p	Vin: THD=1.0% f=10kHz
Y/V OUT2 0dB Maximum Output Level	V_{O055}	2.5	2.7	—	Vp-p	Vin: THD=1.0% f=10kHz
Y/V OUT2 6dB Maximum Output Level	V_{O655}	2.5	2.7	—	Vp-p	Vin: THD=1.0% f=10kHz
Y OUT1 0dB Maximum Output Level	V_{O035}	2.6	2.8	—	Vp-p	Vin: THD=1.0% f=10kHz
Y OUT1 6dB Maximum Output Level	V_{O635}	2.6	2.8	—	Vp-p	Vin: THD=1.0% f=10kHz
Y OUT2 0dB Maximum Output Level	V_{O052}	2.6	2.8	—	Vp-p	Vin: THD=1.0% f=10kHz
Y OUT2 6dB Maximum Output Level	V_{O652}	2.6	2.8	—	Vp-p	Vin: THD=1.0% f=10kHz
C OUT1 0dB Maximum Output Level	V_{O038}	2.8	3.0	—	Vp-p	Vin: THD=1.0% f=10kHz
C OUT1 6dB Maximum Output Level	V_{O638}	2.8	3.0	—	Vp-p	Vin: THD=1.0% f=10kHz
C OUT2 0dB Maximum Output Level	V_{O049}	2.8	3.0	—	Vp-p	Vin: THD=1.0% f=10kHz
C OUT2 6dB Maximum Output Level	V_{O649}	2.8	3.0	—	Vp-p	Vin: THD=1.0% f=10kHz
Y/V OUT1 0dB Frequency Characteristic	F_{032}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y/V OUT1 6dB Frequency Characteristic	F_{632}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y/V OUT2 0dB Frequency Characteristic	F_{055}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y/V OUT2 6dB Frequency Characteristic	F_{655}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y OUT1 0dB Frequency Characteristic	F_{035}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y OUT1 6dB Frequency Characteristic	F_{635}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y OUT2 0dB Frequency Characteristic	F_{052}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y OUT2 6dB Frequency Characteristic	F_{652}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
C OUT1 0dB Frequency Characteristic	F_{038}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
C OUT1 6dB Frequency Characteristic	F_{638}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
C OUT2 0dB Frequency Characteristic	F_{049}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
C OUT2 6dB Frequency Characteristic	F_{649}	-2.0	0	2.0	dB	Vin=1.0Vpp , f=7M/100kHz
Y/V OUT1 MUTE Attenuation	M_{T32}	—	-60	-55	dB	Vin=1.0Vpp , f=4.43MHz 0dB
Y/V OUT2 MUTE Attenuation	M_{T55}	—	-60	-55	dB	Vin=1.0Vpp , f=4.43MHz 0dB
Y OUT1 MUTE Attenuation	M_{T35}	—	-60	-55	dB	Vin=1.0Vpp , f=4.43MHz 0dB
Y OUT2 MUTE Attenuation	M_{T52}	—	-60	-55	dB	Vin=1.0Vpp , f=4.43MHz 0dB
C OUT1 MUTE Attenuation	M_{T38}	—	-60	-55	dB	Vin=1.0Vpp , f=4.43MHz 0dB
C OUT2 MUTE Attenuation	M_{T49}	—	-60	-55	dB	Vin=1.0Vpp , f=4.43MHz 0dB
Y/V OUT Channel Crosstalk	C_{TYV0}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
Y OUT Channel Crosstalk	C_{TY0}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
C OUT Channel Crosstalk	C_{TC0}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
Y/V, V, C OUT Channel Crosstalk	C_{TYVC0}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
VSW1V Switch Crosstalk	C_{T32}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
VSW2V Switch Crosstalk	C_{T55}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
VSW1Y Switch Crosstalk	C_{T35}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
VSW2Y Switch Crosstalk	C_{T52}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
VSW1C Switch Crosstalk	C_{T38}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
VSW2C Switch Crosstalk	C_{T49}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
YVSW1 Switch Crosstalk	C_{T32YV}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
YVSW2 Switch Crosstalk	C_{T55YV}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
LPFSW Switch Crosstalk	C_{T32BF}	—	-60	-55	dB	Vin=1.0Vpp,f=4.43MHz,AMP0dB
<AUDIO Part>						
L OUT1 Frequency Characteristic	F_{33}	-3.0	0.0	3.0	dB	Vin=1.0Vpp , f=50kHz/1k
R OUT1 Frequency Characteristic	F_{36}	-3.0	0.0	3.0	dB	Vin=1.0Vpp , f=50kHz/1k
L OUT2 Frequency Characteristic	F_{54}	-3.0	0.0	3.0	dB	Vin=1.0Vpp , f=50kHz/1k
R OUT2 Frequency Characteristic	F_{51}	-3.0	0.0	3.0	dB	Vin=1.0Vpp , f=50kHz/1k
L OUT1 0dB Voltage Gain	G_{033}	-1.0	0	1.0	dB	Vin=1.0Vpp , f=1kHz
L OUT1 6dB Voltage Gain	G_{633}	5.0	6.0	7.0	dB	Vin=1.0Vpp , f=1kHz
R OUT1 0dB Voltage Gain	G_{036}	-1.0	0	1.0	dB	Vin=1.0Vpp , f=1kHz
R OUT1 6dB Voltage Gain	G_{636}	5.0	6.0	7.0	dB	Vin=1.0Vpp , f=1kHz
L OUT2 0dB Voltage Gain	G_{054}	-1.0	0	1.0	dB	Vin=1.0Vpp , f=1kHz
L OUT2 6dB Voltage Gain	G_{654}	5.0	6.0	7.0	dB	Vin=1.0Vpp , f=1kHz
R OUT2 0dB Voltage Gain	G_{051}	-1.0	0	1.0	dB	Vin=1.0Vpp , f=1kHz
R OUT2 6dB Voltage Gain	G_{651}	5.0	6.0	7.0	dB	Vin=1.0Vpp , f=1kHz
L OUT1 Total Harmonic Distortion	T_{HD033}	—	0.003	0.1	%	Vin=2.2Vpp,f=1kHz,0dB ※1
R OUT1 Total Harmonic Distortion	T_{HD036}	—	0.003	0.1	%	Vin=2.2Vpp,f=1kHz,0dB ※1
L OUT2 Total Harmonic Distortion	T_{HD054}	—	0.003	0.1	%	Vin=2.2Vpp,f=1kHz,0dB ※1
R OUT2 Total Harmonic Distortion	T_{HD051}	—	0.003	0.1	%	Vin=2.2Vpp,f=1kHz,0dB ※1
L OUT1 Input D Range	T_{HDR33}	2.8	3.0	—	Vrms	f=1kHz, 0dB,Maximum value of Distortion<0.3%
R OUT1 Input D Range	T_{HDR36}	2.8	3.0	—	Vrms	f=1kHz, 0dB, Maximum value of Distortion<0.3%
L OUT2 Input D Range	T_{HDR54}	2.8	3.0	—	Vrms	f=1kHz, 0dB, Maximum value of Distortion<0.3%
R OUT2 Input D Range	T_{HDR51}	2.8	3.0	—	Vrms	f=1kHz, 0dB, Maximum value of Distortion<0.3%
L-R OUT1 Channel Crosstalk	C_{TLR01}	—	-90	-80	dB	Vin=1.0Vpp , f=1kHz, 0dB
L-R OUT2 Channel Crosstalk	C_{TLR02}	—	-90	-80	dB	Vin=1.0Vpp , f=1kHz, 0dB
R.R.Ratio	P_{SR}	—	-65	-45	dB	※2
DC Offset	V_{OS}	-30	—	30	mV	Offset voltage between in and output
Remain Noise	N	0	20	100	μVrms	※1
<ADR>						
Input Voltage H	V_{IH42}	2.0	—	Vcc	V	
Input Voltage L	V_{IL42}	0.0	—	1.0	V	
Input Impedance	Z_{42}	65	100	135	kΩ	Pull down resistance

Item	Symbol	Limit			Unit	Conditions
		MIN.	TYP.	MAX.		
<SCL, SDA>						
Input Voltage H	V_{IHIIC}	2.0	—	Vcc	V	
Input Voltage L	V_{ILIIC}	0.0	—	1.0	V	
Input Bias Current	I_{BIIC}	0	-1	-10	mA	
<I2C-BUS Control>						
S1/S2 DET Detection Level H	V_{DSSH}	3.4	—	Vcc	V	
S1/S2 DET Detection Level M	V_{DSSM}	1.3	1.9	2.5	V	
S1/S2 DET Detection Level L	V_{DSSL}	0.0	—	0.7	V	
C/S DET Detection Level H	V_{DCSH}	3.5	—	VCC	V	
C/S DET Detection Level L	V_{DCSL}	0	—	2.5	V	
C/S DET Input Impedance	Z_{ICS}	100	150	200	KΩ	Pull up resistance
<DC OUT>						
Output Voltage H	V_{O48H}	4.0	4.5	4.9	V	
Output Voltage M	V_{O48M}	1.8	2.1	2.4	V	
Output Voltage L	V_{O48L}	0	0.1	0.5	V	
Output Impedance	Z_{O48}	0.5	0.9	1.3	kΩ	Pull down resistance

※1   400Hz HPF+30kHz LPF ON
※2   Vin=0.3Vpp,f=100Hz, 30kHz LPF ON

■ Cautions on use

(1) Numbers and data in entries are representative design values and are not guaranteed values of the items.

(2) Although we are confident in recommending the sample application circuits, carefully their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.

(3) 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 exceeded 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 rations are exceeded to the LSI.

(4) DVGND, AGND pins (-7V)
Make the DVGND, AGND pin voltage such that it is lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the DVGND, AGND pin, including transient phenomena.
GND pin (0V) is the DVBIAS, ABIAS pin.

(5) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use. Within the limits of operating temperature (-25℃～+75℃), although basic circuit functional operation is guaranteed. Please take into consideration enough for a hindsight. In the case of a set design, please circulation of the air of IC circumference secured according to installation a fan and PCB layout, and please sufficient measure against heat dissipation.

(6) 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.

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

(8) Supply voltage of operation
Although basic circuit function is guaranteed within the limits of supply voltage(1: 4.75V～5.25V, 2: -6.5V～-7.5V) of operation. Please be sure element and each parameter, when this device use.

(9) Please lay out outside parts nearest IC, and set lines from output amplifier short.

(10) Please lay out the coupling capacitor nearest IC and each pin.

(11) VCC for this IC should use the same power source. And impedance should connect as well as possible for each VCC pin, for each GND pin.

Notes

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