

4-HEAD PLAYBACK AND RECORD AMPLIFIER FOR VCR

PRELIMINARY DATA

- ONE 5V POWER SUPPLY
- PLAYBACK/RECORD MODE SELECTION THROUGH A LOGIC INPUT
- PINNING COMPATIBLE WITH STV5727 AND STV5728
- SO20 PACKAGE

PLAYBACK MODE

- LOW NOISE AND WIDE BAND AMPLIFIERS FOR 4 HEADS
- AUTOMATIC OFFSET CANCELLATION BETWEEN THE 2 SELECTED HEADS
- ONE PLAYBACK OUTPUT WITH AGC
- ONE PLAYBACK OUTPUT (CONSTANT GAIN)
- ONE OUTPUT FOR AUTOMATIC VIDEO TRACKING
- SP/LP ENVELOPE COMPARATOR OUTPUT

RECORD MODE

- TRANSCONDUCTANCE AMPLIFIER

DESCRIPTION

STV5725 is intended for 4 heads VCR applications. It includes all the electrical functions necessary to achieve play-back and record processing for VHS applications.

Record or Playback Mode can be selected through the SWR Pin. SWH allows to select the video head input (H1SP or H2SP, H1LP or H2LP), while SWM will select the mode SP or LP.

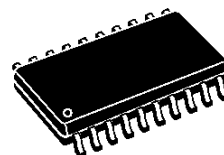
Playback Mode

Signals applied on H1SP, H2SP, H1LP and H2LP input pins will be amplified by 60dB voltage gain. I_{OUTSP} and I_{OUTLP} Pins are AC short-circuited to ground. The input signal can be selected through SWH and SWM inputs and the corresponding output signal will be available on Pin CPB. The offset voltage between the two selected heads is automatically cancelled after 32 switching head cycles. A constant output signal will be available on Pin YPB thanks to an AGC function (Automatic Gain Control). The time constant of the AGC is determined by the capacitor value connected to CAGC Pin. For Automatic Tracking, a signal which is a

function of the selected input signal amplitude is present on Pin TRIV.

Record Mode

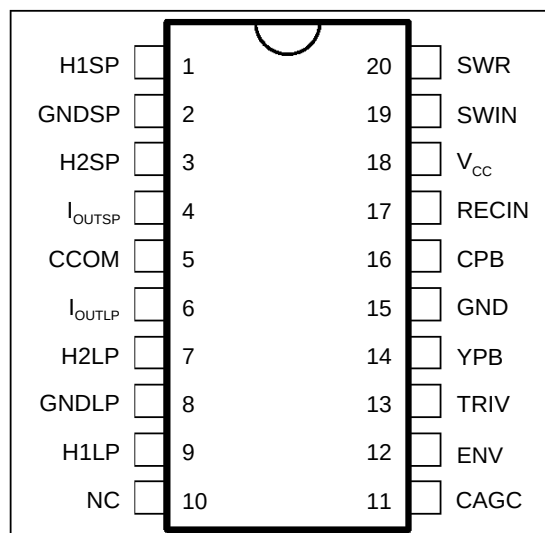
The current input applied on RECIN Pin is amplified through a transconductance amplifier. Special care has been taken to speed up commutation from Playback to Record and from Record to Playback, avoiding spikes through the loads (the rotary transformers). The recording current level in LP mode is 0.9 time the value of SP one.



SO20
(Plastic Micropackage)

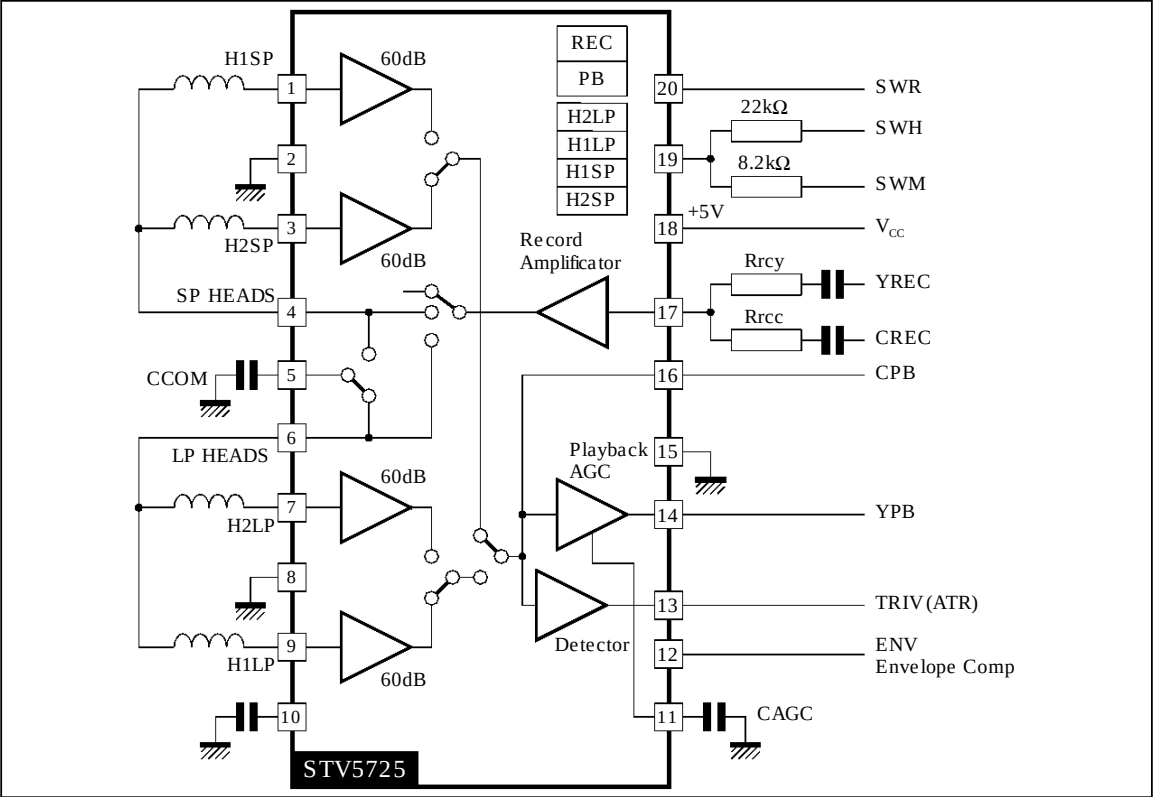
ORDER CODE : STV5725

PIN CONNECTIONS



5725-01.EPS

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Power Supply Voltage	6	V
T _j	Junction Temperature	150	°C
T _{oper}	Operating Temperature	0, +70	°C

THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th (j-a)}	Junction-ambient Thermal Resistance (IC soldered on the PC board)	90	°C/W

RECOMMENDED OPERATING CHARACTERISTICS

Symbol	Parameter	Min.	Typ.	Max.	Unit
V _{CC}	Power Supply	4.75	5	5.25	V
CAGC	Capacitance on Pin CAGC	4.7	22		nF
CCOM	Decoupling Capacitor	4.7	470		nF

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}C$, unless otherwise specified)**Playback Mode**

$V_{CC} = 5V$, no load on YPB and CPB Pins, after 32 SWH (SWitching Head) cycles.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
PLAYBACK AMPLIFIER						
I_{CC1}	Supply Current		34	46	54	mA
GPB	Playback Gain	Sinewave 600kHz, 0.4mV _{PP} on inputs	58	60	62	dB
EN	Equivalent Voltage Noise	Input grounded via I _{OUT} Pin @ 600kHz, BW = 10kHz	0.5	0.6	0.7	$\frac{nV}{\sqrt{Hz}}$
IN	Equivalent Input Current	Input open @ 6MHz, BW = 10kHz	1.4	2	2.6	$\frac{pA}{\sqrt{Hz}}$
CRT1	Crosstalk	Sinewave @ 4MHz, 0.4mV _{PP}		-35	-30	dB
CRT2	Crosstalk	Sinewave @ 600kHz, 0.4mV _{PP}		-50		dB
CRT3	Crosstalk Between SP1 and LP2 Channels (or SP2 to LP1 Channels)	Sinewave @ 6MHz, 0.4mV _{PP}		-60	-50	dB
RPBSW	Playback Switch on Resistor	@ 6MHz	0.8	2.5	18	Ω
BWLCF	Attenuation @ 100kHz	Reference level @ 600kHz	-1	0	1	dB
BWHCF	Attenuation @ 8MHz	Reference level @ 4MHz	-3	-1	1	dB
C_{IN}	Input Capacitance	@ 6MHz	22	27	32	pF
R_{IN}	Input Resistance	@ 6MHz	500	730	930	Ω
ZCPB	Output Resistance	DC	5	14	50	Ω
VDCPB1	DC Level on Pin CPB		1.35	1.75	2.15	V
DVDC	Head Switch Offset		-200	0	200	mV
SHPB1	2nd Harmonic	Sinewave @ 4MHz, 0.4mV _{PP}		-43	-37	dB

PLAYBACK AGC FUNCTION

ZYPB	Output Impedance @ YPB		5	14	50	Ω
VDCPB2	DC Level @ YPB		1.15	1.45	1.85	V
BWLCF2	Attenuation @ 100kHz	Reference @ 4MHz, PB AGC locked	-1	0	1	dB
BWHCF2	Attenuation @ 8MHz	Reference @ 4MHz, PB AGC locked	-3	-1	1	dB
VLPB	Output Amplitude	Sinuswave @ 4MHz, 0.4mV _{PP} on input	160	200	250	mV _{PP}
SHPB2	Second Harmonic	Sinuswave @ 4MHz, 0.4mV _{PP} on input		-44	-40	dB
IPB+	CAGC Sink Current		50	100	150	μA
IPB-	CAGC Source Current		-150	-100	-50	μA
DVLP	AGC Sensitivity	Sinuswave @ 4MHz, 0.2mV _{PP} on input, -5dB and +6dB	-1	0	1	dB

TRIV FUNCTION

VTRIV0	Output Level (1)	SP mode, $V_{cpb} = 0mV_{PP}$ @ 4MHz	0.05	0.28	0.7	V
VTRIV4	Output Level (4)	LP mode, $V_{cpb} = 600mV_{PP}$ @ 4MHz	3.8	4.1	4.5	V
VTRIV5	Output Level (5)	SP mode, $V_{cpb} = 100mV_{PP}$ @ 4MHz		1.33		V
VTRIV6	Output Level (6)	SP mode, $V_{cpb} = 200mV_{PP}$ @ 4MHz		2.27		V
VTRIV7	Output Level (7)	LP mode, $V_{cpb} = 100mV_{PP}$ @ 4MHz	1.4	1.8	2.2	V
VTRIV8	Output Level (8)	LP mode, $V_{cpb} = 200mV_{PP}$ @ 4MHz		3.11		V
VTRIV9	Output Level (9)	SP mode, $V_{cpb} = 300mV_{PP}$ @ 4MHz		2.95		V
VTRIV10	Output Level (10)	SP mode, $V_{cpb} = 600mV_{PP}$ @ 4MHz	3.45	3.85	4.25	V
FTRIV1	Response Lower Frequency, Attenuation @ 1MHz	Reference : SP mode, $V_{cpb} = 100mV_{PP}$ @ 4MHz		-6		dB
FTRIV2	Response Higher Frequency, Attenuation @ 8MHz	Reference : SP mode, $V_{cpb} = 100mV_{PP}$ @ 4MHz		-1		dB

5725-04.TBL

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified) (continued)**Playback Mode** (continued)

$V_{CC} = 5\text{V}$, no load on YPB and CPB Pins.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
SP/LP ENVELOPE DETECTOR						
R_{OH}	Output Resistance @ ENVC	Sinewave $600\mu\text{V}_{PP}$ @ 4 MHz on H2SP	0.65	1.6	2.8	$k\Omega$
R_{OL}	Output Resistance @ ENVC	Sinewave $600\mu\text{V}_{PP}$ @ 4 MHz on H1LP	0.65	1.6	2.8	$k\Omega$
VENVCH	Output Level		4		5	V
VENVCL	Output Level		0		1	V
SENS1	Sensibility	$100\mu\text{V}_{PP}$ to $600\mu\text{V}_{PP}$ @ LP input pins			1	V
SENS2	Sensibility	$100\mu\text{V}_{PP}$ to $600\mu\text{V}_{PP}$ @ SP input pins	4			V

Record Mode

$V_{CC} = 5\text{V}$, $SWR = 5\text{V}$, $RRCY = 2.2k\Omega$, $RRCC = 8.2k\Omega$, $CCOM = 470\text{nF}$, $SWM = 0\text{V}$.

Load $10\mu\text{H}/1k\Omega$ for each simulated head.

Damping network of $1\text{nF}/620\Omega$ connected between I_{OUTSP} record output and Ground.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
RECORD AMPLIFIER						
I_{CC2}	Current Supply		59	75	95	mA
IHA0	DC Current through I_{OUT}		27	42	55	mA
IHA2	2nd Harmonic	$VRCY = 300\text{mV}_{PP}$ @ 4MHz		-49	-40	dB
IMAX	Maximum Current	@ 4MHz, 2nd harmonic < 35dB	35			mA_{PP}
BWRECL	Attenuation at 100kHz	Reference level @ 600kHz	-1	0	1	dB
BWRECH	Attenuation at 8MHz	Reference level @ 4MHz	-2	0	1	dB
TRSP	Transconductance SP	$V_{IN} = 300\text{mV}_{PP}$ @ 4MHz	63	68	73	mA/V
TRLP	Transconductance LP	$V_{IN} = 300\text{mV}_{PP}$ @ 4MHz, $SWM = 5\text{V}$	58	62.5	67	mA/V
RSAT	Output Stage Resistance	@ 4MHz	5	11	20	Ω
TRR	Transconductance Ratio	$TRSP / TRLP$	0.8	1	1.2	dB
RIOUT	Impedance on I_{OUTSP} (I_{OUTLP})	$\Delta V = 1\text{V}$	40	100	300	$k\Omega$

SWITCHING LEVELS

VSWIN1	SWIN Input Threshold	Selects head H2SP	0		0.4	V
VSWIN2	SWIN Input Threshold	Selects head H1SP	1		2.2	V
VSWIN3	SWIN Input Threshold	Selects head H1LP	2.8		4	V
VSWIN4	SWIN Input Threshold	Selects head H2LP	4.6		5	V
ISWIN1	$VSWIN = 0\text{V}$	Input current	-1	-0.5	-0.1	μA
ISWIN2	$VSWIN = 1.5\text{V}$	Input current	0.1	0.4	2	μA
ISWIN3	$VSWIN = 3.5\text{V}$	Input current	0.1	0.4	2	μA
ISWIN4	$VSWIN = 5\text{V}$	Input current	0.1	0.5	2	μA
VSWRH	SWR Input Threshold	Selects record mode	3.5		5	V
VSWRL	SWR Input Threshold	Selects playback mode	0		1.5	V
ISWRH	$VSWR = 5\text{V}$	Input current	0	0.1	5	μA
ISWRL	$VSWR = 0\text{V}$	Input current	-10	-5	-0.5	μA
T_{ON}	Switching Delay	Signal appears on CPB			500	ns
T1	Delay from Playback to Record : Signal Disappears on Pin CPB			1		μs
T2	Delay from Record to Playback : Signal Appears on Pin CPB			800		μs
T3	Delay from Playback to Record : Signal Appears on Pin I_{OUTSP} or I_{OUTLP}			20		μs
T4	Delay from Record to Playback : Signal Disappears on Pin I_{OUTSP} or I_{OUTLP}			1		μs

5725-05.TBL

INPUTS/OUTPUTS EQUIVALENT INTERNAL DIAGRAMS

Figure 1

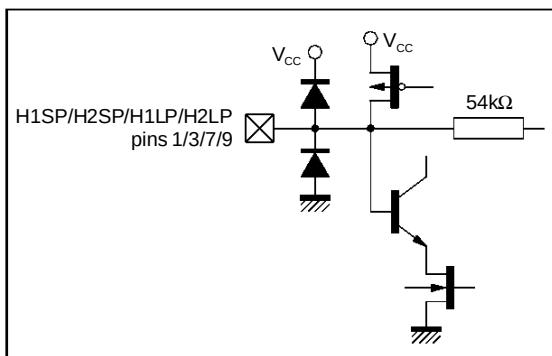


Figure 2

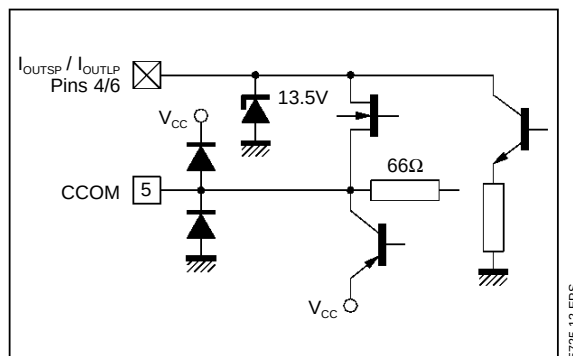


Figure 3

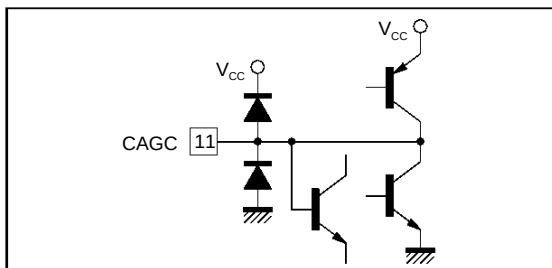


Figure 4

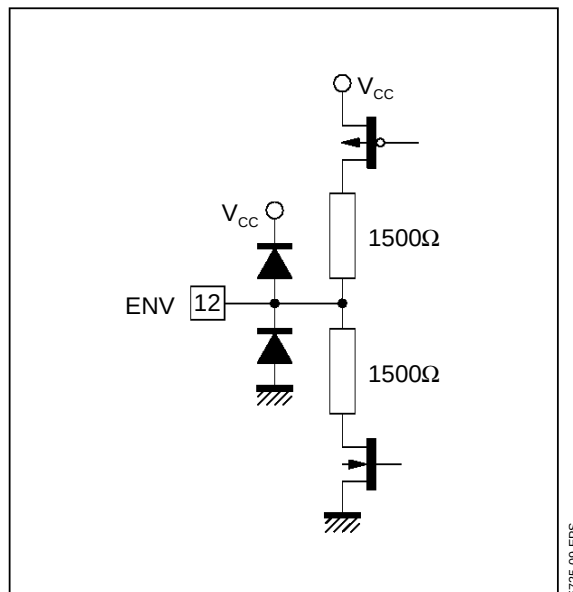


Figure 5

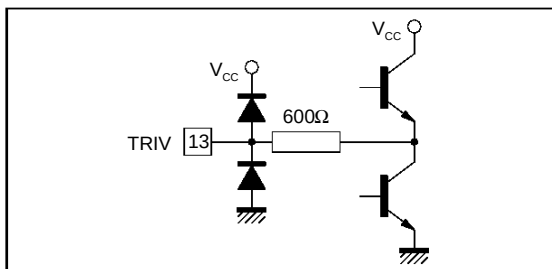


Figure 6

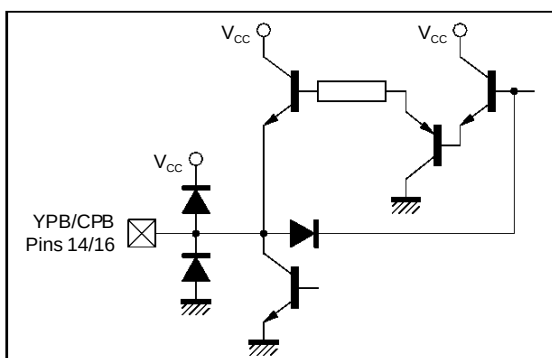
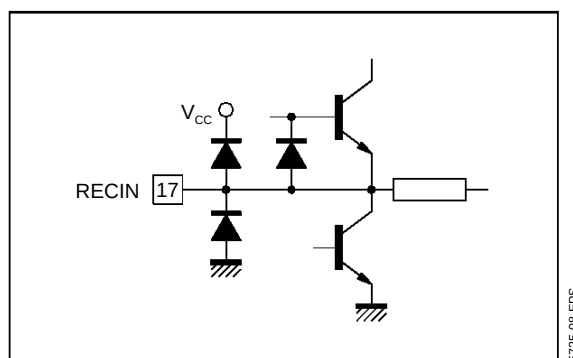
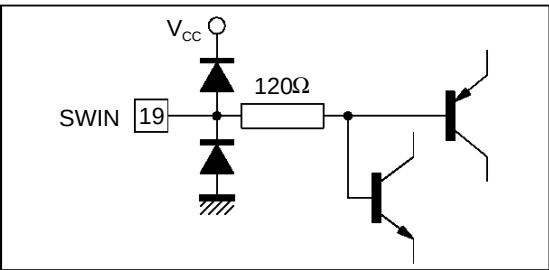


Figure 7



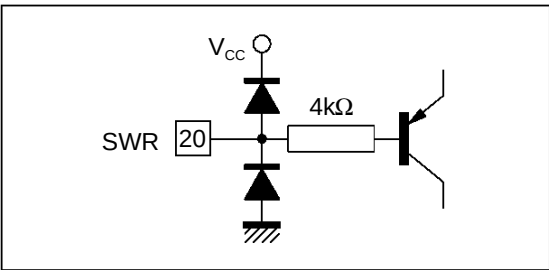
INPUTS/OUTPUTS EQUIVALENT INTERNAL DIAGRAMS (continued)

Figure 8



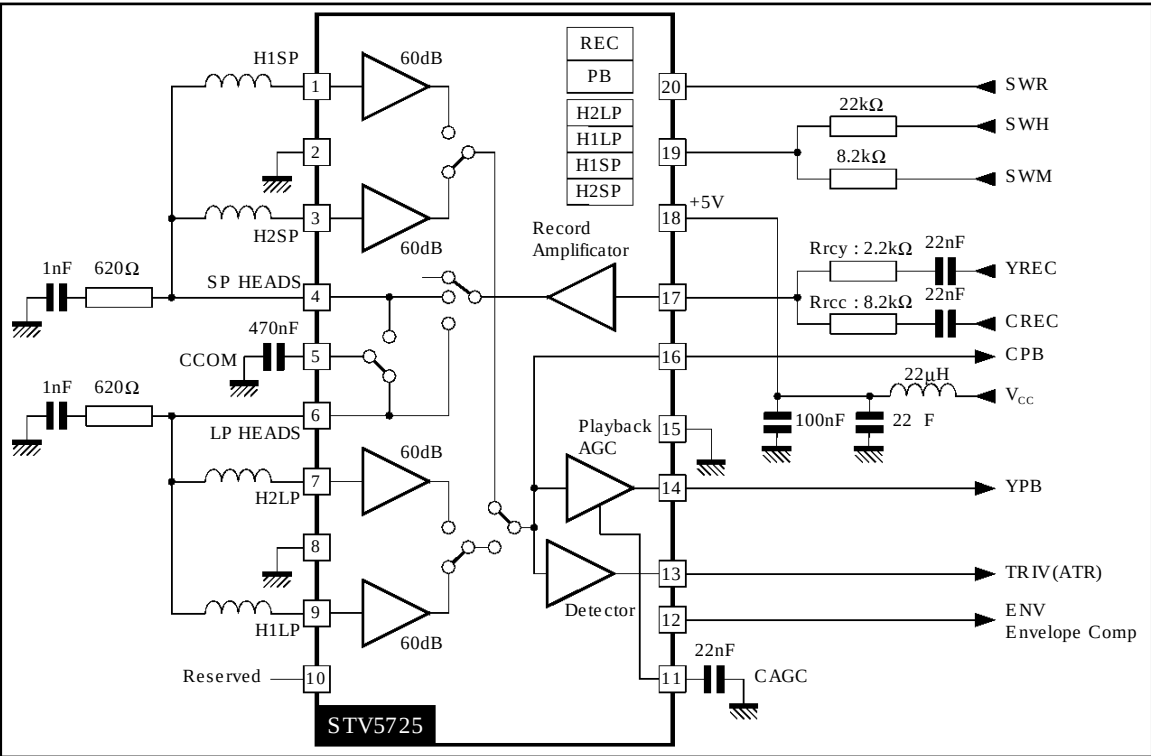
5725-04.EPS

Figure 9



5725-11.EPS

TYPICAL APPLICATION



5725-03.EPS

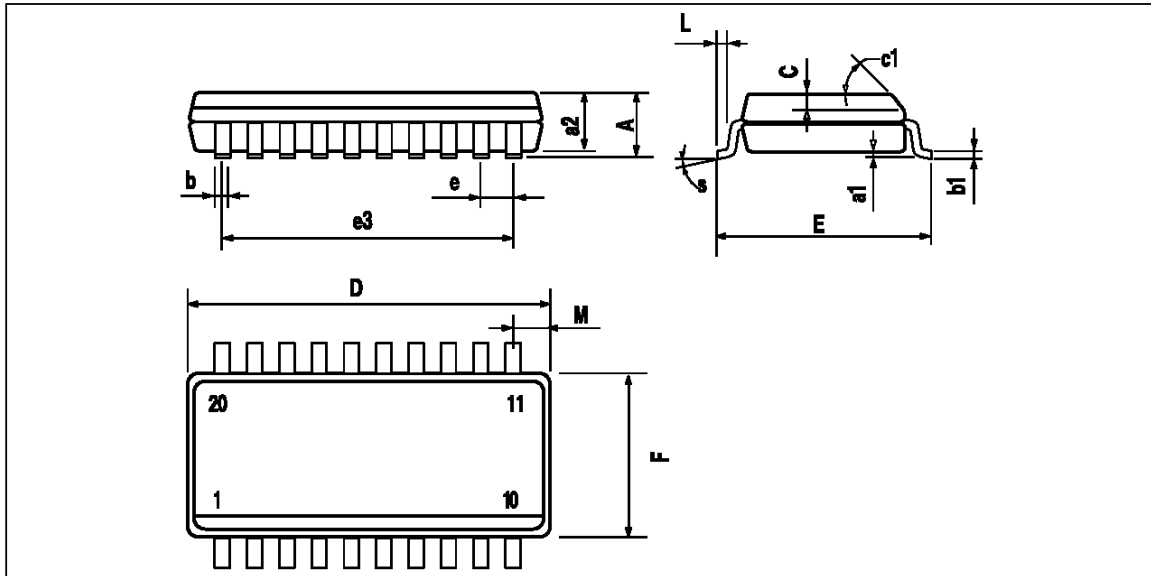
SWITCH TABLE

SWR	SWM	SWH	Channel	ENVC
L (PB)	L	L	H2SP	HIGH if LP < SP
		H	H1SP	
	H	L	H1LP	LOW if LP > SP
		H	H2LP	
H (REC)	L	L	SP	
		H		
	H	L	LP	
		H		

5725-06.TBL

PACKAGE MECHANICAL DATA

20 PINS - PLASTIC MICROPACKAGE (SO)



PM-SO20.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			2.65			0.104
a1	0.1		0.3	0.004		0.012
a2			2.45			0.096
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.013
C		0.5			0.020	
c1			45° (typ.)			
D	12.6		13.0	0.496		0.512
E	10		10.65	0.394		0.419
e		1.27			0.050	
e3		11.43			0.450	
F	7.4		7.6	0.291		0.299
L	0.5		1.27	0.020		0.050
M			0.75			0.030
S			8° (Max.)			

SO20.TBL

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No licence is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1996 SGS-THOMSON Microelectronics - All Rights Reserved

Purchase of I²C Components of SGS-THOMSON Microelectronics, conveys a license under the Philips I²C Patent. Rights to use these components in a I²C system, is granted provided that the system conforms to the I²C Standard Specifications as defined by Philips.

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco
The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.