SGS-THOMSON MICROELECTRONICS

STV5744A

4-HEAD PLAYBACK AND RECORD AMPLIFIER FOR VCR

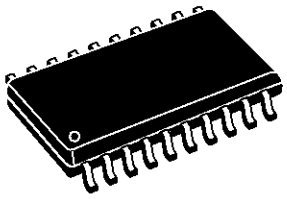
- ONE 5V POWER SUPPLY
- PLAYBACK/RECORD MODE SELECTION THROUGH A LOGIC INPUT
- SO20 PACKAGE
- NO ADJUSTMENT FOR LUMINANCE RECORDING

PLAYBACK MODE

- LOW NOISE AND WIDE BAND AMPLIFIERS FOR 4 HEADS
- AUTOMATIC OFFSET CANCELLATION BETWEEN THE 2 SELECTED HEADS
- ONE PLAYBACK OUTPUT
- ONE OUTPUT FOR AUTOMATIC VIDEO TRACKING
- SP/LP ENVELOPE COMPARATOR
- SHORT-CIRCUIT SWITCHES ON UNUSED HEADS

RECORD MODE

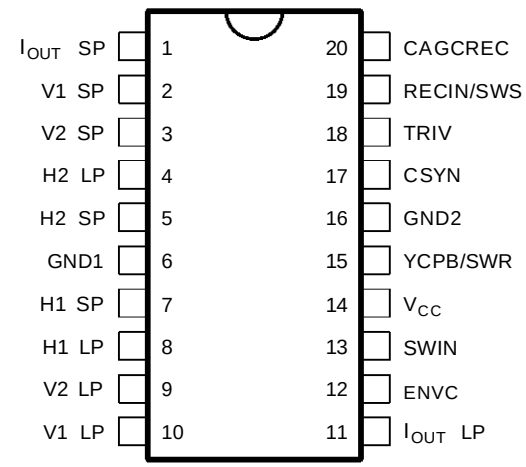
- RECORD AGC AMPLIFIER SAMPLED BY SYNCHRO SIGNAL
- RECORDING SIGNAL LEVEL ADJUSTABLE BY EXTERNAL RESISTOR
- SHORT-CIRCUIT SWITCHES ON UNUSED HEADS



SO20
(Plastic Micropackage)

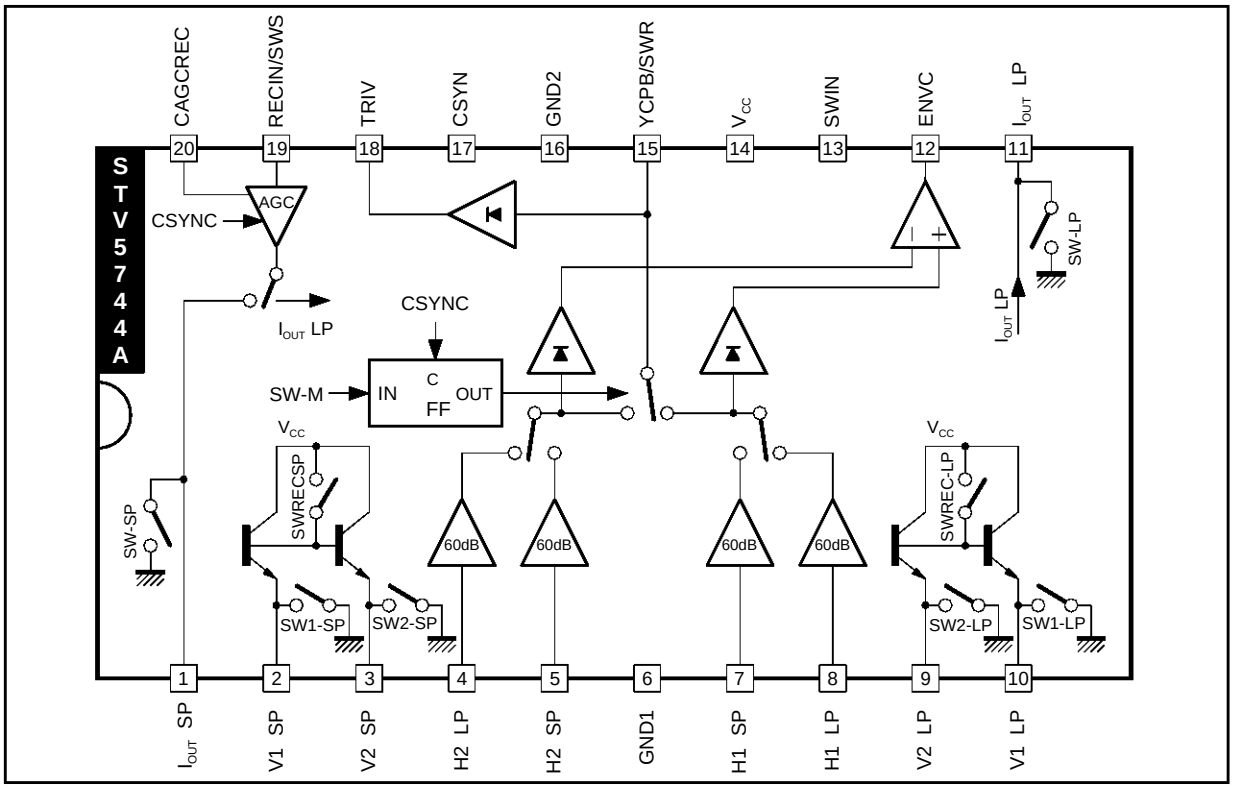
ORDER CODE : STV5744A

PIN CONNECTIONS



5744A-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

5744A-01.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th\ (j-a)}$	Junction-ambient Thermal Resistance	Max.	75	°C/W

5744A-02.TBL

RECOMMENDED OPERATING CHARACTERISTICS

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{CC}	Power Supply	4.75	5	5.25	V
CAGC	Capacitance on Pin CAGCREC	4.7			nF
RECADJ	Record Biasing Resistor	10		33	kΩ

5744A-03.TBL

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C, unless otherwise specified)
Playback Mode (V_{CC} = 5V, no load on Pin YCPB, Recadj = 12kΩ)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
PLAYBACK AMPLIFIER						
I_{CC1}	Supply Current		42	52	62	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		0.6	0.7	$\frac{nV}{\sqrt{Hz}}$
IN	Equivalent Input Current Noise	Input open @ 6MHz, BW = 10kHz		1.7		$\frac{pA}{\sqrt{Hz}}$
CRT1	Crosstalk (LP → SP)	Sinewave @ 4MHz, 0.4mV$_{PP}$		-45	-40	dB
CRT2	Crosstalk (SP → LP)	Sinewave @ 4MHz, 0.4mV$_{PP}$		-41	-35	dB
RPBSW	Playback Switch on Resistor	@ 6MHz	5	10	15	Ω
BWLCF	Attenuation @ 100KHz	Reference level @ 600kHz	-3	-2	1	dB
BWHCF	Attenuation @ 8MHz	Reference level @ 4MHz	-3	-1	0	dB
C_{IN}	Input Capacitance	@ 6MHz, 22nF between Vi/Hi	40	50	60	pF
Z_{IN}	Input Impedance	@ 6MHz	300	450	600	Ω
ZCPB	Output Resistance	DC	5	24	50	Ω
VDCPB1	DC Level on Pin YCPB		1.6	2	2.4	V
DVDC	Head Switch Offset		-0.2	0	0.2	V
SHPB1	2nd Harmonic	Sinewave @ 4MHz, 0.4mV$_{PP}$		-45	-40	dB
RCST	Off-resistance on unused channel	SW-S high	10	15	20	Ω
TRIV FUNCTION						
TRIV0	Output Level (1)	No input signal	0	0.3	1	V
TRIV1	Output Level (2)	Sinewave @ 4MHz, 100mV$_{PP}$ @ YCPB		1.3		V
TRIV4	Output Level (3)	Sinewave @ 4MHz, 400mV$_{PP}$ @ YCPB	2.5	3.1	3.5	V
TRIV6	Output Level (4)	Sinewave @ 4MHz, 600mV$_{PP}$ @ YCPB	3.15	3.65	4.15	V
TRIV1 - TRIV0			0.5	1		V
SP/LP ENVELOPE DETECTOR						
VENVCH	Output Level		4	4.5	5	V
VENVCL	Output Level		0	0.3	1	V
SENS1	Sensitivity	50μV$_{PP}$ to 600μV$_{PP}$ @ SP input pins		0.3	1	V
SENS2	Sensitivity	50μV$_{PP}$ to 600μV$_{PP}$ @ LP input pins	4	4.5		V

57444A-04.TBL

ELECTRICAL CHARACTERISTICS (T_{amb} = 25°C, unless otherwise specified (continued)
Record Mode (V_{CC} = 5V, Recadj = 12kΩ, SWR = 5V, CAGCREC = 470pF, RRCY = 2.2kΩ, RRCC = 8.2kΩ, Load 10µH//1kΩ for each simulated head)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
RECORD AMPLIFIER						
I_{CC2}	Current Supply		68	91	115	mA
IHA0	DC Current through I_{OUT}		24	33	41	mA
IHA1	Fundamental	VRCY = 300mV$_{PP}$ @ 4MHz	30	32	34	mA$_{PP}$
IHA2	2nd Harmonic	VRCY = 300mV$_{PP}$ @ 4MHz		-40	-36	dB
IHA2M	2nd Harmonic	VRCY = 400mV$_{PP}$ @ 4MHz, AGC adjusted for IAH1 = 40mA$_{PP}$			-34	dB
BWRECL	Attenuation at 100kHz	Reference level @ 600kHz, AGC locked	-3	0	1	dB
BWRECH	Attenuation at 8MHz	Reference level @ 4MHz, AGC locked	-2	-0.5	1	dB
DVLREC	Record AGC Sensitivity	V_{IN} = 300mV$_{PP}$ ±3dB @ f = 4MHz	-0.2	0	+0.2	dB
RIOUT	Output Resistance	ΔV = 5V	3.5	5.5		kΩ
RSAT	Output Stage Resistance	ΔI = 10mA	5	10	50	Ω
IRN	AGC Capacitor downloading Current	4.5V at CAGC Pin		160		µA
IRP	AGC Capacitor uploading Current	0.5V at CAGC Pin, V_{IN} = 300mV$_{PP}$ @ 4MHz		-165		µA
SWITCHING LEVELS						
VSWINL	SWIN Input Voltage	Selects head H2SP	0		0.8	V
VSWIN1	SWIN Input Voltage	Selects head H1SP	1.3		2.3	V
VSWIN2	SWIN Input Voltage	Selects head H1LP	2.8		3.8	V
VSWINH	SWIN Input Voltage	Selects head H2LP	4.3		5	V
ISWINH	SWIN Input Leakage Current	5V at SWIN input		0.5		µA
ISWINL	SWIN Input Leakage Current	0V at SWIN input		-0.2		µA
VSWRCH	SWRC Input Threshold	Selects record mode, 0 to 5V	3.2	3.4	3.8	V
VSWRCL	SWRC Input Threshold	Selects playback mode, 5 to 0V	3.1	3.35	3.8	V
ISWRCH	SWRC Input Leakage Current	5V at SWRC input	2	5	8	mA
ISWRCL	SWRC Input Leakage Current	0V at SWRC input	-20	0	20	µA
t_{ON}	Delay	Signal appears on YCPB		1.6		ms
t1	Delay from playback to record : Signal disappears on Pin YCPB	22nF between Hi/Vi		1		µs
t2	Delay from record to playback : Signal appears on Pin YCPB			1.9		ms
t3	Delay from playback to record : Signal appears on Pin I_{OUT}	VRCY = 300mV$_{PP}$ @ 4MHz		2		ms
t4	Delay from record to playback : Signal disappears on Pin I_{OUT}			10		µs
VCSYH	CSYN Input Threshold	Sampling on (I = -25µA)	2.2	2.5	2.8	V
VCSYL	CSYN Input Threshold	Sampling off (I = 25µA)	2.2	2.5	2.8	V
ICSYH	Leakage Current	Sampling on			-10	µA
ICSYL	Leakage Current	Sampling off	10			µA
VSWST	SWS Input Threshold			3		V
ISWSH	SWS Input Leakage Current	5V at SWS Input	90	130	170	µA
ISWSL	SWS Input Leakage Current	0V at SWS Input	-20	0	20	µA

5744A-05.TBL

INTERNAL SCHEMATICS

Figure 1

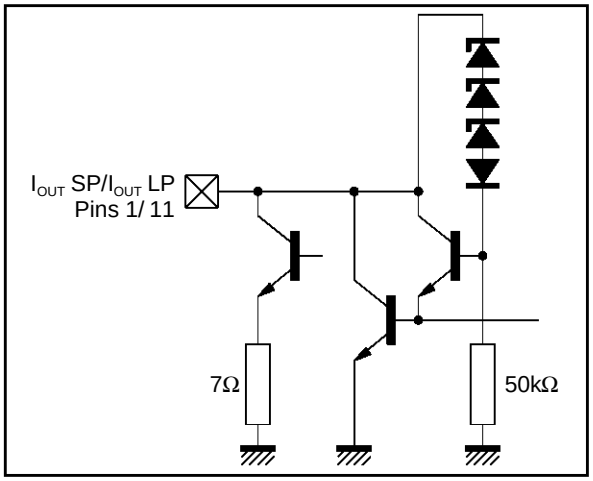


Figure 2

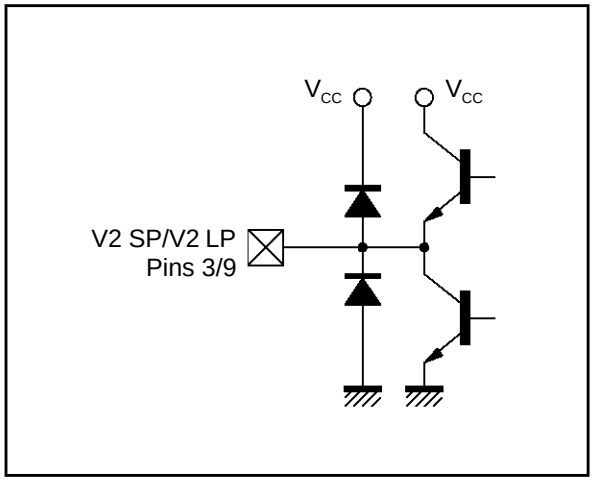


Figure 3

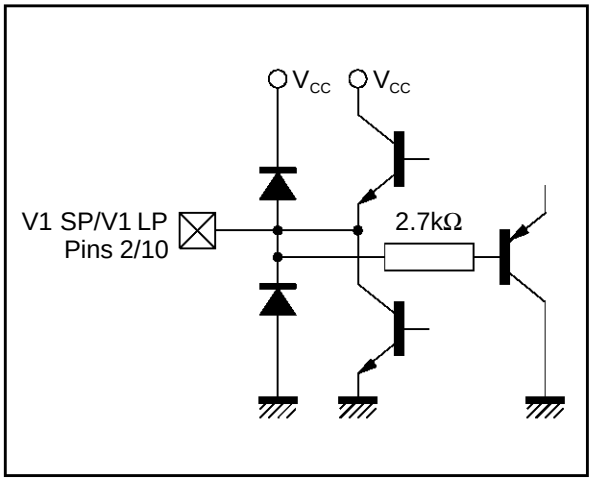


Figure 4

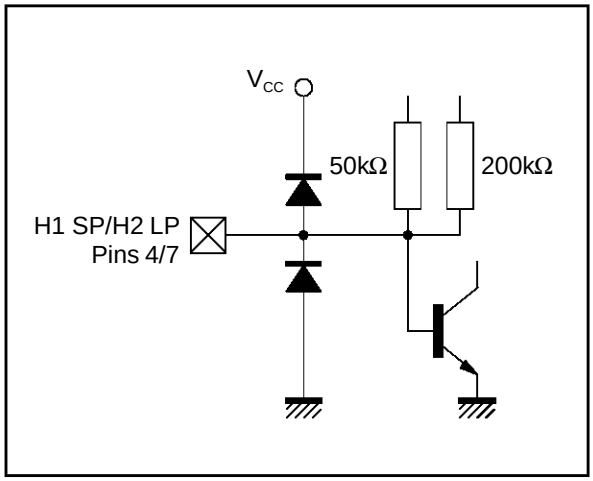


Figure 5

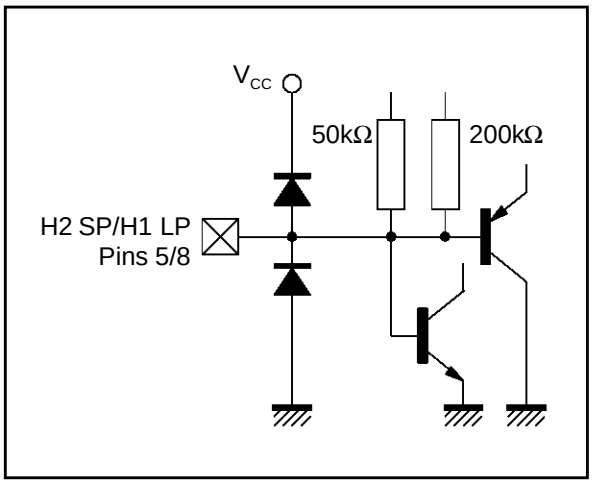
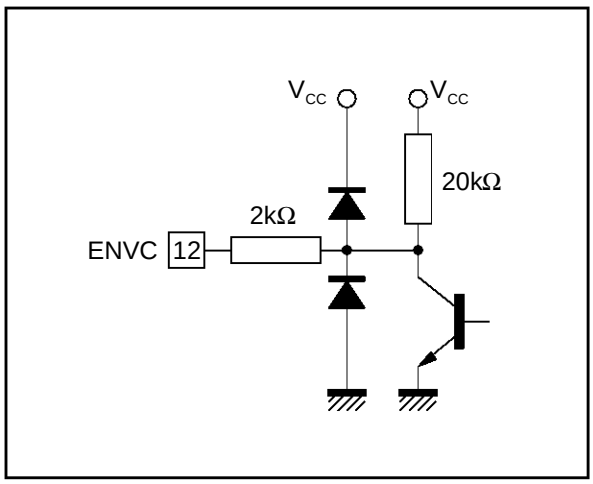


Figure 6



INTERNAL SCHEMATICS (continued)

Figure 7

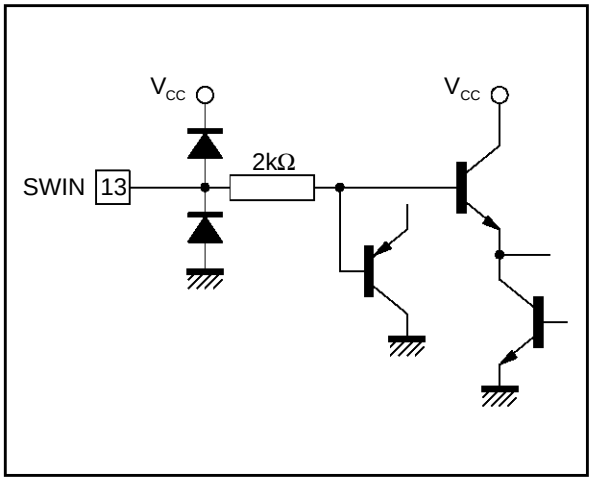


Figure 8

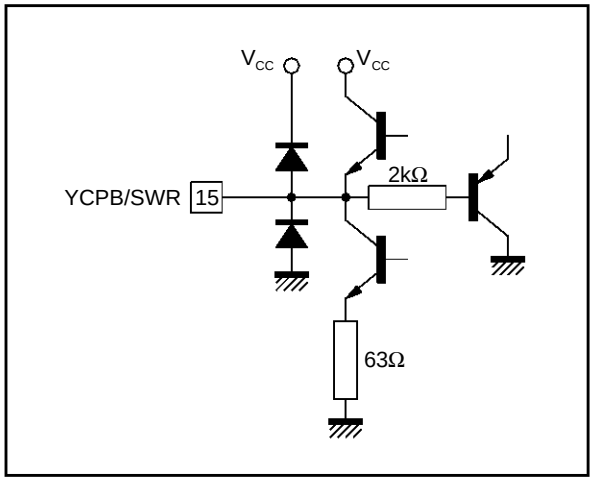


Figure 9

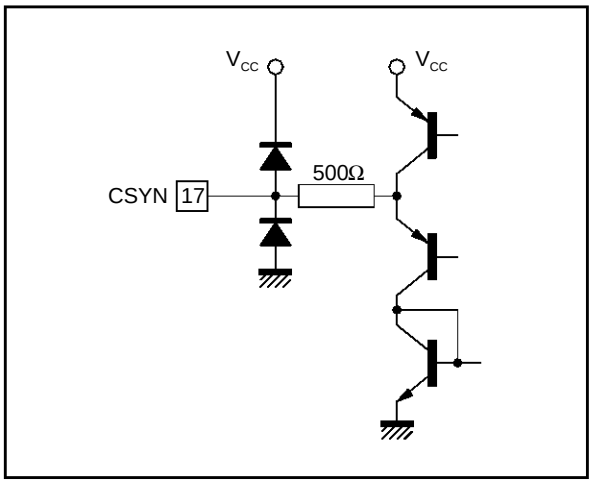


Figure 10

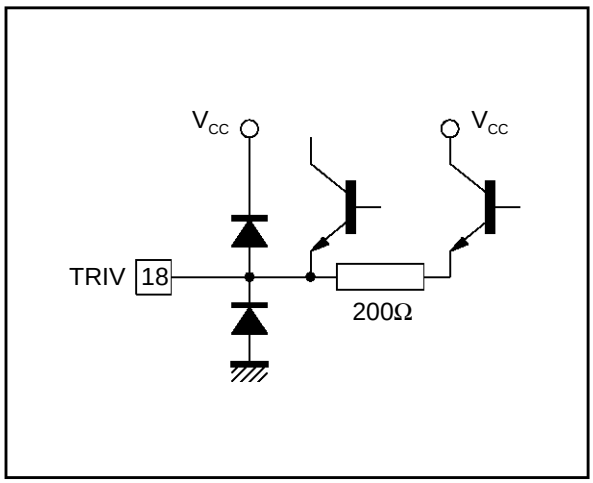


Figure 11

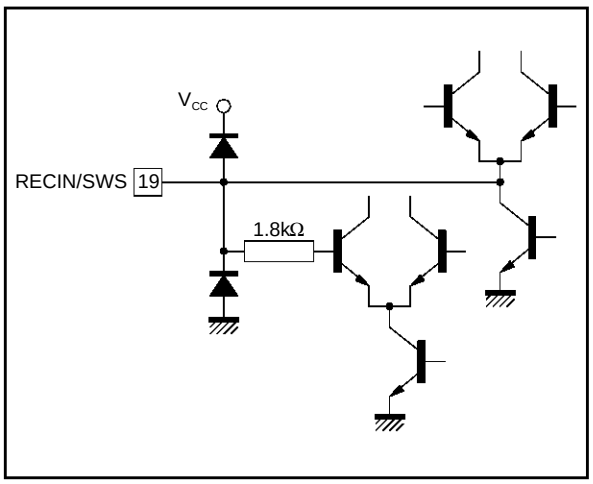
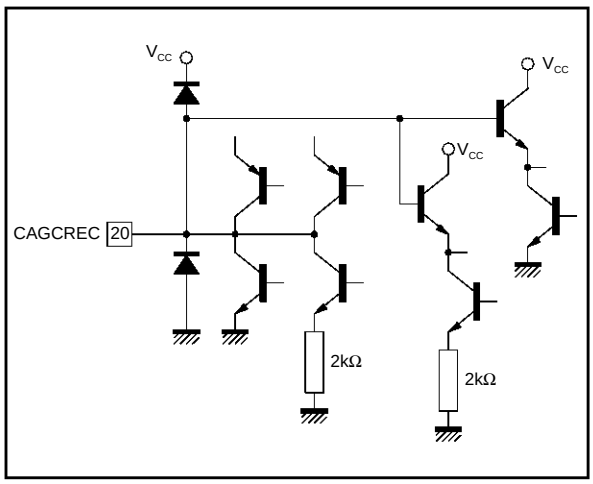
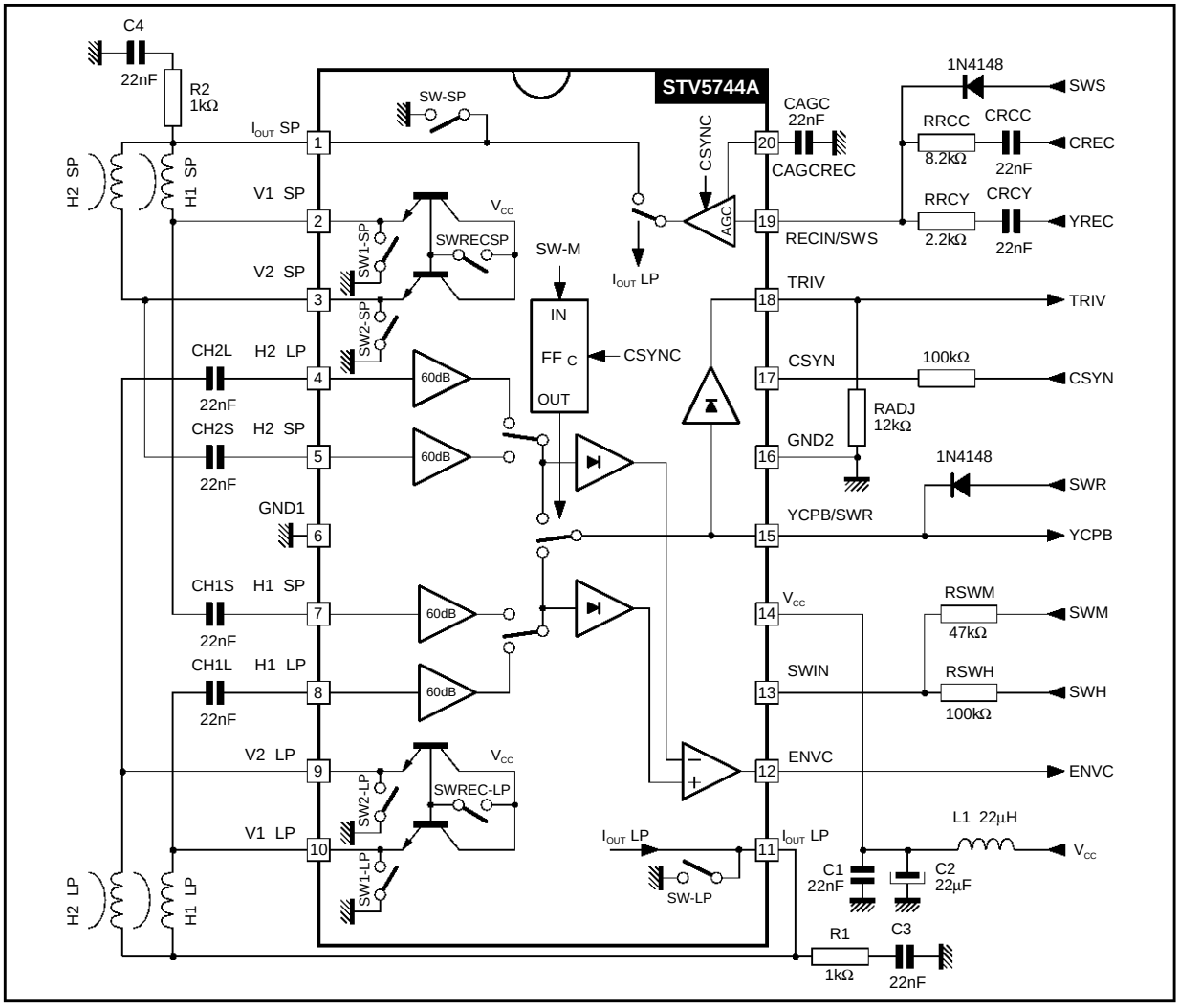


Figure 12



APPLICATION DIAGRAM



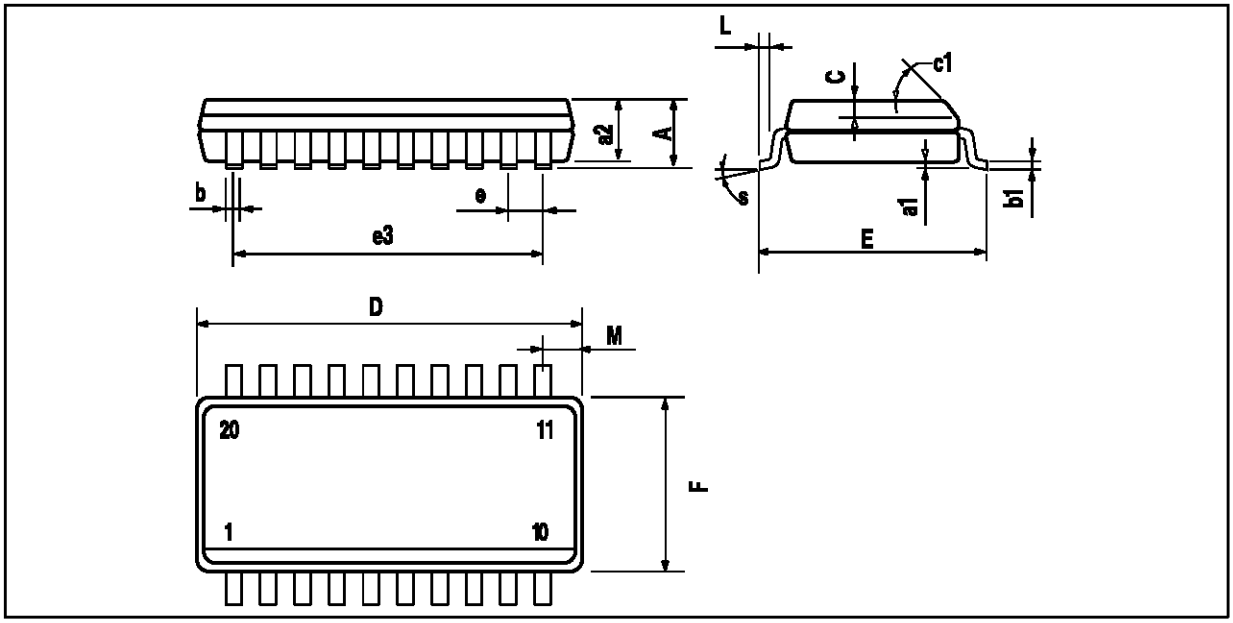
SWITCH TABLE

SW-R	SW-M	SW-S	SW-H	Channel	SW1-SP SW2-SP	SW1-LP SW2-LP	SW-SP	SW-LP	SWREC-SP	SWREC-LP	ENVC (SPLP)
L	L	L	L	2-SP	OFF	OFF	ON	ON	OFF	OFF	High IF LP > SP
			H	1-SP							Low IF LP < SP
	H		L	1-LP							
			H	2-LP							
	L	H	L	2-SP	OFF	ON					
			H	1-SP							
	H		L	1-LP	ON	OFF					
			H	2-LP							
H	L	L	L	SP	OFF	ON	OFF	ON	ON	OFF	High
			H								
	H		L	LP	ON	OFF	ON	OFF	OFF	ON	
			H								

5744A-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		0.2	0.004		0.0078
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^o (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^o (Max.)					

SO20C.TBL