RF EXPOSURE EVALUATION FOR MC11-OPS

Construction tools PC AB

1 APPLICANT DETAILS

Table 1 Applicant Details	
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2 DETAILS OF DEVICE

Table 2 Details of device	
Description of device:	Bluetooth Remote control with UWB distance sensor
Manufacturer:	Åkerströms
Model Name:	Bluetooth remote control with UWB Distance sensor: MC11-OPS
#FCC ID (or other ID Type):	Remote control with UWB Distance sensor: 2AK36MC11-OPS Bluetooth module: FCC ID: PVH0946
#Other Type ID:#	UWB Distance sensor radio: DWM100 Bluetooth Remote control radio: CB-0946
DUT Status	Remote control with UWB Distance sensor: FCC pending Bluetooth Remote control: FCC approved

3 EVALUATION

3.1 Summary

This device, MC11-OPS a UWB radio is located within a handheld Bluetooth remote control called MC11. MC11-OPS unit is at its closets point12cm from the user's body.

MC11-OPS is within maximum applicable output power for both FCC and IC limits and no RF exposure evaluation is required.

3.2 Applicable Standards

FCC KDB 447498 D01 General RF Exposure Guidance v06

RSS-102 Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus, Issue 5

3.3 Physical placement of antenna in relation to user

Figure 1: MDS11 remote control.

Document ID	Title	Version	Date
SCDOC-74-6	RF exposure evaluation for MC11-OPS	V5.0	2019-01-24
Author	**Document Responsible**	**Approved By**	
Henrik Sihm	Construction tools PC AB		

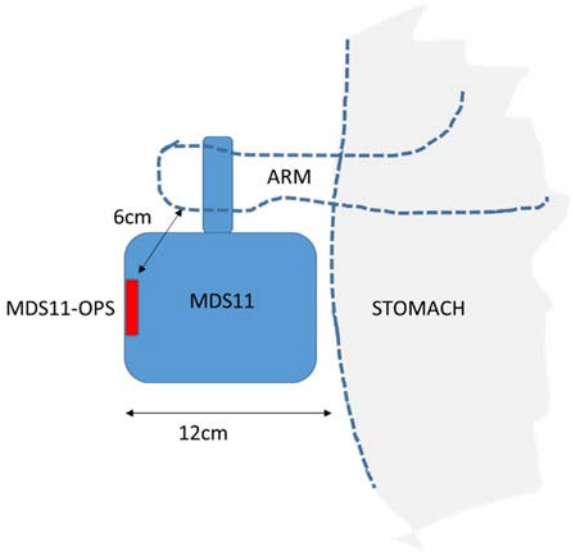

Figure 2: Side view of normal usage of MDS11 with MDS11-OPS marked.

Minimum separation distance to any body part is 6cm.

4 DETAILED MPE CALCULATIONS

4.1 FCC rule

According to FCC 47 CFR 2.1093 (b) the MC11-OPS which is to be used within 20 centimetres of the body of the user and therefore defined as a PORTABLE DEVICE.

GENERAL POPULATION EXPOSURE limits is to be applied since when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. FCC 47 CFR 2.1093 (2)(i).

MPE limits defined in 47 CFR 1.1310 (e) table 1 shall be used in all cases to evaluate the environmental impact of human exposure to RF radiation.

4.2 IC rule

According to RSS-102 (1.1) MC11-OPS is Body-worn (or body-mount) radio is a wireless transceiver that is normally operated while maintained close to the body by means of a belt clip and used by general public (uncontrolled environment) and general public SAR and RF field strength limits apply.

RSS-102 (3) Devices operating above 6 GHz regardless of the separation distance shall undergo an RF exposure evaluation.

4.3 Evaluation

According to Table 3 below, MC11-OPS is below maximum applicable output power for both FCC and IC limits and no exposure evaluation is required.

				Power Density		FCC limit	IC limit
Center frequency (GHz)	MPE distance (cm)	DUT output power (dBm EIRP)	DUT antenna gain (dBi)	(mW/cm^2	(W/m^2)	(mW/cm^2)	(W/m^2)
	#1	#2	#3	#4		#5	#6
6.489	6	-8	2.6	0.00064	0.00638	1	10
#1	Reference CFR 2.1093(b): For purpose of this section , a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 12cm of the body of the user.						
#3	Data from antenna manufacture						
#4	PD = 10^((#2+#3)/10)/(4*Pi*#1^2)						
#5	Reference CFR 1.1310, table 1 (B) Limits for General Population/Uncontrolled Exposure						
#6	Reference IC RSS-102 Section 4 table 4 RF Field Strength Limits for Devices Used by the General Public (Uncontrolled Environment)						

Table 3: exposure calculation for RF above 6GHz.

5 ENDMENT HISTORY

Version	Date	Author(s)/ Function	Reviewed by	Approved by	Nature of Changes
Initial Draft					
1.0	29 Nov 2016	Created			First Release
2.0	19 Nov 2018	Henrik Sihm			Name change
3.0	17 Dec 2018	Henrik Sihm			RSS-102 added
4.0	26 Dec 2018	Henrik Sihm			Document updated
5.0	24 Jan 2019	Henrik Sihm			Document updated