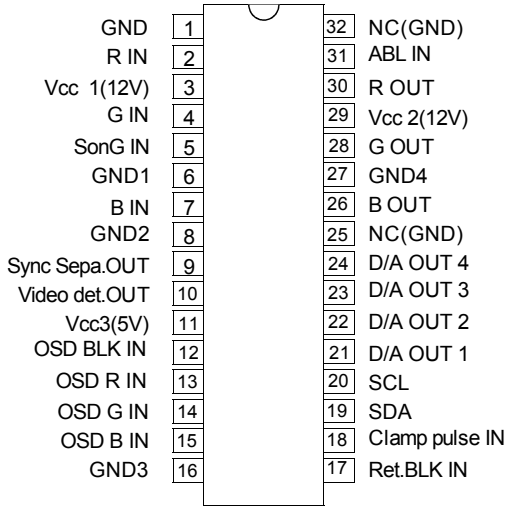
# M61314SP

## I²C 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 Amplifer. Brightness Control, Main/Sub Contrast,OSD level, 4ch D/A OUT,Video response adjust can be controlled by I²C Bus.

## PIN CONFIGURATION (TOP VIEW)




Package:32P4B

## FEATURES

■Frequency Band Width

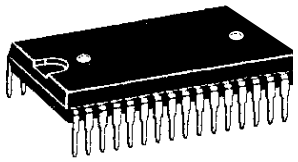
RGB: 180MHz (3Vp-p at -3dB)
OSD: 80MHz

■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



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)

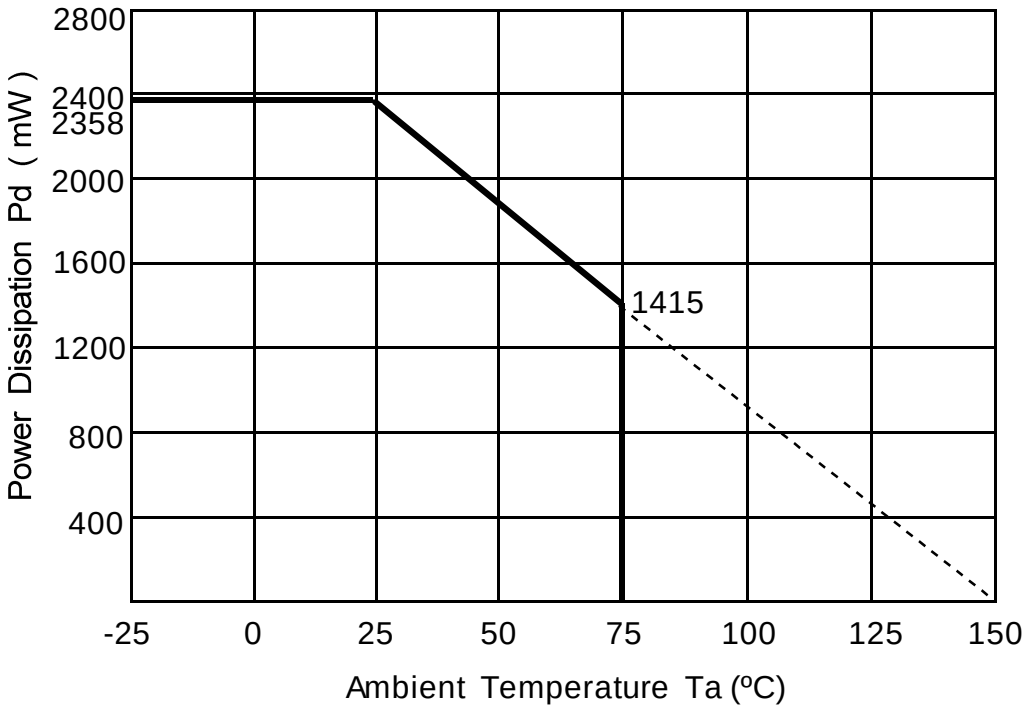
## APPLICATION EXAMPLE

CRT Display Monitor

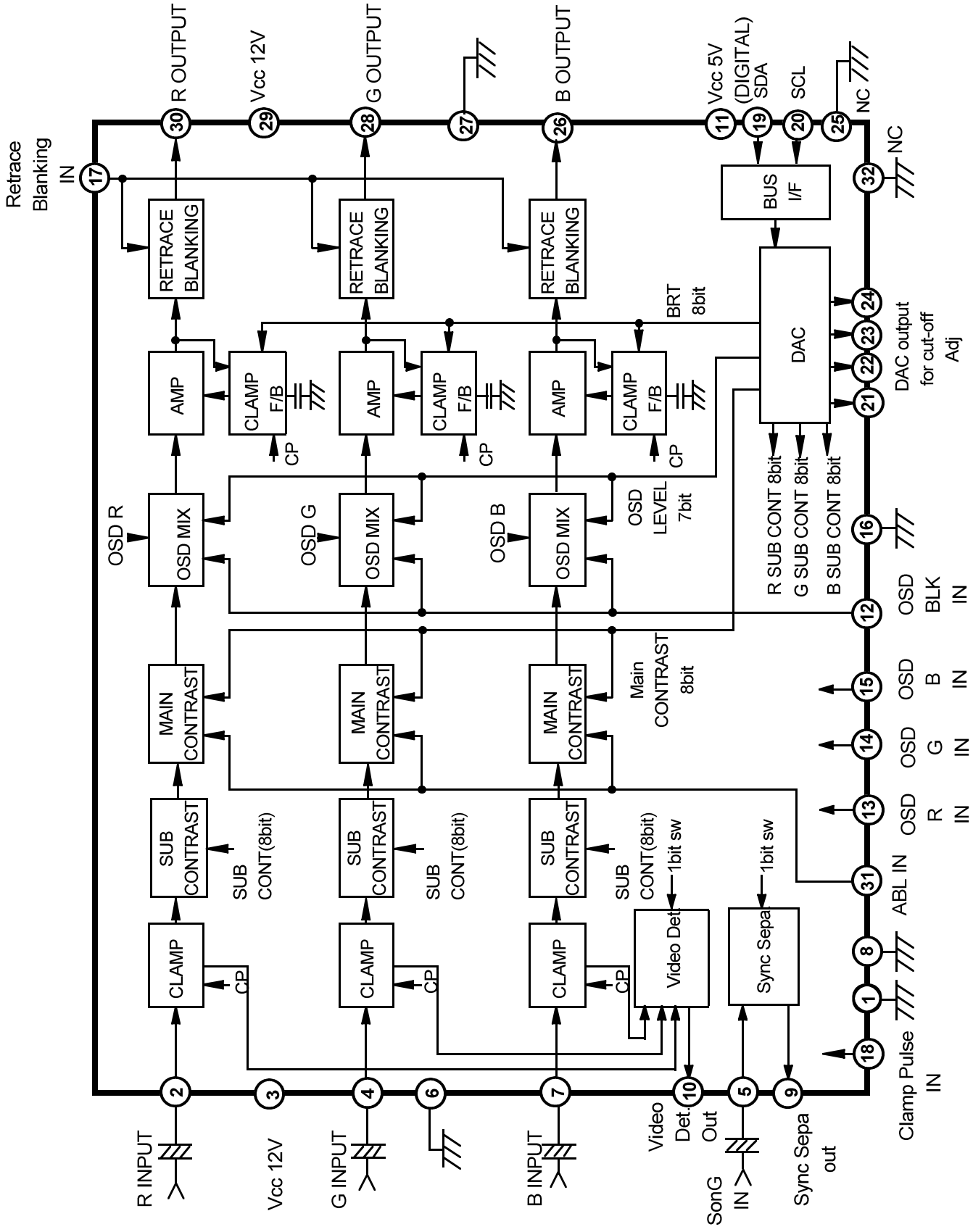
## ABSOLUTE MAXIMUM RATINGS(Ambient temperature 25ºC)

| 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 | ºC |
| Storage temperature | Tstg | -40 ~ +150 | ºC |
| 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



## BLOCK DIAGRAM



## 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

| | 8bit | | 8bit | | 8bit | | |
|---|---|---|---|---|---|---|---|
| S | SLAVE ADDRESS | A | SUB ADDRESS | A | DATA BYTE | A | P |

auto increment mode

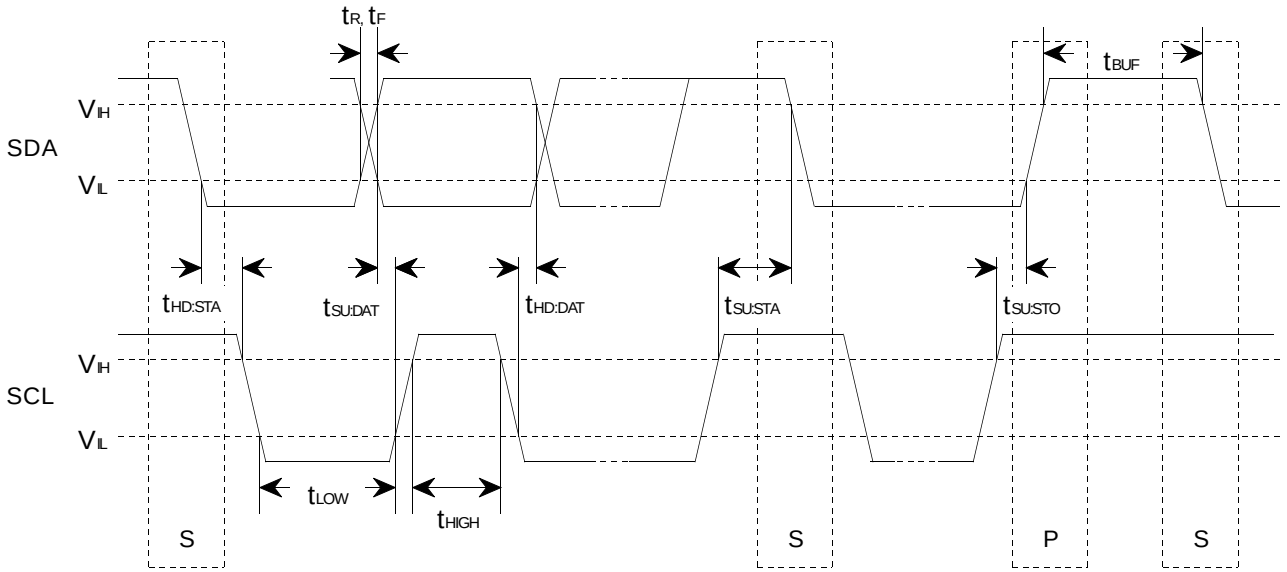
| 8bit | | 8bit | | 8bit | |
|---|---|---|---|---|---|
| S | SLAVE ADDRESS | A | SUB ADDRESS (0XH)+10H | A | DATA (SUB ADD.=0XH) | A |

| 8bit | | 8bit | |
|---|---|---|---|
| DATA (SUB ADD.=0(X+1)H) | A | DATA (SUB ADD.=0(X+2)H) | A |

S : Start condition
A : Acknowledge
P : Stop condition

## SDA, SCL CHARACTERISTIC

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



(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

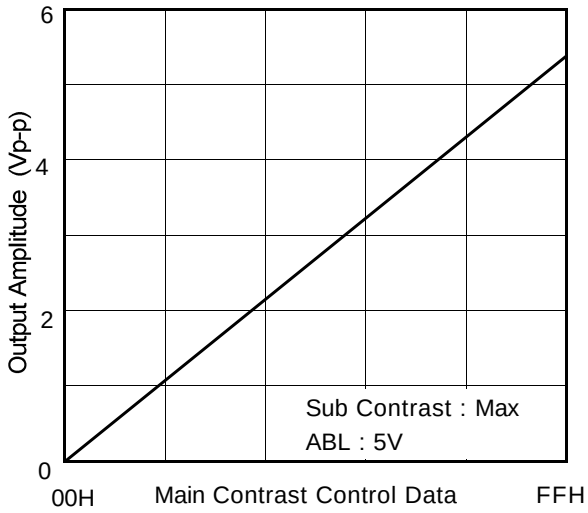
Video Det SW AA5 0:Video Det ON 1:Video Det OFF

Always set up as AA6 and AA7 in 0

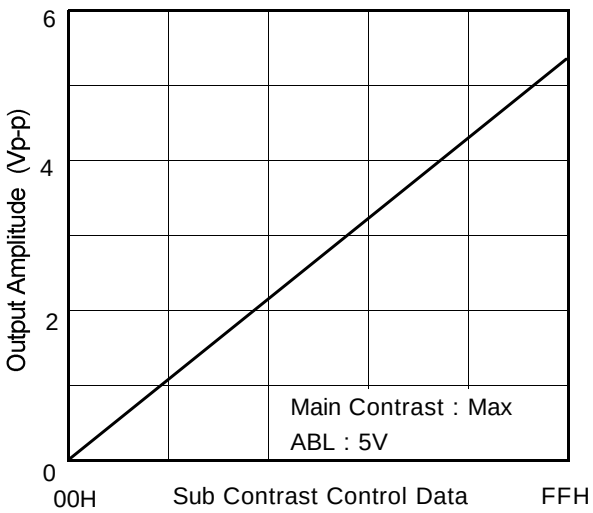
For IIC Data, please transfer in the period of Vertical.

## ELECTRICAL CHARACTERISTICS

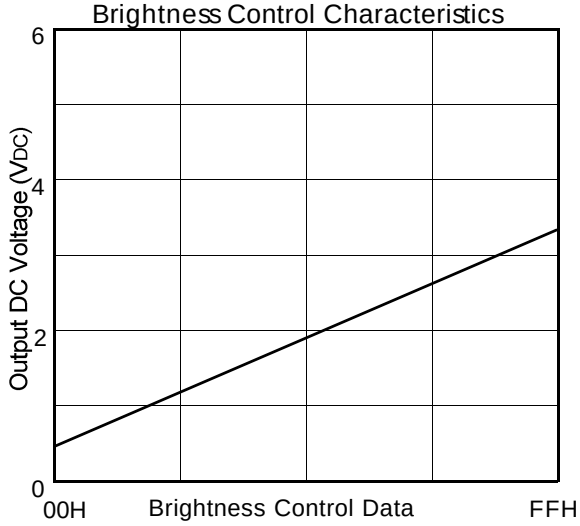
Main Contrast Control Characteristics



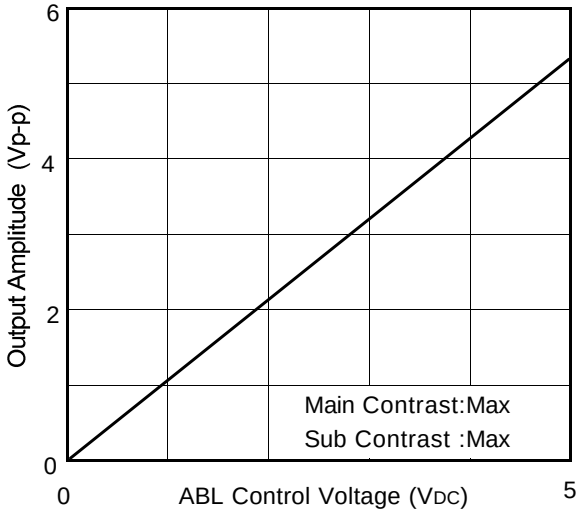

Sub Contrast Control Characteristics



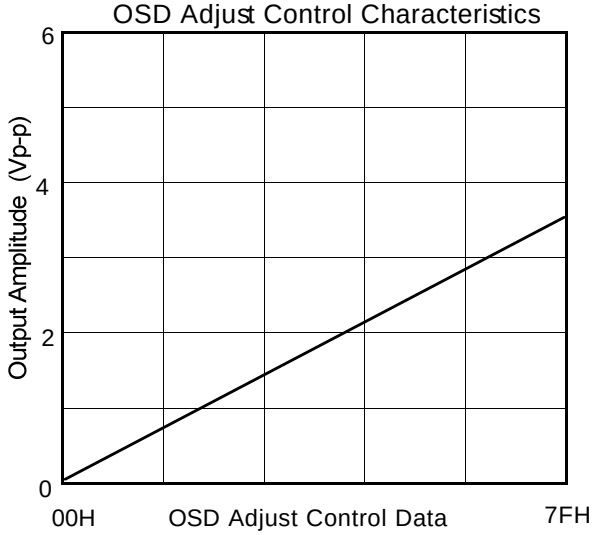

Brightness Control Characteristics



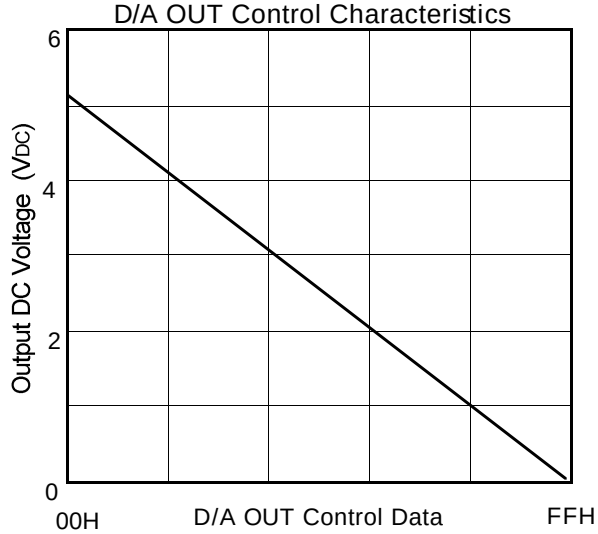

ABL Characteristics



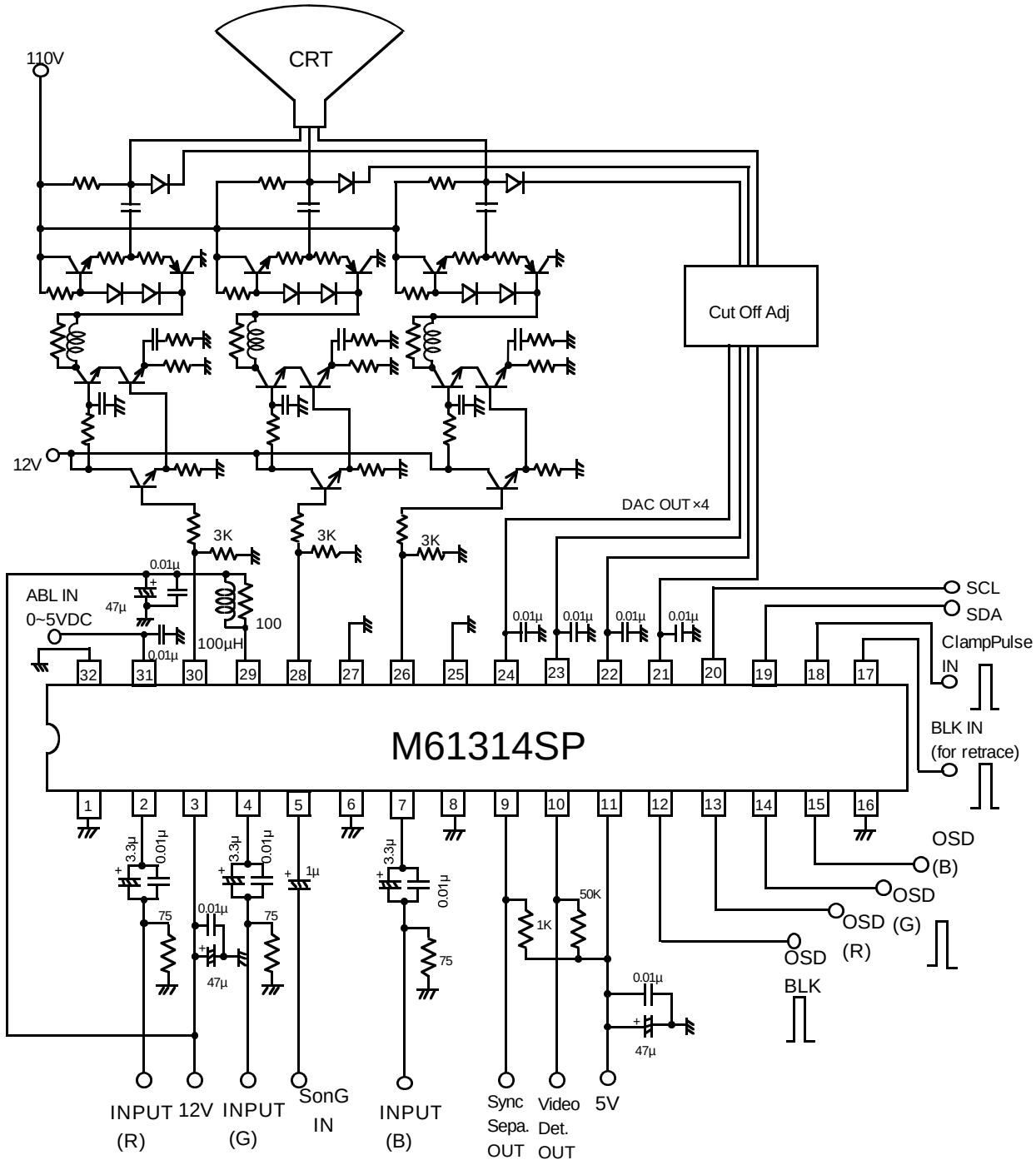

OSD Adjust Control Characteristics




D/A OUT Control Characteristics



## APPLICATION EXAMPLE

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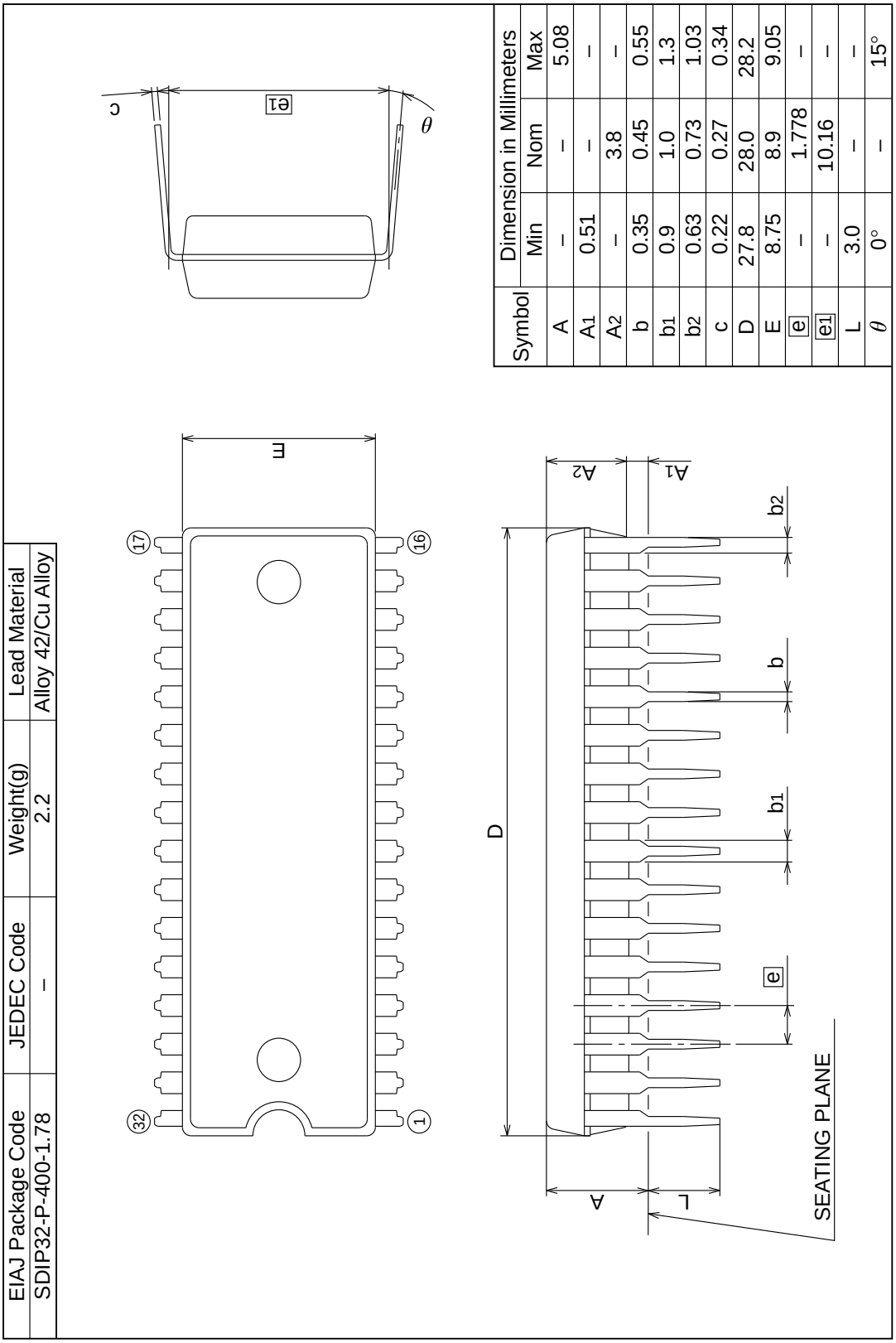
## DETAILED DIAGRAM OF PACKAGE OUTLINE

**Plastic 32pin 400mil SDIP**




| 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 | – | – |
| θ | 0° | – | 15° |

**32P4B**

| EIAJ Package Code | JEDEC Code | Weight(g) | Lead Material |
|---|---|---|---|
| SDIP32-P-400-1.78 | – | 2.2 | Alloy 42/Cu Alloy |

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