

FCC Measurement/Technical Report on

NAR Compenser LTE-MBC-NAR2

FCC ID: RK7MBC-NAR2 IC: 4774A-MBCNAR2

Test Report Reference: MDE_MOLEX_1901_FCC_01_rev01

Test Laboratory: 7layers GmbH Borsigstrasse 11 40880 Ratingen Germany



Note:

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1 APPLIED STANDARDS AND TEST SUMMARY

1.1 APPLIED STANDARDS

Type of Authorization

Certification for an Wideband Consumer signal Booster.

Applicable FCC Rules

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 2 and 20, 22, 24, 27 (10-1-18 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

Part 20, Commercial Mobiles Serviced

§ 20.21 Signal Boosters

Part 22, Subpart H – Cellular Radiotelephone Service

§ 22.905 – Channels for cellular service

§ 22.913 – Effective radiated power limits

- § 22.917 Emission limitations for cellular equipment
- Part 24 E Personal Communication Services

§ 24.229 - Frequencies

§ 24.232 – Power and antenna height limits

§ 24.238 – Emission limitations for Broadband PCS equipment

Part 27 – Miscellaneous Wireless Communication Services

§ 27.5 (b), (c) - Frequencies
§ 27.50 (b) (c) - Power limits and duty cycle
§ 27.53 (c), (f), (g), (h) - Emission limits

The tests were selected and performed with reference to the FCC Public Notice 935210 applying "Wideband Consumer Signal Booster Compliance Measurement Guidance" 935210 D03 v04r03, 2019-04-15.



Summary Test Results:

The EUT complied with all performed tests as listed in chapter 1.3 Measurement Summary / Signatures.

1.2 FCC-IC CORRELATION TABLE

Measurement	FCC reference	ISED reference
Anti-oscillation	§20.21(e)(8)(ii)(A) §20.21(e)(5)	RSS-131 Issue 3: 5.1.1.1
Gain control	§20.21(e)(8)(ii)(B)	RSS-131 Issue 3: 5.1.1.2
Power down	§20.21(e)(8)(i)(H)	RSS-131 Issue 3: 5.1.1.3
Interference avoidance for wireless subsystems	§20.21(e)(8)(ii)(C)	RSS-131 Issue 3: 5.1.1.4
Bidirectional capability	§20.21(e)(8)(i)(B)	RSS-131 Issue 3: 5.1.2
Noise limits	§20.21(e)(8)(i)(A)	RSS-131 Issue 3: 5.1.3.1
Gain limits	§20.21(e)(8)(i)(C)(1)	RSS-131 Issue 3: 5.1.3.2
Power limits	§20.21(e)(8)(i)(D)	RSS-131 Issue 3: 5.1.3.3
Out-of-band emission limits	§20.21(e)(8)(i)(E)	RSS-131 Issue 3: 5.1.3.4
Intermodulation limits	§20.21(e)(8)(i)(F)	RSS-131 Issue 3: 5.1.3.5
Transmit power off mode	§20.21(e)(8)(i)(H)	RSS-131 Issue 3: 5.1.3.6
Uplink inactivity	§20.21(e)(8)(i)(I)	RSS-131 Issue 3: 5.1.3.7

FCC-ISED Correlation of measurement requirements for Wideband Consumer Signal Booster from FCC and ISED Canada



1.3 MEASUREMENT SUMMARY / SIGNATURES

47 CFR CHAPTER I FCC PART 20 §20.21

§ 20.21 (e) (3) Frequency Bands

Authorized Frequency Band The measurement was performed according to KDB 935210 D03

The measurement was performed accordin	performed according to KDB 935210 D03			lt
OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction				
Band 12, Downlink	S01_AA01	2020-01-20	Performed	Performed
Band 12, Uplink	S01_AA01	2020-01-20	Performed	Performed
Band 13, Downlink	S01_AA01	2020-01-20	Performed	Performed
Band 13, Uplink	S01_AA01	2020-01-20	Performed	Performed
Band 2, Downlink	S01_AA01	2020-01-20	Performed	Performed
Band 2, Uplink	S01_AA01	2020-01-20	Performed	Performed
Band 4, Downlink	S01_AA01	2020-01-20	Performed	Performed
Band 4, Uplink	S01_AA01	2020-01-20	Performed	Performed
Band 5, Downlink	S01_AA01	2020-01-20	Performed	Performed
Band 5, Uplink	S01_AA01	2020-01-20	Performed	Performed

47 CFR CHAPTER I FCC PART 20 §20.21

§ 20.21 (e) (8) (i) (D) Power Limits; § 20.21 (e) (8) (i) (B) Bidirectional Capability

Maximum Power

The measurement was performed according to KDB 935210 D03

Final Result

OP-Mode Frequency Band, Direction, Signal Type	Setup	Date	FCC	ISED
Band 12, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 12, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 12, Uplink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 12, Uplink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 13, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 13, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 13, Uplink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 13, Uplink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 2, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 2, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 2, Uplink, AWGN	S01_AA01	2020-01-20	Passed	Passed
Band 2, Uplink, Pulsed CW	S01_AA01	2020-01-20	Passed	Passed
Band 4, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 4, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 4, Uplink, AWGN	S01_AA01	2020-01-20	Passed	Passed
Band 4, Uplink, Pulsed CW	S01_AA01	2020-01-20	Passed	Passed
Band 5, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 5, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 5, Uplink, AWGN	S01_AA01	2020-01-20	Passed	Passed
Band 5, Uplink, Pulsed CW	S01_AA01	2020-01-20	Passed	Passed



§ 20.21 (e)(8)(i)(C)(2) Booster Gain Limits; § 20.21 (e)(8)(i)(B) Bidirectional Capability

Maximum Booster Gain	• •			
The measurement was performed according	ng to KDB 935210	D03	Final Res	sult
OP-Mode Frequency Band, Direction, Signal Type	Setup	Date	FCC	ISED
Band 12, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 12, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 12, Uplink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 12, Uplink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 13, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 13, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 13, Uplink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 13, Uplink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 2, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 2, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 2, Uplink, AWGN	S01_AA01	2020-01-20	Passed	Passed
Band 2, Uplink, Pulsed CW	S01_AA01	2020-01-20	Passed	Passed
Band 4, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 4, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 4, Uplink, AWGN	S01_AA01	2020-01-20	Passed	Passed
Band 4, Uplink, Pulsed CW	S01_AA01	2020-01-20	Passed	Passed
Band 5, Downlink, AWGN	S01_AA01	2020-01-21	Passed	Passed
Band 5, Downlink, Pulsed CW	S01_AA01	2020-01-21	Passed	Passed
Band 5, Uplink, AWGN	S01_AA01	2020-01-20	Passed	Passed
Band 5, Uplink, Pulsed CW	S01_AA01	2020-01-20	Passed	Passed

47 CFR CHAPTER I FCC PART 20 §20.21

§ 20.21 (e) (8) (i) (F) Intermodulation Limits

Final Result

Intermodulation The measurement was performed according to KDB 935210 D03

OP-Mode Frequency Band, Direction, Input Power	Setup	Date	FCC	ISED
Band 12, Downlink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 12, Uplink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 12, Uplink, AGC+10dB	S01_AA01	2020-01-22	Passed	Passed
Band 13, Downlink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 13, Uplink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 13, Uplink, AGC+10dB	S01_AA01	2020-01-22	Passed	Passed
Band 2, Downlink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 2, Uplink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 2, Uplink, AGC+10dB	S01_AA01	2020-01-22	Passed	Passed
Band 4, Downlink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 4, Uplink, AGC	S01_AB01	2020-01-23	Passed	Passed
Band 4, Uplink, AGC+10dB	S01_AB01	2020-01-23	Passed	Passed
Band 5, Downlink, AGC	S01_AA01	2020-01-22	Passed	Passed
Band 5, Uplink, AGC	S01_AA01	2020-01-22	Passed	Passed



§ 20.21 (e)(8)(i)(F) Intermodulation Limits

320.21				
Intermodulation			Final Da	ault
the measurement was performed according	IG KDB 935210	0 003	Final Re	suit
OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction, Input Power	•			
Band 5, Uplink, AGC+10dB	S01_AA01	2020-01-22	Passed	Passed
47 CFR CHAPTER I FCC PART 20	§ 20.21 (e)(8	5)(i)(E) Out-	of-bands	Limits
920.21 Out of hand Emission				
The measurement was performed accordin	na to KDB 93521(0 D03	Final Re	sult
···· ··· ··· ··· ··· ··· ··· ··· ··· ·	·g ·····			
OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction, Signal Type, Band				
Band 12, Downlink, CDMA, lower	S01_AA01	2020-01-27	Passed	Passed
Band 12, Downlink, CDMA, upper		2020-01-27	Passed	Passed
Band 12, Downlink, GSM, lower	S01_AA01	2020-01-27	Passed	Passed
Band 12, Downlink, GSM, upper	S01_AA01	2020-01-27	Passed	Passed
Band 12, Downlink, LTE, lower	S01_AA01	2020-01-27	Passed	Passed
Band 12, Downlink, LTE, upper	S01_AA01	2020-01-27	Passed	Passed
Band 12, Uplink, CDMA, lower	S01_AA01	2020-01-27	Passed	Passed
Band 12, Uplink, CDMA, upper	S01_AA01	2020-01-27	Passed	Passed
Band 12, Uplink, GSM, lower	S01_AA01	2020-01-27	Passed	Passed
Band 12, Uplink, GSM, upper	S01_AA01	2020-01-27	Passed	Passed
Band 12, Uplink, LTE, lower	S01_AA01	2020-01-27	Passed	Passed
Band 12, Uplink, LTE, upper	S01_AA01	2020-01-27	Passed	Passed
Band 13, Downlink, CDMA, lower	S01_AA01	2020-01-27	Passed	Passed
Band 13, Downlink, CDMA, upper	S01_AA01	2020-01-27	Passed	Passed
Band 13, Downlink, GSM, lower	S01_AA01	2020-01-27	Passed	Passed
Band 13, Downlink, GSM, upper	S01_AA01	2020-01-27	Passed	Passed
Band 13, Downlink, LTE, lower	S01_AA01	2020-01-27	Passed	Passed
Band 13, Downlink, LTE, upper	S01_AA01	2020-01-27	Passed	Passed
Band 13, Uplink, CDMA, lower	S01_AA01	2020-01-27	Passed	Passed
Band 13, Uplink, CDMA, upper	S01_AA01	2020-01-27	Passed	Passed
Band 13, Uplink, GSM, lower	S01_AA01	2020-01-27	Passed	Passed
Band 13, Uplink, GSM, upper	S01_AA01	2020-01-27	Passed	Passed
Band 13, Uplink, LTE, lower	S01_AA01	2020-01-27	Passed	Passed
Band 13, Uplink, LTE, upper	S01_AA01	2020-01-27	Passed	Passed
Band 2, Downlink, CDMA, lower	S01_AA01	2020-01-27	Passed	Passed
Band 2, Downlink, CDMA, upper	SUI_AAUI	2020-01-27	Passed	Passed
Band 2, Downlink, GSM, lower	SU1_AAU1	2020-01-27	Passed	Passed
Band 2, Downlink, GSM, upper	SUI_AAUI	2020-01-27	Passed	Passed
Banu 2, DOWNIINK, LTE, IOWER	SUI_AAUI	2020-01-27	Passed	Passed
Danu 2, Downlink, LTE, Upper	SO1 AA01	2020-01-27	Passeu	Passeu
Band 2, Uplink, CDMA, IUWEI Rand 2, Uplink, CDMA, upper	SO1 4401	2020-01-24	Passed	Passed
Band 2. Unlink, CDIVIA, Upper Band 2. Unlink, CSM Jower		2020-01-24	Passed	Passed
	301_AAU1	2020-01-24	rasseu	rasseu



§ 20.21 (e) (8) (i) (E) Out-of-bands Limits

Out-of-band Emission				
The measurement was performed according	g to KDB 935210	D03	Final Res	ult
OP-Mode Frequency Band, Direction, Signal Type, Band Edge	Setup	Date	FCC	ISED
Band 2, Uplink, GSM, upper	S01_AA01	2020-01-24	Passed	Passed
Band 2, Uplink, LTE, lower	S01_AA01	2020-01-23	Passed	Passed
Band 2, Uplink, LTE, upper	S01_AA01	2020-01-24	Passed	Passed
Band 4, Downlink, CDMA, lower	S01_AA01	2020-01-27	Passed	Passed
Band 4, Downlink, CDMA, upper	S01_AA01	2020-01-27	Passed	Passed
Band 4, Downlink, GSM, lower	S01_AA01	2020-01-27	Passed	Passed
Band 4, Downlink, GSM, upper	S01_AA01	2020-01-27	Passed	Passed
Band 4, Downlink, LTE, lower	S01_AA01	2020-01-27	Passed	Passed
Band 4, Downlink, LTE, upper	S01_AA01	2020-01-27	Passed	Passed
Band 4, Uplink, CDMA, lower	S01_AA01	2020-01-24	Passed	Passed
Band 4, Uplink, CDMA, upper	S01_AA01	2020-01-24	Passed	Passed
Band 4, Uplink, GSM, lower	S01_AA01	2020-01-24	Passed	Passed
Band 4, Uplink, GSM, upper	S01_AA01	2020-01-24	Passed	Passed
Band 4, Uplink, LTE, lower	S01_AA01	2020-01-24	Passed	Passed
Band 4, Uplink, LTE, upper	S01_AA01	2020-01-24	Passed	Passed
Band 5, Downlink, CDMA, lower	S01_AA01	2020-01-27	Passed	Passed
Band 5, Downlink, CDMA, upper	S01_AA01	2020-01-27	Passed	Passed
Band 5, Downlink, GSM, lower	S01_AA01	2020-01-27	Passed	Passed
Band 5, Downlink, GSM, upper	S01_AA01	2020-01-27	Passed	Passed
Band 5, Downlink, LTE, lower	S01_AA01	2020-01-27	Passed	Passed
Band 5, Downlink, LTE, upper	S01_AA01	2020-01-27	Passed	Passed
Band 5, Uplink, CDMA, lower	S01_AA01	2020-01-24	Passed	Passed
Band 5, Uplink, CDMA, upper	S01_AA01	2020-01-24	Passed	Passed
Band 5, Uplink, GSM, lower	S01_AA01	2020-01-24	Passed	Passed
Band 5, Uplink, GSM, upper	S01_AA01	2020-01-24	Passed	Passed
Band 5, Uplink, LTE, lower	S01_AA01	2020-01-24	Passed	Passed
Band 5, Uplink, LTE, upper	S01_AA01	2020-01-24	Passed	Passed

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§ 2.1051 Spurious emissions at antenna terminals

Conducted Spurious Emissions

The measurement was performed according to KDB 935210 D03

OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction				
Band 12, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 12, Uplink	S01_AA01	2020-01-22	Passed	Passed
Band 13, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 13, Uplink	S01_AA01	2020-01-22	Passed	Passed
Band 2, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 2, Uplink	S01_AA01	2020-01-22	Passed	Passed
Band 4, Downlink	S01_AA01	2020-01-22	Passed	Passed

Final Result



47 CFR CHAPTER I FCC PART 20 § 2.1051 Spurious emissions at antenna §20.21 terminals **Conducted Spurious Emissions** The measurement was performed according to KDB 935210 D03 **Final Result OP-Mode** FCC Setup ISED Date Frequency Band, Direction Band 4, Uplink S01_AA01 2020-01-22 Passed Passed S01_AA01 2020-01-22 Band 5, Downlink Passed Passed Band 5, Uplink S01_AA01 2020-01-22 Passed Passed **47 CFR CHAPTER I FCC PART 20** § 20.21 (e) (8) (i) (A) Noise Limits; § 20.21 §20.21 (e)(8)(i)(H) Transmitter Power Off Mode Maximum Transmitter Noise Power The measurement was performed according to KDB 935210 D03 **Final Result OP-Mode** Setup Date FCC ISED Frequency Band, Direction, Signal Type 2020-01-28 Band 12, Downlink, None S01_AA01 Passed Passed Band 12, Uplink, AWGN DL S01_AA01 2020-01-28 Passed Passed Band 12, Uplink, None S01_AA01 2020-01-28 Passed Passed Band 13, Downlink, None S01_AA01 2020-01-28 Passed Passed S01_AA01 2020-01-28 Band 13, Uplink, AWGN DL Passed Passed Band 13, Uplink, None S01_AA01 2020-01-28 Passed Passed S01_AA01 2020-01-28 Band 2, Downlink, None Passed Passed 2020-01-28 Band 2, Uplink, AWGN DL S01_AA01 Passed Passed S01_AA01 2020-01-28 Band 2, Uplink, None Passed Passed S01_AA01 2020-01-28 Band 4, Downlink, None Passed Passed Band 4, Uplink, AWGN DL S01_AA01 2020-01-28 Passed Passed Band 4, Uplink, None S01_AA01 2020-01-28 Passed Passed Passed Band 5, Downlink, None S01_AA01 2020-01-28 Passed S01_AA01 2020-01-28 Band 5, Uplink, AWGN DL Passed Passed S01_AA01 2020-01-28 Band 5, Uplink, None Passed Passed

920.21		ansmitter	Power Off	would
Variable Uplink Noise Timing				
The measurement was performed according	ng to KDB 935210	D03	Final Res	sult
	Catan	Data	500	
OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction				
Band 12, Uplink	S01_AA01	2020-01-28	Passed	Passed
Band 13, Uplink	S01_AA01	2020-01-28	Passed	Passed
Band 2, Uplink	S01_AA01	2020-01-28	Passed	Passed
Band 4, Uplink	S01_AA01	2020-01-28	Passed	Passed
Band 5, Uplink	S01_AA01	2020-01-28	Passed	Passed

§ 20.21 (e) (8) (i) (A) Noise Limits; § 20.21

47 CFR CHAPTER I FCC PART 20

600 04



§ 20.21 (e)(8)(i)(I) Uplink Inactivity

§20.21				
Uplink Inactivity				
The measurement was performed accor	ding to KDB 9352	210 D03	Final Re	esult
OD Mada	Satur	Dete	FCC	
Frequency Band Direction	Setup	Date	FUU	ISED
Band 12. Uplink	S01 AA01	2020-01-28	Passed	Passed
Band 13 Unlink	S01_AA01	2020-01-28	Passed	Passed
Band 2 Unlink	S01_AA01	2020-01-28	Passod	Passod
Band 4. Unlink	S01_AA01	2020-01-28	Dassod	Dassod
Band 5, Uplink	S01_AA01	2020-01-28	Passod	Passod
	301_AA01	2020-01-20	rasseu	rasseu
47 CFR CHAPTER I FCC PART 20 §20.21	§ 20.21 (e) Limits, § 20 Power Off N	(8)(i)(C)(1) B).21 (e)(8)(i)(/lode	ooster Ga H) Transi	ain mit
Variable Booster Gain		10 000		
The measurement was performed accor	ding to KDB 9352	210 D03	Final Re	esult
OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction	Corup	Duto		
Band 12, Uplink	S01_AA01	2020-01-29	Passed	Passed
Band 13, Uplink	S01_AA01	2020-01-29	Passed	Passed
Band 2, Uplink	S01_AA01	2020-01-29	Passed	Passed
Band 4, Uplink	S01_AA01	2020-01-29	Passed	Passed
Band 5, Uplink	S01_AA01	2020-01-29	Passed	Passed
47 CFR CHAPTER I FCC PART 20 §20.21	§ 20.21 (e) Limits, § 20 Power Off M	(8)(i)(C)(1) B 0.21 (e)(8)(i)(<i>N</i> ode	ooster Ga H) Transi	ain mit
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accord	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352	(8)(i)(C)(1) B 0.21 (e)(8)(i)(Mode 210 D03	ooster Ga H) Transi Final Re	ain mit esult
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03	ooster Ga H) Transi Final Re	ain mit esult
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Erequency Band, Direction	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup	(8) (i) (C) (1) B 0.21 (e) (8) (i) (Mode 210 D03 Date	ooster Ga H) Transi Final Re FCC	ain mit esult ISED
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12 Uplink	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29	ooster Ga H) Transi Final Re FCC Passed	ain mit esult ISED
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (Aode 210 D03 Date 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed	ain mit esult ISED Passed
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed Passed	ain mit esult ISED Passed Passed Passed
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 4, Uplink	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed	esult ISED Passed Passed Passed Passed Passed
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (Aode 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed	esult ISED Passed Passed Passed Passed Passed Passed
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed Passed	ain mit esult ISED Passed Passed Passed Passed Passed Passed
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink Band 5, Uplink	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed Vidth	esult ISED Passed Passed Passed Passed Passed Passed
47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 12, Uplink Band 2, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink 47 CFR CHAPTER I FCC PART 20 §20.21 Occupied Bandwidth	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Aode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed vidth	ain mit esult ISED Passed Passed Passed Passed Passed
 47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink 47 CFR CHAPTER I FCC PART 20 §20.21 Occupied Bandwidth The measurement was performed accor 	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_A01 S01_A0	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed Vidth	esult ISED Passed Passed Passed Passed Passed Passed
 47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink 47 CFR CHAPTER I FCC PART 20 §20.21 Occupied Bandwidth The measurement was performed accor OP-Mode Frequency Band, Direction, Signal Type 	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_A00 S01_A	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-20 20	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed Vidth Final Re FCC	ain mit esult ISED Passed Passed Passed Passed Passed Passed Passed
 47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink 47 CFR CHAPTER I FCC PART 20 §20.21 Occupied Bandwidth The measurement was performed accor OP-Mode Frequency Band, Direction, Signal Type Band 12, Downlink, CDMA 	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 § 2.1049 Oc ding to KDB 9352 Setup S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (Mode 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-30	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Vidth Final Re FCC Passed	ain mit esult ISED Passed Passed Passed Passed Passed Passed Passed
 47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink 47 CFR CHAPTER I FCC PART 20 §20.21 Occupied Bandwidth The measurement was performed accor OP-Mode Frequency Band, Direction, Signal Type Band 12, Downlink, CDMA Band 12, Downlink, GSM 	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-30 2020-01-30 2020-01-30	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed Vidth Final Re FCC Passed Passed	ain mit esult ISED Passed Passed Passed Passed Passed Passed Passed Passed
 47 CFR CHAPTER I FCC PART 20 §20.21 Variable Uplink Gain Timing The measurement was performed accor OP-Mode Frequency Band, Direction Band 12, Uplink Band 13, Uplink Band 2, Uplink Band 2, Uplink Band 4, Uplink Band 5, Uplink 47 CFR CHAPTER I FCC PART 20 §20.21 Occupied Bandwidth The measurement was performed accor OP-Mode Frequency Band, Direction, Signal Type Band 12, Downlink, CDMA Band 12, Downlink, GSM Band 12, Downlink, LTE 	§ 20.21 (e) Limits, § 20 Power Off M ding to KDB 9352 Setup S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01 S01_AA01	(8) (i) (C) (1) B 0.21 (e) (8) (i) (<u>Mode</u> 210 D03 Date 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-29 2020-01-30 2020-01-30 2020-01-30 2020-01-30	ooster Ga H) Transi Final Re FCC Passed Passed Passed Passed Passed Vidth Final Re FCC Passed Passed Passed Passed Passed Passed	esult Passed Passed Passed Passed Passed Passed Passed Passed Passed Passed Passed
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47 CFR CHAPTER I FCC PART 20 § 2.1049 Occupied Bandwidth §20.21

The measurement was performed according to KDB 935210 D03			Final Result	
OP-Mode Frequency Band, Direction, Signal Type	Setup	Date	FCC	ISED
Band 12, Uplink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 12, Uplink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 13, Downlink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 13, Downlink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 13, Downlink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 13, Uplink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 13, Uplink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 13, Uplink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 2, Downlink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 2, Downlink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 2, Downlink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 2, Uplink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 2, Uplink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 2, Uplink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 4, Downlink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 4, Downlink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 4, Downlink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 4, Uplink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 4, Uplink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 4, Uplink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 5, Downlink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 5, Downlink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 5, Downlink, LTE	S01_AA01	2020-01-30	Passed	Passed
Band 5, Uplink, CDMA	S01_AA01	2020-01-30	Passed	Passed
Band 5, Uplink, GSM	S01_AA01	2020-01-30	Passed	Passed
Band 5, Uplink, LTE	S01_AA01	2020-01-30	Passed	Passed

47 CFR CHAPTER I FCC PART 20 <u>§20</u>.21

§ 20.21 (e) (8) (ii) (A) Ant-Oscillation, § 20.21 (e) (5) Anti-Oscillation

Oscillation Restart		*		
The measurement was performed	l according to KDB 9352	210 D03	Final Re	esult
OP-Mode Frequency Band, Direction	Setup	Date	FCC	ISED
Band 12, Downlink	S01_AA01	2020-01-21	Passed	Passed
Band 12, Uplink	S01_AA01	2020-01-21	Passed	Passed
Band 13, Downlink	S01_AA01	2020-01-21	Passed	Passed
Band 13, Uplink	S01_AA01	2020-01-21	Passed	Passed
Band 2, Downlink	S01_AA01	2020-01-21	Passed	Passed
Band 2, Uplink	S01_AA01	2020-01-21	Passed	Passed
Band 4, Downlink	S01_AA01	2020-01-21	Passed	Passed
Band 4, Uplink	S01_AA01	2020-01-21	Passed	Passed
Band 5, Downlink	S01_AA01	2020-01-21	Passed	Passed



§ 20.21 (e) (8) (ii) (A) Ant-Oscillation, § 20.21 (e) (5) Anti-Oscillation

The measurement was performed according to KDB 935210 D03 Final Result				sult
OP-Mode Frequency Band, Direction	Setup	Date	FCC	ISED
Band 5, Uplink	S01_AA01	2020-01-21	Passed	Passed
47 CFR CHAPTER I FCC PART 20 §20.21	§ 20.21 (e) 20.21 (e)(5	(8)(ii)(A) Ant) Anti-Oscillat	-Oscillatio	on, §
Oscillation Shutdown or Mitigation The measurement was performed accord	ling to KDB 9352	210 D03 Fi	nal Resul	t

OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction	-			
Band 12, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 12, Uplink Remark: EUT does not start up at 30 dB below AGC	S01_AA01	2020-01-21	Performed	Performed
Band 13, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 13, Uplink Remark: EUT does not start up at 30 dB below AGC	S01_AA01	2020-01-21	Performed	Performed
Band 2, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 2, Uplink Remark: EUT does not start up at 30 dB below AGC	S01_AA01	2020-01-21	Performed	Performed
Band 4, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 4, Uplink Remark: EUT does not start up at 30 dB below AGC	S01_AA01	2020-01-21	Performed	Performed
Band 5, Downlink	S01_AA01	2020-01-22	Passed	Passed
Band 5, Uplink Remark: EUT does not start up at 30 dB below AGC	S01_AA01	2020-01-21	Performed	Performed

47 CFR CHAPTER I FCC PART 20 §20.21

§ 2.1053 Field strength of Spurious Radiation

Radiated Spurious Emissions The measurement was performed according to KDB 935210 D03

OP-Mode	Setup	Date	FCC	ISED
Frequency Band, Direction				
Band 12, Downlink	S01_AB01	2020-01-22	Passed	Passed
Band 12, Uplink	S01_AB01	2020-01-22	Passed	Passed
Band 13, Downlink	S01_AB01	2020-01-22	Passed	Passed
Band 13, Uplink	S01_AB01	2020-01-22	Passed	Passed
Band 2, Downlink	S01_AB01	2020-01-22	Passed	Passed
Band 2, Uplink Remark: 1880 MHz is an wanted signal	S01_AB01	2020-01-22	Passed	Passed
Band 4, Downlink	S01_AB01	2020-01-22	Passed	Passed
Band 4, Uplink Remark: 1732.5 MHz is an wanted signal	S01_AB01	2020-01-22	Passed	Passed
Band 5, Downlink	S01_AB01	2020-01-22	Passed	Passed
Band 5, Uplink	S01_AB01	2020-01-22	Passed	Passed

N/A: Not applicable N/P: Not performed

Final Result



2 REVISION HISTORY

	Report version control			
Version	Release date	Change Description	Version validity	
initial	2020-02-13		valid	
rev01	2020-03-20	Added marker values to result table and added additional markers to plots in chapter conducted spurious emissions	valid	

COMMENT: -

(responsible for accreditation scope) Dipl.-Ing. Marco Kullik

(responsible for testing and report) Dipl.-Ing. Daniel Gall

layers

7 layers GmbH, Borsigstr. 11 40880 Ratingen, Germany Phone +49 (0)2102 749 0



3 ADMINISTRATIVE DATA

3.1 TESTING LABORATORY

Company	Name:
---------	-------

7layers GmbH

Address:

Borsigstr. 11 40880 Ratingen Germany

The test facility is accredited by the following accreditation organisation:

Laboratory accreditation no:	DAkkS D-PL-12140-01-01 D-PL-12140-01-02 D- PL-12140-01-03
FCC Designation Number:	DE0015
FCC Test Firm Registration:	929146
ISED CAB Identifier	DE0007; ISED#: 3699A
Responsible for accreditation scope:	DiplIng. Marco Kullik
Report Template Version:	2019-12-16
3.2 PROJECT DATA	
Responsible for testing and report:	DiplIng. Daniel Gall
Employees who performed the tests:	documented internally at 7Layers
Date of Report:	2020-03-20
Testing Period:	2020-01-20 to 2020-01-30
3.3 APPLICANT DATA	

Company Name:	Molex CVS Dabendorf GmbH
Address:	Märkische Straße 72 15806 Zossen Germany
Contact Person:	Ines Baufeld



3.4 MANUFACTURER DATA

Company Name:

Address:

Molex CVS Dabendorf GmbH

Märkische Straße 72 15806 Zossen Germany

Contact Person:

Sebastian Dern



4 TEST OBJECT DATA

4.1 GENERAL EUT DESCRIPTION

Kind of Device product description	Consumer mobile Signal Booster supporting bands 2, 4, 5, 12, 13
Product name / Model	LTE-MBC-NAR2
Type number	17400213
Declared EUT data by	the supplier
General Product Description	The EUT is a single housing wideband consumer signal booster with a single donor and single server port. It supports the eFDD bands 2, 4, 5, 12 and 13. Spectrum block filtering is not supported.
Booster Type	Mobile Wideband Consumer Signal Booster
Booster Connection	Direct Contact Coupling (e.g. cradle type)
MSCL Value	7 dB
Voltage Type	DC
Voltage Level	12 V
Maximum Output Donor Port [Uplink]:	22.0 dBm (conducted)
Maximum Output Server Port [Downlink]:	1.0 dBm (conducted)
Maximum Gain [Uplink]	22.1 dB
Maximum Gain [Downlink]	22.4 dB
The EUT provides the following ports:	Donor Port: Input BS-Signal, Output MS-Signal Server Port: Input MS-Signal, Output BS-Signal DC Port

The below Variant models are declared by the manufacturer as electrically identical but have not been tested:

Product name / Model	Product Type number
LTE-MBC-NAR2	17401213
LTE-MBC-NAR2	17400214
LTE-MBC-NAR2	17402213



4.2 EUT MAIN COMPONENTS

Sample Name	Sample Code	Description	
EUT aa01	DE1386008aa01		
Sample Parameter	Value		
Serial No.	0D0FKW-00117.01.2098210013	0D0FKW-00117.01.2098210013	
HW Version	004		
SW Version	0003		
Comment			

Sample Name	Sample Code	Description	
EUT ab01	DE1386008ab01		
Sample Parameter		Value	
Serial No.	0D0FKW-00117.01.2098210011		
HW Version	004		
SW Version	0003		
Comment			

NOTE: The short description is used to simplify the identification of the EUT in this test report.

4.3 ANCILLARY EQUIPMENT

For the purposes of this test report, ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Ancillary Equipment can influence the test results.

Device	Details (Manufacturer, Type Model, OUT Code)	Description
-	-	-

4.4 AUXILIARY EQUIPMENT

For the purposes of this test report, auxiliary equipment is defined as equipment which is used temporarily to enable operational and control features especially used for the tests of the EUT which is not used during normal operation or equipment that is used during the tests in combination with the EUT but is not subject of this test report. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Auxiliary Equipment can influence the test results.

Device	Details (Manufacturer, Type Model, HW, SW, S/N)	Description
_	_	-



4.5 EUT SETUPS

This chapter describes the combination of EUTs and equipment used for testing. The rationale for selecting the EUTs, ancillary and auxiliary equipment and interconnecting cables, is to test a representative configuration meeting the requirements of the referenced standards.

Setup	Combination of EUTs	Description and Rationale
S01_AA01	EUT aa01	Representative Setup
S01_AB01	EUT ab01	Representative Setup

4.6 OPERATING MODES

This chapter describes the operating modes of the EUTs used for testing.

4.6.1 TEST CHANNELS

Band	Direction	Lower Frequency Band Edge [MHz]	Upper Frequency Band Edge [MHz]	Center Frequency [MHz]	Port
2	downlink	1930.00	1990.00	1960.00	Donor
4	downlink	2110.00	2155.00	2132.50	Donor
5	downlink	869.00	894.00	881.50	Donor
12	downlink	728.00	746.00	737.00	Donor
13	downlink	746.00	756.00	751.00	Donor
2	uplink	1850.00	1910.00	1880.00	Server
4	uplink	1710.00	1755.00	1732.50	Server
5	uplink	824.00	849.00	836.50	Server
12	uplink	698.00	716.00	707.00	Server
13	uplink	777.00	787.00	782.00	Server

4.7 PRODUCT LABELLING

4.7.1 FCC ID LABEL

Please refer to the documentation of the applicant.

4.7.2 LOCATION OF THE LABEL ON THE EUT

Please refer to the documentation of the applicant.



5 TEST RESULTS

5.1 AUTHORIZED FREQUENCY BAND

Standard

The test was performed according to: KDB 935210 D03

5.1.1 TEST DESCRIPTION

This test case is intended to confirm that the signal booster only operates on the CMRS frequency bands authorized for use by the NPS. In addition, this test will identify the frequency at which the maximum gain is realized within each CMRS operational band, which then serves as a basis for subsequent tests.

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.1; Authorized Frequency Band Verification

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.1.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21 (e)(3) Frequency Bands

For this test case exists no applicable limit.



5.1.3 TEST PROTOCOL

Ambient temperature:	25 °C
Air Pressure:	1036 hPa
Humidity:	34 %
Band 2, downlink	

Frequency	Frequency [MHz]	Output Power [dBm]	
Lower Band Edge	1930.000	-7.0	
Highest Power	1951.090	-5.5	
Upper Band Edge	1990.000	-7.0	

Band 4, downlink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	2110.000	-6.0
Highest Power	2110.411	-6.0
Upper Band Edge	2155.000	-6.8

Band 5, downlink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	869.000	-6.1
Highest Power	875.750	-5.8
Upper Band Edge	894.000	-6.7

Band 12, downlink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	728.000	-4.6
Highest Power	745.930	-3.6
Upper Band Edge	746.000	-3.6

Band 13, downlink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	746.000	-4.6
Highest Power	752.580	-4.4
Upper Band Edge	756.000	-5.0

Band 2, uplink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	1850.000	16.3
Highest Power	1865.870	18.1
Upper Band Edge	1910.000	14.0

Band 4, uplink

Frequency		Output Power
Lower Band Edge	1710.000	16.9
Highest Power	1719.751	18.2
Upper Band Edge	1755.000	17.9



Band 5, uplink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	824.000	16.7
Highest Power	834.391	17.6
Upper Band Edge	849.000	15.9

Band 12, uplink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	698.000	17.7
Highest Power	709.010	17.8
Upper Band Edge	716.000	17.1

Band 13, uplink

Frequency	Frequency [MHz]	Output Power [dBm]
Lower Band Edge	777.000	16.4
Highest Power	780.390	17.5
Upper Band Edge	787.000	16.8

Remark: Please see next sub-clause for the measurement plot.



5.1.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")



Frequency Band = Band 2, Direction = Downlink (S01_AA01)

Date: 20.JAN.2020 16:25:52

Frequency Band = Band 4, Direction = Downlink (S01_AA01)

Spectrum	Γ									
Ref Level Att	10.00 dBm 15 dB	Offset SWT	10.80 dB (113.8 μs (RBW	100 kHz 300 kHz	Mode	Auto FF1	г		· · · ·
●1Pk Max										
0 dBm						٩	M1[1]		2.1	-5.98 dBn 1041130 GH
		INIDAL N				r	M2[1]	M3	21	-5.99 dBn 1000000 CH
-10 dBm							1			1
-20 dBm				_						_
-30 dBm			-	_						
-40 dBm				_						
-50 dBm				+						
-60 dBm			-	-						-
-70 dBm				+						
-80 dBm		F1					+	F2 -		
Start 2.08	75 GHz				32001	pts			Stop	2.1775 GHz
Marker										
Type Re	f Trc	X-val	ue	Y-	value	Fun	ction	F	unction Res	ult
M1	1	2.1104	4113 GHz		5.98 dBm					
M2	1		2.11 GHz		-5.99 dBm					
M3	1	2	.155 GHz		-6.84 dBm					
	Τ					Me	asuring		1 1 1 1 1 1 1 1 1 1	20.01.2020

Date: 20.JAN.2020 16:33:57





Frequency Band = Band 5, Direction = Downlink (S01_AA01)

Date: 20.JAN.2020 16:38:28

Frequency Band = Band 12, Direction = Downlink (S01_AA01)



Date: 20.JAN.2020 16:42:44





Frequency Band = Band 13, Direction = Downlink (S01_AA01)

Date: 20.JAN.2020 16:47:27

Frequency Band = Band 2, Direction = Uplink (S01_AA01)



Date: 20.JAN.2020 15:53:10





Frequency Band = Band 4, Direction = Uplink (S01_AA01)

Date: 20.JAN.2020 16:00:55

Frequency Band = Band 5, Direction = Uplink (S01_AA01)



Date: 20.JAN.2020 16:07:42





Frequency Band = Band 12, Direction = Uplink (S01_AA01)

Date: 20.JAN.2020 16:13:50

Frequency Band = Band 13, Direction = Uplink (S01_AA01)



Date: 20.JAN.2020 16:17:58

5.1.5 TEST EQUIPMENT USED

- R&S TS8997



5.2 MAXIMUM POWER

Standard

The test was performed according to: KDB 935210 D03

5.2.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the signal booster power limits and requirements as specified in \S 20.21(e)(8)(i)(D) and 20.21(e)(8)(i)(B) for wideband consumer signal boosters.

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.2; Maximum Power

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.2.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(D)

Power Limits. A booster's uplink power must not exceed 1 watt composite conducted power and equivalent isotropic radiated power (EIRP) for each band of operation. Composite downlink power shall not exceed 0.05 watt (17 dBm) conducted and EIRP for each band of operation. Compliance with power limits will use instrumentation calibrated in terms of RMS equivalent voltage.

FCC Part 20, § 20.21(e)(8)(i)(B)



Bidirectional Capability. Consumer Boosters must be able to provide equivalent uplink and downlink gain and conducted uplink power output that is at least 0.05 watts. One-way consumer boosters (*i.e.*, uplink only, downlink only, uplink impaired, downlink impaired) are prohibited. Spectrum block filtering may be used provided the uplink filter attenuation is not less than the downlink filter attenuation, and where RSSI is measured after spectrum block filtering is applied referenced to the booster's input port for each band of operation.

5.2.3 TEST PROTOCOL

Ambient temperature:	25 °C
Air Pressure:	1036 hPa
Humidity:	34 %
Band 2, downlink	

Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	1951.090	-20.0	0.4	0.4		17.0		16.6
AWGN	1951.090	-23.0	-1.8	-1.0		17.0		18.0

Band 4, downlink

Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	2110.411	-20.0	0.0	0.0		17.0		17.0
AWGN	2110.411	-23.9	-2.8	-2.1		17.0		19.1

Band 5, downlink

Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	875.750	-20.0	0.5	0.5		17.0		16.5
AWGN	875.750	-23.4	-1.5	-1.3		17.0		18.3

Band 12, downlink

Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	745.930	-20.0	0.6	0.6		17.0		16.4
AWGN	745.930	-21.7	0.5	0.6		17.0		16.4

Band 13, downlink

Signal Type	Frequency	AGC	Minimum	Maximum	Lower	Upper	Margin	Margin
	[MHz]	Start	Output	Output	Limit	Limit	to	to
		Input	Power	Power	Output	Output	Lower	Upper
		Power	[dBm]	[dBm]	Power	Power	Limit	Limit
		[dBm]			[dBm]	[dBm]	[dB]	[dB]
Pulsed CW	752.580	-20.0	1.0	1.0		17.0		16.0
AWGN	752.580	-22.2	0.2	0.3		17.0		16.7



Band 2, uplink								
Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	1865.870	2.6	21.0	21.5	17.0	30.0	4.0	8.5
AWGN	1865.870	-1.9	19.7	19.8	17.0	30.0	2.7	10.2

Band 4, uplink

Bana 4, apinik									
Signal Type	Frequency	AGC	Minimum	Maximum	Lower	Upper	Margin	Margin	
	[MHz]	Start	Output	Output	Limit	Limit	to	to	
		Input	Power	Power	Output	Output	Lower	Upper	
		Power	[dBm]	[dBm]	Power	Power	Limit	Limit	
		[dBm]			[dBm]	[dBm]	[dB]	[dB]	
Pulsed CW	1719.751	0.9	21.3	21.6	17.0	30.0	4.3	8.4	
AWGN	1719.751	-2.1	19.9	20.0	17.0	30.0	2.9	10.0	

Band 5, uplink

Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	834.391	3.6	20.6	22.0	17.0	30.0	3.6	8.0
AWGN	834.391	-1.3	19.8	19.9	17.0	30.0	2.8	10.1

Band 12, uplink

Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	709.010	4.1	21.8	21.9	17.0	30.0	4.8	8.1
AWGN	709.010	-1.8	19.8	20.0	17.0	30.0	2.8	10.0

Band 13, uplink

Signal Type	Frequency [MHz]	AGC Start Input Power [dBm]	Minimum Output Power [dBm]	Maximum Output Power [dBm]	Lower Limit Output Power [dBm]	Upper Limit Output Power [dBm]	Margin to Lower Limit [dB]	Margin to Upper Limit [dB]
Pulsed CW	780.390	4.1	21.6	21.8	17.0	30.0	4.6	8.2
AWGN	780.390	-2.4	19.7	19.7	17.0	30.0	2.7	10.3

Remark: Please see next sub-clause for the measurement plot.



5.2.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE") Frequency Band = Band 2, Direction = Downlink, Signal Type = Pulsed CW







Date: 21.JAN.2020 12:34:19





Date: 21.JAN.2020 12:32:17

Frequency Band = Band 4, Direction = Downlink, Signal Type = Pulsed CW (S01_AA01)



Date: 21.JAN.2020 12:39:42





Frequency Band = Band 4, Direction = Downlink, Signal Type = AWGN (S01_AA01)

Date: 21.JAN.2020 12:46:18



Date: 21.JAN.2020 12:43:48



Frequency Band = Band 5, Direction = Downlink, Signal Type = Pulsed CW (S01_AA01)



Frequency Band = Band 5, Direction = Downlink, Signal Type = AWGN (S01_AA01)



Date: 21.JAN.2020 12:54:28





Date: 21.JAN.2020 12:56:09

Frequency Band = Band 12, Direction = Downlink, Signal Type = Pulsed CW (S01_AA01)



Date: 21.JAN.2020 12:58:20





Frequency Band = Band 12, Direction = Downlink, Signal Type = AWGN (S01_AA01)

Date: 21.JAN.2020 13:05:14



Date: 21.JAN.2020 13:04:17


Frequency Band = Band 13, Direction = Downlink, Signal Type = Pulsed CW (S01_AA01)







Date: 21.JAN.2020 13:10:52





Date: 21.JAN.2020 13:11:38





Date: 20.JAN.2020 17:31:29





Date: 20.JAN.2020 17:43:03





Date: 20.JAN.2020 18:24:25





Date: 20.JAN.2020 18:20:08



Frequency Band = Band 4, Direction = Uplink, Signal Type = Pulsed CW (S01_AA01)

Spectrum Offset 10.70 dB ● RBW 300 kHz SWT 6.3 µs ● VBW 1 MHz GAT: IFP Ref Level 30.00 dBm Att 35 dB Mode FFT SGL Count 1000/1000 ●1Rm AvgPwr 21.34 dBn 1.719751300 GH M1[1] м1 20 dBm-10 dBm 0 dBm--10 dBm -20 dBm -30 dBm--40 dBm--SU dBm--60 dBm-Span 10.0 MHz CF 1.7197513 GHz 32001 pts

Date: 20.JAN.2020 19:04:28



Date: 20.JAN.2020 19:06:12





Frequency Band = Band 4, Direction = Uplink, Signal Type = AWGN (S01_AA01)

Date: 20.JAN.2020 19:16:47



Date: 20.JAN.2020 19:16:05



Spectrum Ref Level 30.00 dBm Offset 10.70 dB ● RBW 300 kHz SWT 6.3 µs ● VBW 1 MHz TRG:IFP Att 35 dB Mode FFT SGL Count 1000/1000 ●1Rm AvgPwr 22.29 dBn 834.390690 MHz M1[1] M 20 dBm 10 dBm 0 dBm -10 dBm -20 dBm -30 dBm -40 dBm--50 dBm--60 dBm-CF 834.391 MHz Span 10.0 MHz 32001 pts

Frequency Band = Band 5, Direction = Uplink, Signal Type = Pulsed CW (S01_AA01)

Date: 20.JAN.2020 19:43:57





Date: 20.JAN.2020 19:41:29

Note: Wrong offset, actual value is 0.3 dB lower





Frequency Band = Band 5, Direction = Uplink, Signal Type = AWGN (S01_AA01)

Date: 20.JAN.2020 20:07:58





Date: 20.JAN.2020 19:58:12

Note: Wrong offset, actual value is 0.3 dB lower



Frequency Band = Band 12, Direction = Uplink, Signal Type = Pulsed CW (S01_AA01)



Date: 21.JAN.2020 10:49:13



Date: 21.JAN.2020 10:53:37





Frequency Band = Band 12, Direction = Uplink, Signal Type = AWGN (S01_AA01)

Date: 21.JAN.2020 11:10:53



Date: 21.JAN.2020 11:07:38



Frequency Band = Band 13, Direction = Uplink, Signal Type = Pulsed CW (S01_AA01)



Date: 21.JAN.2020 11:34:50



Date: 21.JAN.2020 11:39:57





Frequency Band = Band 13, Direction = Uplink, Signal Type = AWGN (S01_AA01)

Date: 21.JAN.2020 11:46:00



Date: 21.JAN.2020 11:46:48

5.2.5 TEST EQUIPMENT USED

- R&S TS8997



5.3 MAXIMUM BOOSTER GAIN

Standard

The test was performed according to: KDB 935210 D03

5.3.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the signal booster gain limits and bidirectional capabilities as specified in § 20.21(e)(8)(i)(C)(2) and § 20.21(e)(8)(i)(B) for wideband consumer signal boosters.

The results of this test case are computed by the measurement values from test case 7.1 and 7.2.

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.3; Maximum Booster Gain

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

5.3.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(C)(2)

Booster Gain Limits. The uplink and downlink maximum gain of a Consumer Booster referenced to its input and output ports shall not exceed the following limits: (*i*) Fixed Booster maximum gain shall not exceed 6.5 dB + 20 Log₁₀ (Frequency) (*ii*) Where, Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.

(*iii*) Mobile Booster maximum gain shall not exceed 50 dB when using an inside antenna (e.g., inside a vehicle), 23 dB when using direct contact coupling (e.g., cradle-type boosters), or 15 dB when directly connected (e.g., boosters with a physical connection to the phone).



FCC Part 20, § 20.21(e)(8)(i)(B)

Bidirectional Capability. Consumer Boosters must be able to provide equivalent uplink and downlink gain and conducted uplink power output that is at least 0.05 watts. One-way consumer boosters (*i.e.*, uplink only, downlink only, uplink impaired, downlink impaired) are prohibited. Spectrum block filtering may be used provided the uplink filter attenuation is not less than the downlink filter attenuation, and where RSSI is measured after spectrum block filtering is applied referenced to the booster's input port for each band of operation.

Note:

The margin for equivalent uplink and downlink gain is considered as 9 dB. This margin is a provisional specification determined by the ANSI ASC C63® task group working in collaboration and consultation with FCC OET Laboratory Division staff.



5.3.3 TEST PROTOCOL

Ambient ter Air Pressure Humidity:	mperature: e:	25 °C 1036 hPa 34 %	
Band 2			
Signal	Maximum	Maximum	I
Туре	Gain	Gain	(
	Downlink	Uplink	
	[dB]	[dB]	
	[ub]	Lapl	

Signal Type	Maximum Gain Downlink IdB1	Maximum Gain Uplink [dB]	Difference Gain [dB]	Absolut Gain Limit IdB1	Difference Gain Limit [dB]	Margin Absolute Gain Downlink	Margin Absolute Gain Uplink	Margin Difference Gain [dB]		
	[GD]	[ub]		[ub]		[dB]	[dB]			
Pulsed CW	20.4	18.4	2.0	23.0	9.0	2.6	4.6	7.1		
AWGN	22.0	21.7	0.3	23.0	9.0	1.0	1.3	8.7		

Band 4

Signal Type	Maximum Gain Downlink [dB]	Maximum Gain Uplink [dB]	Difference Gain [dB]	Absolut Gain Limit [dB]	Difference Gain Limit [dB]	Margin Absolute Gain Downlink [dB]	Margin Absolute Gain Uplink [dB]	Margin Difference Gain [dB]
Pulsed CW	20.0	20.6	0.6	23.0	9.0	3.0	2.4	8.4
AWGN	21.8	22.0	0.2	23.0	9.0	1.2	1.0	8.8

Band 5

Signal Type	Maximum Gain Downlink [dB]	Maximum Gain Uplink [dB]	Difference Gain [dB]	Absolut Gain Limit [dB]	Difference Gain Limit [dB]	Margin Absolute Gain Downlink [dB]	Margin Absolute Gain Uplink [dB]	Margin Difference Gain [dB]
Pulsed CW	20.5	17.0	3.5	23.0	9.0	2.5	6.0	5.5
AWGN	22.1	21.1	1.0	23.0	9.0	0.9	1.9	8.0

Band 12

Signal Type	Maximum Gain Downlink [dB]	Maximum Gain Uplink [dB]	Difference Gain [dB]	Absolut Gain Limit [dB]	Difference Gain Limit [dB]	Margin Absolute Gain Downlink [dB]	Margin Absolute Gain Uplink [dB]	Margin Difference Gain [dB]
Pulsed CW	20.6	17.7	3.0	23.0	9.0	2.4	5.4	6.0
AWGN	22.3	20.0	2.3	23.0	9.0	0.7	3.0	6.8

Band 13

Signal Type	Maximum Gain Downlink [dB]	Maximum Gain Uplink [dB]	Difference Gain [dB]	Absolut Gain Limit [dB]	Difference Gain Limit [dB]	Margin Absolute Gain Downlink [dB]	Margin Absolute Gain Uplink [dB]	Margin Difference Gain [dB]
Pulsed CW	21.0	17.6	3.4	23.0	9.0	2.0	5.4	5.6
AWGN	22.4	22.1	0.4	23.0	9.0	0.6	1.0	8.6

Remark: Values are taken from measurements of test case Maximum Power.

5.3.4 TEST EQUIPMENT USED

- R&S TS8997



5.4 INTERMODULATION

Standard

The test was performed according to: KDB 935210 D03

5.4.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the intermodulation limit § 20.21(e)(8)(i)(F) for wideband consumer signal boosters.

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.4; Intermodulation

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.4.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(F)

Intermodulation Limits. The transmitted intermodulation products of a consumer booster at its uplink and downlink ports shall not exceed the power level of -19 dBm for the supported bands of operation. Compliance with intermodulation limits will use boosters operating at maximum gain and maximum rated output power, with two continuous wave (CW) input signals spaced 600 kHz apart and centered in the pass band of the booster, and with a 3 kHz measurement bandwidth.



5.4.3 TEST PROTOCOL

Ambient temperature:	23 °C
Air Pressure:	1030 hPa
Humidity:	34 %
Band 2, downlink	

Input Power	f1 [MHz]	f2 [MHz]	Combined Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]
AGC	1950.8	1951.4	-21.4	-49.6	-19.0	30.6
	1950.8	1951.4	-20.0	-46.5	-19.0	27.5

Band 4, downlink

Input Power	f1 [MHz]	f2 [MHz]	Combined Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]
AGC	2110.1	2110.7	-22.1	-49.3	-19.0	30.3
	2110.1	2110.7	-20.0	-45.0	-19.0	26.0

Band 5, downlink

Input Power	f1 [MHz]	f2 [MHz]	Combined Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]
AGC	875.5	876.1	-22.1	-55.1	-19.0	36.1
	875.5	876.1	-20.0	-52.9	-19.0	33.9

Band 12, downlink

Input Power	f1 [MHz]	f2 [MHz]	Combined Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]
AGC	745.4	746.0	-20.3	-52.2	-19.0	33.2
	745.4	746.0	-20.0	-48.5	-19.0	29.5

Band 13, downlink

Input Power	f1 [MHz]	f2 [MHz]	Combined Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]
AGC	752.3	752.9	-20.0	-51.7	-19.0	32.7

Band 2, uplink

Input Power	f1	f2	Combined Input	Maximum Inter	Inter modulation	Margin to
	[MHz]	[MHz]	Power [dBm]	modulation [dBm]	Limit [dBm]	Limit [dB]
AGC	1865.6	1866.2	-0.2	-22.5	-19.0	3.5
	1865.6	1866.2	1.8	-22.5	-19.0	3.5
	1865.6	1866.2	3.8	-22.2	-19.0	3.2
	1865.6	1866.2	5.8	-24.5	-19.0	5.5
	1865.6	1866.2	7.8	-22.6	-19.0	3.6
AGC+10dB	1865.6	1866.2	9.8	-22.7	-19.0	3.7

Band 4, uplink

Input Power	f1	f2	Combined Input	Maximum Inter	Inter modulation	Margin to
	[MHz]	[MHz]	Power [dBm]	modulation [dBm]	Limit [dBm]	Limit [dB]
AGC	1719.5	1720.1	-1.0	-22.1	-19.0	3.1
	1719.5	1720.1	1.0	-20.7	-19.0	1.7
	1719.5	1720.1	3.0	-21.1	-19.0	2.1
	1719.5	1720.1	5.0	-21.9	-19.0	2.9
	1719.5	1720.1	7.0	-23.5	-19.0	4.5
AGC+10dB	1719.5	1720.1	9.0	-22.5	-19.0	3.5



Band 5, uplink	3and 5, uplink								
Input Power	f1 [MHz]	f2 [MHz]	Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]			
AGC	834.1	834.7	-0.2	-28.7	-19.0	9.7			
	834.1	834.7	1.8	-26.0	-19.0	7.0			
	834.1	834.7	3.8	-26.0	-19.0	7.0			
	834.1	834.7	5.8	-26.4	-19.0	7.4			
	834.1	834.7	7.8	-27.4	-19.0	8.4			
AGC+10dB	834.1	834.7	9.8	-28.4	-19.0	9.4			

Band 12, uplink

Input Power	f1 [MHz]	f2 [MHz]	Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]
AGC	708.7	709.3	0.0	-22.5	-19.0	3.5
	708.7	709.3	2.0	-22.4	-19.0	3.4
	708.7	709.3	4.0	-22.3	-19.0	3.3
	708.7	709.3	6.0	-22.5	-19.0	3.5
	708.7	709.3	8.0	-22.2	-19.0	3.2
AGC+10dB	708.7	709.3	10.0	-22.2	-19.0	3.2

Band 13, uplink

Input Power	f1 [MHz]	f2 [MHz]	Input Power [dBm]	Maximum Inter modulation [dBm]	Inter modulation Limit [dBm]	Margin to Limit [dB]
AGC	780.1	780.7	-0.5	-27.7	-19.0	8.7
	780.1	780.7	1.5	-27.9	-19.0	8.9
	780.1	780.7	3.5	-27.7	-19.0	8.7
	780.1	780.7	5.5	-27.6	-19.0	8.6
	780.1	780.7	7.5	-27.3	-19.0	8.3
AGC+10dB	780.1	780.7	9.5	-27.3	-19.0	8.3

Remark: Please see next sub-clause for the measurement plot.



5.4.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE") Frequency Band = Band 2, Direction = Downlink, Input Power = AGC (S01_AA01)



Date: 22.JAN.2020 17:55:43

Frequency Band = Band 4, Direction = Downlink, Input Power = AGC (S01_AA01)



Date: 22.JAN.2020 18:11:29



Frequency Band = Band 5, Direction = Downlink, Input Power = AGC (S01_AA01)



Date: 22.JAN.2020 17:47:36





Date: 22.JAN.2020 17:34:03





Frequency Band = Band 13, Direction = Downlink, Input Power = AGC (S01_AA01)

Date: 22.JAN.2020 17:19:22





Frequency Band = Band 2, Direction = Uplink, Input Power = AGC (S01_AA01)

Date: 22.JAN.2020 16:02:33

Frequency Band = Band 4, Direction = Uplink, Input Power = AGC (S01_AB01)

Spectrum	n				
Ref Level	30.00 dBm Offset :	10.70 dB 👄 RBW 3 kH:	2		
Att	35 dB SWT	1.3 ms 👄 VBW 10 kH:	Z Mode A	uto FFT	
SGL Count	300/300				
●1Rm AvgP	wr				
20 d8m			M	1[1]	1.79 dBm 1.719503330 GHa
20 ubiii		4			
10 dBm		M1			
0 dBm					
-10 dBm					
-20 dBm	D1 -19.000 dBm	3			
-30 dBm					
-40 dBm-					8
-50 dBm-		H A	<u> </u>		
-60 dBm	and the second s				
CF 1.7198	GHz	3200	1 pts		Span 5.0 MHz
Marker Pea	nk List				
No	X-value	Y-value	No	X-value	Y-value
1	1.717700 GHz	-40.078 dBm	5	1.720100 GHz	17.152 dBm
2	1.718300 GHz	-32.400 dBm	6	1.720700 GHz	-20.709 dBm
3	1.718900 GHz	-23.131 dBm	7	1.721300 GHz	-32.666 dBm
4	1.719500 GHz	17.162 dBm	8	1.721900 GHz	-40.413 dBm
4	1.719500 GHz	17.162 dBm	8	1.721900 GHz	-40.413 de

Date: 23.JAN.2020 18:04:01





Frequency Band = Band 5, Direction = Uplink, Input Power = AGC (S01_AA01)

Date: 22.JAN.2020 16:38:23



0.00 dBm Offset 35 dB SWT 00/300	10.40 dB 👄 H 1.3 ms 👄 V	RBW 3 kHz VBW 10 kHz	: Mode á		
35 dB SWT 00/300	1.3 ms 👄 🕻	/BW 10 kHz	Mode A		
10/300 r			. mode A	uto FFT	
r					
· · · · · · · · · · · · · · · · · · ·					
			M	1[1]	-60.84 dBm
		4	5		711.500000 MH
		11	I ĭ		
	+				+
	-				+ +
10.200 d8m					
-19.300 ubm	1 ¥			9	
2					2
					T §
	++	<u> </u>	<u> </u>		+
			- Server		2
z		3200	1 pts		Span 5.0 MHz
List					
X-value	Y-va	lue	No	X-value	Y-value
706.900070 MHz	-3:	3.605 dBm	5	709.299990 MHz	17.383 dBm
707.500050 MHz	-2	8.681 dBm	6	709.899970 MHz	-22.178 dBm
708.100030 MHz	-2:	2.155 dBm	7	710.499950 MHz	-31.022 dBm
708.700010 MHz	1	7.466 dBm	8	711.099930 MHz	-34.022 dBm
	z z z z z z z z z z z z z z z z z z z	Z L -19.300 dBm 2 2 List X-value Y-val 706.90070 MHz -3 707.500050 MHz -22 708.700010 MHz 11	z 3200 List X-value Y-value 706.90070 MHz -33.605 dBm 707.500050 MHz -28.661 dBm 708.100030 MHz -22.155 dBm 708.700010 MHz 17.466 dBm	z 32001 pts List X-value Y-value No 706.90070 MHz -22.155 dBm 7 708.100030 MHz -22.155 dBm 7 708.20010 MHz 17.466 dBm 8	z 32001 pts X-value Y-value No X-value 706.90070 MHz -33.605 dBm 5 709.299990 MHz 706.90070 MHz -22.155 dBm 7 709.299990 MHz 708.700010 MHz -22.155 dBm 7 710.499930 MHz 708.700010 MHz 17.466 dBm 8 711.099330 MHz

Date: 22.JAN.2020 16:52:47



Frequency Band = Band 13, Direction = Uplink, Input Power = AGC (S01_AA01)



Date: 22.JAN.2020 17:02:10

5.4.5 TEST EQUIPMENT USED - R&S TS8997



5.5 OUT-OF-BAND EMISSION

Standard

The test was performed according to: KDB 935210 D03

5.5.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the out-of-band emission limit § 20.21(e)(8)(i)(E) for wideband consumer signal boosters. The limits itself come from the applicable rule for each operating as listed in Appendix A of KDB 935210 D03

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.5; Out-of-band emissions

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

5.5.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(E)

Out of Band Emission Limits. Booster out of band emissions (OOBE) shall be at least 6 dB below the FCC's mobile emission limits for the supported bands of operation. Compliance to OOBE limits will utilize high peak-to-average CMRS signal types.

Part 22, Subpart H – Cellular Radiotelephone Service; Band 5 (Cellular)

§ 22 917 – Emission limitations for cellular equipment



(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.

Part 24 E – Personal Communication Services

§ 24.238 – Emission limitations for Broadband PCS equipment; Band 2 (Broadband PCS)

(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P) dB$.

Part 27 – Miscellaneous Wireless Communication Services;

Band 4 (AWS-1) § 27.53 (h) – Emission limits

(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}$ (P) dB.

(2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:

(i) Operations in the 2180-2200 MHz band are subject to the out-of-band emission requirements set forth in §27.1134 for the protection of federal government operations operating in the 2200-2290 MHz band.

(ii) For operations in the 2000-2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least 70 + 10 log₁₀(P) dB. (iii) For operations in the 1915-1920 MHz band, the power of any emission between 1930-1995 MHz shall be attenuated below the transmitter power (P) in watts by at least 70 + 10 log₁₀(P) dB.

(iv) For operations in the 1995-2000 MHz band, the power of any emission between 2005-2020 MHz shall be attenuated below the transmitter power (P) in watts by at least 70 + 10 $\log_{10}(P)$ dB.



Band 12 (Lower 700 MHz) § 27.53 (g) – Emission limits

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed

Band 13 (Upper 700 MHz) § 27.53 (c), (f) – Emission limits

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P) dB$;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 76 + 10 log (P) dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.



5.5.3 TEST PROTOCOL

Ambient temperature:	23 – 26 °C
Air Pressure:	997 – 1017 hPa
Humidity:	33 %
Band 2. downlink	

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out- of-band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	1989.80	-20.0	-33.4	-19.0	14.4
LTE	upper	1987.50	-23.0	-45.8	-19.0	26.8
CDMA	upper	1988.75	-23.0	-53.4	-19.0	34.4
GSM	lower	1930.20	-20.0	-34.3	-19.0	15.3
LTE	lower	1932.50	-23.0	-45.4	-19.0	26.4
CDMA	lower	1931.25	-23.0	-55.1	-19.0	36.1

Band 4, downlink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out- of-band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	2154.80	-20.0	-33.1	-19.0	14.1
LTE	upper	2152.50	-23.9	-45.9	-19.0	26.9
CDMA	upper	2153.75	-23.9	-51.7	-19.0	32.7
GSM	lower	2110.20	-20.0	-32.8	-19.0	13.8
LTE	lower	2112.50	-23.9	-45.6	-19.0	26.6
CDMA	lower	2111.25	-23.9	-50.8	-19.0	31.8

Band 5, downlink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out- of-band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	893.80	-20.0	-31.6	-19.0	12.6
LTE	upper	891.50	-23.4	-45.9	-19.0	26.9
CDMA	upper	892.75	-23.4	-56.3	-19.0	37.3
GSM	lower	869.20	-20.0	-32.1	-19.0	13.1
LTE	lower	871.50	-23.4	-45.3	-19.0	26.3
CDMA	lower	870.25	-23.4	-55.8	-19.0	36.8

Band 12, downlink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out- of-band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	745.80	-20.0	-31.9	-19.0	12.9
LTE	upper	743.50	-21.7	-43.5	-19.0	24.5
CDMA	upper	744.75	-21.7	-56.1	-19.0	37.1
GSM	lower	728.20	-20.0	-32.0	-19.0	13.0
LTE	lower	730.50	-21.7	-43.7	-19.0	24.7
CDMA	lower	729.25	-21.7	-56.8	-19.0	37.8

Band 13, downlink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out- of-band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	755.80	-20.0	-31.9	-19.0	12.9
LTE	upper	753.50	-22.2	-44.0	-19.0	25.0
CDMA	upper	754.75	-22.2	-56.1	-19.0	37.1
GSM	lower	746.20	-20.0	-32.3	-19.0	13.3
LTE	lower	748.50	-22.2	-43.7	-19.0	24.7
CDMA	lower	747.25	-22.2	-56.0	-19.0	37.0



Band 2, uplink						
Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out-of- band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	1909.80	2.6	-34.4	-19.0	15.4
LTE	upper	1907.50	-1.9	-23.4	-19.0	4.4
CDMA	upper	1908.75	-1.9	-23.9	-19.0	4.9
GSM	lower	1850.20	2.6	-34.9	-19.0	15.9
LTE	lower	1852.50	-1.9	-22.4	-19.0	3.4
CDMA	lower	1851.25	-1.9	-28.1	-19.0	9.1

Band 4, uplink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out-of- band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	1754.80	0.9	-33.5	-19.0	14.5
LTE	upper	1752.50	-2.1	-24.0	-19.0	5.0
CDMA	upper	1753.75	-2.1	-30.1	-19.0	11.1
GSM	lower	1710.20	0.9	-34.6	-19.0	15.6
LTE	lower	1712.50	-2.1	-23.9	-19.0	4.9
CDMA	lower	1711.25	-2.1	-28.8	-19.0	9.8

Band 5, uplink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out-of- band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	848.80	3.6	-32.7	-19.0	13.7
LTE	upper	846.50	-1.3	-20.8	-19.0	1.8
CDMA	upper	847.75	-1.3	-24.5	-19.0	5.5
GSM	lower	824.20	3.6	-33.3	-19.0	14.3
LTE	lower	826.50	-1.3	-21.9	-19.0	2.9
CDMA	lower	825.25	-1.3	-26.3	-19.0	7.3

Band 12, uplink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out-of- band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	715.80	4.1	-29.7	-19.0	10.7
LTE	upper	713.50	-1.8	-26.0	-19.0	7.0
CDMA	upper	714.75	-1.8	-27.7	-19.0	8.7
GSM	lower	698.20	4.1	-29.6	-19.0	10.6
LTE	lower	700.50	-1.8	-23.9	-19.0	4.9
CDMA	lower	699.25	-1.8	-27.8	-19.0	8.8

Band 13, uplink

Signal Type	Band Edge	Signal Frequency [MHz]	AGC Start Input Power [dBm]	Maximum Out-of- band Power [dBm]	Limit Out-of- band Power [dBm]	Margin to Limit [dB]
GSM	upper	786.80	4.1	-30.2	-19.0	11.2
LTE	upper	784.50	-2.4	-27.9	-19.0	8.9
CDMA	upper	785.75	-2.4	-32.5	-19.0	13.5
GSM	lower	777.20	4.1	-29.7	-19.0	10.7
LTE	lower	779.50	-2.4	-29.4	-19.0	10.4
CDMA	lower	778.25	-2.4	-32.6	-19.0	13.6

Remark: Please see next sub-clause for the measurement plot.



5.5.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE") Frequency Band = Band 2, Direction = Downlink, Signal Type = GSM, Band Edge = upper (S01_AA01)



Date: 27.JAN.2020 20:36:27

Frequency Band = Band 2, Direction = Downlink, Signal Type = LTE, Band Edge = upper (S01_AA01)

Spectrum	ר								Ē
Ref Level 25.0 Att SGL Count 2000	0 dBm (30 dB ()/2000	Offset 10 SWT 1).70 dB 👄 F l8.9 μs 👄 Ν	RBW 100 kH /BW 300 kH	z z Mode /	Auto FFT			
●1Rm AvgPwr									
20 dBm					M	1[1]		1.990	·45.81 dBm)00150 GHz
10 dBm									
0 dBm									
-10 dBm									
-20 dBm D1 -	19.000 dB	m					_		
-30 dBm									
140 dBm							_		
-50 dBm									
-60 dBm							<u> </u>	+	<u> </u>
-70 dBm							_		
Start 1.99 GHz				1001	pts			Stop	1.993 GHz
Marker Type Ref Tr M1	rc	X-value 1.990001	15 GHz	Y-value -45.81 dB	Funct	tion	Fur	nction Result	t
						eady			27.01.2020

Date: 27.JAN.2020 20:40:15



Frequency Band = Band 2, Direction = Downlink, Signal Type = CDMA, Band Edge = upper (S01_AA01)



Date: 27.JAN.2020 20:38:26

Frequency Band = Band 2, Direction = Downlink, Signal Type = GSM, Band Edge = lower (S01_AA01)

Spect	rum										
Ref Le ^r Att SGL Co	vel 2 Junt 2	5.00 dBm 30 dB 000/2000	Offset SWT	10.70 dB (18.9 μs (RBW VBW	100 kHz 300 kHz	Mode	Auto FFT	r		
●1Rm A	vgPwi	r									
20 dBm-	-				-		N	11[1]		1.929	34.30 dBm 99850 GHz
10 dBm-	+				_						
0 dBm—	+										
-10 dBm	+				+						
-20 dBm		1 -19.000	dBm====	-	-						
-30 dBm	`†			1	+						M
-40 dBm											
-60 dBm											
-70 dBm	-				_						
Start 1	.927	GHz				1001	ots			Stop	1.93 GHz
Marker											
Type M1	Ref	Trc 1	X-val 1.9299	ue 9985 GHz	Y-1	value 4.30 dBn	Fund	tion	Fu	nction Result	
)[]						Ready			27.01.2020

Date: 27.JAN.2020 20:34:21



Frequency Band = Band 2, Direction = Downlink, Signal Type = LTE, Band Edge = lower (S01_AA01)



Date: 27.JAN.2020 20:29:44

Frequency Band = Band 2, Direction = Downlink, Signal Type = CDMA, Band Edge = Iower (S01_AA01)

spectrum					
Ref Level 25.0 Att SGL Count 2000	0 dBm Of 30 dB SV 0/2000	fset 10.70 dB ⊖ VT 18.9 µs ⊖	RBW 100 kHz VBW 300 kHz	Mode Auto FFT	x
●1Rm AvgPwr					
20 dBm				M1[1]	-55.12 dBm 1.92999850 GHz
10 dBm			+		
0 dBm					
-10 dBm					
-20 dBm D1 -	-19.000 dBm				
-30 dBm			+		
-40 dBm					
-50 dBm					
-69-d8m			++		
-70 dBm					
Start 1.927 GH	z		1001 pt	s	Stop 1.93 GHz
Marker					
Type Ref T	rc >	(-value	-55,12 dBm	Function	Function Result
	-, -,			Ready	27.01.2020

Date: 27.JAN.2020 20:32:24



Frequency Band = Band 4, Direction = Downlink, Signal Type = GSM, Band Edge = upper (S01_AA01)



Date: 27.JAN.2020 20:47:54

Frequency Band = Band 4, Direction = Downlink, Signal Type = LTE, Band Edge = upper (S01_AA01)

Spectrum	\neg						
Ref Level 2 Att SGL Count 2	25.00 dBm 30 dB 2000/2000	Offset SWT	10.80 dB 👄 18.9 μs 👄	RBW 100 kHz VBW 300 kHz	Mode Auto FF1	r	
●1Rm AvgPw	r						
20 dBm					M1[1]		-45.93 dBm 2.15500000 GHz
10 dBm				++			
0 dBm							
-10 dBm				++			
-20 dBm - 0	01 -19.000	dBm		+			
-30 dBm			+				
-40 dBm				+ +			
-50-dBm				+			
-60 dBm							
Start 2.155	GHz			1001	pts		Stop 2.158 GHz
Marker							-
Type Ref	Trc 1	X-valu 2.	ie 155 GHz	Y-value -45.93 dBn	Function	Fun	ction Result
	J				Ready		27.01.2020

Date: 27.JAN.2020 20:43:45



Frequency Band = Band 4, Direction = Downlink, Signal Type = CDMA, Band Edge = upper (S01_AA01)



Date: 27.JAN.2020 20:46:14

Frequency Band = Band 4, Direction = Downlink, Signal Type = GSM, Band Edge = lower (S01_AA01)

Spectrum							
Ref Level 2 Att SGL Count 2	5.00 dBm 30 dB 000/2000	Offset 1 SWT	l0.80 dB 👄 18.9 μs 👄	RBW 100 kHz VBW 300 kHz	Mode Auto FF	r	\
●1Rm AvgPwi	r						
20 dBm					M1[1]		-32.76 dBm 2.10999850 GHz
10 dBm							
0 dBm						_	
-10 dBm							
-20 dBm 0	1 -19.000	dBm					
-30 dBm				++			
-40 dBm							
-50 dBm				+ +			
-60 dBm				+ +		_	
-70 dBm				+ +			
Start 2.107	GHz			1001	pts		Stop 2.11 GHz
Marker							
Type Ref	Trc 1	2.1099	985 GHz	<u>Y-value</u> -32,76 dBn	Function	Fun	ction Result
	Υ				Ready		27.01.2020

Date: 27.JAN.2020 20:49:58



Frequency Band = Band 4, Direction = Downlink, Signal Type = LTE, Band Edge = lower (S01_AA01)



Date: 27.JAN.2020 20:53:21

Frequency Band = Band 4, Direction = Downlink, Signal Type = CDMA, Band Edge = lower (S01_AA01)

Spectrum	٦						
Ref Level Att	25.00 dBm 30 dB	Offset 1 SWT	0.80 dB 👄 18.9 µs 👄	RBW 100 kHz VBW 300 kHz	Mode Auto F	FT	
SGL Count	2000/2000						
20 dBm-					M1[1]		-50.76 dBm 2.10999850 GHz
10 dBm				++			
0 dBm							
-10 dBm	D1 10 000	40.00					
-20 dBm	DI -19.000	dem					
-40 dBm							
-50 dBm							M
60 dBm •							
-70 dBm							
Start 2.10	7 GHz			1001	pts		Stop 2.11 GHz
Marker Type Re M1	f Trc	X-value 2.10999	e 85 GHz	Y-value -50,76 dBm	Function	Fun	ction Result
					Ready		27.01.2020

Date: 27.JAN.2020 20:51:40



Frequency Band = Band 5, Direction = Downlink, Signal Type = GSM, Band Edge = upper (S01_AA01)



Date: 27.JAN.2020 20:20:30



Spectrum									₩	
Ref Level 2 Att SGL Count 2	5.00 dBm 30 dB 000/2000	Offset 10 SWT).40 dB 👄 F 18.7 μs 👄 🕻	(BW 100 kHz /BW 300 kHz	Mode Aut	O FFT				
●1Rm AvgPwr	r									
20 dBm					M1[1	u ,		-45.85 dBm 894.000150 MHz		
10 dBm										
0 dBm										
-10 dBm										
-20 dBm 0	1 -19.000	dBm								
-30 dBm										
1 ⁴⁰ dBm										
-50 dBm										
-50 dBm										
Start 894.0	MHz			1001	pts			Stop 8	94.3 MHz	
Marker										
Type Ref M1	Trc 1	X-value 894.00015 MHz		Y-value -45.85 dBm	Function	n	Function Result			
][]				Rea	dy 🚺			7.01.2020	

Date: 27.JAN.2020 20:24:51


Frequency Band = Band 5, Direction = Downlink, Signal Type = CDMA, Band Edge = upper (S01_AA01)



Date: 27.JAN.2020 20:22:45



Spectrum							E ↓
Ref Level 2 Att SGL Count 2	25.00 dBm 30 dB 2000/2000	Offset SWT	10.40 dB 👄 18.7 μs 👄	RBW 100 kHz VBW 300 kHz	Mode Auto FFT		
●1Rm AvgPw	r						
20 dBm					M1[1]		-32.06 dBn 868.999850 MH
10 dBm				++			
0 dBm							
-10 dBm				+ +			
-20 dBm 0	1 -19.000	dBm					
-30 dBm				+ +			
-40 dBm							
-50 dBm							
-70 dBm							
Start 868.7	MHz			1001	pts		Stop 869.0 MHz
Marker							
Type Ref	Trc X-value 1 868.99985 MHz		Y-value -32.06 dBm	Function	Fun	Function Result	
)[Ready		27.01.2020

Date: 27.JAN.2020 20:18:18