

Maximum Permissible Exposure

1. Introduction

According to CFR 15 §1.1307 (b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

The average output power under normal worst-case operation of the maximum output + antenna configuration (when operating duty cycle is applied) is $2.812 \text{ mW} < 60/f(\text{GHz}) \text{ mW}$ or 24.19 mW for $d < 2.5 \text{ cm}$ (general population category). For the product, the user is instructed in the product manual to maintain no less than a 20 cm separation distance from this portable device. Worst case conducted output power with the product is measured to be 27.48 mW without duty cycle applied. Per the calculations below, SAR measurements are not necessary.

Health Hazard:

The following table summarizes the power density at a distance of 20 cm as calculated from FCC OET Bulletin 65.

2. Description of EUT

Equipment	SilverCare Health Care System
Applicant Name	SilverPlus, Inc.
Applicant Address	2F.-4, No.15, Ln. 360, Sec. 1, Neihu Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)
Manufacturer Name	Solidyear Co., Ltd.
Manufacturer Address	2F.-1, No.94, Baozhong Rd., Xindian City, Taipei County 231, Taiwan (R.O.C.)
Model No	HC1XXYY(X=0~9 ; Y=0~9,A~Z)
FCC ID	X4LHC100WW

3. RF Exposure Friis Formula

Friis transmission formula : $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm^2

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

$\pi = 3.1416$

R = distance between observation point and center of the radiator in cm (20cm)

Max RF Power = P_{out} Conduct + Antenna Gain

4. RF Exposure Limit :

According to FCC 1. 1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

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				
300-1500			F/300	6
1500-100,000			5	6
(B) Limits For General Population / Uncontrolled Exposure				
300-1500			F/1500	30
1500-100,000			1	30

Test Result :

Frequency (MHz)	Max RF Power (mW)	TX Antenna Gain (dBi)	Testing Result (mW/cm^2)	MPE Limit (mW/cm^2)
2404	27.48	4.4	0.02405	1
2441	25.70	4.4	0.02250	1
2479	26.49	4.4	0.02318	1

5. No SAR Evaluation Required if power is below the following threshold :

Frequency Range (GHz)		Center Frequency (GHz)	60/f Limitation (mW)
Frequency (LOW)	Frequency (HI)		
2.404	2.479	2.441	24.19

Test Result :Maximum measured transmitter power:

Pout Conduct (dBm)	Maximum Antenna Gain (dBi)	Duty Cycle (dB)	Pout EIRP (dBm)	Pout EIRP (mW)
9.99	4.4	-9.9	4.49	2.812

Threshold for no SAR evaluation is 24.19 mW

Maximum TX Power is 27.48 mW Conducted and 2.812 mW EIRP

Conclusion: No SAR evaluation required since maximum Transmitter Pout (both conducted and EIRP) is below FCC threshold

6. Duty Cycle:

The duty cycle was determined by the following equation :

TO calculate the actual field intensity, the duty cycle correction factor in decibel is needed for later use and can be obtained from following conversion :

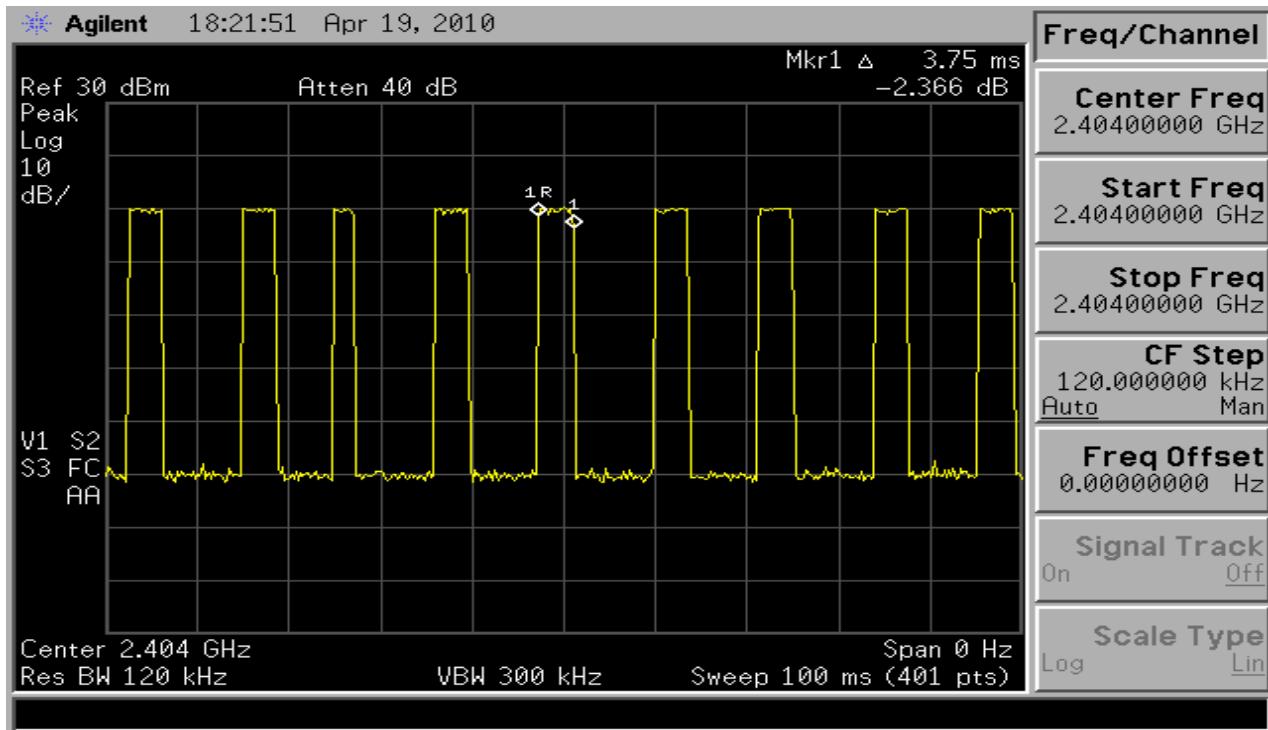
$$\text{Duty Cycle}(\%) = \frac{(\text{Total On Interval in a Complete Pulse Train})}{(\text{Length of a Complete Pulse Train})} \times 100\%$$

Duty Cycle Correction Factor (dB)= 20 X Log10 (Duty Cycle(%))

Pulse Train	Number of Pulse	T(ms)	Total Time (ms)	
Long Pulse	8	3.75	30	msec
Short Pulse	1	2	2	msec

Total ON interval in a complete pulse train	32	msec
Length of a complete pulse train	100	msec
Duty Cycle (%)	32	%
Duty Cycle Correction Factor (dB)	-9.9	dB

Long Pulse



Short Pulse

