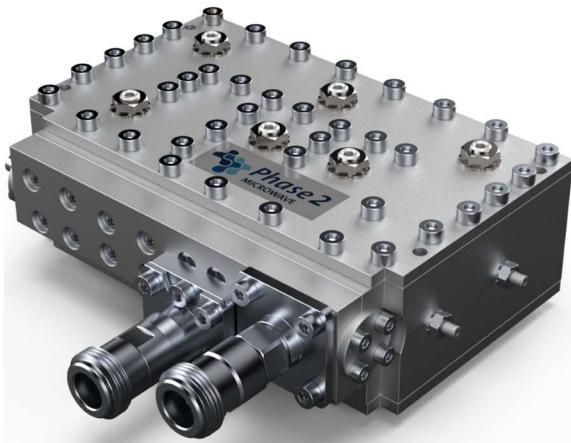


## Case Study-Q525 – Protecting the 2.6GHz LTE band from Radar transmissions at 2.7GHz.



### Overview

The LTE band 7 runs from 2.5 to 2.69GHz while the important S band radar band is 2.7 to 3.1GHz. The radar transmissions, which can be up to a 1 megawatt peak are only 10MHz away from the LTE band.

### Challenge

A high power filter with a very sharp cut off is required to protect the LTE band and allow as much as possible of the radar band to be used.

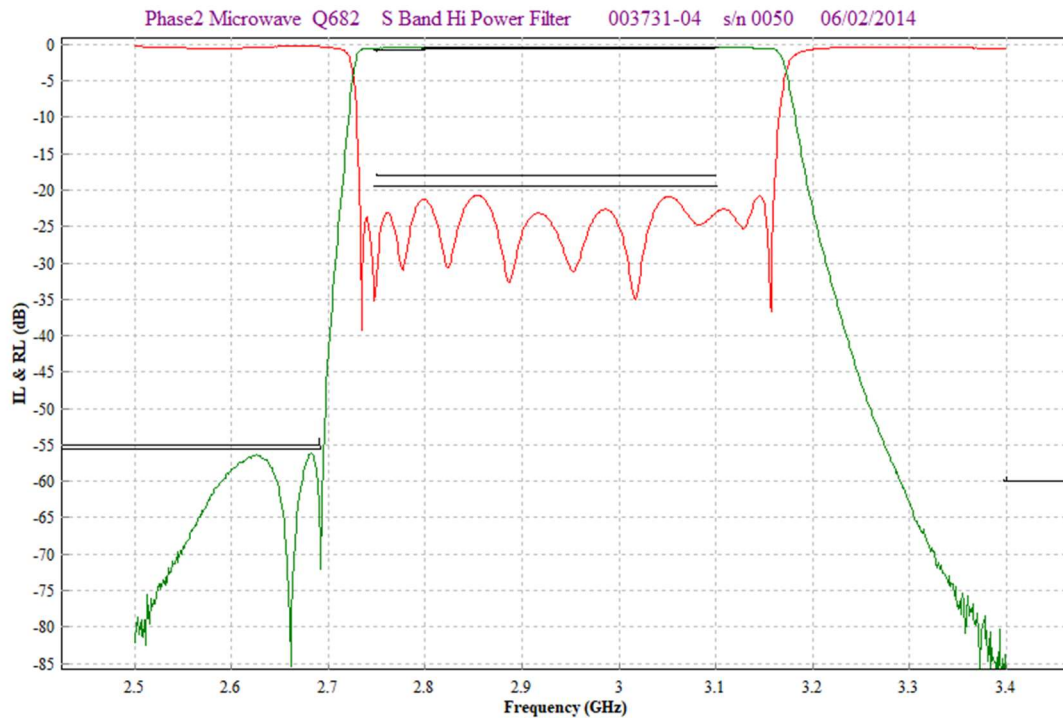
Out of band rejection up to 18GHz was also required, and the filter needed to be as small as possible.

### Solution

A coaxial solution was required to fit the tight space requirements. Normally a combline filter is the most efficient package but in this case, because of the peak power requirements of several kilowatts, an interdigital filter was needed. In-house software allows the calculation of the correct gaps needed to prevent breakdown for the difficult combination of peak power, temperature and altitude.



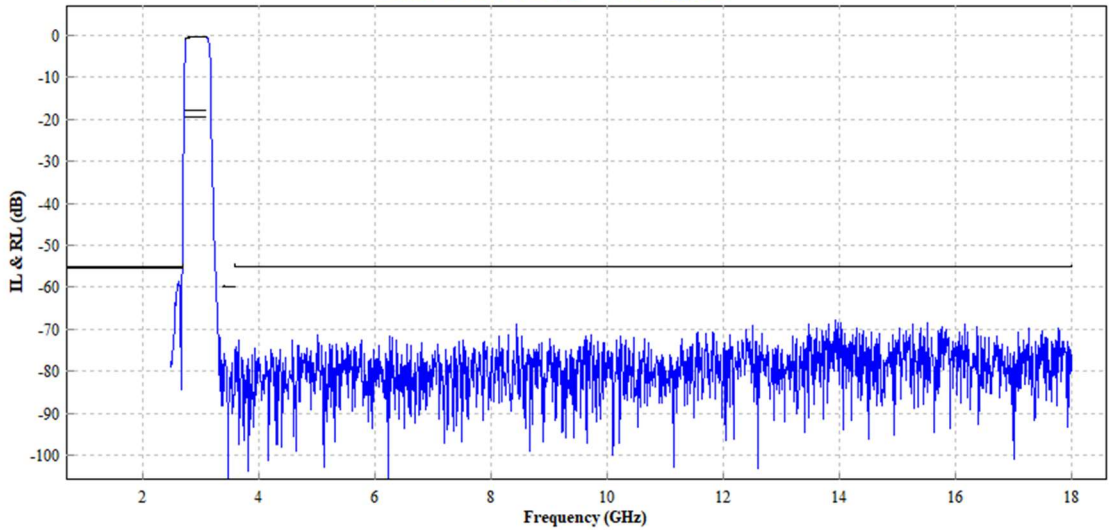
Using in-house synthesis programs two stop poles were placed at the top of the LTE band and an extracted pole technique used to realise a 10 resonator filter. The design was completed in a very compact form using Mician's Microwave Wizard software and extensively tested under high power and low pressure conditions.



A tiny cylindrical lowpass filter was integrated onto the output to provide the rejection up to 18GHz and beyond.



Phase 2 MW Q569\_3 - 003731\_M25



This is one of many solutions Phase2 Microwave has for filtering the output of Radar Transmitters with power levels up to 1MW.

