

## 2.4GHz Wireless Digital Audio Modules

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### Product Description

The EB352x wireless digital audio transmission module is the highly integrated, small form factor wireless audio solution delivering the CD quality sound effects. By adopting the latest 2.4G RF and digital transmission technologies, the modules can maintain a robust RF link and work against various RF interferences. By adopting the 2.4G ISM band, the module is qualified to ship around global market. Also, the flexible design of the module can offer extra custom functions that can save the total system cost and reduce the time to market.

### Applications

- Speakers
- Headphones
- Surround Speakers
- Microphones
- CD Player, DVD Player
- Music Instruments



### Features

- 2.4GHz, 125 Channels
- Digital transmission with robust communication protocol.
- CD sound quality, 20Hz ~ 20 KHz audio frequency response
- Highly integrated, small form factor
- Low latency (<3ms), good for surround speakers.
- Low power consumption for portable applications
- Power management function for battery powered applications
- Auto muting function when suffering interference or at poor receiving conditions
- Supporting auto channel scan
- 10dBm RF output, range is up to 30 meters (L.O.S.)
- Flexible design, custom functions supported

**Electrical Specification**

	Description	EB352TP Transmitter	EB352R Receiver
<b>General</b>	Supply voltage	2.7V ~ 3.3V DC	2.7V ~ 3.3V DC
	Supply current	80mA (with PA)	50mA (50mW Audio )
	Operation temperature	-10 ~ +60	-10 ~ +60
<b>RF</b>	RF IC Frequency	2400 ~ 2524MHZ	2400 ~ 2524MHZ
	RF IC Channels	125 Channels	125 Channels
	Modulation	GFSK	GFSK
	Data rate	1M bps	1M bps
	Channel number	125	125
	Channel interval	1MHz	1M
	Frequency stability	±156KHz	±156KHz
	TX Power	+10dBm	
	RX Sensitivity		-85 dBm
	Module used Frequency range	2400 ~ 2480MHz	2400 ~ 2480MHz
	Module used Channels	16 Channels	16 Channels
	Module Channel Interval	5MHz	5MHz
	RF Range	50m LOS outdoor	
<b>Audio</b>	Input level	1.0Vrms	
	Input impedance	10K Ohm	
	Output Power		30mW RL=32
			50mW RL=16
	Output impedance		1K Ohm
	Output/input gain	1:1	
	Frequency Response	20Hz ~ 20KHz( -3dB)	
	Latency	< 3ms	
	Sampling	44.1KHz, 16bit	
	S/N ratio	80dB	
	THD	1.2% @ 1KHz	
	Dynamic range	90dB	
Channel Separation	65dB		

Table [1]: Electrical Specification

### EB352TP Transmitter

EB352TP is the 2.4G wireless digital audio transmitter. The pin assignment is as Table[2]. EB352TP has 16 RF channel, the channel can be changed by a key connect to the Pin 3. Each key input advance to the next channel, and cycle to the 1<sup>st</sup> channel if the 16<sup>th</sup> channel reached. The LED is used to display working status; this can be modified to customer requirements. EB352TP has 2 spare I/O ports, also can be used to add some custom function required by the customer.

The EB352TP features power management functions. If there is no audio signal input within 10s, the module will enter the standby mode with a standby current below 1mA. It will automatic exit the standby mode within 1ms if the audio signal input applied again. This is quite necessarily for the battery power-ed applications. The module also monitors the supply power voltage, and alarms by the LED if the voltage is low. This may be used to indicate the battery low condition.

No.	PIN	I/O	Description
1	GND	NA	Power ground
2	VCC	NA	2.7V ~ 3.3V DC input
3	KEY	I	Channel selection, push to next channel
4	LED	O	LED output Pin, displaying module working status.
5	IO	I/O	General purpose I/O, for custom function
6	IO	I/O	General purpose I/O, for custom function
7	L	I	Audio L channel input, 1Vrms
8	R	I	Audio R channel input, 1Vrms

Table [2]: EB352TP Pin Assignment

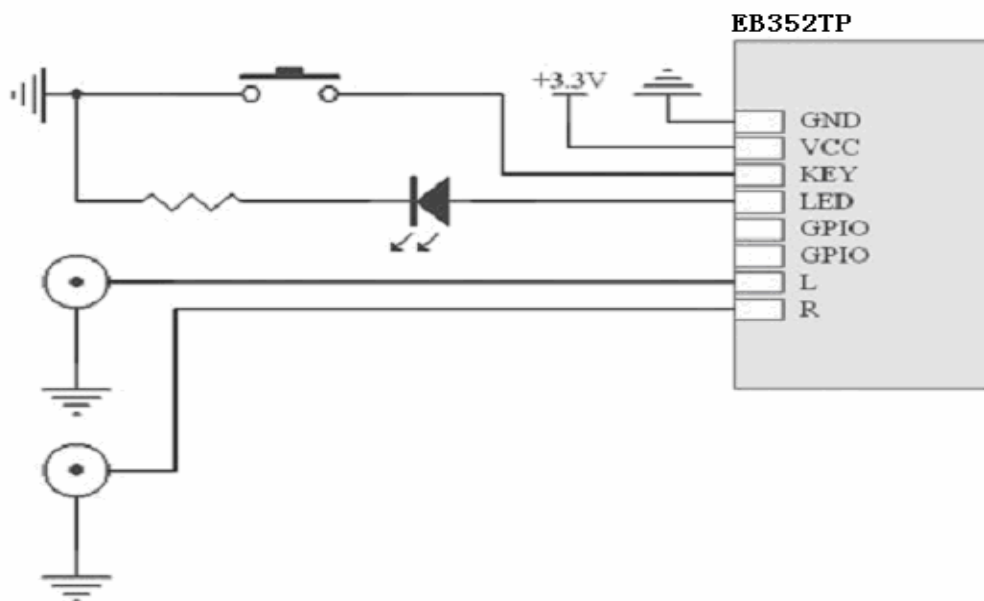


Figure [2]: EB352TP Interface

### EB352R Receiver

The EB352R is 2.4G wireless digital audio receiver. The pin assignment is as Table[3]. EB352R has 16 RF channels. EB352R has channel auto scan function. If there is no RF signal within 1s, the EB352R will enter the auto search mode to search the available RF channel. The KEY can act as a manual channel scan, push the KEY will search the next available channel even the current channel is working.

No.	PIN	I/O	Description
1	GND	NA	Power ground
2	VCC	NA	2.7V ~ 3.3V DC input
3	KEY	I	Channel selection, push to next channel
4	LED	O	LED output Pin, displaying module working status.
5	VOL-	I	Volume control key
6	VOL+	I	Volume control key
7	L	I	Audio L channel input, 1Vrms
8	R	I	Audio R channel input, 1Vrms

Table [3]: EB352R Pin Assignment

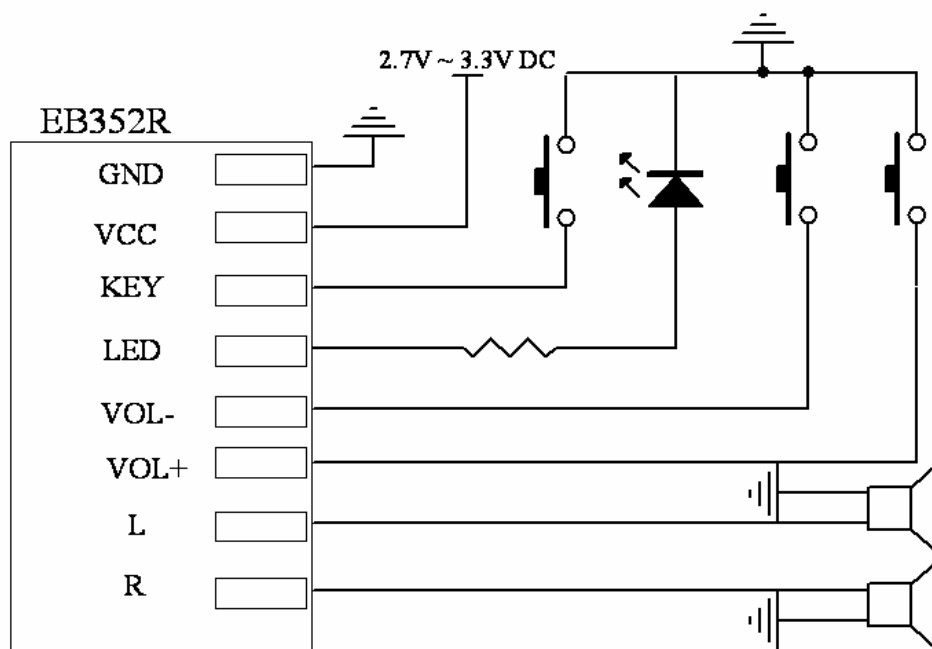


Figure [3]: EB352R Interface

To get a more cleanly audio output for some high-end applications like wireless microphone, wireless speakers, once can add the following active low pass filter to the EB352R output. This can help to further reduce the digital noise caused by the sigma-delta DAC. This is a 3 pole active low pass filter with a gain of 2.0, and a 20 KHz stop band.

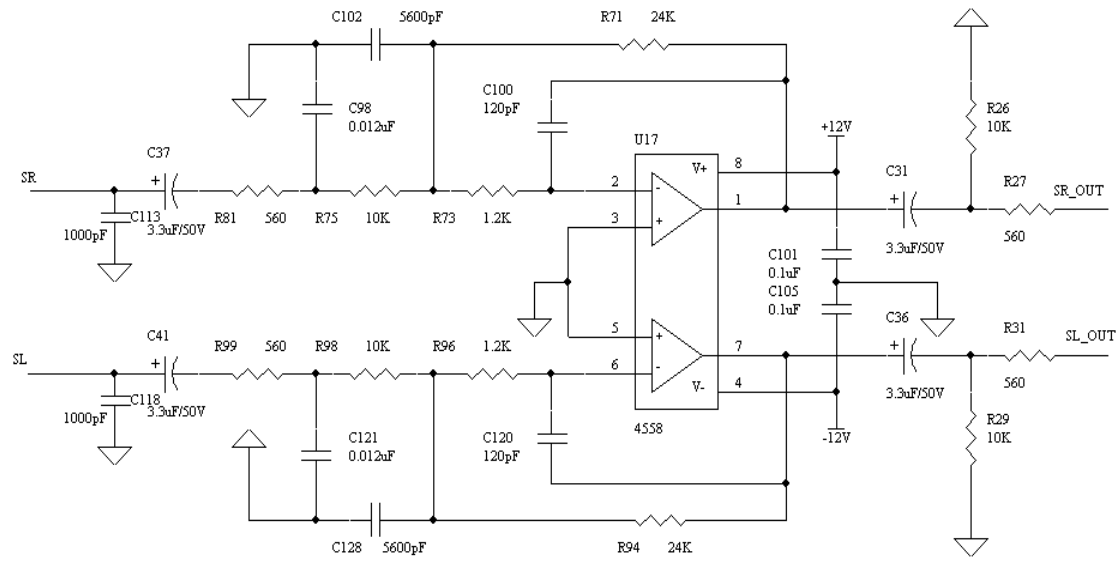


Figure [4]: Low-pass Filter Schematic for Receiver (Optional)

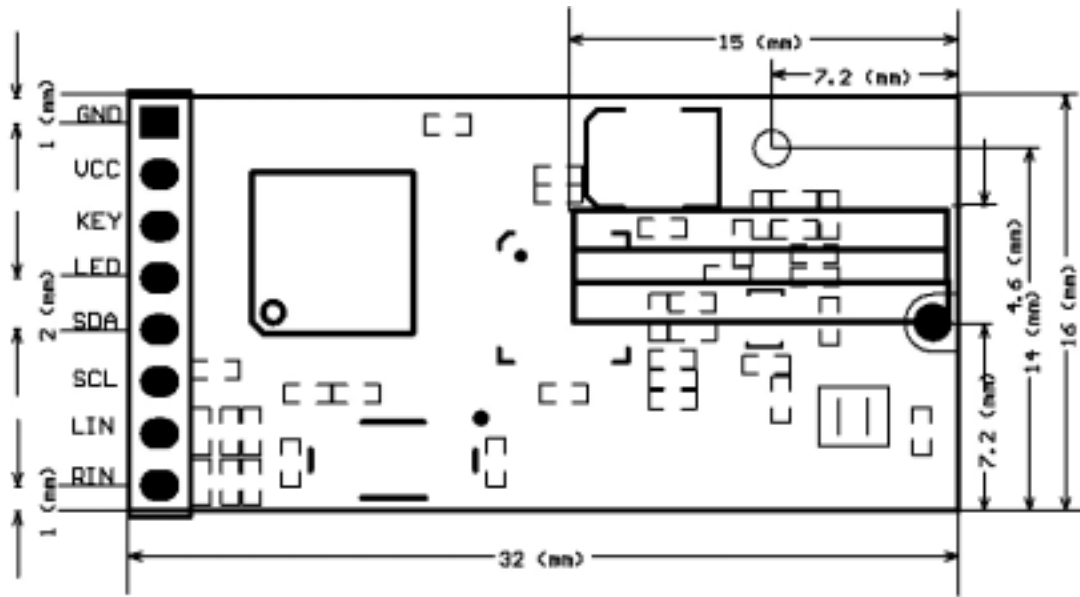


Figure [5]: B352TP Outline

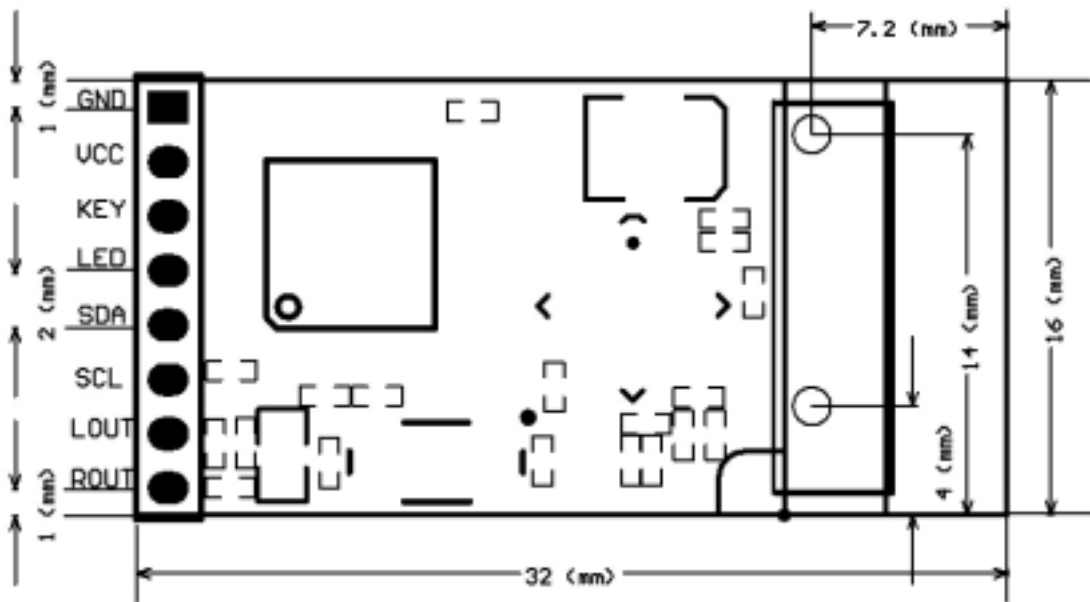


Figure [6]: B352R Outline

Fre-Response curve

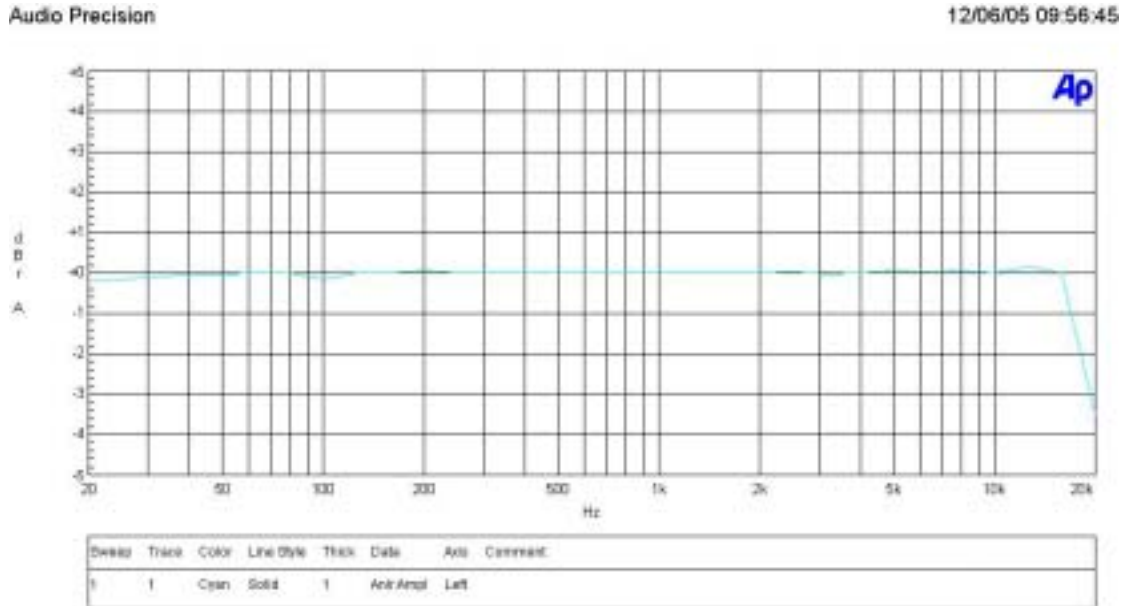


Figure [7]: Frequency Responce of Left

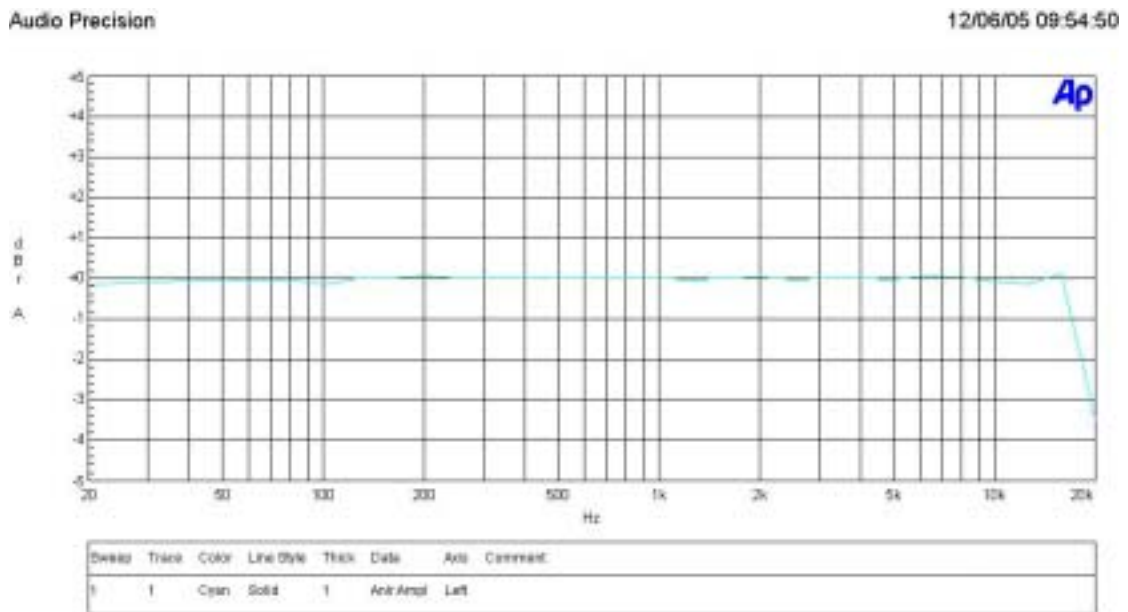


Figure [8]: Frequency Responce of Right

Channel Separation Test Curve

Audio Precision

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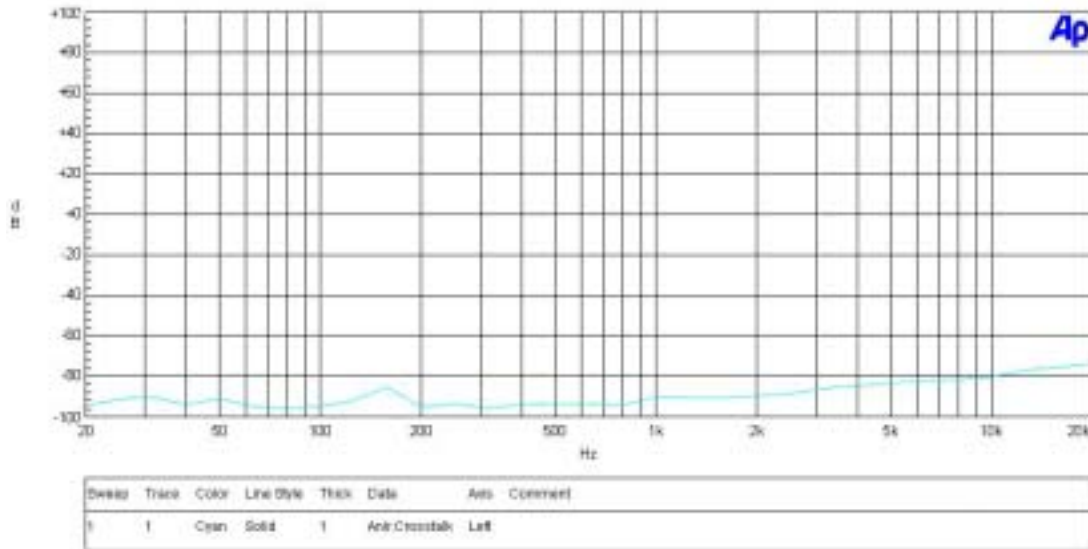


Figure [9]: Crosstalk of left

Audio Precision

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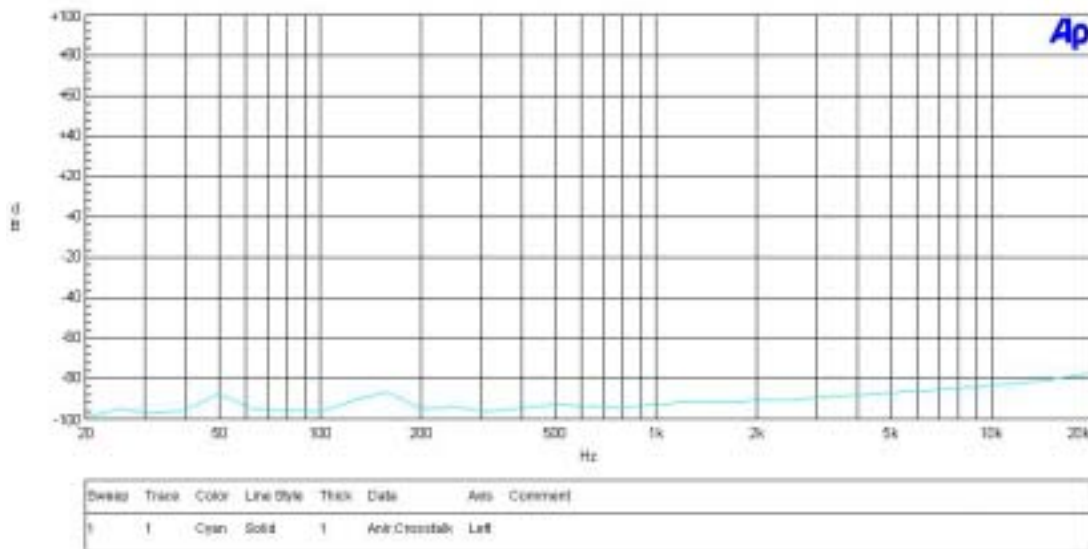


Figure [10]: Crosstalk of right

Ordering Information

Enbia ID.	Description
EB350TP	2.4G Wireless Digital Audio Transmitter
EB350R	2.4G Wireless Digital Audio Receiver
EB352TPm	2.4G Wireless Digital Audio Transmitter for Microphone
EB352Rm	2.4G Wireless Digital Audio Receiver for Microphone

**Notes:**