

FCC SAR TEST EXCLUSION CALCULATION

FCC ID: VC7120-0131

Model number: Chroma 60

Based on guidance from KDB 447498

Time averaged conducted power		
Nominal power output	-5dBm	Set by Firmware
Production tolerance	+0.5dB	IC tolerance over temperature and supply
max conducted power	-4.5dBm (0.35mW)	"tune up tolerance"
Max theoretical duty cycle in normal operation	0.14%	25ms every 17.6s
Max average conducted power	0.00049 mW	
Rounded up to nearest mW	1 mW	(clause 4.3.1)

Minimum test Separation Distance	
Minimum 5mm is used (clause 4.1.5)	It is conceivable that a user might touch the electronic shelf label display while it is transmitting. Antenna is 4mm from the surface of the display.

Minimum frequency	902.5 MHz
Maximum frequency	927.5 MHz

SAR test exclusion threshold calculation (clause 4.3.1)

*Calculation = Power of channel (mW) / min test separation(mm) * [sqrt freq (GHz)].
result rounded to 1 decimal place*

Min channel : $1 / 5 * [\text{sqrt } 0.9025] = 0.2$

Max channel: $1 / 5 * [\text{sqrt } 0.9275] = 0.2$

This is below the limits for 1-g SAR (3.0) and 10-g SAR (7.5) and so the product meets the thresholds for SAR test exclusion.

MPE CALCULATION AND RADIATION EXPOSURE RISK ASSESSMENT

FCC ID: VC7120-0131

IC ID: 8910A-1200131

Model: Chroma 60

MPE Calculation

Following guidelines in KDB 447498 D03 supplement C Cross-reference v01

Prediction of MPE limit at a given distance

$$S = \frac{1.64ERP}{4\pi R^2} \text{ re - arranged } R = \sqrt{\frac{1.64ERP}{S4\pi}}$$

where:

S = power density

R = distance to the centre of radiation of the antenna

ERP = EUT Maximum power

With the maximum test case 100% duty cycle the MPE calculation result based on radiated field measurements from Chroma 60 test report 14601 FR (Max Result @ 913.5MHz = 85.65dBuV @ 3m = 0.07mW ERP)

Prediction frequency (MHz)	Max ERP (mW)	Power density limit (S) (mW/cm2)	Distance R cm required to be less than 0.6mW/cm2
913.5MHz	0.07	0.6	0.12

Exposure risk in normal operation

The maximum theoretical transmitter duty cycle in operation is 25ms every 17.6s, (0.14%) However, it must be noted that this is impossible to be sustained by the control system. The typical duty cycle of the transmitter is max pulse 25ms, 5 times a day. ie 0.00003%.

Chroma 60 is a fixed installation. In a retail shelf edge context it is possible human body will contact the device, but with only momentary exposure.

**INDUSTRY CANADA RSS-102 requirements:-
IC ID: 8910A-1200131**

Installation of the device when in service could be <20cm from any part of the user.

Therefore the electronic shelf label Chroma 60 falls under RSS-102 issue 4, section 2.5.1

The maximum EIRP must then be less than 200mW.

From Chroma 60 test report 14R601FR

Maximum TX power = 85.65dBuV @ 3m @ 913.5MHz = 0.11mW EIRP
(0.07mW ERP)

Assessment carried out by:-



Simon Cox

Senior Hardware Engineer

Date of Assessment: Feb 16th 2015

+447713261059

simon.cox@displaydata.com