SPECIFICATION

DVB-T/DVB-C Half NIM Tuner (Hybrid Silicon-IC Module , Digital & Analog) Revision:1.0

1. Feature

*. Integrated DSP for demodulator both in Analog and Digital !

*.Output : Low IF for Digital , CVBS + SIF/AF for Analog

*.Receiving System

Digital : ATSC, DVB-T, ISDB-T ...etc

Analog : NTSC, PAL, SECAM

2. Applications

* Digital cable iDTV set, NIM, and STB

* Personal Video Recorder (DVD or HDD-based)

* Digital cable PC-TV tuner peripheral

3. General Specifications

3-1. Receiving Frequency Range : 42 ~1002MHz

3-2. Temperature Range

Storage Temperature : -20°C ~ + 80°C

Operation Temperature : 0°C ~ + 50°C

3-3. Input impedance 75 Ohm unbalanced

3-4. Output Signal Analog CVBS/SIF & DVB-T/ DVB-C Low IF

3-5. Application standard Compatible with FCC/A74 and BSMI

3-6. IF bandwidth 6,7,8 MHz

3-7. Weight : 16g

3-8. Holding strength of ant jack

Initial Inserting Force :Max. 5.0 kg

Extracting Force After 5 Cycles :Min. 0.7 kg

4. Test Conditions

4-1. Test conditions : All data held under following conditions

: +25+/-2°C / Humidity : 45 ~ 65% RH

4-2. Supply Voltage : B1 3V3 +/-2% Ripple < 15mV

SPECIFICATION

DVB-T/DVB-C Half NIM Tuner (Hybrid Silicon-IC Module , Digital & Analog) Revision:1.0

5.RF Electrical Specification (Control refer to Si2177 data sheet)

NO	ITEM	CONDITION	MIN	TYP	MAX	NOTES
5.1	GENERAL SPECIFICATIONS					
5.1.1	Receiving frequency range		42		1002	MHz
5.1.2	RF input impedance	F CONNECTOR 75 OHM				
5.1.3	L.O PLL synthesizer IC	Si2177				
5.1.4	PLL synthesizer crystal	+/- 50 ppm		24		MHz
5.1.5	Noise Figure	VHF-L1, Maximum gain (Terrestial Mode)		5.0	8.0	dB
		VHF-L2, Maximum gain		3.5	5.8	dB
		VHF-H, Maximum gain		3.4	7.0	dB
		UHF, Maximum gain		3.7	6.3	dB
		VHF-L1, Maximum gain (Cable Mode)		6.2		dB
		VHF-L2, Maximum gain		4.6		dB
		VHF-H, Maximum gain		5.1		dB
		UHF, Maximum gain		5.2		dB
		UHF-C, Maximum gain		6.4		dB
5.1.6	Input return loss	(Terrestial Mode)		3		dB
		(Cable Mode)		8		dB
5.1.7	Composite Triple Beat	Per OpenCable™ OCSP-HOST2.0-CFRI03-050121		-68.5	-63	dBc
5.1.8	Composite Second Order			-69	-60	dBc
5.1.9	Cross Modulation			-62	-57	dBc
5.1.10	CONSUMPTION CURRENT	B1 : 3.3V		200		mA

SPECIFICATION

DVB-T/DVB-C Half NIM Tuner (Hybrid Silicon-IC Module , Digital & Analog) Revision:1.0

NO	ITEM	CONDITION	MIN.	TYP.	MAX.	NOTES
6.1	Analog ATV Electrical Characterisitics Control refer to Si2177 datasheet					
6.1.1	Sensitivity	S/N=30dB 100% White pattern, PAL:87.5%		47	45	dBuV
		S/N=30dB 100% White pattern, SECAM:90%		51	43	dBuV
6.1.2	Video Output Level	color bar pattern, PAL:87.5%	0.8	1.0	1.2	Vp-p
		color bar pattern, SECAM:90%	0.7	0.9	1.1	Vp-p
6.1.3	Video Frequency Response	Video Signal : 87.5% AM Mod.				
	0.8 MHz	Multi- Burst Signal	-2.0	0	+1.0	dB
	1.8 MHz	at CH.14 (471.25MHz)	-2.0	0	+1.5	dB
	2.8 MHz		-3.0	0	+1.5	dB
	3.0 MHz		-4.0	-1.0	+1.5	dB
	3.8 MHz		-4.0	-1.0	+1.5	dB
6.1.4	Video S/N	INPUT LEVEL 70dBuV 100% White pattern,PAL:87.5%	48	51		dB
6.1.5	Chroma Distortion DP	5 Step Linearity Signal		+/-2	+/-5	Deg
	Chroma Distortion DG	87.5% mod. Ref. 471.25MHz Level:70dBuV		+/-3	+/-5	%
6.1.6	Audio Output Level			0.8		Vp-p
6.1.7	Audio S/N	Input Level 70dBuV	42		dB	
6.1.8	Audio THD (Total Harmonic Distortion)			0.5		%
6.1.9	Audio Output 3dB Response De-emphasis 70us	Audio De-emphasis	90	90		KHz
6.1.10	Audio 2nd SIF Output Level		0.3	0.4		Vp-p
6.1.11	SIF Out Level	Video mod : 0FF Video Signal : 70dBuV Sound Signal : 63dBuV	420	500	580	mVp-p

SPECIFICATION

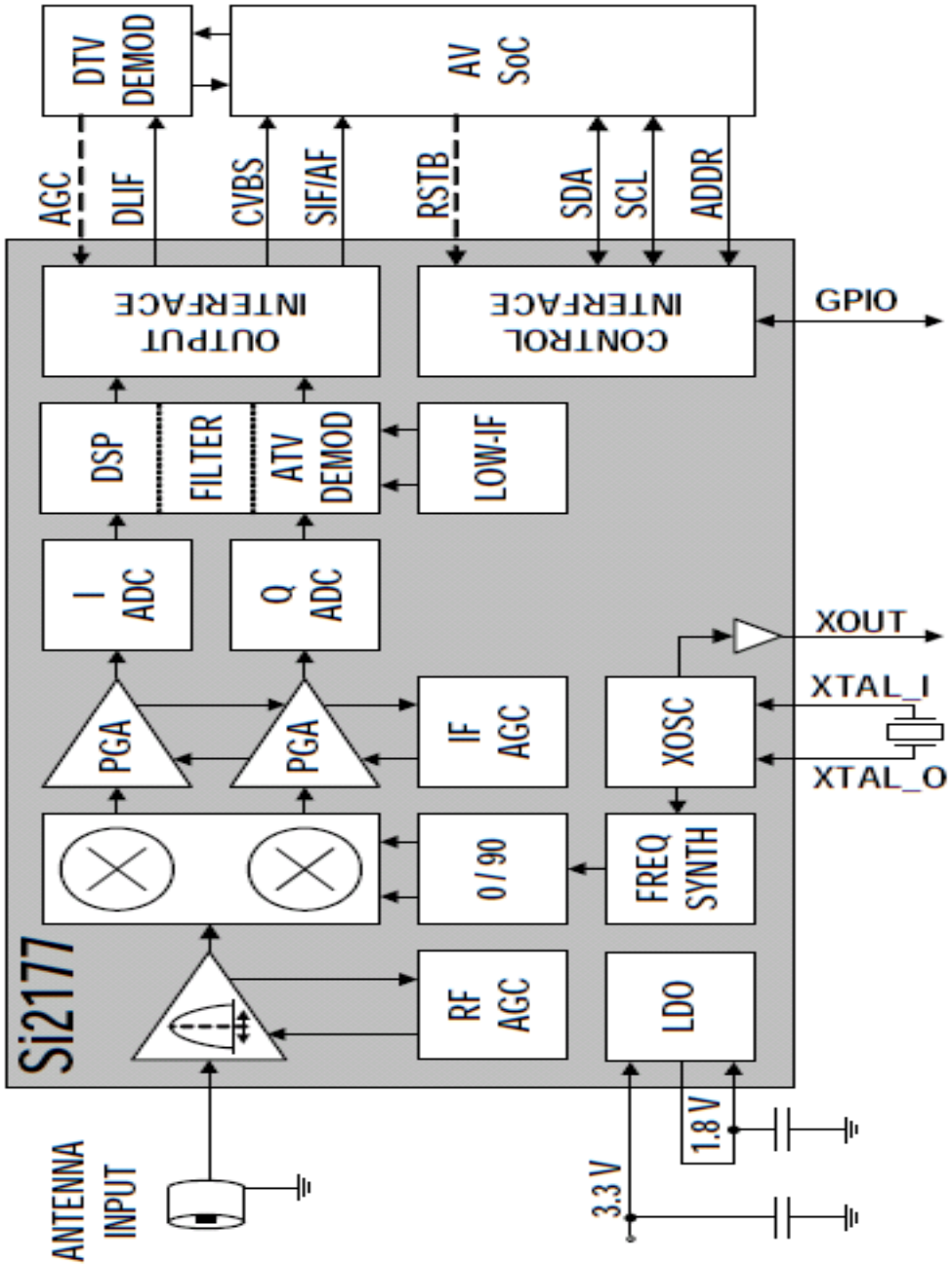
DVB-T/DVB-C Half NIM Tuner (Hybrid Silicon-IC Module , Digital & Analog) Revision:1.0

NO	ITEM	CONDITION	MIN.	TYP.	MAX.	NOTES
6.2	DTV Tuner Output Driver	Control refer to Si2177 datasheet				
6.2.1	DLIF Output Center Frequency	channel BW = 6 MHz		4 to 7		MHz
		channel BW = 7 MHz		4.5~6.5		MHz
		channel BW = 8MHz		5.0~6		MHz
6.2.2	Differential Output Voltage Swing	ac-coupled output		0.5~2.0		Vppd
6.2.3	Load Resistance (each pin)	ac-coupled output	1			Kohm
6.2.4	Load Capacitance (each pin)	ac-coupled output			50	pF

SPECIFICATION

DVB-T/DVB-C Half NIM Tuner (Hybrid Silicon-IC Module , Digital & Analog) Revision:1.0

7. Block Diagram



8. **Electorstic discharge**

8.1 **Test**

Each front-end must be capable of normal performance following its subjection to the following tests:

MIL STD 883C HBM

Test is performed with a voltage discharge from a 100 **PF** capacitor over a 1500 **OHM** series resistance in the discharge path. There is a direct contact between the test probe head and the unit under test, using the test points and conditions detailed below:

o Test to pins 1 through 9:
3 successive ESD discharges of **+/-2 KVDC** between each pin and the front-end frame.

IEC 1000-4-2

Test is performed with a voltage discharge from a 150 **PF** capacitor over a 330 **OHM** series resistance in the discharge path. There is a direct contact between the test probe head and the unit under test, using the test points and conditions detailed below:

o Test for antenna input socket +/-8 **KVDC**

8.2 **Handling**

Anyone handling a front-end must wear a properly grounded anti-static discharge bracelet to minimize **ESD** damage.
After each front-end is aligned and tested, it will be packed with anti-static material prior to transportation and storage. This package is to remain in place until the front-end is assembled and soldered onto the receiver main board.

9. **Reliability test procedure & conditions**

Note:Room temperature = 25°C +/- 2°C

9.1 **Heat load test**

- o Measure the DUTs at room temperature
- o Load the DUTs into chamber of the following conditions:

Temperature	=	60 °C
Period	=	500 hrs
Cycle	=	1.5 hrs on; 0.5 hrs off
Quantity	=	10 pcs

- o Cool-down 0.5 hr at room temperature, then measured the DUTs within 1 hr
- o The test shall be continued to 1000 cycles for information only

9.2 **Humidity load test**

- o Measure the DUTs at room temperature
- o Load the DUTs into chamber of the following conditions:

Temperature	=	40 +/- 5 °C
Period	=	24 hrs
Cycle	=	constantly on
Quantity	=	24 pcs

- o Cool-down 0.5 hr at room temperature, then measured the DUTs within 1 hr
- o Load the DUTs again into chamber of the following conditions:

Temperature	=	40+/-5°C
Humidity	=	90 to 95%
Period	=	500 hrs
Cycle	=	1.5 hrs on; 0.5 hr off
Quantity	=	20 pcs

- o Cool down 0.5hr at room temperature, then measured the DUTs within 1 hr

9.3 **Cold test**

- o Measure the DUTs at room temperature
- o Load the DUTs into chamber of the following conditions:

  Temperature = -2 +/-5 °C
  Period = 500 hrs
  Cycle = constantly on
  Quantity = 10 pcs

- o Warm up for 2 hrs at room temperature, then measured the DUTs within 1 hr

9.4 **Thermal shock**

- o Measure the DUTs at room temperature
- o Load the DUTs into chamber of the following conditions:

  Temperature = -25°C for 60 min
  ↓ ↑
  80°C for 60 min
  Period = 200 cycles
  Power = power off
  Quantity = 10 pcs

- o Cool-down 0.5 hr at room temperature then measured the DUTs within 1 hr

9.5 **Temperature cycle test**

- o Measure the DUTs at room temperature
- o Load the DUTs into chamber of the following conditions:

  Temperature = -5°C for 16 hrs then 60°C for 8 hrs
  Period = 500 hrs
  Cycle = constantly on
  Quantity = 10pcs

- o Cool down 0.5 hr at room temperature, then measured the DUTs within 1 hr
- o Load the DUTs again into chamber of the following conditions:

  Temperature = 40 +/- 5°C
  Humidity = 90 to 95%
  Period = 500 hrs
  Cycle = 1.5 hrs on; 0.5 hrs off
  Quantity = 10 pcs

- o Cool down 0.5 hr at room temperature, then measured the DUTs within 1hr

9.6 **Vibration test**

- o Frequency: 3.5 Hz
- o Vertical amplitude: 15 to 25 mm
- o Duration: 1 hr
- o Quantity: 1 carton

9.7 **Drop test**

- o Packaged apparatus: <or = 50 kg
- o Height: depend on weight
- o 1 corner + 3 edge + 6 faces

Drop on the weakest corner (point G)
Drop on the shortest edge on contact with point G
Drop on average edge in contact with point G
Drop on the longest edge in contact with point G
Drop flat wise on the side of minimum surface
Drop flat wise on the side of opposite minimum surface
Drop flat wise on the side of average surface
Drop flat wise on the side of opposite average surface
Drop flat wise on the side of maximum surface
Drop flat wise on the side of opposite maximum surface

- o Quantity :1 carton

9.8 Life test

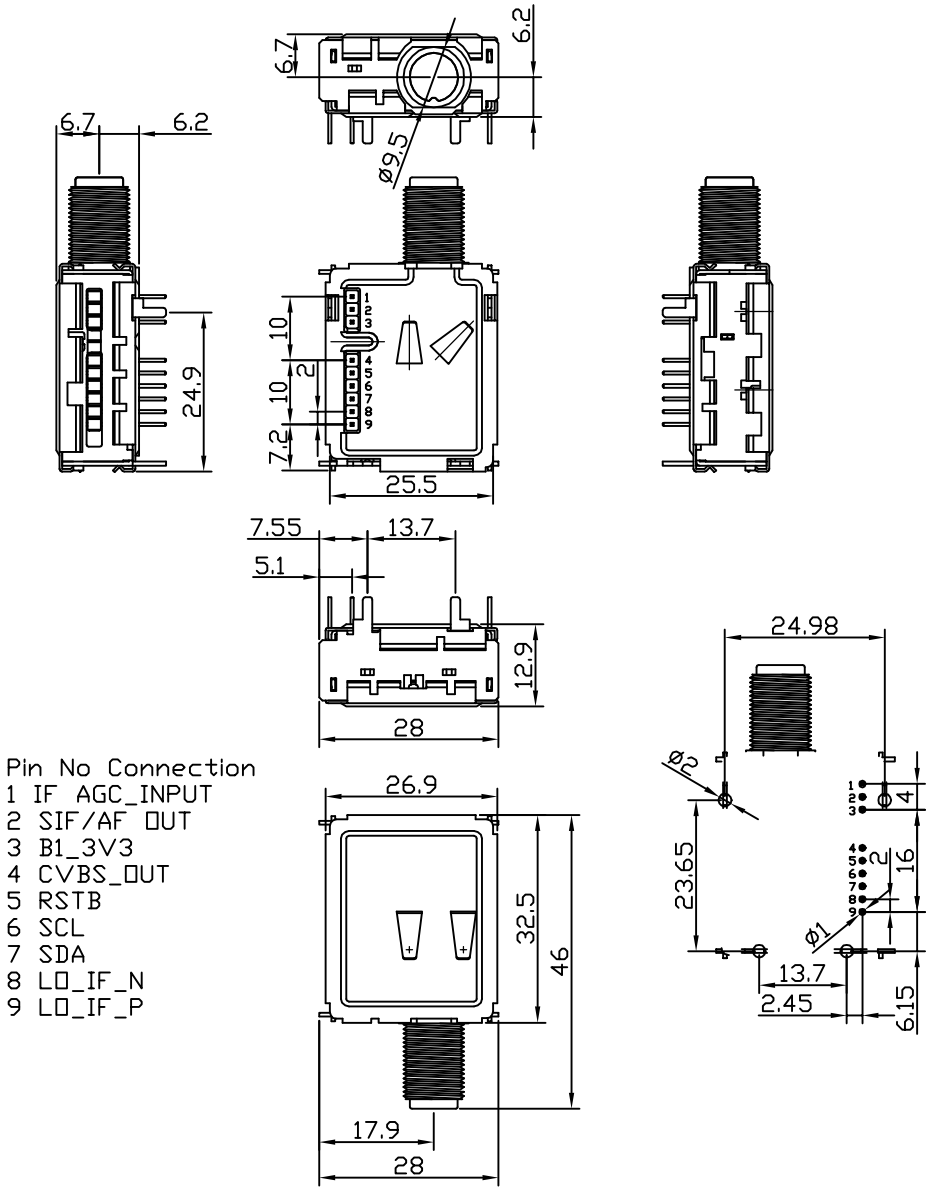
- o Measure the DUTs at room temperature
- o Load the DUTs into chamber of the following conditions:

Temperature = 60 °C
Period = 500 hrs
Cycle = constantly on
Quantity = 20 pcs

- o Cool down 0.5 hr at room temperature, then measure the DUTs within 1hr

SPECIFICATION

DVB-T/DVB-C Half NIM Tuner (Hybrid Silicon-IC Module , Digital & Analog) Revision:1.0



Pin No Connection
1 IF_AGC_INPUT
2 SIF/AF_OUT
3 B1_3V3
4 CVBS_OUT
5 RSTB
6 SCL
7 SDA
8 LO_IF_N
9 LO_IF_P

NOTE 1.TOLERANCES ARE ±0.5.
UNLESS OTHERWISE SPECIFIED.

ZONE	SYMB	DATE OR NO.	APPD	CHKD	DSGD		
						comtech COMTECH TECHNOLOGY CO., LTD	
						DSGD.	SCALE 1/1 / TOLERANCE ±0.5mm
						CHKD.	TITLE
						APPD.	UNIT mm / DOCUMENT NO.