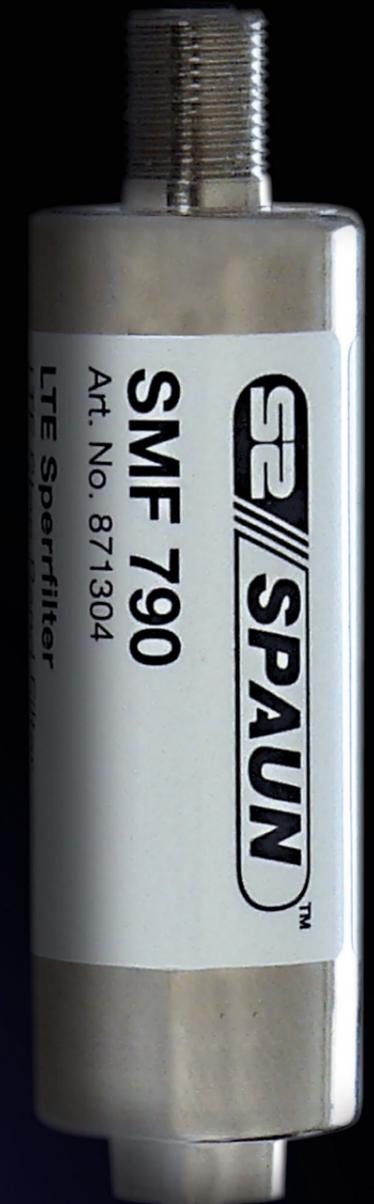


# SPAUN SMF 790 LTE Stop Band Filter



■ The SPAUN SMF 790 filter inserted next to the antenna input of a DVB-T receiver. The filter effectively blocks any unwanted signals from nearby LTE mobile phone and data transmitter



- safely blocks interference from LTE networks
- very easy to install
- performance better than its specifications
- small product but very effective



# Do Not Allow LTE Data Transmissions To Interfere With Your DVB-T/T2 Reception

3GPP LTE wireless high speed data transmissions for mobile phones and data terminals may in some circumstances interfere with regular terrestrial TV reception. That's because the highest part of the classical terrestrial TV range is today dedicated for LTE rather than DVB-T/T2. As digital TV requires much less bandwidth than analog TV to transmit the same number of TV channels, it became possible to dedicate part of its original frequency range for high speed data transmissions. But because most of the existing antenna installations pass the whole frequency range up to 862 MHz, LTE signals may find their way into your DVB-T/T2 receiver's input.

Despite the fact that LTE data is transmitted in a different frequency range than DVB-T/T2 terrestrial signals, if they are strong enough they can interfere with regular TV reception. If LTE signals are strong and you do not use any filter, some intermodulation might take place in your receiver's demodulator. Spurious signals created due to intermodulation will manifest themselves as excessive noise degrading the quality of the

desired signals. You can easily detect this with an analog signal (unwanted additional white/black dots and audio noise). With a digital receiver you can detect it by measuring signal quality. If signal quality measured by your receiver changes over time, or worse your receiver from time to time loses completely the ability to process video and audio, one of possible causes can be interference created by LTE signals intermodulating with your receiver's input. It is very easy to confirm such hypothesis: just connect the SMA 790 and observe if signal quality improves.

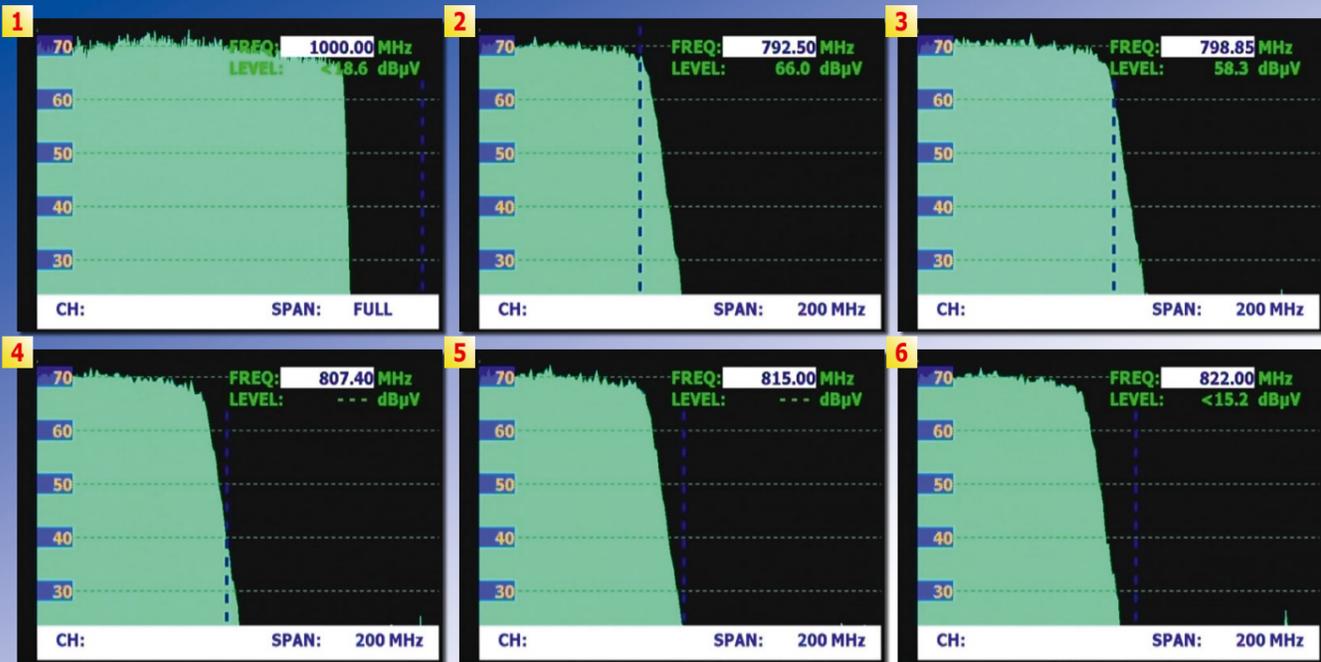
For the best results, the SPAUN SMF 790 filter should be placed before the first active component of the reception system. An active

component is an amplifier, a multiswitch, a receiver or any equipment that requires electric power to operate. In simple installations with no additional components, you connect the filter anywhere between the antenna and the receiver. Probably it will be more practical to put it next to the receiver. In more complex installation, the filter should be inserted before the amplifier or the multiswitch whatever happens first when looking from the antenna side. One filter should be enough for the whole network if only your signal distribution equip-

ment is well shielded and the connectors are firmly attached to coaxial cable ends.

If the antenna has a built-in amplifier, you will have no choice but to connect the filter at the antenna output. The results could be slightly worse because LTE signals will have the opportunity to mix up with terrestrial TV signals in the antenna amplifier and can intermodulate one another. However, such not desired intermodulation should be minimal in well designed amplifiers having high dynamic range. So even if you have an active antenna with a built-in am-





1. The SPAUN SMF 790 has a very sharp roll off at the higher end of the terrestrial/cable frequency range.
2. Up to 792 MHz there is practically no attenuation.
3. At approx. 799 MHz the filter has a 10 dB attenuation.
4. Attenuation increases to 30 dB at approximately 807 MHz.
5. Full 50 dB attenuation is reached at 815 MHz.
6. In accordance with specifications, there is more than 50 dB attenuation at 822 MHz and above

plifier, it will still make sense to connect the SMA filter before the next active component (amplifier, multiswitch, receiver).

According to its specifications, it should pass the range from 5 through 790 MHz with minimum attenuation while severely attenuate the frequency band from 822 through 1000 MHz (where LTE signals are transmitted). The range from 790 to 822 MHz is a transition region where attenuation gradually changes from single decibels to over 50 dB.

In order to check whether the SMF 790 complies with the published specifications, we used a noise generator and a signal analyzer capable of measuring the signal up to 1000 MHz. Perhaps the term "noise generator" does not sound as a measurement equipment to non-specialists but in fact it is a very useful device. When combined with a spectrum

analyzer it produces nice spectral views that reveal the true frequency characteristics of a filter.

As our measurements revealed (and you can see that on the attached screen shots), the SMF 790 starts rolling off at about 792 MHz and reaches its maximum attenuation at 815 MHz. So it is even sharper than the specifications promise. We confirm that it attenuates signals more than 50 dB in the range 815-1000 MHz. We took two additional measurements at -10 dB and -30 dB. As this happened at 799 and 807 MHz, we can calculate that the filter roll-off is: 20 dB per 8 MHz. That is a very steep transfer characteristic what you can evidently see in our screen shots. We can do nothing but praise SPAUN for such excellent performance! It safely blocks the LTE signals from entering your DVB-T/T2 terrestrial receiver.



TECHNICAL DATA	
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Model	SMF 790
Function	LTE Stop Band Filter
Pass band	5-790 MHz
Pass Band Attenuation	1 dB typ.
Stop Band	822-1000 MHz
Stop Band Attenuation	50 dB typ.

### Expert Opinion

**+** Very steep frequency characteristics  
Low attenuation in the pass band and high attenuation in the stop band  
Actual performance better than specification

**-** None

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