

G5 Px Pocket MPE and SAR exclusion analysis

Product: 2,4 GHz Transceiver G5 P1, G5 P2, G5 P3, G5 P4, G5 P5, G5 P6, G5 P7, G5 P8

Company: ScanrecoIndustri Elektronik AB, Box 47144/ÅrstaSkolgränd 22, S-10074, Stockholm, Sweden

The radio part in this device is used in other hand-held / hand-operated devices and in equipment that is permanently installed to provide a separation distance of at least 20 cm from the user. In this hand-held / hand-operated device the antenna to extremity separation distance is at least 10 mm. The distance from the user to the antenna is at least 20 cm. Therefore body SAR is not required.

For permanently installed equipment with separation distance of at least 20 cm the max duty cycle is 72,36%.

For hand-held/hand operated radio remote controls the max duty cycle is 10%. The duty cycle is hardly coded in the firmware under production and cannot be changed by the user.

Extremity SAR exclusion based on 10 mm separation distance and 10% maximum duty cycle for this hand-hand operated device is documented below.

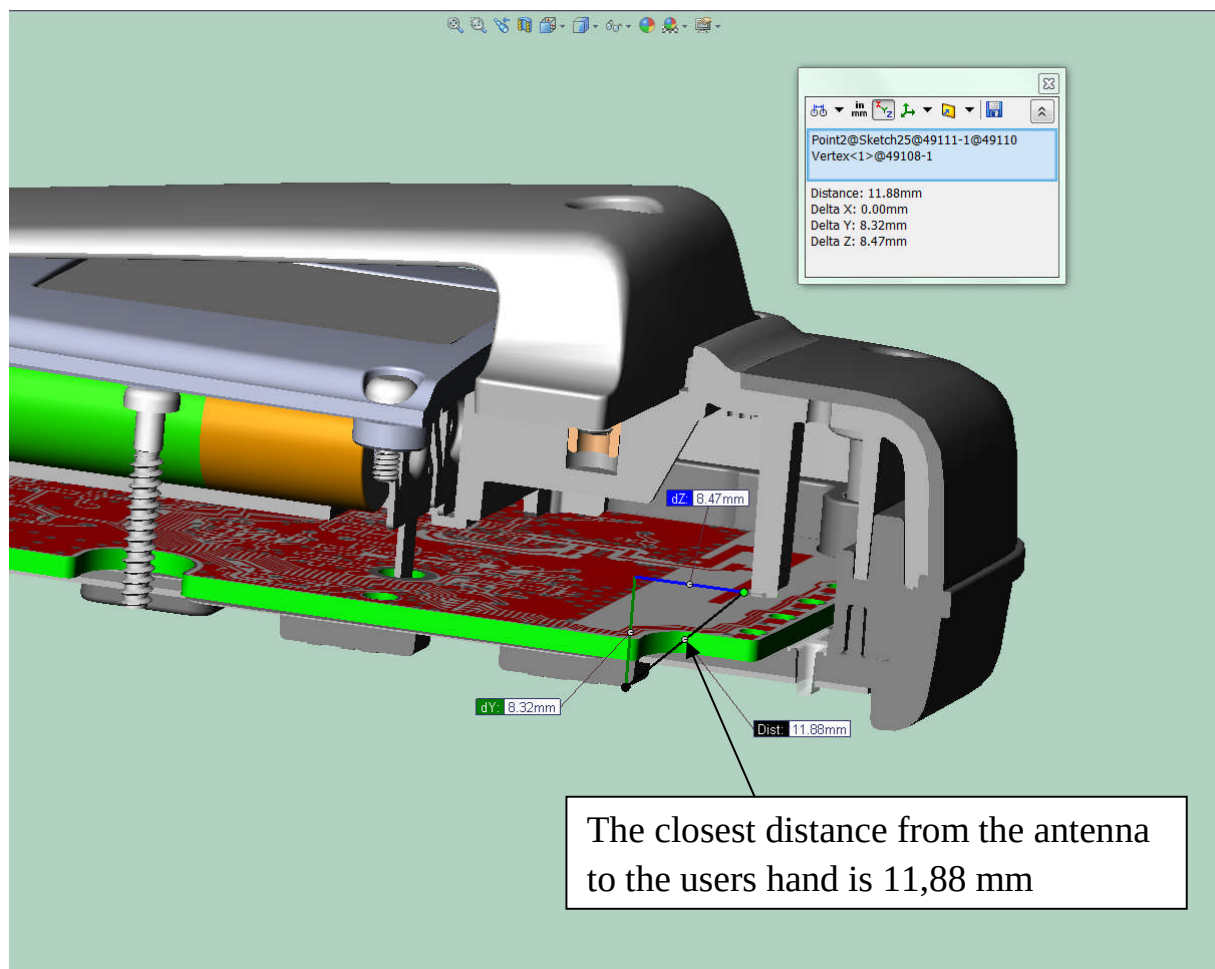


Postal address
Box 47144/Årsta Skolgränd 22
SE-100 74 Stockholm, SWEDEN

Telephone +46 8 556 32 800
Telefax +46 8 556 32 828
E-mail scanreco@scanreco.se

VAT No SE556245004801
Org No 556245-0048

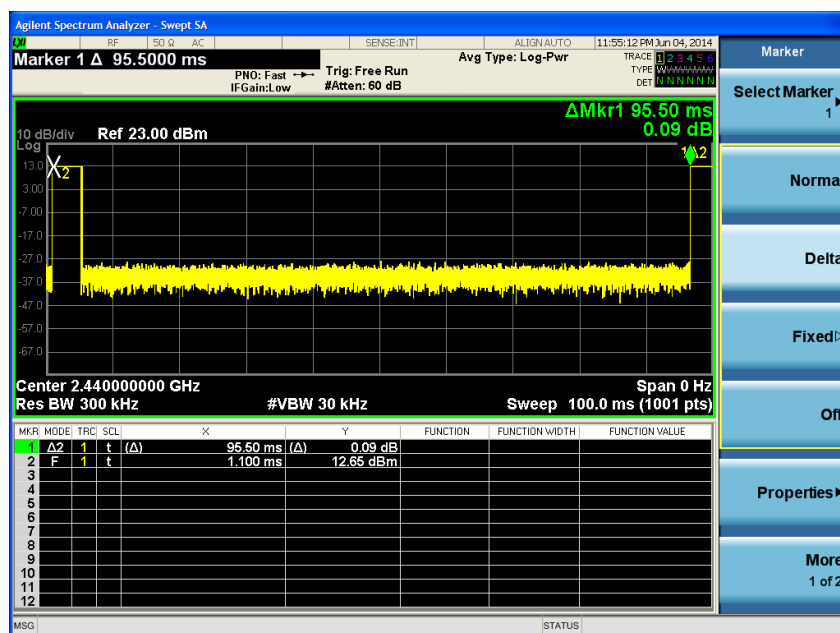
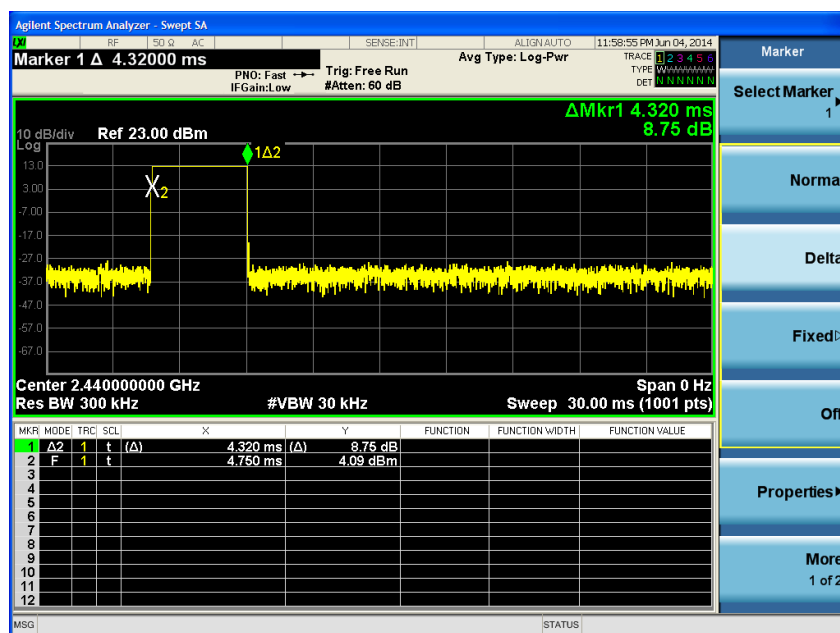
Minimum test separation distance “d”: see 4.3.1 of 447498 “The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1).”



When the device is stored on the operators belt it must be shut off. Pressing the buttons and operating the machine while the device is hanging from the belt or any other place it not allowed. It must be held in the hand.

When the radio part in this device is used in other permanently installed equipment that provides a separation distance > 20cm it has the duty cycle max 72,36%.

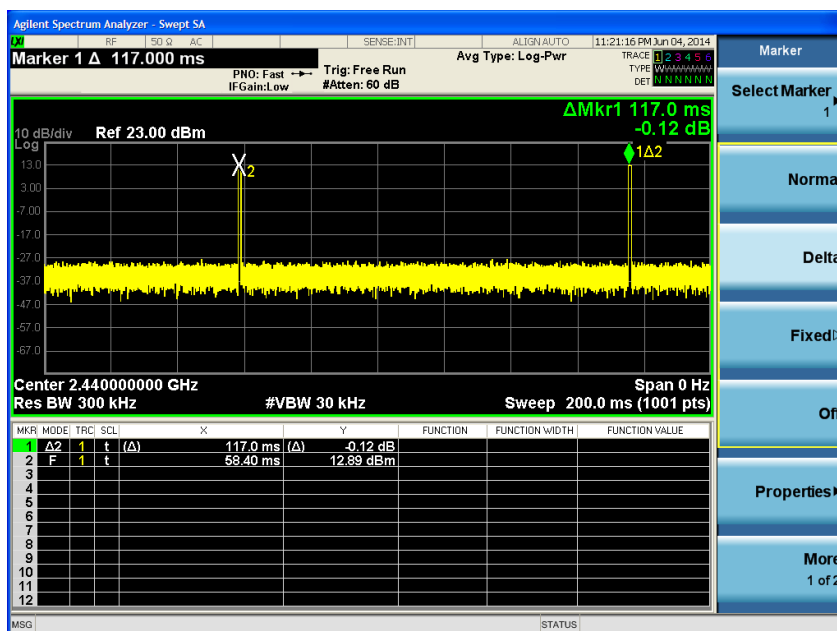
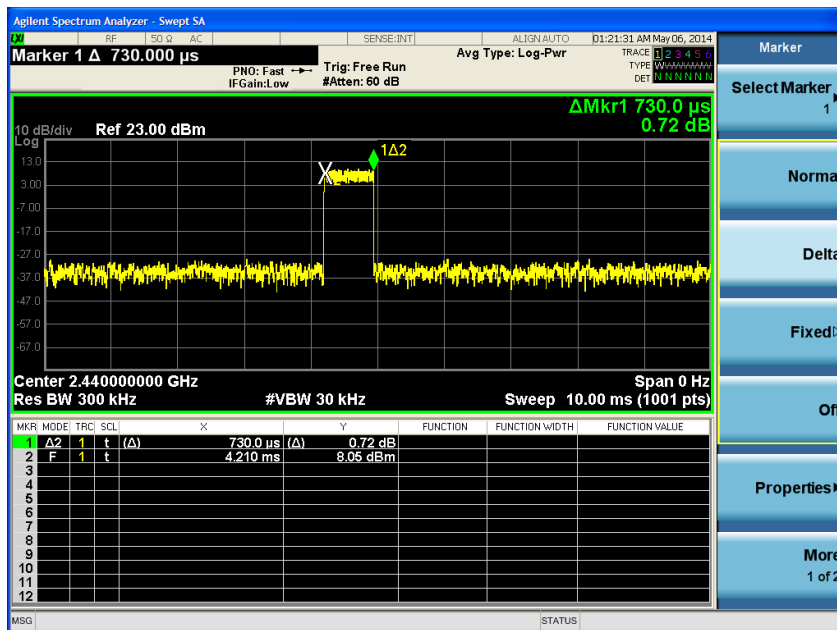
From the picture below the duty cycle :
 $(4,32\text{ms}/95,5\text{ms}) \cdot 16\text{channels} = 72,36\%$.



This device is a hand-held/hand operated radio remote control.
The maximum duty cycle of this device is 10%.

From the picture below:

$$(0,73\text{ms}/117\text{ms}) * 16\text{channels} = 10\%$$



The Rated output power is 20dBm.
The tune up tolerance is 0,5dB.
The internal antenna gain is 0dBi.

FCC SAR exclusion analysis as per section 4.3.1 of “447498 D01 General RF Exposure Guidance v05r02”:

P	19,99	dBm
Tune-up tolerance	0,50	dB
Duty Cycle	10,00	%
P average	11,19	mW
d	10	mm
f	2480	MHz
x	7,5	for 1-g SAR
SAR exclusion*	1,76	<7.5
Limit	7,5	
Pmax	48	mW

* calculated using 447498 D01 General RF Exposure Guidance v05r02 section 4.3.1 1) $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [v_f(\text{GHz})]$

The equipment meets the FCC SAR exemption limits and SAR measurement is not required.

RSS-102 exemption Notice_2013DRS0911 Extremity SAR Evaluation:

SAR evaluation – exemption limits for routine routine evaluation based on frequency and separation distance at 2450 MHz, 10 mm, extremity = $7 \times 2.5 = 17.5$ mW

Prediction of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density

P = power input to the antenna

G = antenna gain

R = distance

Conducted output power:	19,99	(dBm)
Tune up tolerance	0,5	(dB)
Number of carriers	1	(N)
	112	(mW)
	0,112	(W)
P Average	0,01119	(W)
Antenna gain:	0,0	(dBi)
Maximum antenna gain:	1,00	(numeric)
EIRP Average	0,01119	(W)
ERP Average	0,00684	(W)
Distance:	20	(cm)
Duty Cycle:	10	(%)
Frequency:	2400	(MHz)
MPE Limit:	1	(mW/cm ²)
Power density:	0,0022	(mW/cm ²)
	0,022	(W/m ²)
Margin	26,5	(dB)

The EIRP meets the RSS-102 exemption limits in “Notice_2013DRS0911”.

Conclusion: The product satisfies the OET Bulletin 65 Edition 97-1 and RSS-102 Notice 2013_DRS0911.

June 04, 2014



Andrei Sazonov, PhD

Senior RF Specialist