



RF Exposure Assessment

**Report Reference: 2024-0349-MPE-TR-24-0196-V02 and
2024-0349-MPE-TR-24-0197-V02**

on

**Commscope Inc.
ERA CAP H2 34T/37T F-AC-F1
Medium Power Carrier Access Point**

FCC ID: XS5-H23437

according to:

OET Bulletin 65 Edition 97-01: August 1997

Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency
Electromagnetic Fields

			Signature:
Date of issue:	21.02.2025	Technical Reviewer:	
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The test results relate only to the tested item. The sample has been provided by the client.

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1 Summary

The RF-exposure assessment according to OET Bulletin 65 Edition 97-01: August 1997 shows, that the worst-case RF exposure values of the assessed radio technologies and bands are below the Limits for General Population/Uncontrolled Exposure:

- Table 1 (B) of OET Bulletin 65
- Table 1 (II) to § 1.1310(E)(1) of 47 CFR Ch. I (10-1-21 Edition).

COMMENTS:

- Assessment limited to supported North American frequency bands
- Prediction distance R = 356 cm

2 Administrative Data

2.1 Testing Laboratory

Company Name: Bureau Veritas Consumer Products Services
Germany GmbH
Address: Thurn-und-Taxis-Straße 18
90411 Nürnberg
Germany

2.2 Applicant Data

Company Name: CommScope
Andrew Wireless Systems GmbH
Address: Industriering 10
86675 Buchdorf
Germany
Contact Person: Mr. Jiri Cecka

2.3 Manufacturer Data

Company Name: CommScope
Andrew Wireless Systems GmbH
Address: Industriering 10
86675 Buchdorf
Germany
Contact Person: Mr. Jiri Cecka

2.4 Versions Management

V 01.00 Initial release.
V 02.00 Correction of redactional changes.

3 Test object Data

Declared EUT data by the supplier	
Kind of Device product description	The ERA product is a digital distribution system with focus on flexibility, easy installing, commissioning, and reliable operation. The system is designed in a way to satisfy all of today's needs as well as unknown future standards and requirements. The ERA system comprises of two main parts. A base station interface (Master or Head End Unit) that takes RF signals as well as digital signals from the base stations, conditions the signals for the given application and assigns them to the coverage zones. The coverage side is built of one or more Remote Units. The "Remote Unit" (hereinafter referred to as "RU") is connected via a 10GBASE SFP+ fiber optical link to the ERA Master Unit. This link gives a total RF bandwidth of up to 320 MHz. For higher bandwidth requirements up to 640 MHz, a secondary 10G link can be used in parallel. RF signals between Master Unit and Remote Units are sent digitally over the fiber optical link. At the receiver side these signals are converted back to analog and amplified up to appropriate transmit levels.
Product name	High Power Carrier Access Point
Type	ERA CAP H2 34T/37T F-AC-F1
Hardware version	7857017-0001 Rev: 00
Software version	1.10.0.180007
Integrated transmitter	High Power Carrier Access Point
supported Radio technologies	TDD 34 and TDD 37; 5G n77
Antenna	None.
Supplied document(s)	-

4 Assessment

4.1 Assessment method and subject of assessment

Calculation of power density and comparison with reference levels for general public exposure.
Applicability area and limitations: Power density can be calculated in far field region.

Applied Standards:

- IEEE Std C95.3-2021, D.4.2 Antennas – Main beam on-axis, general method for determining the power density at points in the radiating near-field and far-field antenna regions.
- IEEE Std C95.1-2019, D.2 Multifrequency exposures (exposures to multiple sources)

Specific information:

- Values used for calculation are based on supplied documents. Hereby for the calculation the nominal output power values are considered.
- Output power values are based on the supplied test reports and technical data sheet + tolerances.
- Antenna gain values are taken from the supplied data sheets.

Worst case considerations:

- Main beams of the antennas are directed to the same point in the prediction distance.
- Cable loss of internal antenna cables set to 0.
- Duty factor GSM/GPRS/EDGE = 0.5 (4 of 8 active time slots),
- Duty factor Bluetooth low energy = 0.5 (1 of 2 active time slots),
- Duty factor WLAN 2.4 GHz = 1,
- Duty factor UMTS = 1,
- Duty factor LTE = 1.
- The radio modules can transmit independently from each other:
(1 cellular band + WLAN 2,4 GHz + Bluetooth low energy).

Selected bands for multi frequency exposure calculations:

worst case of each cellular technology + WLAN 2.4 GHz + Bluetooth low energy
and WLAN 2,4 GHz + Bluetooth low energy.

4.2 Exposure limits

Extract of

- Table 1 (B) of OET Bulletin 65
- Table 1 (II) to § 1.1310(E)(1) of 47 CFR Ch. I (10–1–21 Edition).

<i>Frequency range</i>	<i>Power density</i>	<i>Power density</i>
<i>MHz</i>	<i>W/m²</i>	<i>mW/cm²</i>
300 – 1500	f/150	f/1500
1500 - 100000	10	1

Note:

f as indicated in the frequency range column

4.3 Formulas used for calculation

4.3.1 Single-frequency exposures (exposures to one source)

Table D.2—Determining power density on antenna main beam axis:

$$S_{FF} = \frac{G_i P_{in}}{4\pi d^2}$$

In this report is the power density S_i at frequency i calculated in mW/cm^2 .

G_i is the (isotropic) far-field antenna gain (power ratio) at frequency i .

P_{in} is the power into the antenna in mW => P_{mW} .

d is the distance to the antenna in cm.

4.3.2 Multi-frequency exposures (exposures to multiple sources)

Summation based on IEEE Std C95.1-2019, D.2

$$\sum_{i=1}^n \frac{exposure_i}{ERL_i} < 1$$

In this report is the power density calculated. In the tables below is “*exposure*” = S_i = power density at frequency i .

ERL_i is the corresponding exposure reference level at frequency i .

IEEE Std C95.1-2019:

exposure reference level (ERL): The maximum exposure level relative to ambient electric and/or magnetic field strength or power density, induced and/or contact current, or contact voltage.

NOTE 1— ERLs provide an adequate margin of safety against established adverse health effects.

NOTE 6— In some documents, ERLs are called reference levels, derived limits, permissible exposure limits, maximum permissible exposure values, action levels, or investigation levels.

4.4 Calculation

4.4.1 Calculation of single-frequency exposures

Single-frequency exposures (exposures to one source)

Limit: FCC OET Bulletin 65 Edition 97-01, Table 1 (B) Limits for General Population/Uncontrolled Exposure

Prediction distance d in cm =>	356	TX frequ. band	Prediction frequ.	Duty factor (lin.)	Max power (log.)	Average (temporal) power (log.)	Average (temporal) power (lin.)	Gain (log.)	Gain (lin.)	Power density at distance d	Power density limit at frequency f _i	Ratio to exposure reference level	Sum of S _i / ERL _i	Minimum distance to be ensured
		f _{Band}	f _i	-	P _{dBm}	P _{dBm}	P _{mW}	g _{dB}	G _i	S _i	ERL _i	S _i / ERL _i	-	-
Radio technology	Repeater configuration	MHz	MHz	-	dBm	dBm	mW	dB	-	mW/cm ²	mW/cm ²	-	-	cm
5G n77	34T ANT 1 1 carrier	3450 - 3550	3450	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250	0,250	177,990
5G n77	34T ANT 2 1 carrier	3450 - 3550	3450	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250	0,250	177,990
5G n77	37T ANT 1 1 carrier	3700 - 3980	3840	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250	0,250	177,990
5G n77	37T ANT 2 1 carrier	3700 - 3980	3840	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250	0,250	177,990

Bold marked = worst case band of the radio technology

Information: 10 W m⁻² = 1 mW cm⁻²

4.4.2 Calculation of multi-frequency exposures

Multi-frequency exposures (exposures to multiple sources), Summation based on IEEE Std C95.1-2005

Limit: FCC OET Bulletin 65 Edition 97-01, Table 1 (B) Limits for General Population/Uncontrolled Exposure

Prediction distance d in cm =>	356	TX frequ. band	Prediction frequ.	Duty factor (lin.)	0,00	Average (temporal) power (log.)	Average (temporal) power (lin.)	Gain (log.)	Gain (lin.)	Power density at distance d	Power density limit at frequency f_i	Ratio to exposure reference level	Sum of S_i / ERL_i	Minimum distance to be ensured
		f_{Band}	f_i	-	P_{dBm}	P_{dBm}	P_{mW}	g_{dBi}	G_i	S_i	ERL_i	S_i / ERL_i	-	-
Radio technology	Repeater configuration	MHz	MHz	-	0,00	dBm	mW	dBi	-	mW/cm ²	mW/cm ²	-	-	cm
5G MIMO: 2 bands simultaneously on 2 antenna ports	34T ANT 1	3450 - 3550	3500	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250	1,000	355,980
	34T ANT 2	3450 - 3550	3500	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250		
	37T ANT 1	3700 - 3980	3840	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250		
	37T ANT 2	3700 - 3980	3840	1	43,0	43,00	19952,62	13,00	19,95	0,250	1,000	0,250		

Information: $10 \text{ W m}^{-2} = 1 \text{ mW cm}^{-2}$

END OF REPORT