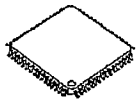
# SIGNAL PROCESSOR FOR COLOR TV

## ■ GENERAL DESCRIPTION

**The NJW1300A** is a color TFT signal processor which include color signal modulator , count down circuit , RGB demodulator , RGB interface , and common pole driver , required by color TFT signal processing after Y/C separator. It corresponds broadcasting systems of both NTSC and PAL , because it can select the down (1/525 or 1/625) by the internal switch.

**The NJW1300A** is suitable for TFT LCD pannel and car navigation systems.

## ■ PACKAGE OUTLINE

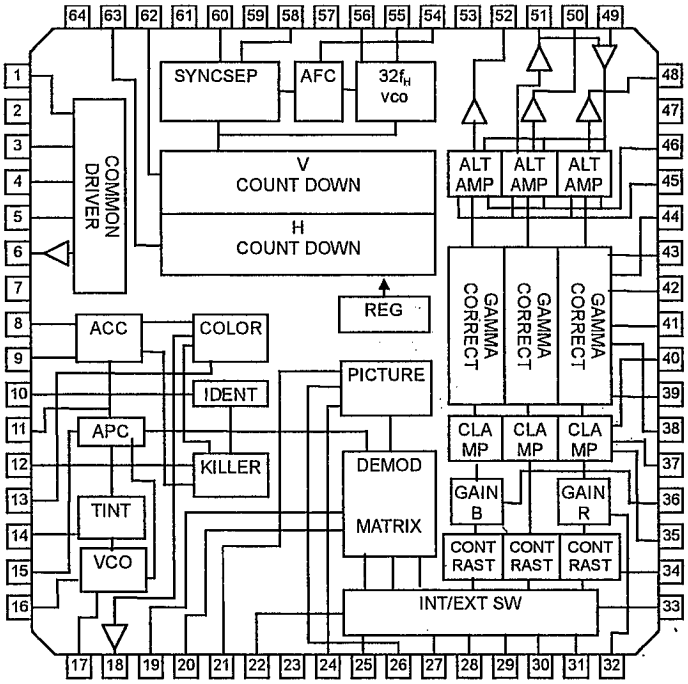


NJW1300AFG1

## ■ FEATURES

- Low Supply Voltage 5V
- Y/C Separator Input
- NTSC/PAL System (3.58MHz, 4.43MHz)
- Unnecessary Adjustment of Oscillation Frequency for Internal Count Down Circuit.
- External Two System Input for Analog RGB
- Internal Enhancer Circuit
- Internal GAMMA 2 Point Correction Circuit
- Internal Color TFT Common Pole Driver
- Bi-CMOS Technology
- Package Outline TQFP64

## ■ PIN CONFIGURATION




PIN FUNCTION

| | | |
|---|---|---|
| 1.VCOMAMP | 23.VCC1 | 45.BRIGHT |
| 2.VCC3 | 24.YINH | 46.FRP |
| 3.VCOMIN | 25.EXTINB2 | 47.VCC2 |
| 4.VCOMCENT | 26.YIN | 48.ROUT |
| 5.VCOMFB | 27.EXTING1 | 49.VCENTER |
| 6.VCOMOUT | 28.SW1 | 50.GOUT |
| 7.VEE1 | 29.EXTING2 | 51.CDET |
| 8.ACCDET | 30.SW2 | 52.BOUT |
| 9.CIN | 31.EXTINR1 | 53.REGOUT |
| 10.IDENT | 32.GAINR | 54.LPF |
| 11.CLEANING | 33.EXTINR2 | 55.VCOOUT |
| 12.KILLER | 34.CONTRAST | 56.VCOIN |
| 13.COLOR | 35.GACLAMPR | 57.GND1 |
| 14.TINT | 36.GAINB | 58.VS |
| 15.APC | 37.GACLAMPG | 59.GND2 |
| 16.VCXO1 | 38.VG1 | 60.SYNCIN |
| 17.VCXO2 | 39.VG2 | 61.VDD |
| 18.CHROMAOUT | 40.GACLAMPB | 62.VD |
| 19.RYIN | 41.SUBVG2R | 63.HD |
| 20.BYIN | 42.SUBVG2B | 64.DIGREF |
| 21.PICTURE | 43.SUBVG1R | |
| 22.EXTINB1 | 44.SUBVG1B | |

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## ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

| PARAMETERS | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Supply Voltage 1 | $V_{CC}1-$ GND | 8.0 | V |
| Supply Voltage 2 | $V_{CC}2-$ GND | 8.0 | V |
| Supply Voltage 3 | $V_{CC}3-V_{EE}1$ | 15.0 | V |
| Supply Voltage 4 | $V_{DD}-$ DIGREF | 7.0 | V |
| Supply Voltage 5 | $V_{EE}1-GND$ | −7.0 | V |
| Power Dissipation | $P_D$ | 700 | mW |
| Each Adjustment Terminal | $V_{IN}$ | $V_{CC}1$ | V |
| SYNC OUT Voltage | $V_{SD}$ | $V_{EE}1+15.0$ | V |
| Picture Input Voltage | $V_{VDIN}$ | 3.0 | $V_{PP}$ |
| External Input Voltage | $EXT_{IN}$ | $V_{CC}1$ | V |
| FRP Input Signal Voltage | $FRP_{IN}$ | $V_{CC}1$ | V |
| SYNC Input Voltage | $SYNC_{IN}$ | $V_{CC}1$ | V |
| Analog RGB Input Signal | $RGB_{IN}$ | 3.0 | $V_{PP}$ |
| Operating Temperature Range | Torp | −30～+85 | °C |
| Storage Temperature Range | Tstr | −40～+125 | °C |

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## ■ RECOMMENDED OPERATING CONDITION (Ta=25°C)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Supply Voltage Range | | $V_{CC}1-GND$ | 4.75 | 5.00 | 5.25 | V |
| | | $V_{CC}2-GND$ | $V_{CC}1$ | 5.00 | 5.25 | V |
| | | $V_{CC}3-V_{EE}1$ | 11.00 | 12.00 | 13.00 | V |
| | | $V_{EE}1-GND$ | −5.25 | −5.0 | −4.75 | V |
| | | $V_{DD}-DIGREF$ | 4.75 | 5.00 | 5.25 | V |
| Y Input Signal Voltage | $Y_{IN}$ | Pedestal−White | 0.30 | 0.35 | 0.40 | $V_{P-P}$ |
| Y Input Signal Voltage | $C_{IN}$ | Amplitude of Burst Signal | 0.10 | 0.15 | 0.20 | $V_{P-P}$ |
| Analog RGB Input Signal | $RGB_{IN}$ | | 0.6 | 0.7 | 0.8 | $V_{P-P}$ |
| SYNC Input Signal | $SYNC_{IN}$ | | 0.3 | 1.0 | 1.5 | $V_{P-P}$ |

■ ELECTRICAL CHARACTERICS ($V_{CC}1$=5V,$V_{CC}2$=5V,$V_{CC}3$=7V,$V_{DD}$=5V,$V_{EE}1$=−5V,Ta=25°C)

| PARAMETERS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| Operating Current 1 | $I_{CC}1$ | $V_{CC}1$ | — | 33.5 | 45.0 | mA |
| Operating Current 2 | $I_{CC}2$ | $V_{CC}2$ | — | 6.5 | 8.4 | mA |
| Operating Current 3 | $I_{CC}3$ | $V_{CC}3$ | — | 5.8 | 7.7 | mA |
| Operating Current 4 | $I_{CC}4$ | $V_{DD}$ | — | 4.7 | 6.6 | mA |
| Operating Current 5 | $I_{EE}1$ | $V_{EE}1$ | −11.8 | −7.5 | — | mA |
| Contrast Adjust Gain Variable Range | $G_{CT1}$ | SG1 applied to V22 ,V27 and V31,define the each amplitude (BLK − WHT) at V28=H,V30=L and V34=0V,2.5V,5V as A,B and C. $G_{ST1}$ = 20log(A / B) $G_{ST2}$ = 20log(C / B) $R_{OUT}$,$G_{OUT}$, $B_{OUT}$ terminals. | — | −12.5 | −9.0 | dB |
| | $G_{CT2}$ | | 1.0 | 2.5 | — | dB |
| Sub Contrast Adjust Gain Variable Range | $G_{SC1}$ | SG1 applied to V22 and V31 , define the each amplitude (BLK − WHT) at V28=H,V30=L ,V34=0V,V32=0V,2.5V, 5V,V36=0V,2.5V,5V as A,B, and C. $G_{SC1}$ = 20log(A / B) $G_{SC2}$ = 20log(C / B) $R_{OUT}$,$G_{OUT}$ ,$B_{OUT}$ terminals. | — | −2.5 | −1.0 | dB |
| | $G_{SC2}$ | | 1.0 | 2.5 | — | dB |
| Image Quality Adjust Variable Minimum Range | $G_{PS}$ | SG3(100KHz,2.4MHz) applied to V24, V26 define each gain of sin signal of frequency as A,B. $G_P$ = A−B (at V21=5V) | — | 0 | — | dB |
| Image Quality Adjust Variable Maximum Range | $G_{PM}$ | SG3(100KHz,2.4MHz) applied to V24, V26 define each gain of sin signal of frequency as A,B. $G_P$= A−B (at V22=5V) | — | 16.0 | — | dB |
| Chroma Maximum Output | $V_{CMAX}$ | SG6(4.43MHz) applied to V14=0V, V13=5V,V9, measure the chroma amplitude on V18. | 0.6 | 0.95 | 1.35 | $V_{P-P}$ |
| ACC Characteristic (NTSC) | $G_{A1}$ | SG6(3.58MHz,0dB,+6dB,-−25dB) applied to V9, measure the amplitude on V18 at 0dB,+6dB,−25dB. Define the each value as A,B, and C. $G_{A1}$ = 20log(B / A) $G_{A2}$ = 20log(C / A) | — | 0.0 | 2.0 | dB |
| | $G_{A2}$ | | −12.5 | −7.5 | — | dB |
| ACC Characteristic (PAL) | $G_{A3}$ | SG6(4.43MHz,0dB,+6dB,-−25dB) applied to V9, measure the amplitude on V18 at 0dB,+6dB,−25dB. Define the each value as A,B, andC. $G_{A3}$ = 20log(B / A) $G_{A4}$ = 20log(C / A) | — | 0.0 | 2.0 | dB |
| | $G_{A4}$ | | −12.5 | −7.5 | — | dB |

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■ ELECTRICAL CHARACTERICS (Ta=25°C,VCC1=5V,VCC2=5V,VC3=7V,VDD=5V,VEE1=−5V)

| PARAMETERS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| Color Control Gain Variable Range | $G_{c1}$ | SG6 applied to define the each chroma amplitude of V18 at V14=0V,2.9V and 5V as A,B and C. $G_{c1}$ = 20log(A / B) $G_{c2}$ = 20log(C / B) | −40.0 | −30.0 | −20.0 | dB |
| | $G_{c2}$ | | 0.7 | 2.7 | − | dB |
| APC Capture Range (NTSC) | $f_{A1}$ | SG6(3.58MHz,0dB) applied to V9,Variable the BURST frequency until the voltage on V12 drops below 2V. Work out the difference between the frequency at that time and 3.579545MHz. $f_{A1}$ = when approach BURST frequency from low frequency. $f_{A2}$ = when approach BURST frequency from high frequency | − | −2900 | −700 | Hz |
| | $f_{A2}$ | | +700 | +1500 | − | Hz |
| APC Capture Range (PAL) | $f_{A3}$ | SG6(4.43MHz,0dB) applied to V9,Variable the BURST frequency until the voltage on V12 drops below 2V. Work out the difference between the frequency at that time and 4.433619MHz. $f_{A3}$ = when approach BURST frequency from low frequency $f_{A4}$ = when approach BURST frequency from high frequency | − | −2500 | −600 | Hz |
| | $f_{A4}$ | | +600 | +1700 | − | Hz |
| TINT Variable Range | $\Theta_{T1}$ | SG6 applied to V9, define the phase causing the maximum amplitude at V14= 8V on Gout as A. Define the each phase causing the maximum amplitude at V14=2.7V,3.6V on Gout as B and C. $\Theta_{T1}$ = A−B $\Theta_{T2}$ = C−B | +30 | +60 | − | deg |
| | $\Theta_{T2}$ | | − | −60 | −30 | deg |
| NTSC /PAL Switching Voltage | $V_{THNP}$ | SG6 applied to V9 decrease the voltage on V14 until the signal on Gout disappears. V14 terminals. | 0.4 | 0.7 | 1.0 | V |
| Color Killer Operating Input Level(NTSC) | $V_{KIN1}$ | SG6(NTSC) applied to V9,decause the input amplitude until the killer is turned on , and measure the input attenuation. | − | −42 | −37 | dB |
| Color Killer Operating Input Level (PAL) | $V_{KIN2}$ | SG6(PAL) applied to V9,decause the input amplitude until the killer is turned on , and measure the input attenuation | − | −38 | −32 | dB |

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■ ELECTRICAL CHARACTERICS (Ta=25°C, $V_{CC}1$=5V, $V_{CC}2$=5V, $V_{CC}3$=7V, $V_{DD}$=5V, $V_{EE}1$=−5V)

| PARAMETERS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| Output Level Voltage Difference among RGB | ΔVBCEN | SG1(0.7Vpp) and V46=SG10 applied to V60=SG2,V21=0V,V28=H,V22,V27,V31, adjust the amplitude of Gout 3.0Vpp.Then define the non-inverting side of Rout, Gout, Bout as VRB, VGB, and VBB, the invert side of them as VRBI, VGBI, and VBBI.<br>ΔVBRGB=VRB−VGB、VBB−VGB<br>=VRBI−VGBI, VBBI−VGBI | −150 | 0 | +150 | mV |
| INT−EXT Output Black Level Voltage Difference | ΔVBIE | SG4 applied to V28=L,V26, define the non-inverting side of Rout, Gout, Bout as VRB(Y), VGB(Y), and VBB(Y), the invert side of VRBI(Y), VGBI(Y), and VBBI(Y).<br>VBIE=VRB−VRBI(Y),VGB−VGBI,<br>=VBB−VBB(Y),VRBI−VRBI(Y),<br>=VGBI−VGBI(Y),VBBI−VBBI(Y) | | | | |
| Gain Difference Between Invert And Non-invert | ΔGINV | SG1(0.7Vpp) applied to V28=H, V22, V27, V31, measure the amplitude(BLK−WHT) of $R_{OUT}$, $G_{OUT}$, $B_{OUT}$. Define the non-inverting side of VRG, VGG, VBG, the invert side of VRGI, VGGI, VBGI.<br>ΔGINV=20log(VRGI/VRG)<br>=20log(VGGI/VGG)<br>=20log(VBGI/VBG)<br>ΔVRG=20log(VRG/VGG)<br>=20log(VGG/VBG)<br>=20log(VBG/VRG) | — | 0 | ±0.6 | dB |
| Gain Difference Among RGB | ΔVRGB | | | | | |
| FRP Input Threshold Voltage | $V_{TH}$FRP | SG1 applied to V28=H,V27, increase V46 until the signal on Gout invert. Then, measure the voltage on V46. | 1.2 | 1.5 | 1.8 | V |
| Interface Frequency Characteristic | $f_{INT}$ | SG1(100kHz) applied to V28=H,V27, for making the amplitude of sine wave part of the non-invert signal on Gout, inclease the frequency until attenuate by 3dB from the amplitude at the 100kHz. | 6 | 7 | — | MHz |
| EXTRGB Input Threshold Voltage | $V_{TH}$EXH | Switching Voltage of V28,V30<br>$V_{TH}$EXH=ON level voltage | 3.3 | — | — | V |
| | $V_{TH}$EXL | $V_{TH}$EXH=OFF level voltage | — | — | 1.6 | V |

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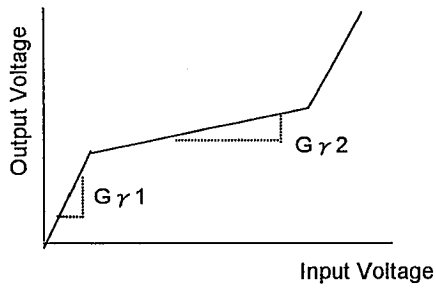
■ ELECTRICAL CHARACTERICS (Ta=25°C, $V_{CC}1$=5V, $V_{CC}2$=5V, $V_{CC}3$=7V, $V_{DD}$=5V, $V_{EE}1$=−5V)

| PARAMETERS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| Gamma Characteristic | $G\gamma 1$ | SG7 applied to V28=H, V22, V27 and V31, define at V38=1.8V, V39=3.0V, measure the slope on Rout, Gout, and $B_{OUT}$.   | 17.0 | 23.0 | 29.0 | dB |
| | $G\gamma 2$ | | 4.0 | 9.0 | 14.0 | dB |
| AFC Lock Range | $\Delta f_{HL1}$ | SG2 applied to V28=H, V60, define frequency of miss lock SYNC at valuable frequency of SG2 when AFC is lock. $\Delta f_{HL1}$=miss lock to high frequency $\Delta f_{HL2}$=miss lock to low frequency | — | +700 | — | Hz |
| | $\Delta f_{HL2}$ | | — | −1000 | — | Hz |
| AFC Capture Range | $\Delta f_{HP1}$ | SG2 applied to V28=H, V60, define frequency of miss lock SYNC at valuable frequency of SG2 when AFC is miss lock. $\Delta f_{HP1}$=capture from high frequency $\Delta f_{HP2}$=capture from low frequency | — | +700 | — | Hz |
| | $\Delta f_{HP2}$ | | — | −1000 | — | Hz |
| AFC Free-run Frequency | $f_{OH}$ | V60 is non-input. Measure the output frequency on V63. | 15.2 | 15.7 | 16.2 | kHz |
| Horizontal Output Pulth Width | $P_W$HD | Output pulth width on V63 | 3.5 | 3.9 | 4.3 | μS |
| Horizontal Output Delay | $T_P$DH | Delay time of between before external filter and V63. | 0.70 | 0.86 | 1.02 | μS |
| Horizontal Output Saturation Level | $V_O$LH | Low level of output on V63 | — | 0.1 | 0.3 | V |
| Vertical Output Pulth Width | $P_W$VD | Output pulth width on V63 | 3.5 | 4.0 | 4.5 | H |
| Vartical Output Delay | $T_P$VD | | 0.45 | 0.65 | 0.85 | H |

(※Point1) When suspected SYNC input to NJW1300A, necessary on 5H(1H:horizontal term ,about 63.5us) of pulth width of suspected SYNC.

■ ELECTRICAL CHARACTERICS (Ta=25°C,$V_{CC}$1=5V,$V_{CC}$2=5V,$V_{CC}$3=7V,VDD=5V,VEE1=−5V)

| PARAMETERS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| Crosstalk Among RGB | CTRGB1 | SG5(1MHz,700mVpp) applied to V28=H, V 22.V21,V27,V31=GND,V49=1.3V.Measure the amplitude of 1MHz component on Rout, Gout and Bout. Calculate the amplitude ratio of Rout and Gout to Bout. | — | −50 | −40 | dB |
| | CTRGB2 | SG5(1MHz,700mVpp) applied to V28=H, V 27.V21,V23,V31=GND,V49=2.2V.Measure the amplitude of 1MHz component on Rout, Gout and Bout. Calculate the amplitude ratio of Rout and Bout to Gout. | — | −50 | −40 | dB |
| | CTRGB3 | SG5(1MHz,700mVpp) applied to V28=H, V 31.V21,V27=GND,V49=1.3V.Measure the amplitude of 1MHz component on Rout, Gout and Bout. Calculate the amplitude ratio of Rout to Gout and Bout. | — | −50 | −40 | dB |
| Crosstalk 1 Between SW (EXT1→INT) (※Point2) | CTE1IR | SG5(1MHz,700mVpp) applied to V31, V21, V26=GND,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V . | — | −50 | −35 | dB |
| | CTE1IG | SG5(1MHz,700mVpp) applied to V27, V21, V26=GND,V49=2.2V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| | CTE1IB | SG5(1MHz,700mVpp) applied to V22, V21, V26=GND,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| Crosstalk 2 Between SW (EXT1→EXT2) | CTE1E2R | SG5(1MHz,700mVpp) applied to V31, V21, V33=GND,V28=5V,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V30=0V,5V . | — | −50 | −35 | dB |
| | CTE1E2G | SG5(1MHz,700mVpp) applied to V27, V21, V33=GND,V28=5V,V49=2.2V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V30=0V,5V . | — | −50 | −35 | dB |
| | CTE1E2B | SG5(1MHz,700mVpp) applied to V22, V21, V33=GND,V28=5V,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V30=0V,5V . | — | −50 | −35 | dB |

(※Point 2) Investigation Crosstalk level when design for depend to application.

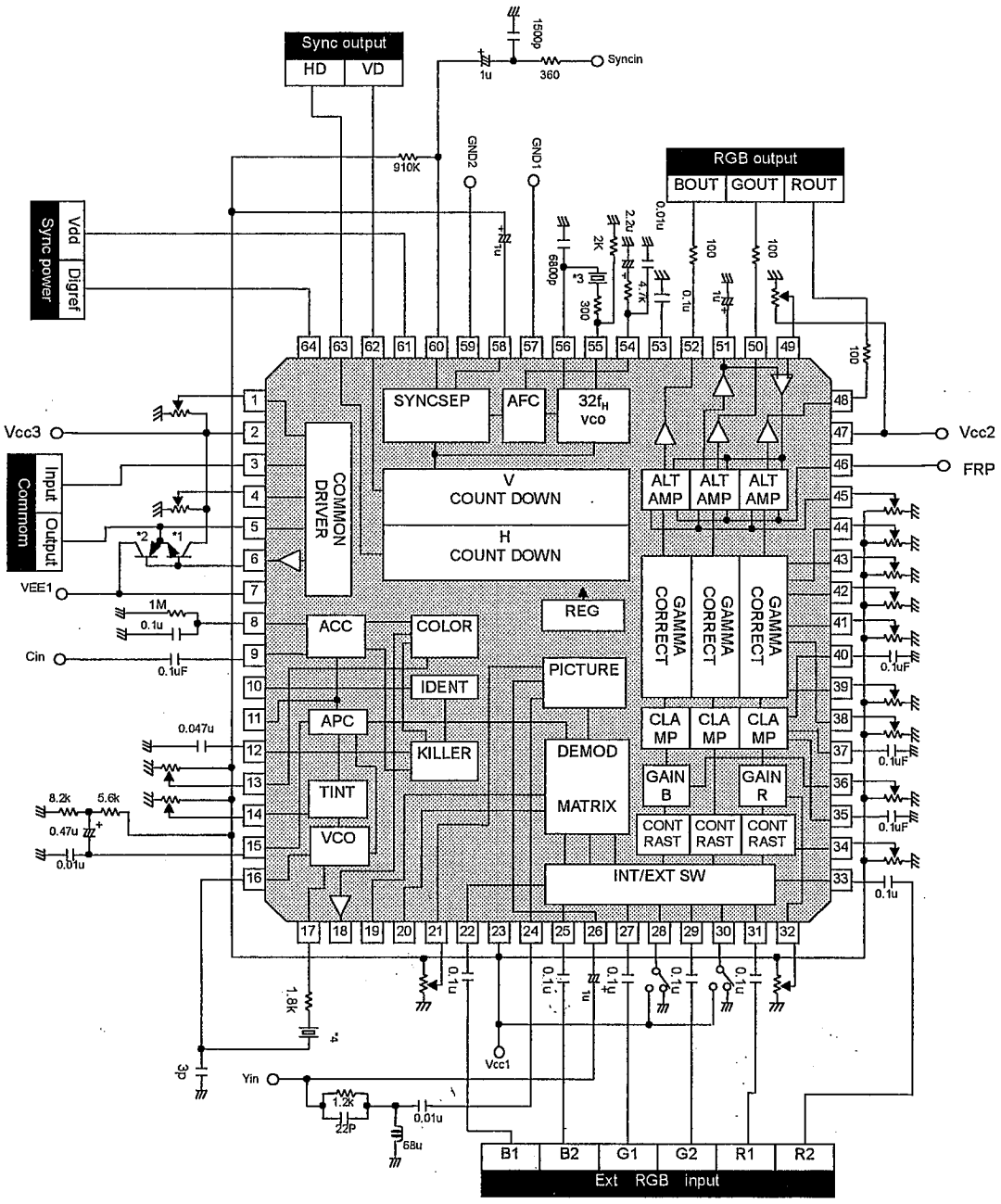
■ ELECTRICAL CHARACTERICS (Ta=25°C,$V_{CC}$1=5V,$V_{CC}$2=5V,$V_{CC}$3=7V,$V_{DD}$=5V,$V_{EE}$1=−5V)

| PARAMETERS | SYMBOL | TEST CONDITIONS | MIN. | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| Crosstalk 3 Between SW (EXT2→INT) (※Point 2) | CTE2IR | SG5(1MHz,700mVpp) applied to V33, V21, V26=GND,V30=5V,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| | CTE2IG | SG5(1MHz,700mVpp) applied to V29, V21, V26=GND,V30=5V,V49=2.2V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| | CTE2IB | SG5(1MHz,700mVpp) applied to V25, V21, V26=GND,V30=5V,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| Crosstalk 4 Between SW (EXT2→EXT1) | CTE2E1R | SG5(1MHz,700mVpp) applied to V33, V21, V31=GND,V28=5V,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V30=0V,5V. | — | −50 | −35 | dB |
| | CTE2E1G | SG5(1MHz,700mVpp) applied to V29, V21, V27=GND,V28=5V,V49=2.2V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V30=0V,5V. | — | −50 | −35 | dB |
| | CTE2E1B | SG5(1MHz,700mVpp) applied to V25, V21, V23=GND,V28=5V,V49=1.3V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V30=0V,5V. | — | −50 | −35 | dB |
| Crosstalk 5 Btween SW (INT→ EXT1) | CTIE1R | SG5(1MHz,350mVpp) applied to V26, V21, V31=GND,V49=2.2V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| | CTIE1G | SG5(1MHz,350mVpp) applied to V26, V21, V26=GND,V49=2.2V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| | CTIE1B | SG5(1MHz,700mVpp) applied to V26, V21, V23=GND,V49=2.2V.Measure the amplitude of 1MHz component on Rout. Calculate the amplitude ratio of V28=0V,5V. | — | −50 | −35 | dB |
| VCOM Output Slew Rate | SRVCOM | SG9 applied to V3. Measure the output on V5. | 4.0 | 9.0 | — | V/μS |
| VCOM Center Voltage | VCVCOM | SG9 applied to V3. Measure the output on V5. | — | 1.2 | — | V |
| VCOM Amplitude | VAVCOM | SG9 applied to V3. Measure the output on V5. | — | 6.5 | — | $V_{P-P}$ |
| Delay Between Y-C | ΔTdYC | | — | 400 | — | nS |

(※Point 2) Investigation Crosstalk level when design for depend to application

## ■ Application Circuit ( NTSC )

($V_{CC}1$=5V,$V_{CC}2$=5V,$V_{CC}3$=7V,$V_{DD}$=5V,$V_{EE1}$=−5V,GND=0V,DIGREF=0V)




*1 : 2SC2120Y、2SC1959Y

*2 : 2SA950Y、2SA562TM

*3 : 32$f_H$ Ceramic CSB503F02 (Murata)

*4 : 3.579545MHz X'tal NR18 (Nippon Denpa Kougyo)

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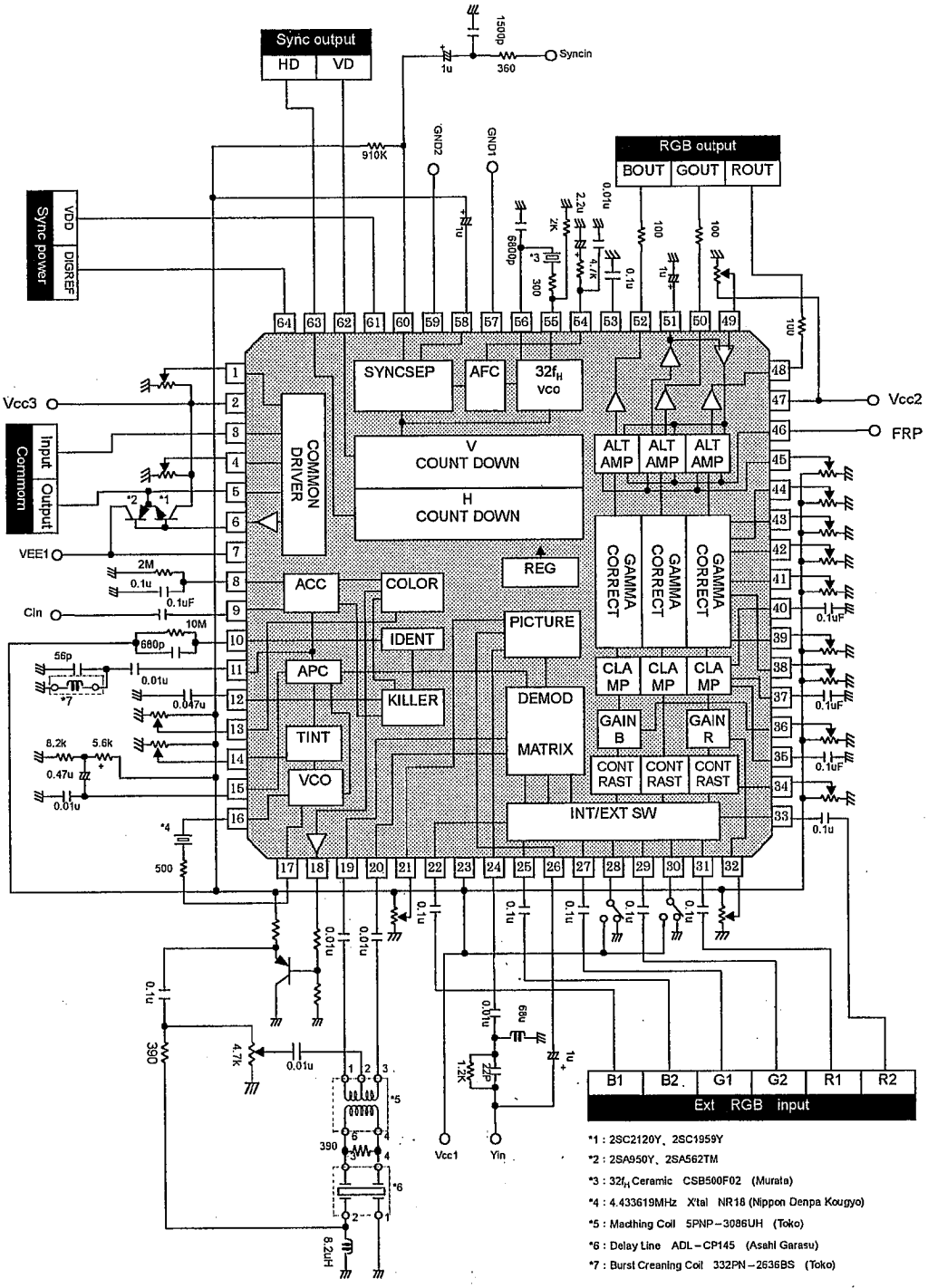
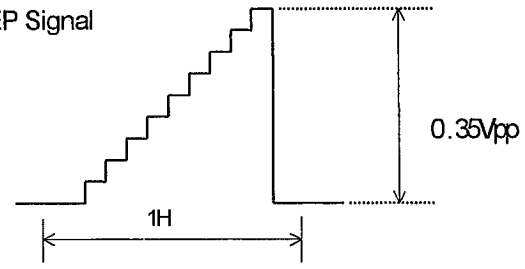
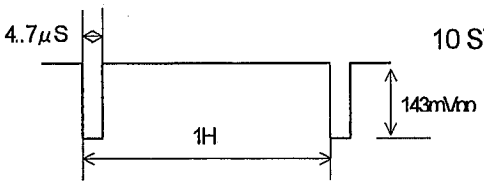
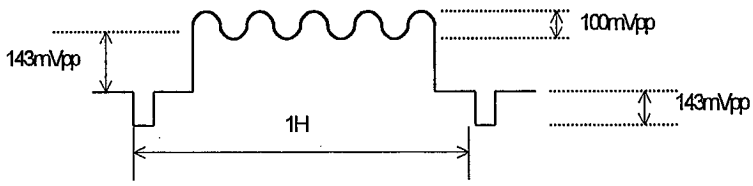
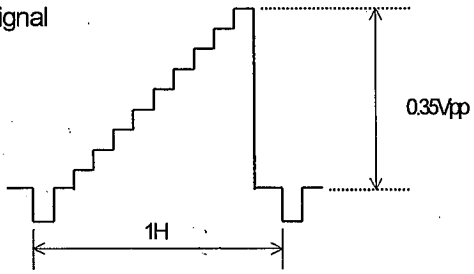
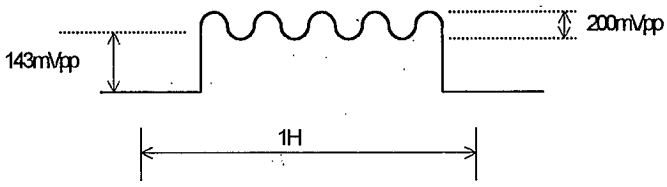
## ■ Application Circuit (PAL)

($V_{CC}1$=5V,$V_{CC}2$=5V,$V_{CC}3$=7V,$V_{DD}$=5V,$V_{EE1}$=−5V,GND=0V,DIGREF=0V)



| | |
|---|---|
| SG 1 | No Sync 10STEP Signal<br>  |
| SG 2 | Composite Y Signal With Sync<br>  |
| SG 3 | Sine Video Signal With Sync<br>  |
| SG 4 | 10STEP Video Signal<br>  |
| SG 5 | No SYNC Sine Video Signal<br>  |

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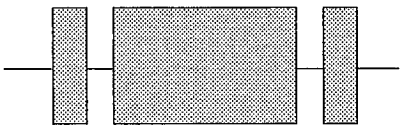
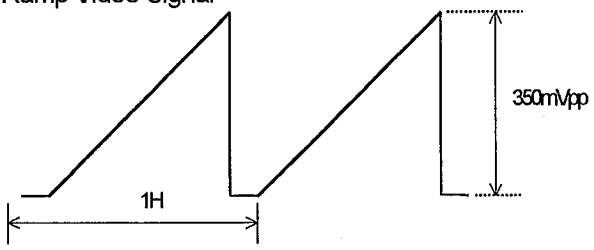
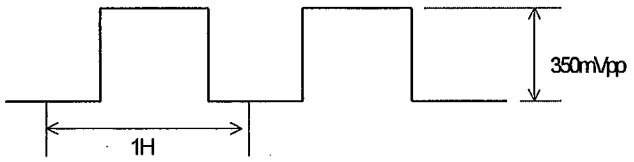
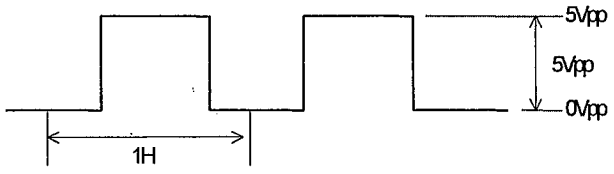
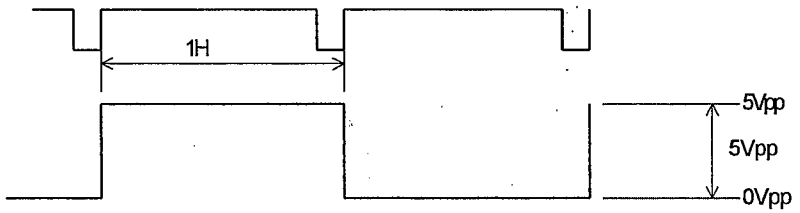
| SG 6 | C Signal<br>  <br>Burst Amplitude=150mVpp<br>Chroma Amplitude=150mVpp |
| SG 7 | No SYNC Ramp Video Signal<br>  |
| SG 8 | Video Signal Of Turn ON, Turn OFF Under 50nS<br>  |
| SG 9 | Turn ON, Turn OFF Under 50nS<br>  |
| SG 10 |  <br>FRP Signal Of Non-inverting Every 1H |

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