

SWOT of Discrete LAN transformer for 10/100/1G-base-T



Inductive Chip LAN Transformer
Conductive Chip LAN Transformer

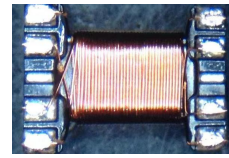
Date: 2021/04/19



东莞市天富电子科技有限公司

Dongguan Tian Fu Electronic Technology Co.,Ltd

SWOT comparing to Conventional T core



Strength

- 25 years OBM of power transformer
- 15 years OEM of conventional LAN transformer
- Experienced sales group on transformer & passive component
- Strong RD & AE/FAE technical service
- Investment of LAN transformer SMD automatic Wiring/Assembly (2020'4E)

Opportunity

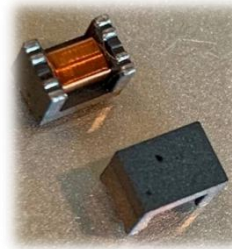
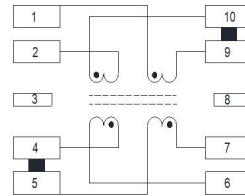
- 1G LAN transformer cost down pressure
- Customer designer start adopting the Capacitive coupled solution for LAN port protection
- Coming 2.5G ethernet networking market
- 10G/5G still not auto-wiring design in T core, profit margin high & worthy to approach

Weakness

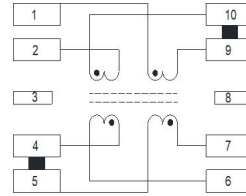
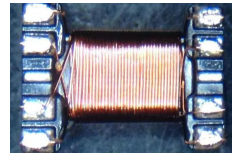
- High-Pot limited around 1.2KV
- Magnetic material limited to NiZn ferrite, costing more wiring turns to meet the inductance of T core design
- Low profile design is difficult
- Machines expansion need more capital expense

Threat

- Potential players/competitors: current inductor/CMC players
- The T core process tends to break-through of the automation of wire wrapping



Why YSE



Company

- Existing power transformer vender/manufacture
- New member in Conventional LAN transformer market

Product scope/span

- Power transformer
- Lan transformer
- RF transformer
- EMC choke
- RF inductor

Service

- Experienced sales group on transformer & passive component
- Strong technical pre/post service
- Plenty of instrument & design software for design & FAE support



Process difference & migration of LAN transformer

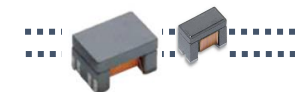
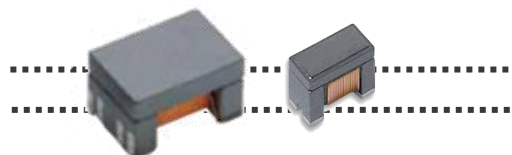
Toroid Core process (higher labor cost)



Drum Core automation process

Inductive chip LAN

Capacitive chip LAN



**COB by SMT
(chip on board)**



**COB &
PCB substrate saving
Colayout is possible**

Pin-to-Pin compatible

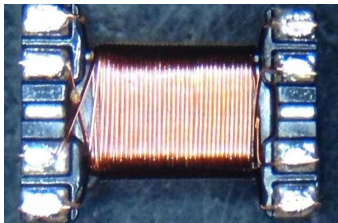
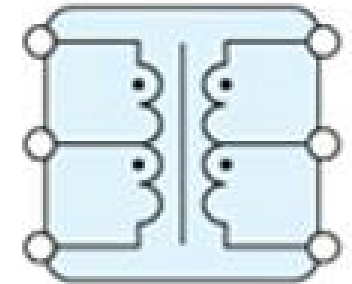
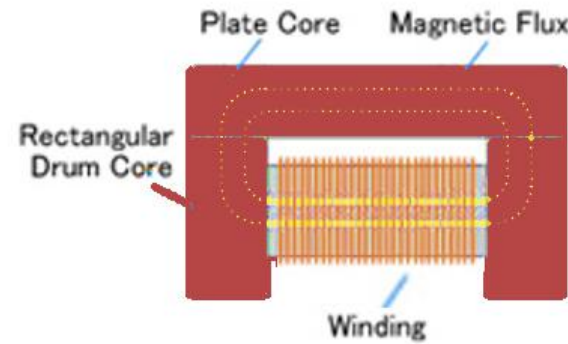
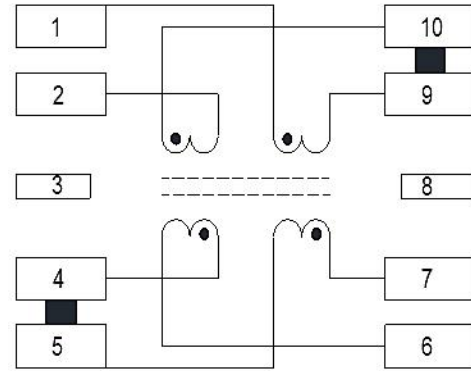
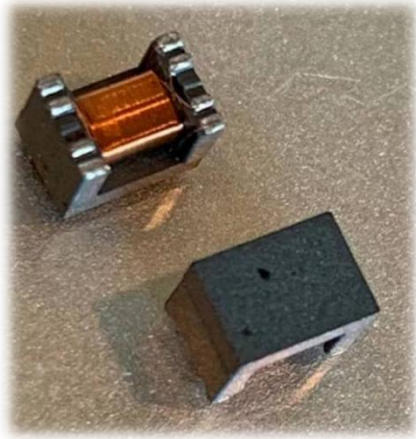
**SMT & assembly
On PCB (pin-to-pin)**

High labor percentage
on assembly of wired core in
package case



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Patented core structure of Auto-wiring SMD lan transformer



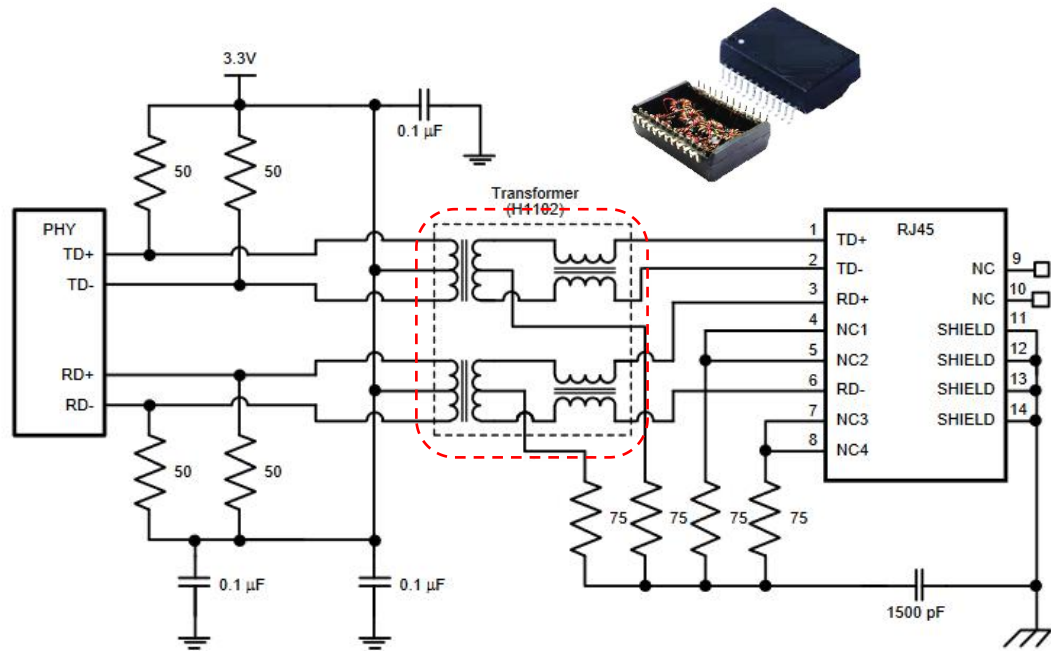
Size: 4732(MP) → 3532 (U/D)

**Automation design/manufacture
with less labor's uncertainty**

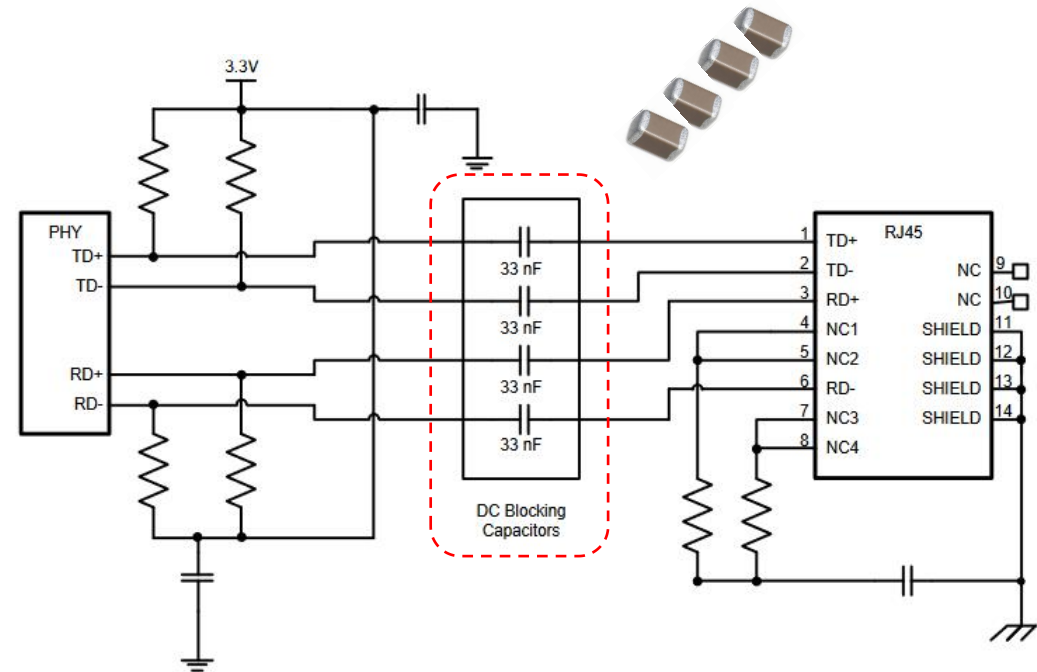
Two LAN solutions recommended by IC reference design (Intel/TI)

- Transformer (Inductive coupled)
- Transformerless (Capacitive coupled)

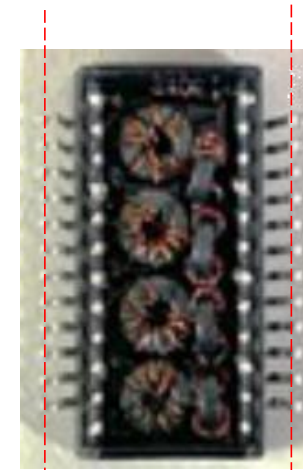
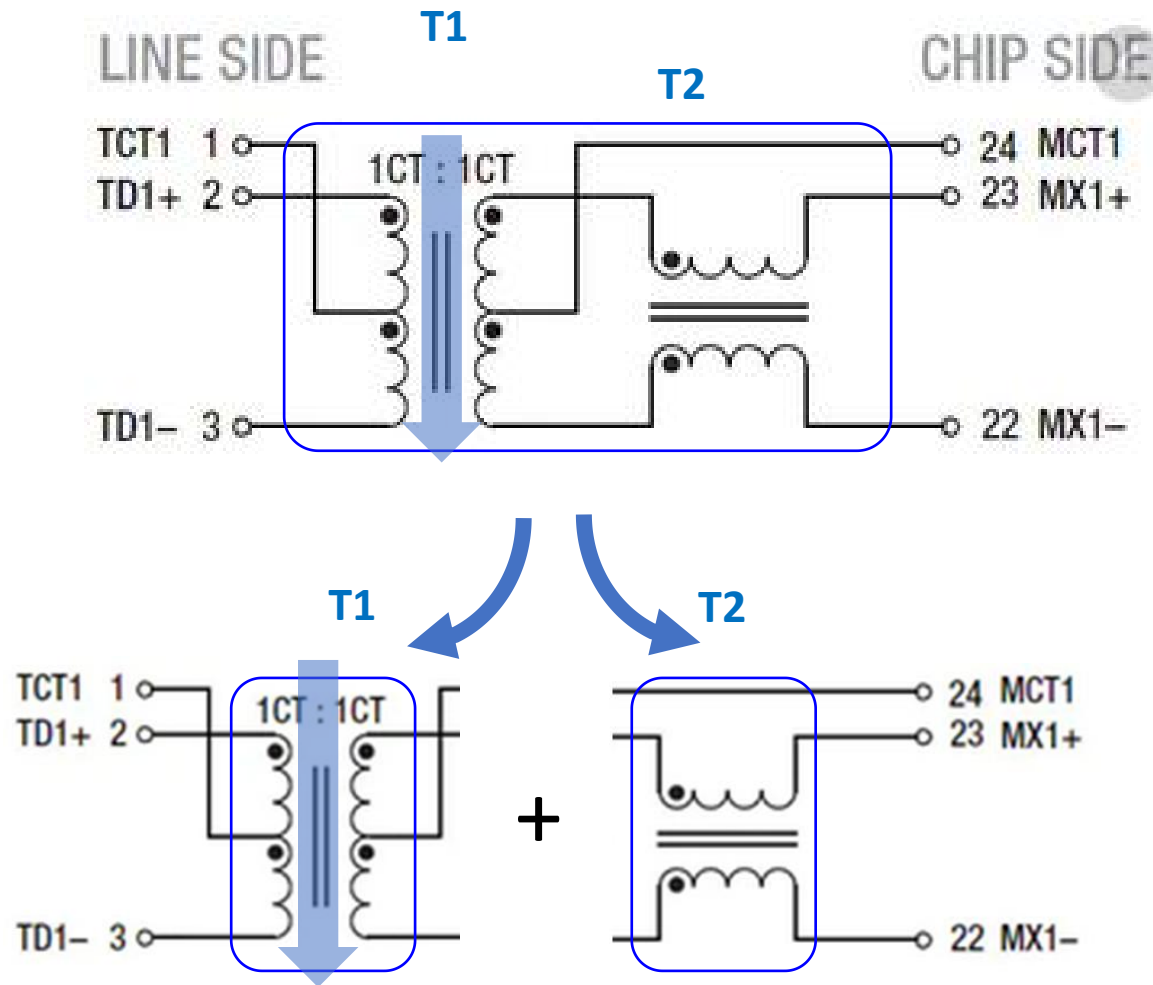
- **Transformer** design with conventional transformer module



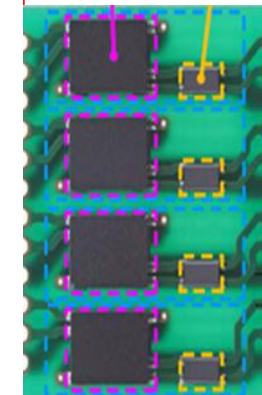
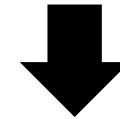
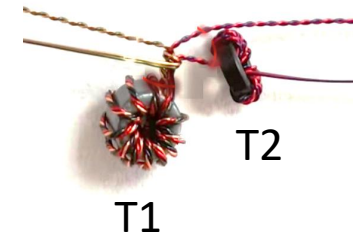
- **Transformerless** design with DC blocking discrete capacitors



Inductive Chip LAN solutions for ethernet-1G base-T

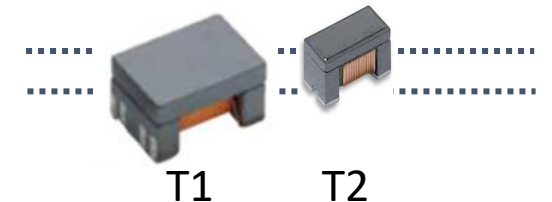


T1: Transformer/low freq. EMC
T2: CMC for high freq. EMC

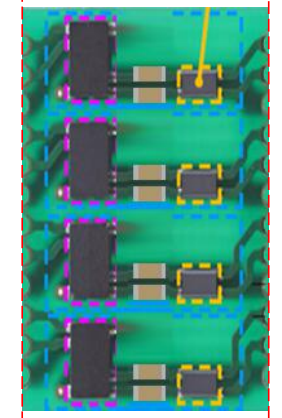
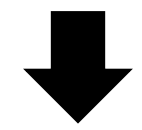
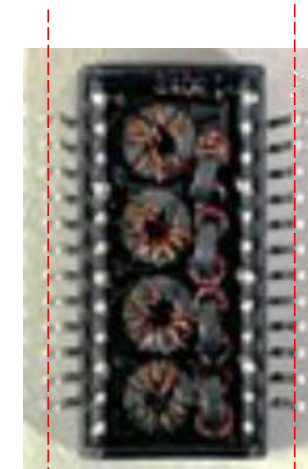
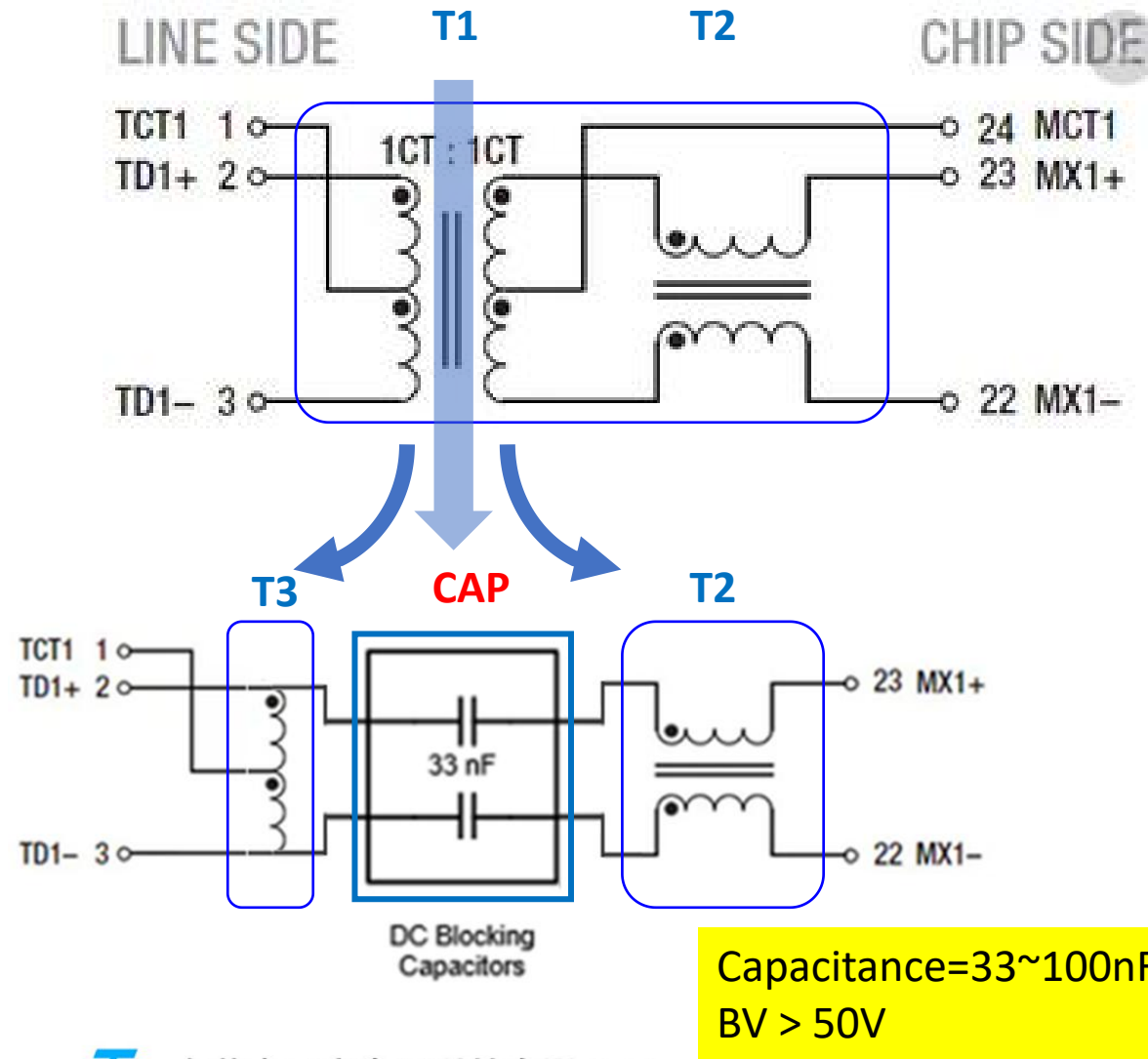


COB scheme

- Discrete T1&T2/pair
- Size, T1:4532, T2:2012
- Chip on board (COB)

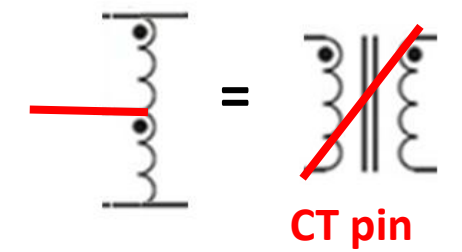


Capacitive Chip LAN solutions for ethernet-1G base-T

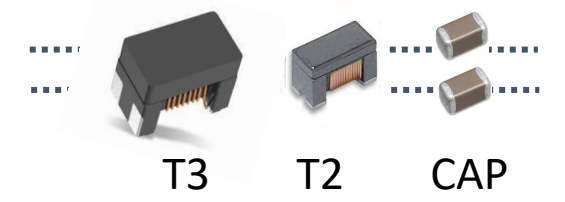


COB scheme

- T1: Transformer
- T2: CMC for high freq. EMC
- T3: CMC for low freq. EMC/ESD/Surge (Auto-transformer-like)



- Discrete T3/T2 & 2*capacitor/pair
- Size, T3:3216, T2:2012/1210
- Chip on board (COB)



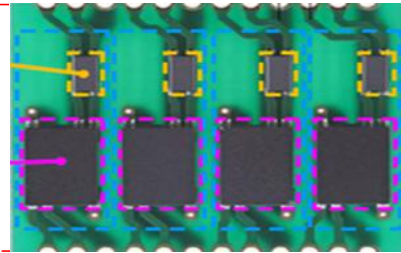
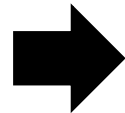
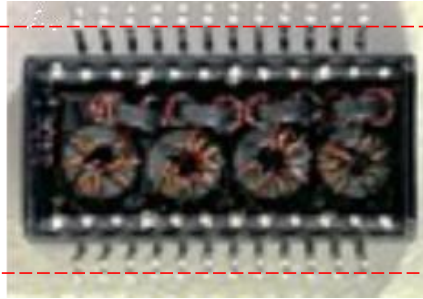
Discrete LAN solutions guide for 10/100&1G



SMD inductive LAN



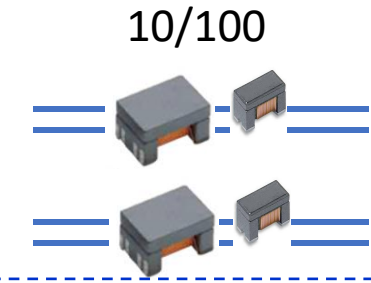
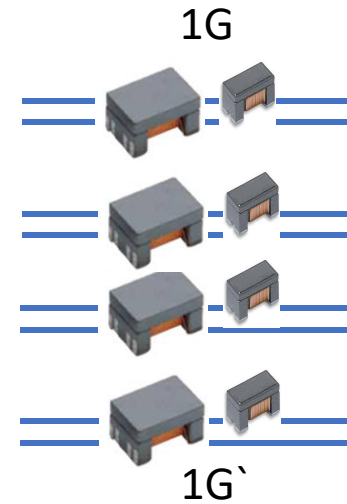
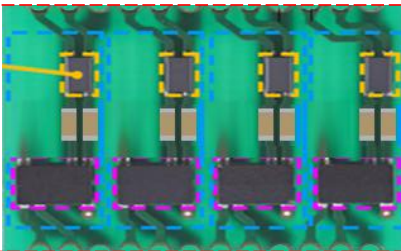
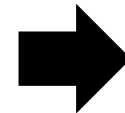
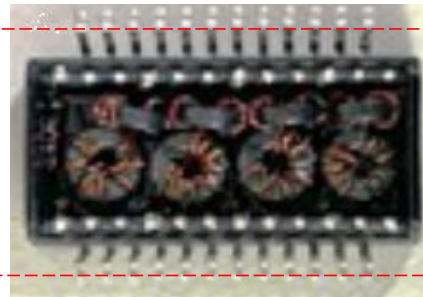
COB scheme



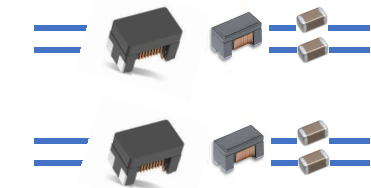
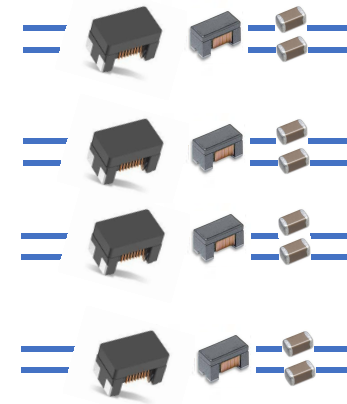
SMD capacitive LAN



COB scheme



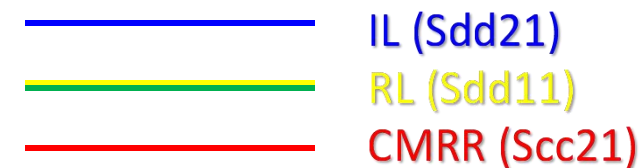
- 4 pairs for 1G/2.5G/5G/10G
- 2 pairs for 10/100



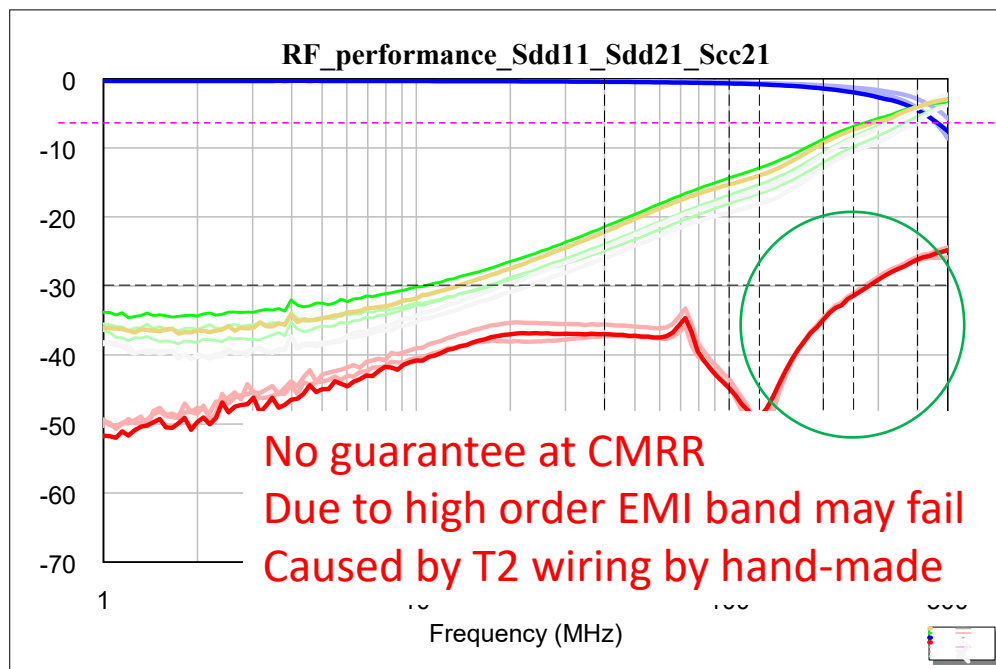
BOM cost for 10/100 & 1G are easily to be counted!

We can help co-layout service

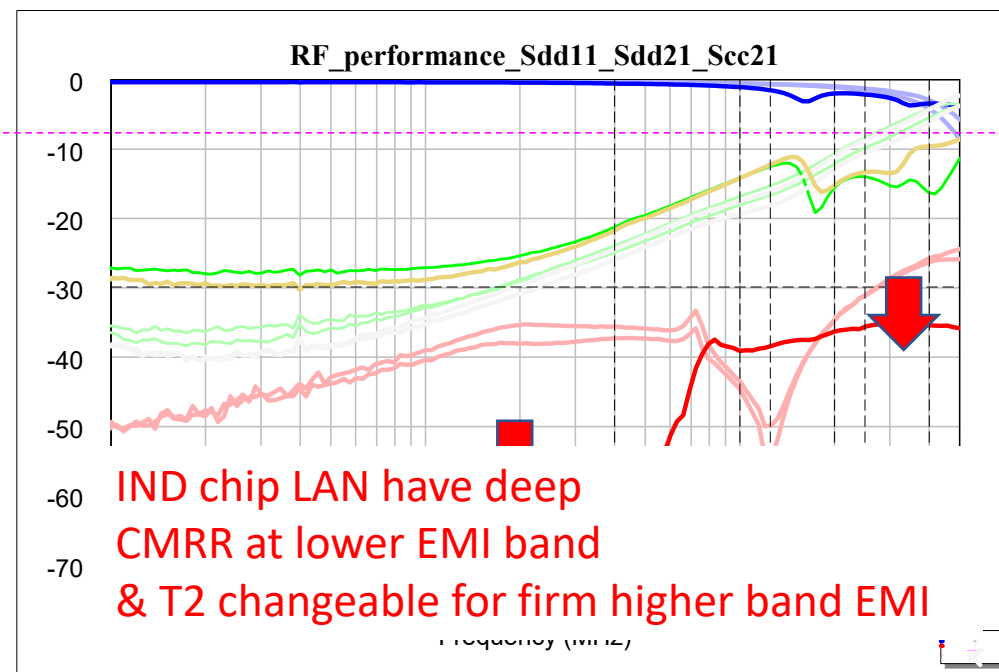
T core vs, Inductive chip LAN



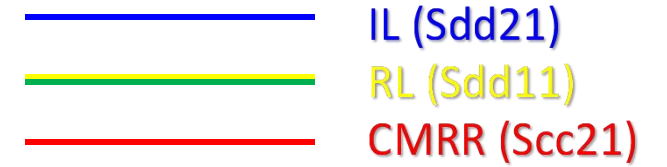
Conventional T core (1G)



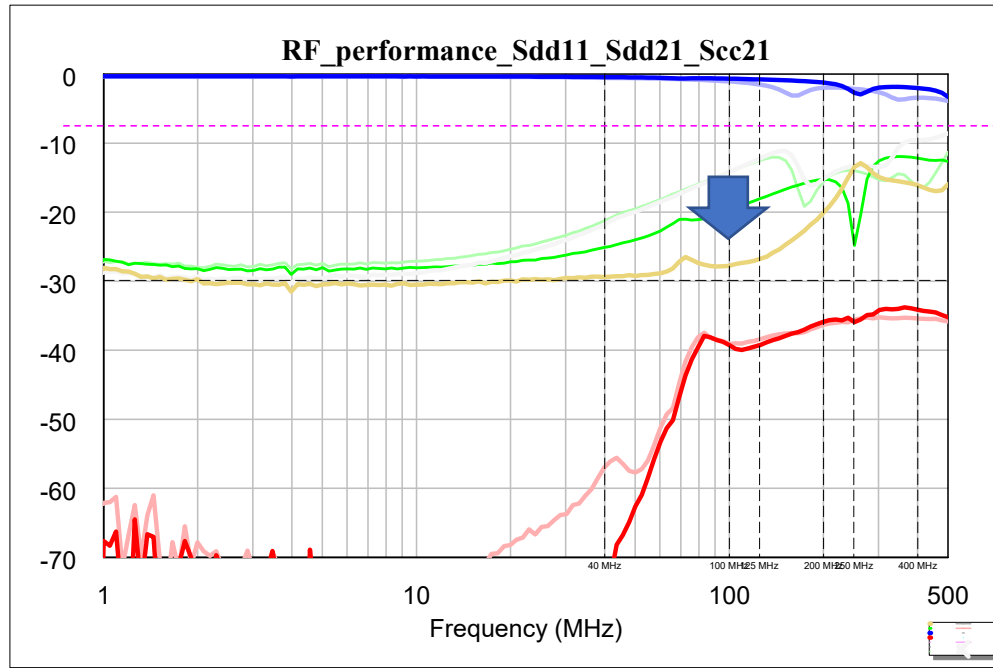
Discrete T1/T2 (1G)



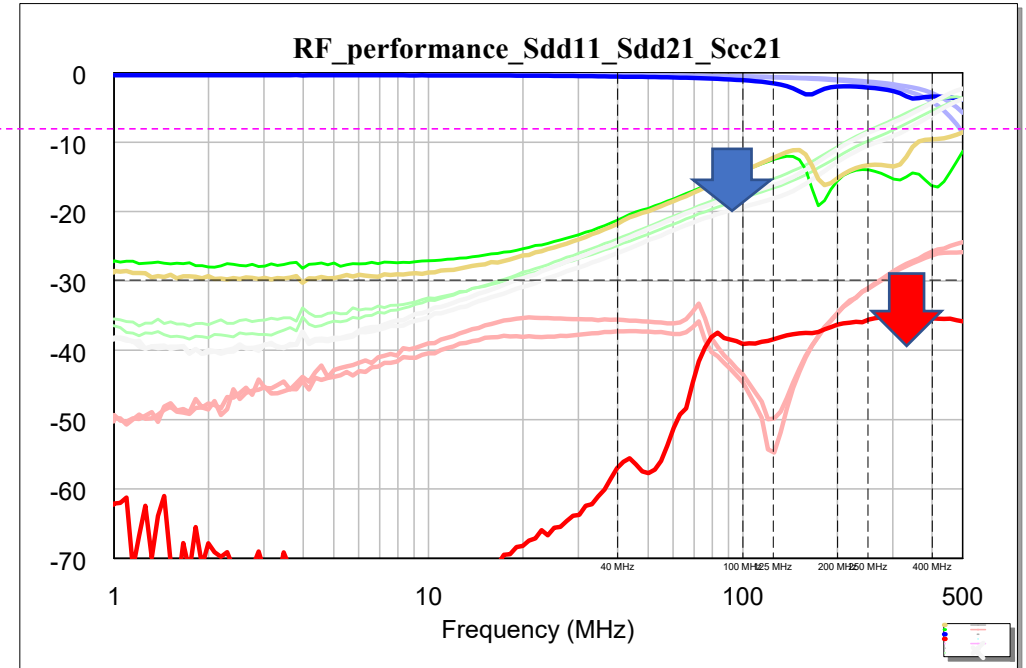
Inductive chip LAN 2.5G/1G



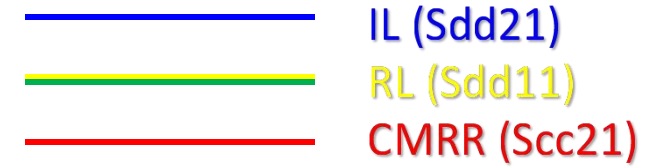
Discrete T1/T2 (2.5G)



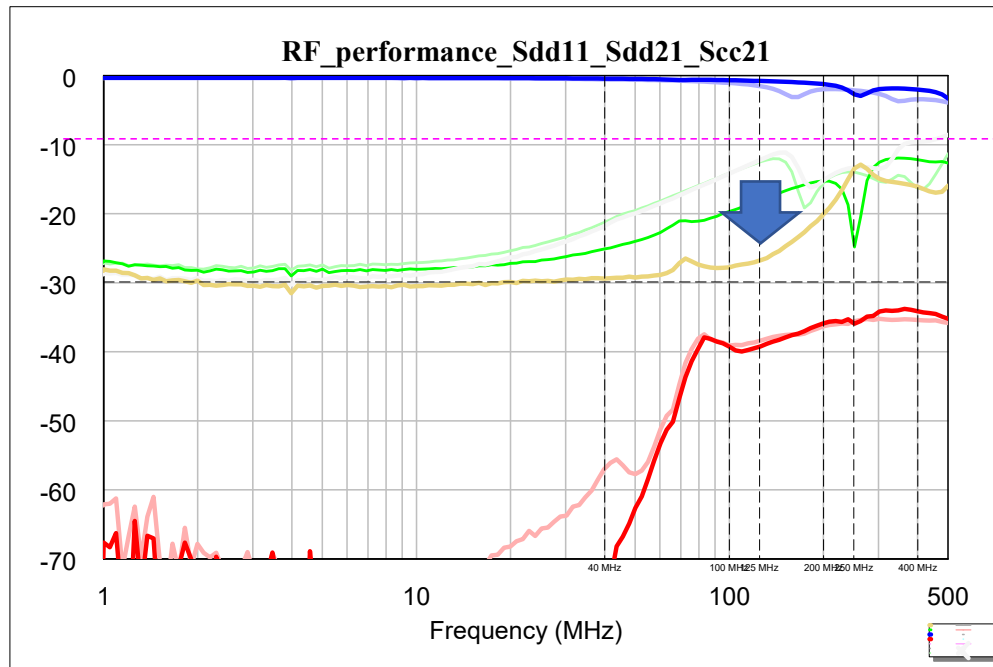
Discrete T1/T2 (1G)



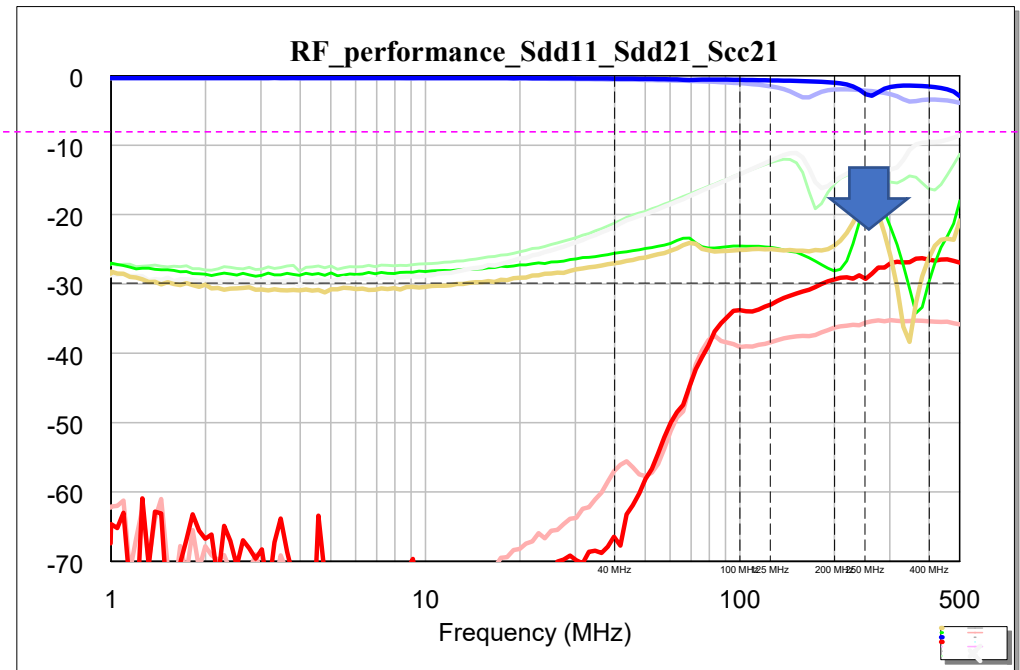
Inductive chip LAN 5G/2.5G



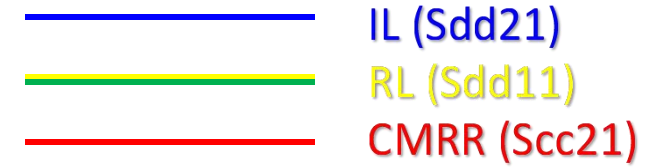
Discrete T1/T2 (2.5G)



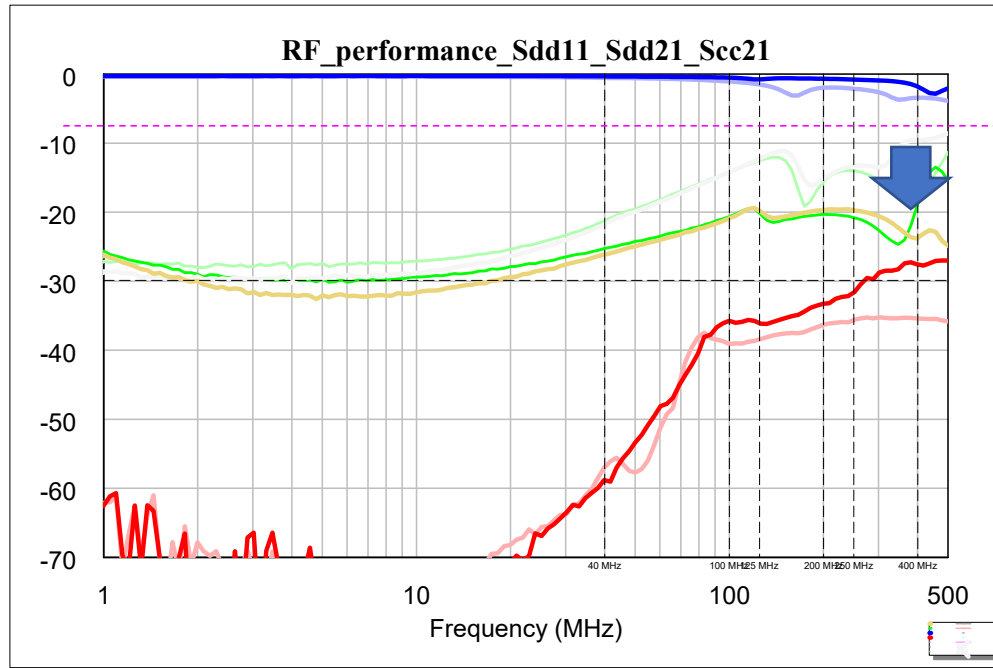
Discrete T1/T2 (5G)



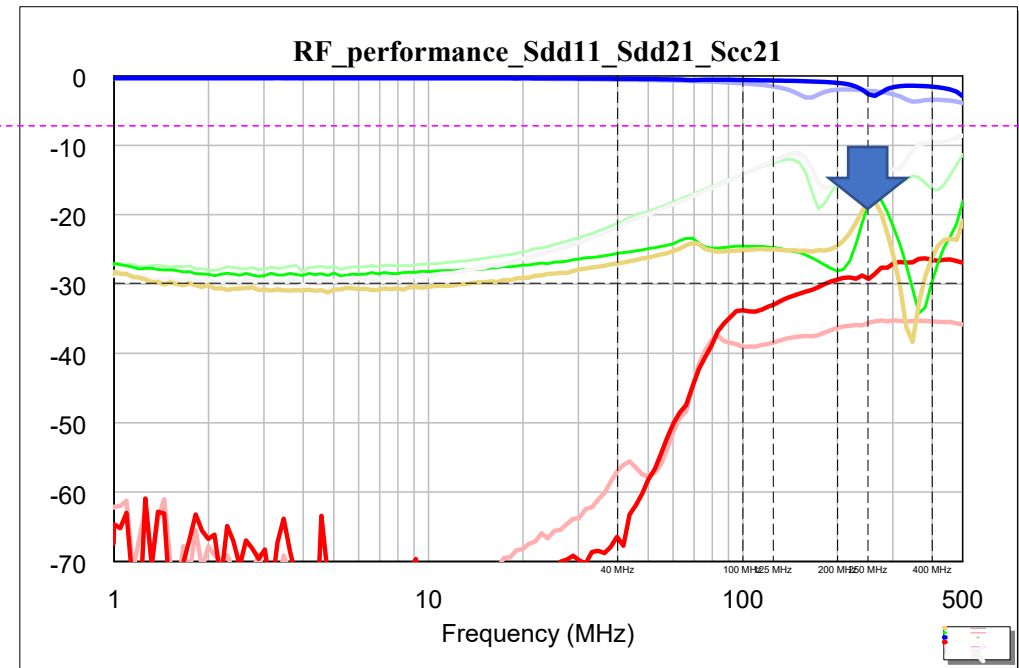
Inductive chip LAN 5G/10G



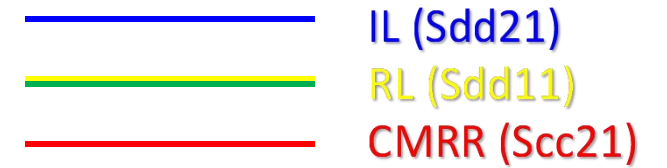
Discrete T1/T2 (10G)



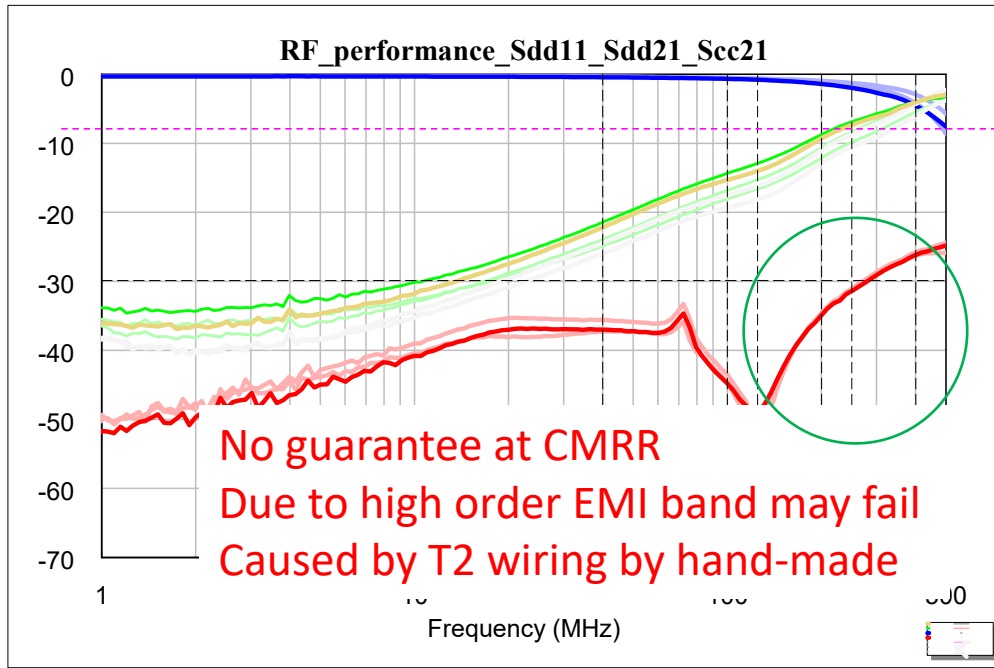
Discrete T1/T2 (5G)



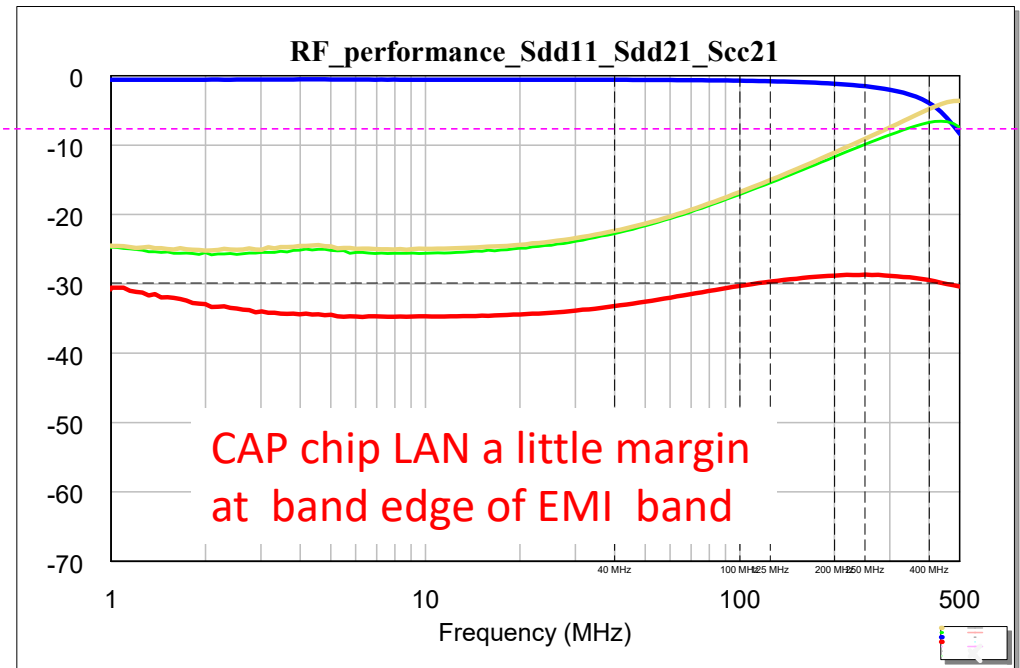
T core vs, Cap chip LAN

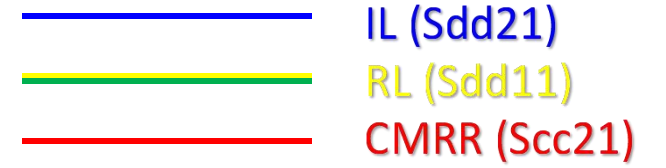


Conventional T1+T2 module

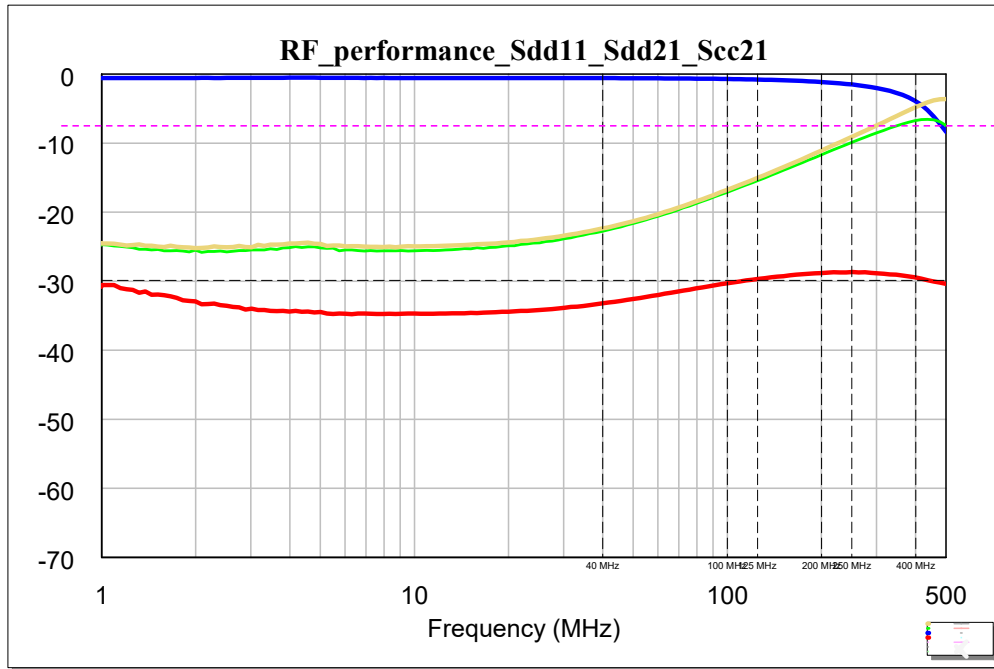


CAP LAN(1G), right T2 CMC





CAP LAN(1G), right T2 CMC



CAP LAN(1G), poorer T2 CMC

