SPECIFICATION

ISDBT TUNER

1.SCOPE

Jdvbt-90502 series is RF unit for Japan digital terrestrial broadcast reception.
Built in OFDM demodulator IC.

2.GENERAL SPECIFICATIONS

2-1. RECEIVING FREQUENCY RANGE UHF 470~770MHz

2-2. SUPPLY VOLTAGE

:B1	1.5V	+/-2%	Ripple < 7mV
B2	5V	+/-2%	
B3	2.5V	+/-2%	
B4	3.3V	+/-2%	

2-3. CONSUMPTION GURRENT

:B1	1.5V	180	mA
B2	5V	140	mA
B3	2.5V	40	mA
B4	3.3V	3	mA

Pin 2 Ant Power is for active Ant. The maximum current shall not exceed 100mA.
To avoid destroying the components inside the tuner,please offer current limited circuit if you need to supply Pin 2 with current.

2-4. OPERATION AND STORAGE CONDITIONS FOR CUARANTEE
TEMPERATURE 0~50^{O}C
HUMIDITY 85% OR LESS

3.TEST CONDITIONS

3-1. TESTING AMBIENT CONDITIONS
DEFINED AS TEMPERATURE OF 25+/-2^{O}C AND HUMIDITY OF 65+/-5% RH.
NOTE : THAT TEMPERATURES OF 5~30^{O}C AND HUMIDITY OF 45~85% MAY BE REGARDED AS STANDARD.

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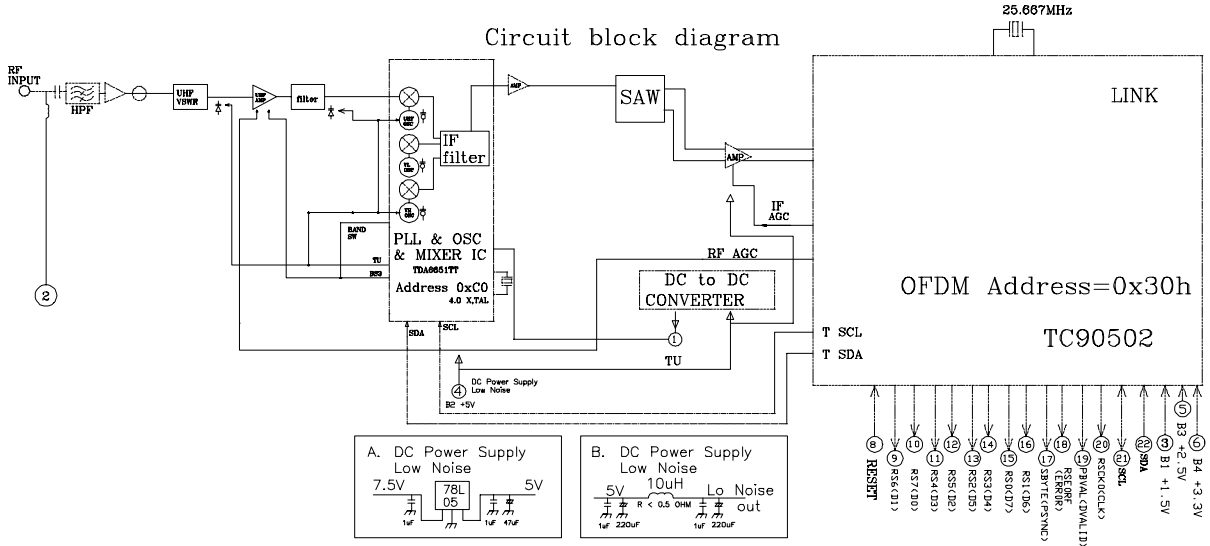
NO	ITEM	CONDITION	MIN	TYP	MAX	NOTES
1.	GENERAL SPECIFICATIONS					
1.1	Receiving frequency range	UHF SEE Page 7	470		770	MHz
1.2	Mergin frequency	UHF	-6		+3	MHz
1.3	RF input impedance	F CONNECTOR 75 OHM				
1.5	L.O PLL synthesizer IC	TUA6034 Address 0xC0				
1.6	PLL synthesizer crystal	+/- 50 ppm		4.0		MHz
1.7	1st intermediate frequency	DVB-T		57		MHz
	3dB BW			6		MHz
1.10	AGC voltage input external	0V to 5V 0V min gain 5V max gain				Current 20uA max
2	Operating Voltage	Supply voltage 5V +/- 2% 3.3V +/- 2% 1.5 +/- 2% 2.5 +/- 2%				
2.2	Humidity	Operating less than 85% Storage less than 95%				
2.3	Temperature	Operation 0°C to 50°C Storage -20°C to 75°C%				

Circuit block diagram



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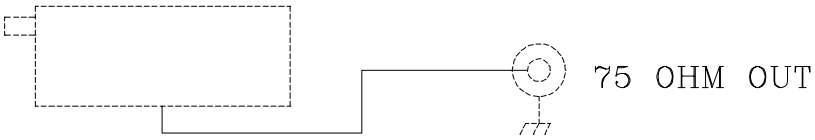
NO.	ITEM	CONDITION	MIN.	TYP.	MAX.	NOTES
	TEST CONDITION					
3.	Supply voltage Ambient humidity Ambient temperature	B1+1.5V B2+5V B3+2.5V B4+3.3V 60% to 70% 20°C to 30°C				
3.1	Test circuit					
3.2	Noise Figure	UHF		5	8	dB
3.3	AGC Range AGC voltage 5V to 0.5V	UHF	35	55		dB
3.5	Gain taper				8	dB
3.6	VSWR	UHF		2		dB
3.7	IF Rejection	UHF	45	50		dB
3.8	Image Rejection	UHF	40	50		dB
3.9	RF input oscillator leakage	<890 MHz <1800 MHz			46 46	dBuV dBuV
3.10	Phase noise offset 1KHz offset 10KHz offset 100KHz	UHF UHF UHF		-70 -80 -95		dBc/Hz dBc/Hz dBc/Hz
3.2	1% cross modulation input Channel +/-2Channel level 60dBuV	UHF	80			dBuV

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NO.	ITEM	CNODITION	MIN.	TYP.	MAX.	NOTES.
5.0	Electrical Characteristics Control refer to TC90502 data sheet					
5.1	C/N in AWGN	8K 64QAM R7/8		21.5		dB
	8MHz,G1/4,RF=50dBm	8K 16QAM R1/2		10		dB
	RS uncorrected error=0					
5.2	Sensitivity in AWGN	8K 64QAM R7/8		-75		dBm
	8MHz,GI=1/4	8K 16QAM R1/2		-80		dBm
	RS uncorrected error=0					

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TABLE 8-4 BIT Read/Write

ADDRESS Btye	1	1	0	0	0	MA1	MA0	0	A	BYET1
Divider Byte1	0	14 2	13 2	12 2	11 2	10 2	9 2	8 2	A	BYTE2
Divider Byte2	7 2	6 2	5 2	4 2	3 2	2 2	1 2	0 2	A	BYTE3
Control byte	1	CP	T2	T1	T0	RSA	RSB	OS	A	BYTE4
Bandswitch Byte	0	0	0	P4	P3	P2	P1	P0	A	BYTE5
Agc Control Byte*	ATC	AL2	AL1	AL0	0	0	0	0	A	BYTE6

* Byte6 replaces byte5 when T2,T1,T0=0,1,1

ADDRESS	1	1	0	0	0	MA1	MA0	1	A	BYTE1
STATUS BYTE	POR	FL	1	1	AGC	A2	A1	A0	A	BYTE2

A:ACKNOWLEDGE BIT.

MA1,MA0:VOLTAGE ADDRESS BITS.(Fix MA1,MA0=0,0)

CP:charge pump current bits bit=0 50uA or 125uA

bit=1 250uA(default)or 650uA

see table 8-11 charge pump current

TO,T1,T2:test bits.see table 8-7 test modes

RSA,RSB:reference divider bits see table 8-8 reference divider

OS:tuning control bit bit=0 enable Vt

bit=1 disable Vt

P0,P1,P2,P3:VHFLO,VHFHI,UHF,BANDSWITCH AND ANT SWITCH see table 8-12

P4:NPN port control bit bit=0(fix AGC Voltage input)

ATC:AGC timer constant bit bit=0 time 2S

bit=1 time 50ms

AL0,AL1,AL2:AGC take-over point bits,see table 8-9

POR:power-on reset flag:POR=0 AT POWER-ON

FL:PHASE LOCK DETECT FLAG.bit=1 OSC LOCK

bit=0 OSC UNLOCK

AGC:internal AGC .fiag AGC=1 when internal AGC is active (level below 3V)

A0,A1,A2:5-level AGC Voltage

TABLE 8-7 Test modes	T1	T2	T0
Normal mode, charge pump currents 50 and 250uA selectable	0	0	0
Normal mode, charge pump currents 50 and 250uA selectable(default)	0	0	1
CP is in high-impedance state	0	1	0
Byte6 will follow(otherwise byte5 will follow)	0	1	1
P0=Fdiv OUTPUT ,P1=Fref OUTPUT	1	0	0
not in use	1	0	1
Extended mode charge pump currents 50 and 250uA selectable	1	1	0
Extended mode charge pump currents 125 and 650uA selectable	1	1	1

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TABLE 8-8 feferencr divider ratios

Reference divider ratios	PLL 4MHz quartz	Mode	T2	T1	REA	RSB
80	50KHz	normal	0	0	0	0
128	31.25KHz	normal	0	0	0	1
24	166.67KHz	X	X	X	1	0
64	62.5KHz	X	X	X	1	1
32	125KHz	extended	1	1	0	0
28	142.86KHz	extended	1	1	0	1

TABLE 8-9 AGC Take-over point

IF output level symmetrical mode	A2	A1	A0
118 dBuV	0	0	0
115 dBuV	0	0	1
112 dBuV	0	1	0
109 dBuV	0	1	1
106 dBuV	1	0	0
103 dBuV	1	0	1

TABLE 8-10 RF INPUT LEVEL

P4 5-LEVEL ADC (reference)	A2	A1	A0
ANT INPUT LEVEL >110	0	0	0
80~110dBuV	0	0	1
70~80 dBuV	0	1	0
60~70 dBuV	0	1	0
<60 dBuV	1	0	0

TABLE 8-11 charge pump current

Charge pump current	mode	CP	T2	T1	T0
50uA	normal	0	0	0	x
250uA	normal	0	0	0	x
50uA 174~349 MHz 428.1~659 MHz	extended	0	1	1	0
125uA 349.1~397 MHz 659.1~759 MHz	extended	0	1	1	1
250uA 397.1~428 MHz 759.1~862 MHz	extended	1	1	1	0
650uA	extended	1	1	1	1

note :x=don't care.

Analog signal charge pump=50uA ,Digital signal charge=50uA~250uA

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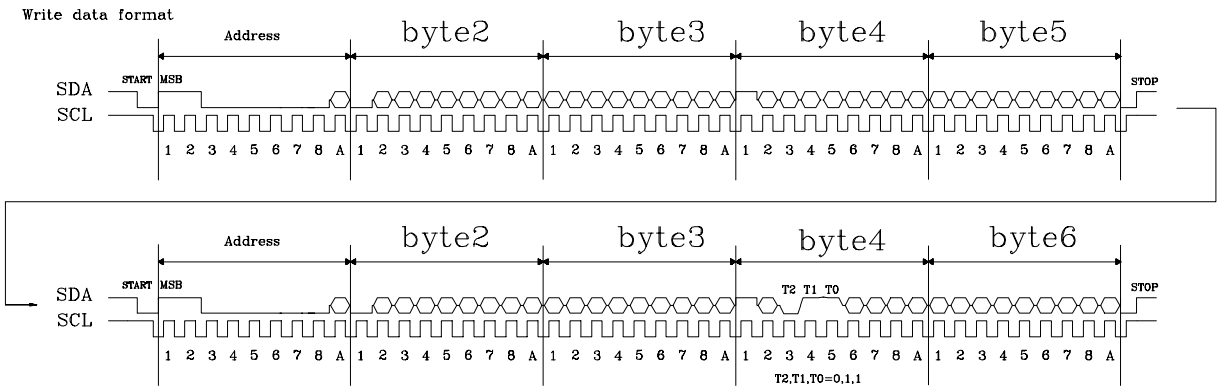
TABLE 8-12 3-band selection and ANT switch

	P0	P1	P3	P2
UHF	0	0	1	0

I2C BUS Timing Diagram and telegram examples



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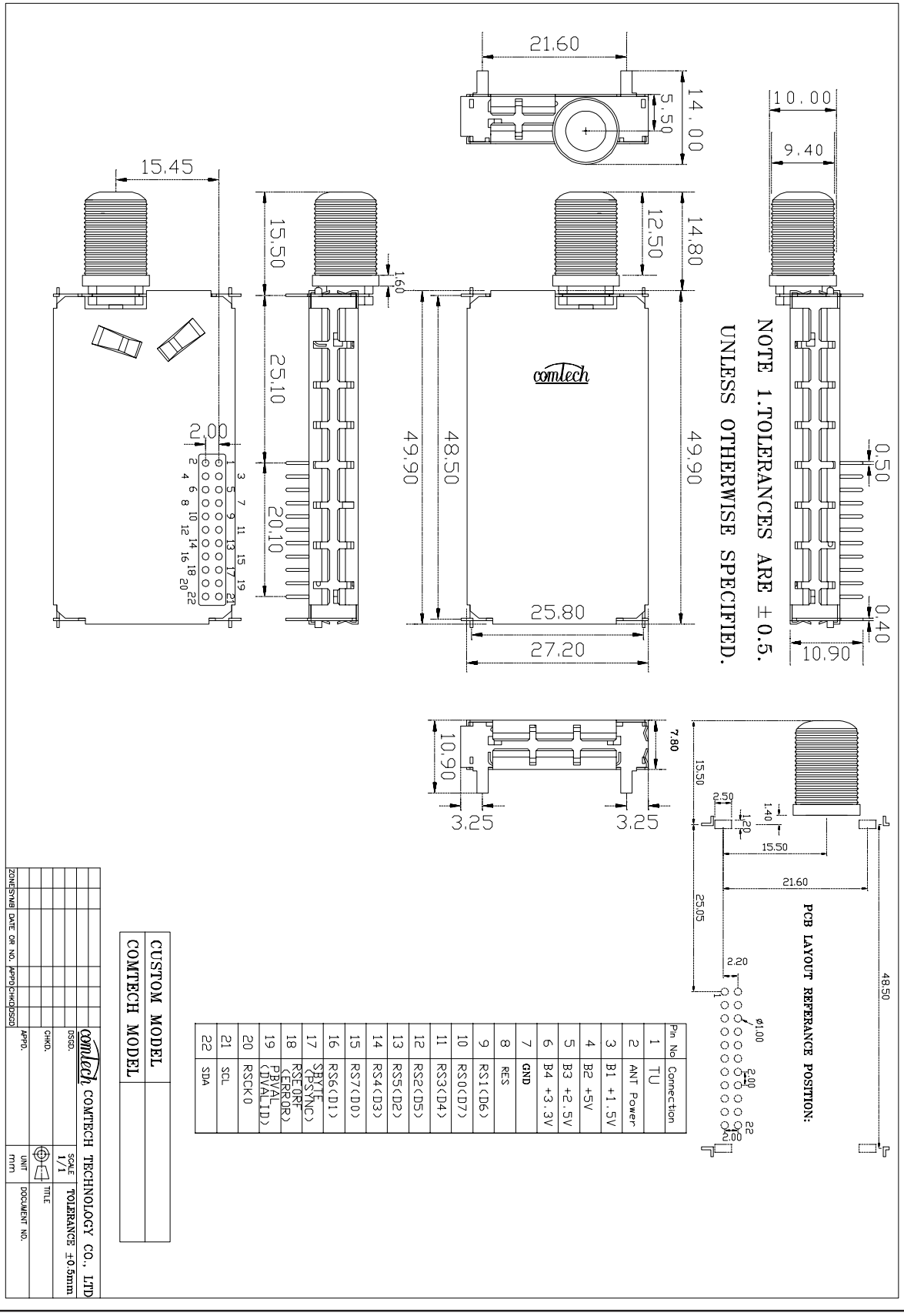

Pin No	Connection
1	TU
2	ANT Power
3	B1 +1.5V
4	B2 +5V
5	B3 +2.5V
6	B4 +3.3V
7	GND
8	RES
9	RS1(D6)
10	RS0(D7)
11	RS3(D4)
12	RS2(D5)
13	RS5(D2)
14	RS4(D3)
15	RS7(D0)
16	RS6(D1)
17	SBYT(SYNC)
18	RSEOP(ERROR)
19	PBVAL(DVAL_ID)
20	RSCK0
21	SCL
22	SDA

CUSTOM MODEL	
COMTECH MODEL	

ZONE|SYMB|DATE OR NO.|APPD|CHKD|DSGD

APPD. CHKD. DSGD. comtech COMTECH TECHNOLOGY CO., LTD

UNIT mm | TITLE | SCALE 1/1 | TOLERANCE ±0.5mm

DOCUMENT NO.