To our customers,

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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) .

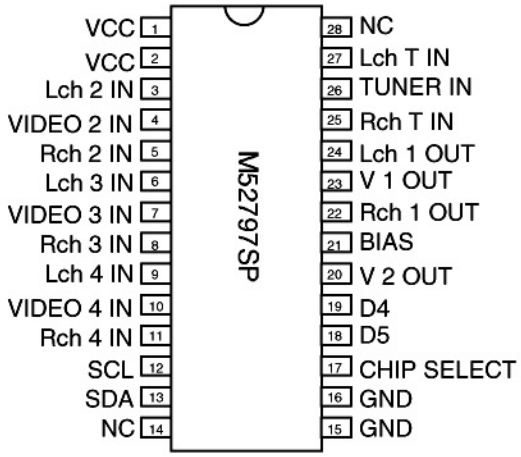
APPLICATION

Video equipment

RECOMMENDED OPERATING CONDITION

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

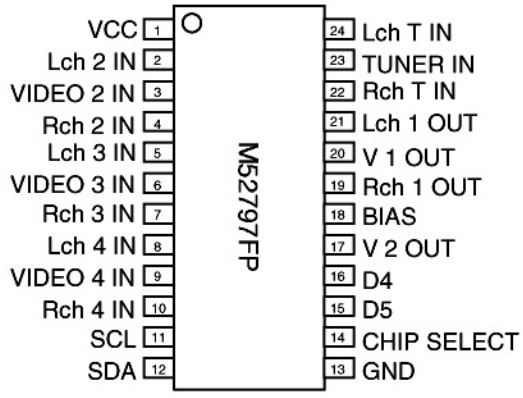
PIN CONFIGURATION (TOP VIEW)



Outline 28P4B
(Lead pitch :1.778mm)

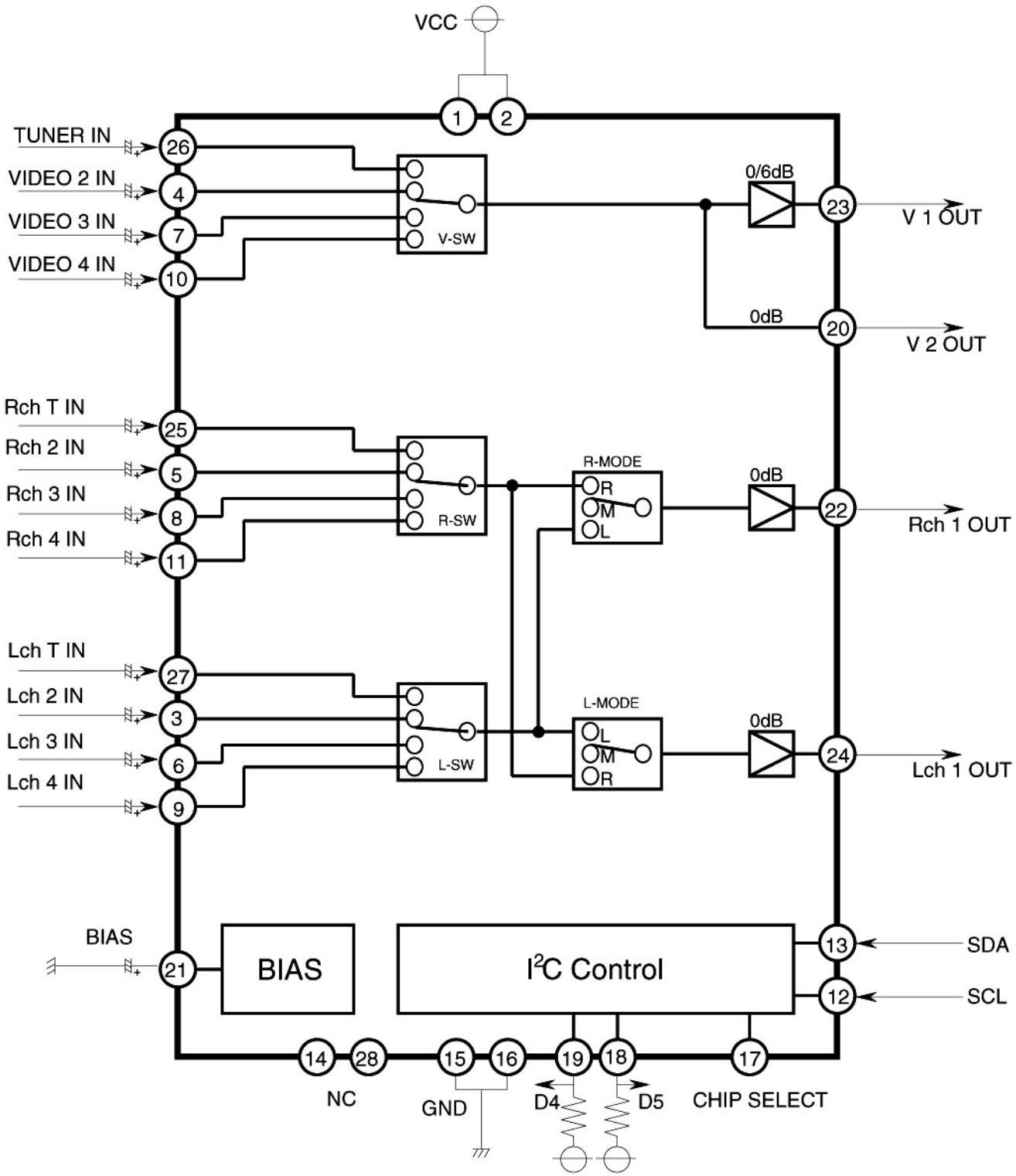
NC: No connection

PIN CONFIGURATION (TOP VIEW)



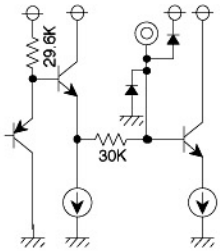
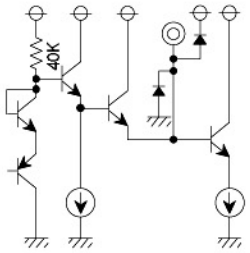
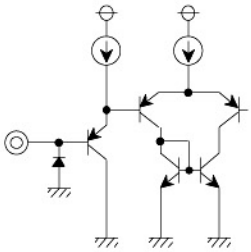
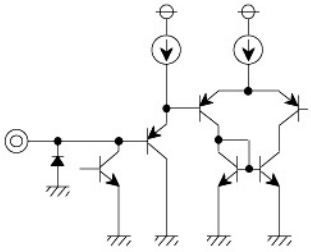
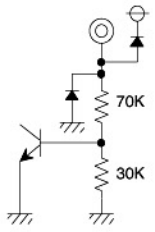
Outline 24P2N-B
(Lead pitch :1.27mm)

BLOCK DIAGRAM

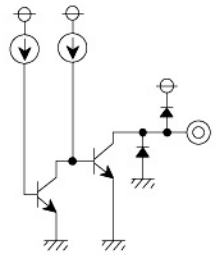
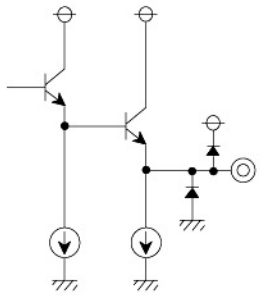
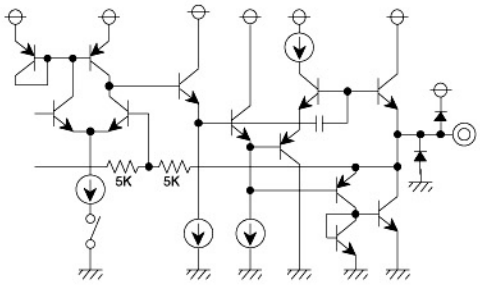
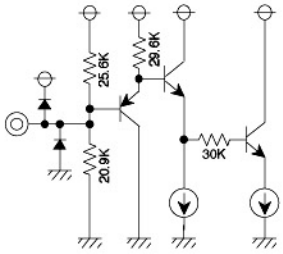
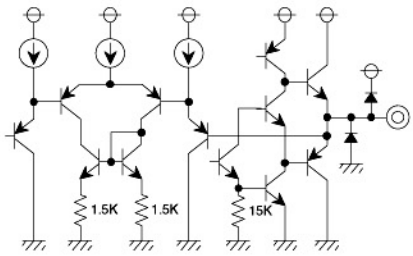


(at 28P4B)

DESCRIPTION OF PIN

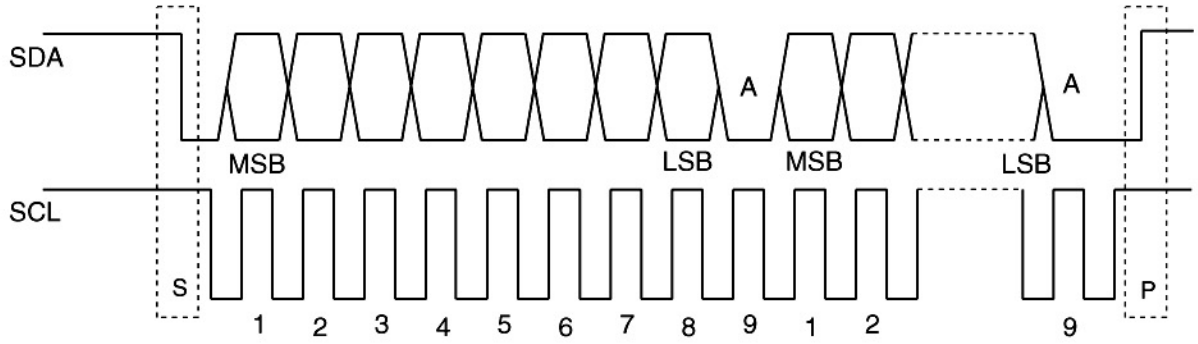
Pin No.	Name	Peripheral circuit pins	DC voltage(V)	Remarks
1 2	**Vcc**		9V	5~9V
3 5 6 8 9 11 25 27	**Lch 2 IN** **Rch 2 IN** **Lch 3 IN** **Rch 3 IN** **Lch 4 IN** **Rch 4 IN** **Rch T IN** **Lch T IN**		4.7V	
4 7 10 26	**VIDEO 2 IN** **VIDEO 3 IN** **VIDEO 4 IN** **TUNER IN**		3.6V	Clamp in
12	**SCL**			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

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	

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 ; Acknownledge

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 switchs with 1-byte data (DATA1) .

S	SLAVE ADDRESS	A	DATA1	A	P

S : Start
A : Acknowledge
P : Stop

SLAVE ADDRESS

1	0	0	1	0	0	X	0

R/W bit
Usually ` 0 ` (W : Master transmitter transmits to slave receiver)

Possible to select
17PIN Hi:1,Lo:0

(at 28P4B)

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	D7	D6	D5	D4	D3	D2	D1	D0
CONT	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	Rch OUT 1
0	0	MUTE	MUTE	Rch T IN	Rch T IN	Lch 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	Lch 2 IN	Rch 2 IN
1	0	MUTE	MUTE	Rch 3 IN	Rch 3 IN	Lch 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	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

ELECTRICAL CHARACTERISTICS

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

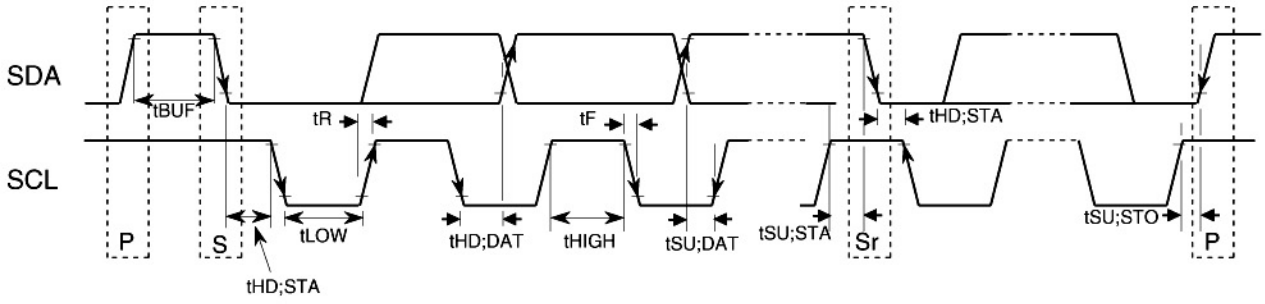
Parameter	Symbol	Test condition		Min.	Typ.	Max.	Unit
Supply voltage	Vcc			4.7	-	9.3	V
Circuit current	Icc	Vcc=9V,Vin=0Vp-p ,Rl=∞Ω		-	24	32	mA
		Vcc=5V,Vin=0Vp-p ,Rl=∞Ω		-	20	27	
VIDEO							
Voltage gain	G	f=100kHz,1Vp-p (0dB)(T→V_{1OUT})		-0.5	0	0.5	dB
		f=100kHz,1Vp-p (6dB)(T→V_{1OUT})		5.5	6	6.5	
Frequency characteristics	F	f=10MHz/100kHz,1Vp-p (0dB)(T→V_{1OUT})		-2.0	0	2.0	dB
		f=10MHz/100kHz,1Vp-p (6dB)(T→V_{1OUT})		-2.0	0	2.0	
Dynamic Range	D	Vcc=9V(0dB)(T→V_{1OUT})	f=100kHz Maximum with distortion<1.0%	4	-	-	Vp-p
		Vcc=5V(0dB)(T→V_{1OUT})		2	-	-	
Input impedance	Z_{IV}	Clamp in(T,V_2,V_3,V_4)		-	-	-	kΩ
Crosstalk	CT	f=1MHz,1Vp-p T→V_{1OUT} (at V_2 mode)		-	-60	-54	dB
AUDIO							
Voltage gain	G	f=1kHz ,1Vp-p (Vcc9V)(R_T→R_{1OUT})		-0.5	0	0.5	dB
		f=1kHz ,1Vp-p (Vcc5V)(R_T→R_{1OUT})		-0.5	0	0.5	
Frequency characteristics	F	f=100kHz/1kHz , 1Vp-p(R_T→R_{1OUT})		-2.0	0	1.0	dB
Total harmonic distortion	THD	f=1kHz,2Vp-p,at 400HzHPF+30kHzLPF (R_T→R_{1OUT})		-	0.01	0.05	%
Dynamic Range	D	f=1kHz ,Maximum with distortion<0.5% (R_T→R_{1OUT})		5.5	6.0	-	Vp-p
Output DC offset voltage	V_{OFF}	(MODE:R_T,R_2,R_3,R_4→ R_{1OUT})		-20	0	20	mV
Input impedance	Z_1	(R_T,R_2,R_3,R_4,L_T,L_2,L_3,L_4)		22	30	38	kΩ
Crosstalk	CT	1kHz,1Vp-p R_T→R_{1OUT}(at R_2 mode)		-	-90	-84	dB

ELECTRICAL CHARACTERISTICS

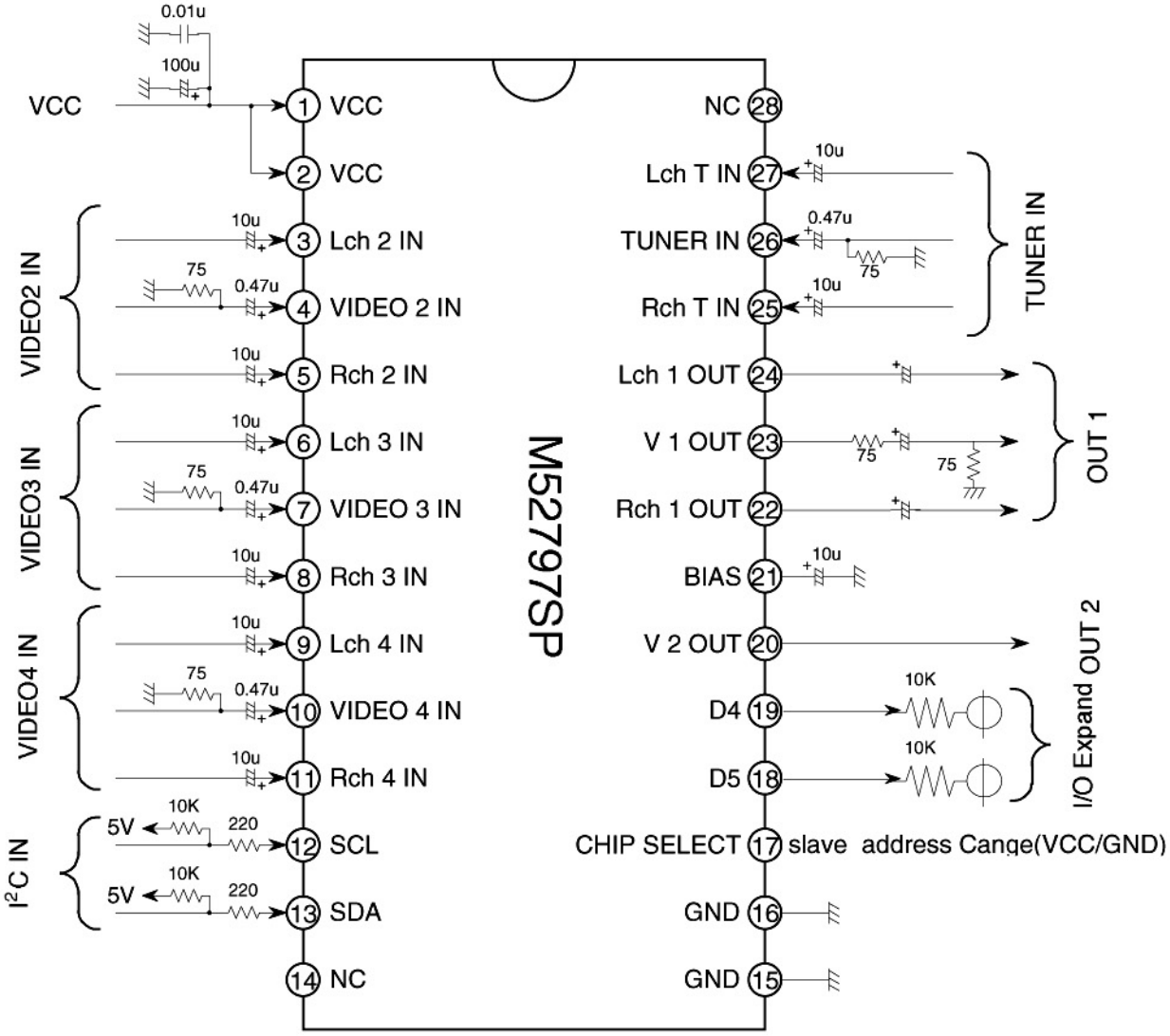
(Ta=25°C,Vcc=9V,unless otherwise noted)

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	-	-	µS

I^2C BUS CONTROL SIGNAL



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 intermal power-on reset function that sets each control r egister to "0" during IC power ON.

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