



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238 (b)
Industry Canada RSS-133, Clause 6.5

2.3.2 Date of Test and Modification State

10 June 2020 - Modification State 0

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Environmental Conditions

Ambient Temperature 23.1°C
Relative Humidity 48.3%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \log(N)$, where N is equal to the number of MIMO antenna ports.

For single port, the limit was calculated as being $-13 \text{ dBm} - 10 * \log(1) = -13 \text{ dBm}$.

For dual port, the limit was calculated as being $-13 \text{ dBm} - 10 * \log(2) = -16 \text{ dBm}$.

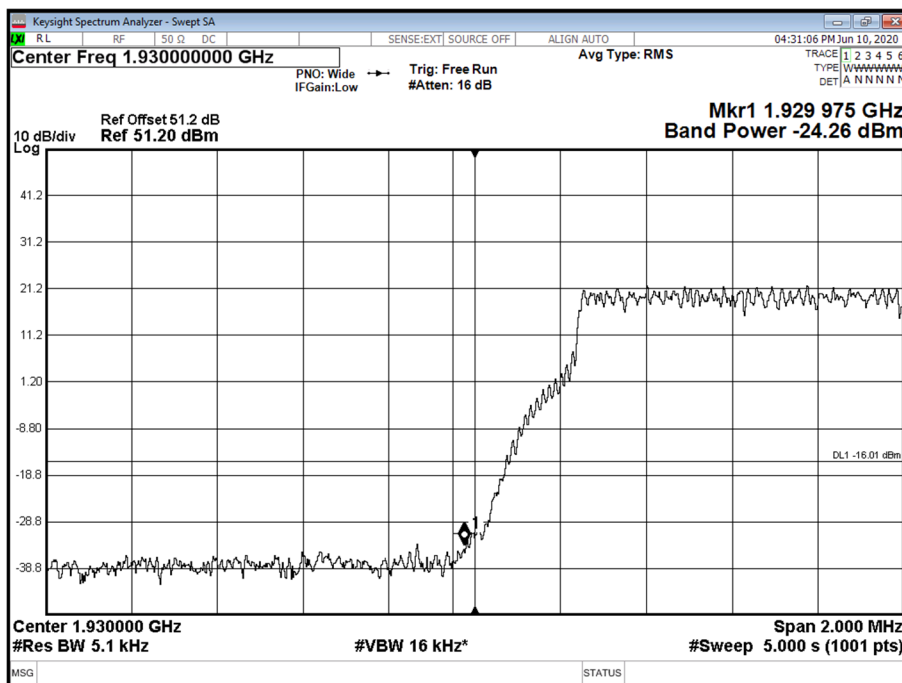
2.3.6 Test Results

Configuration 1

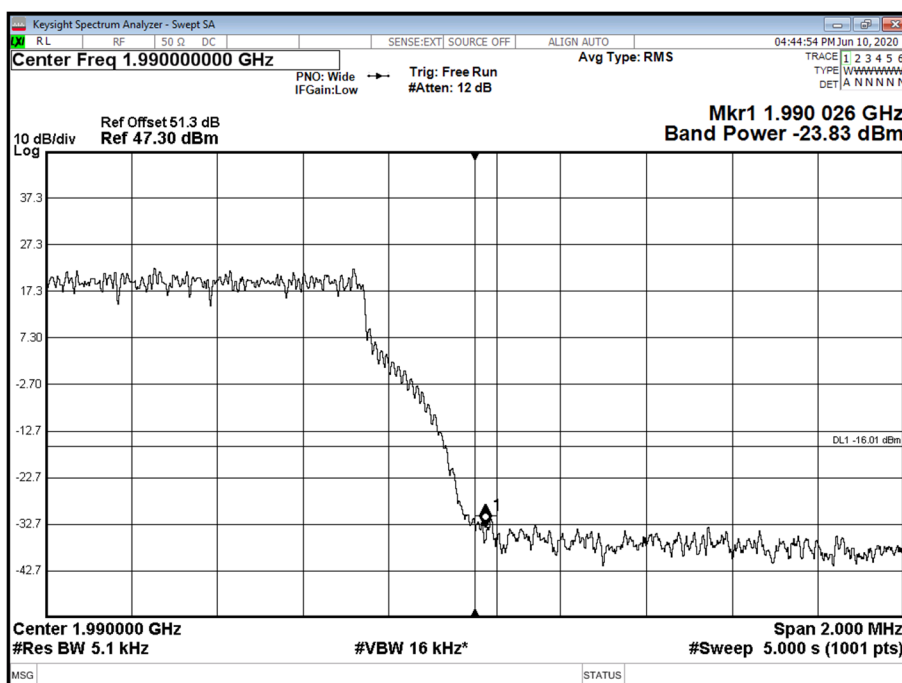
Maximum Output Power 49 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	QPSK	5.0 MHz 15 kHz SCS	1,932.5	1,987.5
A	QPSK	10.0 MHz 15 kHz SCS	1,935.0	1,985.0
A	QPSK	15.0 MHz 15 kHz SCS	1,937.5	1,982.5
A	QPSK	20.0 MHz 15 kHz SCS	1,940.0	1,980.0
A	QPSK	20.0 MHz 60 kHz SCS	1,940.0	1,980.0

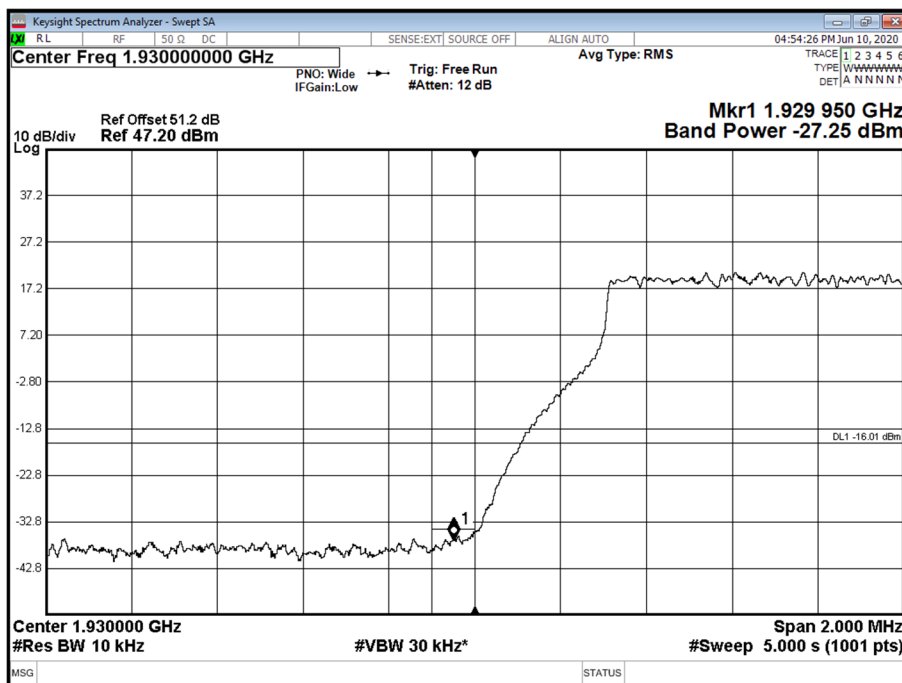
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B



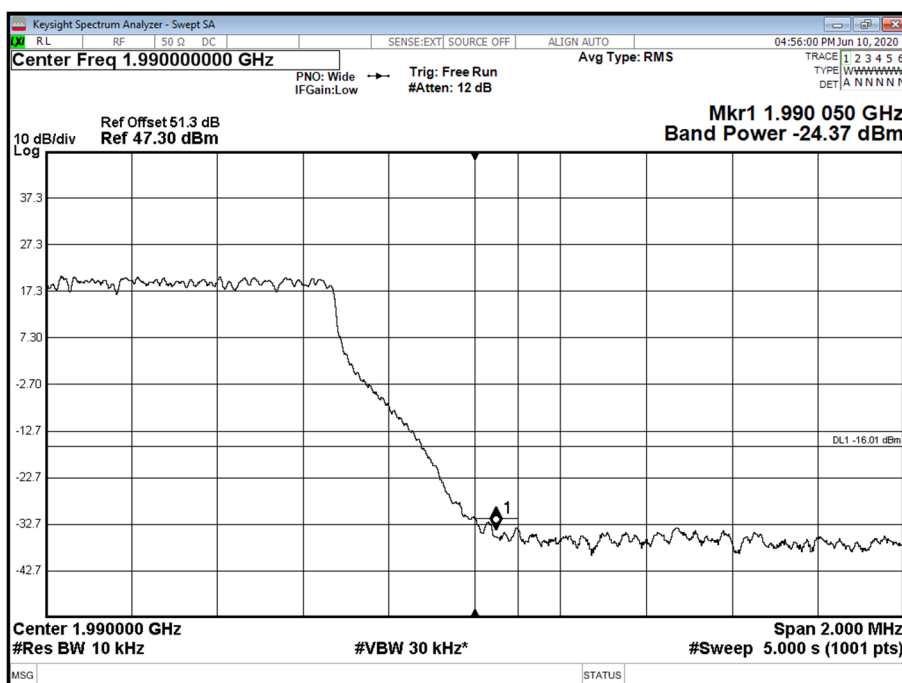
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T



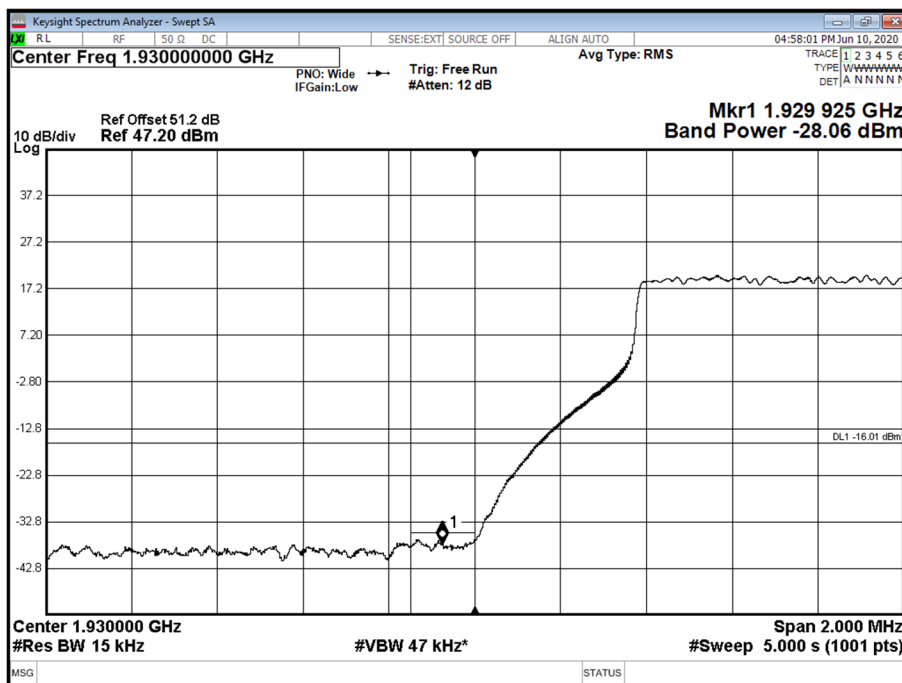
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position B



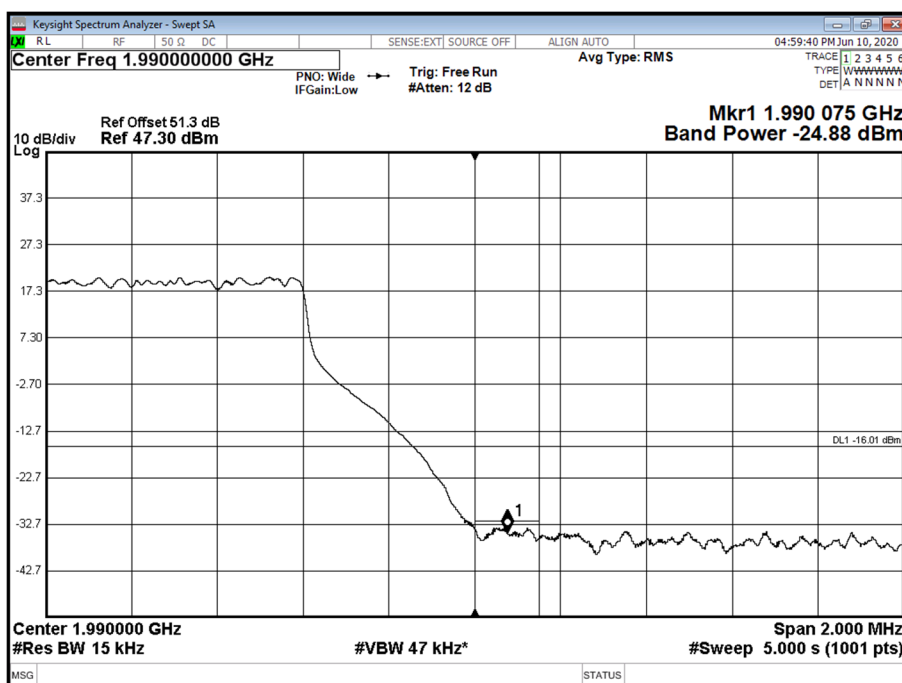
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position T



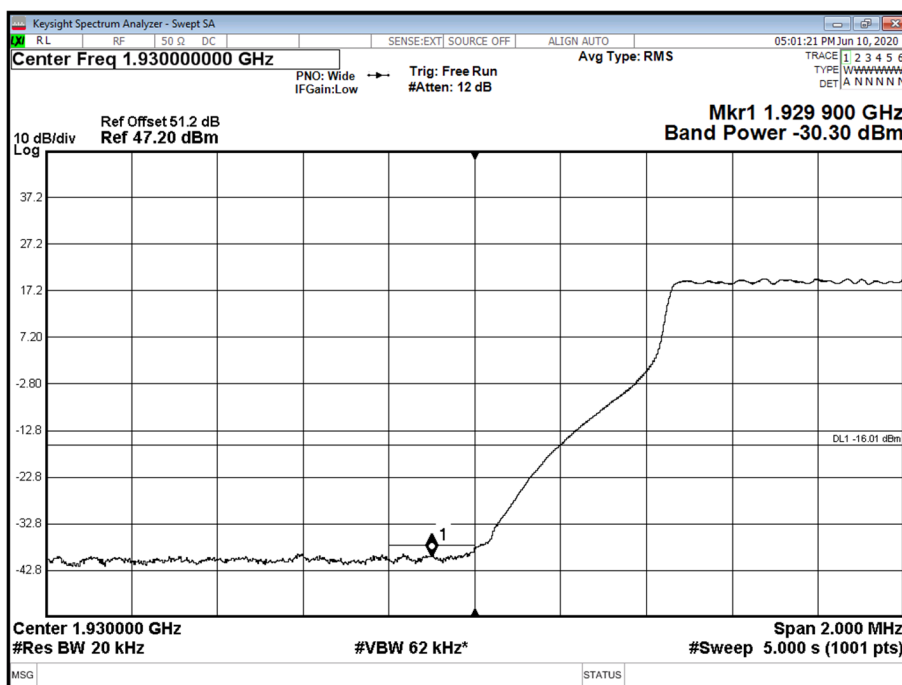
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position B



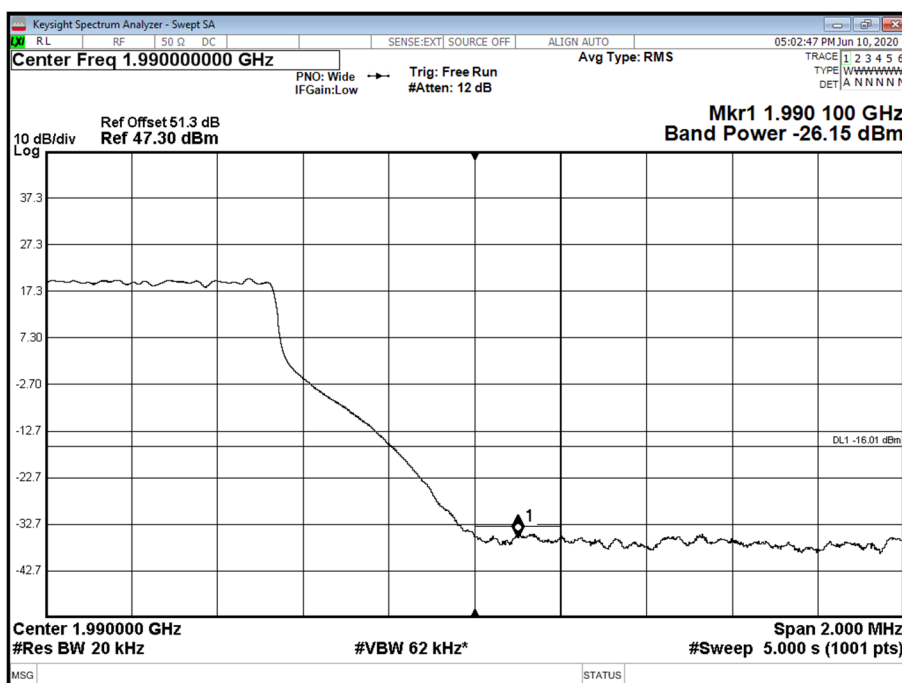
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position T



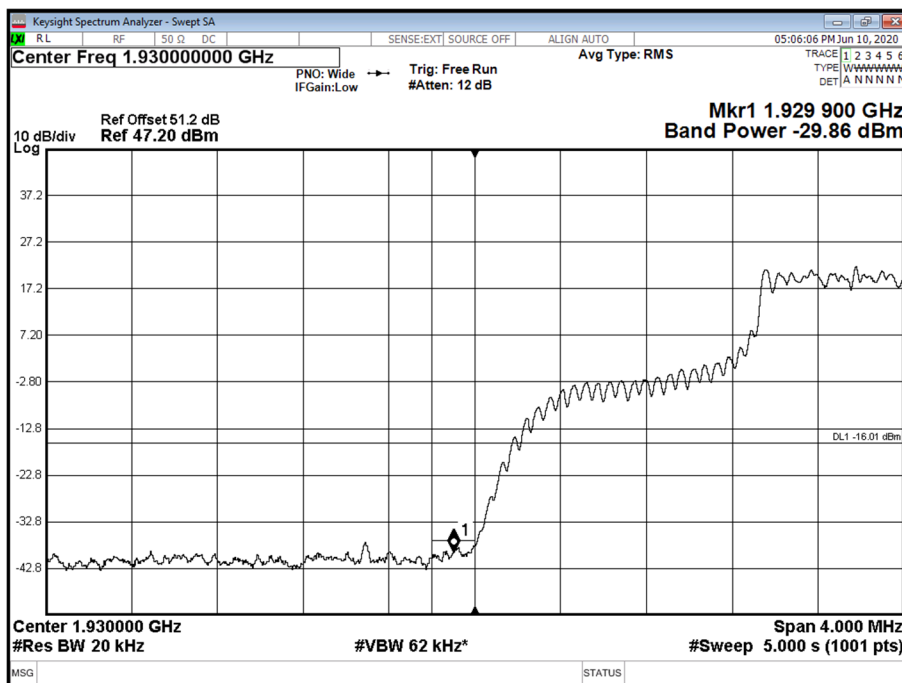
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position B



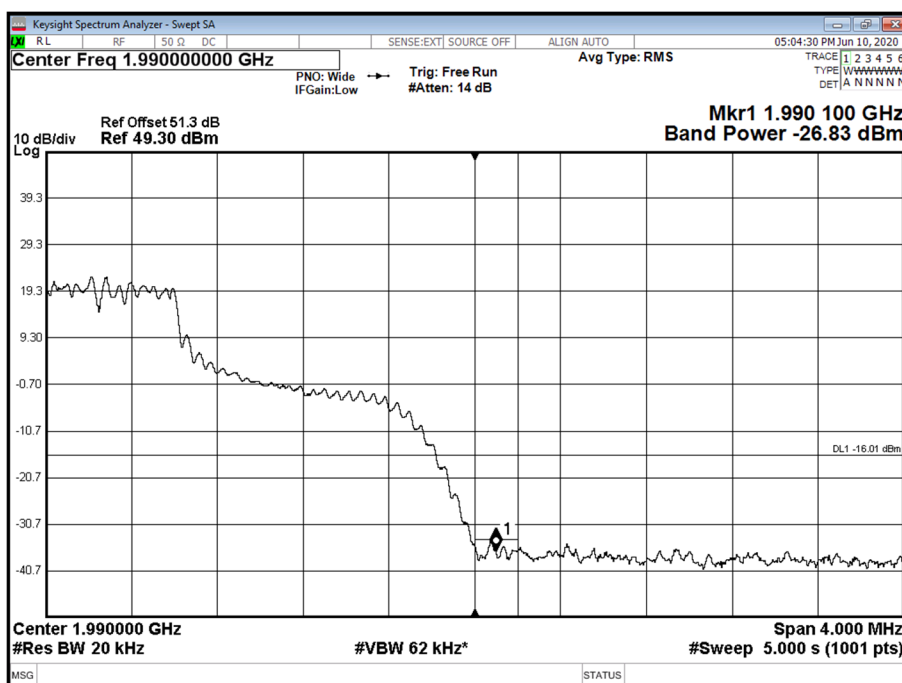
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position T



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 60 kHz SCS - Channel Position B



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 60 kHz SCS - Channel Position T



Limit	-16 dBm
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2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 24, Clause 24.238 (a)
Industry Canada RSS-GEN, Clause 6.13
Industry Canada RSS-133, Clause 6.5

2.4.2 Date of Test and Modification State

10 June 2020 - Modification State 0

2.4.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.4 Environmental Conditions

Ambient Temperature	23.1°C
Relative Humidity	48.3%

2.4.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \log(N)$, where N is equal to the number of MIMO antenna ports.

For single port, the limit was calculated as being $-13 \text{ dBm} - 10 * \log(1) = -13 \text{ dBm}$.

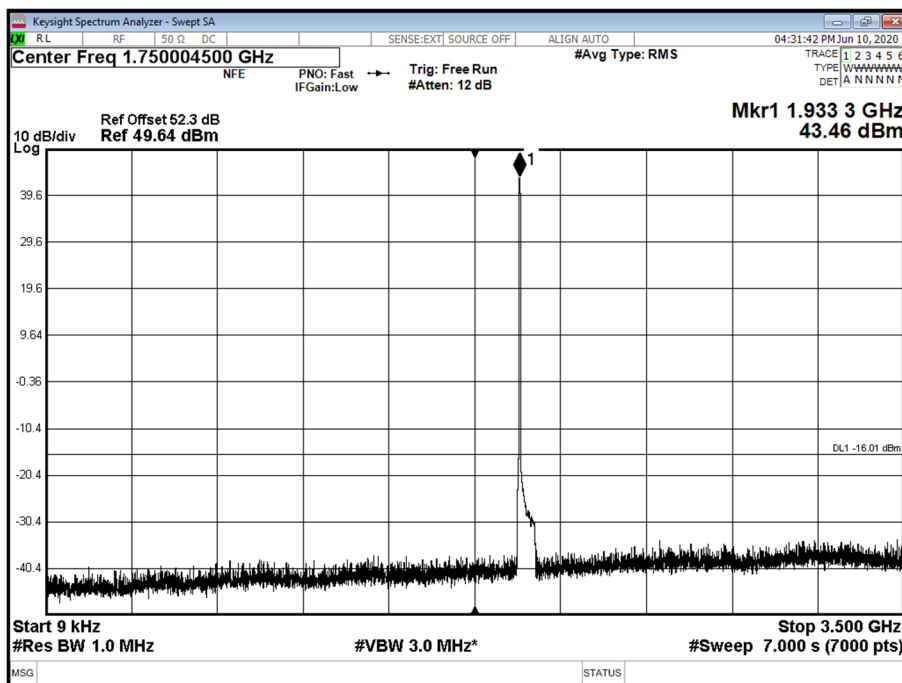
For dual port, the limit was calculated as being $-13 \text{ dBm} - 10 * \log(2) = -16 \text{ dBm}$.

2.4.6 Test Results

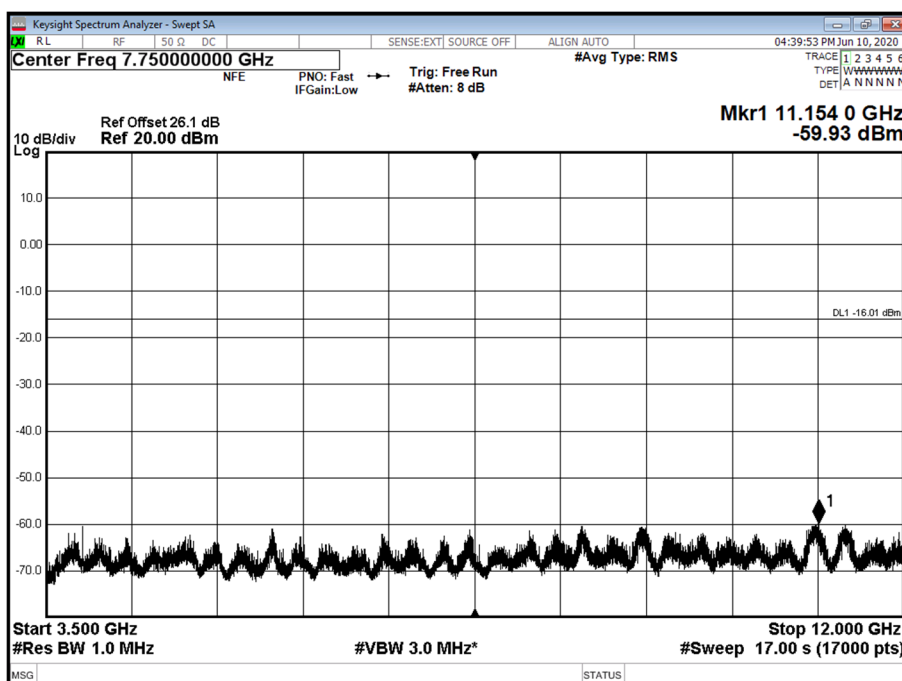
Configuration 1

Maximum Output Power 49 dBm

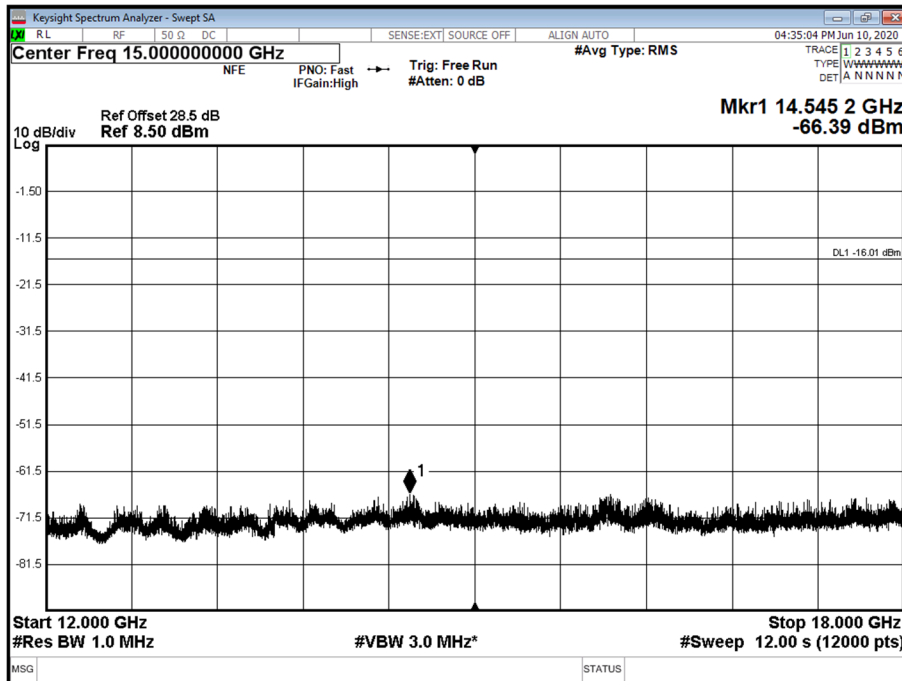
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B - Band 1 - Range 0.009 to 3500 MHz



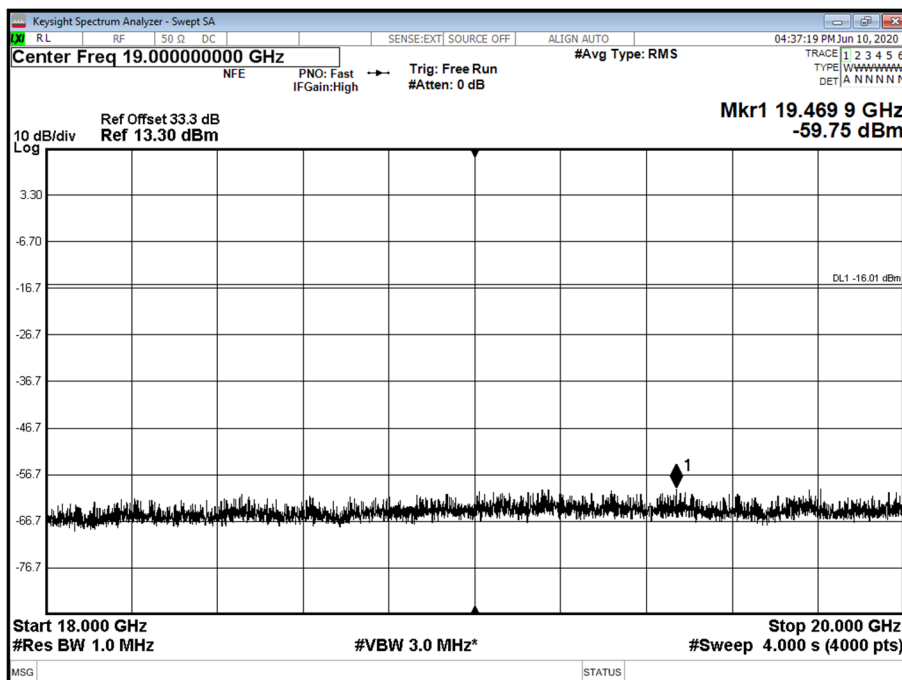
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B - Band 2 - Range 3500 to 12000 MHz



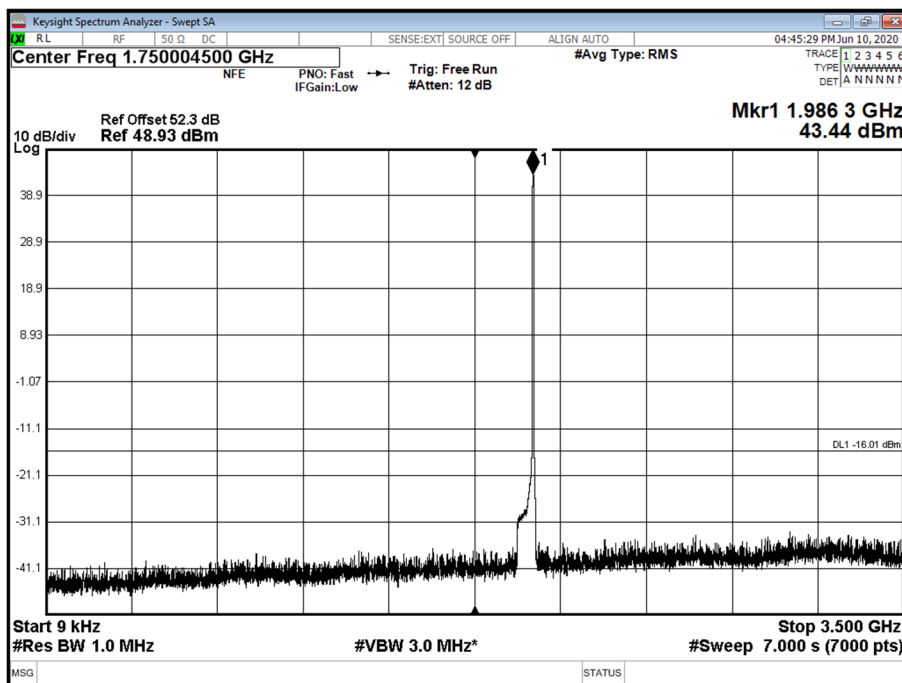
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B - Band 3 - Range 12000 to 18000 MHz



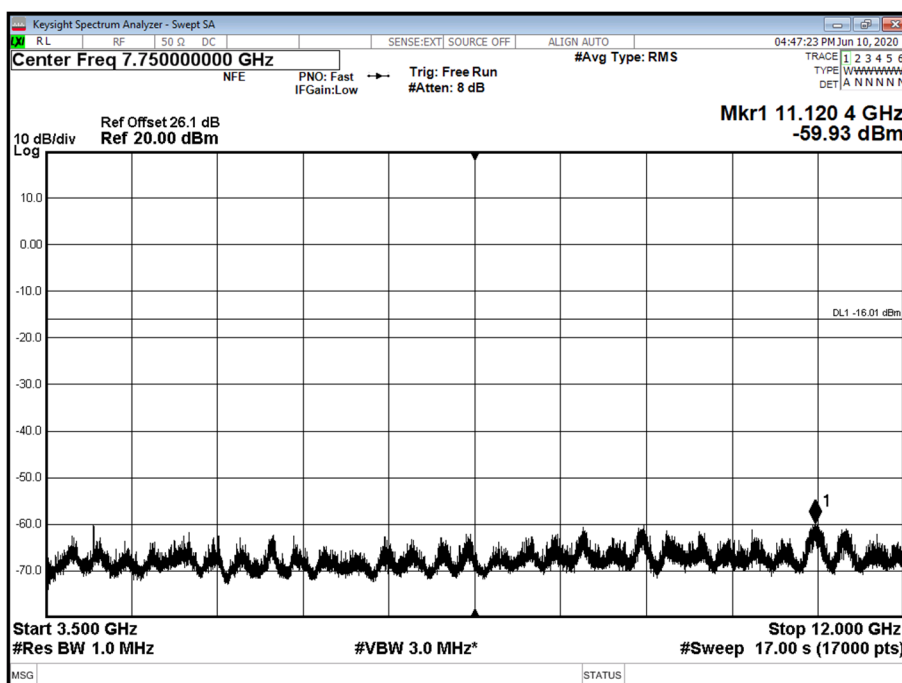
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B - Band 4 - Range 18000 to 20000 MHz



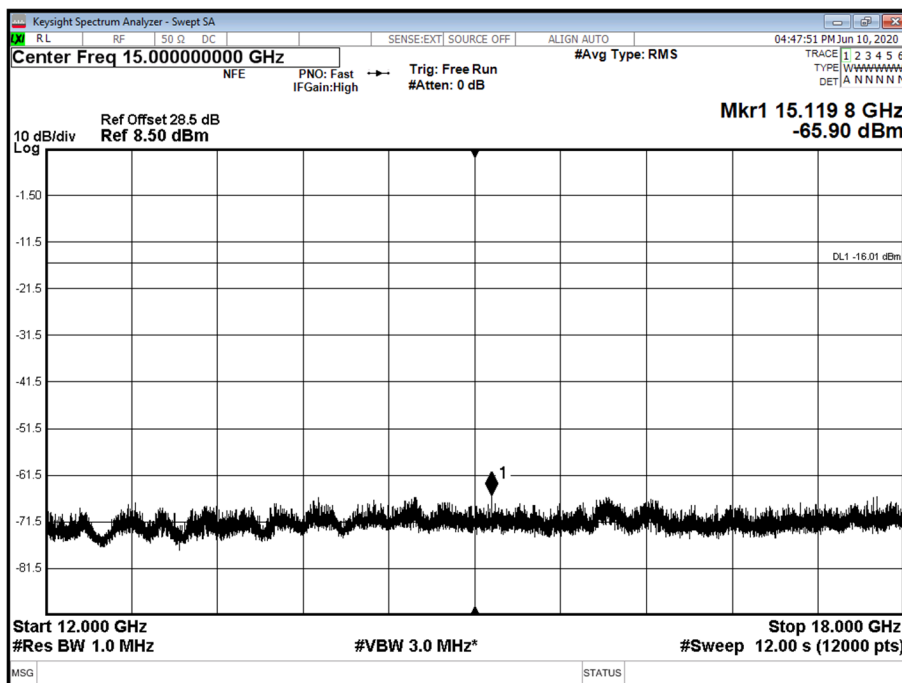
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T - Band 1 - Range 0.009 to 3500 MHz



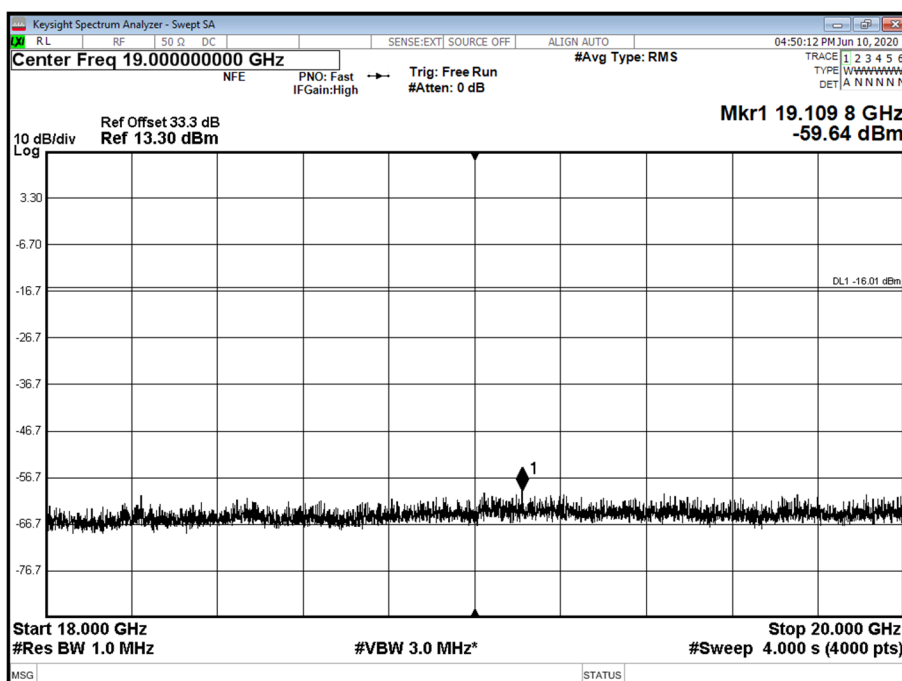
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T - Band 2 - Range 3500 to 12000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T - Band 3 - Range 12000 to 18000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T - Band 4 - Range 18000 to 20000 MHz



Limit	-16dBm
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SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Broadband Transmitting Power Limits					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	OP/MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	OP/MON
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
Occupied Bandwidth					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	OP/MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	OP/MON
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
Band Edge					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	OP/MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	OP/MON
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
Transmitter Spurious Emissions					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	OP/MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	OP/MON
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
HPF	RLC Electronics	F-100-3000-5-R	3349	-	OP/MON
Cable attenuator	Aralab	CSF6767C-C2S6500	5175	-	OP/MON
WG filter	Flann	18-26G	-	-	OP/MON
Maximum Peak Output Power and Peak to Average Ratio - Conducted					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	OP/MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	OP/MON



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020

N/A – Not Applicable

O/P Mon – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter		MU
Conducted Maximum Peak Output Power	30 MHz to 20 GHz Amplitude		± 0.95 dB
Occupied Bandwidth	Up to 20 MHz Bandwidth	5 MHz Bandwidth	± 33.321 kHz
		10 MHz Bandwidth	± 67.172 kHz
		15 MHz Bandwidth	± 353.783 kHz
		20 MHz Bandwidth	± 145.902 kHz
		40 MHz Bandwidth	± 264.635 kHz
Band Edge	30 MHz to 20 GHz Amplitude		±0.95 dB

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

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ANNEX A

MODULE LIST

Configuration 1 & 2			
Product	Product No	R-State	Serial No
Radio 2219 B2	KRC 161 627/1	R1B	D825905776
Software Version:	CXP9013268/9	Revision:	R78HT