

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

TYPE B D 7 6 2 0 K S 2

ABSOLUTE MAXIMUM RATING (T a = 2 5 °C)

| Item | Symbol | Rating | Unit |
|-----------------------------|--------|-----------------|------|
| Power Supply Voltage 1 | V | 6 . 0 | V |
| Power Supply Voltage 2 | V | - 8 . 0 | V |
| Power Dissipation | Pd | ※ 1 1 5 0 0 | mW |
| Operating Temperature Range | Topr | - 2 5 ~ + 7 5 | °C |
| Storage Temperature Range | Tstg | - 5 5 ~ + 1 5 0 | °C |

※ 1 When absolute temperature exceeds Ta=25°C, rated value is reduced by 12mW/°C

OPERATING RANGE

| Item | Symbol | Limit | Unit |
|------------------|-------------|-------------------|------|
| Supply Voltage 1 | DVVCC, AVCC | 4 . 7 5 ~ 5 . 2 5 | 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

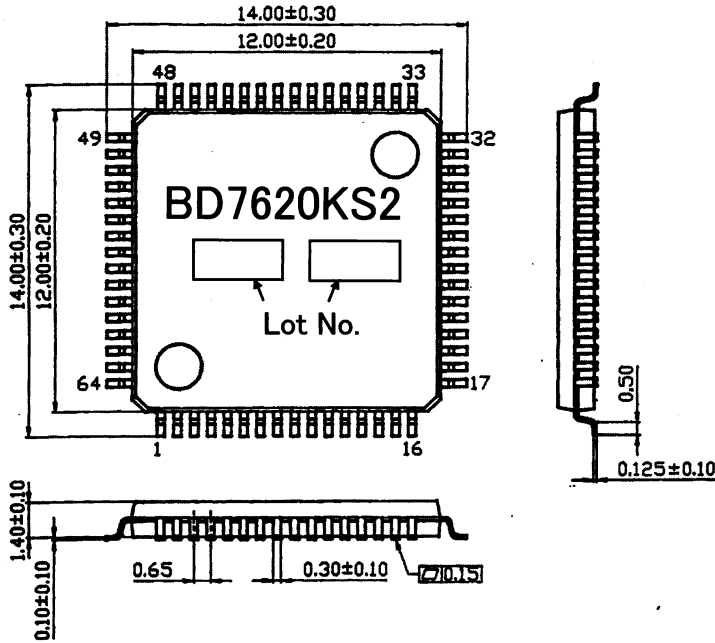
- Built-in 6 input Video switch, 3-input Y switch and 3-input C switch
- Input terminal (3ch) of the S1/S2 standard suitability
- Optional 75Ω driver output using external Tr
- Built-in path selector outside LPF
- Attaching HiZ control of video output (YVOUT2)
- Built-in gain adjuster of Video/Audio (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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(UNIT :mm)

Fig-1 PACKAGE (SQFP-T64)

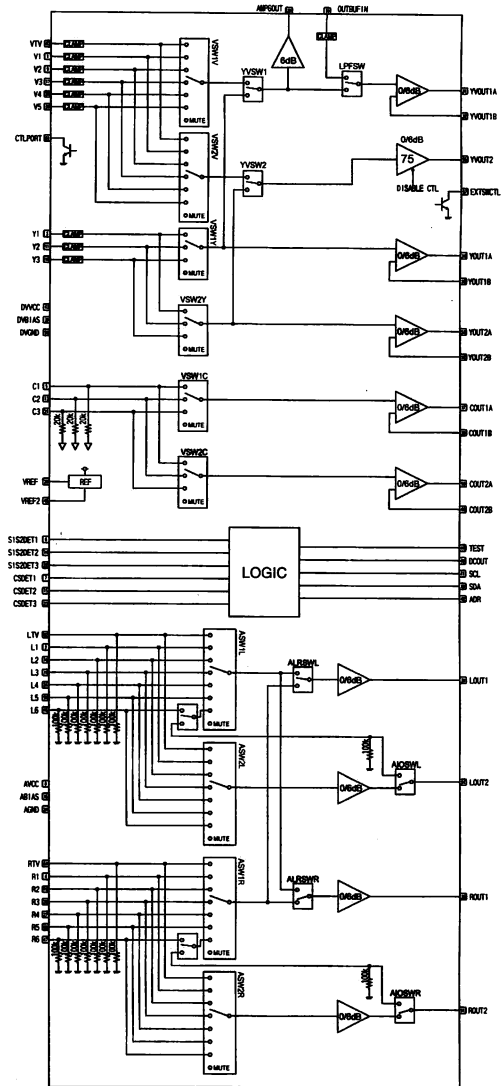


Fig-2 BLOCK DIAGRAM

PIN ASSINGMENT

| 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 |

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

| Item | Symbol | Limit | | | Unit | Conditions |
|---------------------------------------|--------|-------|-------|------|-------|---|
| | | MIN. | TYP. | MAX. | | |
| <All Circuits> | | | | | | |
| VCC Circuit Current | Ivcc | 38 | 63 | 88 | mA | No Signal |
| VEE Circuit Current | Ivee | -88 | -63 | -38 | mA | No Signal |
| <VIDEO Part> | | | | | | |
| Y/V OUT1 0dB Voltage Gain | Gv02 | -0.7 | -0.2 | 0.3 | dB | Vin=1.0Vpp, f=100kHz |
| Y/V OUT1 6dB Voltage Gain | G62 | 5.5 | 6.0 | 6.5 | dB | Vin=1.0Vpp, f=100kHz |
| Y/V OUT2 0dB Voltage Gain | Gv55 | -0.7 | -0.2 | 0.3 | dB | Vin=1.0Vpp, f=100kHz |
| Y/V OUT2 6dB Voltage Gain | G65 | 5.5 | 6.0 | 6.5 | dB | Vin=1.0Vpp, f=100kHz |
| Y OUT1 0dB Voltage Gain | Gv05 | -0.7 | -0.2 | 0.3 | dB | Vin=1.0Vpp, f=100kHz |
| Y OUT1 6dB Voltage Gain | G65 | 5.5 | 6.0 | 6.5 | dB | Vin=1.0Vpp, f=100kHz |
| Y OUT2 0dB Voltage Gain | Gv52 | -0.7 | -0.2 | 0.3 | dB | Vin=1.0Vpp, f=100kHz |
| Y OUT2 6dB Voltage Gain | G62 | 5.5 | 6.0 | 6.5 | dB | Vin=1.0Vpp, f=100kHz |
| C OUT1 0dB Voltage Gain | Gv38 | -0.7 | -0.2 | 0.3 | dB | Vin=1.0Vpp, f=100kHz |
| C OUT1 6dB Voltage Gain | G68 | 5.5 | 6.0 | 6.5 | dB | Vin=1.0Vpp, f=100kHz |
| C OUT2 0dB Voltage Gain | Gv49 | -0.7 | -0.2 | 0.3 | dB | Vin=1.0Vpp, f=100kHz |
| C OUT2 6dB Voltage Gain | G69 | 5.5 | 6.0 | 6.5 | dB | Vin=1.0Vpp, f=100kHz |
| Channel Differential Gain | Gd | -0.5 | 0.0 | 0.5 | dB | Vin=1.0Vpp, f=100kHz |
| Y/V OUT1 0dB Maximum Output Level | Vv02 | 2.6 | 2.8 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y/V OUT1 6dB Maximum Output Level | V62 | 2.6 | 2.8 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y/V OUT2 0dB Maximum Output Level | Vv55 | 2.5 | 2.7 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y/V OUT2 6dB Maximum Output Level | V65 | 2.5 | 2.7 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y OUT1 0dB Maximum Output Level | Vv05 | 2.6 | 2.8 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y OUT1 6dB Maximum Output Level | V65 | 2.6 | 2.8 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y OUT2 0dB Maximum Output Level | Vv52 | 2.6 | 2.8 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y OUT2 6dB Maximum Output Level | V62 | 2.6 | 2.8 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| C OUT1 0dB Maximum Output Level | Vv38 | 2.8 | 3.0 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| C OUT1 6dB Maximum Output Level | V68 | 2.8 | 3.0 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| C OUT2 0dB Maximum Output Level | Vv49 | 2.8 | 3.0 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| C OUT2 6dB Maximum Output Level | V69 | 2.8 | 3.0 | — | Vp-p | Vin: THD=1.0% f=10kHz |
| Y/V OUT1 0dB Frequency Characteristic | Fv02 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y/V OUT1 6dB Frequency Characteristic | F62 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y/V OUT2 0dB Frequency Characteristic | Fv55 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y/V OUT2 6dB Frequency Characteristic | F65 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y OUT1 0dB Frequency Characteristic | Fv05 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y OUT1 6dB Frequency Characteristic | F65 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y OUT2 0dB Frequency Characteristic | Fv52 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y OUT2 6dB Frequency Characteristic | F62 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| C OUT1 0dB Frequency Characteristic | Fv38 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| C OUT1 6dB Frequency Characteristic | F68 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| C OUT2 0dB Frequency Characteristic | Fv49 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| C OUT2 6dB Frequency Characteristic | F69 | -2.0 | 0 | 2.0 | dB | Vin=1.0Vpp, f=7M/100kHz |
| Y/V OUT1 MUTE Attenuation | Mv02 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz 0dB |
| Y/V OUT2 MUTE Attenuation | Mv55 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz 0dB |
| Y OUT1 MUTE Attenuation | Mv05 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz 0dB |
| Y OUT2 MUTE Attenuation | Mv52 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz 0dB |
| C OUT1 MUTE Attenuation | Mv38 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz 0dB |
| C OUT2 MUTE Attenuation | Mv49 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz 0dB |
| Y/V OUT Channel Crosstalk | CvYV0 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| Y OUT Channel Crosstalk | CvY0 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| C OUT Channel Crosstalk | CvC0 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| Y/V, V, C OUT Channel Crosstalk | CvYVCO | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| VSW1V Switch Crosstalk | CvS1 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| VSW2V Switch Crosstalk | CvS2 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| VSW1Y Switch Crosstalk | CvS3 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| VSW2Y Switch Crosstalk | CvS4 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| VSW1C Switch Crosstalk | CvS5 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| VSW2C Switch Crosstalk | CvS6 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| YVSW1 Switch Crosstalk | CvS7 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| YVSW2 Switch Crosstalk | CvS8 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| LPSW Switch Crosstalk | CvS9 | — | -60 | -55 | dB | Vin=1.0Vpp, f=4.43MHz, AMP0dB |
| <AUDIO Part> | | | | | | |
| L OUT1 Frequency Characteristic | F23 | -3.0 | 0.0 | 3.0 | dB | Vin=1.0Vpp, f=50kHz/1k |
| R OUT1 Frequency Characteristic | F36 | -3.0 | 0.0 | 3.0 | dB | Vin=1.0Vpp, f=50kHz/1k |
| L OUT2 Frequency Characteristic | F54 | -3.0 | 0.0 | 3.0 | dB | Vin=1.0Vpp, f=50kHz/1k |
| R OUT2 Frequency Characteristic | F51 | -3.0 | 0.0 | 3.0 | dB | Vin=1.0Vpp, f=50kHz/1k |
| L OUT1 0dB Voltage Gain | Gv03 | -1.0 | 0 | 1.0 | dB | Vin=1.0Vpp, f=1kHz |
| L OUT1 6dB Voltage Gain | G63 | 5.0 | 6.0 | 7.0 | dB | Vin=1.0Vpp, f=1kHz |
| R OUT1 0dB Voltage Gain | Gv06 | -1.0 | 0 | 1.0 | dB | Vin=1.0Vpp, f=1kHz |
| R OUT1 6dB Voltage Gain | G66 | 5.0 | 6.0 | 7.0 | dB | Vin=1.0Vpp, f=1kHz |
| L OUT2 0dB Voltage Gain | Gv54 | -1.0 | 0 | 1.0 | dB | Vin=1.0Vpp, f=1kHz |
| L OUT2 6dB Voltage Gain | G64 | 5.0 | 6.0 | 7.0 | dB | Vin=1.0Vpp, f=1kHz |
| R OUT2 0dB Voltage Gain | Gv51 | -1.0 | 0 | 1.0 | dB | Vin=1.0Vpp, f=1kHz |
| R OUT2 6dB Voltage Gain | G61 | 5.0 | 6.0 | 7.0 | dB | Vin=1.0Vpp, f=1kHz |
| L OUT1 Total Harmonic Distortion | THD033 | — | 0.003 | 0.1 | % | Vin=2.2Vpp, f=1kHz, 0dB ※1 |
| R OUT1 Total Harmonic Distortion | THD036 | — | 0.003 | 0.1 | % | Vin=2.2Vpp, f=1kHz, 0dB ※1 |
| L OUT2 Total Harmonic Distortion | THD054 | — | 0.003 | 0.1 | % | Vin=2.2Vpp, f=1kHz, 0dB ※1 |
| R OUT2 Total Harmonic Distortion | THD051 | — | 0.003 | 0.1 | % | Vin=2.2Vpp, f=1kHz, 0dB ※1 |
| L OUT1 Input D Range | THD033 | 2.8 | 3.0 | — | Vrms | f=1kHz, 0dB, Maximum value of Distortion<0.3% |
| R OUT1 Input D Range | THD036 | 2.8 | 3.0 | — | Vrms | f=1kHz, 0dB, Maximum value of Distortion<0.3% |
| L OUT2 Input D Range | THD054 | 2.8 | 3.0 | — | Vrms | f=1kHz, 0dB, Maximum value of Distortion<0.3% |
| R OUT2 Input D Range | THD051 | 2.8 | 3.0 | — | Vrms | f=1kHz, 0dB, Maximum value of Distortion<0.3% |
| L-R OUT1 Channel Crosstalk | CvLR01 | — | -90 | -80 | dB | Vin=1.0Vpp, f=1kHz, 0dB |
| L-R OUT2 Channel Crosstalk | CvLR02 | — | -90 | -80 | dB | Vin=1.0Vpp, f=1kHz, 0dB |
| R, R Ratio | PSR | — | -85 | -45 | dB | ※2 |
| DC Offset | Vos | -30 | — | 30 | mV | Offset voltage between in and output |
| Remain Noise | N | 0 | 20 | 100 | μVrms | ※1 |
| <ADR> | | | | | | |
| Input Voltage H | VH42 | 2.0 | — | Vcc | V | |
| Input Voltage L | VL42 | 0.0 | — | 1.0 | V | |
| Input Impedance | Zi42 | 65 | 100 | 135 | kΩ | Pull down resistance |

| Item | Symbol | I limit | | | Unit | Conditions |
|-----------------------------|-------------------|---------|------|-----------------|------|----------------------|
| | | MIN. | TYP. | MAX. | | |
| <SCL, SDA> | | | | | | |
| Input Voltage H | V _{HIIC} | 2.0 | — | V _{CC} | V | |
| Input Voltage L | V _{LIIC} | 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 | — | V _{CC} | 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 | — | V _{CC} | 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 ratings 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°C~+75°C), 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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Please contact our sales offices for details ;

| | | |
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| Dilian | TEL : +86(411)8230-8549 | FAX : +86(411)8230-8537 |
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| Taiwan / Taipei | TEL : +866(2)2500-6956 | FAX : +866(2)2503-2869 |
| Korea / Seoul | TEL : +82(2)8182-700 | FAX : +82(2)8182-715 |
| Singapore | TEL : +65-6332-2322 | FAX : +65-6332-5662 |
| Malaysia / Kuala Lumpur | TEL : +60(3)7958-8355 | FAX : +60(3)7958-8377 |
| Philippines / Manila | TEL : +63(2)807-6872 | FAX : +63(2)809-1422 |
| Thailand / Bangkok | TEL : +66(2)254-4890 | FAX : +66(2)256-6334 |

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(Internal Sales)

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| Yokohama | 2-4-8, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa 222-8575 | TEL : +81(45)476-2131 | FAX : +81(45)476-2128 |
| Nagoya | Dainagayo Building 9F 3-28-12, Meieki, Nakamura-ku, Nagoya, Aichi 450-0002 | TEL : +81(52)581-8521 | FAX : +81(52)561-2173 |
| Kyoto | 579-32 Higashi Shiokouji-cho, Karasuma Nishi-iru, Shiokoujidori, Shimogyo-ku, Kyoto 600-8216 | TEL : +81(75)311-2121 | FAX : +81(75)314-6559 |

(Contact address for overseas customers in Japan)

| | | |
|----------|-----------------------|------------------------|
| Yokohama | TEL : +81(45)476-9270 | FAX : +81(045)476-9271 |
|----------|-----------------------|------------------------|