

Easily Remove LTE Interference

As the 4G mobile communication is becoming more and more common today all over the world, LTE data transmission may sometimes interfere with normal digital terrestrial TV reception. LTE channels are located in the frequency spectrum just above terrestrial TV channels. You may encounter such interference in the form of a loss of sound, blocky or pixelated images or loss of some channels. These symptoms might be experienced occasionally or all of the time.

Of course, there might be more causes of such symptoms, for example: misaligned antenna or unreliable coax cable connections. However, if your antenna is

aimed correctly, cable installation also looks OK, and the problem exists first of all for higher frequency TV channels (higher channel number), LTE transmissions should be suspected.

Fortunately, there is a very simple solution that everybody can use: passive low pass filter inserted in a cable connection between an aerial and a DVB-T or DVB-T2 receiver. We have described one such filter: SPAUN SMF 790 LTE stop band filter in the 04-05/2012 issue of TELE-satellite. Since then, SPAUN have expanded their product line by adding three other models: SLTE 30, SLTE 60 and SLTE 90, and we decided to have a closer look at them.

As always with SPAUN products, they are perfectly finished off, have very clear markings and every product has a leaflet with technical advices and short form product specification. The products differ in connector types: F or IEC and female-female or female-male configuration. So, depending on your installation you may want to choose this or that model. They also differ in frequency response.

Let's first look at the SLTE 30: this filter does not have a very sharp roll-off, in other words, its signal attenuation increases with frequency at a moderate rate. However, it can reach more than 60 dB attenuation. It has a classical low pass filter characteristics. The filter has a female F connector on one end and male F connector on the other. So, it is possible to install it directly on your



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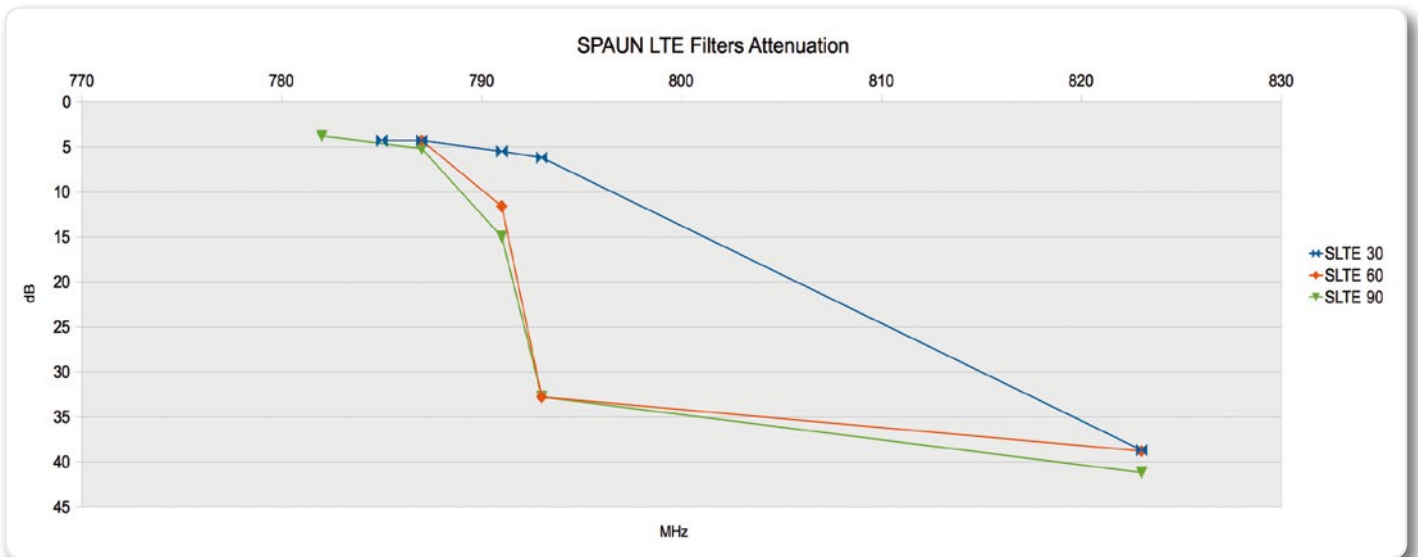
Tested & Recommended Product by
TELE-audiovision Magazine
The World's Leading Digital TV Industry Publication



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SPAUN SLTE 30, SLTE 60 and SLTE 90
Effectively stops interferences from
LTE/4G mobile signals

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terrestrial receiver antenna terminal without adding any additional coax cable.

Next is the SLTE 60: it offers very steep edge amplitude response right above 790 MHz. However, it is not a low pass filter but a band stop filter. So, above about 850 MHz its attenuation becomes small again. It has IEC connectors and due to that it is well prepared to be added to the TV receivers equipped with this type of antenna connector. Sometimes some of signal distribution components are equipped with this type of connector and then SLTE 60 is a very convenient choice.

Finally, the SLTE 90 is a low pass filter with extremely steep characteristics. According to SPAUN specification, SLTE 90 performance is really the best among these three models. It has female F connectors

on both ends, so in most applications you will have to add an additional short coax cable with male F connectors to hook it up.

In order to test the filters, we created a setup consisting of a wideband noise generator and a terrestrial TV spectrum analyzer. We took a number of screen shots. We maintained the same frequency span setting so that you could see the difference in the steepness of filter characteristics

among the filter models. As expected, both SLTE 60 and SLTE 90 had very sharp roll-off while the SLTE 30 filter had a moderate one (Figure 1 through 7).

Then, we measured all the filters at the frequencies for which their attenuation had been specified by SPAUN. We got results very close to the manufacturer's data. We must note here that in some measurement points filter attenuation was so deep that our TV analyzer was not able to measure it accurately. For example, our analyzer measured attenuation "> 41.2 dB" at the point where SPAUN specification read 45 dB. Simply our general purpose TV signal analyzer was not able to measure characteristics of high quality filter at points

of high attenuation. In this case, we left 41.2 dB as a measurement result but we had a good reason to believe that indeed those 45 dB were achieved for SLTE 90 at 823 MHz.

In the graph, we present the measurement results of all three filters at the frequencies in which we compared their performance with the specification. Also here you can easily see the difference among the filter models. Please note though that straight line interpolation between the measured values does not reflect actual filter characteristics. The purpose of those straight line segments is just to make it easier to identify which measurement point belongs to which filter model. The actual characteristics are presented in the analyzer screenshots.

Finally, we took the analyzer screen shots showing all three filters response in the full analyzer bandwidth: up to 1 GHz. In these pictures, it is clearly visible that the SLTE 60 is a band rejecting filter while the other two are low pass filters. If you take a closer look, you will also notice that the SLTE 30 has smoother transition from pass band to stop band





■ The SLTE 30 is easy to install: just plug it directly into the antenna input of your terrestrial receiver.

EXPERT
OPINION

SPAUN SLTE 30, SLTE 60 & SLTE 90
LTE Filters

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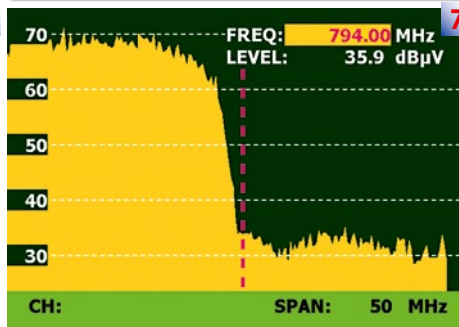
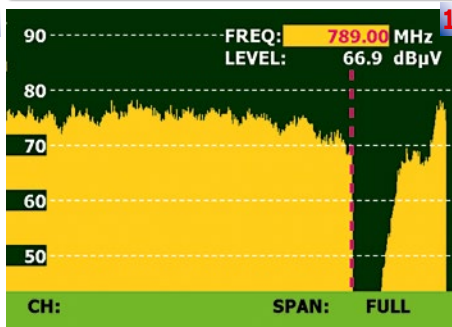
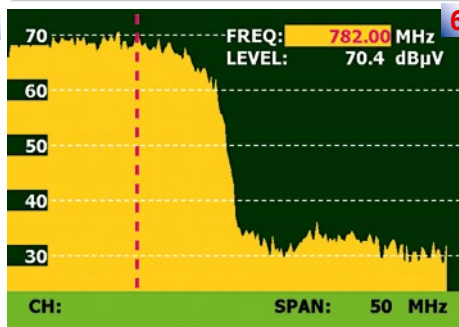
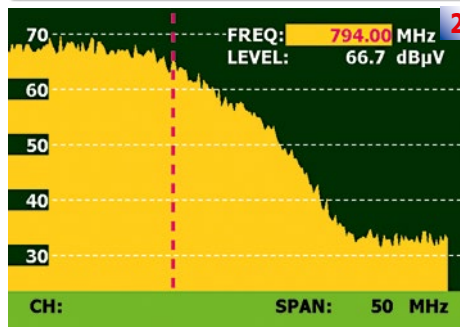
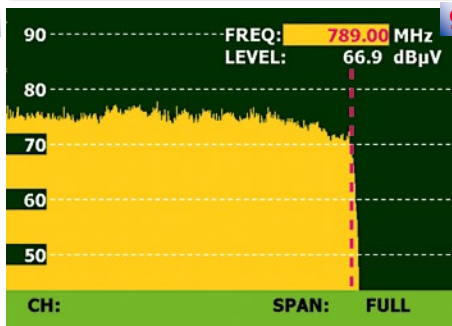
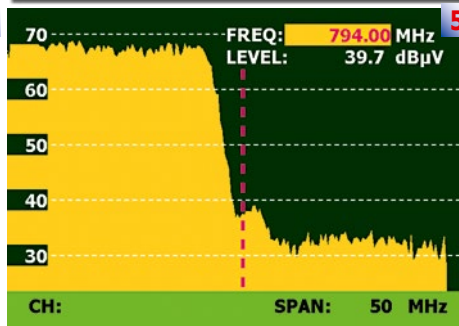
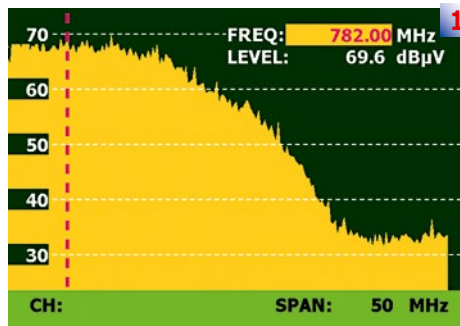
- Electrical parameters meet manufacturer's specifications
- Very high attenuation in stop band (LTE band)
- Very solid workmanship and attention to detail

-

- None

than the other two devices. All these facts are perfectly in line with SPAUN specifications.

We can conclude that these filters perfectly help to reduce any LTE interferences. With the three different models and their different connectors you can choose the perfect filter for your existing setup.



1. Frequency Response of SLTE 30 at 782 MHz
2. Frequency Response of SLTE 30 at 794 MHz
3. Frequency Response of SLTE 30 at 813 MHz
4. Frequency Response of SLTE 60 at 782 MHz
5. Frequency Response of SLTE 60 at 794 MHz
6. Frequency Response of SLTE 90 at 782 MHz
7. Frequency Response of SLTE 90 at 794 MHz
8. Full Bandwidth Spectrum with the STLE30
9. Full Bandwidth Spectrum with the STLE60
10. Full Bandwidth Spectrum with the STLE90

SPAUN SLTE 30 SLTE 60 SLTE 90



Low Pass and Band Stop Filters

- *available with different connectors*
- *both low pass and band stop filter types available*
- *easy installation directly at receiver or tv-set*
- *perfect workmanship*



SPAUN SLTE 30, SLTE 60 & SLTE 90
LTE Filters

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