










Annex D. Calibration Certificates

Device	Type/Model	Serial Number	Manufacturer	Calibration Certificate
SAR E-Field Probe	SSE2	27/13 EP184	SATIMO	
SAR E-Field Probe	SSE2	17/14 EP224	SATIMO	
IEEE REF Dipole 750 MHz	SID750	14/13 DIP 0G750- 229	SATIMO	
IEEE REF Dipole 835 MHz	SID835	47/12 DIP 0G835- 210	SATIMO	
IEEE REF Dipole 1800 MHz	SID1800	47/12 DIP 1G800- 212	SATIMO	
IEEE REF Dipole 1900 MHz	SID2450	47/12 DIP 1G900- 213	SATIMO	
Dosimetric E-field Probe	EX3DV4	3978	SPEAG	
2450MHz System Validation Dipole	D2450V2	937	SPEAG	
5GHz System Validation Dipole	D5GHzv2	1164	SPEAG	

Annex E. LTE CA setup description

As per *FCC OET KDB 941225 D05A – Rel. 10 LTE SAR Test Guidance and KDB Inquiries*, when carrier aggregation is limited to downlink only; i.e., there is no uplink carrier aggregation, uplink maximum output power (single carrier) is measured for the supported combinations of downlink carrier aggregation according to the frequency bands and channel bandwidths allowed for the uplink and downlink configuration combinations.

Uplink maximum output power is measured with downlink carrier aggregation active, using the channel with highest measured maximum output power when downlink carrier aggregation is inactive, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than $\frac{1}{4}$ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

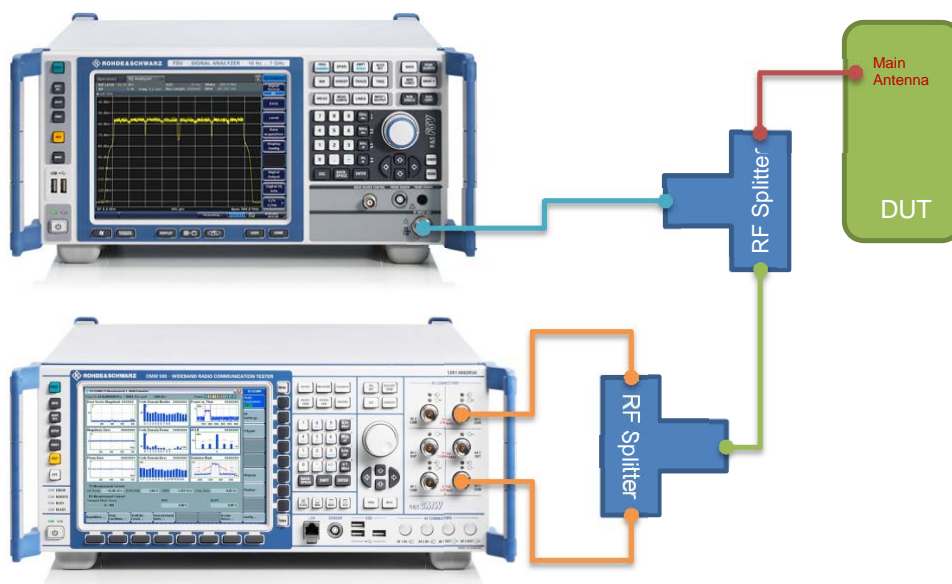
If the DUT meets this $\frac{1}{4}$ dB limit, no SAR evaluation is required for Carrier Aggregation modes.

This Annex describes the setup used and provides spectrum screenshot samples for each CA band combination.

E.1 LTE CA Conducted Power Measurement Setup

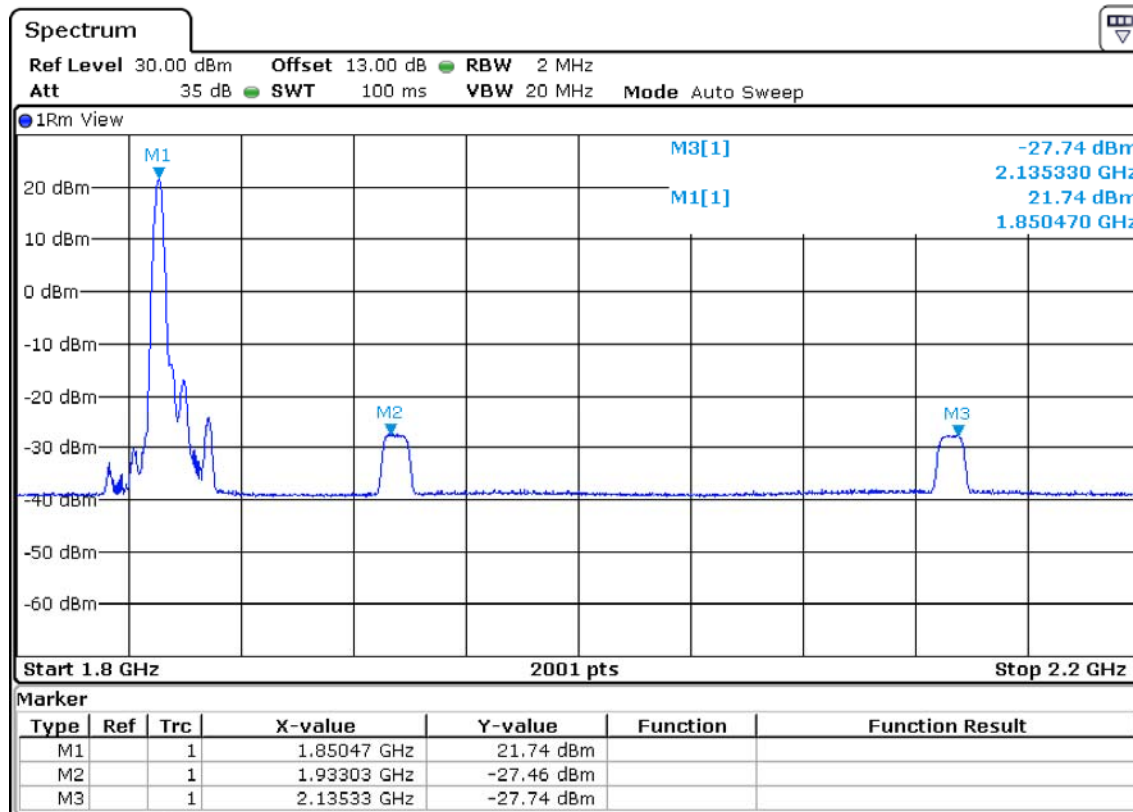


E.2 LTE CA Spectrum Measurement Setup



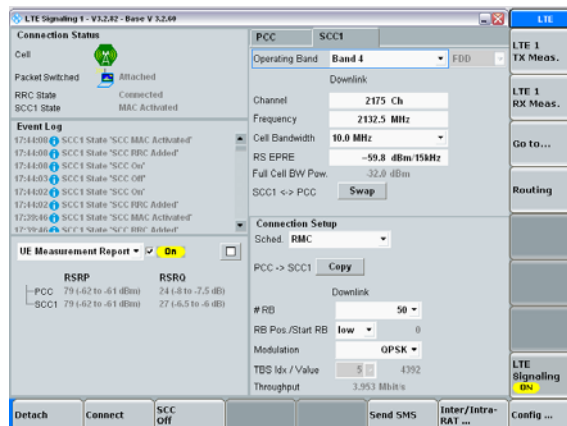
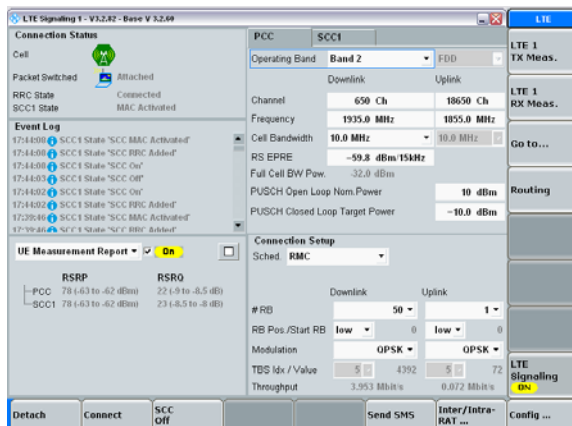
E.3 Sample Spectrums and CMW500 Configuration

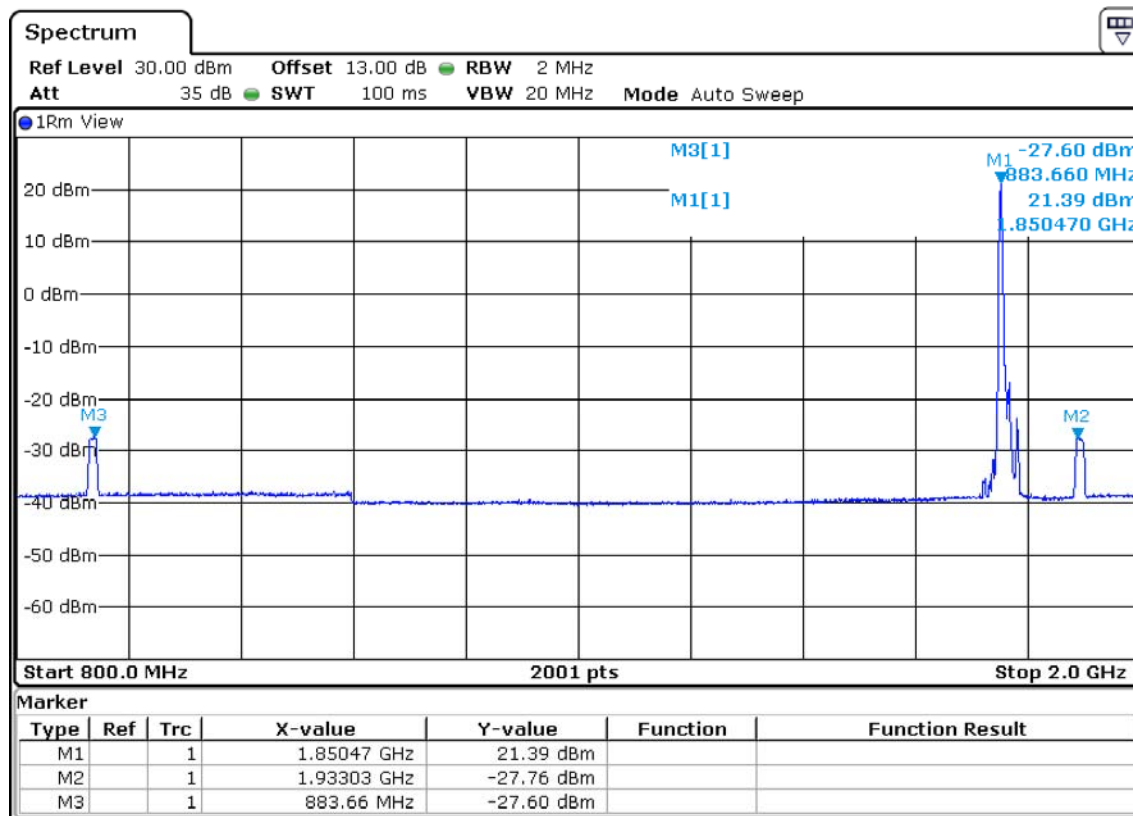
E.3.1 CA_2A_4A



Primary Component Carrier Configuration

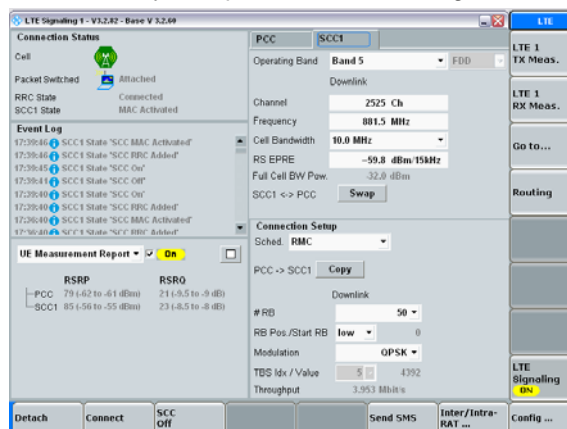
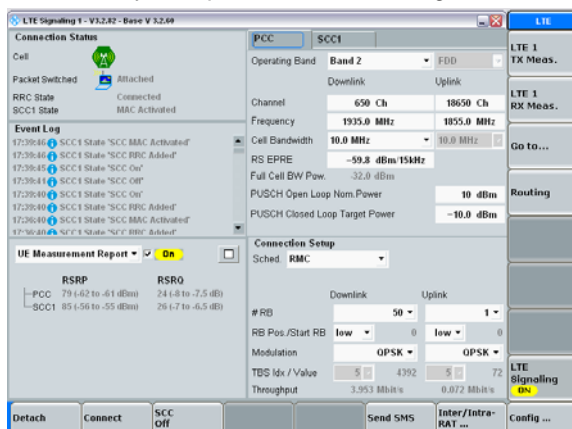
Secondary Component Carrier Configuration

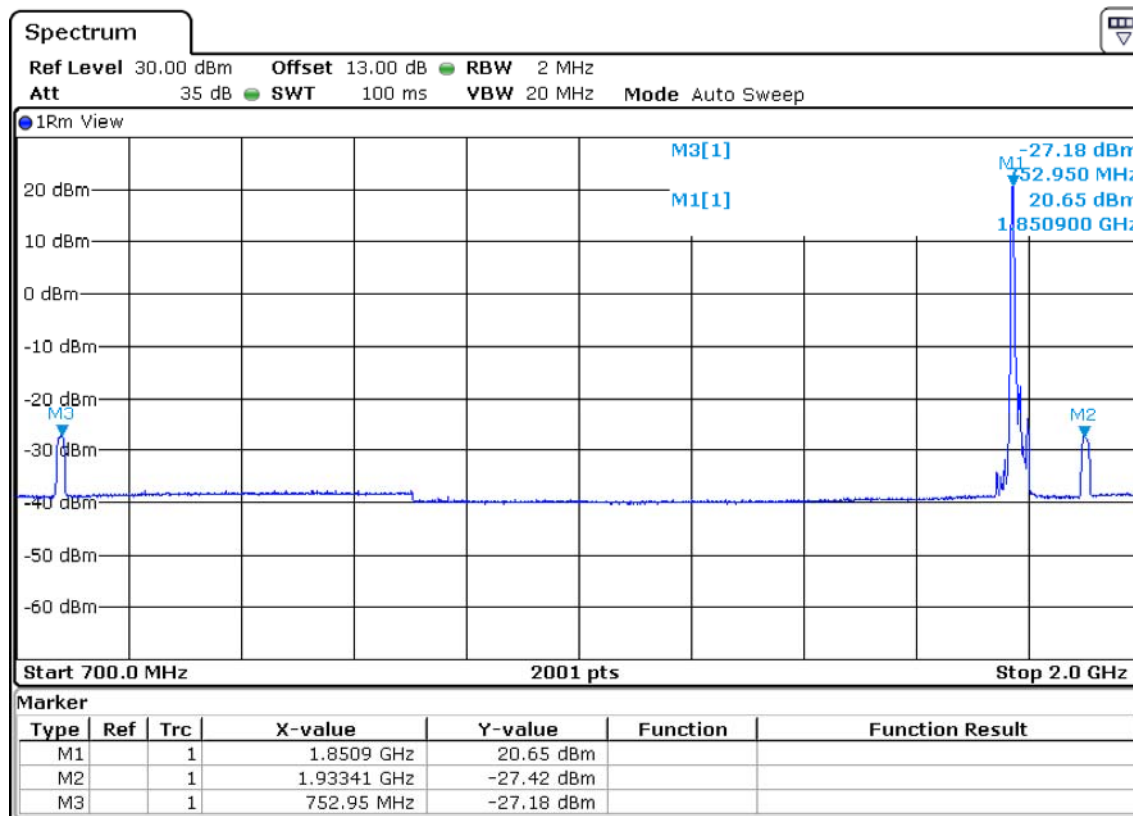


E.3.2 CA_2A_5A


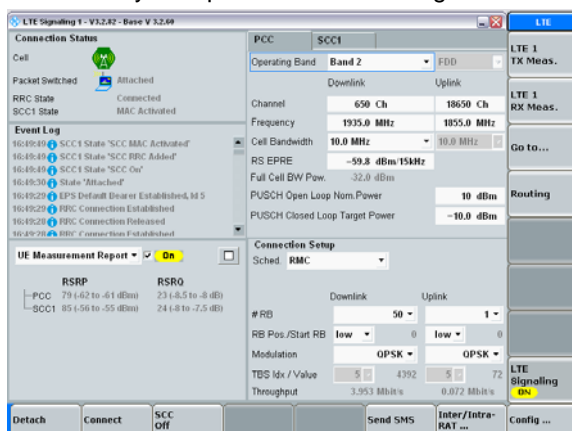
Primary Component Carrier Configuration

Secondary Component Carrier Configuration

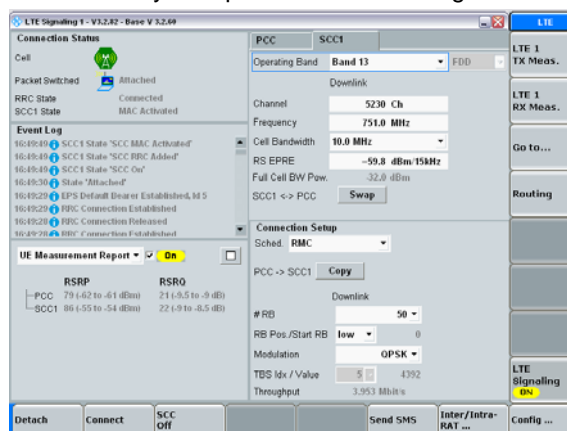


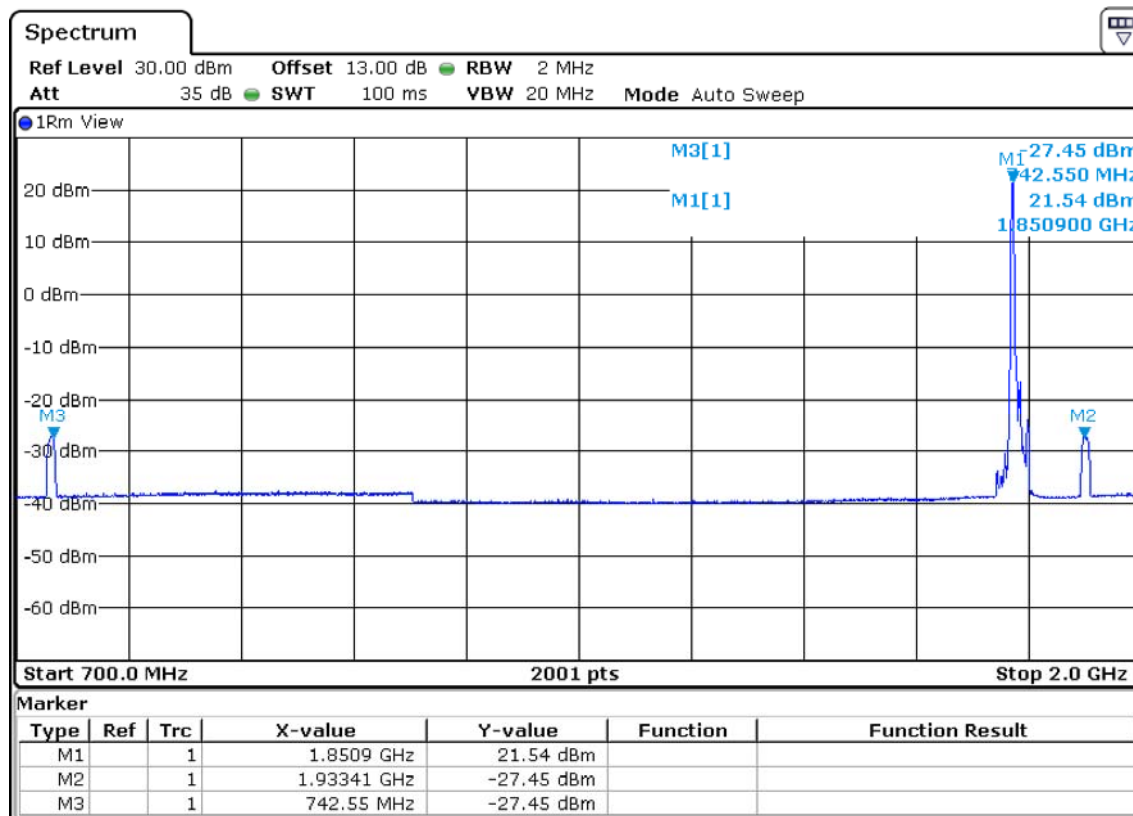
E.3.3 CA_2A_13A


Primary Component Carrier Configuration



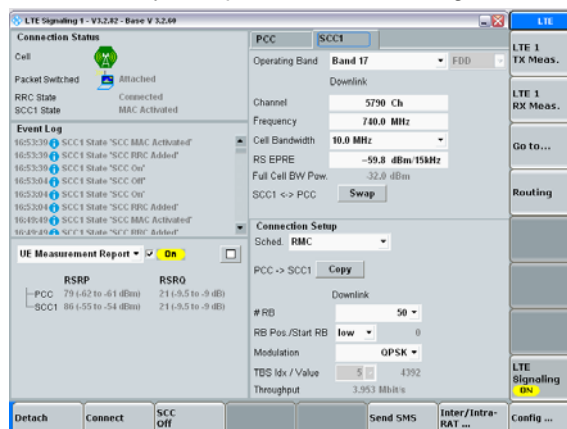
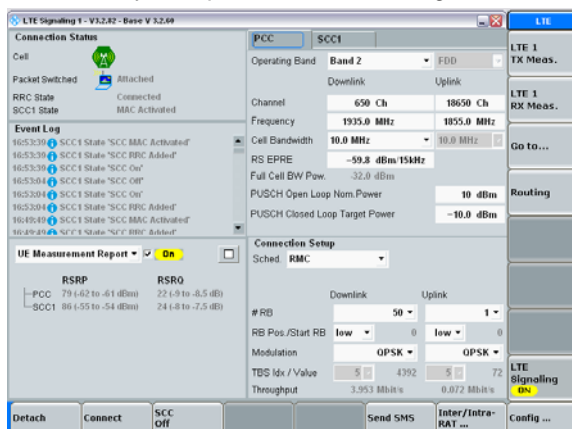
Secondary Component Carrier Configuration

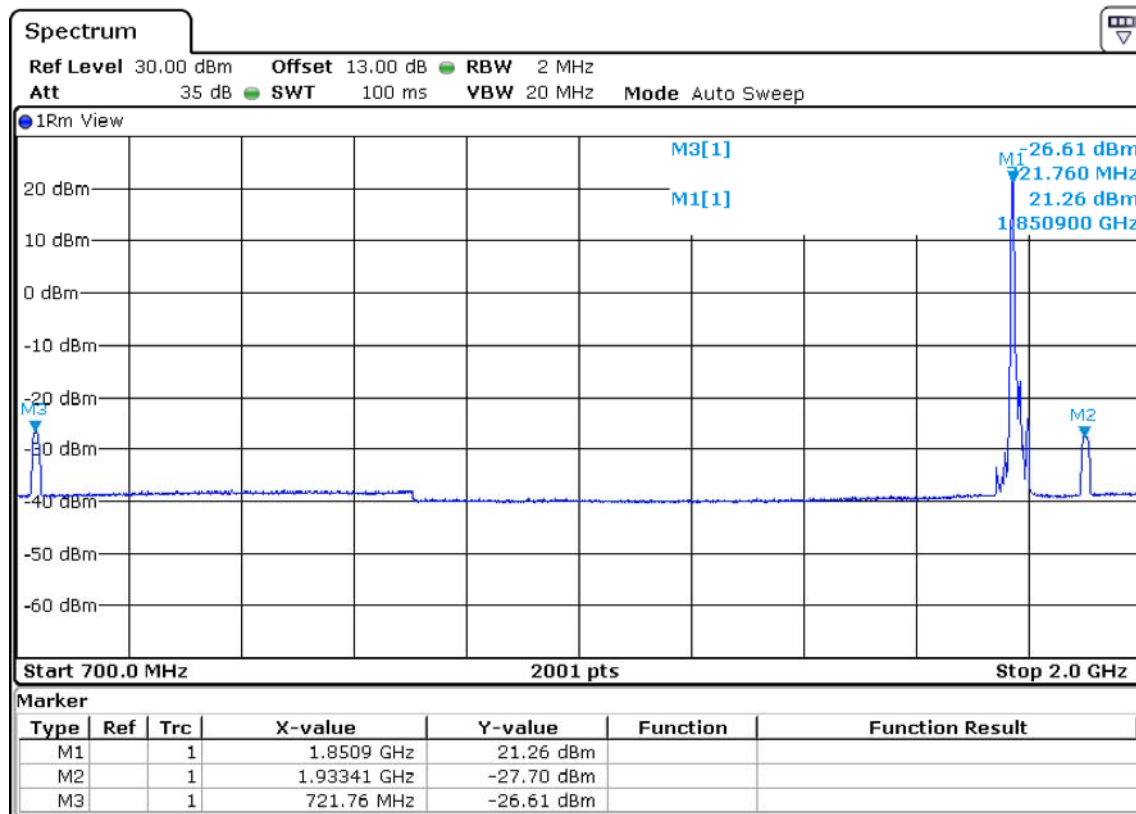


E.3.4 CA_2A_17A


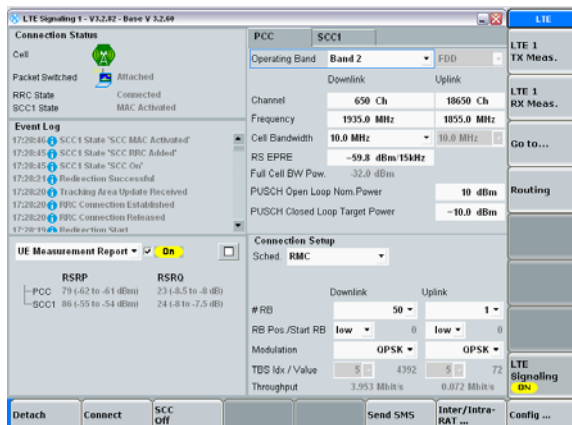
Primary Component Carrier Configuration

Secondary Component Carrier Configuration

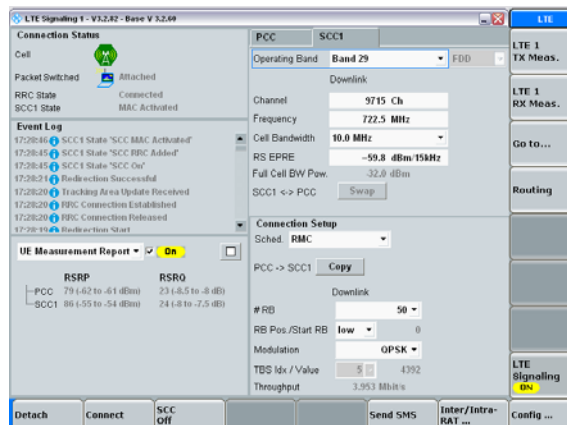


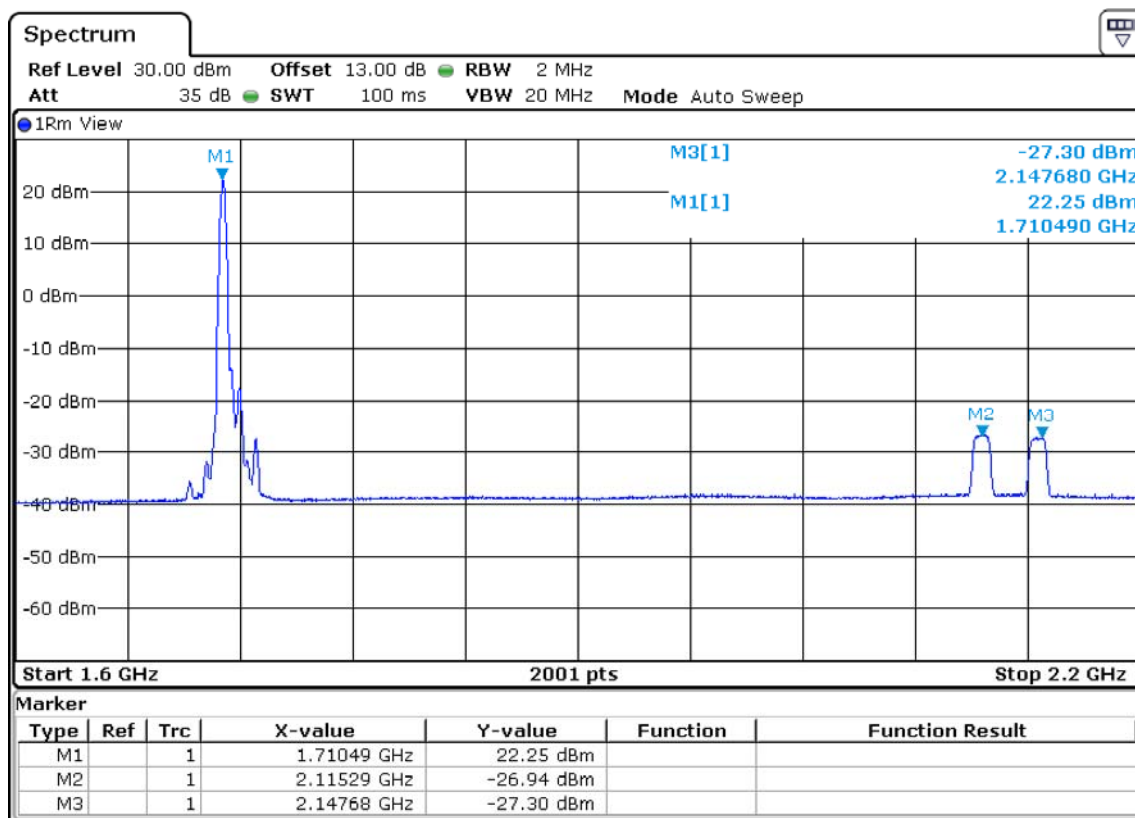
E.3.5 CA_2A_29A


Primary Component Carrier Configuration



Secondary Component Carrier Configuration



E.3.6 CA_4A_4A


Primary Component Carrier Configuration

Secondary Component Carrier Configuration

Primary Component Carrier Configuration

Connection Status: Cell Attached, RRC State Connected, SCC1 State MNC Activated

Event Log: SCC1 State "SCC MNC Activated", SCC1 State "SCC RRC Added", SCC1 State "SCC Out", Redirection Successful, Tracking Area Update Received, RRC Connection Established, RRC Connection Released, Redirection Start

UE Measurement Report: On

RSRP: PCC 83 (-58 to -57 dBm), RSR0 20 (-10 to -9.5 dB)

RSRQ: PCC 37 (-104 to -103 dBm), RSRQ 0 (-19.5 dB)

Connection Setup: Sched. RMC

Downlink: #RB 50, Modulation QPSK, TBS Idx / Value 5 / 4392, Throughput 3.953 Mbit/s

Uplink: #RB 1, Modulation QPSK, TBS Idx / Value 5 / 72, Throughput 0.072 Mbit/s

Secondary Component Carrier Configuration

Connection Status: Cell Attached, RRC State Connected, MNC Activated

Event Log: SCC1 State "SCC MNC Activated", SCC1 State "SCC RRC Added", SCC1 State "SCC Out", Redirection Successful, Tracking Area Update Received, RRC Connection Established, RRC Connection Released, Redirection Start

UE Measurement Report: On

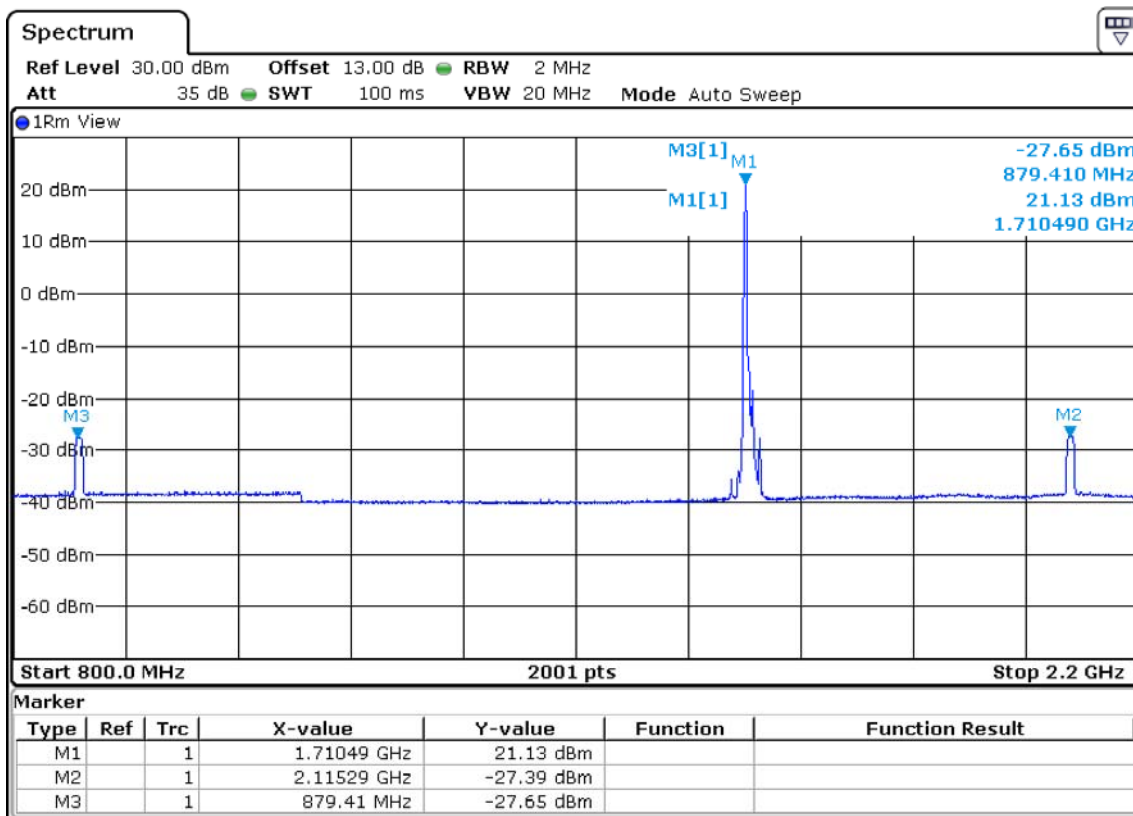
RSRP: PCC 83 (-58 to -57 dBm), RSR0 19 (-10.5 to -10 dB)

RSRQ: PCC 37 (-104 to -103 dBm), RSRQ 0 (-19.5 dB)

Connection Setup: Sched. RMC

Downlink: #RB 50, Modulation QPSK, TBS Idx / Value 5 / 4392, Throughput 3.953 Mbit/s

Uplink: #RB 0, Modulation QPSK, TBS Idx / Value 5 / 72, Throughput 0.072 Mbit/s

E.3.7 CA_4A_5A


Primary Component Carrier Configuration

LTE Signaling 1 - V3.2.42 - Base V 3.2.69

Connection Status: Cell Attached, Packet Switched, RRC State Connected, SCC1 State MNC Activated

Event Log: 17:08:46 SCC1 State 'SCC MNC Activated', 17:08:46 SCC1 State 'SCC RRC Added', 17:08:46 SCC1 State 'SCC On', 17:08:09 SCC1 State 'SCC Off', 17:08:09 SCC1 State 'SCC On', 17:08:09 SCC1 State 'SCC RRC Added', 17:04:50 SCC1 State 'SCC MNC Activated', 17:04:50 SCC1 State 'SCC RRC Added'

UE Measurement Report: RSRP PCC 78 (-63 to -62 dBm), RSRQ PCC 23 (-8.5 to -8 dB), RSRP SCC1 85 (-56 to -55 dBm), RSRQ SCC1 23 (-8.5 to -8 dB)

Connection Setup: PCC SCC1, Operating Band Band 4, FDD, Downlink 2000 Ch, 2115.0 MHz, 10.0 MHz, Uplink 20000 Ch, 1715.0 MHz, 10.0 MHz, RS EPRE -59.8 dBm/15kHz, Full Cell BW Pow. -32.0 dBm, PUSCH Open Loop Nom Power 10 dBm, PUSCH Closed Loop Target Power -10.0 dBm

Connection Setup: #RB Downlink 50, Uplink 1, RB Pos/Start RB low, 0, Modulation QPSK, QPSK, TBS Idx / Value 5, 4392, 5, 72, Throughput 3.953 Mbit/s, 0.072 Mbit/s

Buttons: Detach, Connect, SCC Off, Send SMS, Inter/Intra-RAT, Config ...

Secondary Component Carrier Configuration

LTE Signaling 1 - V3.2.42 - Base V 3.2.69

Connection Status: Cell Attached, Packet Switched, RRC State Connected, MNC Activated

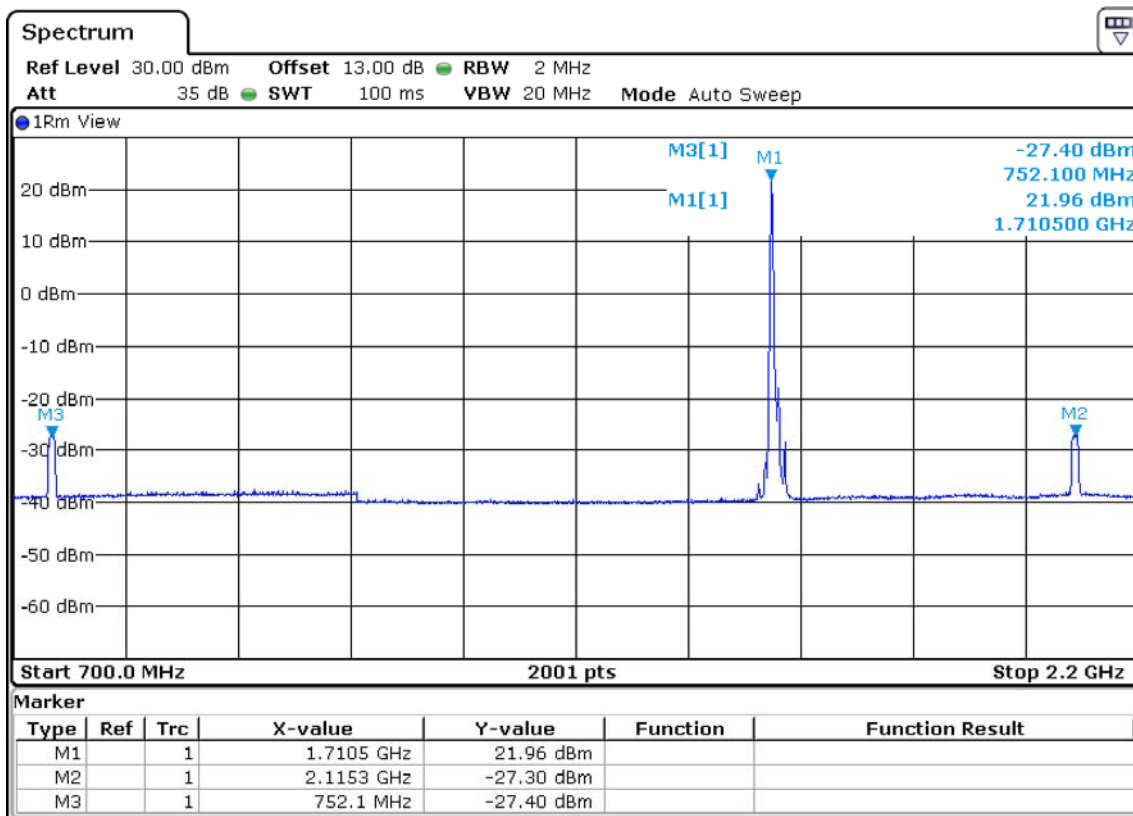
Event Log: 17:08:46 SCC1 State 'SCC MNC Activated', 17:08:46 SCC1 State 'SCC RRC Added', 17:08:46 SCC1 State 'SCC On', 17:08:09 SCC1 State 'SCC Off', 17:08:09 SCC1 State 'SCC On', 17:08:09 SCC1 State 'SCC RRC Added', 17:04:50 SCC1 State 'SCC MNC Activated', 17:04:50 SCC1 State 'SCC RRC Added'

UE Measurement Report: RSRP PCC 78 (-63 to -62 dBm), RSRQ PCC 23 (-8.5 to -8 dB), RSRP SCC1 85 (-56 to -55 dBm), RSRQ SCC1 23 (-8.5 to -8 dB)

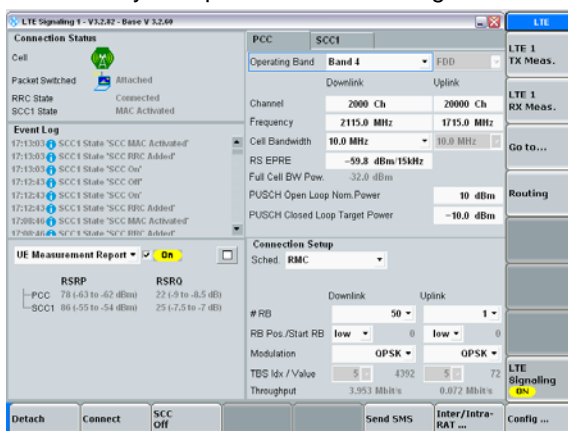
Connection Setup: PCC SCC1, Operating Band Band 5, FDD, Downlink 2525 Ch, 881.5 MHz, 10.0 MHz, Uplink 20000 Ch, 1715.0 MHz, 10.0 MHz, RS EPRE -59.8 dBm/15kHz, Full Cell BW Pow. -32.0 dBm, PUSCH Open Loop Nom Power 10 dBm, PUSCH Closed Loop Target Power -10.0 dBm

Connection Setup: #RB Downlink 50, Uplink 1, RB Pos/Start RB low, 0, Modulation QPSK, QPSK, TBS Idx / Value 5, 4392, 5, 72, Throughput 3.953 Mbit/s, 0.072 Mbit/s

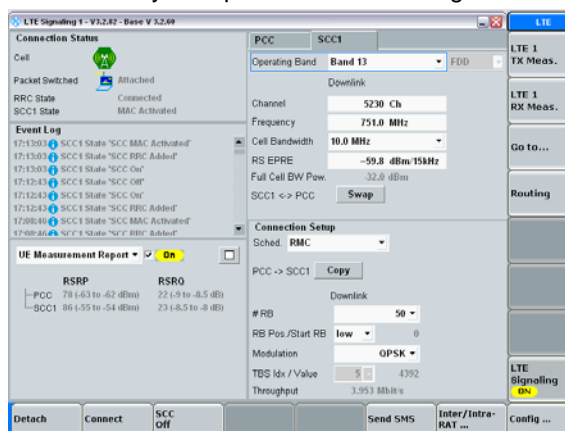
Buttons: Detach, Connect, SCC Off, Send SMS, Inter/Intra-RAT, Config ...

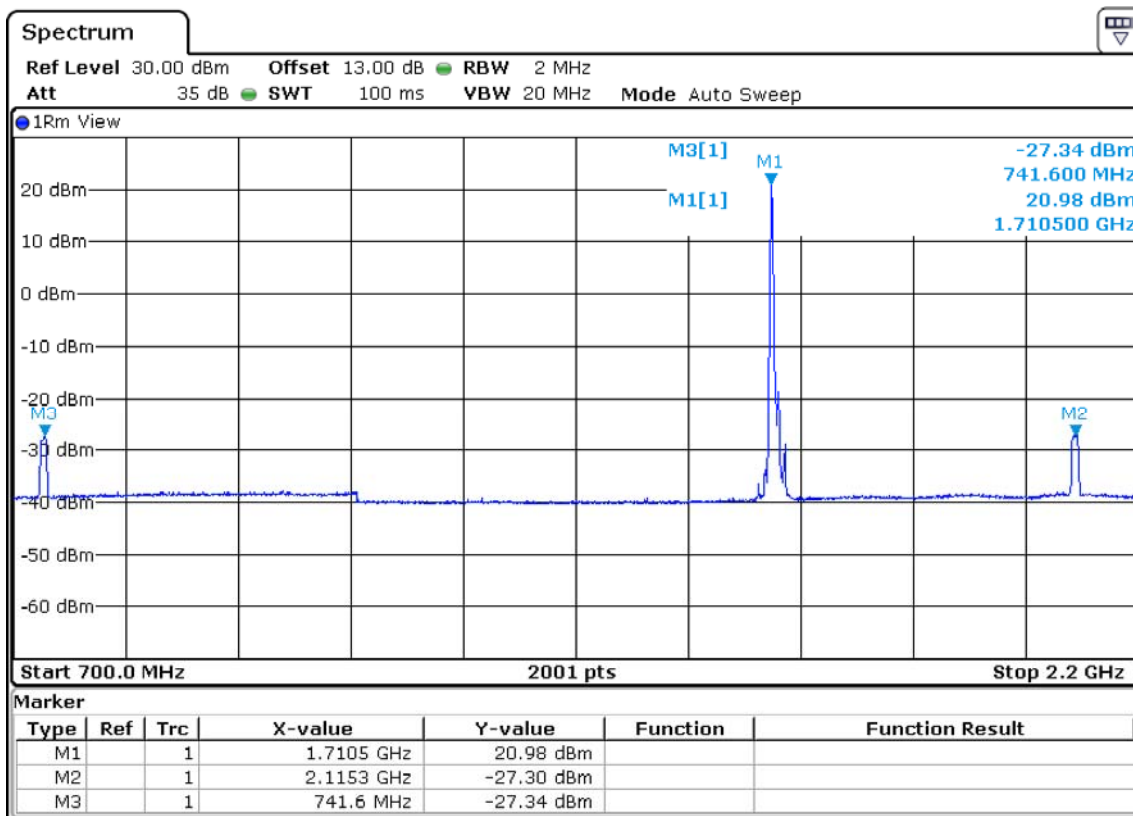
E.3.8 CA_4A_13A


Primary Component Carrier Configuration

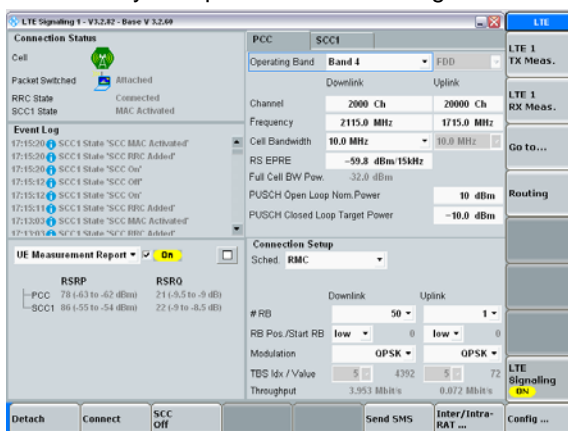


Secondary Component Carrier Configuration

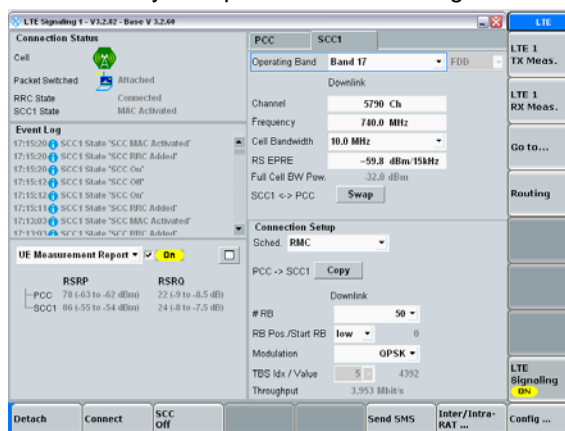


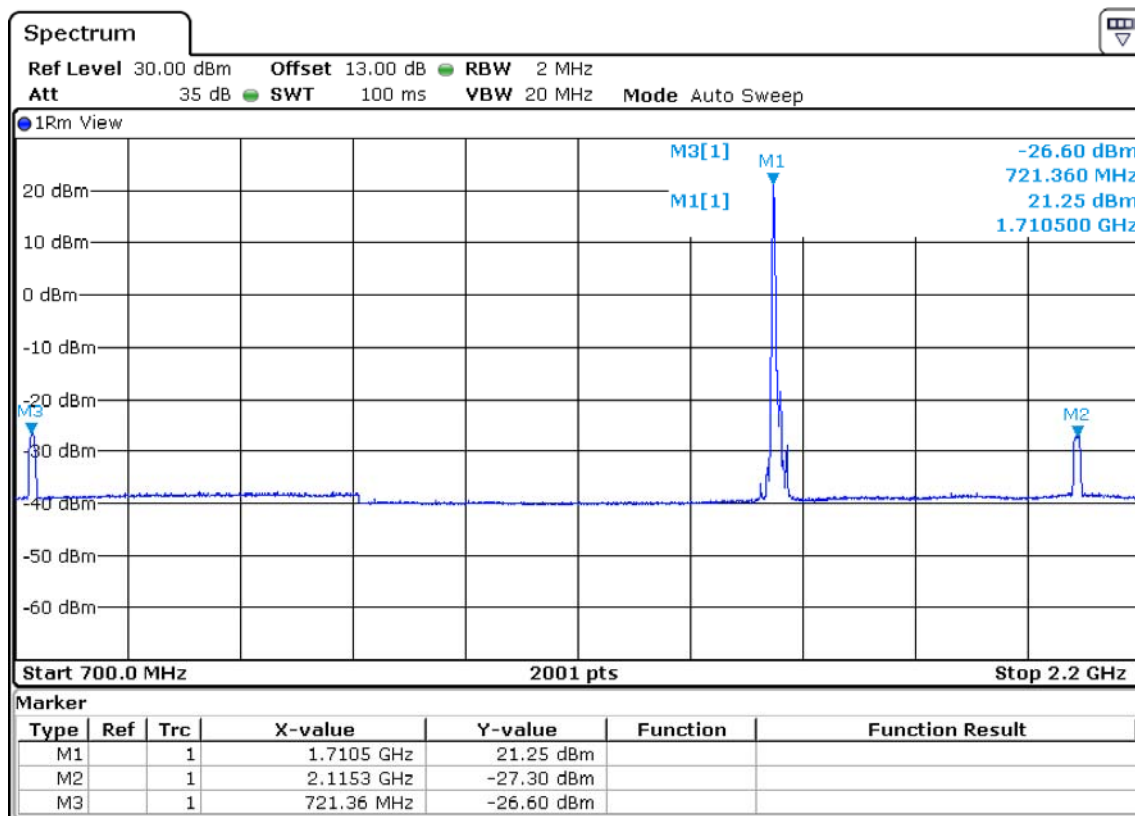
E.3.9 CA_4A_17A


Primary Component Carrier Configuration



Secondary Component Carrier Configuration



E.3.10 CA_4A_29A


Primary Component Carrier Configuration

Secondary Component Carrier Configuration

