

2H - VIDEO SCANNING PROCESSOR

PRODUCT PREVIEW

VIDEO PART

- USER CONTROL FUNCTIONS :
CONTRAST, BRIGHTNESS, SATURATION,
COLOR EQUALIZER
- RGB INPUT WITH FAST-BLANKING FOR
ON-SCREEN-DISPLAY / TELETEXT
- FAST BLANKING INPUT FOR CONTRAST
REDUCTION (TRANSPARENT MENU BOX)
- AVERAGE BEAM LIMITER FUNCTION WITH
CONTRAST AND BRIGHTNESS REDUCTION
- PAL/SECAM OR NTSC MATRIX SWITCHA-
BLE BY BUS
- AUTOMATIC CUT-OFF LOOP WITH INTE-
GRATED DIGITAL MEMORY AND LEAKAGE
CURRENT COMPENSATION
- FULL WHITE ADJUSTMENT VIA BUS
- BUS REPLY FOR TUBE COLD INFORMA-
TION AND CUT-OFF COUNTER STATUS
- APX (AUTO PIX) : ADAPTIVE CONTRAST
CONTROL
- COLOR MATCHING (IN CONNECTION WITH
WHITE STRETCH)
- APL (AUTO PEDESTAL) = ADAPTIVE
BRIGHTNESS
- WHITE STRETCH
- VERTICAL AND OVERSIZE BLANKING AC-
CORDING TO ALL ZOOMS
- INDEPENDENT RIGHT AND LEFT ADJUST-
MENT OF HORIZONTAL OVERSIZE BLANKING

SCANNING PART

- INTERNAL OR EXTERNAL 27MHz CLOCK
- VERTICAL SYNCHRONISATION OUTPUT
FOR VIDEO TEXT AND OSD DISPLAY
- PHI2 LOOP WITH INTERNAL LOOP FILTER
- PULSE OUTPUT FOR DRIVING HORIZON-
TAL OUTPUT STAGE
- VERTICAL COUNTDOWN CIRCUIT FOR
CLEAN VERTICAL DEFLECTION
- INTEGRATED VERTICAL SAWTOOTH GENE-
RATOR WITH AMPLITUDE CONTROL LOOP
- VERTICAL AND HORIZONTAL BUS ADJUSTA-
BLE SIZE CORRECTION (BREATHING) TO
ADAPT DEFLECTION SENSITIVITY TO THE
CURRENT BEAM

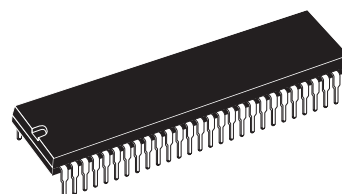
- BUS ADJUSTED VERTICAL PARAMETERS:
VERTICAL AMPLITUDE, VERTICAL POSI-
TION AND S-CORRECTION
- PANNING FOR VERTICAL DEFLECTION
- BUS CONTROLLED EAST-WEST FUNCTION
GENERATOR WITH INTEGRATED ERROR
AMPLIFIER
- VARIABLE FIX-POINTS FOR S-CORRECTION
VERTICAL BLANKING AND EAST-WEST
CORNER CORRECTION
- SUPER SANDCASTLE OUTPUT
- VERTICAL POWER SAVE MODE

SMPS PART

- SMPS PULSE-WIDTH MODULATOR WITH
BUS CONTROLLED REFERENCE VOLTAGE
- SOFTSTART FOR SMPS MODULATOR,
EVEN IN CASE OF MISSING HORIZONTAL
CLOCK (27MHz)
- SOFTSTART FOR HORIZONTAL OUTPUT STAGE
- SMOOTH TRANSITION FROM SOFTSTART
TO NORMAL MODE
- GENERAL STANDBY MODE CONTROL
- PROTECTION CIRCUIT FOR OVERLOAD
DETECTION (SHORT CIRCUITS) AND CON-
TROL OF SMPS MODULATOR
- BUS REPLY FOR OVERLOAD

DESCRIPTION

The STV2162 is an I²C bus controlled Video and Deflexion Processor for 2H-Deflection Television Sets. The IC incorporates also an secondary SMPS (Switch Mode Power Supply) controller with Soft-start and Protection facilities.



SHRINK56
(Plastic Package)

ORDER CODE : STV2162

PIN CONNECTIONS

WHITE STRETCH CAPACITOR	WS	1	56	YOUT	Y OUTPUT OF WHITE STRETCH
U INPUT	UIN	2	55	RES55	RESERVED
V INPUT	VIN	3	54	RES54	RESERVED
Y INPUT	YIN	4	53	Y	Y INPUT VIDEO OF MAIN SIGNAL
APL CONTROL	APL	5	52	NC	NOT CONNECTED
VERTICAL SYNC INPUT	VDFL	6	51	CONVAR	CONTRAST VARIATION (FOR TRANSPARENT MENU)
HORIZONTAL SYNC INPUT	HDFL	7	50	FBTXT	FAST BLANKING INPUT FOR TEXT/OSD
27MHz CLOCK	LDFL	8	49	APX	AUTO PIX CAPACITOR
NOT CONNECTED	NC	9	48	BTXT	BLUE INPUT TEXT/OSD
GROUND	GNDLIN	10	47	GTXT	GREEN INPUT TEXT/OSD
COLOR MATCHING	COLM	11	46	RTXT	RED INPUT TEXT/OSD
V _{CC}	V _{CCLIN}	12	45	GNDVID	GROUND FOR VIDEO PART
NOT CONNECTED	NC	13	44	V _{CCVID}	V _{CC} FOR VIDEO PART
BLUE CUT-OFF REFERENCE	BCUTREF	14	43	ICUTOFF	CUT-OFF AND LEAKAGE MEASUREMENT
GREEN CUT-OFF REFERENCE	GCUTREF	15	42	ROUT	RED OUTPUT
RED CUT-OFF REFERENCE	RCUTREF	16	41	GOUT	GREEN OUTPUT
SOFTSTART CAPACITOR	CSOFT	17	40	BOUT	BLUE OUTPUT
SERIAL CLOCK (I ² C BUS)	SCL	18	39	VABL	AVERAGE BEAM LIMITER INPUT
SERIAL DATA (I ² C BUS)	SDA	19	38	HDRIVE	OUTPUT FOR HORIZONTAL DRIVER
5V STANDBY (SHUNT REGULATOR)	V5V	20	37	SMPSOUT	PWM OUTPUT FOR SMPS
LOOP ϕ 1 LOW PASS FILTER	SLPF	21	36	TXT_OUT	SYNC OUTPUT FOR TELETEXT/OSD
V _{CC} FOR SCANNING PART	V _{CC1}	22	35	SSC	SSC SUPER SANDCASTLE OUTPUT
REFERENCE RESISTOR FOR CURRENT	I _{REF}	23	34	GND1	GROUND FOR SCANNING PART
REGULATOR OUTPUT	REG	24	33	HFLY	HORIZONTAL FLYBACK INTERFACE
VERTICAL SAWTOOTH ERROR OUTPUT	FROUT	25	32	EWOUT	EAST/WEST OUTPUT
RESISTOR BRIDGE POSITIVE INPUT	SENSEP	26	31	SMPSIN	VOLTAGE INPUT FOR SMPS ERROR AMPLIFIER
RESISTOR BRIDGE NEGATIVE INPUT	SENSEM	27	30	EWIN	EAST/WEST INPUT OF ERROR AMPLIFIER
THT MODULATION AND PROTECTION	BREATH	28	29	CVERT	VERTICAL AGC CAPACITOR

2162-01:EPS

PIN DESCRIPTION

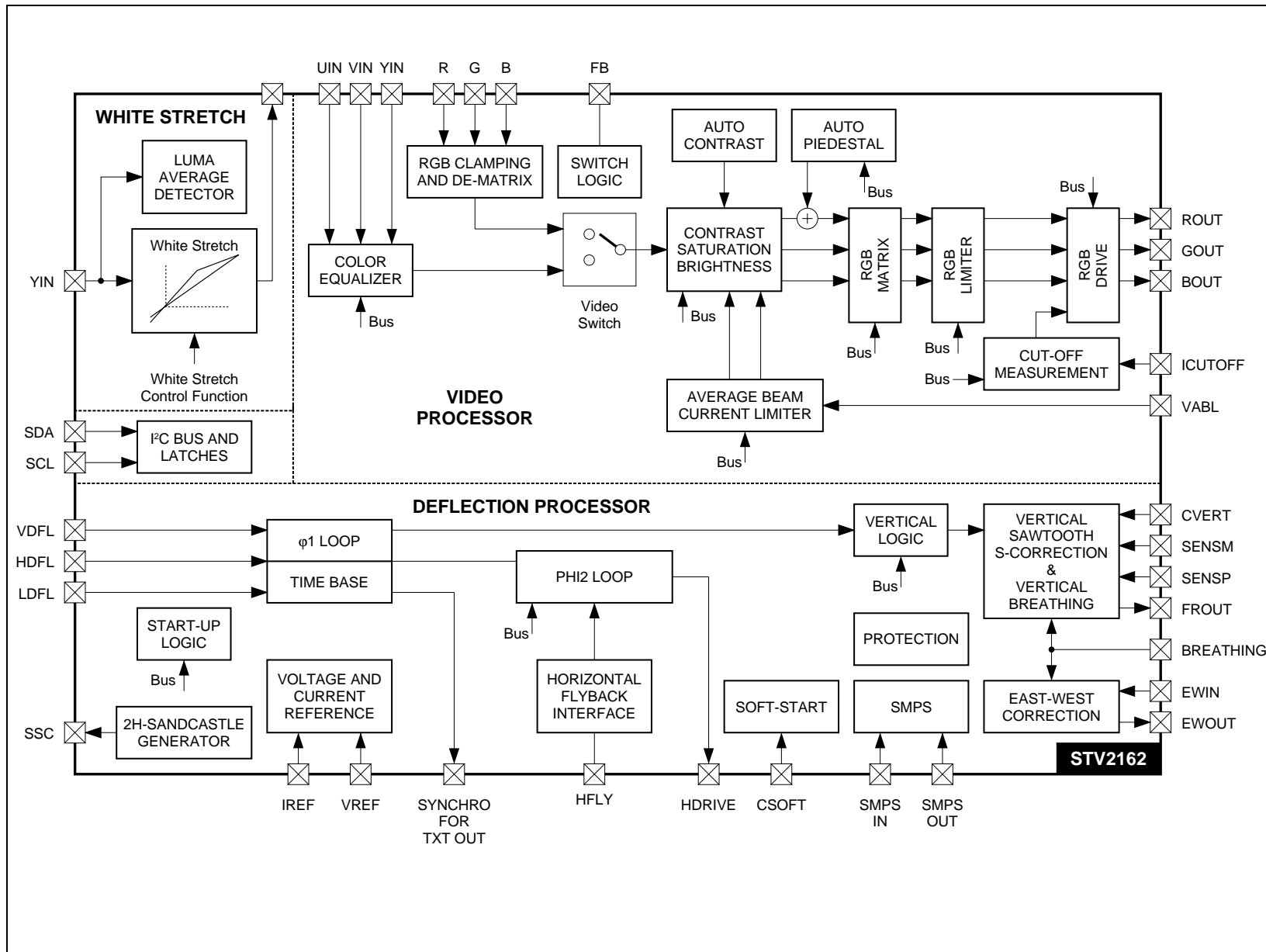
Pin	Name	Function	Description, Test Conditions, Remark
1	WS	Time Constant	White stretch time constant adjustment. External capacitor, internal 200k Ω resistor.
2	UIN	Input	B-Y signal, AC coupling
3	VIN	Input	R-Y signal, AC coupling
4	YIN	Input	Luminance before white stretch, AC coupling
5	APL	Time Constant	Auto Pedestal (APL) time constant. External capacitor, internal 200k Ω resistor
6	VDFL	Input	Vertical synchro
7	HDFL	Input	Horizontal synchro
8	LDFL	Input	27MHz Line Clock
9	NC	Reserved	Not connected
10	GNDLIN	Power supply	Ground for Scanning Logic
11	COLM	Control	Color Matching strength. This pin must be grounded through a resistor . Resistor value determines Color Matching effect : 0 (short Circuit) = no effect, 44k Ω = maximal Colormatching.
12	V _{CCLIN}	Power supply	V _{CC} for Scanning Logic
13	NC	-	Not Connected
14	BCUTREF	Reference	Clamping B. Capacitor 47nF against Ground : cut-off Black Reference.
15	GCUTREF	Reference	Clamping G. Capacitor 47nF against Ground : cut-off Black Reference.

2162-01:TEL

PIN DESCRIPTION (continued)

Pin	Name	Function	Description, Test Conditions, Remark
16	RCUTREF	Reference	Clamping R. Capacitor 47nF against Ground : cut-off Black Reference.
17	CSOFT	Time Constant	Capacitor for softstart, value determines softstart time (typ. 220µF).
18	SCL	Input	Serial Clock for I ² C bus
19	SDA	Input	Serial Data for I ² C bus (pull down - capability for acknowledge and data reply)
20	V5V	Power supply	Voltage supply for standby biasing, voltage is regulated via internal shunt regulator
21	SLPF	Time Constant	Loop filter for horizontal VCO
22	V _{CC1}	Power supply	Supply voltage for Scanning part, connected with external series regulator transistor.
23	I _{REF}	Current Reference	External programming resistor 1% metal type (25kΩ against V _{CC1}). Determines the horizontal free running frequency.
24	REG	Output	Output for controlling the external regulator transistor
25	FROUT	Output	Output of transconductance Frame Amplifier, pin has to be connected to the inverting input of the vertical power amplifier.
26	SENSEP	Input	Input of internal resistor bridge for sensing the vertical deflection yoke current
27	SENSEM	Input	Input of Internal resistor bridge for sensing the vertical deflection yoke current
28	BREATH	Input	Two functions : - if input voltage >1.5V, Vertical size (V_BREATING) and Horizontal width (H_BREATING) compensation. - if pin pulled down by external transistor : protection activated.
29	CVERT	Reference	Regulation of vertical sawtooth amplitude
30	EWIN	Input	Input of the error-amplifier for the East-West modulator
31	SMPSIN	Input	Input for the secondary Switch Mode Power Supply pulse width modulator
32	EWOUT	Output	Output of the error amplifier for the East-West modulator (current output, biasing directly the darlington output transistor
33	HFLY	Input	Horizontal Flyback Input
34	GND1	Power supply	Ground for all scanning functions
35	SSCOUT	Output	Super sandcastle output from the scanning processor part.
36	TXTOUT	Output	Composite 2H synchro for Teletext, OSD, ...
37	SMPSOUT	Output	Output for SMPS driver transistor
38	HDRIVE	Output	Open collector output for the horizontal line transistor
39	VABL	Input	Voltage input for the Average Beam Limiter function
40	BOUT	Output	Video output blue channel
41	GOUT	Output	Video output green channel
42	ROUT	Output	Video output red channel
43	ICUTOFF	Input	Input for the leakage and cut-off current measurement
44	V _{CCVID}	Power supply	Voltage supply for the video part
45	GNDVID	Power supply	Ground for video
46	RTXT	Input	Input for red channel of TEXT/OSD
47	GTXT	Input	Input for green channel of TEXT/OSD
48	BTXT	Input	Input for blue channel of TEXT/OSD
49	APX	Time constant	External capacitor and resistor to determine the attack and delay time of the APX detector
50	FBTXT	Input	Fast Blanking input for TXT/OSD insertion (VFBTXT = 0 . . 3 V)
51	CONVAR	Input	Voltage at this Input decreases instantaneously the Contrast : Contrast-reduction for transparent Menu box
52	NC	Reserved	Not connected
53	Y	Input	Video input Y channel
54	RES54	Reserved	Must be grounded
55	RES55	Reserved	Must be grounded
56	YOUT	Luma Output Signal	Luminance output after white stretch. (Application : connect YOUT with Y (Video Part) via capacitor of 47nF.)

2162-01.TBL



BLOCK DIAGRAM

STV2162

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V5V	Own Protection structure (Power-Zener-Protection-Diode) (Pin 20)	6	V
SCL,SDA	Protection Structures connected to V5V (each of this pin has an own Power-Zener-Protection Diode) (Pins 18-19)	7	V
VCCLIN, VCCVID, V _{CC1}	Voltage regulated via ext.Transistor (Pins 12-22-44)	8.4V	
VSENSP, VSENSM	Voltage on Pins 26-27	18	V
Toper	Operating Ambient Temperature	0, 70	°C
Tstg	Storage Temperature	-55 , +150	°C

2162-02.TBL

THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th (j-a)}	Junction-ambient Thermal Resistance Max.	40	°C/W

2162-03.TBL

BUS DESCRIPTION**1 - Slave-Address**

Address : hex 8C/8D

MSB						LSB	
1	0	0	0	1	1	0	Read-Write

2 - Address-Mapping (write mode)

x = don't care-bits, not used in the decoding of the subaddress.

Subaddress			Data Bits							
(binary)	dec	hex	MSB				LSB			
xxx00000	0	00			VID_ACT	S_ON	H_VCO			
xxx00001	1	01	S_CORR_3	S_CORR_2	S_VOLTAGE					
xxx00010	2	02	S_CORR_1	S_CORR_0	EW_SHAPE					
xxx00011	3	03	MPX_3	MPX_2	EW_AMPLITUDE					
xxx00100	4	04	MPX_1	MPX_0	HPOS_5	HPOS_4	HPOS_3	HPOS_2	HPOS_1	HPOS_0
xxx00101	5	05		FSC	EW_TILT					
xxx00110	6	06	AUTO_VCR	FORCE_VCR	H_WIDTH					
xxx00111	7	07	TST_V1	TST_V0	V_DC					
xxx01000	8	08		V_AMPLITUDE						
xxx01001	9	09		VPAN_2		H_RIGHT_BLANKING				
xxx01010	10	0A	VPAN_1	VPAN_0		H_LEFT_BLANKING				
xxx01011	11	0B	APL_LEVEL							
xxx01100	12	0C	H_BREATHING				V_BREATHING			
xxx01101	13	0D	VSTART_4	VSTART_3	VSTART_2	CEQU_4	CEQU_3	CEQU_2	CEQU_1	CEQU_0
xxx01110	14	0E	VSTART_1	VSTART_0	WS_THRESHOLD					
xxx01111	15	0F	NTSC_PAL	WS_ON	CONTRAST					
xxx10000	16	10	EWS12	ENVPS	BRIGHTNESS					
xxx10001	17	11	STOP_C_VAR	DRV_GAIN	SATURATION					
xxx10010	18	12	RGB_LIM		APX_THRESHOLD					
xxx10011	19	13	V_CORR_3	V_CORR_2	R_CUTOFF					
xxx10100	20	14	V_CORR_1	V_CORR_0	G_CUTOFF					
xxx10101	21	15	RES_CUT	FUF	R_DRIVE					
xxx10110	22	16	VID_OFF	DIS_CUT	G_DRIVE					
xxx10111	23	17	SSC_TRI	FORCE_MUTE	B_DRIVE					

Subaddress 0 (hex 00)

MSB					LSB		
X	X	VID_ACT	S_ON	H3	H2	H1	H0

VID_ACT : Video Processor Activation

Switch to activate Video processor

0 : Startup phase : Video output (R,G,B_OUT) hard blanked (0.9V) , no cut-off insertion lines

1 : RGB outputs active

S_ON : TV Mode Selection

Switch to change from standby mode to operation mode

0 : Standby operation : I²C bus active ; Protection logic active ; Pin REG pulled down to ground

1 : TV set = ON : Vcc regulator active

H[3..0] : Horizontal Free Running Frequency

H_VCO 0000 (hex 0) minimal free running frequency

1111 (hex F) maximum free running frequency

BUS DESCRIPTION (continued)**Subaddress 1** (hex 01)

& System-Voltage -

MSB						LSB	
S_CORR_3	S_CORR_2	S5	S4	S3	S2	S1	S0

S_CORR_3, : S_Correction (2 MSB) (see subaddress 2)

S_CORR_2

S[5..0] : System Voltage Adjustment (S_VOLTAGE)

S_VOLTAGE 000000 (hex 00) minimal position : System voltage minimal

111111 (hex 3F) maximal position : System voltage maximal

Subaddress 2 (hex 02)

MSB						LSB	
S_CORR_1		E5	E4	E3	E2	E1	E0

S_CORR_1, : S_Correction (2 LSB)

S_CORR_0 S_CORRECTION 0000 (hex 0) minimal S_Correction (vertical sawtooth flat)

1111 (hex F) maximal S_Correction

E[5..0] : EW_Shape (corner correction)

EW_SHAPE 000000 (hex 0) minimal parabola flattening (ideal parabola)

111111 (hex 3F) maximal parabola flattening (flattened corners of parabola)

Subaddress 3 (hex 03)

MSB						LSB	
0	0	E5	E4	E3	E2	E1	E0

E[5..0] : EW-Amplitude

EW_AMPLITUDE 000000 (hex 00) minimal Parabola-Amplitude = 0V (=no Parabola)

111111 (hex 3F) maximal Parabola-Amplitude = 0.7V

Subaddress 4 (hex 04)

MSB						LSB	
0	0	H5	H4	H3	H2	H1	H0

H[5..0] : Horizontal Picture Position (left-right-shift)

H_POSITION : fine tuning of reference slope

H_POSITION 000000 (hex 00) minimal position :

rising edge of HDFL in the middle of HFLY.

100000 (hex 20) nominal position

111111 (hex 3F) maximal position :

rising edge of HDFL 4.7µs before middle of HFLY.

BUS DESCRIPTION (continued)**Subaddress 5** (hex 05)

East-West - Tilt (Unsymmetry):

MSB				LSB			
	FSCk	E5	E4	E3	E2	E1	E0

FSCk : Selector for free run horizontal frequency (start) of 27MHz clock operation
 0 : Normal operation = external 27MHz Clock (LDfL) used to control horizontal deflection after the softstart operation and video identification (VIDID=1)
 1 : Internal clock

E[5..0] : East/West Tilt (unsymmetry)

EW_TILT 000000 (hex 00) minimal position :
 parabola unsymmetrical, (higher on the top of the picture)
 100000 (hex 20) nominal position : parabola symmetrical
 111111 (hex 3F) maximal position :
 parabola unsymmetrical, (lower on the top of the picture)

Subaddress 6 (hex 06)

MSB				LSB			
AUTO_VCR	FORCE_VCR	H5	H4	H3	H2	H1	H0

AUTO_VCR / FORCE_VCR : VCR Mode Selection

TV-Mode	FORCE_VCR	AUTO_VCR
PHI1 loop forced to NOVCR mode (TV operation)	0	0
VCR trick mode automatically detected and VCR mode forced (Trick mode = not 312.5 lines per frame in 100Hz mode ; not 265.5 lines per frame in 120Hz mode)	0	1
Phi1 loop forced to VCR mode	1	0
Test mode for vertical countdown logic test (only IC testing)	1	1

H[5..0] : H_WIDTH (picture width controlled by the East/West modulator)

H_WIDTH 000000 (hex 00) minimal picture size
 111111 (hex 3F) maximal picture size

Subaddress 7 (hex 07)

MSB				LSB			
0	0	V5	V4	V3	V2	V1	V0

V[5..0] : Vertical Position (vertical DC shift)

V_DC 000000 (hex 00) picture shifted down
 111111 (hex 3F) picture shifted up

Subaddress 8 (hex 08)

MSB				LSB			
X	V6	V5	V4	V3	V2	V1	V0

V[6..0] : Vertical Sawtooth Amplitude

V_AMPLITUDE 0000000 (hex 00) minimal amplitude
 (0.65V_{PP} (between 270 lines) on SENSP/SENSM)*
 1111111 (hex 7F) maximal amplitude
 (1.73V_{PP} (between 270 lines) on SENSP/SENSM)*

* : With no vertical power safe function.

BUS DESCRIPTION (continued)

Subaddress 9 (hex 09)

MSB						LSB	
	VPAN_2	X	H4	H3	H2	H1	H0

VPAN_2 : Vertical Panning (1 MSB) (see subaddress 10)

H[4..0]	:	Horizontal Blanking on right picture side (reference slope : middle of HFLY)
H_RIGHT_BLANKING	0000 (hex 0)	minimal horizontal oversize blanking (-2μs)
	1111 (hex 1F)	maximum horizontal oversize blanking (-6.74μs on right side)

Stepsize $\sim 0.15\mu\text{s}$

Subaddress 10 (hex 0A)

MSB							LSB
VPAN_1		X	H4	H3	H2	H1	H0

VPAN_1, : Vertical Panning (2 LSB)

VPAN_0	VPAN	000 (hex 0)	no vertical panning (no vertical deflection delay)
		111 (hex 7)	maximum vertical panning = 30 lines delay of vertical deflection

Stepsize : 4 lines delay

H[4..0]	:	Horizontal Blanking on left picture side
H_LEFT_BLANKING	00000 (hex 00)	minimal horizontal oversize blanking (+2μs)
	11111 (hex 1F)	maximum horizontal oversize blanking (+6.74μs on left side)

Stepsize $\sim 0.15\mu\text{s}$

Subaddress 11 (hex 0B)

MSB				LSB			
A3	A2	A1	A0	V3	V2	V1	V0

A[3..0] : Auto Pedestal Level "APL_LEVEL" (adaptive brightness)

APL_LEVEL	0000 (hex 0)	minimal value = no influence = 0 IRE
	1111 (hex F)	maximal value = maximum brightness increase (20 IRE when luma averagevalue 100 IRE)

V[3..0]	:	Vertical Blanking (also changes vertical fix points for S_Correction and East/West parabola)
V_BLANKING	0000 (hex 00)	minimal value of fix points and vertical blanking (0.52V on SENSM/SENSP)
	1111 (hex 0F)	maximal value of fix points and vertical blanking (0.6V on SENSM/SENSP)

Subaddress 12 (hex 0C)

MSB				LSB			
H3	H2	H1	H0	V3	V2	V1	V0

H[3..0] : Horizontal Breathing

H_BREATHING	0000 (hex 0)	minimal Horizontal Breathing (0%)
	1111 (hex F)	maximal Horizontal Breathing (10%)

V[3..0] : Vertical Breathing

V_BREATHING	0000 (hex 0)	minimal Vertical Breathing (0%)
	1111 (hex F)	maximal Vertical Breathing (10%)

BUS DESCRIPTION (continued)**Subaddress 13** (hex 0D)

MSB						LSB	
VSTART_4	VSTART_3	VSTART_2	C4	C3	C2	C1	C0

VSTART_4, : Vertical Ramp Start Panning (3MSB) (see subaddress 14)

VSTART_3,
VSTART_2

C[4..0] : Color Equalizer (differential gain between UIN- and VIN- channel)
 COLOR_EQUALIZER 00000 (hex 00) minimal position :
 max. gain for UIN, min. gain for VIN
 10000 (hex 10) nominal position : same gain for UIN and VIN
 11111 (hex 1F) maximal position :
 min. gain for UIN, max. gain for VIN

Subaddress 14 (hex 0E)

MSB						LSB	
VSTART_1	VSTART_0	W5	W4	W3	W2	W1	W0

VSTART_1, : Vertical Ramp Start (2 LSB)

VSTART_0 VSTART 00000 (hex 0) vertical ramp start at line 0
 11111 (hex 1F) vertical ramp start at line 64

W[5..0] : White Stretch Threshold
 WS_THRESHOLD 000000 (hex 00) minimal position : threshold value = 5 IRE
 111111 (hex 3F) maximal position : threshold value = 40 IRE

Subaddress 15 (hex 0F)

MSB						LSB	
NTSC_PAL	WS_ON	C5	C4	C3	C2	C1	C0

NTSC_PAL : RGB Matrix Selection

0 : RGB matrix uses the PAL/SECAM - Coefficients for the Conversion YUV -> RGB

1 : RGB matrix uses the NTSC - Coefficients for the Conversion YUV -> RGB

Note : The input-dematrix for RGBTXT is always "PAL/SECAM" dematrix !! i.e. at the NTSC-mode the colors are correct only for YUV-input.

WS_ON : White Stretch Selection

0 : White Stretch is switched off

1 : White Stretch is activated

C[5..0] : Contrast Adjustment

CONTRAST 000000 (hex 00) minimal position : smallest contrast level
 = 20% of maximal contrast

111111 (hex 3F) maximal position : maximal contrast

Subaddress 16 (hex 10)

MSB						LSB	
EWS12	ENVPS	B5	B4	B3	B2	B1	B0

EWS12 : Selection of Parabole Corner Type

ENVPS : Vertical Power Safe Selection

0 : vertical power safe function not active

1 : vertical power safe function active

B[5..0] : Brightness

BRIGHTNESS 000000 (hex 00) minimal position : brightness = -30 IRE

100000 (hex 20) nominal position : brightness = 0

111111 (hex 3F) maximal position : brightness = +30 IRE

BUS DESCRIPTION (continued)**Subaddress 17** (hex 11)

MSB				LSB			
STOP_C_VAR	DRV_GAIN	S5	S4	S3	S2	S1	S0

- STOP_C_VAR** : Contrast Variation with TXT insertion
 with this bit, the user saturation and contrast setting will be partially removed i.e. moved toward contrast = max., saturation = 100% (middle) for TXT/OSD insertion (RTXT, GTXT, BTXT))
 0 : TXT/OSD insertion : same contrast as main channel
 1 : TXT/OSD insertion (FBTXT=1) toward max. contrast and mid. saturation
- DRV_GAIN** : Selection of gain range (changes the range of the gain adjustment drive)
 0 : maximum gain = 4.6
 1 : maximum gain = 6.5
- S[5..0]** : Color Saturation Adjustment
 SATURATION 000000 (hex 00) minimal position = completely suppressed colors
 111111 (hex 3F) maximal position : maximal saturation (3dB oversaturation)

Subaddress 18 (hex 12)

MSB				LSB			
RGBLIM1	RGBLIM0	A5	A4	A3	A2	A1	A0

- RGBLIM[1..0]** : RGB Hard Limiter
 Voltage limitation of R,G,B at the output of the matrix , just before drive adjustment
 RGB_LIM 00 (hex 0) limitation at 100 IRE
 11 (hex 3) limitation at 150IRE
- A[5..0]** : Auto Pix (APX) Threshold Voltage
 APX_THRESHOLD 000000 (hex 00) minimal position : threshold value = 50 IRE
 111111 (hex 3F) maximal position : threshold value = 100 IRE

Subaddress 19 (hex 13)

MSB				LSB			
V_CORR_3	V_CORR_2	R5	R4	R3	R2	R1	R0

- V_CORR_3, V_CORR_2** : Vertical Corner Point of EW Shape (2 MSB) (see subaddress 20)
- R[5..0]** : Red Cut-off Adjustment (Blue is fixed value of 0.45V at BOUT)
 R_CUTOFF 000000 (hex 00) insertion of 0.675V at ROUT for red measurement pulse
 111111 (hex 3F) insertion of 0.225V at ROUT for red measurement pulse

Subaddress 20 (hex 14)

MSB				LSB			
V_CORR_1	V_CORR_0	G5	G4	G3	G2	G1	G0

- V_CORR_1, V_CORR_0** : Corner Point of EW-Shape (2 LSB)
 V_CORNER 0000 (hex 0) corner point of EW shape @ 60% of fix point
 1111 (hex F) corner point of EW shape @ 80% of fix point
- G[5..0]** : Green Cut-off Adjustment (Blue is fixed value of 0.45V at BOUT)
 G_CUTOFF 000000 (hex 00) insertion of 0.675V at GOUT for green measurement pulse
 111111 (hex 3F) insertion of 0.225V at GOUT for green measurement pulse

BUS DESCRIPTION (continued)**Subaddress 21** (hex 15)

MSB				LSB			
RES_CUT	FUF	D5	D4	D3	D2	D1	D0

- RES_CUT** : Reset of Cut-off Counters and TUBE_COLD bit ; at the same time : stop of cut-off function
 0 : cut-off loop active
 1 : cut-off loop stopped and Reset of all cut-off counters and TUBE_COLD bit
- FUF** : Full Frame Mode (selects cut-off loop operation modus)
 0 : cut-off loop is active during the whole frame (adjustment of VG2 on the CRT board in production)
 1 : cut-off loop is active during the first 4 active Video lines : normal mode
- D[5..0]** : Drive Register for Red Channel (gain adjustment of the red driver output stage)
 R_DRIVE 000000 (hex 00) minimal position : 0.33 of maximal value
 111111 (hex 3F) maximal position : 3.2VPP at ROUT for contrast = max.,
 DRV_GAIN=1 and Y=70 IRE; or DRV_GAIN=0 and Y = 100 IRE

Subaddress 22 (hex 16)

MSB				LSB			
VID_OFF	DIS_CUT	D5	D4	D3	D2	D1	D0

- VID_OFF** : Hard Blanking of Video Output
 0 : normal operation
 1 : ROUT, GOUT, BOUT is hard blanked, while the cut-off measurement is still active.
- DIS_CUT** : Disable of Cut-off Loop
 0 : Cut-off loop is active.
 1 : Cut-off loop is stopped, actual values in the registers are frozen.

Truth - Table for DIS_CUT / FUF

Operation Mode	DIS_CUT	FUF
Video signal present at RGBOUT ; 3 cut-off measurement lines in the lines 21,22,23	0	0
Cut-off measurement during the whole frame with the sequence --> Leakage - Blue, green, red (repetitive each 4th line)	0	1
Video signal present at RGBOUT but no cut-off measurement (last values of cut-off counter frozen)	1	0
All Outputs ROUT, GOUT, BOUT hard blanked all the time ; no video ; no cut-off measurement (useful when TV is switched off --> immediate stop of video output)	1	1

- D[5..0]** : Green Drive Register (gain adjustment of the GREEN driver outputstage)
 G_DRIVE 000000 (hex 00) minimal position : 0.33 of maximal value
 111111 (hex 3F) maximal position : 3.2 VPP at GOUT for contrast = max.,
 DRV_GAIN=1 and Y=70 IRE; or DRV_GAIN=0 and Y=100 IRE

Subaddress 23 (hex 17)

MSB				LSB			
SSC_TRI	FORCE_MUTE	D5	D4	D3	D2	D1	D0

- SSC_TRI** : Mode switch for super sandcastle output (only useful in test mode)
 0 : SSC Pin delivers super sandcastle output
 1 : Super sandcastle output disabled ; Pin SSC can serve as input for PSI and video part
- FORCE_MUTE** : Test mode for accelerating the test of the PHI1 mute circuit
 0 : normal operation ; TV application
 1 : PHI1 circuit set to mute ; $\phi 1$ forced to free run mode
- D[5..0]** : Blue Drive Register (gain adjustment of the blue driver output stage)
 B_DRIVE 000000 (hex 00) minimal position : 0.33 of maximal value
 111111 (hex 3F) maximal position :
 3.2 VPP at BOUT for contrast = max., DRV_GAIN=1 and
 Y=70 IRE ; or DRV_GAIN=0 and Y=100 IRE

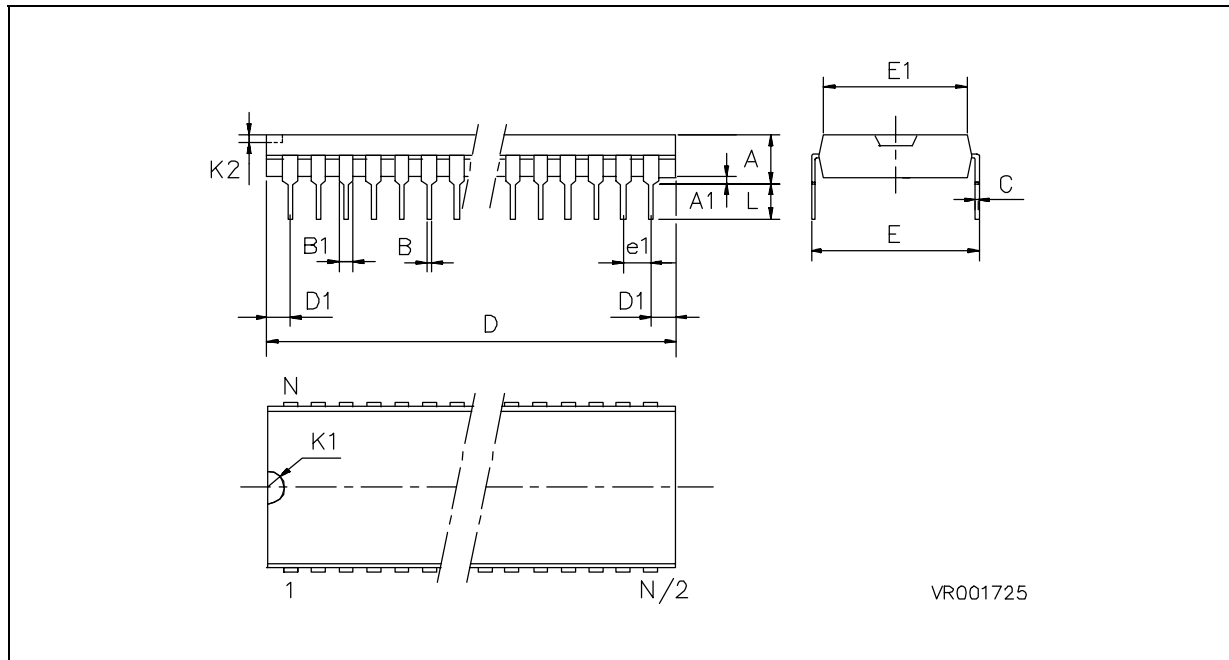
BUS DESCRIPTION (continued)**3 - Output Signals** (Read-Mode)

Reply Byte	MSB							LSB
1st	PONRESET	OVERLOAD	VIDID	S120/100	VSTD	TUBECOLD	PHI1MUTE	SYNCVID
2nd	LSB_R_CUT	LSB_G_CUT	LSB_B_CUT	VERS_NBR			VERS_EXT	
3rd	R_CUTOFF_COUNTER							
4th	G_CUTOFF_COUNTER							
5th	B_CUTOFF_COUNTER							

PONRESET	: 1 if voltage drop on V5V (< 4.5V) has been detected (risk of data loss in latch memory)
OVERLOAD	: 1 if after 3 restart trials TV set is switched off definitely since breathing pin was pulled down due to an error (reset to 0 can be done by switching off the TV set (S_ON = 0 ; see Subaddress 0)
VIDID	: 1 if Start-Oscillator PHI1 is locked to HDFL pulse after 7 frames 0 if not
S120/100	: 1 if vertical sync pulse frequency = 120Hz 0 if vertical sync pulse frequency = 100Hz
VSTD	: 1 if line-numbers per frame are interlace standard : exactly 312.5 (100Hz) or 262.5 (120Hz) 0 if line-numbers per frame are different from this standard -> VCR trick mode recognition
TUBECOLD	: 1 after start of TV set 0 if the first time one of the cut-off counters is decremented (tube starts to deliver beam current)
PHI1MUTE	: 1 if PHI1 loop is in mute mode (no valid HDFL detected) ; SLPF connected to a fix voltage
SYNCVID	: 1 if Start oscillator PHI1 is in phase to HDFL pulse 0 if not
VERS_NBR	: Version number
VERS_EXT	: Version extension
LSB_R_CUT	: LSB of 9 bit red cut-off counter
LSB_G_CUT	: LSB of 9 bit green cut-off counter
LSB_B_CUT	: LSB of 9 bit blue cut-off counter
R_CUTOFF_COUNTER	: Returns the 8 MSB of the 9 bit red cut-off counter
G_CUTOFF_COUNTER	: Returns the 8 MSB of the 9 bit green cut-off counter
B_CUTOFF_COUNTER	: Returns the 8 MSB of the 9 bit blue cut-off counter

PACKAGE MECHANICAL DATA

56 PINS - PLASTIC SHRINK DIP



PMSDIP56.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.08			0.200
A1	0.51			0.020		
B	0.35		0.59	0.014		0.023
B1	0.75		1.42	0.030		0.056
C	0.20		0.36	0.008		0.014
D		52.12			2.052	
D1	—	—	—	—	—	—
E			18.54			0.730
E1		13.72				0.540
K1	—	—	—	—	—	—
K2	—	—	—	—	—	—
L	2.54		3.81	.100		0.150
e1		1.78			0.070	
Number of Pins						
N	56					

SDIP56.TBL

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