Test SIM Cards and eSIMs

For UXM 5G-based Network Emulation Solutions

Introduction

A SIM (Subscriber Identity Module) card is essential for mobile devices as it stores the International Mobile Subscriber Identity (IMSI) and related keys used to identify and authenticate subscribers on mobile networks. This small chip enables users to make calls, send texts, and access mobile data by connecting their device to a carrier's network.

There are two main types of SIMs: physical SIMs and embedded SIMs (eSIMs). Physical SIMs are removable cards that can be inserted into and removed from a device, allowing users to switch between different carriers or devices easily. In contrast, eSIMs are built into the device itself and can be programmed remotely, eliminating the need for a physical card. This makes eSIMs more convenient for users who frequently travel or switch carriers, as they can change their network provider without needing to physically swap out a SIM card.

When testing devices using Keysight's comprehensive range of Network Emulation Solutions based on the UXM 5G platform, the device must contain either a SIM card or an eSIM that is programmed with the correct profile. Keysight offers a range of SIM profiles for testing of different use cases and test scenarios, which can be supplied as either physical SIM cards or as downloadable eSIM profiles.

5G Base SIM (E7515-10911)

The default SIM card used for testing on the UXM 5G platform is E7515-10911. This SIM card contains the standard GSMA TS.48 profile, which is supported by all Keysight's Network Emulation solutions. One of these SIM cards is delivered with every UXM 5G Wireless Test Platform unit. It supports all 3 physical SIM sizes, i.e. Mini (2FF), Micro (3FF) and Nano (4FF), by pressing out the required size from the plastic surround.

The detailed specification of the profile programmed onto this SIM card can be found here:

Keysight 5G Base SIM Profile - E7515-10911

SIM Packs

Keysight also offers a range of SIM Packs, for users who need to order additional physical SIM cards to support testing of multiple devices or to replace lost SIM cards, as follows:

Model	Name	Description
C8806S05A	5G SIM PACK – 5 cards	Pack of 5 SIM cards, with required profiles specified by the user
C8806S10A	5G SIM PACK – 10 cards	Pack of 10 SIM cards, with required profiles specified by the user
C8806S15A	5G SIM PACK – 15 cards	Pack of 15 SIM cards, with required profiles specified by the user

The SIM cards ordered via these SIM packs will be labelled with the relevant profile name and support the 2FF, 3FF and 4FF SIM sizes.

eSIM Activation Vouchers

Additionally, Keysight provides electronic eSIM profiles which may be downloaded to a device containing an eSIM. These are delivered via eSIM Activation Vouchers, which consist of a QR code that may be scanned on the device to trigger the download of the profile from a cloud-hosted server.

Model	Name	Description
C8806SE1A	Activation Voucher for eSIM	An activation voucher for a single eSIM, delivered as a QR code to enable download from the server

A range of eSIM profiles are available to purchase via eSIM activation vouchers. After downloading an eSIM profile onto a device, it may be transferred to another device by first returning it to the server and then downloading it to the other device.

SIM Profiles

Most testing on the UXM 5G platform can be performed using the default E7515-10911 5G Base SIM card delivered with each UXM 5G unit, or with the equivalent 5G Base SIM eSIM profile. However, some test requirements, primarily for Protocol Conformance and Carrier Acceptance testing, demand that different SIM profiles be used. These may be ordered as either:

a)   physical SIM cards via SIM Packs. Profile model = C8806A-{*profile number*}

b)   eSIM profiles via eSIM Activation Vouchers. Profile model = C8806SE1A-{*profile number*}

Profile Number	Profile Name	Description
800	5G Base SIM	Default SIM profile for testing on UXM 5G. Physical SIM cards with this profile are labelled E7515-10911.
801	Keysight Programmable SIM Card	Physical SIM card for use with an A9190A SIM Programmer Switch
802	5G Base SIM with alternate PLMN and MSISDN	Secondary SIM profile for Dual SIM testing, in addition to E7515-10911. Contains the same profile as E7515-10911, but with different PLMN and MSISDN values.
B*nn*	SIM Card *nn* for Verizon	SIM profiles for Verizon carrier acceptance testing
C*nn*	SIM Card *nn* for China Mobile	SIM profiles for China Mobile carrier acceptance testing
D*nn*	SIM Card *nn* for T-Mobile	SIM profiles for T-Mobile carrier acceptance testing
E*nn*	SIM Card *nn* for China Telecom	SIM profiles for China Telecom carrier acceptance testing
H*nn*	SIM Card *nn* for Rakuten	SIM profiles for Rakuten carrier acceptance testing
J*nn*	SIM Card *nn* for China Unicom	SIM profiles for China Unicom carrier acceptance testing
L*nn*	SIM Card *nn* for DISH	SIM profiles for DISH carrier acceptance testing
M*nn*	SIM Card *nn* for Comcast	SIM profiles for Comcast carrier acceptance testing
R*nn*	SIM Card *nn* for Regulatory	SIM profiles for Regulatory testing
nnn	3GPP 5G NR SIM Card *nnn*	SIM profiles for 3GPP Protocol, USIM and USAT Conformance testing

Please refer to the latest Test Case Status spreadsheets for the S8704A Protocol Conformance Toolset and S8706A Protocol Carrier Acceptance Toolset solutions for details about which SIM profile is required when running each test case. New profiles are regularly defined for new test cases, with the relevant profile numbers (*nn* above) being created for these. Specifications for these profiles are defined by the relevant mobile network operator or 3GPP.

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