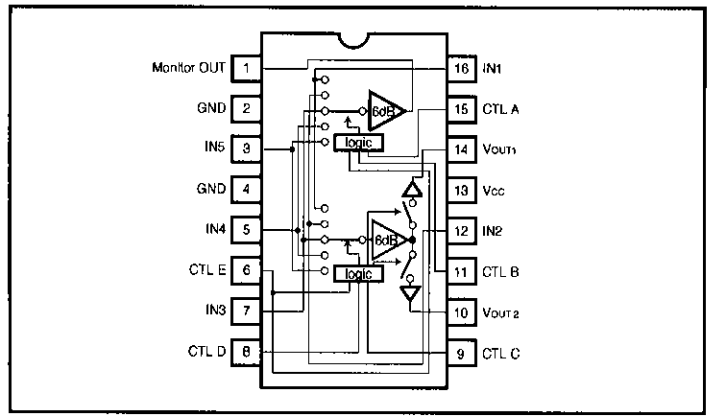
Video signal switcher for AV amplifiers
BA7625

The BA7625 is a video signal switch that contains two five-channel analog multiplexers and wide-band 6dB amplifiers. It designed for use in video cassette recorders. By simply adding transistor buffers to the outputs, it is possible to construct a record/playback switch for two record/playback VCRs, and three video playback machines (eg. laser disk players). Input switching and VCR record switching can be done independently. The BA7625 has sync-tip clamp inputs which are ideal for switching video signals.

●Applications
AV amplifiers and video selectors

●Features
1)5-input / 3-output switches.
2)Sync-tip clamp inputs.
3)Built-in 6dB amplifiers.
4)5V supply voltage.

●Block diagram



●Truth table

A	B	E	Monitor OUT
L	L	*	IN1
H	L	*	IN2
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

C	D	E	VOUT1
L	L	*	—
H	L	*	IN2
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

C	D	E	VOUT2
L	L	*	IN1
H	L	*	—
L	H	*	IN3
H	H	L	IN4
H	H	H	IN5

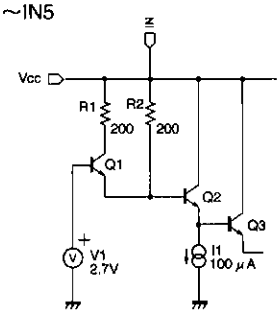
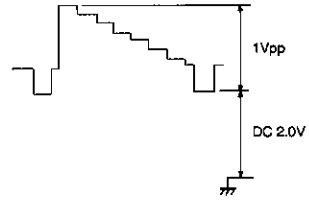
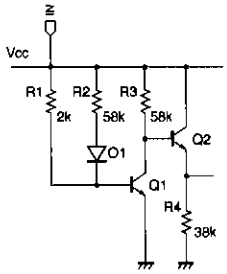
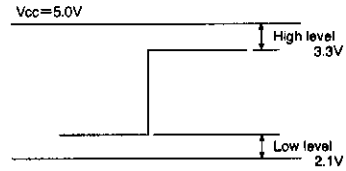
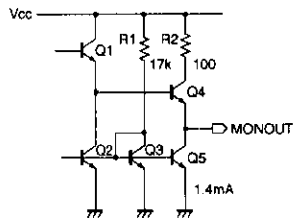
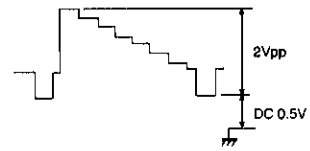
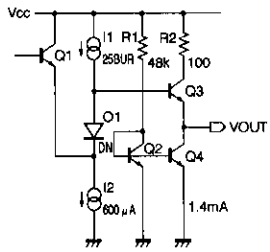
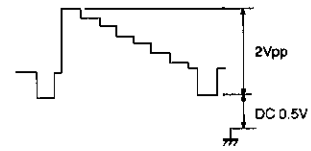
Note 1: * indicates "don't care" (H or L).

●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	9	V
Power dissipation	Pd	500*	mW
Operating temperature	Topr	−25~70	℃
Storage temperature	Tstg	−55~125	℃

* Reduced by 5mW for each increase in Ta of 1°C over 25°C.

●Equivalent input / output circuits

Input circuit	Waveform
IN1~IN5 	
CTLA~CTLE 	
Monitor OUT 	
VOUT1 , VOUT2 	

●Electrical characteristics (Unless otherwise specified Ta=25℃ and V_{CC}=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Operating voltage	V_{CC}	4.5	5.0	5.5	V	—
Circuit current	I_{CC}	—	15.0	20.0	mA	—
Maximum output level	V_{om}	2.6	2.9	—	V_{P-P}	f=1kHz, THD=0.5%
Voltage gain	G_V	5.7	6.2	6.7	dB	f=MHz, V_{IN}=1V_{P-P}
Interchannel crosstalk	CT	—	−65	−45	dB	f=4.43MHz, V_{IN}=1V_{P-P}
Mute level	CTM	—	−35	−25	dB	f=4.43MHz, V_{IN}=1V_{P-P}
Frequency characteristic	G_f	−3	0	3	dB	10MHz / 1MHz, V_{IN}=1V_{P-P}
CTL pin switch level	V_{TH}	2.2	—	3.3	V	—

◎Not designed for radiation resistant.

●Measurement circuit

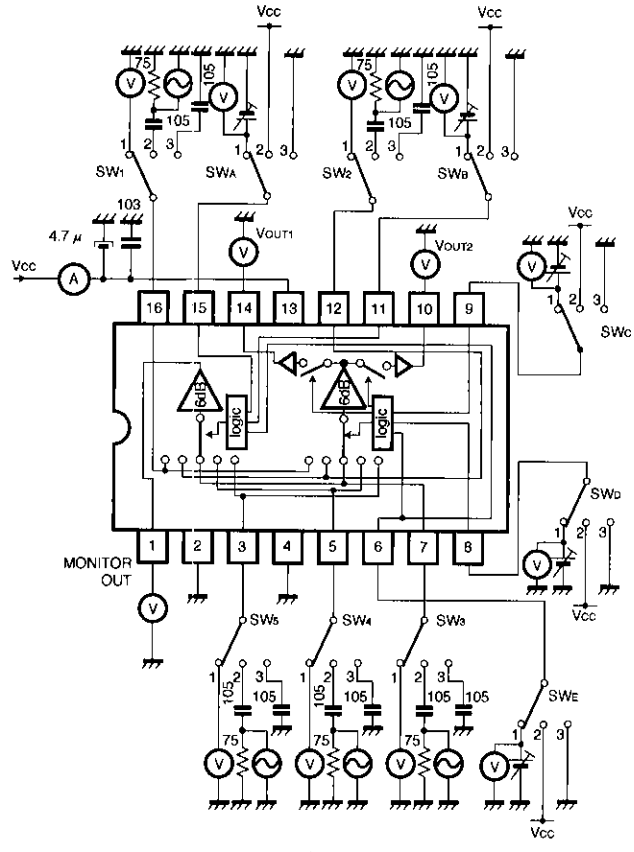


Fig.1

●Measurement conditions

Parameter	Symbol	Switch settings										Measurement method
		SW_1	SW_2	SW_3	SW_4	SW_5	SW_A	SW_B	SW_C	SW_D	SW_E	
Current comsumption	Icc	3	3	3	3	3	2	2	2	2	2	
Monitor OUT maximum output level	V_{om} 1MON	2	3	3	3	3	3	3	*	*	*	Note 1
	V_{om} 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	V_{om} 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	V_{om} 4MON	↓	↓	3	2	↓	2	2	↓	↓	3	
	V_{om} 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
Monitor OUT voltage gain	Gv 1MON	2	3	3	3	3	3	3	*	*	*	Note 2
	Gv 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	Gv 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	Gv 4MON	↓	↓	3	2	↓	2	2	↓	↓	3	
	Gv 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
Monitor OUT interchannel crosstalk	CT1-2MON	2	3	3	3	3	2	3	*	*	*	Note 3
	CT1-3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	CT1-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT1-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	CT2-1MON	3	2	3	3	3	3	3	*	*	*	
	CT2-3MON	↓	↓	↓	↓	↓	3	2	↓	↓	↓	
	CT2-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT2-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	CT3-1MON	3	3	2	3	3	3	3	*	*	*	
	CT3-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	CT3-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT3-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
	CT4-1MON	3	3	3	2	3	3	3	*	*	*	
	CT4-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	CT4-3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	CT4-5MON	↓	↓	↓	↓	↓	2	2	↓	↓	3	
	CT5-1MON	3	3	3	3	2	3	3	*	*	*	
	CT5-2MON	↓	↓	↓	↓	↓	2	3	↓	↓	↓	
	CT5-3MON	↓	↓	↓	↓	↓	2	2	↓	↓	↓	
	CT5-4MON	↓	↓	↓	↓	↓	2	2	↓	↓	2	
Monitor OUT frequency characteristic	Gf 1MON	2	3	3	3	3	3	3	*	*	*	Note 4
	Gf 2MON	3	2	↓	↓	↓	2	3	↓	↓	↓	
	Gf 3MON	↓	3	2	↓	↓	3	2	↓	↓	↓	
	Gf 4MON	↓	↓	3	2	↓	2	2	↓	↓	3	
	Gf 5MON	↓	↓	↓	3	2	2	2	↓	↓	2	
V_{OUT1} maximum output level	V_{om} 2OUT1	3	2	3	3	3	*	*	2	3	*	Note 1
	V_{om} 3OUT1	↓	3	2	↓	↓	↓	↓	3	2	↓	
	V_{om} 4OUT1	↓	↓	3	2	3	↓	↓	2	2	3	
	V_{om} 5OUT1	↓	↓	↓	3	2	↓	↓	2	2	2	

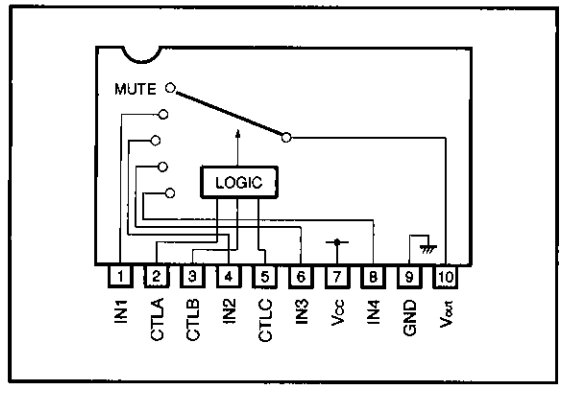
Video signal switcher
BA7645N

The BA7645N is a four-channel analog multiplexer with mute, designed for use in video cassette recorders. It features a large dynamic range, and wide operating frequency range, and has sync-tip inputs which are ideal for switching video signals.

●Applications
Video cassette recorders and televisions

●Features
1)4-input / 1-output switches.
2)Built-in mute.
3)Sync-tip inputs.
4)Wide operating supply voltage range (4.5V to 13.0V).
5)Low power consumption (48mW Typ.).
6)Excellent frequency characteristics (10MHz, 0dB Typ.).
7)Wide dynamic range (3.5V_{P-P} Typ.).
8)Low interchannel crosstalk (-65dB Typ., f=4.43MHz).

●Block diagram



Truth table

CTL - A	CTL - B	CTL - C	OUT
L (OPEN)	L (OPEN)	L (OPEN)	IN1
L (OPEN)	H	L (OPEN)	IN2
H	L (OPEN)	L (OPEN)	IN3
H	H	L (OPEN)	IN4
*	*	H	MUTE

* Either "L" (open) of "H".

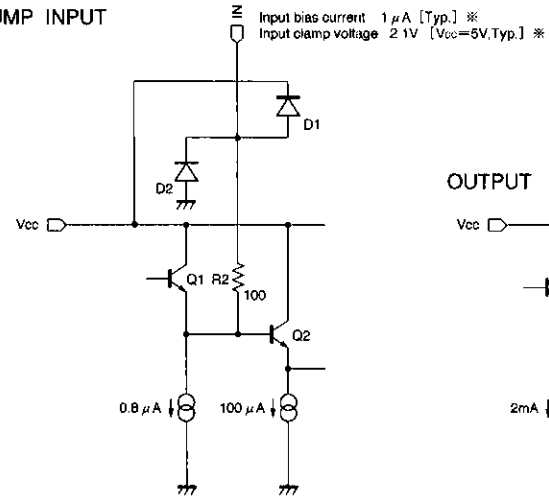
●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limit	Unit
Power supply voltage	Vcc	13.5	V
Power dissipation	Pd	850 *	mW
Operating temperature	Topr	−25~75	℃
Storage temperature	Tstg	−55~125	℃

* Reduced by 8.5mW for each increase in Ta of 1°C over 25°C.

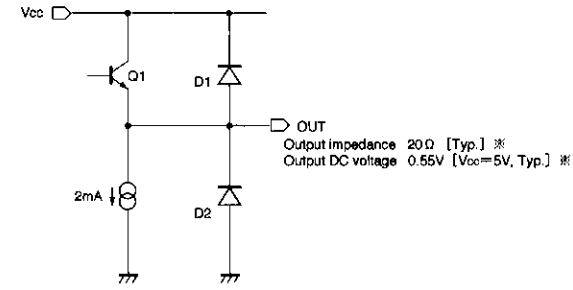
●Equivalent circuits

CLUMP INPUT

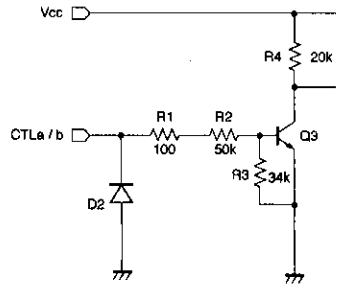


※ Reference value

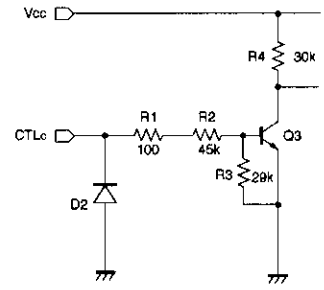
OUTPUT



CTLa / CTLb



CTLc



●Electrical characteristics (Unless otherwise specified Ta=25℃ and V_{CC}=5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
Operating voltage	V_{CC}	4.5	—	13.0	V		Fig. 4
Circuit current	I_{CC}	—	9.5	14.5	mA		Fig. 4
Maximum output level	V_{om}	3.0	3.5	—	V_{P-P}	f=1kHz, THD=0.5%	Fig. 4
Voltage gain	G_V	−0.5	0	+0.5	dB	f=1MHz, V_{in}=1.0V_{P-P}	Fig. 4
Interchannel crosstalk	C_T	—	−65	—	dB	f=4.43MHz, V_{in}=1.0V_{P-P}	Fig. 4
Frequency characteristic	C_I	−3.0	0	+1.0	dB	f=10MHz / 1MHz, V_{in}=1.0V_{P-P}	Fig. 4
CTL pin switching level A	V_{TH-A}	1.0	2.0	3.0	V		Fig. 4
CTL pin switching level B	V_{TH-B}	1.0	2.0	3.0	V		Fig. 4
CTL pin switching level C	V_{TH-C}	1.0	2.0	3.0	V		Fig. 4

◎Not designed for radiation resistant.

●Electrical characteristic curves

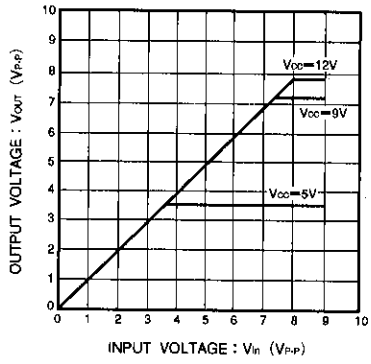


Fig. 1 Vin vs. Vout (f = 1kHz)

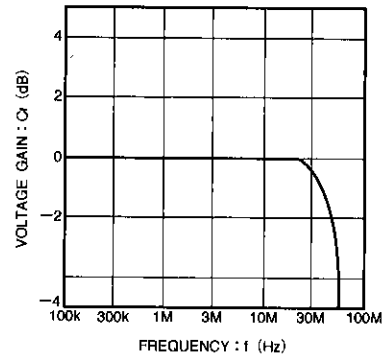


Fig. 2 Frequency characteristic

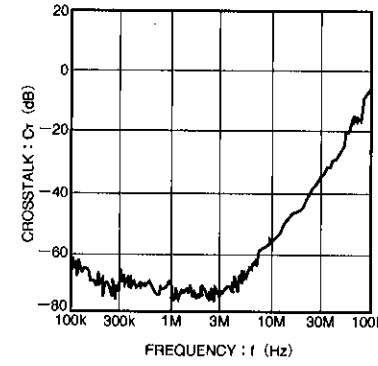


Fig. 3 Interchannel crosstalk

●Measurement circuit

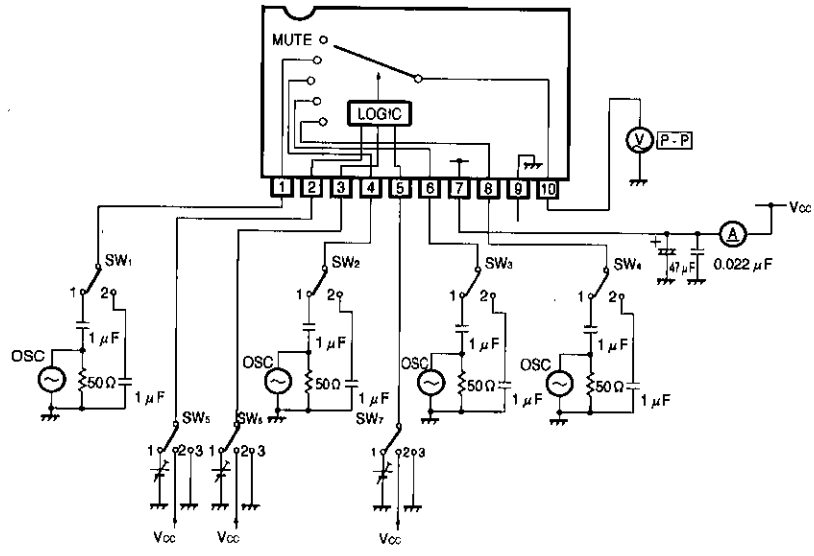


Fig.4

●Measurement conditions

Parameter		Symbol	Switch settings							Measurement method
			SW_1	SW_2	SW_3	SW_4	SW_5	SW_6	SW_7	
Current consumption		I_{CC}	2	2	2	2	2	2	2	Ammeter
Maximum output level	IN 1	V_{om}	1	2	2	2	3	3	3	f=1kHz, THD=0.5% Note 1
	IN 2	V_{om}	2	1	2	2	3	2	3	
	IN 3	V_{om}	2	2	1	2	2	3	3	
	IN 4	V_{om}	2	2	2	1	2	2	3	
Voltage gain	IN 1	G_V	1	2	2	2	3	3	3	f=1MHz, V_{in}=1V_{P-P} Note 2
	IN 2	G_V	2	1	2	2	3	2	3	
	IN 3	G_V	2	2	1	2	2	3	3	
	IN 4	G_V	2	2	2	1	2	2	3	
Interchannel crosstalk	IN1→IN2	C_T	1	2	2	2	3	2	3	f=4.43MHz, V_{in}=1V_{P-P} Note 3
	IN1→IN3	C_T	1	2	2	2	2	3	3	
	IN1→IN4	C_T	1	2	2	2	2	2	3	
	IN1→MUTE	C_T	1	2	2	2	*	*	2	
	IN2→IN3	C_T	2	1	2	2	2	3	3	
	IN2→IN4	C_T	2	1	2	2	2	2	3	
	IN2→MUTE	C_T	2	1	2	2	*	*	2	
	IN3→IN4	C_T	2	2	1	2	2	2	3	
	IN3→MUTE	C_T	2	2	1	2	*	*	2	
	IN4→MUTE	C_T	2	2	2	1	*	*	2	
Frequency characteristic	IN 1	G_f	1	2	2	2	3	3	3	f=10MHz / 1MHz V_{in}=1V_{P-P} Note 4
	IN 2	G_f	2	1	2	2	3	2	3	
	IN 3	G_f	2	2	1	2	2	3	3	
	IN 4	G_f	2	2	2	1	2	2	3	
CTL pin switching level	CTL - A	V_{TH}	2	2	1	2	1	3	3	Note 5
	CTL - B	V_{TH}	2	1	2	2	3	1	3	Note 6
	CTL - C	V_{TH}	1	2	2	2	3	3	1	

* Anywhere possible.

Note 1: Connect a distortion meter to the output, and input a f = 1kHz sine wave. Adjust the input level until the output distortion is 0.5%. This output voltage at this time is the maximum output level Vom (V_{P-P}).

Note 2: Input a 1V_{P-P}, 1MHz sine wave. The voltage gain is given by Gv = 20 log (V_{OUT}/V_{IN}).

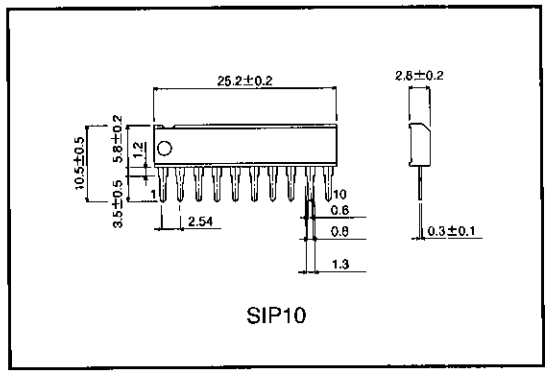
Note 3: Input a 1V_{P-P}, 4.43MHz sine wave. The interchannel crosstalk is given by CT = 20 log (V_{OUT}/V_{IN}).

Note 4: Input 1V_{P-P}, 1MHz and 10MHz sine waves. The frequency characteristic is given by Gf = 20 log (V_{OUT} (f = 10MHz)/V_{IN} (f = 1MHz)).

Note 5: Input a 1V_{P-P}, 1MHz sine wave. Reduce the CTL pin voltage from V_{CC}. The CTL pin switching level (V_{TH}) is the CTL pin voltage at which the V_{OUT} level drops below 20mV_{P-P}.

Note 6: Input a 1V_{P-P}, 1MHz sine wave. Increase the CTL pin voltage from 0V. The CTL pin switching level (V_{TH}) is the CTL pin voltage at which the V_{OUT} level goes below 1.0VDC

●External dimensions (Units: mm)



SIP10

Notes

- The contents described in this catalogue are correct as of March 1997.
- No unauthorized transmission or reproduction of this book, either in whole or in part, is permitted.
- The contents of this book are subject to change without notice. Always verify before use that the contents are the latest specifications. If, by any chance, a defect should arise in the equipment as a result of use without verification of the specifications, ROHM CO., LTD., can bear no responsibility whatsoever.
- Application circuit diagrams and circuit constants contained in this data book are shown as examples of standard use and operation. When designing for mass production, please pay careful attention to peripheral conditions.
- Any and all data, including, but not limited to application circuit diagrams, information, and various data, described in this catalogue are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO., LTD., disclaims any warranty that any use of such device shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes absolutely no liability in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices; other than for the buyer's right to use such devices itself, resell or otherwise dispose of the same; no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by ROHM CO., LTD., is granted to any such buyer.
- The products in this manual are manufactured with silicon as the main material.
- The products in this manual are not of radiation resistant design.

The products listed in this catalogue are 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 these products 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, or other safety devices) please be sure to consult with our sales representatives in advance.

- Notes when exporting
  - It is essential to obtain export permission when exporting any of the above products when it falls under the category of strategic material (or labor) as determined by foreign exchange or foreign trade control laws.
  - Please be sure to consult with our sales representatives to ascertain whether any product is classified as a strategic material.