Keysight Technologies

Propsim F32 Channel Emulator 2.7 GHz

Data Sheet

Advanced End-to-End Performance Testing
with Unrivaled Multi-Link Emulation Capacity

KEYSIGHT
TECHNOLOGIES

Unlocking Measurement Insights

2TEST

Perform advanced testing of chipsets, devices and base stations with Propsim F32

– LTE-A multi-mode chipset and device testing with real base stations
– CTIA/3GPP/CCSA MIMO OTA device testing in anechoic chamber
– LTE-A base station testing with real devices
– Multi-RAT virtual drive testing
– Device and base station testing integrated into the mobile operator test plan
– Applications end-to-end performance testing with live network: VoLTE and data throughput; fall back scenarios to legacy technology voice and data; cell selection/re-selection scenarios and more
– Special VHF to UHF and mobile ad-hoc network radio testing

Unique capabilities for LTE-Advanced Performance Testing

– Unique multi-link emulation capability and integrated programmable LTE interference sources
– 32 bi- and uni-directional RF interface channels and 128 internal channels for flexible multi-link scenario testing
– MU-MIMO testing e.g. 10x UE and 2x eNB/4x UE and 4 x eNB
– LTE small cells and dual connectivity testing. LTE-Hi, LTE-LAA and WiFi offloading
– Multi-RAT live network and device testing e.g. multi-cell LTE, HSPA, GSM
– Single F32 supports LTE Carrier Aggregation testing up to 8CC bands, each 40MHz wide
– Uplink MIMO, LTE 3D beamform testing e.g. 16x8-Bi or up to 64x4-Bi
– Efficient device MIMO OTA testing with Propsim FAST-OTA capability

Easy access to main functionality

– Setup Wizard with guided steps for test scenario creation and editing
– Bi- and uni- directional operation of RF ports
– Built-in input power measurement
– Integrated synchronous LTE Network interference generation
– Fully automated phase and amplitude calibration without external VNA
– Automated 24/7 testing
– ATE remote control interface for GPIB and LAN
– Compatible with other Propsim products test automation interface enabling smooth and convenient transfer or share of test automation scripts

Improve testing accuracy and coverage

– Propsim Geometric Channel Modeling tool (GCM) tool enables easy multi-link test scenario definition based on SCME, WINNER models to test MU-MIMO, beamforming, smart antennas, CoMP, carrier aggregation, HetNet and multi-RAT performance and interoperability testing of real devices and live base stations
– Propsim Virtual Drive Testing modeling toolenable advanced troubleshooting of field issues, benchmarking, interoperability and regression testing by importing field measurement data from a live network captured by drive test tools such as Nemo Outdoor and Nemo Handy
– Propsim MIMO OTA modeling tools compatible with CTIA/3GPP/CCSA test plans (and beyond) enable easy benchmarking of off-the-self devices in anechoic chamber installations

Ready test scenario packs include:

– Operator performance test plans, minimizing time spent on test preparation
– High-speed train, CoMP, MU-MIMO & beamforming testing adopted in test plan by major mobile network operator in Asia
– CTIA MIMO OTA test scenarios
– Propsim FAST-OTA capability enables up to 12x faster device MIMO OTA testing compared to conventional test methods
– LTE carrier aggregation testing, MIMO OTA and RF conductive
– Mobile Adhoc Network and MESH network radio testing

Specifications

RF interface channel configurations	8, 16, 24 or 32
MIMO emulation	2x2, 4x2, 4x4, 8x2, 8x4, 8x8, 10x10, 16x8 up to 64x8[1]
MANET emulation	up to 32 radios in chain, and 11 radios in full mesh network topology
RF interface channel frequency range	30 to 2700 MHz
RF interface channel signal bandwidth	40 MHz/32 RF channels, optionally 80 MHz /16 RF channels
Number of fading paths per channel	up to 48
Number of fading channels	up to 128 all independently controllable via GUI for fading, Doppler, path amplitude and path phase offset
Internal interference generators	LTE fully configurable and synchronous. AWGN and CW
Excess delay range for terrestrial channel emulation	up to 3000 µs
Number of integrated RF local oscillators	up to 8 internal and 8 external carrier frequencies. In total up to 16
Multi-emulator synchronization	up to 6 units
Input power measurement	Automatic input level setting
Input power meter modes	Continuous and RF burst-triggering
Integrated duplex components for uplink and downlink separation	
User-defined active connector settings	
ATE control interface for effortless test case automation	
Integrated phase and amplitude calibration (no need for VNA)	
Fully automatic phase and amplitude calibration with Keysight Technologies ACU external hardware unit (no need for VNA)	

1. multi-F32 unit configuration

RF Performance

RF input range @ 20 MHz BW	– 50 - +20 dBm (CF 10 dB, SNR >35 dB) – 30 - +20 dBm (CF 10 dB, SNR >60 dB, full range)
RF output level range	– 120 to – 20 dBm (RMS, CF 10 dB)
Peak output level	max. 0 dBm
RF output level setting resolution	0.1 dB
Digital fading channel dynamics	60 dB
Noise floor	– 165 dBm/Hz typical
EVM	OFDMA 20 MHz BW < –45 dB typical

Channel Modeling

Standard channel models	3GPP LTE, WCDMA, GSM, 3GPP2 (IS-54, IS 95), TETRA, ITU 3G, WLAN, DVB-T/H
Optional channel models	LTE Advanced evaluation models, IMT-Advanced models, SCM and SCME models, WINNER, WINNER+, operator test plan specific channel model packs on TD-LTE
Fading profiles	Constant, Rayleigh, Rice, Nakagami, Lognormal, Suzuki, Pure Doppler, flat, rounded, Gaussian, Jakes, Butterworth, user-defined profiles, models from 3rd party simulation tools and ray-tracing applications
Delay profiles	Constant, sinusoidal sliding delay, linear sliding delay, 3GPP birth-death, 3GPP sliding delay group, user-defined, delay profiles from 3rd party simulation tools and ray-tracing applications
Channel configuration topologies	Very flexible, single or multiple independent or fully synchronized MIMO, MISO, SIMO, SISO, MANET/mesh carrier aggregation, CoMP and relaying transmission schemes
Run-time fading engine	Amplitude, delay, Doppler and environment separately controlled for each fading channel

Channel modeling tool for user-defined channel models
Emulation of dynamic impulse response data
Flexible control of pre-defined shadowing profiles or user-defined path loss profiles; control of up to 128 channels independently
Emulation of 2D and 3D beamforming channels, single and multi-user scenarios, measured
Emulation of high-speed train scenarios; measured with channel sounder or defined with channel modeling tools
Field to lab virtual drive testing modeling tool for C2K/GSM/WCDMA/ LTE device and base station testing in the lab; use measured radio channel data captured with scanners, test terminals or receivers from the field; seamless operation with Keysight Nemo drive test tools
MIMO OTA modeling tool for CTIA/3GPP/CCSA MIMO OTA testing supports the latest CTIA and 3GPP compliant test scenarios and channel model validations; optional tools for LTE-CA inter- and intraband MIMO (DL), Uplink-MIMO, Bi-directional and 3D MIMO OTA testing
Geometric channel modeling tool for user-defined Multi-link MIMO, beamforming and smart antenna scenarios testing; includes dynamic spatial models, user-defined antenna patterns, 3D modeling and IMTA, WINNER and SCME models
Custom channel modeling tool kit for external PC
Maximize your investment: hardware platform extensions and additional features can be purchased and installed at any time after the initial delivery of an emulator platform