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1.0 Maximum Permissible Exposure Evaluation (Supplements the test report.)

The results of power measurement and intended use/proximity are compared against the requirements for safety of RF exposure.

1.2 Criteria

Reference	Date
447498 D01 General RF Exposure Guidance v06 // RSS-102 Issue 5	17 Oct 2017

1.3 Procedure

Using measurement of peak power and considering the intended application, determine the permissible exposure level, applicability of exclusion, or whether additional exposure tests (SAR) are indicated. When applicable justify conclusion for selected exposure level and separation distance.

1.4 Exposure Assessment

This device is commonly operated in a retail store location, so general public exposure applies. The device operation is initiated by hand/finger contact with a button, so limb exposure applies. The device is not hand held and not worn.

This device is normally wall mounted. Its antenna is an inductively-loaded short monopole embedded within the plastic enclosure. There is a single user interface button presented and its nearest edge is 25 mm from the internally-placed antenna.

The button does not serve as a push to talk button. Instead, it activates the device to send a pre-recorded voice page transmission after a pre-recorded audible announcement and a channel check delay. It does not function as an intercom. It does not support live transmission. The user has no need approach the device any closer than for pressing a button.

Operation is as follows; the user approaches the device and presses then releases the one large button on the front surface. First, the button lights up and an audible message is played to the user confirming operation. Then for a minimum 3 second window the device listens to the RF channel for activity to insure the channel is clear before initiating RF transmission. The RF transmission is not live audio but a pre-recorded voice message of up to 10 seconds length maximum. The device then waits a minimum of 3 seconds (default of 10) before attempting the 2nd and any subsequent transmission 'cycles' up to maximum of 30 (default of 2).

As the user does not maintain contact with the device for the transmission to occur, and the transmission is delayed a minimum 3 seconds, the exposure distance is then assumed to be 200 mm or greater.

A time-weighted calculation puts the worse-case total transmit time as 10*30 seconds per event, assuming worse-case that no local audio message is programmed. The duty cycle over a six minute period becomes 300/360 or 83.3% yielding a source duty cycle factor of $10\log_{10}(0.833) = -0.8$ dB.

Table 1.4.1 Power Calculation for Exposure; Highest frequency 0.1734 GHz

Measured Peak Power dBm	Source Duty Cycle Factor dB	Antenna Gain dBi	Calculated EIRP dBm	EIRP Restated In Linear Terms mW
25.5	-0.8	0	24.7	295

$$S = \frac{Pwr_{avg} * Gain_{Antenna}}{4 * \pi * Distance_{Antenna}^2}$$

Find safe Distance for maximum exposure (30 to 300 MHz) of 0.2 mW/cm²:

Distance_{safe} = $\sqrt{(P \cdot G / 4 \cdot \pi \cdot S)}$ given $Pwr_{avg} = 295$ mW, Gain = 1*, S = 0.2 mW/cm.
 *Gain included in term P.

$$Distance_{safe} = \sqrt{(295 / 4 \cdot \pi \cdot 0.2)} = 10.8 \text{ cm.}$$

Find field density at 20 cm for General Population (uncontrolled) exposure:

Limit S = 0.20 mW/cm²:

$S = (P \cdot G) / (4 \cdot \pi \cdot [Distance]^2)$ = given $Pwr_{avg} = 3311$ mW, Gain = 1*, Distance = 20 cm.
 *Gain included in term P.

$$S = (295) / (4 \cdot \pi \cdot [20 \text{ cm}]^2) = 0.06 \text{ mW/cm}^2$$

$$0.06 \text{ mW/cm}^2 < 0.20 \text{ mW/cm}^2$$

Therefore, the exposure meets the applicable FCC SAR exemption requirements.

Signed:



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