TECHNICAL SPECIFICATIONS

IQcore-5G

5G Network Emulator

LITEPOINT

Overview

LitePoint's IQcore-5G network emulator is a comprehensive 5G call processing unit, simulating functions of a gNodeB base station. Core to LitePoint's IQcell-5G signaling solution, the IQcore-5G is compliant with 3GPP 5G NR Release-16 specification and enables 5G communication in both Non-standalone (NSA) and Standalone (SA) deployment models. As part of the 5G signaling configuration the IQcore-5G unit is paired with either the IQFR1-5G Sub-6GHz test system and/or the IQgig-5GS mmWave test system to support measurements and analysis across varied frequencies within the Sub-6GHz and mmWave bands. The 5G signaling solution is designed to ensure holistic product quality check by supporting RF parametric measurements, mobility testing, user experience testing & end to end iPerf throughput test using the built-in iPerf throughput server.

From Development to Production to Service Centers

The IQcell-5G signaling configuration comprising of - IQcore-5G, IQFR1-5G, IQgig-5GS Model B is built to ensure smooth transition between various stages of product development cycle - supporting:

- Comprehensive RF parametric measurements for end-of-line manufacturing or R&D regression and software stability testing
- MO/MT call flow verification, end-to-end throughput test & finished product quality check
- User experience tests including SMS, file transfer, VoNR, audio loopback, latency test, eSIM, multi-SIM test, etc. for sampling & pre-production test beds

Easy Transition Between SA & NSA and Flexibility to Switch Between FR1 & FR2 Bands

LitePoint's IQcell-5G signaling solution is designed keeping flexibility and scalability in mind. The modular architecture ensures that the solution can easily transition from SA to NSA mode by simply adding LitePoint's IQcell LTE anchor that also brings in support for legacy technologies WCDMA and GSM. Furthermore, to keep up with the changing test requirements the configurations can be upgraded at any time to support either or both Sub-6GHz & mmWave frequency ranges.

Smart Regression & Automation Framework

Before a product is released to volume manufacturing, several iterations of hardware and software changes are made to fine tune the device behavior. LitePoint's automation tool IQfact-s is optimized to ensure quality by verifying the device behavior against a range of test cases. The automation test tool is easily customizable to support regression of RF and throughput test cases under varied conditions, such as bands, bandwidths, modulation schemes, power levels, etc. to ensure the device functionality. In addition, the solution also comes with a ready to use web-based GUI for rapid RF parametric execution and analysis.

Real World Scenario Test

Changing hardware implementation & support for advanced features makes it critical to verify the DUT's performance with real-world use models. IQcell-5G enables validation of mobile-to-mobile calls, SMS, browsing, file transfer, handovers, audio loopback and much more to ensure holistic product quality check.

Multi-SIM & eSIM Test Support

To accommodate the changing flexibility of SIM cards in a device, the solution also supports functional verification of multiple SIM's and remote provisioning & testing of embedded SIM's (eSIM).

Expansive 5G NR Test Support

IQcell-5G supports multiple different configurations and frequency ranges:

- FR1 SA/NSA
- FR2 NSA
- FR1 + FR2 SA/NSA

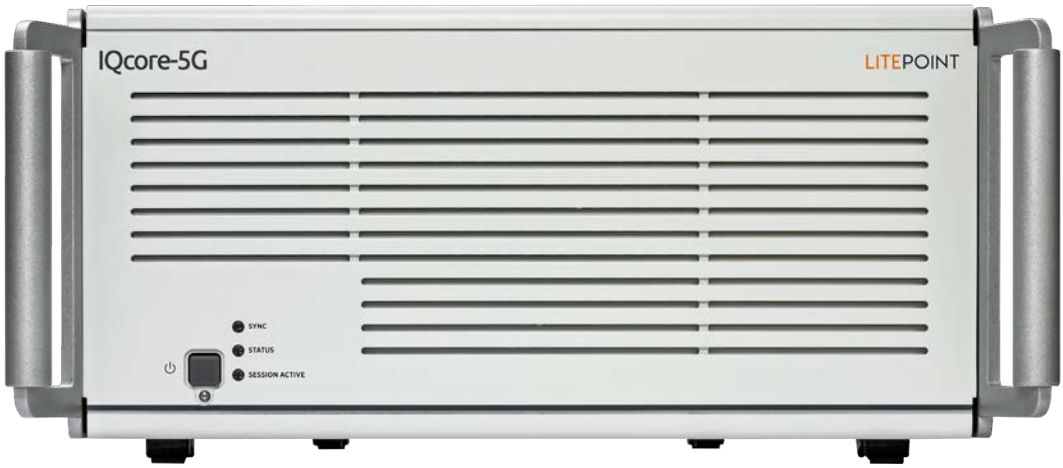
For more details on RF test capabilities, kindly refer to the IQFR1-5G and IQgig-5GS Model B datasheets.

Solution Summary

- Tailored for cellular or cellular-capable connectivity products supporting 5G NR sub-6GHz, 5G NR mmWave, LTE, WCDMA, GSM technologies
- Ideal for end-product quality check, RF regression, stability, and throughput test
- Multi-DUT test capabilities enable lower cost of test for end-of-line manufacturing test
- Economized footprint with a built-in iPerf throughput server
- Flexible licensing models to adapt to changing test needs

Port Descriptions

Front Panel



I/O	Function	Type
Power Button	Power On/Off	Pushbutton Switch
SYNC	LED Green – indicates active signaling between IQcore-5G and RF testers IQFR1-5G or IQgig-5GS Model B LED Orange – indicates physical connection between IQcore-5G and RF testers IQFR1-5G or IQgig-5GS Model B with all the units powered but no active signaling communication LED Red – indicative of absence of physical connection between IQcore-5G and RF testers IQFR1-5G or IQgig-5GS Model B	LED indicator
STATUS	LED Green – no faults/errors detected LED Orange – Software error detected LED Red – Hardware fault detected	LED indicator
SESSION ACTIVE	LED Green – remote session active LED Red – remote session lock	LED indicator

Rear Panel

I/O	Function	Type
LAN (10 ports)	1000 Base-T LAN	RJ-45
USB (4 ports)	USB 3.0 compatible connection to external controller	USB Type A
VGA	Display	15-Pin DSUB (female)
VGA	Display	9-Pin DSUB (male)
QSFP28 4x25GbE	High bandwidth data connection	QSFP connector
SFP (10G)	Data connection	SFP connector
AC in	AC power input	100 to 240V AC (automatically switched) 50 to 60 Hz, Includes hard power switch

Solution Capabilities

Parameter	Value
Frequency Range FR1 FR2	 600 – 6000 MHz 23 – 45 GHz
Operating Mode	Non-standalone (NSA), Standalone (SA)
Test Support	3GPP spec 38.521 -1/2/3
Release Support	Release 16 Sep 2020
Bandwidth FR1 FR2	 5, 10, 15, 20, 30, 40, 50, 60, 80, 100 MHz 50, 100 MHz
MIMO FR1 FR2	 DL SISO, 2x2, 4x4 MIMO; UL SISO, 2x2 MIMO DL SISO; UL SISO
Data Throughput	Built-in iPerf server for data sessions
UE Test Mode Support	Type A & B

Test Support

Parameter	Value
RF Parametric	Tx and Rx characteristic verification (as per 38.521) (Refer to IQFR1-5G and IQgig-5GS Model-B datasheets for measurement specifications across FR1 and FR2 frequency ranges)
Data Throughput FR1 FR2	 Downlink data rate up to 1.9 Gbps (100MHz, 256QAM, 4x4 MIMO) Note: data rate may vary based on the UL/DL format used.
User Experience Test	Audio loopback (for voicemail testing) Web browsing File transfer SMS over IMS and CS Embedded SIM (eSIM) test Multi-SIM test Call stability & regression test Mobile terminated /M originated voice call Multi-cell connected & idle mode mobility

General Hardware Specifications

Parameter	Value
Dimensions	15" W x 7.1" H x 21.3" D (381 mm x 181 mm x 541 mm)
Weight	29.4 pounds (13.3 kg)
Power consumption (maximum)	1200W
Power requirements	100 - 240 VAC, 50-60 Hz
Operating temperature	20°C to 35°C (valid range for specifications)
Storage temperature	-20°C to +70°C (IEC EN60068-2-1, 2, 14)
Operating humidity	15% to 95% relative humidity, non-condensing (IEC EN60068-2-30)
EMC/EMI	61326-1: 2013 Industrial Environment, CISPR11 Class A per EN61326-1:2013, FCC Part 15 Class A, VCCI V-3 Class A, BSMI CNS-13438 Class A, ACMA AS/NZS CISPR11: 2011, ICES-003 Class A
Safety	IEC 61010-1, EN61010-1, UL61010-1:2012 and Canada: CSA C22.2 No. 61010-1, GI1, GI2
Mechanical vibration	MIL-STD 810G for Random Vibration
Mechanical shock	ASTM D3332-99
Warranty	12 months hardware & software updates

Order Codes

Code	Product
0100-5GSG-001	IQcore-5G Signaling Baseband Unit
0100-5GSG-003	IQFR1-5G Sub-6GHz Test System
0100-IG5G-025	IQgig-5GS Model B (2 port - FR2 Signaling System)
0100-IG5G-026	IQgig-5GS Model B (4 port - FR2 Signaling System)
0150-5GSG-001	IQ5041 FR1 NSA/SA RF Chamber
0300-5GSG-001	5G Non-Standalone Mode License
0300-5GSG-002	5G Standalone Mode License
0300-5GSG-004	5G End User Exp Test License
0300-5GSG-005	5G 3GPP SW License
0300-5GSG-006	5G Multicell Signaling License
0300-5GSG-007	5G FR1 MIMO SW License
0100-CELL-001	IQcell LTE Anchor

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