

Specification

(技术规格书)

UV1315

VHF/UHF television tuner (V/U 电视高频头)

Preliminary specification

WANSHENG ELECTRON CO.,LTD

浙江省台州市椒江万胜电子有限公司

TEL: 86-576-8206788

FAX: 86-576-8206512

<http://www.tvetuner.com>

E-mail: wsdz@mail.tzptt.zj.cn

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1. FEATURES (特点)

- Member of the UV1300 family of small sized UHF/VHF tuners
(V/U1300 系列小型 U/V 调谐器的一种)
- Systems CCIR:B/G and OIRT:D/K (CCIR 系统 B/G 制和 OIRT 系统 D/K 制)
- Voltage synthesized tuning (VST) (电压合成调谐)
- Off-air channels. Full cable Channels (接收所有标准频道, 增补频道)
- Globally standardized mechanical. dimensions and global standard pinning.
(统一的国际标准外形和引脚)
- Compact size (小型尺寸)
- Direct drive SAW filter (直接驱动声表面滤波器)

2. INTERMEDIATE FREQUENCIES (中频)

| SIGNAL (信号) | FREQUENCY (MHz) (频率) | |
|----------------|-------------------------|------------|
| | SYSTEM D/K | SYSTEM B/G |
| Picture (图像) | 38.00 | 38.90 |
| Color (彩色) | 33.57 | 34.47 |
| Sound (伴音) | 31.50 | 33.40 |

Note: 1. The oscillator frequency is above the input signal frequency. 本振频率高于输入信号频率

3. CHANNEL COVERAGE (频率覆盖范围)

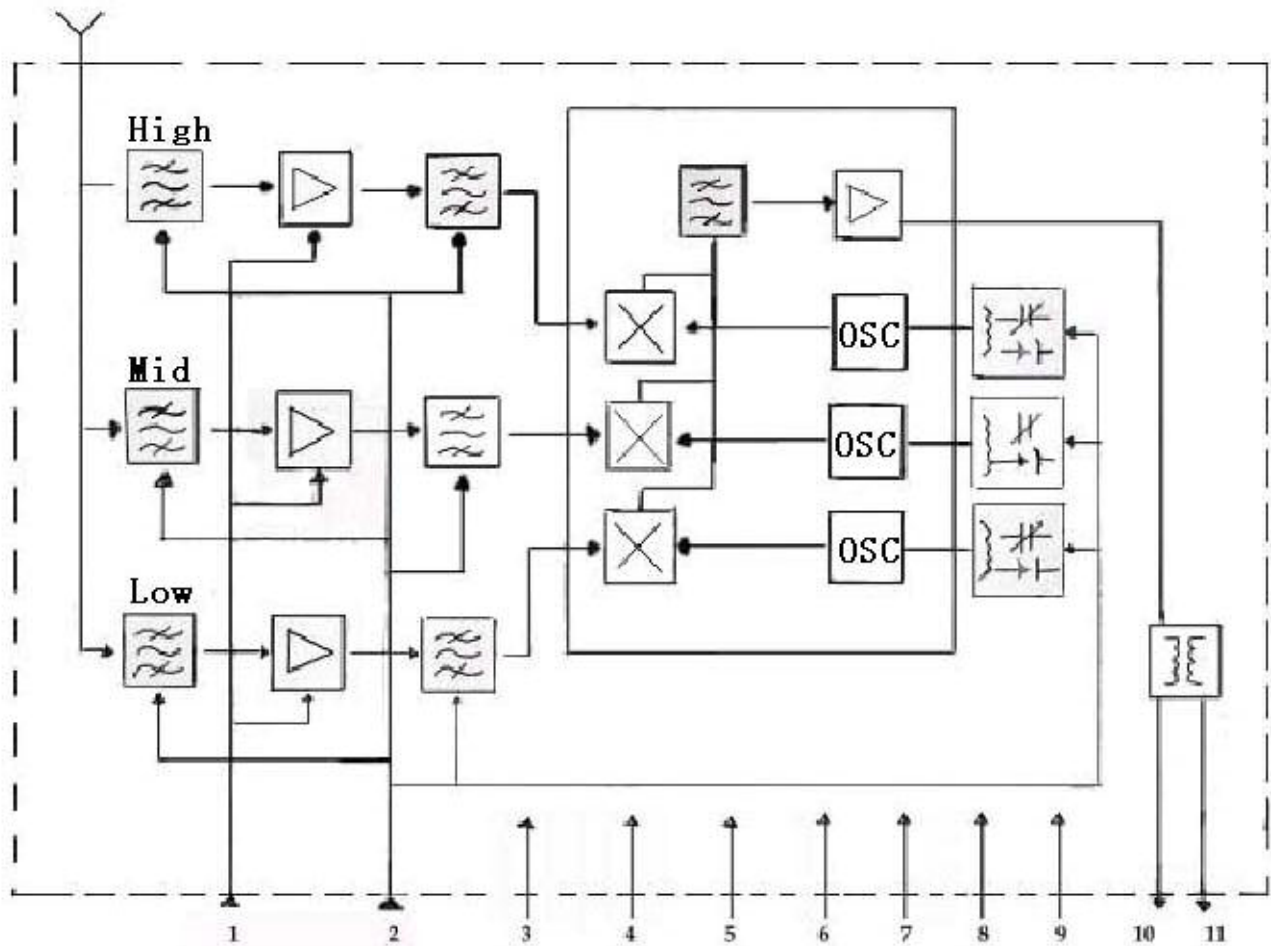
| BAND (波段) | CHANNELS (频道) | | FREQUENCY RANGE (MHz) (频率范围) |
|--------------|---------------|------------|---------------------------------|
| | OFF-AIR (标准) | CABLE (增补) | |
| Low band | 1 to 6 | Z1 to Z7 | 48.25 to 168.25 |
| Mid band | 7 to 12 | Z8 to Z38 | 175.25 to 464.25 |
| High band | 13 to 57 | | 471.25 to 863.25 |

4. DESCRIPTION (描述)

The UV1315 tuner belongs to the UV1300 family of tuners which are designed to meet a wide range of applications. It is a combined VHF, UHF tuner suitable for CCIR systems B/G and OIRT D/K. The low IF output impedance has been designed for direct drive of a wide variety of saw filters with sufficient suppression of triple transient. (UV1315 调谐器属于 UV1300 系列调谐器, 它的设计适合于广阔的应用范围。它是结合甚高频和特高频调谐适合于 CCIR 系统 B/G 制和 OIRT 系统 D/K 制。低中频输出阻抗已设计能直接驱动各种声表面滤波器)

5. PINNING (引脚)

| SYMBOL (符号) | PIN (引脚) | DESCRIPTION (描述) |
|----------------|---------------------|-----------------------------------|
| AGC | 1 | Gain control voltage (增益控制电压) |
| V _T | 2 | Tuning voltage (调谐电压) |
| HIGH. | 3 | High band switch (高波段开关) |
| MID | 4 | Mid band switch (中波段开关) |
| LOW | 5 | Low band switch (低波段开关) |
| V _s | 6 | Supply voltage +5V (电源电压) |
| IF2 | 10 | Symmetrical IF output2 (中频平衡输出 2) |
| IF1 | 11 | Symmetrical IF output1 (中频平衡输出 1) |
| GND | TH1,TH2,TH3 and TH4 | Mounting tags (ground) (支架特征为地) |



Electrical block diagram. (方框图)

6. LIMITING VALUES (极限值)

Environmental conditions (环境条件)

| SYMBOL (符号) | PARAMETER (参数) | CONDITIONS (条件) | MIN (最小) | MAX (最大) | UNIT (单位) |
|--------------------------------------|----------------------------|--------------------|-------------|-------------|------------------|
| Non-operational conditions 存放(不工作)条件 | | | | | |
| T _{amb} | Ambient temperature (环境温度) | | -25 | +85 | °C |
| RH | Relative humidity (相对湿度) | | - | 100 | % |
| g _B | Bump acceleration (加速撞击) | 25g | - | 245 | m/s ² |
| g _s | Shock acceleration (加速震荡) | 50g | - | 490 | m/s ² |
| | Vibration amplitude (震动振幅) | 10 to 55 Hz | - | 0.35 | mm |
| Operational conditions (工作条件) | | | | | |
| T _{amb} | Ambient temperature (环境温度) | | -10 | +60 | °C |
| RH | Relative humidity (相对湿度) | | - | 95 | % |

Limiting values under operational conditions (工作条件下的极值)

The tuner can be guaranteed to function properly under following conditions

(在下列条件下此高频头能保证正常的功能)

| SYMBOL (符号) | PARAMETER (参数) | PIN 引脚 | MIN 最小 | TYP 典型 | MAX 最大 | UNIT 单位 |
|---------------------------------|---|---------------|-----------|-----------|-----------|------------|
| Version with V _S =5V | | | | | | |
| V _S | Supply voltage 电源电压 | | 4.75 | 5.00 | 5.50 | V |
| V _{S(ripple)} | Peak-to-peak ripple voltage susceptibility; note 1 (纹波电压, 注意点 1) | 6 | - | - | 10 | mV |
| I _S | Supply current (工作电流) | | - | - | 50 | mA |
| V _T | Tuning voltage (调谐电压) | 2 | - | - | 35 | V |
| I _T | Tuning current (调谐电流) | | - | - | 2 | μA |
| V _{AGC} | AGC input voltage (AGC 输入电压) | 1 | - | 4.0 | - | V |
| ΔV _{AGC} | AGC input voltage range (AGC 输入电压范围) | | 0.3 | | 4.0 | V |
| I _{AGC} | AGC input current (AGC 输入电流) | | - | 10 | - | μA |
| V _{BS} | Band switching voltage ON (波段选择电压) | | 4.75 | 5.00 | 5.50 | V |
| V _{BS(ripple)} | Ripple voltage (peak-to-peak value); note 1 (波纹电压峰峰值, 注意 1) | 3, 4 and 5 | - | - | 10 | mV |
| I _{BS} | Band switching current (波段选择电流) | | - | - | 20 | mA |

Note 注意

1. Sinusoidal ripple voltage superimposed on the supply voltage in the frequency range of 20 Hz to 500 kHz. Criteria for TV interference >57 dB

(在频率范围为 20 Hz 到 500 kHz 内, 正弦曲线的电压叠加上电源电压。标准电视干扰为在 57 dB。)

Band switching (波段切换)

| BAND SELECTED (波段选择) | STATUS OF INPUT 输入状态 | | |
|-------------------------|-----------------------------|-----------------------------|-----------------------------|
| | PIN 3 (引脚 3) | PIN4 (引脚 4) | PIN5 (引脚 5) |
| Low | open circuit/GND (开路/接地) | open circuit/GN (开路/接地) | V _S |
| Mid | open circuit/GND (开路/接地) | V _S | open circuit/GND (开路/接地) |
| High | V _S | open circuit/GND (开路/接地) | open circuit/GND (开路/接地) |

7. ELECTRICAL DATA 电参数

Conditional data 条件数据

Unless otherwise specified. All electrical values apply at the following

Conditions and the electrical performance is related to system B/G and D/K.

所有电参数都是应用于下列条件，电性能是关于 B/G 制，除非有特别的说明

| SYMBOL (符号) | PARAMETER (参数) | VALUE (值) | UNIT (单位) |
|--------------------|---|-------------|-----------|
| T _{amb} | Ambient temperature 环境温度 | 25 ± 5 | °C |
| RH | Relative humidity 相对湿度 | 60 ± 15 | % |
| V _S | Supply voltage 电源电压 | 5.0 ± 0.125 | V |
| V _{AGC} | AGC input voltage AGC 输入电压 | 4.0 ± 0.1 | V |
| V _T | Tuning voltage 调谐电压 | 33 ± 0.5 | V |
| t _{pr} | Pre-heating time (45V at pin 2) 预热电压 | 10 | minutes |
| Z _{S(AE)} | Aerial source impedance (unbalanced) 天线输入阻抗 (不平衡式) | 75 | Ω |

General characteristics (一般参数)

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP | MAX | UNT |
|------------------|---|------------------------------------|---------------------------|-------------------|----------------------------|--------------------------|
| f_b | frequency range: 频率范围 low band 低波段 mid band 中波段 high band 高波段 | | 48.25 175.25 471.25 | - - - | 168.25 464.25 863.25 | MHz MHz MHz |
| Δf_b | margin: 边限 for low band 对低波段 for mid/high bands 对中/高波段 | | -1/+2 -3/+2 | - - | - - | MHz MHz |
| G_V | voltage gain: 电压增益 all channels 全频道 gain taper(off-air channels) | | 38 - | 45 - | - 8 | dB dB |
| G_A | amplitude response 声频响应振幅 tilt of picture carrier to top of curve 图像信号载波上端曲线的摆动 tilt of sound carrier to top of curve 音频信号载波上端曲线的摆动 | | - - | 2 3 | 4 5 | dB dB |
| F | noise factor 噪声系数 low band 低波段 mid band 中波段 high band 高波段 | | - - - | 5 5 6 | 9 9 11 | dB dB dB |
| ΔV_{AGC} | AGC input voltage range: (AGC 控制深度) low band 低波段 mid band 中波段 high band 高波段 | | 40 40 35 | 50 50 45 | - - - | dB dB dB |
| α_I | Image rejection 镜频抑制比 low band 低波段 mid band 中波段 high band 高波段 | | 60 60 50 | 70 70 58 | - - - | dB dB dB |
| α_{IF} | IF rejection(picture):中频抑制比(图像) all channels 所有通道 | | 60 | 80 | - | dB |
| α_s | sound -chrominance moiré rejection 声音-彩色抑制比 all channels 所有通道 | up to 30 dB gain reduction | 56 | 70 | - | dB |
| M_x | cross modulation: 交扰调制 in-band ($n \pm 2$) 在波段选择 out of band 缺乏波段选择 | | 70 - | 84 100 | - - | dB μV dB μV |
| V_{ocs} | oscillator voltage: 振荡器电压 IF pin 中频引脚 all other pins 所有其它引脚 | | - - | 65 50 | 85 70 | dB μV dB μV |
| | overloading:过载 1 dB gain compression 1 dB 增益压缩 detuning oscillator 振荡器失谐 | | 74 80 | 80 100 | - - | dB dB |
| Δf_t | frequency drift during warm-up 当温度升高时频率飘移 | | - | 90 | 250 | KHz |
| Δf_t | frequency drift with temperature change: 温度变化致使频率飘移 low band 低波段 mid band 中波段 high band 高波段 | $\Delta T_{amb}=25 \pm 25^\circ C$ | - - - | 300 330 500 | 750 900 1000 | KHz KHz KHz |
| Δf_v | frequency drift with change of voltage 电压变化致使频率飘移 | ΔV_s | - | - | 500 | KHz |
| V_{ESD} | Electrostatic discharge (ESD) On all pins 所有引脚静电放电 | note 1 | 2 | >4 | - | KV |

Note1 注意: All the pins of the tuner are protected against electrostatic discharge (ESD) up to 2 KV. 产品是在类别 B "MIL-STD-883C"中分类

VISIBILITY TEST (INPUT IMMUNITY AND IMMUNITY FROM RADIATED FIELDS) APPLICATION INFORMATION

可行性测试 (输入抗干扰性和外界辐射性)

The tuners meet the requirements of the international Standard "CISPR20", when measured in an adequate television receiver. The AGC must be adjusted such that the picture carrier level (top sync.) at the tuner output does not exceed 105 dB μ V at an input signal level of 74 dB μ V or greater.

当在一般的电视接收机中测量, 这些调谐器符合国家标准 "CISPR20" 的要求。在输入信号为 74 dB μ V 或更大时, 为使调谐器输出图像信号载波电平不超过 105 dB μ V 必须调整 AGC

RADIATION 辐射

The tuner meet the requirements of the international Standard "CISPR20", when measured Handling performance the reactive in an adequate television receiver.

当在一般的电视接收机中测量, 这些调谐器符合国家标准 "CISPR20" 的要求

NICROPHONY 颤噪效应

For sound signals in the audio frequency range 100Hz to 10Hz and sound pressure levels up to 105dB (20 μ Pa), the video signal to sound interference ratio will be greater than 40 dB.

伴音信号在声频范围为 100Hz 到 10Hz 和声压平整到 105dB, 视频信号对声音的干扰系统将大于 40 dB.

APPLICATION INFORMATION 应用信息

IF bandwidth 中频带宽

The typical IF bandwidth is 12 MHz 带宽. 标准的中频带宽为 12 MHz

IF output impedance at 35.0MHz is 75+j38.8 Ω 中频输出阻抗在 35.0MHz 为 75+j38.8 Ω

IF load 中频负载

The minimum permissible resistive load is 1 K Ω , the maximum capacitive load is 22Pf

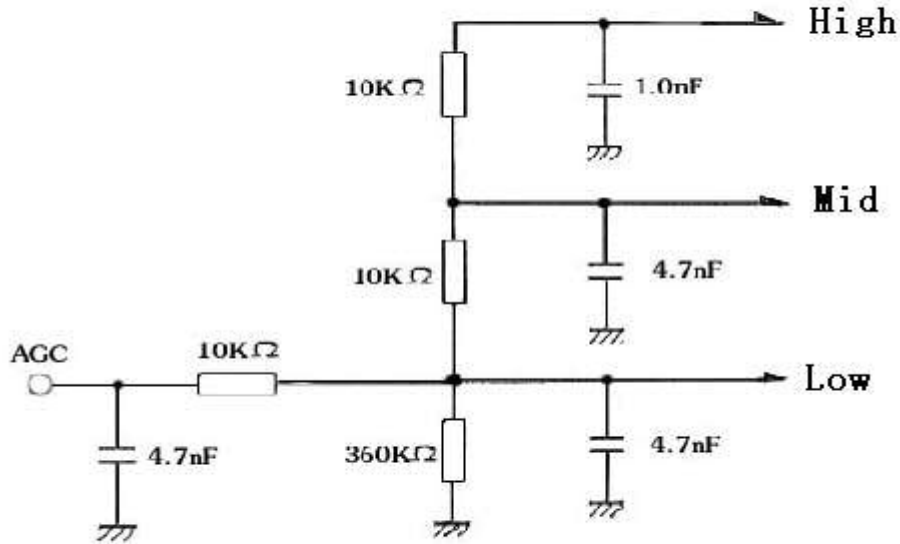
最小的电阻容许为 1 K Ω , 最大的电容为 22Pf

To guarantee optimum signal Handling performance the reactive load of the IF circuitry (interconnections SAW filter) has to be tuned to tuner IF center frequency 为保证最佳信号处理性能, 中频电路的阻抗要与调谐器的中心频率协调

The IF output is to be maintained at 105dBuV maximum. In case this limit is exceeded, the tuner gain should be reduced accordingly 中频输出保持最大 105dBuV, 万一这个限制被子超过, 相应地调谐器的增益必须减少

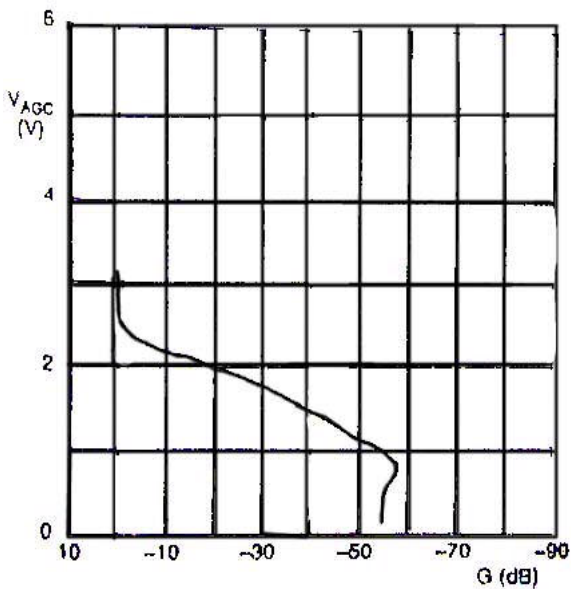
For multi-system IF applications that use more than one SAW filter, an IF buffer amplifier should be added between the tuner IF output and the input to the SAW filters. 对于多制式中频应用, 要用到多个声表面滤波器, 一个中频缓冲放大器加于调谐器中频输出和声表面滤波器输入之间

8. AUTOMATIC GAIN (自动增益控制)

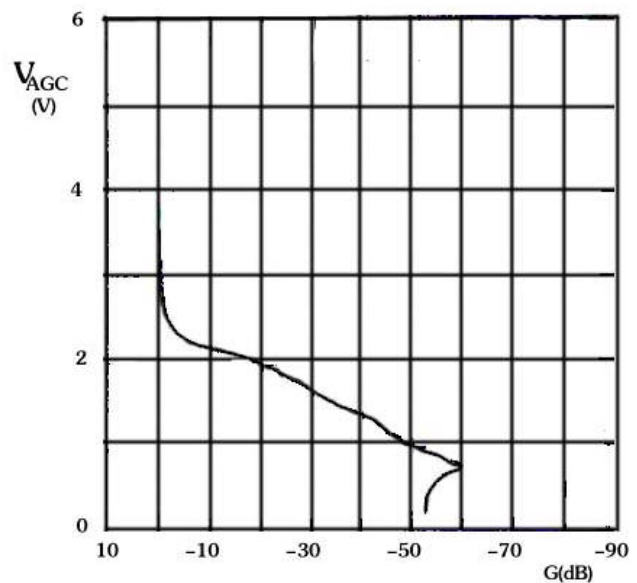


For optimum performance, the adjustment of AGC take over point should be maintained at IF output level of 105 dB μ V (为了得到最佳性能, 调整 AGC 使之保持在高于中频输出水平的 105 dB μ V 处)

9. TYPICAL AGC CURVE (典型 AGC 曲线)

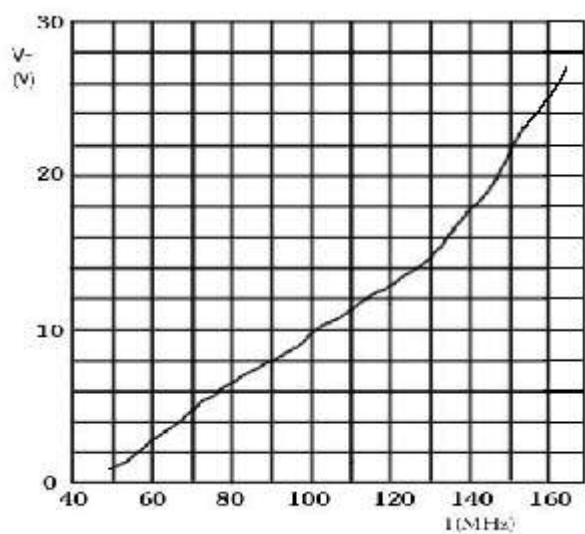


AGC characteristics Channel E2(48.25MHz)

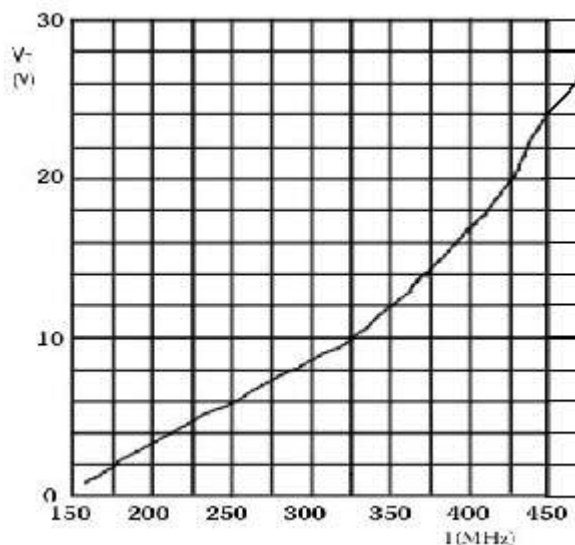


AGC characteristics Channel S8

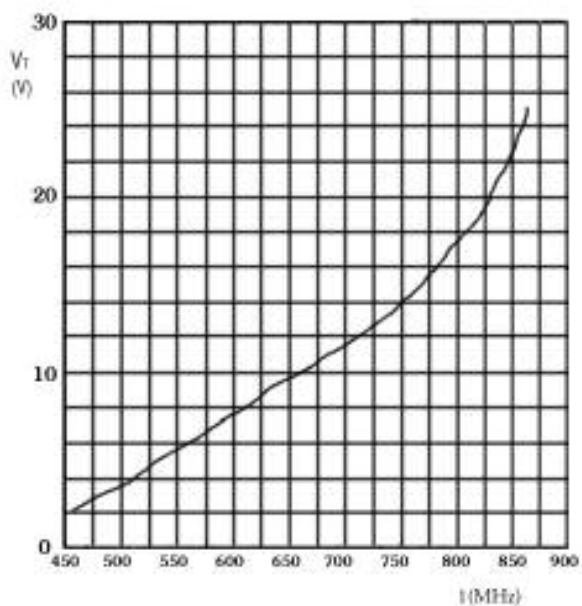
10. TYPICAL TUNING CURVES (标准的调谐曲线)



Low band characteristics (低波段特性)

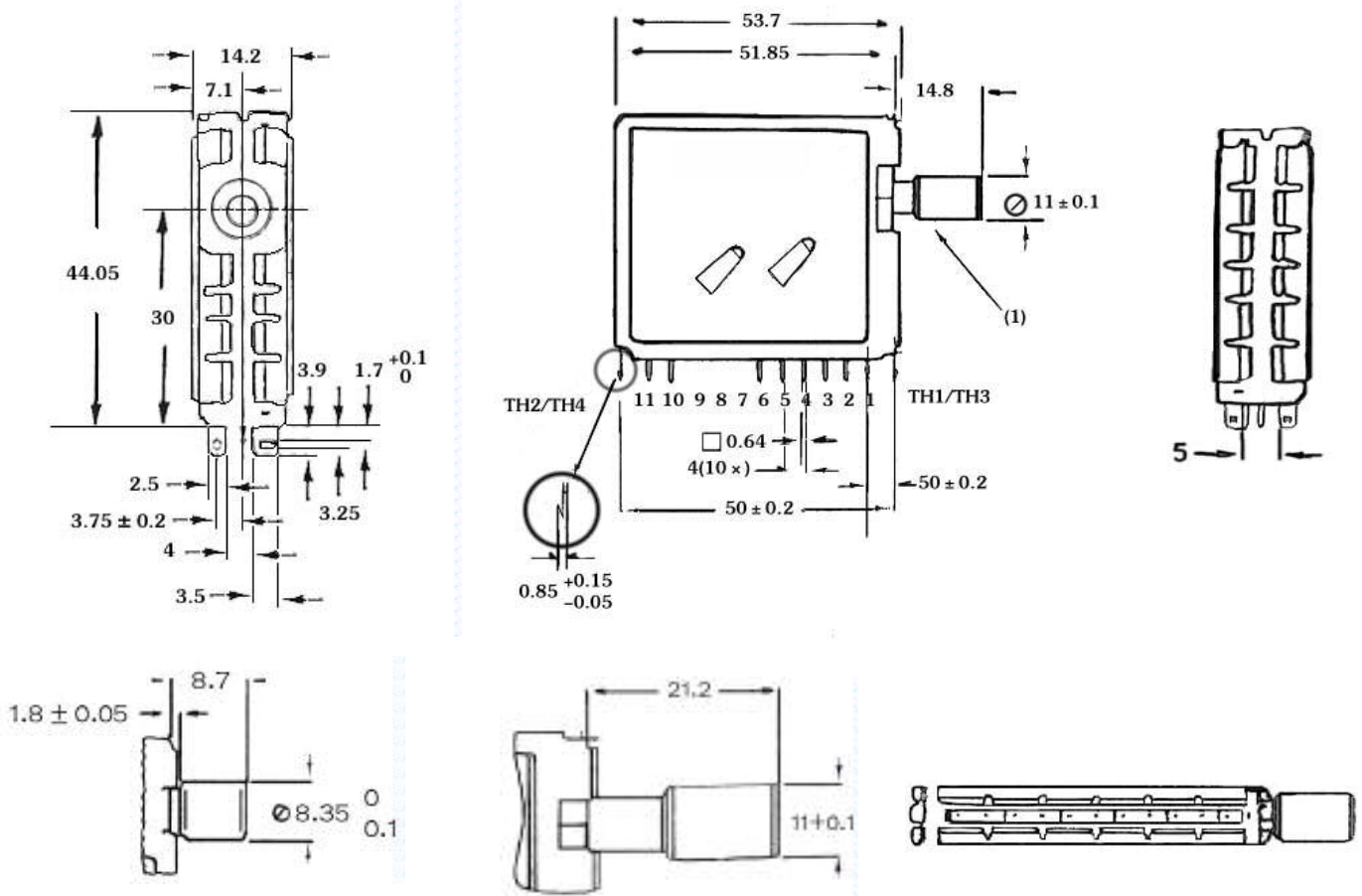


Mid band characteristics (中波段特性)



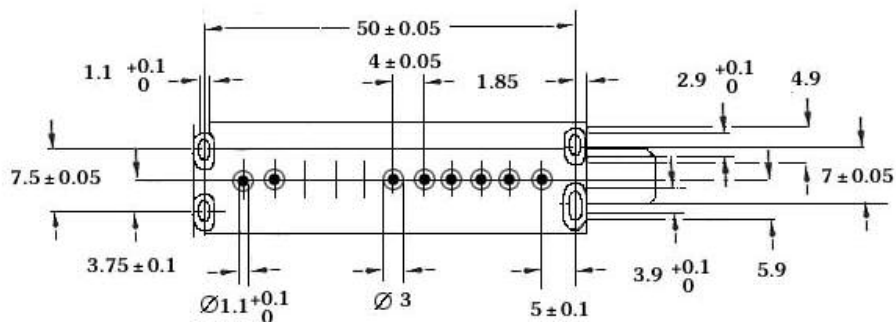
High band characteristics (高波段特性)

11. MECHANICAL DATA (外型尺寸)



Mechanical outline (外型轮廓)

The tuner must be mounted without clearance between the tuner supporting surface and the PCB. When mounted in this way, the tuner must be soldered to the PCB. This can be achieved by pressing the unit vertically on the PCB during soldering. (调谐器必须安装在没有间隙的调谐器支承面和印制线路板之间, 当用这种方法安装时, 调谐器必须焊在印制线路板上。在焊接时把零部件垂直安装在印制线路板上这样就可以完成了)。



印刷电路格设计尺寸参考图

12. DEFINITIONS (此技术规格书定义)

| | |
|--|---|
| Data sheet status (数据状态) | |
| Objective specification (目标说明) | This data sheet contains target or goal specifications for Product development. (这些数据单包含目标或生产发展目标说明书。) |
| Preliminary specification (初步说明) | This data sheet contains preliminary data; supplementary Data may be published later. (这些数据单包含预备数据; 补充数据将以后公布)。 |
| Product specification (产品规格) | This data sheet contains final product specifications (这些数据单包含最终产品规格) |
| Application information (应用信息) | |
| Where application information is given, it is advisory and does not form part of the specification. (它只是提供应用方面信息的建议而不是一定的要求而形成的表格说明书)。 | |

附录 1、电视频道划分表 (中国频道)

图像中频 PIF: 38.00 MHz 伴音中频 SIF: 31.50 MHz

| Band 频段 | Channels 频道 | Picture carrier frequency 图像载频 (MHz) | Sound carrier frequency 伴音载频 (MHz) | Oscillator frequency 本振频率 (MHz) | Band 频段 | Channels 频道 | Picture carrier frequency 图像载频 (MHz) | Sound carrier frequency 伴音载频 (MHz) | Oscillator frequency 本振频率 (MHz) |
|------------|----------------|---|---|--|------------|----------------|---|---|--|
| Low | DS1 | 49.75 | 56.25 | 87.75 | Mid | Z37 | 456.25 | 462.75 | 494.25 |
| | DS2 | 57.75 | 64.25 | 95.75 | | Z38 | 464.25 | 470.75 | 502.25 |
| | DS3 | 65.75 | 72.25 | 103.75 | High | DS13 | 471.25 | 477.75 | 509.25 |
| | DS4 | 77.25 | 83.75 | 115.25 | | DS14 | 479.25 | 485.75 | 517.25 |
| | DS5 | 85.25 | 91.75 | 123.25 | | DS15 | 487.25 | 493.75 | 525.25 |
| | Z1 | 112.25 | 118.75 | 150.25 | | DS16 | 495.25 | 501.75 | 533.25 |
| | Z2 | 120.25 | 126.75 | 158.25 | | DS17 | 503.25 | 509.75 | 541.25 |
| | Z3 | 128.25 | 134.75 | 166.25 | | DS18 | 511.25 | 517.75 | 549.25 |
| | Z4 | 136.25 | 142.75 | 174.25 | | DS19 | 519.25 | 525.75 | 557.25 |
| | Z5 | 144.25 | 150.75 | 182.25 | | DS20 | 527.25 | 533.75 | 565.25 |
| | Z6 | 152.25 | 158.75 | 190.25 | | DS21 | 535.25 | 541.75 | 573.25 |
| | Z7 | 160.25 | 166.75 | 198.25 | | DS22 | 543.25 | 549.75 | 581.25 |
| | Z8 | 224.25 | 230.75 | 262.25 | | DS23 | 551.25 | 557.75 | 589.25 |
| | Z9 | 232.25 | 238.75 | 270.25 | | DS24 | 559.25 | 565.75 | 597.25 |
| Z10 | 240.25 | 246.75 | 278.25 | DS25 | | 607.25 | 613.75 | 645.25 | |
| Z11 | 248.25 | 254.75 | 286.25 | DS26 | | 615.25 | 621.75 | 653.25 | |
| Z12 | 256.25 | 262.75 | 294.25 | DS27 | 623.25 | 629.75 | 661.25 | | |
| Z13 | 264.25 | 270.75 | 302.25 | DS28 | 631.25 | 637.75 | 669.25 | | |
| Z14 | 272.25 | 278.75 | 310.25 | DS29 | 639.25 | 645.75 | 677.25 | | |
| Z15 | 280.25 | 286.75 | 318.25 | DS30 | 647.25 | 653.75 | 685.25 | | |
| Z16 | 288.25 | 294.75 | 326.25 | DS31 | 655.25 | 661.75 | 693.25 | | |
| Z17 | 296.25 | 302.75 | 334.25 | DS32 | 663.25 | 669.75 | 701.25 | | |
| Z18 | 304.25 | 310.75 | 342.25 | DS33 | 671.25 | 677.75 | 709.25 | | |
| Z19 | 312.25 | 318.75 | 350.25 | DS34 | 679.25 | 685.75 | 717.25 | | |
| Z20 | 320.25 | 326.75 | 358.25 | DS35 | 687.25 | 693.75 | 725.25 | | |
| Z21 | 328.25 | 334.75 | 366.25 | DS36 | 695.25 | 701.75 | 733.25 | | |
| Z22 | 336.25 | 342.75 | 374.25 | DS37 | 703.25 | 709.75 | 741.25 | | |
| Z23 | 344.25 | 350.75 | 382.25 | DS38 | 711.25 | 717.75 | 749.25 | | |
| Z24 | 352.25 | 358.75 | 390.25 | DS39 | 719.25 | 725.75 | 757.25 | | |
| Z25 | 360.25 | 366.75 | 398.25 | DS40 | 727.25 | 733.75 | 765.25 | | |
| Z26 | 368.25 | 374.75 | 406.25 | DS41 | 735.25 | 741.75 | 773.25 | | |
| Z27 | 376.25 | 382.75 | 414.25 | DS42 | 743.25 | 749.75 | 781.25 | | |
| Z28 | 384.25 | 390.75 | 422.25 | DS43 | 751.25 | 757.75 | 789.25 | | |
| Z29 | 392.25 | 398.75 | 430.25 | DS44 | 759.25 | 765.75 | 797.25 | | |
| Z30 | 400.25 | 406.75 | 438.25 | DS45 | 767.25 | 773.75 | 805.25 | | |
| Z31 | 408.25 | 414.75 | 446.25 | DS46 | 775.25 | 781.75 | 813.25 | | |
| Z32 | 416.25 | 422.75 | 454.25 | DS47 | 783.25 | 789.75 | 821.25 | | |
| Z33 | 424.25 | 430.75 | 462.25 | DS48 | 791.25 | 797.75 | 829.25 | | |
| Z34 | 432.25 | 438.75 | 470.25 | DS49 | 799.25 | 805.75 | 837.25 | | |
| Z35 | 440.25 | 446.75 | 478.25 | DS50 | 807.25 | 813.75 | 845.25 | | |
| Z36 | 448.25 | 454.75 | 486.25 | DS51 | 815.25 | 821.75 | 853.25 | | |
| | | | | DS52 | 823.25 | 829.75 | 861.25 | | |
| | | | | DS53 | 831.25 | 837.75 | 869.25 | | |
| | | | | DS54 | 839.25 | 845.75 | 877.25 | | |
| | | | | DS55 | 847.25 | 853.75 | 885.25 | | |
| | | | | DS56 | 855.25 | 861.75 | 893.25 | | |
| | | | | DS57 | 863.25 | 869.75 | 901.25 | | |

附录 2、电视频道划分表 (CCIR)

图像中频 PIF: 38.9 MHz 伴音中频 SIF: 33.4 MHz

| Band 频段 | Channels 频道 | Picture carrier frequency 图像载频 (MHz) | Sound carrier frequency 伴音载频 (MHz) | Oscillator frequency 本振频率 (MHz) | Band 频段 | Channels 频道 | Picture carrier frequency 图像载频 (MHz) | Sound carrier frequency 伴音载频 (MHz) | Oscillator frequency 本振频率 (MHz) |
|------------|----------------|---|---|--|------------|----------------|---|---|--|
| Low | E2 | 48.25 | 53.75 | 87.15 | Mid | S38 | 439.25 | 444.75 | 478.15 |
| | E3 | 55.25 | 60.75 | 94.15 | | S39 | 447.25 | 452.75 | 486.15 |
| | E4 | 62.25 | 67.75 | 101.15 | | S40 | 455.25 | 460.75 | 494.15 |
| | X | 69.25 | 74.75 | 108.15 | | S41 | 463.25 | 468.75 | 502.15 |
| | Y | 76.25 | 81.75 | 115.15 | E21 | 471.25 | 476.75 | 510.15 | |
| | Z | 83.25 | 88.75 | 122.15 | E22 | 479.25 | 484.75 | 518.15 | |
| | Z+1 | 90.25 | 95.75 | 129.15 | E23 | 487.25 | 492.75 | 526.15 | |
| | Z+2 | 97.25 | 102.75 | 136.15 | E24 | 495.25 | 500.75 | 534.15 | |
| | S1 | 105.25 | 110.75 | 144.15 | E25 | 503.25 | 508.75 | 542.15 | |
| | S2 | 112.25 | 117.75 | 151.15 | E26 | 511.25 | 516.75 | 550.15 | |
| | S3 | 119.25 | 124.75 | 158.15 | E27 | 519.25 | 524.75 | 558.15 | |
| | S4 | 126.25 | 131.75 | 165.15 | E28 | 527.25 | 532.75 | 566.15 | |
| | S5 | 133.25 | 138.75 | 172.15 | E29 | 535.25 | 540.75 | 574.15 | |
| | S6 | 140.25 | 145.75 | 179.15 | E30 | 543.25 | 548.75 | 582.15 | |
| | S7 | 147.25 | 152.75 | 186.15 | E31 | 551.25 | 556.75 | 590.15 | |
| | S8 | 154.25 | 159.75 | 193.15 | E32 | 559.25 | 564.75 | 598.15 | |
| | S9 | 161.25 | 166.75 | 200.15 | E33 | 567.25 | 572.75 | 606.15 | |
| | S10 | 168.25 | 173.75 | 207.15 | E34 | 575.25 | 580.75 | 614.15 | |
| | Mid | E5 | 175.25 | 180.75 | 214.15 | E35 | 583.25 | 588.75 | 622.15 |
| | | E6 | 182.25 | 187.75 | 221.15 | E36 | 591.25 | 596.75 | 630.15 |
| E7 | | 189.25 | 194.75 | 228.15 | E37 | 599.25 | 604.75 | 638.15 | |
| E8 | | 196.25 | 201.75 | 235.15 | E38 | 607.25 | 612.75 | 646.15 | |
| E9 | | 203.25 | 208.75 | 242.15 | E39 | 615.25 | 620.75 | 654.15 | |
| E10 | | 210.25 | 215.75 | 249.15 | E40 | 623.25 | 628.75 | 662.15 | |
| E11 | | 217.25 | 222.75 | 256.15 | E41 | 631.25 | 636.75 | 670.15 | |
| E12 | | 224.25 | 229.75 | 263.15 | E42 | 639.25 | 644.75 | 678.15 | |
| S11 | | 231.25 | 236.75 | 270.15 | E43 | 647.25 | 652.75 | 686.15 | |
| S12 | | 238.25 | 243.75 | 277.15 | E44 | 655.25 | 660.75 | 694.15 | |
| S13 | | 245.25 | 250.75 | 284.15 | E45 | 663.25 | 668.75 | 702.15 | |
| S14 | | 252.25 | 257.75 | 291.15 | E46 | 671.25 | 676.75 | 710.15 | |
| S15 | | 259.25 | 264.75 | 298.15 | E47 | 679.25 | 684.75 | 718.15 | |
| S16 | | 266.25 | 271.75 | 305.15 | E48 | 687.25 | 692.75 | 726.15 | |
| S17 | | 273.25 | 278.75 | 312.15 | E49 | 695.25 | 700.75 | 734.15 | |
| S18 | | 280.25 | 285.75 | 319.15 | E50 | 703.25 | 708.75 | 742.15 | |
| S19 | | 287.25 | 292.75 | 326.15 | E51 | 711.25 | 716.75 | 750.15 | |
| S20 | | 294.25 | 299.75 | 333.15 | E52 | 719.25 | 724.75 | 758.15 | |
| S21 | | 303.25 | 308.75 | 342.15 | E53 | 727.25 | 732.75 | 766.15 | |
| S22 | | 311.25 | 316.75 | 350.15 | E54 | 735.25 | 740.75 | 774.15 | |
| S23 | | 319.25 | 324.75 | 358.15 | E55 | 743.25 | 748.75 | 782.15 | |
| S24 | | 327.25 | 332.75 | 366.15 | E56 | 751.25 | 756.75 | 790.15 | |
| S25 | | 335.25 | 340.75 | 374.15 | E57 | 759.25 | 764.75 | 798.15 | |
| S26 | | 343.25 | 348.75 | 382.15 | E58 | 767.25 | 772.75 | 806.15 | |
| S27 | | 351.25 | 356.75 | 390.15 | E59 | 775.25 | 780.75 | 814.15 | |
| S28 | | 359.25 | 364.75 | 398.15 | E60 | 783.25 | 788.75 | 822.15 | |
| S29 | | 367.25 | 372.75 | 406.15 | E61 | 791.25 | 796.75 | 830.15 | |
| S30 | | 375.25 | 380.75 | 414.15 | E62 | 799.25 | 804.75 | 838.15 | |
| S31 | | 383.25 | 388.75 | 422.15 | E63 | 807.25 | 812.75 | 846.15 | |
| S32 | | 391.25 | 396.75 | 430.15 | E64 | 815.25 | 820.75 | 854.15 | |
| S33 | | 399.25 | 404.75 | 438.15 | E65 | 823.25 | 828.75 | 862.15 | |
| S34 | | 407.25 | 412.75 | 446.15 | E66 | 831.25 | 836.75 | 870.15 | |
| S35 | | 415.25 | 420.75 | 454.15 | E67 | 839.25 | 844.75 | 878.15 | |
| S36 | | 423.25 | 428.75 | 462.15 | E68 | 847.25 | 852.75 | 886.15 | |
| S37 | | 431.25 | 436.75 | 470.15 | E69 | 855.25 | 860.75 | 894.15 | |