SGS-THOMSON MICROELECTRONICS

STV2162

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 SWITCHABLE BY BUS
- AUTOMATIC CUT-OFF LOOP WITH INTEGRATED DIGITAL MEMORY AND LEAKAGE CURRENT COMPENSATION
- FULL WHITE ADJUSTMENT VIA BUS
- BUS REPLY FOR TUBE COLD INFORMATION 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 ACCORDING TO ALL ZOOMS
- INDEPENDENT RIGHT AND LEFT ADJUSTMENT OF HORIZONTAL OVERSIZE BLANKING

SCANNING PART

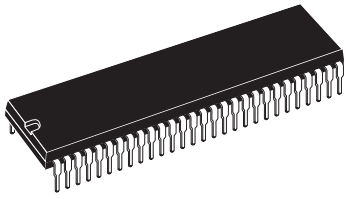
- INTERNAL OR EXTERNAL 27MHz CLOCK
- VERTICAL SYNCHRONISATION OUTPUT FOR VIDEO TEXT AND OSD DISPLAY
- PHI2 LOOP WITH INTERNAL LOOP FILTER
- PULSE OUTPUT FOR DRIVING HORIZONTAL OUTPUT STAGE
- VERTICAL COUNTDOWN CIRCUIT FOR CLEAN VERTICAL DEFLECTION
- INTEGRATED VERTICAL SAWTOOTH GENERATOR WITH AMPLITUDE CONTROL LOOP
- VERTICAL AND HORIZONTAL BUS ADJUSTABLE SIZE CORRECTION (BREATHING) TO ADAPT DEFLECTION SENSITIVITY TO THE CURRENT BEAM
- BUS ADJUSTED VERTICAL PARAMETERS: VERTICAL AMPLITUDE, VERTICAL POSITION 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 CONTROL OF SMPS MODULATOR
- BUS REPLY FOR OVERLOAD

DESCRIPTION

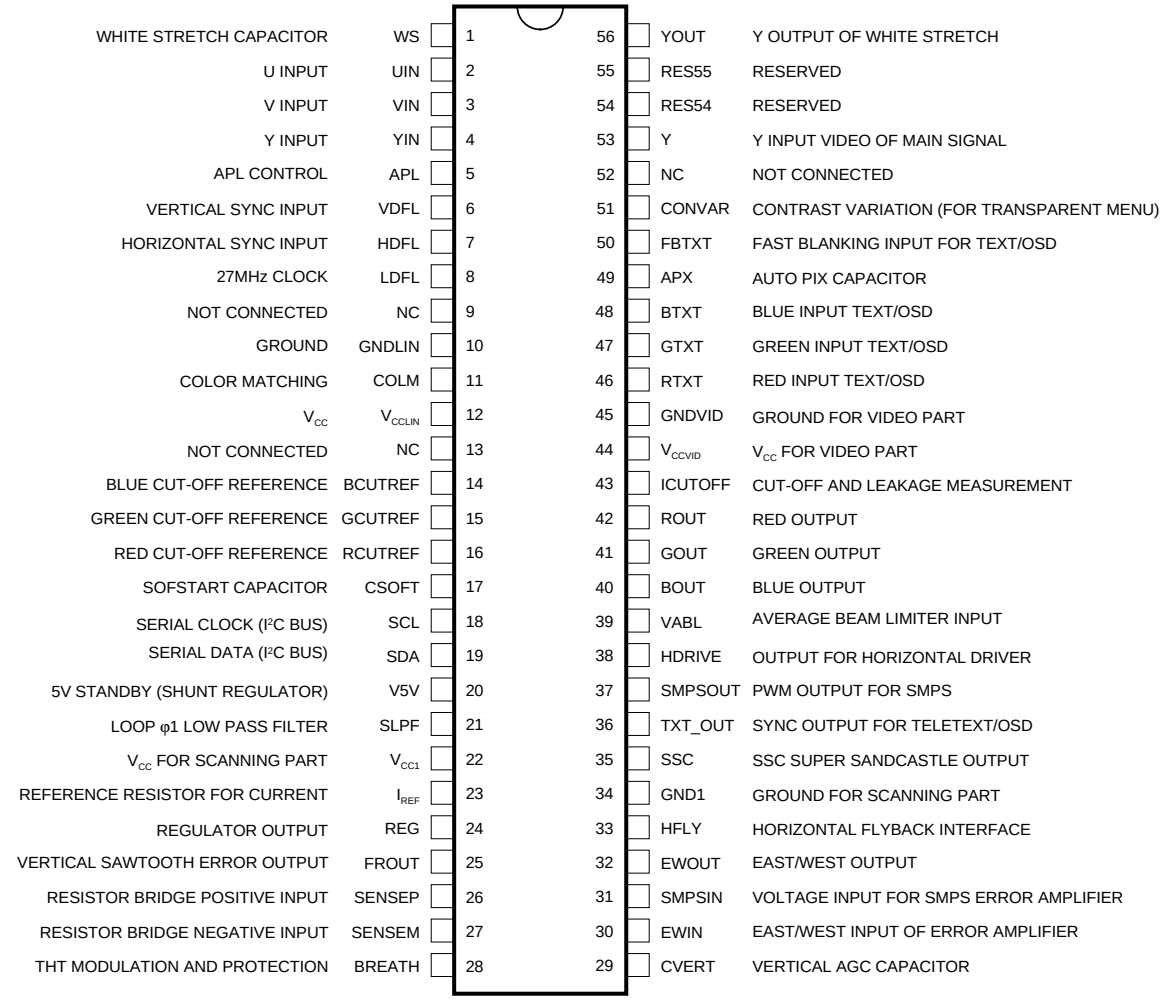
The STV2162 is an I^2C bus controlled Video and Deflexion Processor for 2H-Deflection Television Sets. The IC incorporates also an secondary SMPS (Switch Mode Power Supply) controller with Soft-start and Protection facilities.



SHRINK56
(Plastic Package)

ORDER CODE : STV2162

PIN CONNECTIONS



2162-01.EPS

PIN DESCRIPTION

Pin	Name	Function	Description, Test Conditions, Remark
1	WS	Time Constant	White stretch time constant adjustment. External capacitor, internal 200kΩ 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 200kΩ 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, 44kΩ = 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.

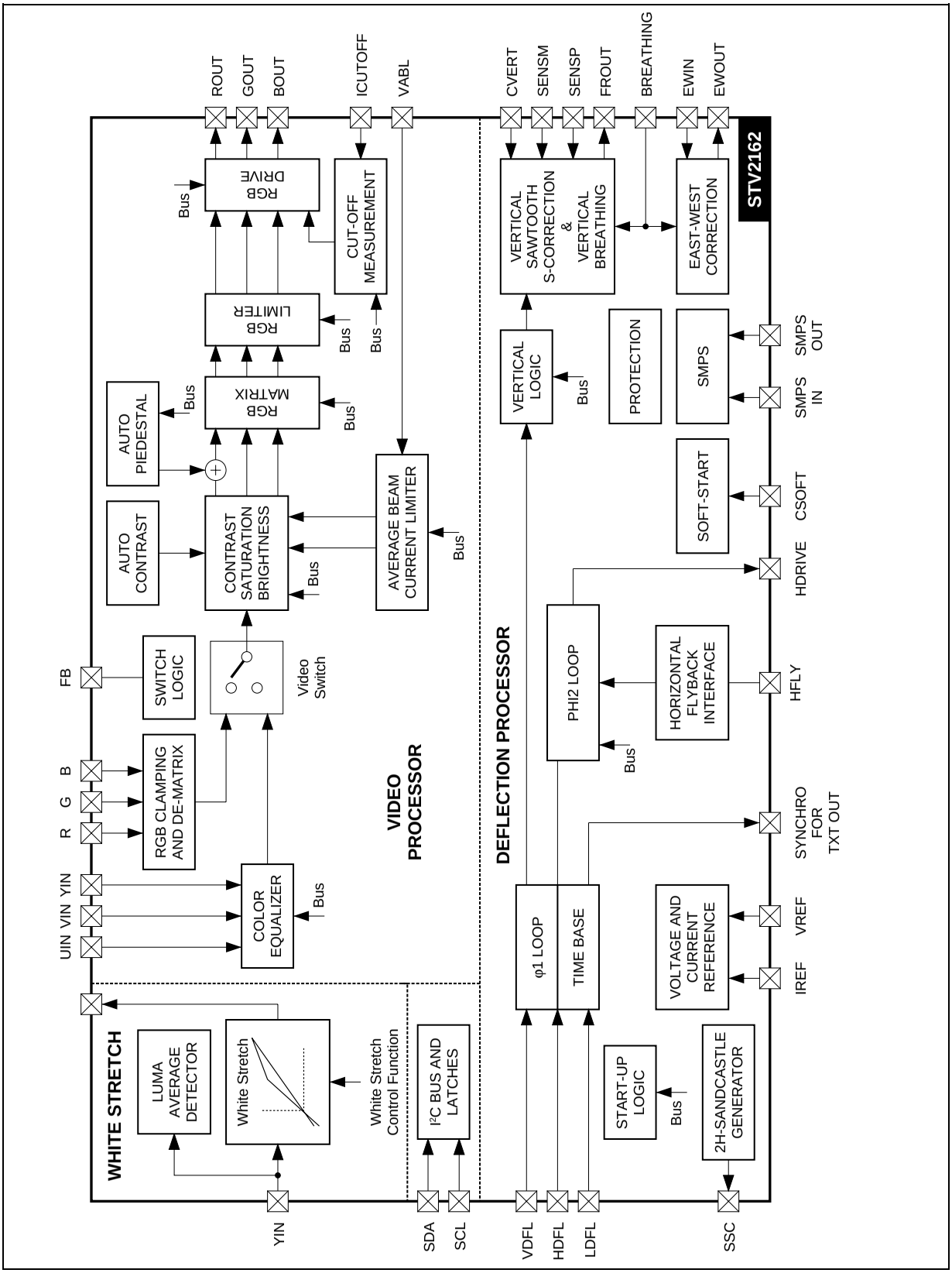
2162-01.TBL

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^2C bus
19	SDA	Input	Serial Data for I^2C 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



2162-02.EPS

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	^{o}C
Tstg	Storage Temperature	-55 , +150	^{o}C

2162-02.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ (j-a)}$	Junction-ambient Thermal Resistance	Max.	40	^{o}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		FSCK	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 : I^2C bus active ; Protection logic active ; Pin REG pulled down to ground
1 : TV set = ON : V_{CC} 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_CORR_2 : S_Correction (2 MSB) (see subaddress 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_CORR_0 : S_Correction (2 LSB)

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 ($0.65V_{PP}$ (between270 lines) on SENSP/SENSM)*
	1111111 (hex 7F)	maximal amplitude ($1.73V_{PP}$ (between270 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 00000 (hex 0) minimal horizontal oversize blanking (-2µs)
11111 (hex 1F) maximum horizontal oversize blanking (-6.74µs on right side)

Stepsize ~ 0.15µs

Subaddress 10 (hex 0A)

MSB							LSB
VPAN_1		X	H4	H3	H2	H1	H0

VPAN_1, VPAN_0 : Vertical Panning (2 LSB)
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 ~ 0.15µs

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, VSTART_3, VSTART_2 : Vertical Ramp Start Panning (3MSB) (see subaddress 14)

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, VSTART_0 : Vertical Ramp Start (2 LSB)

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 actived

C[5..0] : Contrast Adjustment

CONTRAST
- 000000 (hex 00) minimal position : smalles 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 adjustement 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 adjustement 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 adjustement of the GREEN driver outputstage)
G_DRIVE 000000 (hex 00) minimal position : 0.33 of maximal value
111111 (hex 3F) maximal position : 3.2 V_{PP} 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 ; φ1 forced to free run mode

D[5..0] : Blue Drive Register (gain adjustement 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 V_{PP} 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 islocked to HDFL pulse after 7 francs
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 : exactely 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 extention

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

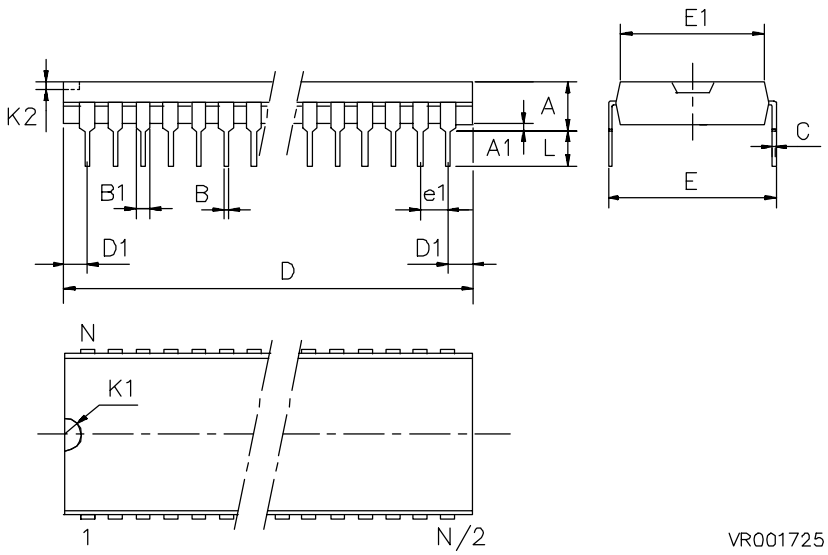
R_CUTOFF_COUNTER : Returns the 8 MSB of the 9 bitred cut-off counter

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