iQnfc

IQnfc™
Near Field Communication Test System

NFC ZigBee 802.11ac
GPS GLONASS GPS ZigBee
WiMAX LTE FM
4G Bluetooth® 802.11ac
WiFi
802.11
MIMO LTE WiFi
WiMAX
GLONASS
WiFi 4G LTE
WiMAX
FM

LITEPOINT

Introduction

IQnfc is a wireless test solution for the NFC enabled devices. It focuses on characterizing the NFC physical layer and ensuring production quality. IQnfc supports main NFC standards and emulation of both initiator (a.k.a. PCD or polling device) and target (a.k.a. PICC or listening device) modes. The table below summarizes the standards test coverage.

NFC Forum	ISO Standard	Initiator	Target
NFC A	14443A (EMVco)	√	√
NFC B	14443B (EMVco)	√	√
NFC F	18092 (FeliCa)	√	√
NFC P2P	18092 peer to peer	√	√

IQnfc Test Instrument Specifications

Monitor Port

Parameter	Value
Input Voltage Range	0.05 to 2 Vpp, +/-1 V Max
Input Voltage Accuracy	+/-5%
Frequency Range	10 to 20 MHz
Frequency Accuracy	< +/-8 ppm (< +/-100 Hz @ 13.56 MHz)
Quantization	14 bits
Spurious (non-harmonic)	< -60 dBc
Input Return Loss	>15 dB

Transceiver Port

Parameter	Value
Output Voltage Range	0.5 to 7 Vpp (re: 50 ohms), Transceiver Mode 0.2 to 2 Vpp (re: 50 ohms), Resonance Sweep Mode
Input Voltage Range	0.3 to 12 Vpp, +/-6 Vmax
Output Voltage Accuracy	+/- 10% with regard to set level (re: 50 ohms)
Output Voltage Resolution	0.25 dB, Transceiver Mode 0.5 dB, Resonance Sweep Mode
Output Frequency Range	13.56 +/- 0.01 MHz, Transceiver Mode 10 to 20 MHz, Resonance Sweep Mode

Input Frequency Range	10 to 20 MHz
Input Quantization	14 bits
Frequency Accuracy	< +/-8 ppm (< +/-100 Hz @ 13.56 MHz)
Frequency Resolution	10 Hz
Output Spurious (non-harmonic)	< -40 dBc
Input Spurious (non-harmonic)	< -60 dBc
Output Impedance	50 ohms
Reflection Uncertainty	When reflection coefficient (linear)=0, Magnitude (linear): +/-0.01; Phase (deg): infinite When reflection coefficient (linear)=1, Magnitude (linear): +/-0.03; Phase (deg): +/-3 degree

IQnfc Test Head Specifications

Monitor Port

Parameter	Value
Frequency Range	10 to 20 MHz
Magnetic Field Strength Accuracy[1]	+/-20% @ 13.56 MHz
Maximum Magnetic Field Strength[1]	12 A/m rms @ 13.56 MHz
Input / Output Impedance	50 ohms

Transceiver Port

Parameter	Value
Resonator Frequencies	13.56, 15, or 16.1 MHz
Resonator Options	13.56 MHz, Low & High Q 15.0 MHz, Low & High Q 16.1 MHz, Low & High Q
Maximum Input Voltage	10 Vpp
Magnetic Field Strength (@ 13.56 MHz)[1]	> 4.5 A/m rms @ 0 mm, both high & low Q[2] > 3.5 A/m rms @ 10 mm & 20 mm, high Q[2] > 1 5 A/m rms @ 10 mm & 20 mm, low Q[2]
Input / Output Impedance	50 ohms

[1] Referenced to ISO/IEC 10373-6/7 (ISO/IEC 18092/14443/15693) Calibration Coil

[2] Referenced to Top Surface of Test Head

NFC Measurement Specifications

Measurement	Description	Performance
Standard	ISO14443A/B, ISO18092, EMVco, Felica, NFC A/B/F/P2P	
Operation Mode	Target and Initiator emulation	
Data Rate	Support various NFC data rates analysis	106, 212 and 424 kbps[3]
Field Strength	Measure carrier field strength (DUT as initiator)	Relative measurement, DUT and Position dependent. Resonator & Q selection dependent.
Frequency Accuracy	Measure DUT frequency error (DUT as initiator)	+/-100 Hz
Target Frame Delay Time	Measure the DUT response time (DUT as target)	Tester contribution <+/-20 ns
Modulation depth / Index / Timing Profile	Measure waveform shape (DUT as initiator and target)	This is a relative measurement: dependent on DUT, position, resonator and Q selection.
Rx Sensitivity	Min detectable field strength (DUT as initiator and target)	This is a relative measurement: dependent on DUT, position, resonator and Q selection.
Payload Data	Provide results of received payload data (DUT as initiator and target)	
CRC Error	Provide results of CRC error (DUT as initiator and target)	
Resonate Frequency & Q / BW	Measure DUT resonate frequency and Q / BW	
S11	Measure return loss (conducted test only)	When reflection coefficient (linear)=0, Magnitude (linear): +/-0.01; Phase (deg): infinite When reflection coefficient (linear)=1, Magnitude (linear): +/-0.03; Phase (deg): +/-3 degree
Impedance	Measure impedance , resistance and reactance (conducted test only)	

[3] Dependent on standard and operation mode

IQnfc Test Instrument Port Description

Front Panel

I/O	Function	Type
Monitor Port	Signal out from the Monitor circuit and coil	BNC female
Transceiver Port	Signal input / output to / from Transceiver circuit and coil	BNC female
Control Port	Digital control and power for the tuning circuit	Proprietary
Status Indicator	Blinking Green indicates that the application is loading. Green indicates that no fault is detected and the system is ready to use. Orange indicates that a software fault has occurred. Red indicates that the test system is on, but the NFC application is not running. It can also occur if the USB connection to the test system is not established. Blinking Red indicates that a hardware fault has occurred. The indicator is off when power is turned off, or if the USB connection to the test system has been lost.	LED

Rear Panel

I/O	Function	Type
Trigger 1 IN/OUT	TTL compatible	BNC female
Trigger 2 IN/OUT	TTL compatible	BNC female
USB	USB 2.0 compatible connection to external controller	USB Type B
AC IN	AC power input	100 to 240 VAC (automatically switched) 50 to 60 Hz Includes hard power switch

IQnfc Test Head Port Description

I/O	Function	Type
Monitor Port	Signal out from the Monitor circuit and coil	SMA female
Transceiver Port	Signal input / output to / from Transceiver circuit and coil	SMA female
Control Port	Digital control and power for the tuning circuit	Mirco-D high density 9 pin

General and Environmental

Dimensions	14.782″ L X 16.707″ W X 2.093″ H
Weight	7.1 pounds
Power Requirements	90-260 VAC, 47-63 Hz; <92 W
Power Consumption	<35 (Maximum), <24 W (standby)
Recommended PC	Intel® Core i5 2.5 GHz with 1 GB of RAM or better
Operating System	Windows® 7 (32 and 64 bits)
Recommended Browser for Optimal Performance	Google Chrome™ R10 Release
Operating Temperature	+10°C to +55°C (IEC EN60068-2-1, 2, 14)
Storage Temperature	-20°C to +70°C (IEC EN60068-2-1, 2, 14)
Specification Validity Temperature	+20°C to +30°C
Operating Humidity	15% to 95% relative humidity, non-condensing (IEC EN60068-2-30)
EMC	EN 61326 Immunity for industrial environment, Class A emissions
Safety	IEC 61010-1, EN61010-1, UL3111-1, CAN/CSA-C22.2 No. 61010-1-12
Mechanical Vibration	IEC 60068, IEC 61010 and MIL-T-28800D, class 5
Mechanical Shock	ASTM D3332-99, Method B
Recommended Calibration Cycle	36 months
Warranty	12 months hardware 12 months software updates

Programming Interface and Graphical User Interface (GUI)

Programmatic Interface	SCPI, C++	
Applications Graphical User Interface	NFC	GUI supports built-in measurement and signal generation functions per standard as appropriate

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