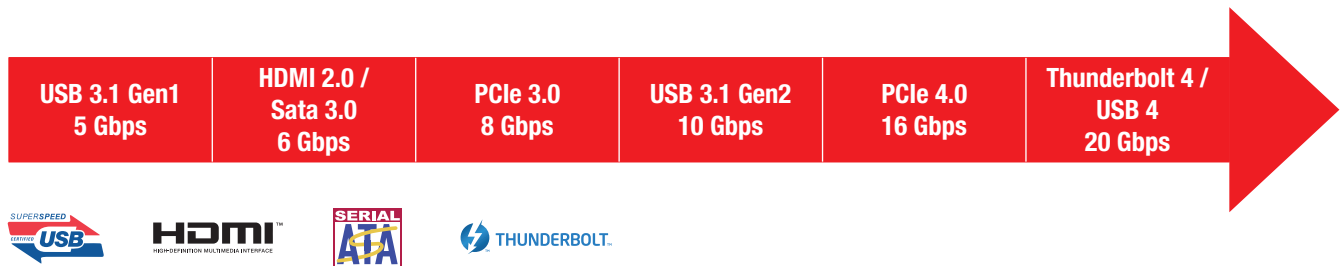






Signal Integrity and EMI

Signal Integrity and Increase in Data Speed

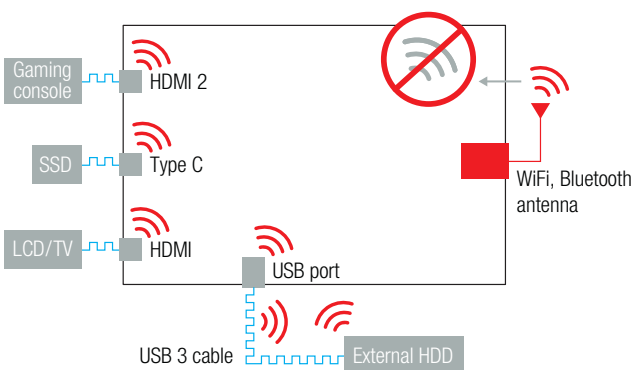
Signal integrity defines the quality of an electrical signal and refers to the challenges that arise due to high frequency data transmission. With the high switching speeds of the modern digital I/O interfaces, we are now able to achieve high data rates and bandwidth. At the same time, noise is a big concern for the integrity of these high frequency digital signals.



Design and Layout Challenges with Fast Data Lines

 <p>Faster Data Rates The switching speeds of the modern digital interfaces are getting increasingly fast which translates to high data rates and bandwidth.</p>	 <p>Higher noise frequency With the increase in the switching speeds of digital circuits like USB 3.2 or HDMI 2.1, more and more noise is being generated at higher frequencies.</p>	 <p>Noise at 2.4/5.0 GHz Noise can interfere with the extremely sensitive wireless channels operating at 2.4/5.0 GHz bands.</p>	 <p>Affected applications</p> <ul style="list-style-type: none"> ■ Wi-Fi 2.4/5 GHz ■ Bluetooth ■ GPS/GNSS ■ 3G, 4G & 5G communications
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Communication Interfaces – source of noise



Noise can interfere with the extremely sensitive wireless channels operating at 2.4/5.0 GHz bands.

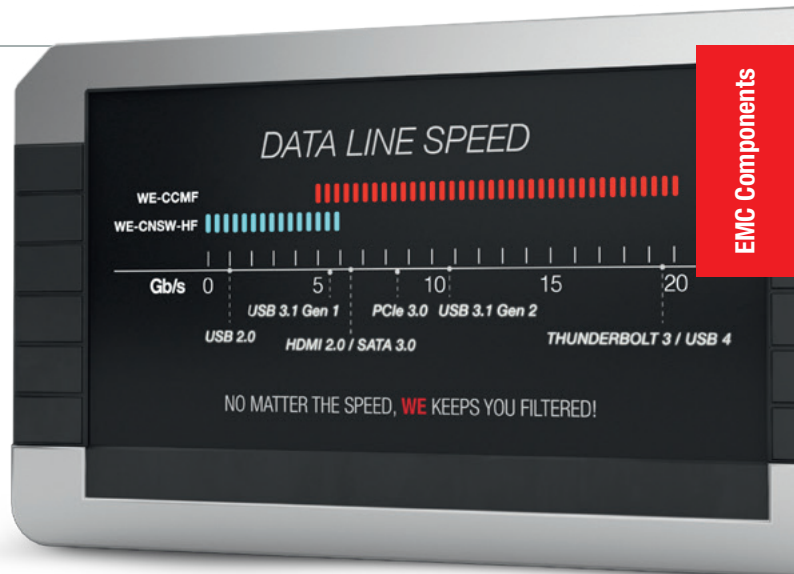
- Communication interfaces radiate noise on a very broad spectrum which can interfere with the wifi signal
- This can lead to loss of the Wi-Fi signal



Webinar Extremely High Data Line Chokes:
www.we-online.com/datalinewebinar

Signal Integrity – Don't lose your useful signal

- Common mode Filters/Chokes are a very effective way of protecting the data lines against noise interference, while reducing emissions at the same time.
- Choosing the appropriate common mode choke for a high-speed differential interface requires knowledge about both the application and the filter itself.
- Differential mode cut-off frequency (also known as 3dB frequency) is one of the most important criteria for the choke selection and can be evaluated with the help of s-parameters

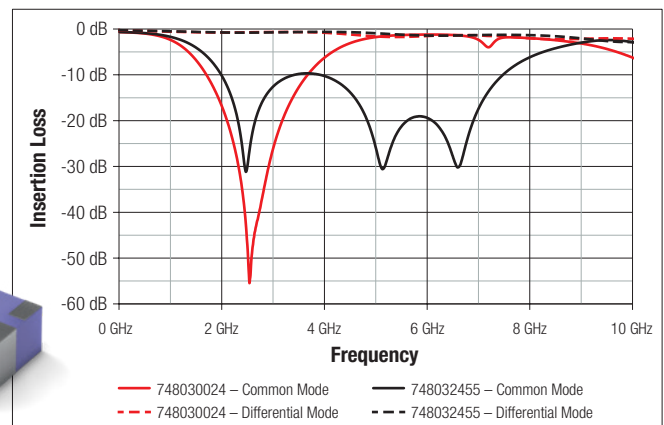
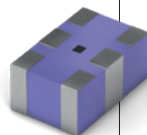


Next Generation Common Mode Chokes for High Speed Data Lines

WE-CCMF

Ceramic Common Mode Filter

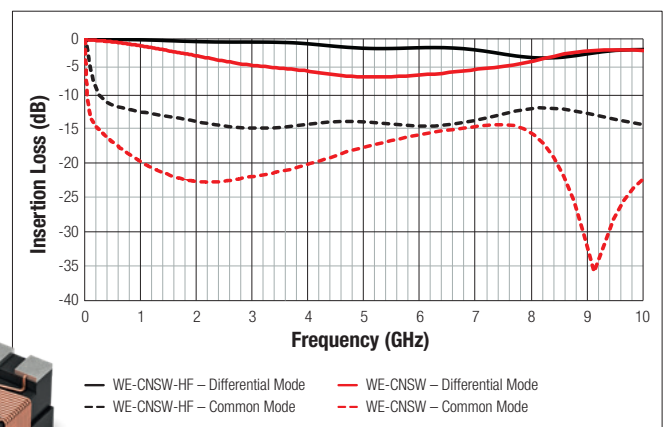
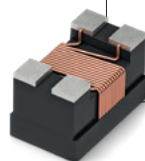
- Ceramic based choke that works on the principle of the transmission line theory
- Complex inner resonant structure ensures high common mode suppression at wireless frequencies (2.4 & 5.0 GHz)
- Keeps the differential signal intact



WE-CNSW HF

SMT Common Mode Line Filter

- Ferrite-based core and winding symmetry chokes.
- While the **WE-CNSW** can work up to USB 2.0 interfaces, the **WE-CNSW HF** version was designed to have wider band to be able to work with the newest high speed interfaces such as USB 3.1 Gen 1 and Gen 2. Wider common mode attenuation band before the cut-off-frequency (-3 dB).
- Wide variety of applications include USB 2.0, USB 3.1, HDMI and other.



Learn more:
www.we-online.com/cmc