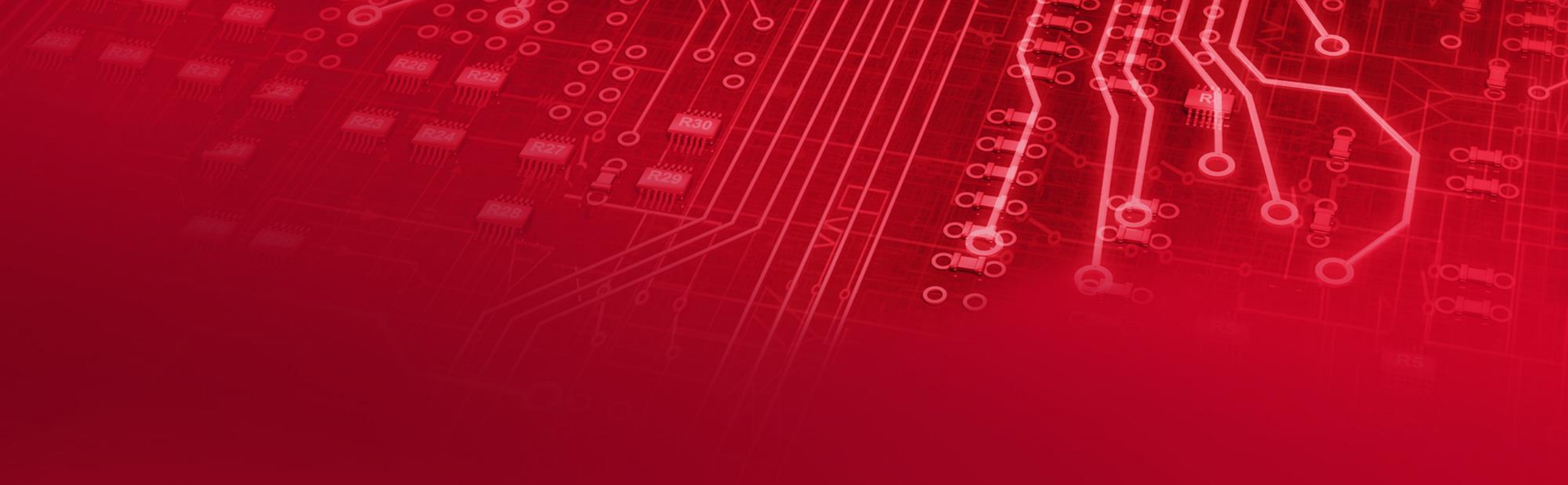




NFC Antenna Matching and Evaluation

Prepared by Speed/ Richard Ni
Reviewed by Josh Liu

2022.12.20
2022.01.15



INTRODUCTION

- This document is for use of Antenna vendors (ODM) for Dell laptops/tablets with Broadcom's Citadel chipset for RFID based secure login and NFC features
- NFC/RFID implementation in these products requires an effective Antenna Match and NFC functionality verification
- The primary scope of this document is limited to evaluating the antenna matching circuit. Scope also covers signal integrity/waveform measurements, field strength validation and Critical card functional tests.
- Implementation has an LC EMI filter on the Lynx Module containing 58102. The rest of match is on Antenna Module and is subject to tuning adjustment based on antenna and related design

ANTENNA DETAILS:

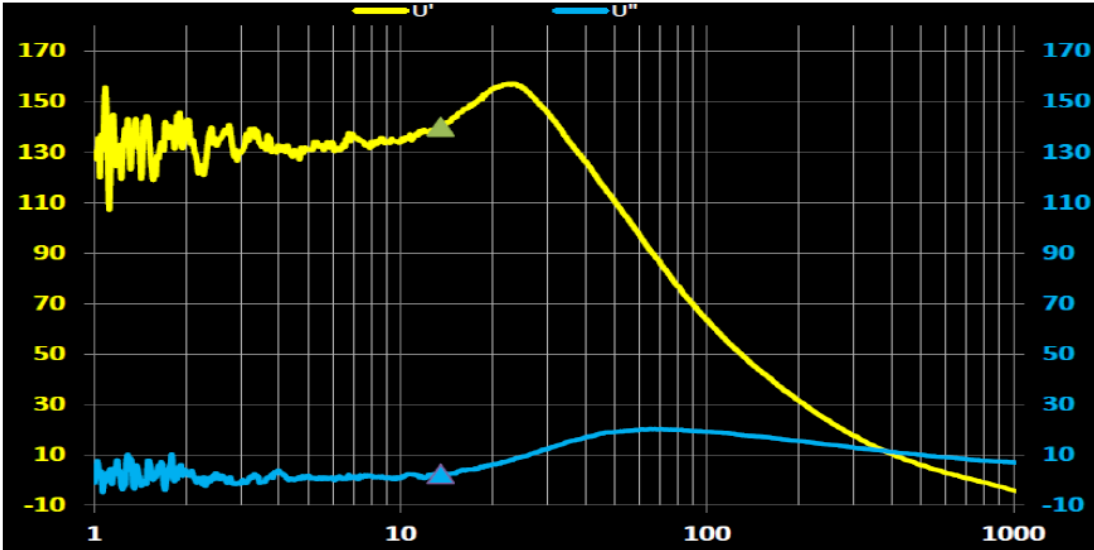
Parameter	Item	Limit	Detail
Product Info	Vendor Name		SPEED
	Date		2022/12/20
	Sample Part Number		F-0W-FH-6160-001-00
Mechanical Design	Coil outer Size (mm*mm)	35 x 44 x 0.9 mm	31 x 40 mm
	Coil area (mm ²)	N/A	1240 mm ²
	Number of turns	3-6	4
	Inductance	<1.5uH	1.34 uH
Antenna PCB	Copper Thickness		0.5 oz
	Trace Width (mm)	>0.6mm	0.7 mm
	Trace Gap(mm)	>0.4mm	0.5 mm
Ferrite	magnetic permeability(u')	>120	130 ±20%
	magnetic loss(u'')	<3	3 ±20%
	Thickness (mm)		0.12 mm
	Ferrite size (mm*mm)		34.7 x 43.7 mm

ANTENNA DETAILS:

U' and U'' SPEC of Selected Ferrite-sheet:

項目 Item	條件 Test Condition	性質 Description
尺寸 長 * 寬 Dimension Length*Width	mm	110mm*110mm± 0.2mm
厚度 Thickness	不含其他材料 (背膠 . Mylar)	0.1mm ± 0.01mm
背膠厚度 Adhesive thickness		0.02mm ± 0.01mm
黑PET厚度 Black PET thickness		0.03mm ± 0.01mm
總厚度 Total thickness		0.15mm ± 0.02mm
建議頻率範圍 Bandwidth Range	以基材為主	13.56 MHz
透磁率 μ' Permeability	At 13.56MHz	130 ± 20%
透磁率 μ'' Permeability	At 13.56MHz	3 ± 20%
表面阻抗 Ω Surface Resistivity		10^6
使用界限溫度 Maximum Operating temperature	HC40243	80 °C
工作溫度範圍 Operating Temperature		-10 °C~100 °C

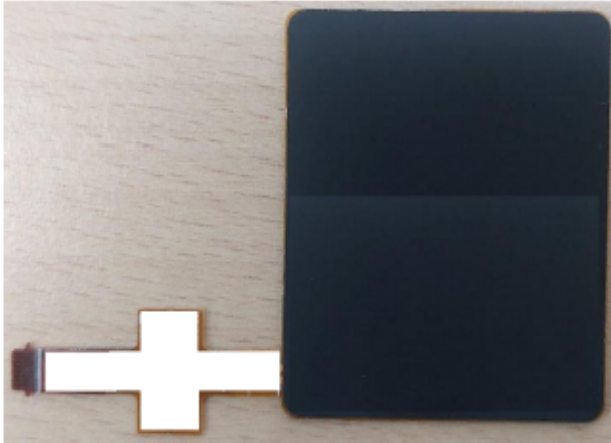
Permeability



ANTENNA DETAILS:

Pictures of NFC Antenna Sample and Layout of Antenna PCB:

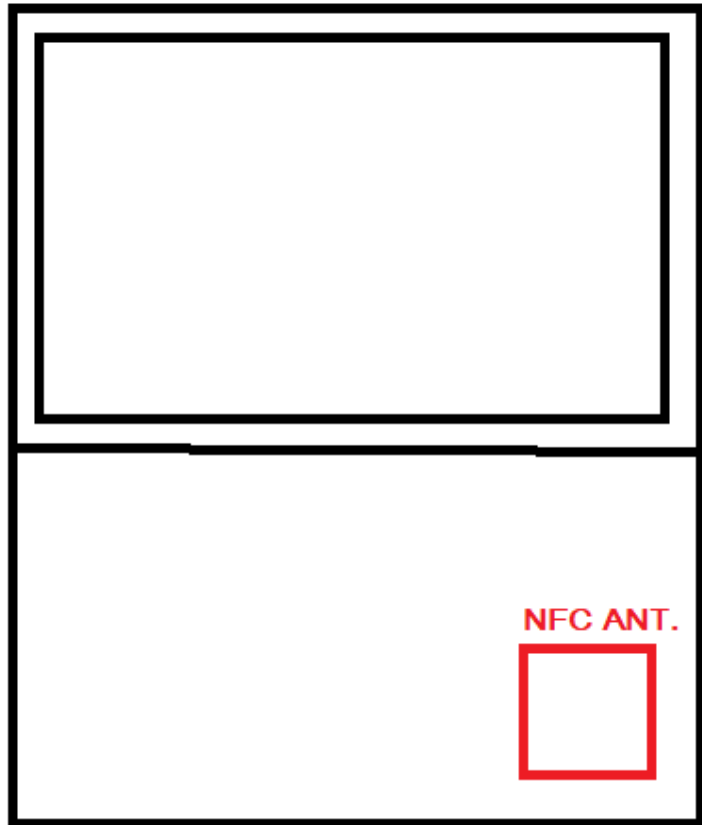
Antenna Type: Loop



NFC Antenna

ANTENNA DETAILS:

Pictures of NFC Antenna in the DUT:





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