SAR Testing for Handheld RFID/Barcode Scanners
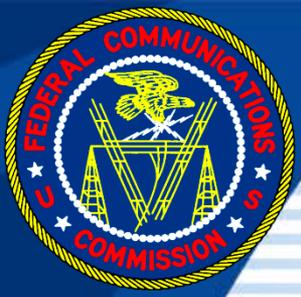
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Handheld RFID/Barcode Scanners

- Often have a pistol grip form factor
- Primarily used in the hands but sometimes they support belt-clips, lanyards, or other body-worn accessories that may be used while transmitting
- Often contain Bluetooth, Wi-Fi, and/or RFID/NFC Antennas
- Often have a low duty cycle or highly directional antenna

Handheld RFID/Barcode Scanner Form Factors

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Handheld Devices KDB Guidance

- KDB Publication 447498 D01 gives general guidance including extremity SAR
- KDB Publications 941225 D01, D05, D07 provide guidance related to 3G/4G devices, if applicable
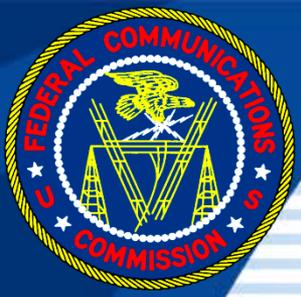- KDB Publication 248227 D01 gives guidance on Wi-Fi, if applicable

General Testing Guidance

- Due to low-duty cycle, often may be excluded from SAR testing. See section 6.3 of KDB 447498 D01. If duty cycle is not fixed, additional information may be required.

- May be excluded from SAR testing due to large distance between fingers and antenna. See section 4.3.1 of KDB 447498 D01. 10-g Extremity SAR exclusion criteria should be used.

General Testing Guidance Continued

- Depending on form factor, use conditions, support for body-worn accessories, and other criteria, both 10-g extremity and 1-g Body-Worn SAR may have to be addressed

- In general, do not test surface that faces away from user or user's hands unless there is an exposure concern

- If they contain multiple transmitters, simultaneous SAR should be addressed
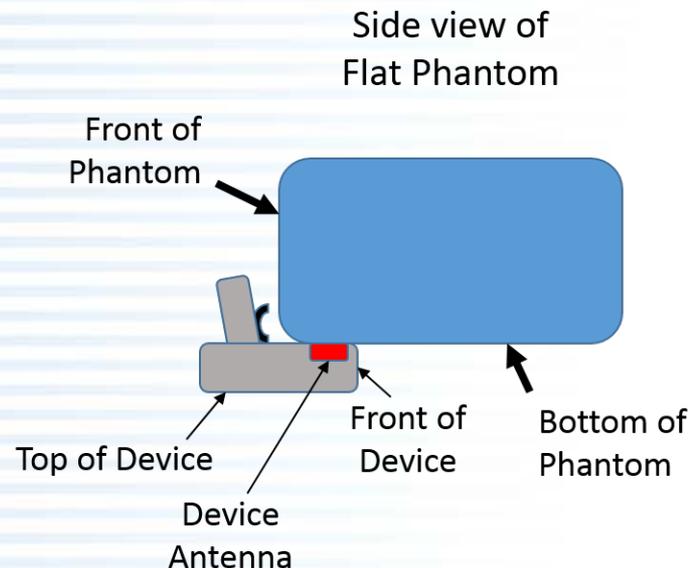
Common Testing Problems

- High powered antenna causes high SAR Values
- Pistol grip gets in the way of positioning
- Large Front antenna gets in the way of positioning

Testing Solutions

- Test exclusion is preferred. Several methods of SAR test exclusion. See slide 5.

- Invert the barcode scanner so the pistol grip is facing upwards but outside the front of the flat phantom (near the spigot)
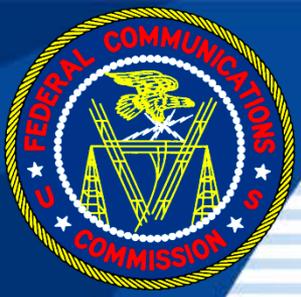
Side view of
Flat Phantom

Front of
Phantom

Top of Device

Device
Antenna

Front of
Device

Bottom of
Phantom

Testing Solutions Continued

- May have trouble capturing hotspot since it is close to front edge of phantom. Submit a KDB Inquiry with sample scans if hotspot is unable to be captured

- Last resort, may have to modify hardware to find reasonable test position. Submit a KDB Inquiry **BEFORE** device modification.

KDB Inquiries

- When submitting inquiries for guidance, please provide specific information

- Propose test configurations based on existing KDB guidance, sound engineering judgement with justification

- Provide information about: wireless modes, power, antenna info and location, use conditions, distances, dimensions, etc.

Questions?

Thank You!