鈞寶電子工業股份有限公司

KING CORE ELECTRONICS INC.

TRADITIONAL

Common Mode Choke, Wound chip type

(KC p/n.WCM-2012HS-900T for HDMI & USB 3.0

or equivalent other brand)

vs.

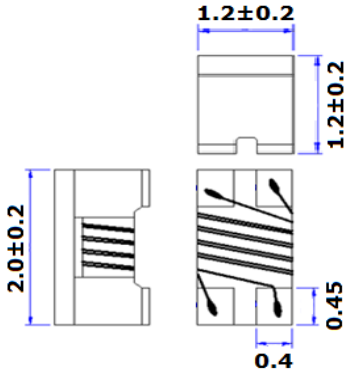
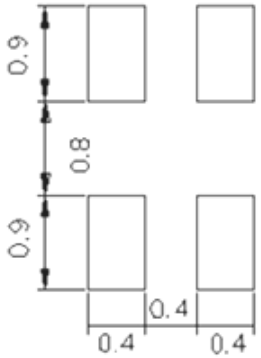
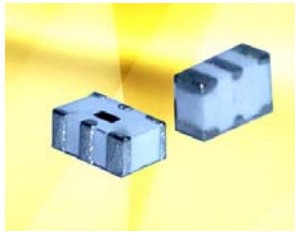
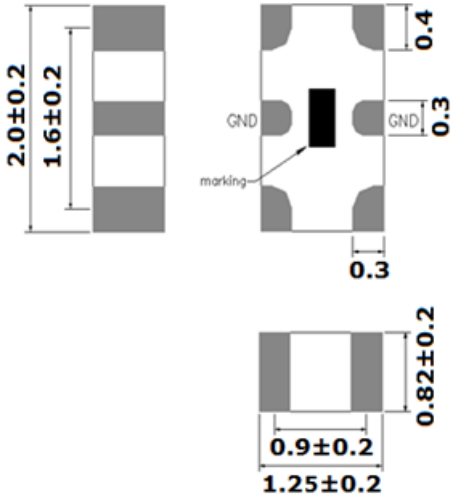
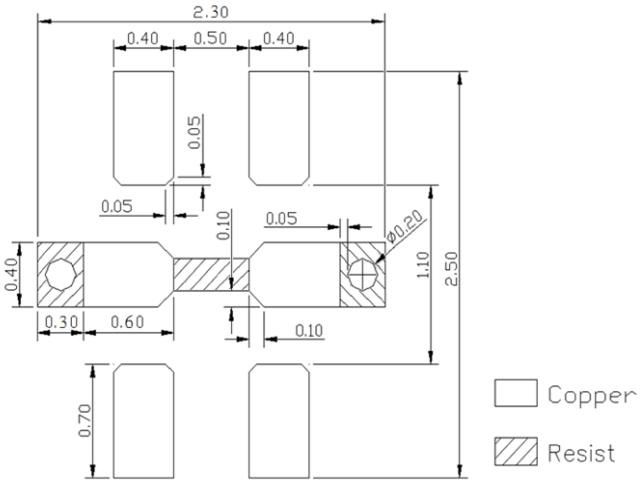
INNOVATIVE

Common Mode Filter, LTCC multilayer ceramic type

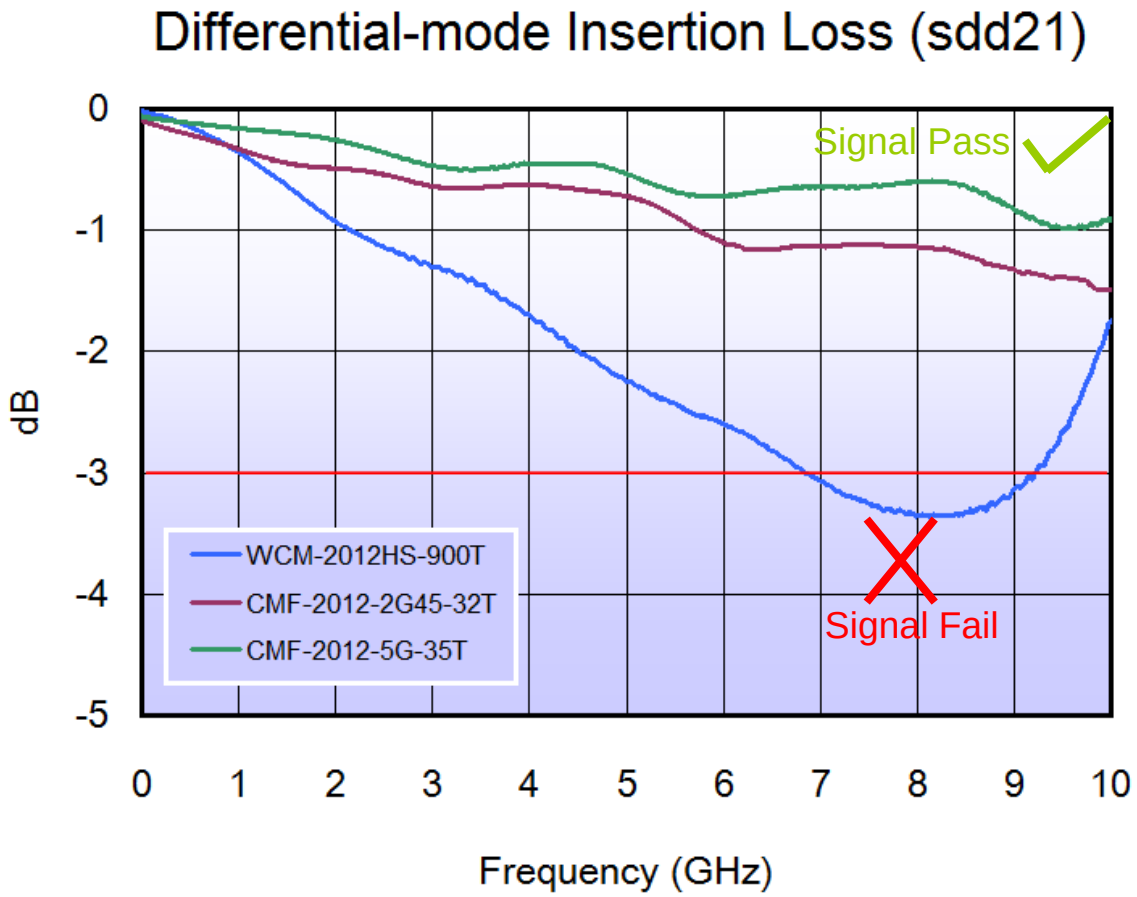
(KC p/n.CMF-2012-2G45-32T & CMF-2012-5G-35T

for Much higher speed differential transmission line)

Shapes and Dimensions

Type	Dimensions (mm)	Patterns (mm)
WCM-2012  (Wound chip type)		
CMF-2012  (LTCC type)		

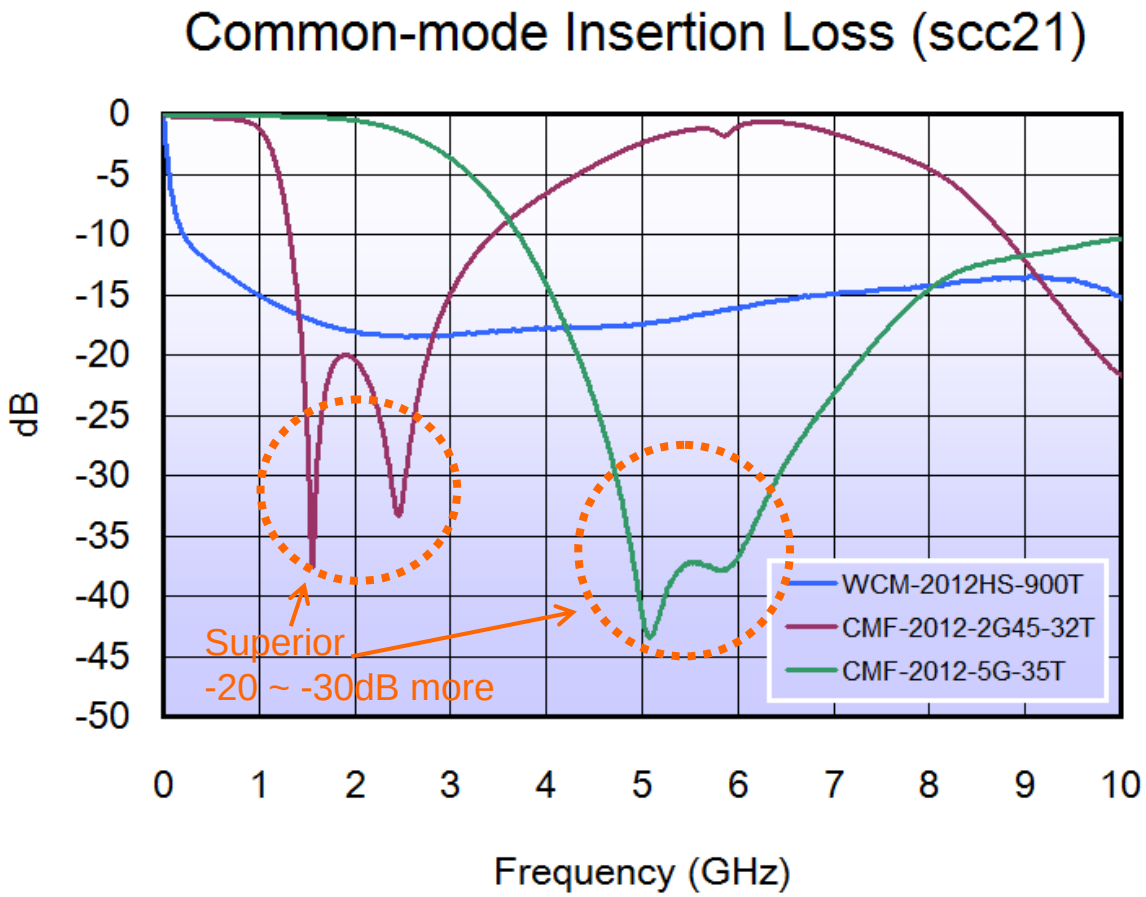
S-Parameters Performance



1. Traditional USB 3.0 or HDMI common mode choke cut-off signal frequency only up to 5~7GHz, which can no more been used on much higher speed version in future, such as USB 3.1、HDMI 2.0…etc.

2. King Core CMF application range can up to 10~20GHz in future much high speed differential signal transmission interfaces.

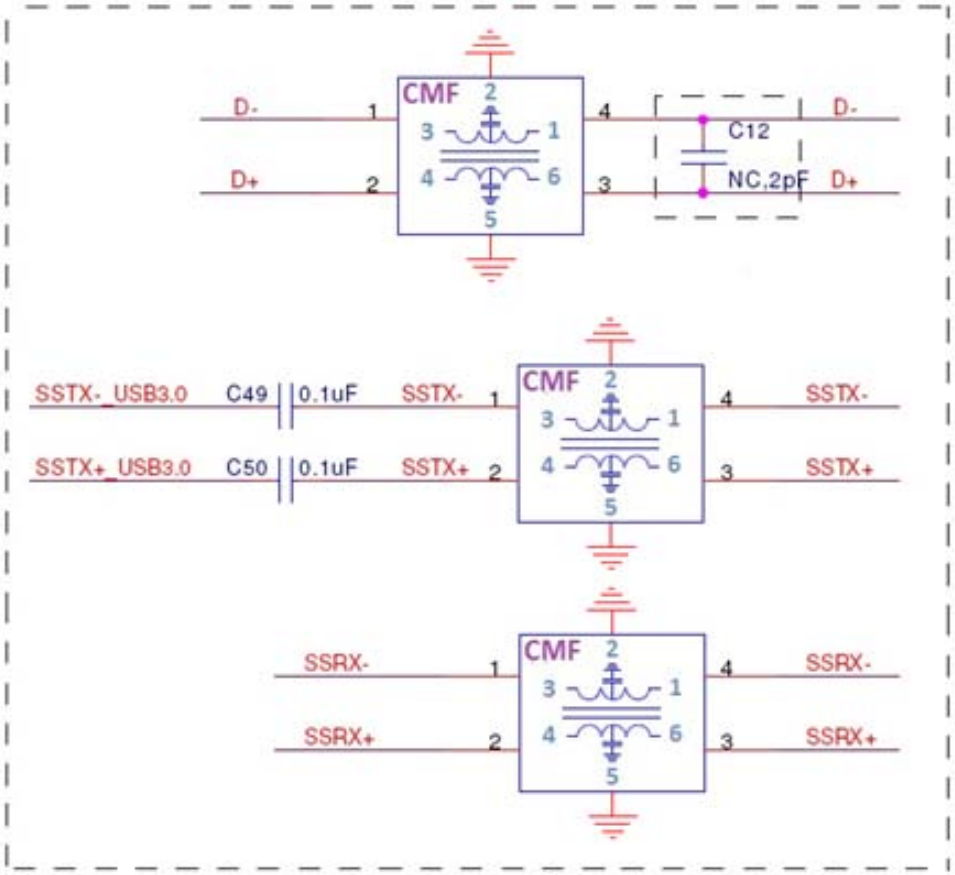
S-Parameters Performance

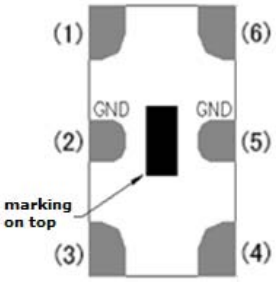


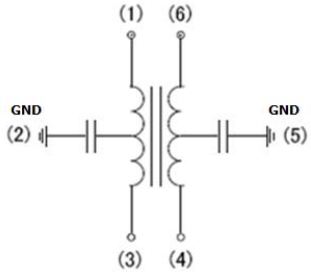
1. King Core CMF is designed to suppress GHz common mode noise, which may have near field interference to sensitive antenna signal receiving, such as GPS 1.575GHz, Wifi 2.45、5GHz…etc, or solve other EMI/RFI interference.

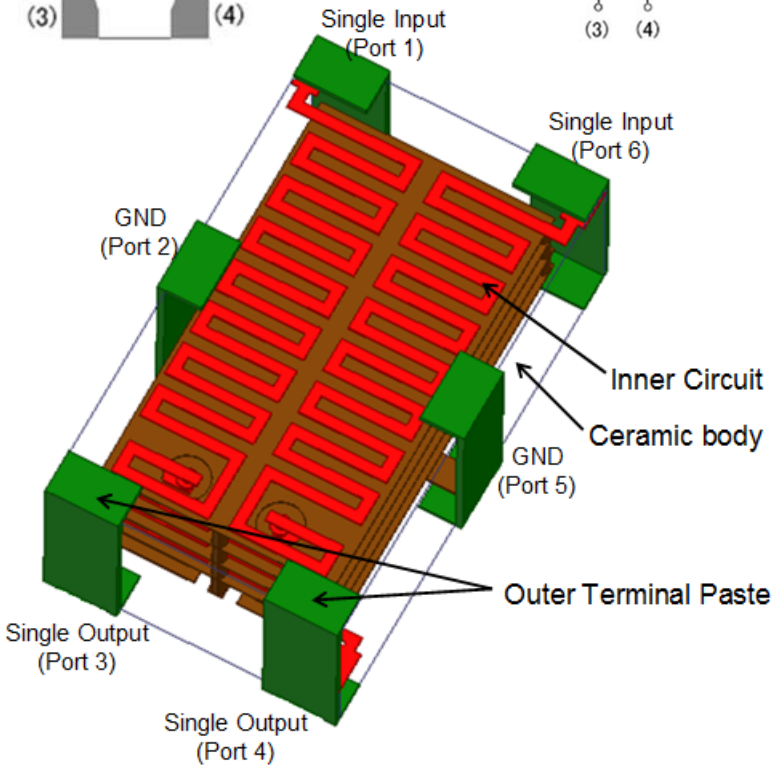
2. Application interface cover USB 2.0、3.0、3.1、HDMI、DVI、SATA 3.0、Display Port、Thunderbolt. King Core CMF's noise suppression effect much superior in frequency range 1.575、2.45、5~6GHz compared to traditional common mode choke.

Pin Definition and USB 3.0 Application Example





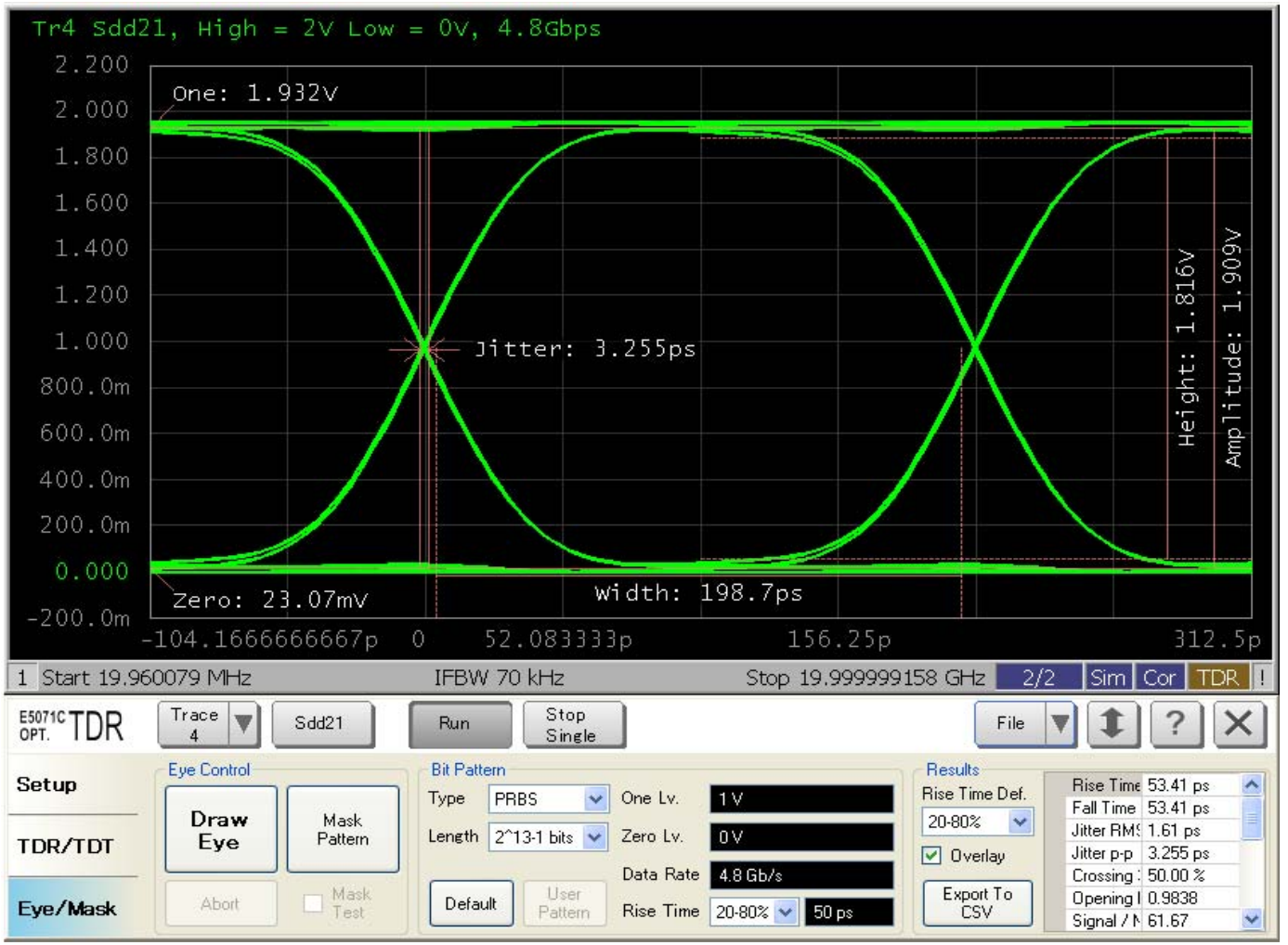




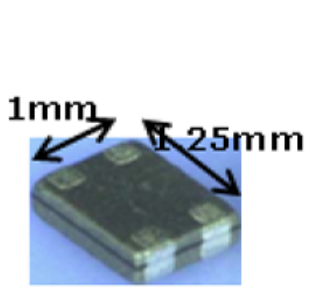
Eye Diagram

Test Sample:

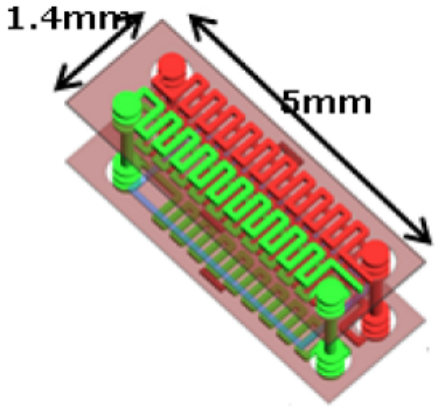
CMF-2012-2G45-32T



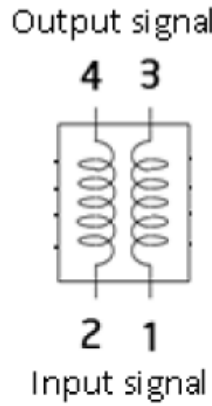
Appendix



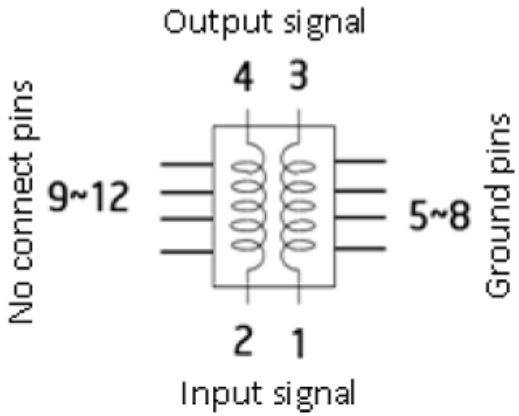
SMT Choke



PCB-CMC



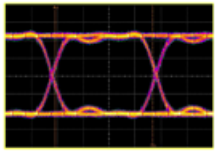
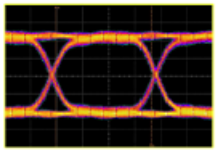
SMT choke schematic symbol



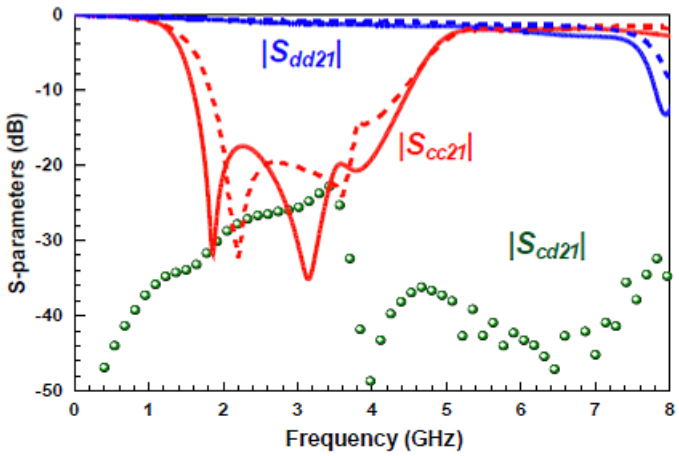
PCB-CMC schematic symbol

Appendix

Signal Integrity and Common-Mode Rejection Performance of PCB-CM

Board Name	REF	CMC 1
Eye Diagram @ 5Gbps PRBS (V_{pp} = 1 V)		
Eye Height/Delta	740.8 mV	683.8 mV/ -7.69%
Eye Width/Delta	191.0 ps	183.6 ps / -3.87%
CM Noise/Delta	892.2 mV	443.3 mV / +50.3%

Test PCB-CMC S-parameter Measurement vs. Simulation



Solid: Meas.

Dash: Simu.

Appendix

PCB-CMC Impact on Common-Mode Radiation