

To all our customers

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The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

# M61314SP

I<sup>2</sup>C BUS CONTROLLED VIDEO PRE-AMP FOR HIGH RESOLUTION COLOR DISPLAY

## DESCRIPTION

M61314SP is Semiconductor Integrated Circuit for CRT Display Monitor. It includes OSD Blanking, OSD Mixing, Retrace Blanking, Video detector, Sync Sepa, Wide band Amplifier. Brightness Control, Main/Sub Contrast, OSD level, 4ch D/A OUT, Video response adjust can be controlled by I<sup>2</sup>C Bus.

## FEATURES

### Frequency Band Width

RGB: 180MHz (3Vp-p at -3dB)  
 OSD: 80MHz

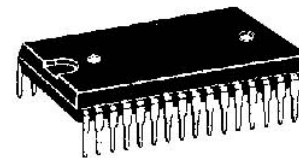
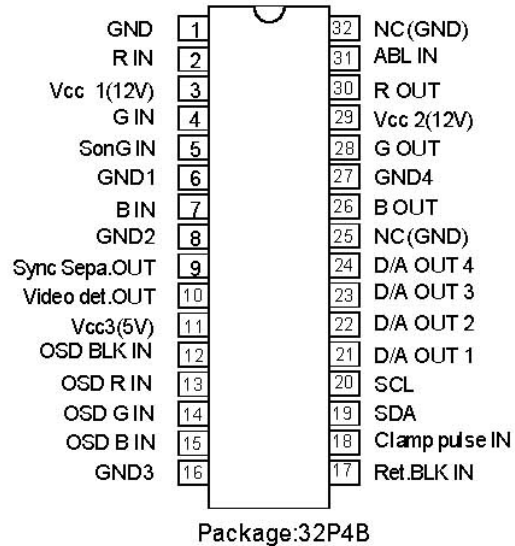
### Input

RGB: 0.7Vp-p(typical)  
 OSD: 3.5V~5V(positive)  
 OSD BLK: 3.5V~5V(positive)  
 Retrace BLK: 2.5V~5V(positive)  
 Clamp Pulse: 2.5V~5V(positive)

### Output

RGB: 5Vp-p  
 (at Brightness less than 2V DC)  
 OSD: 4Vp-p  
 (at Brightness less than 2V DC)  
 Sync OUT: 5Vp-p

## PIN CONFIGURATION (TOP VIEW)



32 pin plastic SDIP

## RECOMMENDED OPERATING CONDITIONS

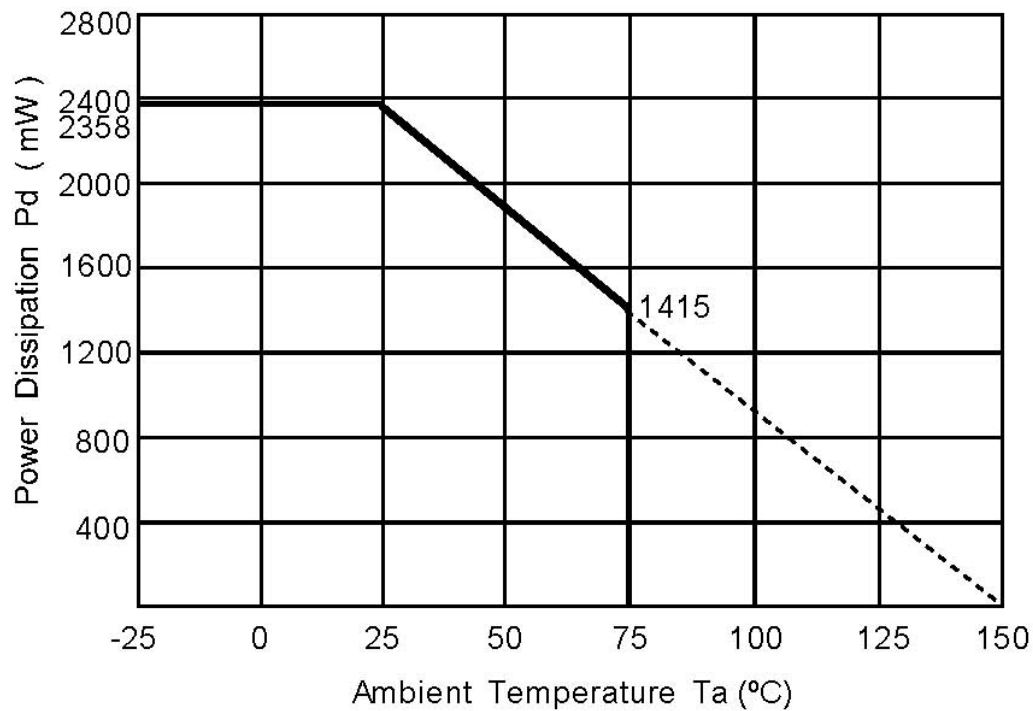
Supply Voltage Range	-----	11.50V ~ 12.50V (V3, V29)
		4.75V ~ 5.25V (V11)
Rated Supply Voltage	-----	12.00V (V3, V29)
		5.00V (V11)

## APPLICATION EXAMPLE

CRT Display Monitor

**ABSOLUTE MAXIMUM RATINGS(Ambient temperature 25°C)**

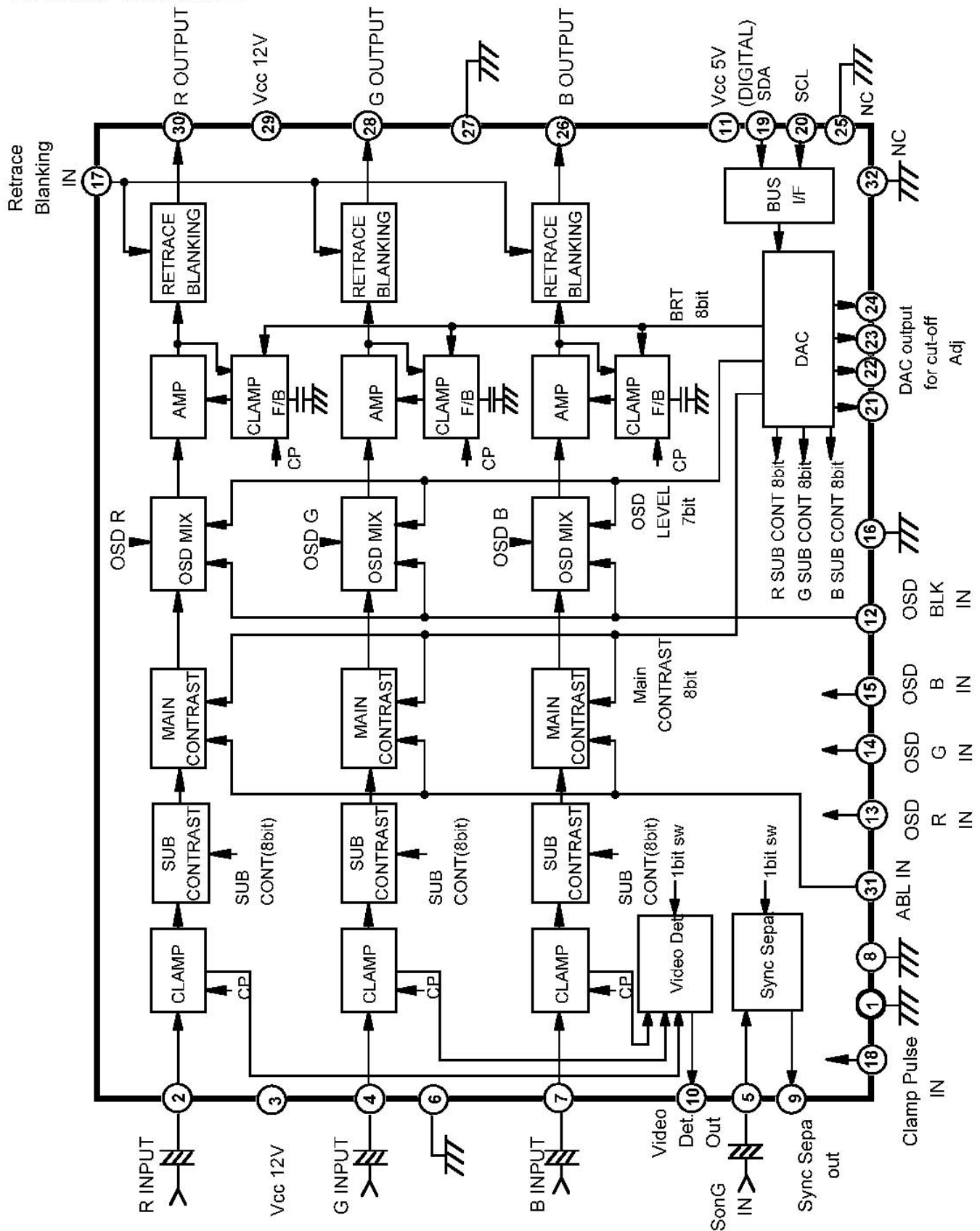
Parameter	Symbol	Rating	Unit
Supply voltage(Pin3,29)	Vcc12	13.0	V
Supply voltage(Pin11)	Vcc5	6.0	V
Power dissipation	Pd	2358	mW
Ambient temperature	Topr	-20 ~ +75	°C
Storage temperature	Tstg	-40 ~ +150	°C
Recommend supply 12	Vopr12	12.0	V
Recommend supply 5	Vopr5	5.0	V
Voltage range 12	Vopr'12	11.5 ~ 12.5	V
Voltage range 5	Vopr'5	4.75 ~ 5.25	V

**THERMAL DERATING**

# M61314SP

I<sup>2</sup>C BUS CONTROLLED VIDEO PRE-AMP FOR HIGH RESOLUTION COLOR DISPLAY

## BLOCK DIAGRAM



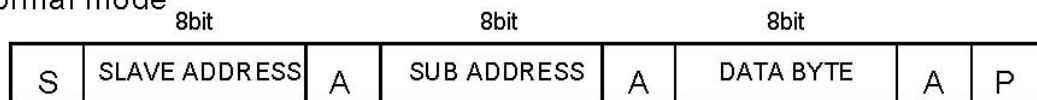
**I<sup>2</sup>C BUS CONTROLLED VIDEO PRE-AMP FOR HIGH RESOLUTION COLOR DISPLAY****BUS CONTROL TABLE**

(1) Slave address:

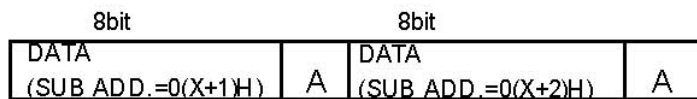
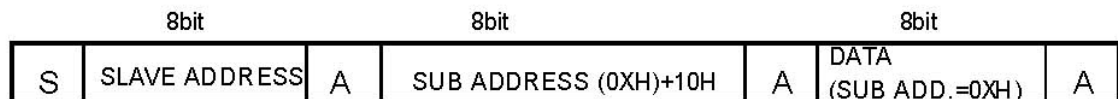
D7	D6	D5	D4	D3	D2	D1	R/W	
1	0	0	0	1	0	0	0	=88H

(2) Slave receiver format:

normal mode



auto increment mode



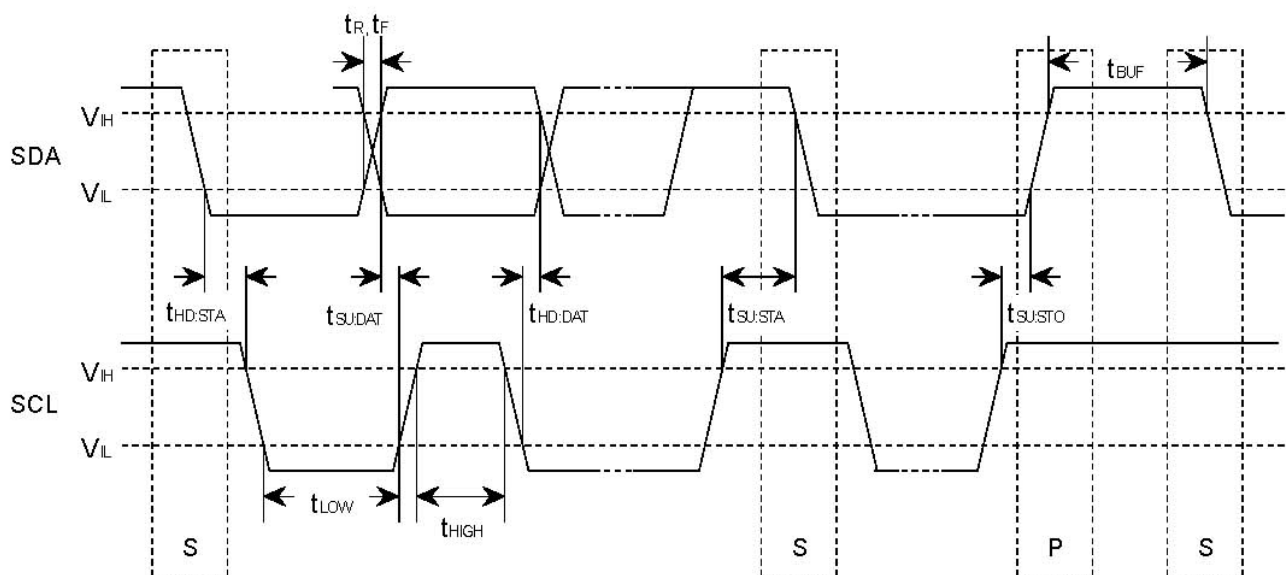
⋮

S : Start condition  
A : Acknowledge  
P : Stop condition

I<sup>2</sup>C BUS CONTROLLED VIDEO PRE-AMP FOR HIGH RESOLUTION COLOR DISPLAY

## SDA, SCL CHARACTERISTIC

parameter	symbol	MIN	MAX	unit
min. input LOW voltage	V <sub>IL</sub>	-0.5	1.5	V
max. input HIGH voltage	V <sub>IH</sub>	3.0	5.5	V
SCL clock frequency.	f <sub>SCL</sub>	0	400	KHz
Time the bus must be free before a new transmission can start.	t <sub>BUF</sub>	1.3	-	μs
Hold time start condition. After this period the first clock pulse is generated.	t <sub>HD:STA</sub>	0.6	-	μs
The LOW period of the clock	t <sub>LOW</sub>	1.3	-	μs
The HIGH period of the clock	t <sub>HIGH</sub>	0.6	-	μs
Set-up time for start condition. (Only relevant for a repeated Start condition.)	t <sub>SU:STA</sub>	0.6	-	μs
Hold time DATA.	t <sub>HD:DAT</sub>	0	0.9	μs
Set-up time DATA	t <sub>SU:DAT</sub>	100	-	ns
Rise time both SDA and SCL lines.	t <sub>R</sub>	20+ 0.1Cb	300	ns
Fall time both SDA and SCL lines.	t <sub>F</sub>	20+ 0.1Cb	300	ns
Set-up time for stop condition	t <sub>SU:STO</sub>	0.6	-	μs





**I<sup>2</sup>C BUS CONTROLLED VIDEO PRE-AMP FOR HIGH RESOLUTION COLOR DISPLAY**

## (3) Pre - Amp Block sub address byte and data byte format

sub add.	function	bit	Data Byte (top:byte format under:start condition)							
			D7	D6	D5	D4	D3	D2	D1	D0
00H	Main contrast	8	A07	A06	A05	A04	A03	A02	A01	A00
			0	0	0	0	0	0	0	1
01H	Brightness control	8	A17	A16	A15	A14	A13	A12	A11	A10
			0	0	0	0	0	0	0	1
02H	Sub contrast R	8	A27	A26	A25	A24	A23	A22	A21	A20
			0	0	0	0	0	0	0	1
03H	Sub contrast G	8	A37	A36	A35	A34	A33	A32	A31	A30
			0	0	0	0	0	0	0	1
04H	Sub contrast B	8	A47	A46	A45	A44	A43	A42	A41	A40
			0	0	0	0	0	0	0	1
05H	OSD level	7	-	A56	A55	A54	A53	A52	A51	A50
			-	0	0	0	0	0	0	1
06H	D/A OUT1	8	A67	A66	A65	A64	A63	A62	A61	A60
			0	0	0	0	0	0	0	1
07H	D/A OUT2	8	A77	A76	A75	A74	A73	A72	A71	A70
			0	0	0	0	0	0	0	1
08H	D/A OUT3	8	A87	A86	A85	A84	A83	A82	A81	A80
			0	0	0	0	0	0	0	1
09H	D/A OUT4	8	A97	A96	A95	A94	A93	A92	A91	A90
			0	0	0	0	0	0	0	1
0AH	Sharpness control	4	-	-	-	-	AA3	AA2	AA1	AA0
			-	-	-	-	0	0	0	1
	Sync Sepa SW	1	-	-	-	AA4	-	-	-	-
			-	-	-	0	-	-	-	-
	Video Det SW	1	-	-	AA5	-	-	-	-	-
-			-	0	-	-	-	-	-	
Test mode	2	AA7	AA6	-	-	-	-	-	-	
		0	0	-	-	-	-	-	-	

\*)pre-data

\*)subadd. 0AH

Sync Sepa SW AA4 0:Sync Sepa ON 1:Sync Sepa OFF

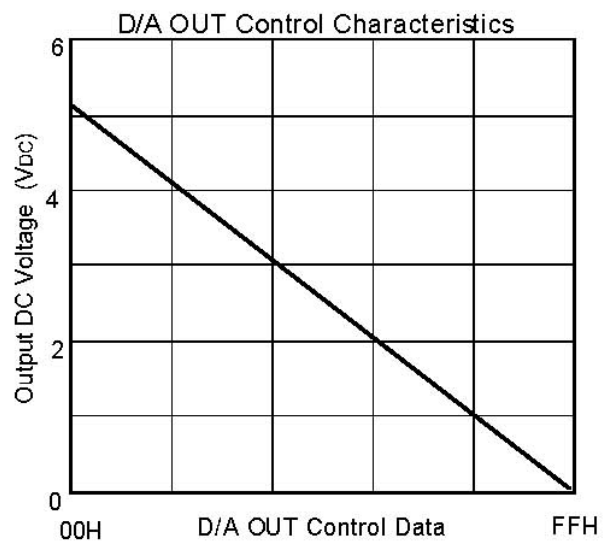
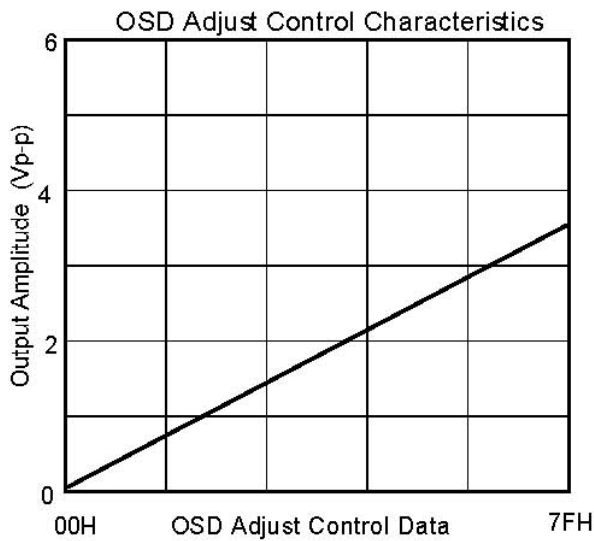
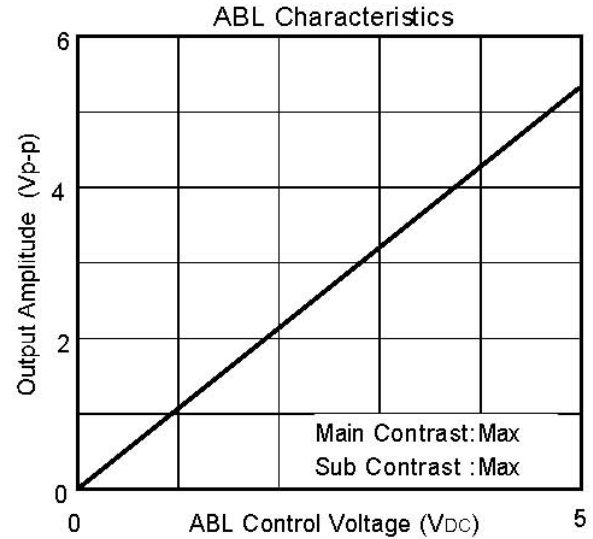
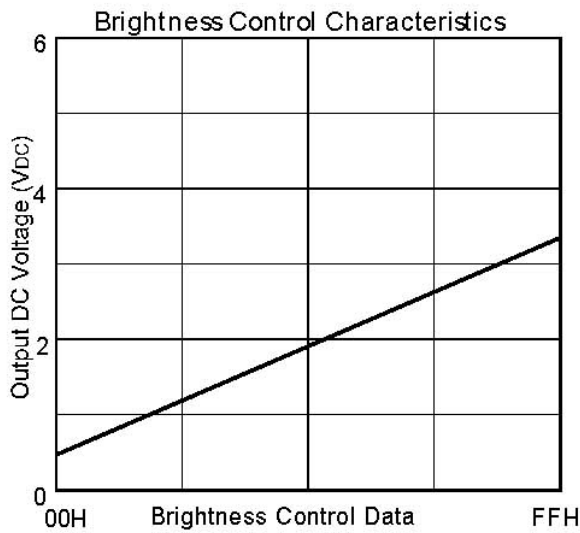
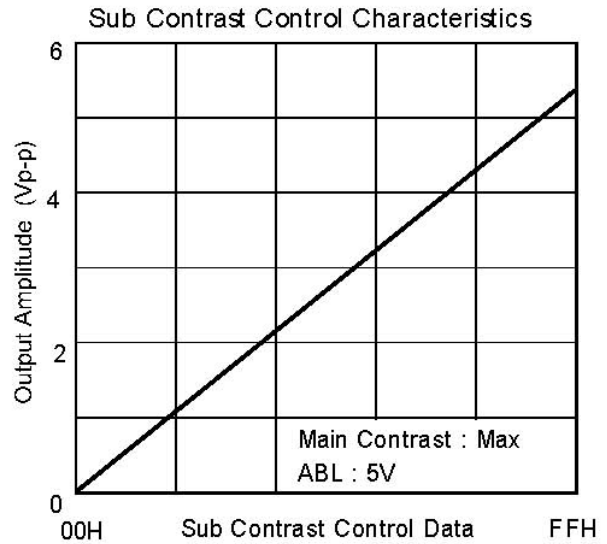
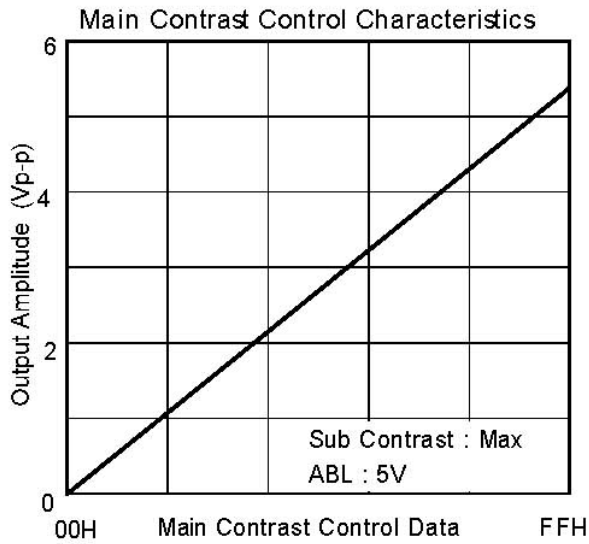
Video Det SW AA5 0:Video Det ON 1:Video Det OFF

Always set up as AA6 and AA7 in 0

For IIC Data, please transfer in the period of Vertical.

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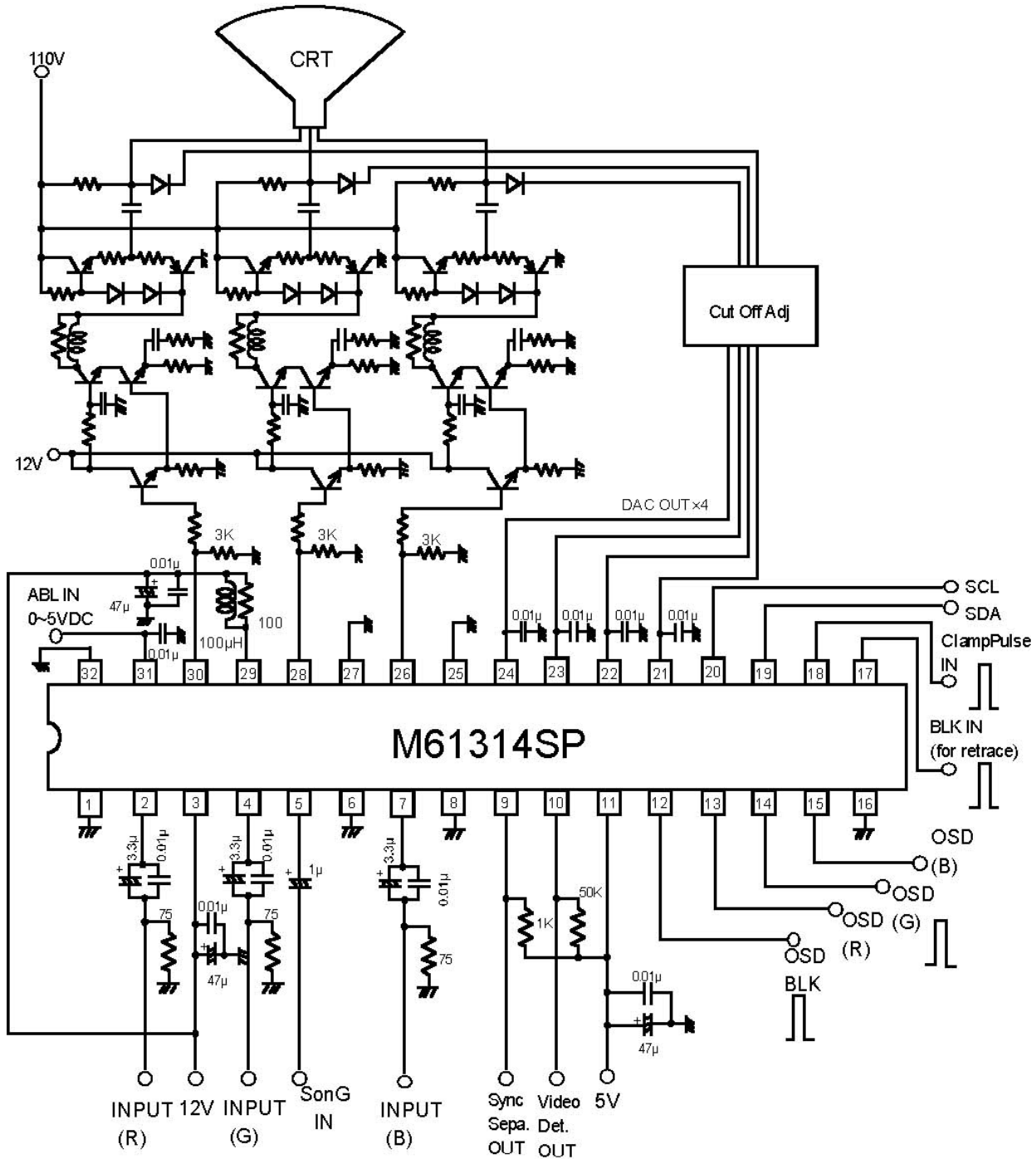
**ELECTRICAL CHARACTERISTICS**





I<sup>2</sup>C BUS CONTROLLED VIDEO PRE-AMP FOR HIGH RESOLUTION COLOR DISPLAY

APPLICATION EXAMPLE



"Purchase of Mitsubishi electric corporation's I<sup>2</sup>C components conveys a licence under the Philips I<sup>2</sup>C Patent Rights to use these components in an I<sup>2</sup>C system, provided that the system conforms the I<sup>2</sup>C Standard Specification as defined by Philips"

# M61314SP

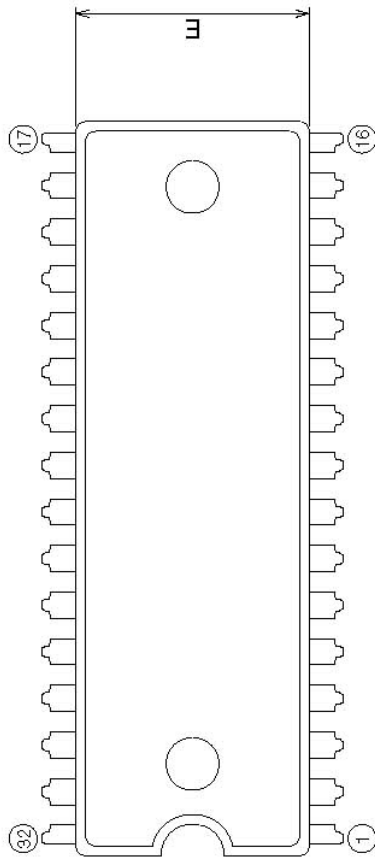
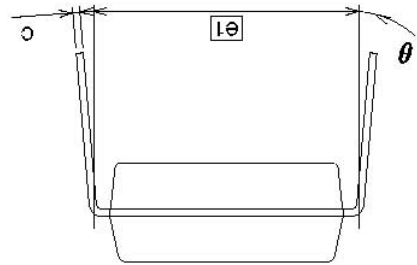
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## DETAILED DIAGRAM OF PACKAGE OUTLINE

Plastic 32pin 400mil SDIP

**32P4B**

EIAJ Package Code SDIP32-P-400-1.78	JEDEC Code -	Weight(g) 2.2	Lead Material Alloy 42/Cu Alloy
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Symbol	Dimension in Millimeters		
	Min	Nom	Max
A	-	-	5.08
A1	0.51	-	-
A2	-	3.8	-
b	0.35	0.45	0.55
b1	0.9	1.0	1.3
b2	0.63	0.73	1.03
c	0.22	0.27	0.34
D	27.8	28.0	28.2
E	8.75	8.9	9.05
e	-	1.778	-
e1	-	10.16	-
L	3.0	-	-
$\theta$	0°	-	15°

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