VIAVI Solutions

Application Note

VIAVI
CellAdvisor 5G

DSS Analyzer

Concurrent 4G LTE and 5G NR Radio Assessment

VIAVI CellAdvisor 5G is the ideal field test solution for 4G LTE and 5G NR radio access networks, performing signal analysis tests for each technology; as well as the capability to perform concurrent LTE and 5G signal analysis transmitted over dynamic spectrum sharing (DSS).

DSS technology has been introduced by the industry to enable 5G services to be delivered in LTE networks to accelerate the availability of 5G services.

Traditionally mobile network operators had two main options to deploy new cellular technologies, as follows:

- Spectrum re-farming, which re-uses the spectrum licensed by mobile operators migrating or replacing the radio access network of conventional cellular technologies, including radio controllers and radios, with network elements that that support this new cellular technology. This option potentially impacts customer experience if they are forced to migrate mobile services and devices, or it can be done gradually incentivizing customers to migrate and experience new services and benefits; however, this migration typically increases mobile charges and can take several months or years to complete.
- Spectrum Acquisition, which requires mobile operators to go through the process of licensing new spectrum that can be assigned for the deployment of new cellular technologies. This option does not disrupt services of existing customers; however, it is an expensive and lengthy proposition since it requires the acquisition or licensing of new spectrum bands from the government and the acquisition of new radio access elements.

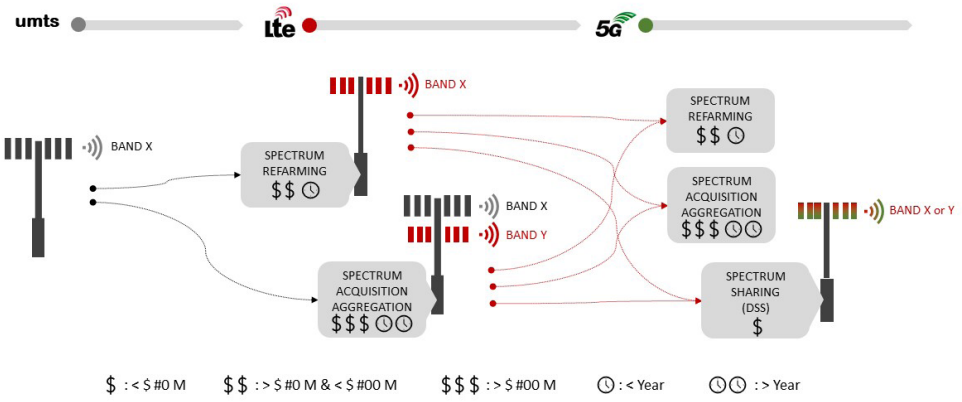
Benefits of CellAdvisor DSS Analyzer

- All-in-one 5G NR and 4G LTE test solution offers the best total cost of ownership.
- 5G signal analysis including beam availability, and signal quality.
- LTE signal analysis including carrier aggregation, and MIMO verification.
- DSS analysis conducting concurrent analysis of 5G NR and 4G LTE radios to quickly Identify signal availability and performance issues.

Features of CellAdvisor 5G DSS Analyzer

- DSS RF Analysis: DSS conformance verification according to 3GPP standard.
- DSS Modulation Analysis: concurrent 5G and LTE channel mapping, frame and subframe analysis, data constellation and time alignment error.
- DSS OTA (over the air) Analysis: concurrent 5G and LTE channel scanner, frequency and time error, and network coverage.

DSS effectively creates a third option for mobile operators to deploy new technology, without disrupting existing customers, and minimizing the implicit cost and extended time of spectrum re-farming and spectrum acquisition.



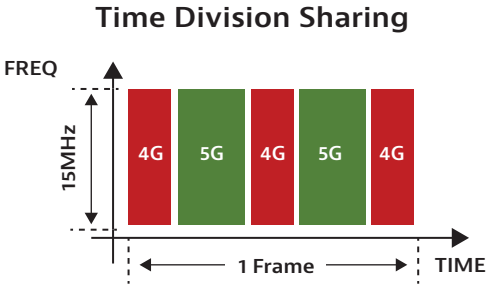
Deployment of New Cellular Technology in Radio Access Networks

Spectrum can be shared between two different technologies in Time, Frequency or a combination of both, this is achieved more efficiently with 4G and 5G since they have an orthogonal signal format that can allocate spectrum resources in frequency and time.

Time Division Sharing

Time division sharing allocates different timeslots to different technologies, this is better realized with LTE and 5G since both have a frame time of 10ms with 10 subframes, and each sub-frame (1ms) can be allocated to LTE or 5G.

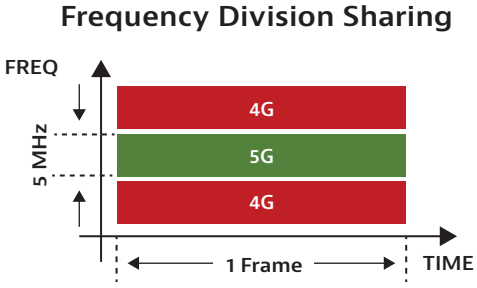
This methodology leverages the LTE multimedia broadband multicast services (MBMS) technology that permits different traffic types in LTE sub-frames, for example LTE and Broadcast, or LTE and 5G.



Frequency Division Sharing

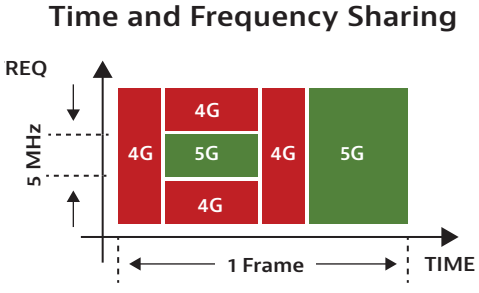
Frequency division sharing allocates different frequency parts to different technologies, for example, an LTE signal with a 15MHz bandwidth, can be partitioned in 3 bandwidth parts of 5MHz each, where LTE and 5G can be assigned independently for each bandwidth part.

The disadvantage of this methodology is that it is not as dynamic as time division sharing.



Time and Frequency Sharing

Time and frequency division sharing allocates spectrum resources in timeslots and bandwidth parts combining LTE and 5G; however, this methodology is more challenging to implement due to the complexity of signal processing and control channels required in radios and mobile devices.

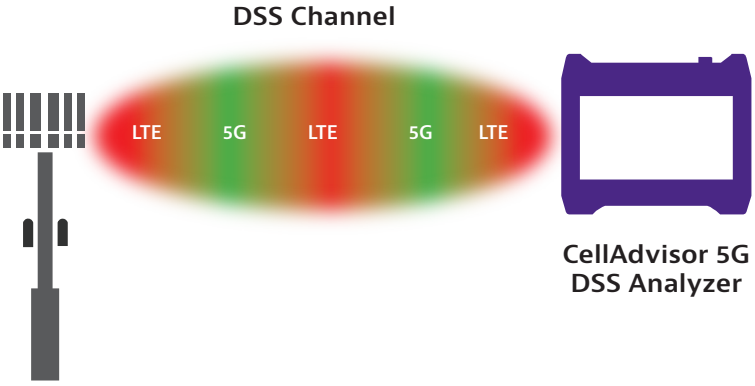


CellAdvisor 5G DSS Analyzer

Concurrent 4G LTE and 5G NR Analysis

CellAdvisor 5G DSS Analyzer option mode offers the following concurrent 5G and LTE measurements:

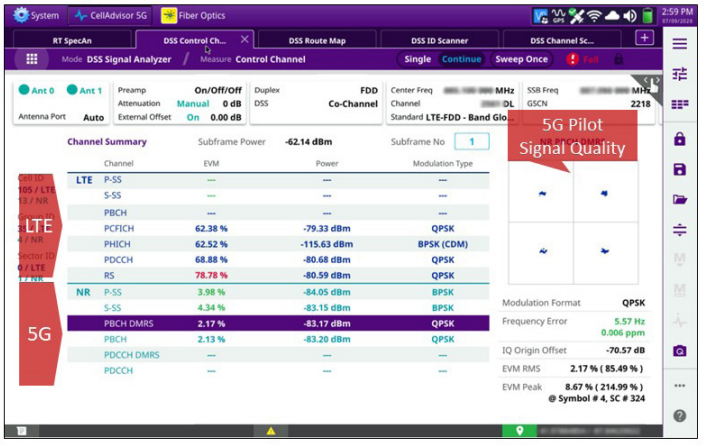
- DSS RF Analysis: DSS conformance verification according to 3GPP standard.
- DSS Modulation Analysis: concurrent 5G and LTE channel mapping, frame and subframe analysis, data constellation and time alignment error.
- DSS OTA (over the air) Analysis: concurrent 5G and LTE channel scanner, frequency and time error, and network coverage.



DSS Modulation Analysis

Control Channel

- 5G Analysis, indicating the power level and quality of pilot signals (beam)
- LTE signal analysis, indicating the power level and quality of pilot signals (MIMO reference signals)

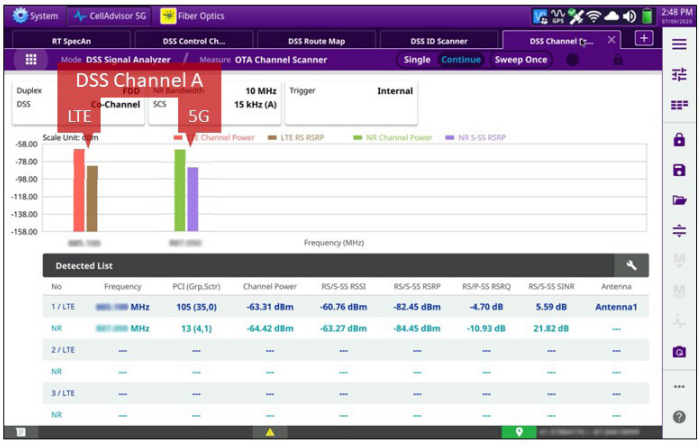


CellAdvisor 5G – DSS Control Channel (5G & LTE)

DSS OTA Analysis

Channel Scanner

- Multi-technology scanning of up to three DSS carriers.
- Performs concurrent channel and pilot power assessment of LTE and 5G signals.

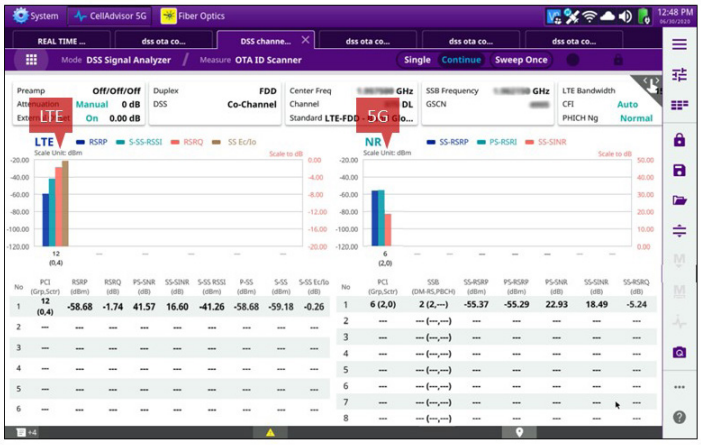


CellAdvisor 5G - DSS Channel Scanner (5G & LTE)

DSS OTA Analysis

ID Scanner

- Multi-technology scanning of up to three DSS carriers.
- Performs concurrent channel and pilot power assessment of LTE and 5G signals.

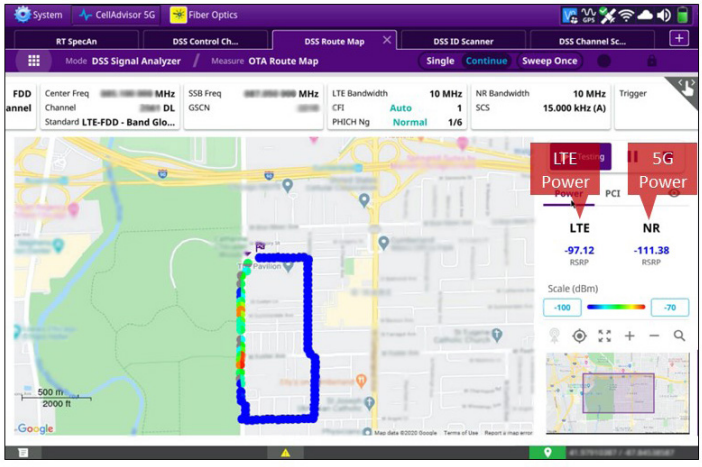


CellAdvisor 5G - DSS ID Scanner (5G & LTE)

DSS Route Map

5G and LTE

- Creates a concurrent 5G and LTE route map for up to 3 carriers in real-time.
- DSS route map measurement data can also be exported for post-processing.



CellAdvisor 5G - DSS Route Map (5G & LTE)

CellAdvisor 5G is the first field-portable test solution in the market that enables RF engineers to test, identify and rectify both 5G and LTE/LTE-A radio access issues with one easy-to-use solution.

Ordering Information

Part Number	Description
CA5000-S034	CellAdvisor 5G DSS Analyzer Note: Requires option S032 LTE/LTE-Advanced FDD Signal Analysis

For more information, visit our CellAdvisor 5G page.

VIAVI Solutions

Contact Us **+1 844 GO VIAVI**
(+1 844 468 4284)

To reach the VIAVI office nearest you,
visit viavisolutions.com/contact

ca5g-dss-an-nsd-nse-ae
30191256 900 0820