TVF8531-BF

FOR RF IN THE PC MULTI-MEDIA ENVIRONMENT

CUSTOMER APPROVAL

REV.	DESCRIPTION	DATE	SIGN
A	Original Release		

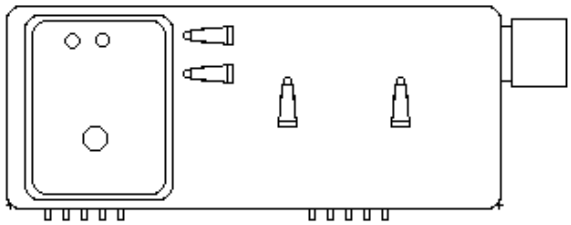
DESCRIPTION **Desktop Video tuner system PAL B/G**		APPROVAL	CHECK	DESIGN
		DATE	DATE 01-01-2000	DATE 01-01-2000
DRAWING NO.				
REVISIONS	PAGES TOTAL **11**			

TVision	PRODUCT SPECIFICATION	MODEL **TVF8531-BF**	PAGE 2
		DESCRIPTION **Desktop Video tuner System PAL B/G**	

NO	ITEM	SPECIFICATION
1.	GENERAL	
1. 1	Supply Voltage	True 5Vdevice (low power dissipation)
1. 2	Control system	I^2C bus control of tuning , address selection AFC status information
1. 3	Tuning System	PLL controlled tuning
1. 4	IF System	True – synchronous vision IF demodulator
1. 5	Receiving System	Systems PAL B/G D/K
1. 6	Receiving Channels	Full frequency range from channel 2CH (48.25MHz) to channel 70CH (863.25MHz)
1. 7	Intermediate Frequency	System B/G (MHz) Picture Carried 38.90 Color Carried 34.47 Sound Carried 33.40
1. 8	Antenna Input Impedance	VHF/UHF: 75 ohm unbalanced
1. 9	Output Impedance	Demodulator Video output: AF Sound output
1. 10	Weight	Approximate: 50 grams
1. 11	Connection	Antenna : IEC Version

BAND	CHANNELS (MHz)
VHF LOW	48.25 to161.25
VHF HIGH	168.25to463.25
UHF	471.25 to 863.25

1. 12



SYMBOL	PIN	DESCRIPTION
V_T	1	Tuning Voltage
V_S	2	Supply Voltage tuner section: +5V
SCL	3	I^2C -bus Serial clock
SDA	4	I^2C -bus Serial date
AS	5	I^2C -bus address Select
N.C	6	Not connected
2nd IF Sound output	7	Second IF Sound output
CVBS	8	Composite video baseboard signal output
V_{IF}	9	Supply Voltage IF section:+5V
AF Sound output	10	AF sound output

NO	ITEM	SPECIFICATION
1. 13	Operating Temp	-10℃ to +60℃: Standard +25℃
1. 14	RH	0 to 90%: Standard 60%
1. 15	Storage Temp	-20℃ to +80℃: Standard +25℃
1. 16	Maximum Supply Voltage to terminal	

SYMBOL	PARAMETER	PIN	MIN	TYP	MAX	UNIT
VS	Supply voltage	2	4.75	5.00	5.25	V
VS (ripple)	Peak-to-peak ripple voltage susceptibility (at 5V+5%): 20Hz to 100KHz		--	--	20	mVp-p
	>100KHz to 500KHz		--	--	10	mVp-p
Is	Supply current		--	--	120	mA
Vscl	SCL-bus input Voltage	3	-0.3	--	+5.25	V
VSDA	SDA-bus input Voltage	4	-0.3	--	+5.25	V
ISDA	SDA-bus current open collector		+1	--	+5	mA
VAS	Address select Voltage	5	--	--	+5.25	V
ZIF	2ndIF Sound output load impedance DC	7	0.5	--	--	KΩ
	AC		0.5	--	--	KΩ
ZCVBS	Compile Video Baseboard signal load impedance: DC	8	--	75	--	Ω
	AC		--	75	--	Ω
TI	Load dune constant		--	--	100	ns
VIF	IF supply voltage	9	4.75	5.00	5.25	V
VIF (ripple)	Peak-to-peak ripple voltage susceptibility (at 5V±5%) 20Hz to 100KHz		--	--	20	mVp-p
	>100KHz to 500KHz		--	--	10	mVp-p
IIF	IF supply carnet				100	mA
ZAF	AF Sound output load impedance DC	10	1.0	--	--	KΩ
	AC		0.6	--	--	KΩ

NO	ITEM
1．17	Overall performance

SYMBOL	PARMETER	VALUE	UNIT
Tamp	Ambient temperature	25±5	℃
RH	Relative humidity	60±5	%
V_S	Supply voltage	5±0.125	V
Z_{CVBS}	Video output load impedance	75	Ω
Z_{IF}	IF sound output load impedance	>500	Ω
TPR	Pre-heating tune: +5V at pin	40	mnule
Z_{SAF}	Aerial source impedance unbalance	75	Ω

2. ELECTRICAL CHARACTERISTICS

NO	ITEM		SPECIFICATION					Notes
			Min	Typ	Max	Unit	Condition	
2．1	V_{SWR}		--	--	5			
2．2	Vant Radiation	0~1.75GHz			46	dBμV	75Ω Terminate	
2．3	Image rejection	VHF low VHF high UHF	51 55 46	70 70 55		dB		
2．4	If rejection		60	--		dB		
2．5	1/2 IF susceptibility off-air UHF		 50 56	-- -- --		dB		
2．6	Cross modulation		70	--		dBμV		
2．7	OSC Voltage at all pins		--	--	80	dBμV		
2．8	OSC lock-in time		--	--	150	ms		
2．9	The Video signal-to-Sound interference ratio with the tuner exposed to sound dingles in the audio frequency range 100Hz to 10KHz and sound pressure levels up to 105dB		40	--	--	dB		

3. Video and audio characteristics

NO	ITEM	Test Point	Min	Typ	Max	Unit	Condition	Notes
3．1	CVBS characteristics: Video amplitude signal at pin 8 DC level sync pulse at pin 8	 8 8	 0.7 --	 -- 0.35	 1.1 --	 V V		

NO	ITEM	Test Point	MIN	TYPE	MAX	UNIT	CONDITION	NOTES
3．2	Video amplitude drop with respect to modulation 0.1 MHz at Tarmb=45℃ At 1MHz At 2MHz At 3MHz At 4MHz At 4.43MHz	8	 -1.0 -1.5 -2.5 -3.0 -7.0	--	 +1.0 +1.5 +1.5 +2.0 +3.0	dB		
3．3	Sound carrier rejection	8	40	--	--	dB		
3．4	CVBS S/N(unweighted)	8	44	--	--	dB		
3．5	Gain limited sensitivity at 1dB reduction of Video output	8	--	--	30	dBμV		
3．6	Audio characteristics: AF output level measured via LP 20KHz filter RMS detector 50 us de-emphasis THD measured via LP 20KHz filter RMS detector 50 us de-emphasis S/N measured via CCIR filter peak CCIR detector 50 us de-emphasis	10	 0.25 -- 44	 0.35 -- --	 0.5 0.5 --	 V % dB		
3．7	AF 3dB response measured via LP 20KHz filter RMS detector de-emphasis off	10	16	--	--	KHz		
3．8	AM suppression ratio	10	40	--	--	dB		

4. Digital AFC Status

Parameter	Conditions	Frequency (KHz)	Digital read-out
	Input voltage at pin 1:0.00 to 0.15 Vs	-125	00
ADC word at I2C bus	Input voltage at pin 1:0.15 to 0.30 Vs	-62.5	01
During read operation	Input voltage at pin 1:0.30 to 0.45 Vs	0	02
	Input voltage at pin 1:0.45 to 0.60 Vs	+62.5	03
	Input voltage at pin 1:0.60 to 1.00 Vs	+125	04

5. Application information (I^2C -bus date format)

A detailed description of the I^2C -bus specification with application, is gives in brochure “the I^2C -bus and how to use it”, This brochure may ordered using the code number 9398 393 40011.

BYTE	MSB	DATA BYTE						LSB	COMMAND
Address byte (ADB)	1	1	0	0	0	MA1	MA2	0	A
Divider byte (DB1)	0	N_{14}	N_{13}	N_{12}	N_{11}	N_{10}	N_9	N_8	A
Divider byte (DB2)	N_7	N_6	N_5	N_4	N_3	N_2	N_1	N_0	A
Control byte (CB)	1	CP	T2	T1	T0	RSA	RSB	OS	A
Ports byte (PB)	P7	P6	P5	P4	P3	P2	P1	P0	A

NOTE:

5．1 A = Acknowledge

5．2 Address selection

Vs = +5V(PLL supply voltage)

Voltage applied on as input	MA1	MA0	Address
0 to 0.1 Vs	0	0	C0
0.2 to 0.3 Vs	0	1	C2
0.4 to 0.6 Vs	1	0	C4
0.9 to 1 Vs	1	1	C8

IF the as pin is left floating, the internal bias will automatically set address to C2.

5．3 Divider ratio:

N=16/{f_{RF}(pc) + f_{IF}(pc)}, where (pc) is picture carrier and f_{RF} and f_{IF} are expressed in MHz.

f_{OSC}=N/16(MHz)

$N=2^{14}\times N_{14}+2^{13}\times N_{13}+2^{12}\times N_{12}+ \cdots +2^{2}\times N_{2}+2^{1}\times N_{1}+2^{0}\times N_{0}$

5．4 Ratio select bits

RSA	RSB	STEP SIZE
X	0	50KHz
0	1	31.25KHz(for slow picture search)
1	1	62.50KHz(for normal picture search)

5．5 Band switching

BAND	BITE							
	P7	P6	P5	P4	P3	P2	P1	P0
Low band	1	0	1	0	X	0	0	0
mid band	1	0	0	1	X	0	0	0
High band	0	0	1	1	X	0	0	0

NOTES:

1. X = don't care P0 to P7 are output ports on the PLL device.
2. P3 is a system switch output for customer applications.

5．6 Control Byte：

CP=1 for fast tuning.

CP=0 for moderate speed turning with slightly better residual oscillator FM.

5．7 Test mode settings：

T2=T1=0; T=1 for normal operation.

5．8 PLL disabling：

OS=0, for normal operation.

OS=1, for switching the charge pump to the high impedance state.

5．9 Write mode：

Start-Adb-Ack-Db1-Ack-Db2-Ack-cb-Ack-pb-Ack–Stop.

Start-Adb-Ack -cb-Ack-pb-Ack-Db1-Ack-Db2-Ack–Stop.

Start-Adb-Ack-Db1-Ack-Db2-Ack-cb-Ack–Stop.

Start-Adb-Ack-Db1-Ack-Db2-Ack–Stop.

Where：

Start = start condition Adb = address byte Ack = acknowledge

Db1 = divider byte1 Db2 = divider byte2 Cb = control byte

Pb = ports byte Stop = stop condition

5．10 READ mode：

The in-lock can be to read by setting the R/W bit to logica1.

BYTE	MSB	DATA BYTE						LSB	COMMAND
Address byte	1	1	0	0	0	MA1	MA0	1	A
Status byte	POR(1)	FL(2)	I2(3)	I1(3)	I0(3)	A2(4)	A1(4)	AO(4)	A

NOTES：

1. POR = Power on Reset, POR=1 at power-on.
2. FL = In-lock flage, FL=1: loop is phase-locked.
3. I2 to I0=digital levels for I/O ports P2, P1 and P0 respectively.
4. A2 to A0=digital outputs of the 5-level ADC.
5. A = Acknowledge.
6. READ mode.

Start-Adb-Ack-STB-Ack-STROb2-stoping Ack form processor-End-of data.

Start-Adb-Ack-STB-stoping Ack form processor-End-of data.

Where：

STB = status bytes.

FREQUENCY TABLE

unit: MHz

BAND	CHANNEL NO.	PICTURE FREQ.	SOUND FREQ.	LOCAL OSC FREQ.	IMAGE FREQ.
VHF LOW	1	48.25	53.75	87.15	126.05
	2	55.25	60.75	94.15	133.05
	3	62.25	67.75	101.15	140.05
	4	69.25	74.75	108.15	147.05
	5	76.25	81.75	115.15	154.05
	6	83.25	88.75	122.15	161.05
	7	90.25	95.75	129.15	168.05
	8	97.25	102.75	136.15	175.05
	9	105.25	110.75	144.15	183.05
	10	112.25	117.75	151.15	190.05
	11	119.25	124.75	158.15	197.05
	12	126.25	131.75	165.15	204.05
	13	133.25	138.75	172.15	211.05
	14	140.25	145.75	179.15	218.05
	15	147.25	152.75	186.15	225.05
	16	154.25	159.75	193.15	232.05
	17	161.25	166.75	200.15	239.05
VHF HIGH	18	168.25	173.25	207.15	246.05
	19	175.25	180.75	214.15	253.05
	20	182.25	187.75	221.15	260.05
	21	189.25	194.75	228.15	267.05
	22	196.25	201.75	235.15	274.05
	23	203.25	208.75	242.15	281.05
	24	210.25	215.75	249.15	288.05
	25	217.25	222.75	256.15	295.05
	26	224.25	229.75	263.15	302.05
	27	231.25	236.75	270.15	309.05
	28	238.25	243.75	277.15	316.05
	29	245.25	250.75	284.15	323.05
	30	252.25	257.75	291.15	330.05
	31	259.25	264.75	298.15	337.05
	32	266.25	271.75	305.15	344.05
	33	273.25	278.75	312.15	351.05
	34	280.25	285.75	319.15	358.05

FREQUENCY TABLE

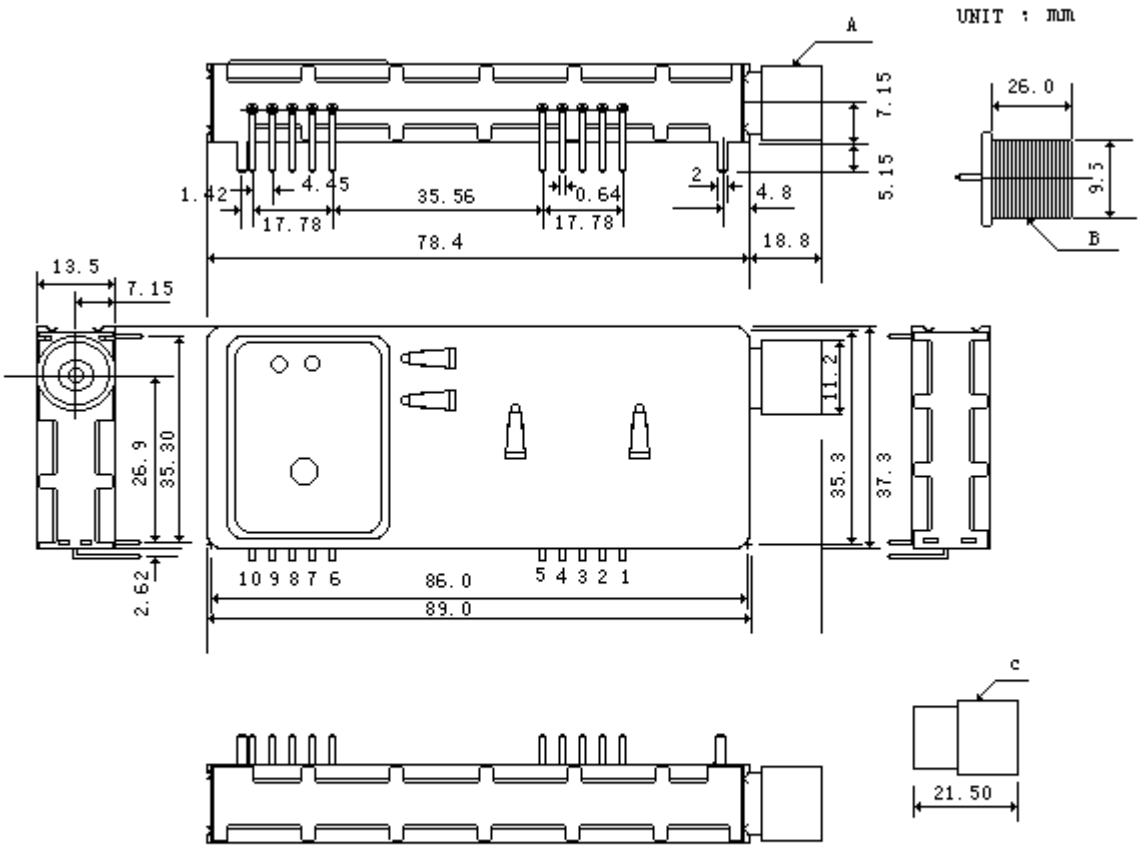
unit: MHz

BAND	CHANNEL NO.	PICTURE FREQ.	SOUND FREQ.	LOCAL OSC FREQ.	IMAGE FREQ.
VHF HIGH	35	287.25	292.75	326.15	365.05
	36	294.25	299.75	333.15	372.05
	37	303.25	308.75	342.15	381.05
	38	311.25	316.75	350.15	389.05
	39	319.25	324.75	358.15	397.05
	40	327.25	332.75	366.15	405.05
	41	335.25	340.75	374.15	413.05
	42	343.25	348.75	382.15	421.05
	43	351.25	356.75	390.15	429.05
	44	359.25	364.75	398.15	437.05
	45	367.25	372.75	406.15	445.05
	46	375.25	380.75	414.15	453.05
	47	383.25	388.75	422.15	461.05
	48	391.25	396.75	430.15	469.05
	49	399.25	404.75	438.15	477.05
	50	407.25	412.75	446.15	485.05
	51	415.25	420.75	454.15	493.05
	52	423.25	428.75	462.15	501.05
	53	431.25	436.75	470.15	509.05
	54	439.25	444.75	478.15	517.05
	55	447.25	452.75	486.15	525.05
	56	455.25	460.75	494.15	533.05
	57	463.25	468.75	502.15	541.05
UHF	121	471.25	476.75	510.15	549.05
	122	479.25	484.75	518.15	557.05
	123	487.25	492.75	526.15	565.05
	124	495.25	500.75	534.15	573.05
	125	503.25	508.75	542.15	581.05
	126	511.25	516.75	550.15	589.05
	127	519.25	542.75	558.15	597.05
	128	527.25	532.75	566.15	605.05
	129	535.25	540.75	574.15	613.05
	130	543.25	548.75	582.15	621.05
	131	55125	556.75	590.15	629.05
	132	559.25	564.75	598.15	637.05
	133	567.25	572.75	606.15	645.05

FREQUENCY TABLE

unit: MHz

BAND	CHANNEL NO.	PICTURE FREQ.	SOUND FREQ.	LOCAL OSC FREQ.	IMAGE FREQ.
UHF	134	575.25	580.75	614.15	653.05
	135	583.25	588.75	622.15	661.05
	136	591.25	596.75	630.15	669.05
	137	599.25	604.75	638.15	677.05
	138	607.25	612.75	646.15	685.05
	139	615.25	620.75	654.15	693.05
	140	623.25	628.75	662.15	701.05
	141	63125	636.75	670.15	709.05
	142	639.25	644.75	678.15	717.05
	143	647.25	652.75	686.15	725.05
	144	655.25	660.75	694.15	733.05
	145	663.25	668.75	702.15	741.05
	146	671.25	676.75	710.15	749.05
	147	679.25	684.75	718.15	757.05
	148	687.25	692.75	726.15	765.05
	149	695.25	700.75	734.15	773.05
	150	703.25	708.75	742.15	781.05
	151	711.25	716.75	750.15	789.05
	152	719.25	724.75	758.15	797.05
	153	727.25	732.75	766.15	805.05
	154	735.25	740.75	774.15	813.05
	155	743.25	748.75	782.15	821.05
	156	751.25	756.75	790.15	829.05
	157	759.25	764.75	798.15	837.05
	158	767.25	772.75	806.15	845.05
	159	775.25	780.75	814.15	853.05
	160	783.25	788.75	822.15	861.05
	161	791.25	796.75	830.15	869.05
	162	799.25	804.75	838.15	877.05
	163	807.25	812.75	846.15	885.05
	164	815.25	820.75	854.15	893.05
	165	823.25	828.75	862.15	901.05
	166	831.25	836.75	870.15	909.05
	167	839.25	844.75	878.15	917.05
	168	847.25	852.75	886.15	925.05
	169	855.25	860.75	894.15	933.05
	170	863.25	868.75	902.15	941.05



TVF5531## Connector : B
TVF8531## Connector : A
TVF9531## Connector : C

SYMBOL	PIN	DESCRIPTION
V_T	1	Tuning Voltage
V_S	2	Supply Voltage tuner section: +5V
SCL	3	I^2C-bus Serial clock
SDA	4	I^2C -bus Serial data
AS	5	I^2C -bus address select
N.C	6	Not connected
2nd IF Sound output	7	Second IF Sound output
CVBS	8	Composite Video Baseboard signal output
V_{IF}	9	Supply Voltage IF section: +5V
AF Sound output	10	AF sound output