Power over coax (PoC) filter solution for automotive application

SMD-POC-041F

Date:- 12th November, 2019

Overview:

Following application is designed to cover the frequency range from 8 MHz to 3 GHz for an impedance of 1kΩ, and 1A max current. The measurement of S-parameters are done on complete POC system in which two solution boards are connected through Leoni Decar-302 automotive cable with different lengths . In complete POC system, different currents up to max rating of the current are injected to get S-parameters under different loads.

Coilcraft Solution:

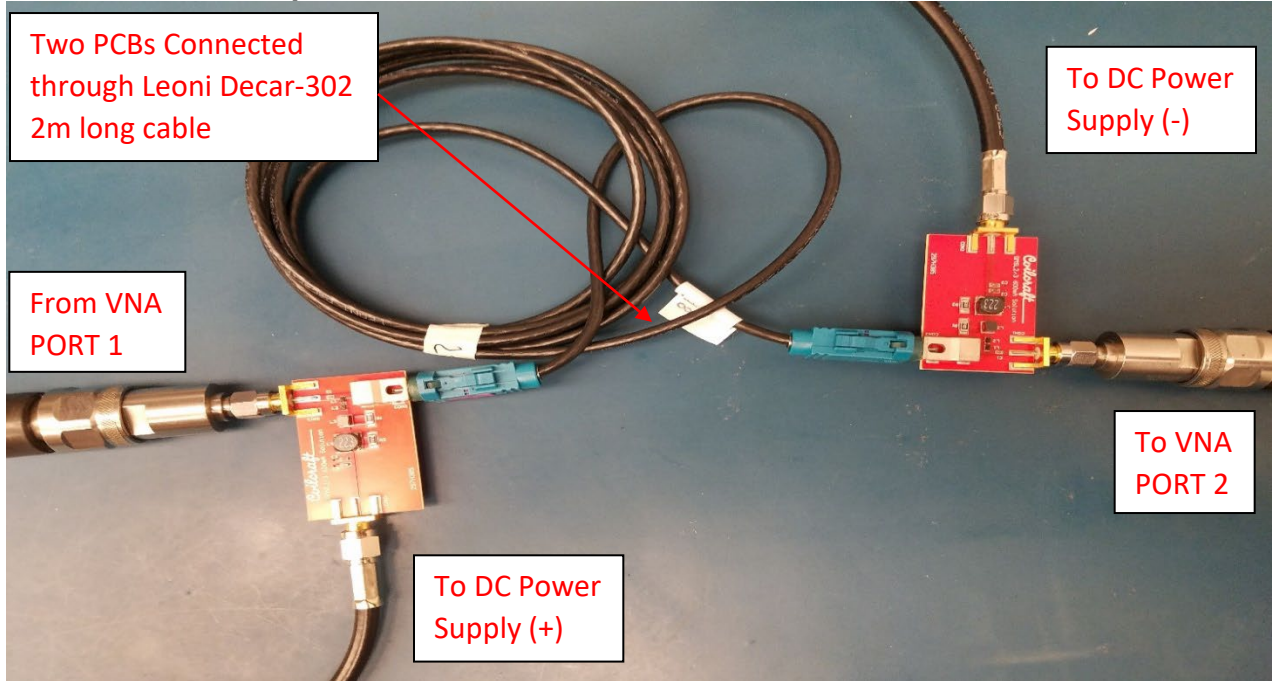| Inductors	DCR (Ohms)	Max area (mm²)	Current (A)		Notes
			Irms	Isat (30%)	
PFL2015-561 (0.56uH)	0.070	3.19	1.80 (40C rise)	1.900	
1210POC-222 (2.2uH)	0.140	8.811	1.65 (40C rise)	2.000	
LPS3015-332 (3.3uH)	0.130	9.157	1.40 (40C rise)	1.500	5.1k resistor in parallel
MSS5050T-223 (22uH)	0.140	28.62	1.65 (40C rise)	1.400	5.1k resistor in parallel
Total	**0.48**	**50**			

Schematic:
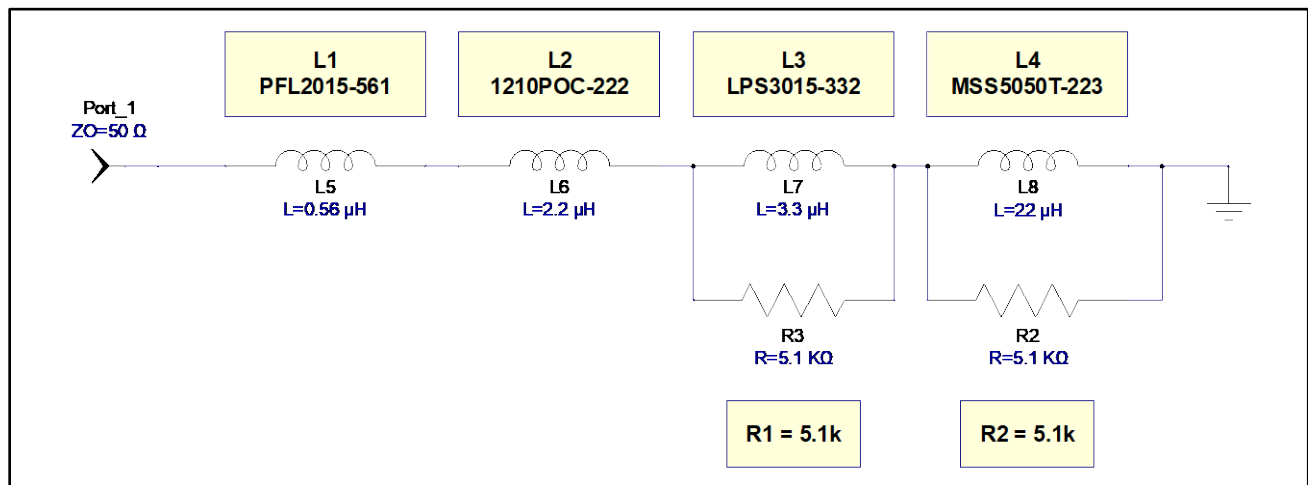
Coilcraft Complete POC System S-Parameters Measurements:-

2m length of Leoni decar-302 automotive cable was used to connect two PCBs. Below measurement setup picture is just for illustration may not represent actual boards.

Measurement Setup:-

Two PCBs Connected through Leoni Decar-302 2m long cable

From VNA PORT 1

To DC Power Supply (+)

To DC Power Supply (-)

To VNA PORT 2

Performance:

S11 Parameters For Complete POC System Under Different Load (2m Cable)

- No Load
- 800mA Load
- 1000mA Load
- 1200mA Load

S21 Parameters For Complete POC System Under Different Load (2m Cable)

Legend:
- No Load
- 800mA Load
- 1000mA Load
- 1200mA Load

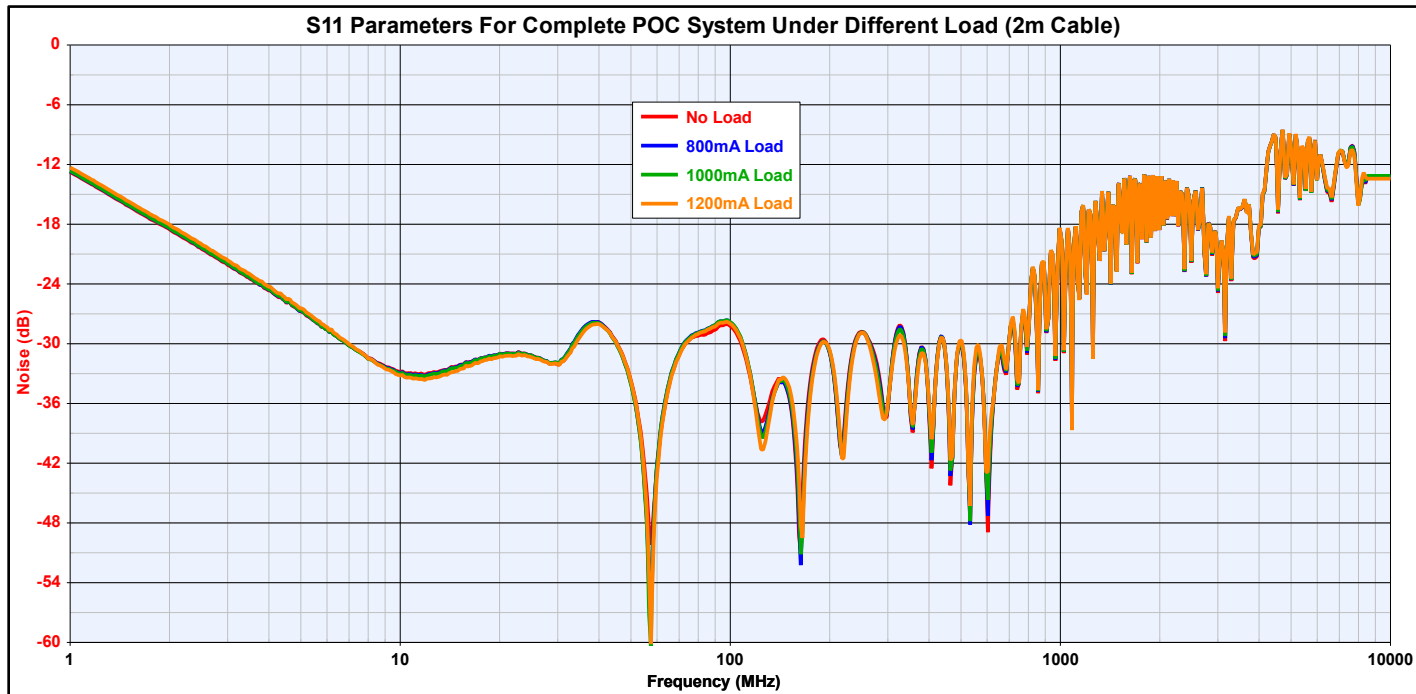X-axis: Frequency (MHz)
Y-axis: Noise (dB)

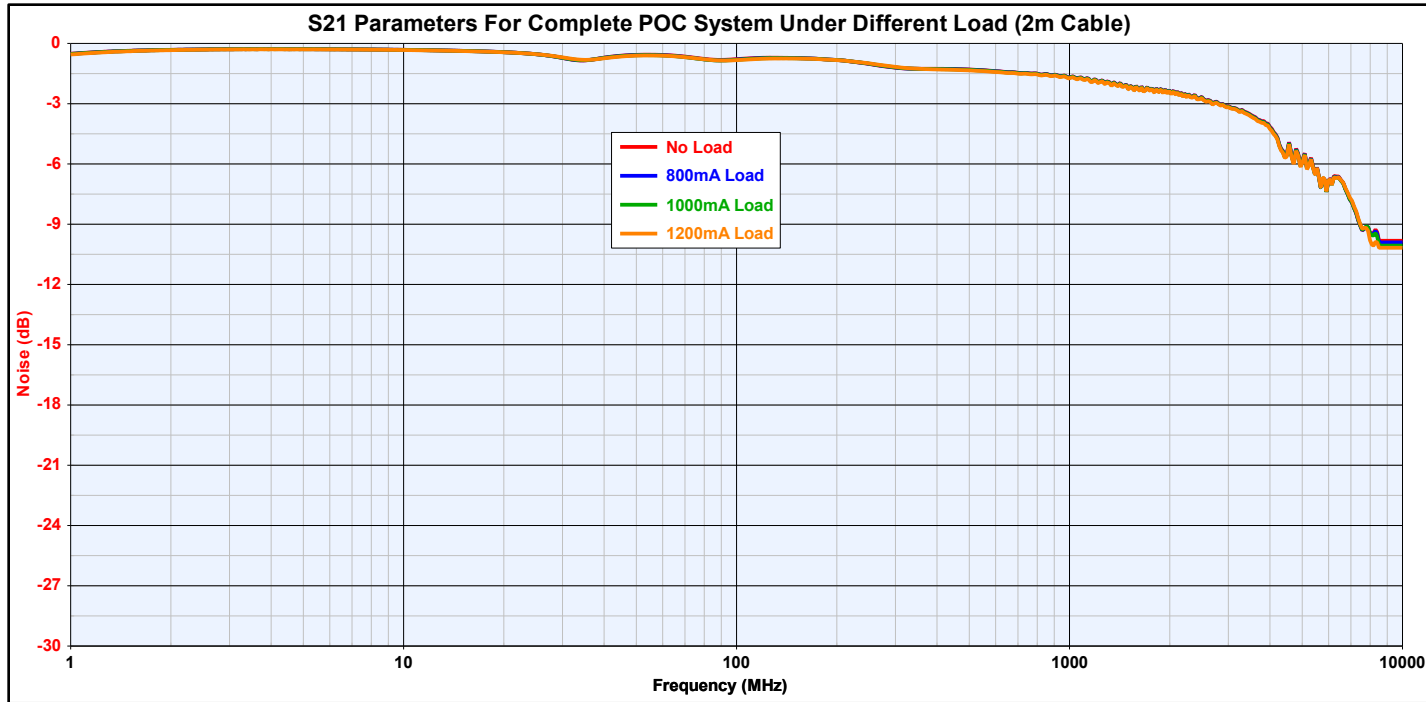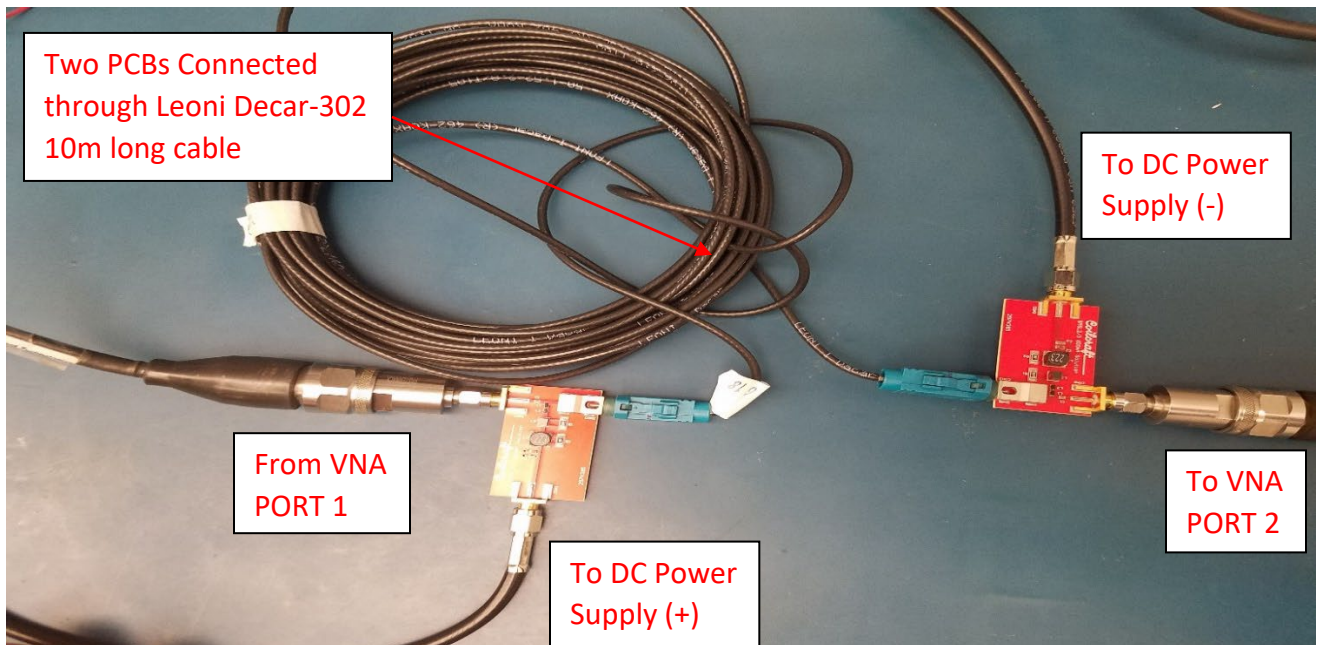## Coilcraft Complete POC System S-Parameters Measurements:-

10m length of Leoni decar-302 automotive cable was used to connect two PCBs. Below measurement setup picture is just for illustration may not represent actual boards.

Measurement Setup:-

Two PCBs Connected through Leoni Decar-302 10m long cable

To DC Power Supply (-)

From VNA PORT 1

To VNA PORT 2

To DC Power Supply (+)

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Performance:

S11 Parameters For Complete POC System Under Different Load (10m Cable)

Legend:
- No Load
- 800mA Load
- 1000mA Load
- 1200mA Load

Y-axis: Noise (dB), X-axis: Frequency (MHz)

S21 Parameters For Complete POC System Under Different Load (10m Cable)

Legend:
- No Load
- 800mA Laod
- 1000mA Load
- 1200mA Load

Y-axis: Noise (dB), X-axis: Frequency (MHz)