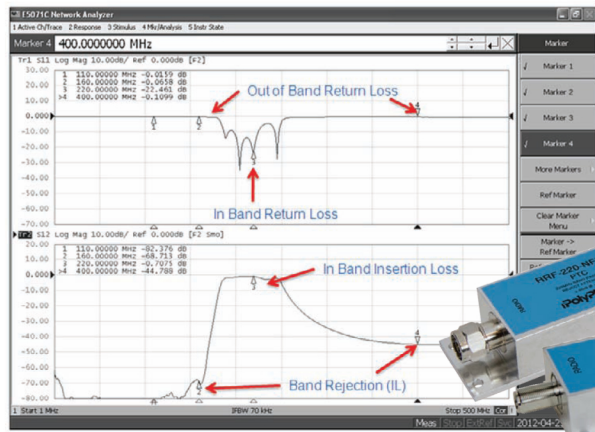


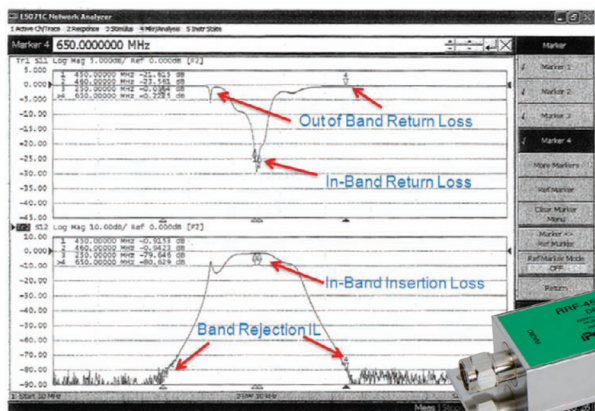
160 MHz Band Pass Filter

Part Nr:  
RRF-160-NFF  
RRF-160-NFM-L



220 MHz Band Pass Filter

Part Nr:  
RRF-220-NFF  
RRF-220-NFM-L



450 MHz Band Pass Filter

Part Nr:  
RRF-450-NFM-L



## RRF Band Pass Filter

The RRF family of high performance band pass filters are specifically designed to support Positive Train Control systems in locomotives and wayside bungalow communications networks. PolyPhaser RRF Band Pass Filters block unwanted signal interferences and lead the industry with superior in band RF performance.

### RRF Band Pass Filter Advantages

#### Effective Noise Filtering

- Out-of-Band Rejection :  $\geq -60\text{dB}$

#### Industry Leading Signal Integrity Protection

- Return Loss:  $\geq 20\text{dB}$
- Insertion Loss:  $\leq 0.9\text{ dB}$  ( $\leq 1.5\text{dB}$  for 450MHz model)

#### Integrated High Performance Surge Protection

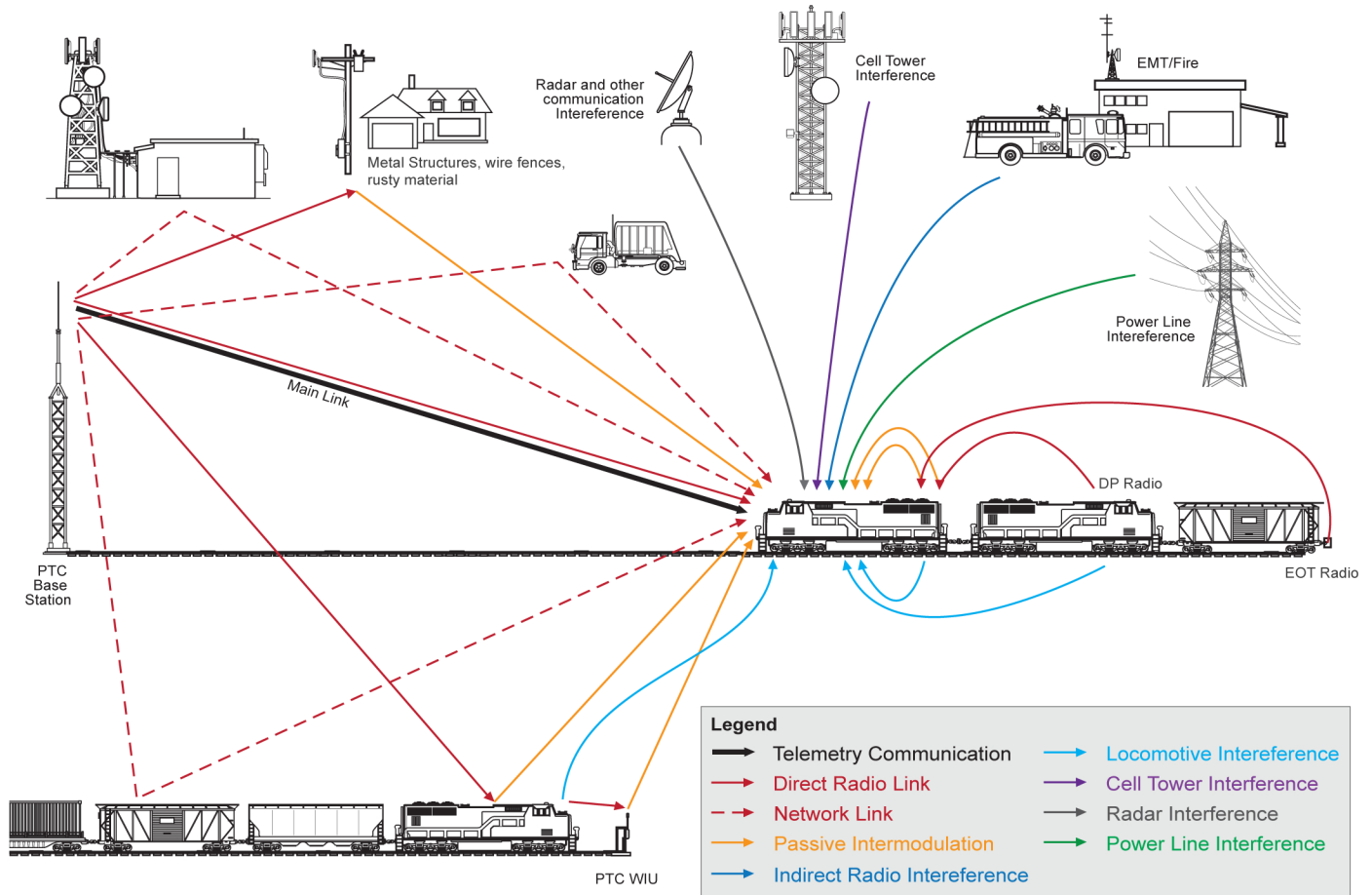
- Max Surge: 10kA IEC 61000-4-5, 8/20us waveform
- Throughput Energy:  $< 50\mu\text{J}$  for 3kA, 8/20us waveform

#### Colored Labels

- Easily distinguishable labels for ease of installation and service

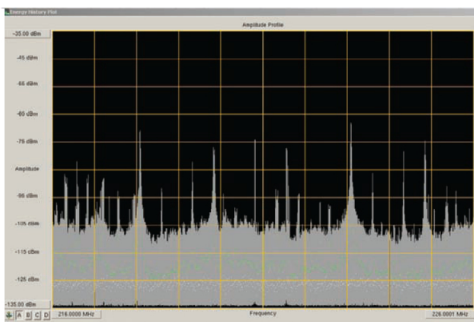


# Signal Interferences

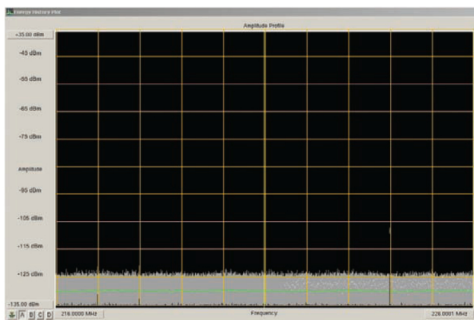


## Receive Intermodulation Testing

DPA RX: DPB TX, EOT TX, AAR Voice TX (216 MHz to 226 MHz)



HOT/EOT Unfiltered



HOT/EOT Filtered

Signal interferences take many forms and are caused by a multitude of sources, all of which can adversely affect the flawless operation of Positive Train Control (PTC) systems. PTC is designed to provide safety by eliminating the elements of human error in responding to communication signals sent by locomotive and wayside equipment. To deliver on its promise, reliable data transfer must occur. A critical component of ensuring the uninterrupted data transfer is effective noise filtering and surge protection, which has to meet much higher performance demands as the components of PTC continue to advance in sensitivity and complexity.

The graphs on the left show locomotive radio interference in an unfiltered and filtered environment. A clear reduction in interference problems is visible when a filter is applied.

The complete locomotive noise testing report by METEORCOMM is available online on the Federal Railroad Administration website at <http://www.fra.dot.gov/Elib/Document/2217>