

PRELIMINARY

Notice. This is not a final specification.
Some parametric limits are subject to change.

MITSUBISHI ICs (AV COMMON) M52797SP/FP AV SWITCH with I2C BUS CONTROL

DESCRIPTION

The M52797 is AV switch semiconductor integrated circuit with I2C bus control .

This IC contains 1-channel of 4-input audio switches and 1-channel of 4-input video switches. Each audio switches and video switches can be controled independently .

The video switches contain amplifiers can be controled a gain of output 0dB or 6dB .

FEATURES

- Video and stereo sound switches in one package
- Wide frequency range (video switch).....DC~20MHz
- High separation (video switch)
.....Crosstalk -60dB (typ.) at 1MHz
- Two types of packages are provided : SDIP with a lead pitch of 1.778mm (M52797SP) ; and SOP with a lead pitch of 1.27mm (M52797FP) .

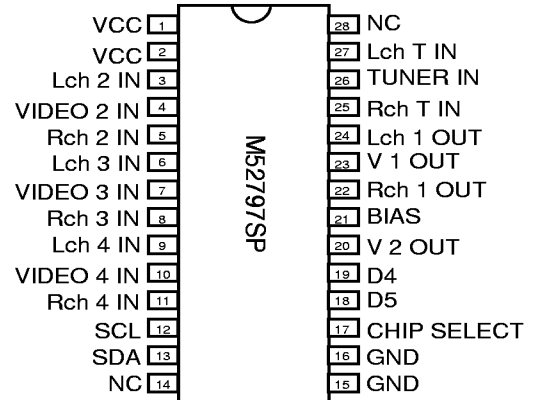
APPLICATION

Video equipment

RECOMMENDED OPERATING CONDITION

Supply voltage	4.7V~9.3V
Rated supply voltage	5V,9V
Maximum output current	24mA(at 9V)

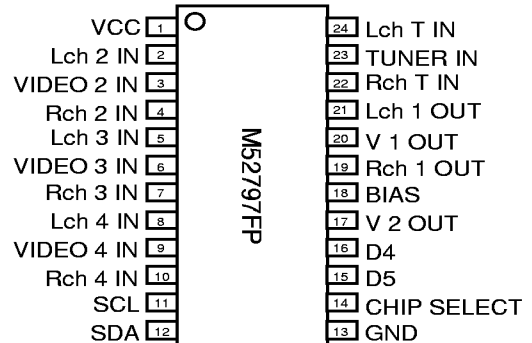
PIN CONFIGURATION (TOP VIEW)



Outline 28P4B
(Lead pitch :1.778mm)

NC: No connection

PIN CONFIGURATION (TOP VIEW)



Outline 24P2N-B
(Lead pitch :1.27mm)

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1 - 9

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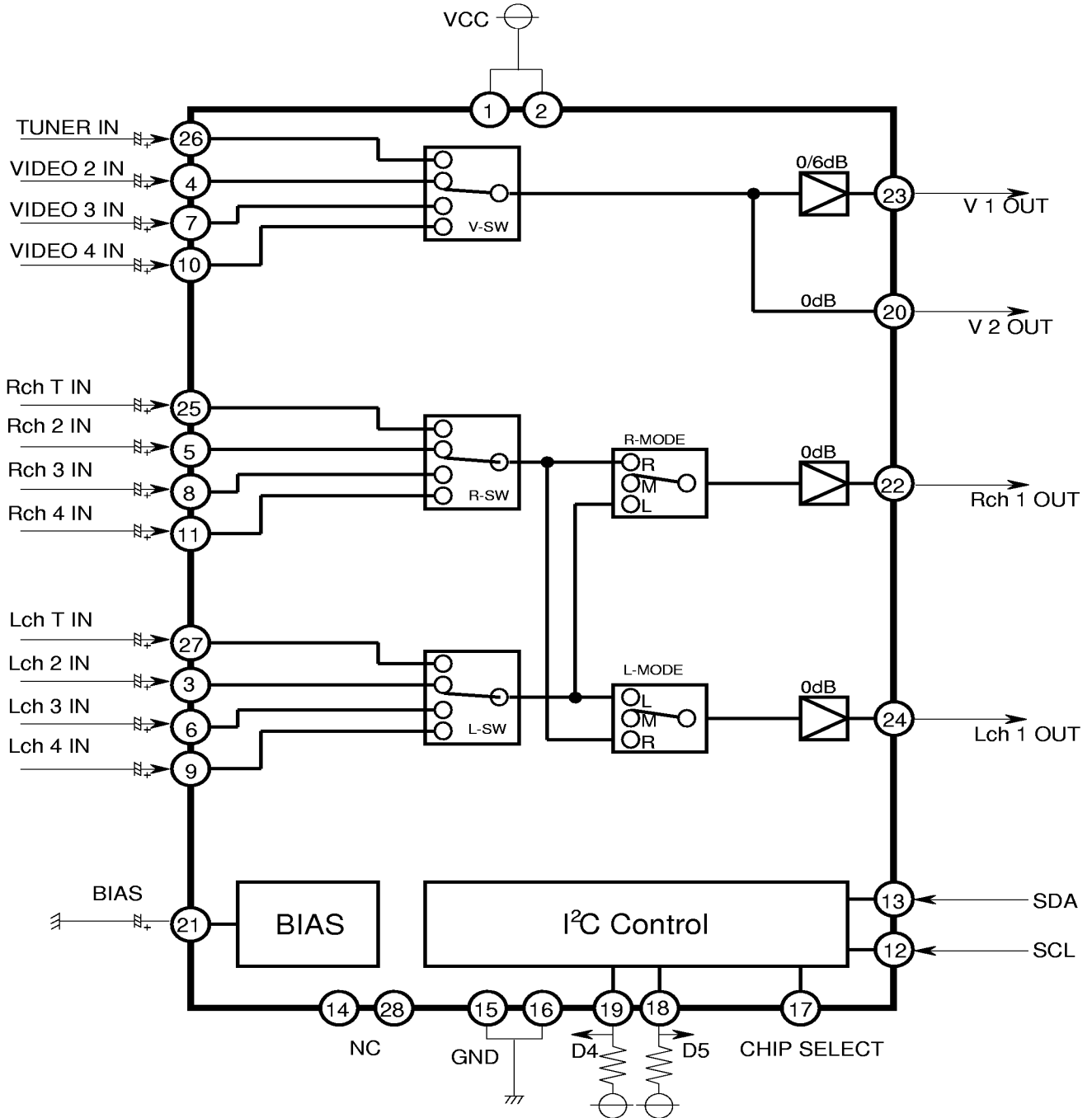
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AV SWITCH with I2C BUS CONTROL

BLOCK DIAGRAM



(at 28P4B)

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2 - 9
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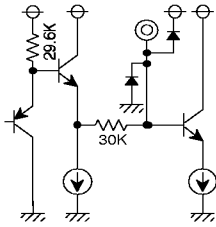
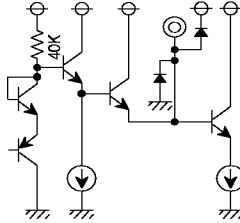
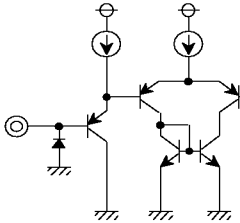
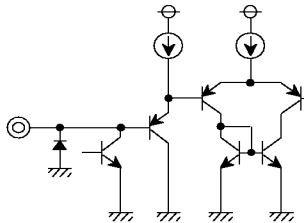
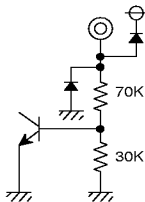
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AV SWITCH with I2C BUS CONTROL

DESCRIPTION OF PIN

Pin No.	Name	Peripheral circuit pins	DC voltage(V)	Remarks
1 2	Vcc		9V	5~9V
3 5 6 8 9 11 25 27	Lch 2 IN Rch 2 IN Lch 3 IN Rch 3 IN Lch 4 IN Rch 4 IN Rch T IN Lch T IN		4.7V	
4 7 10 26	VIDEO 2 IN VIDEO 3 IN VIDEO 4 IN TUNER IN		3.6V	Clamp in
12	SCL			VIL max.=1.5V VIH min.=3.0V
13	SDA			VIL max.=1.5V VIH min.=3.0V VOL max.=0.4V (at Iin=3mA)
15 16	GND			
17	CHIP SELECT			SLAVE ADDRESS 0~1.5V-----90H 2.5V~Vcc--92H OPEN-----90H

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3 - 9

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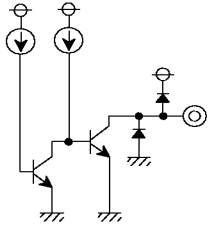
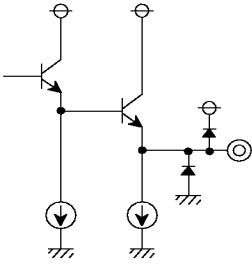
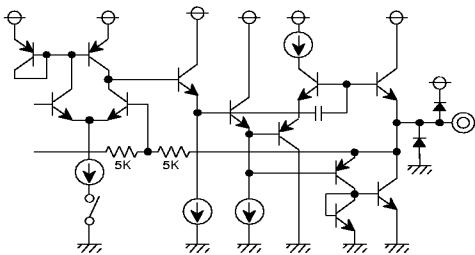
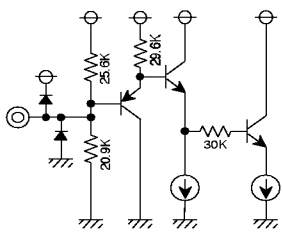
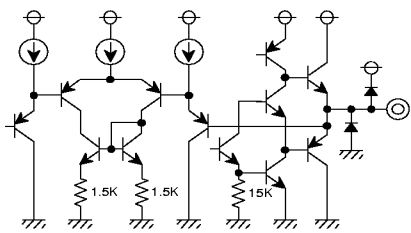
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AV SWITCH with I2C BUS CONTROL

DESCRIPTION OF PIN (cont.)

Pin No.	Name	Peripheral circuit pins	DC voltage(V)	Remarks
18 19	D5 D4			VOL max.=0.4V (at Iin=1mA)
20	V 2 OUT		SYNC CHIP DC=2.2V	
23	V 1 OUT		SYNC CHIP DC=2.9V	
21	BIAS		4.2V	
22 24	Rch 1 OUT Lch 1 OUT		4.0V	

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4 - 9

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PRELIMINARY

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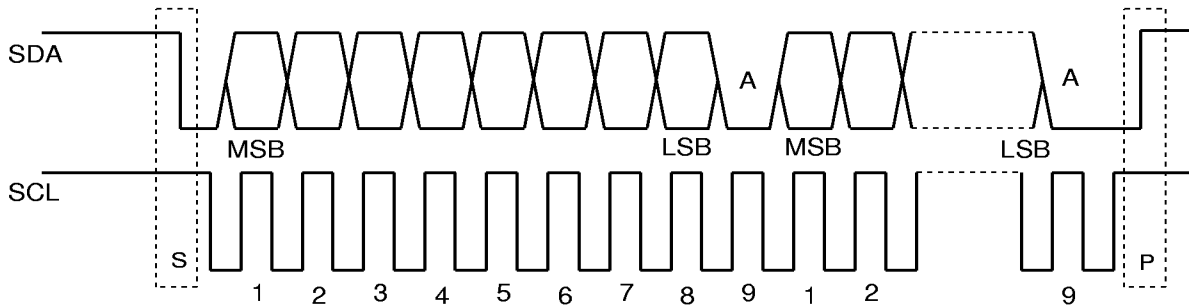
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AV SWITCH with I²C BUS CONTROL

I²C BUS

I²C BUS (Inter IC BUS) is multi master bus system developed by PHILIPS. Two wires (SDA - serial data, SCL - serial clock) realize functions of start , stop , transferring data , synchronization and arbitration. The output stages of device connected to the bus must have an open drain or open collector in order to perform the wired-AND function .

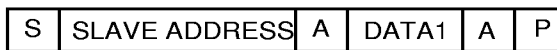


S ; Start condition, a high to low transition of the SDA line while SCL is high
P ; Stop condition, a low to high transition of the SDA line while SCL is high
A ; Acknowledge

Every byte put on the SDA line must be 8-bits long . Each byte has to be followed by an acknowledge bit. Data is transferred with the most significant bit (MSB) first . The data on the SDA line must be stable during the HIGH period of the clock . The HIGH or LOW state of the data line can only change when the clock signal on the SCL line is LOW .

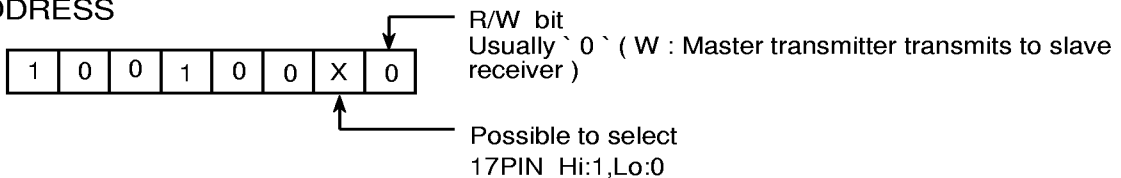
CONTROL

This IC controls channel switches with 1-byte data (DATA1) .



S : Start
A : Acknowledge
P : Stop

SLAVE ADDRESS



(at 28P4B)

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5 - 9

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AV SWITCH with I2C BUS CONTROL

Data byte format

M52797 FUNCTION TABLE

S	SLAVE ADDRESS	A	DATA(D7~D0)	A	P
---	---------------	---	-------------	---	---

SLAVE ADDRESS

SLAVE ADDRESS	A6	A5	A4	A3	A2	A1	A0	R/W
	1	0	0	1	0	0	0 / 1	0

DATA1 CONT

DATA CONT	D7	D6	D5	D4	D3	D2	D1	D0
	AUDIO MODE		I/O	I/O	V AMP		SW CONT	

VIDEO SW CONT

DATA	OUT	
V-SW	V OUT	
D1	D0	
0	0	T IN
0	1	V 2 IN
1	0	V 3 IN
1	1	V 4 IN

AUDIO MODE CONT

DATA	MODE	
D7	D6	
0	0	MUTE
0	1	R/R
1	0	L/L
1	1	NORMAL

AUDIO SW CONT

MODE	MUTE		R/R		L/L		NORMAL	
DATA	OUT		OUT		OUT		OUT	
D1	D0	Lch OUT 1	Rch OUT 1	Lch OUT 1	Rch OUT 1	Lch OUT 1	Rch OUT 1	Lch OUT 1
0	0	MUTE	MUTE	Rch T IN	Rch T IN	Lch T IN	Lch T IN	Rch T IN
0	1	MUTE	MUTE	Rch 2 IN	Rch 2 IN	Lch 2 IN	Lch 2 IN	Rch 2 IN
1	0	MUTE	MUTE	Rch 3 IN	Rch 3 IN	Lch 3 IN	Lch 3 IN	Rch 3 IN
1	1	MUTE	MUTE	Rch 4 IN	Rch 4 IN	Lch 4 IN	Lch 4 IN	Rch 4 IN

AMP GAIN CONT.

DATA	AMP
D3	V AMP1
0	0dB
1	6dB

I/O CONT.

DATA	OUT	DATA	OUT
D4	D4 OUT	D5	D5 OUT
0	HI	0	HI
1	LO	1	LO

PRELIMINARY

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MITSUBISHI ICs (AV COMMON)

M52797SP/FP

AV SWITCH with I2C BUS CONTROL

ELECTRICAL CHARACTERISTICS

(Ta=25°C, Vcc=9V, unless otherwise noted)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Supply voltage	Vcc		4.7	-	9.3	V
Circuit current	Icc	Vcc=9V, Vin=0Vp-p, RI=∞Ω	-	24	32	mA
		Vcc=5V, Vin=0Vp-p, RI=∞Ω	-	20	27	
VIDEO						
Voltage gain	G	f=100kHz, 1Vp-p (0dB)(T→V1OUT)	-0.5	0	0.5	dB
		f=100kHz, 1Vp-p (6dB)(T→V1OUT)	5.5	6	6.5	
Frequency characteristics	F	f=10MHz/100kHz, 1Vp-p (0dB)(T→V1OUT)	-2.0	0	2.0	dB
		f=10MHz/100kHz, 1Vp-p (6dB)(T→V1OUT)	-2.0	0	2.0	
Dynamic Range	D	Vcc=9V(0dB)(T→V1OUT)	4	-	-	Vp-p
		Vcc=5V(0dB)(T→V1OUT)	2	-	-	
Input impedance	ZIV	Clamp in(T, V2, V3, V4)	-	-	-	kΩ
Crosstalk	CT	f=1MHz, 1Vp-p T→V1OUT (at V2 mode)	-	-60	-54	dB
AUDIO						
Voltage gain	G	f=1kHz, 1Vp-p (Vcc9V)(RT→R1OUT)	-0.5	0	0.5	dB
		f=1kHz, 1Vp-p (Vcc5V)(RT→R1OUT)	-0.5	0	0.5	
Frequency characteristics	F	f=100kHz/1kHz, 1Vp-p(RT→R1OUT)	-2.0	0	1.0	dB
Total harmonic distortion	THD	f=1kHz, 2Vp-p, at 400HzHPF+30kHzLPF (RT→R1OUT)	-	0.01	0.05	%
Dynamic Range	D	f=1kHz, Maximum with distortion<0.5% (RT→R1OUT)	5.5	6.0	-	Vp-p
Output DC offset voltage	VOFF	(MODE:RT, R2, R3, R4→R1OUT)	-20	0	20	mV
Input impedance	Z1	(RT, R2, R3, R4, LT, L2, L3, L4)	22	30	38	kΩ
Crosstalk	CT	1kHz, 1Vp-p RT→R1OUT(at R2 mode)	-	-90	-84	dB

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7 - 9

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M52797SP/FP

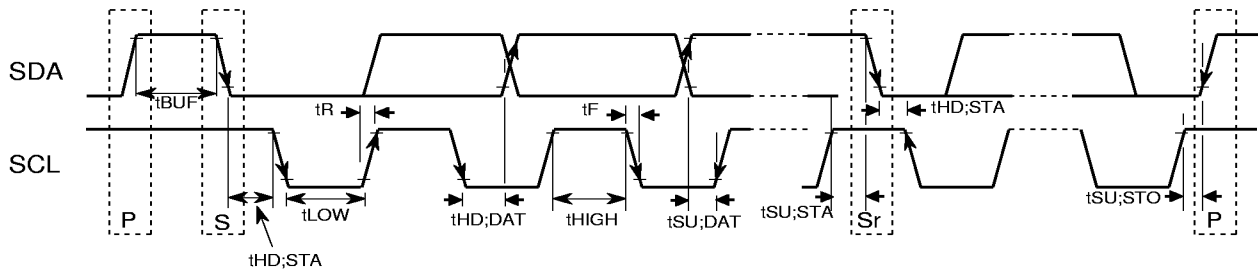
AV SWITCH with I2C BUS CONTROL

ELECTRICAL CHARACTERISTICS

(Ta=25°C, Vcc=9V, unless otherwise noted)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
I2C BUS CONTROL SIGNAL						
Max. input high voltage	V _{IH}		3.0	-	5.0	V
Min. input low voltage	V _{IL}		0.0	-	1.5	
Low level output voltage(SDA)	V _{OL}	SDA = 3mA	0.0	-	0.4	
High level input current	I _{IH}	SDA, SCL = 4.5 V	-10	-	10	μA
Low level input current	I _{IL}	SDA, SCL = 0.4 V	-10	-	10	
SCL clock frequency	f _{SCL}		0.0	-	100	kHz
Time of bus must be free before a new transmission can start	t _{BUF}		4.7	-	-	μS
Hold time at start condition	t _{HD;STA}		4.0	-	-	
The low period of the clock	t _{LOW}		4.7	-	-	
The high period of the clock	t _{HIGH}		4.0	-	-	
Setup time for start condition	t _{SU;STA}		4.7	-	-	
Hold time DATA	t _{HD;DAT}		5.0	-	-	nS
Setup time DATA	t _{SU;DAT}		250	-	-	
Rise time of both SDA and SCL line	t _R		-	-	1000	
Fall time of both SDA and SCL line	t _F		-	-	300	
Setup time for stop condition	t _{SU;STO}		4.0	-	-	

I²C BUS CONTROL SIGNAL



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8 - 9

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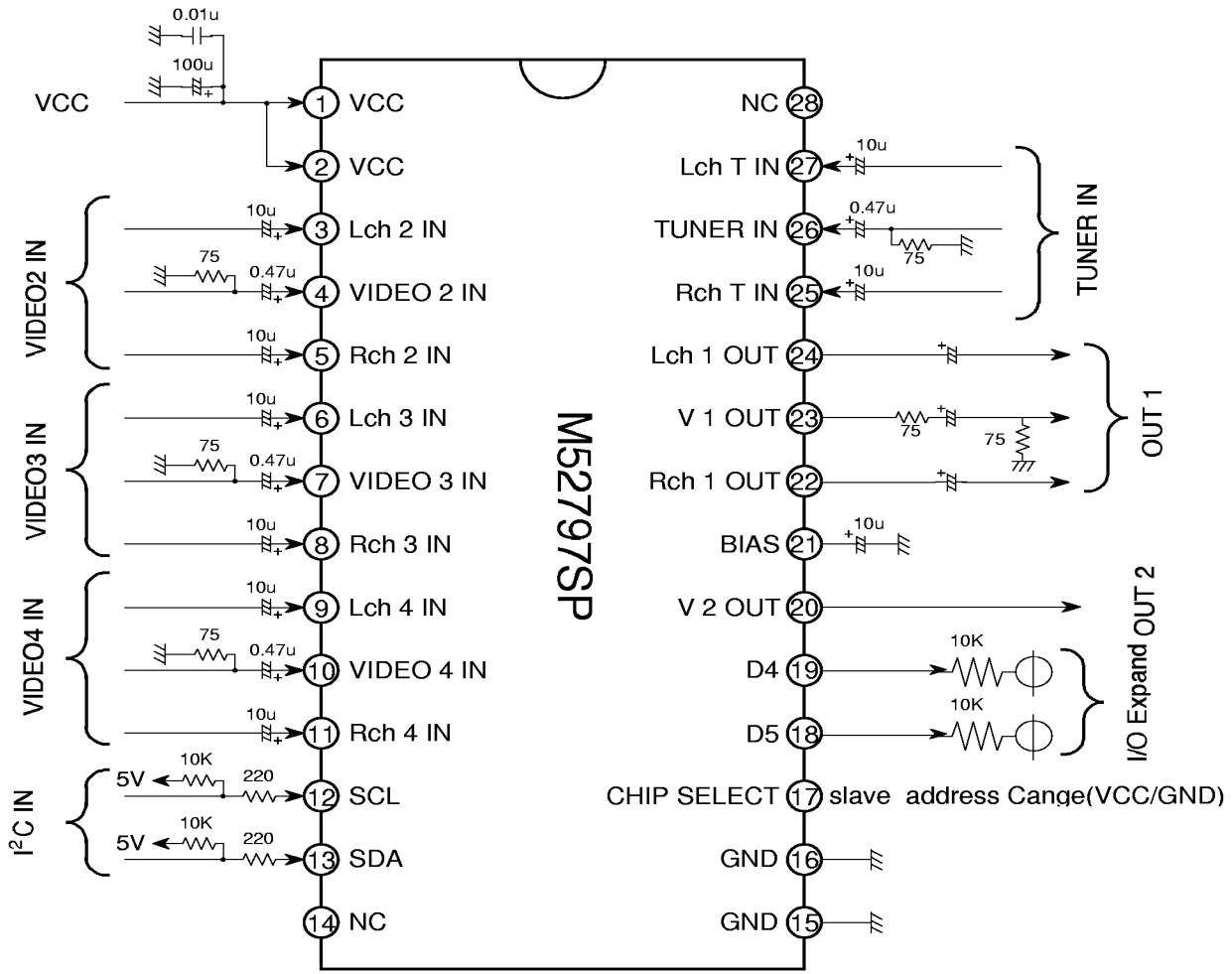
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AV SWITCH with I2C BUS CONTROL

Application Circuit Example



(at 28P4B)

Note how to use this IC

Input signal with sufficient low impedance to input terminal.

The capacitance of output terminal as small as possible.

Set the capacitance between Vcc and GND near the pins if possible.

Assign an area as large as possible for grounding.

Power-on Reset

The M52797 has an internal power-on reset function that sets each control register to "0" during IC power ON.

The power-on reset V_{TH} has 2.5V.

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9 - 9

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