

RF EXPOSURE EVALUATION REPORT

ACCORDING TO: FCC 47 CFR part 1, §1.1307, §1.1310

FOR:

Siklu Communication Ltd.

**Terminal unit of point-to-multipoint high
BW system operating in 57-66 GHz**

Model: MH-T260-CNN-N-MWB

FCC ID: 2ACYESK-MH60TG-A4

IC:12353A-MH60TGA4

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Table of contents

1	Applicant information	3
2	Equipment under test attributes	3
3	Manufacturer information	3
4	Test details	3
5	Tests summary	4
6	EUT description	5
6.1	General information	5
6.2	Transmitter characteristics	5
7	RF Exposure Evaluation	6
7.1	Maximum Permissible Exposure	6
7.2	MPE calculation	6
7.3	Test results of RF exposure evaluation	7
8	APPENDIX A Test laboratory description	8
9	APPENDIX B Specification references	8
10	APPENDIX C Abbreviations and acronyms	9

1 Applicant information

Client name: Siklu Communication Ltd.
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E-mail: baruch@siklu.com
Contact name: Mr. Baruch Schwarz

2 Equipment under test attributes

Product name: Terminal unit of point-to-multipoint high BW system operating in 57-66 GHz
Product type: Transceiver
Model(s): MH-T260-CNN-N-MWB
Brand name: MultiHaul™
Serial number: FB06444487
Hardware version: A1
Software release: 1.1.1
Receipt date: 24-May-21

3 Manufacturer information

Manufacturer name: Siklu Communication Ltd.
Address: 43 Hasivim street, Petach-Tikva 49517, Israel
Telephone: +972 3921 4015
Fax: +972 3921 4162
E-Mail: baruch@siklu.com
Contact name: Mr. Baruch Schwarz

4 Test details

Project ID: 42910
Location: Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started: 24-May-21
Test completed: 07-Jun-21
Test specification(s): FCC 47 CFR part 1, §1.1307, §1.1310

5 Tests summary

Test	Status
FCC Section 1.1310, RF exposure evaluation	Pass

This report is based on the test report SIKRAD_FCC.42910 issued by Hermon Laboratories.

The test results relate only to the items tested.

	Name and Title	Date	Signature
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	December 13, 2021	
Approved by:	Mr. S. Samokha, Technical Manager, EMC and Radio	December 20, 2021	

6 EUT description

6.1 General information

The EUT is the Terminal Unit, model MH-T260-CNN-N-MWB. The unit operates in 57-66 GHz regulated V-band. It communicates to the MH-N366-CCP-PoE-MWB TG Distribution node using the TG protocol, acting as an end point in a fully meshed MultiHahul TG topology.

6.2 Transmitter characteristics

Type of equipment					
V	Stand-alone (Equipment with or without its own control provisions)				
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)				
	Plug-in card (Equipment intended for a variety of host systems)				
Intended use		Condition of use			
V	fixed	Always at a distance more than 2 m from all people			
	mobile	Always at a distance more than 20 cm from all people			
	portable	May operate at a distance closer than 20 cm to human body			
Assigned frequency range		57.0 GHz – 66.0 GHz			
Operating frequency range		58320 -64800 MHz			
Test frequencies		58320 MHz, 62640 MHz, 64800 MHz			
Maximum rated output power		EIRP		41.30 dBm	
Is transmitter output power variable?		V No			
		Yes	continuous variable		
			stepped variable with stepsize		dB
			minimum RF power		dBm
			maximum RF power		
Antenna connection					
unique coupling	standard connector	V	Integral	with temporary RF connector	
				without temporary RF connector	
Antenna/s technical characteristics					
Type	Manufacturer	Model number		Gain	
Patch antenna array	Siklu	PCB267		24	
Transmitter 99% power bandwidth, MHz		Transmitter aggregate data rate/s, Mbps		Type of modulation	
2135.1		385		16QAM	
2082.2		4620		16QAM	
Type of multiplexing		TDD			
Transmitter power source					
		Nominal rated voltage	Battery type		
V	DC	Nominal rated voltage	48 V via POE		
		Voltage range			
	AC mains	Nominal rated voltage	120 V	Frequency	60 Hz
Common power source for transmitter and receiver			V	yes	no

7 RF Exposure Evaluation

7.1 Maximum Permissible Exposure

7.1.1 General

According to FCC CFR 47 §1.1310 the criteria listed in the Table 7.1.1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in CFR 47 §1.1307 (b).

Table 7.1.1 Limits for Maximum Permissible Exposure (MPE)

Frequency range, MHz	Electric field strength, V/m	Magnetic field strength, A/m	Power density, mW/cm ²	Average time, minutes
(A) Limits for Occupational / Control Exposures				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1500			f/300	<6
1500-100000			5.0	<6
(B) Limits for General Population / Uncontrolled Exposures				
0.3-3.0	614	1.63	*(100)	<30
3.0-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1500			f/1500	<30
1500-100000			1.0	<30

f - frequency in MHz; * - Plane-wave equivalent power density

7.2 MPE calculation

The calculation was made in accordance with ANSI C95.1 standard and FCC OET Bulletin 65 for fixed device. The applicable exposure environment is General Population/Uncontrolled.

According to Friis transmission formula $P_d = P_T / 4\pi r^2$, where

P_d - power density in mW/cm²

$P_T = P_{out} \times G$ - highest Effective Isotropic Radiated Power (EIRP) in mW

P_{out} - highest output power to antenna in mW

G - gain of antenna in linear scale

r - distance to the centre of radiation of the antenna

7.3 Test results of RF exposure evaluation

The calculation was done to confirm required safe distance for fixed device.

Limit for power density for general population/uncontrolled exposure is $P_d = 1 \text{ mW/cm}^2$
for 1500 -100000 MHz frequency range

The minimum safe distance “r” for general population/uncontrolled exposure, where RF exposure does not exceed FCC permissible limit, is

$$r = \sqrt{PT / (Px4\pi)} = \sqrt{13489 / 12.56} = 32.77 \text{ cm} \approx 33 \text{ cm}.$$

The minimum safe distance “r” for occupational exposure, where RF exposure does not exceed FCC permissible limit, is

$$r = \sqrt{PT / (Px4\pi)} = \sqrt{13489 / 5 \times 12.56} = 15 \text{ cm}$$

The information note about safe distance shall be provided in the User Manual.

8 APPENDIX A Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, Radio, Safety, Environmental and Telecommunication testing facility.

Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for relevant parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; Recognized by Innovation, Science and Economic Development Canada for wireless and terminal testing (ISED), ISED #2186A, CAB identifier is IL1001; Certified by VCCI, Japan (the registration numbers for OATS are R-10808 for RE measurements below 1 GHz, G-20112 for RE measurements above 1 GHz, R-11082 for anechoic chamber for RE measurements below 1 GHz, G-10869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-11606 for conducted emissions at telecommunication ports).

The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

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9 APPENDIX B Specification references

FCC 47CFR part 1: 2020	Practice and Procedure; Subpart I—Procedures Implementing the National Environmental Policy Act of 1969
ANSI C95.1™-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
IEEE Std C95.1™-2019	IEEE Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz
OET Bulletin 65:1997	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

10 APPENDIX C Abbreviations and acronyms

cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
EIRP	equivalent isotropically radiated power
EUT	equipment under test
F	frequency
G	antenna gain
GHz	gigahertz
HL	Hermon laboratories
m	meter
MHz	megahertz
min	minute
mW	milliwatt
NA	not applicable
RF	radio frequency
Rx	receive
s	second
Tx	transmit
W	watt

END OF REPORT