



## Technical Problems with TCB Filings

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## Technical Problems with TCB Filings

- Part 15 Devices
  - General Issues
  - Device Specific Issues
  - RF Safety Issues
- Licensed Devices
  - General Issues
  - Device Specific Issues
  - RF Safety Issues
- TCB Excluded Devices



## Part 15 Technical Problems

### ➤ General Issues

- Section 15.203 Compliance
  - Profession Installation not justified or missing
    - See interpretation 20011004-002
    - Intended use, installation requirements & marketing method
  - Unique antenna connector
  - Permanently connected antenna
- Section 15.204 Compliance (except 15.247)
  - Amplifier system approved together
  - Label on TX only

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## Part 15 Technical Problems

### ➤ General Issues (Cont'd)

- Test Highest Gain Antenna/Highest Power Out
  - List approved antennas in filing
  - Provide photos of approved antennas
  - Describe output power selection/control
  - Type/length of cable when not provided
- Ave. & Pk. Radiated Limits above 1 GHz
  - Comply with both limits
- Conducted Power Listed on Grant
  - ERP as grant note

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## Part 15 Technical Problems

- General Issues (Cont'd)
  - Pulsed Emissions meas. w/Ave. Detector
    - Measure w/Pk. detector & apply duty cycle
  - FCC ID Label on Battery Cover
    - Covers break off or are lost
  - Inconsistencies Throughout Most Filings
    - Output power, SAR/MPE distances, operational description, user manual
  - Multiple Transmitters/Modules
    - Transmit simultaneously?
    - RF safety evaluation
    - EMC evaluation
    - Spurious/Intermod evaluation

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## Part 15 Technical Problems

- Device Specific Issues
  - Integral Antenna Requirement (15.407(d))
    - UNII device in 5.15-5.25 GHz band
  - Radiated Emissions Tested while Antenna Laying on Wood
    - Module w/cabled antennas
  - Mobile PCMICA Card w/Integral Antenna
    - Justification for not being portable device?
  - Used Wrong Limits for Harmonic Rad. Levels
    - 15.231 – Fundamental determines limits for fund. & harm. Emissions

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## Part 15 Technical Problems

- Device Specific Issues (Cont'd)
  - Restricted Band (15.205) Freqs. Use 15.209 Limits not 15.231 Limits
    - Emission in 15.205 Bands = RB = 15.209 limits
  - Band Edge Compliance @ 2.485 GHz (DTS)
    - Wide signal tuned to band edge will fail
  - Manual/Automatic Activated TX; Cease < 5 Sec.
    - 15.231(a)(1) & (2)
  - Rolling Codes
    - Pulses change w/each transmission
    - Duty cycle changes w/each transmission

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## Part 15 Technical Problems

- Device Specific Issues (Cont'd)
  - Maximize Emission Levels
    - Test in 3 orth. planes
    - Test at max. power
    - Test all accessories/devices
  - Site Must be 2.948 Listed for Part 15/18 Filings

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## Part 15 Technical Problems

### ➤ RF Safety Issues

- 20 cm is minimum Mobile Distance
  - MPE estimate not valid < 20 cm
  - Less than 20 cm. = SAR applies
- Use Phantom of Correct Size
  - OET Bulletin 65, Sup. C, Annex D
- Body Worn Statement Needed
  - Sup. C, Annex D
- Describe Holster
  - Metal spring, distance from body, holds EUT forwards or backwards

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## Part 15 Technical Problems

### ➤ RF Safety Issues (Cont'd)

- Inconsistent RF Safety Info
  - MPE/SAR distances in manual & tests
  - Power listed in oper. description & tests
- SAR Test for Keyboard TX w/Screen Next to Phantom
  - Wrong SAR test distance used
  - Wrong face of device against phantom
- List Head & Body SAR Values on Grant
  - Follow convention provided by FCC
- MPE: Limits Wrong – Tests Needed

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## Licensed Problems

### ➤ General Issues

- Amplifier Guidelines Not Followed
  - See interpretation 20040310-001
- Band edge Compliance Not Determined
  - Full power test @ band edge
  - Low & high channel too close to band edge for emission bandwidth
- Conducted Measurements Missing
  - Output power, output spurious conducted, freq. stability, temp. stability, etc.

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## Licensed Problems

### ➤ General Issues (Cont'd)

- Multiple Transmitter Evaluation
  - Simultaneous transmission capability?
  - TCBs can approve per 02 TCB Exc. List
  - MPE/SAR evaluation – RF safety
  - EMC evaluation – Spurious/intermod emissions
- Power Exclusion in 2.1091 Exceeded
  - Routine evaluation required = MPE tests or computer simulation
- AC Line Conducted Tests Don't Apply
  - 15.207 or 15.107 not applicable

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## Licensed Problems

### ➤ Device Specific Issues

- 800/1900 MHz Non-US Functions Note Code Needed
  - This device contains 900/1800 MHz GSM functions that are not operational in U.S. territories. This filing is only applicable for...
- Section 24.232(b) – 2 W EIRP Limit Exceeded
  - Calculate EIRP w/power out & high antenna gain
- Section 27.50©(2) – 30 W ERP Limit Exceeded
  - Calculate ERP w/power out & high antenna gain

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## Licensed Problems

### ➤ Device Specific Issues (Cont'd)

- Full Modular Approval for Portable Devices not available
  - Only limited modular approvals only
  - Device specific because SAR is device specific
- Non-Voice Data Transmission in GMRS Prohibited
  - Section 95.631(f)

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## Licensed Problems

### ➤ RF Safety Issues

- List Head & Body SAR Values on Grant
  - Follow convention provided by FCC
  - List correct values
- User Manual Info Missing/Inconsistent
  - Hosts tested, accessories identified
  - Non-metallic spring in holster
  - Hand held use only
- Grant Comment Wrong/Inconsistent
  - MPE/SAR distance, body worn Sup. C accessory limitation, non-metallic spring in holster

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## Licensed Problems

### ➤ RF Safety Issues (Cont'd)

- SAR Tested at Maximum Output Power
  - EUT in all modes/configurations too
  - Describe test conditions/software setup
- Describe Holster Construction
  - Metallic or not
  - Hold EUT face and back to body of person
- Provide Complete SAR Test Report
- Provide Secondary SAR Hotspots

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## Licensed Problems

- RF Safety Issues (Cont'd)
  - User Manual Missing SAR Info
  - Number of Time Slots Used in Transmission
    - Affects SAR values
    - Lower SAR w/2 time slots vs. 1 time slot – why?
  - Occupational Exposure Requirements – Pt 90
    - Warning label on device
    - Info in user manual
    - Operational training to limit exposure

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## Licensed Problems

- RF Safety Issues (Cont'd)
  - MPE Evaluation Missing/Needed
    - Power exclusion in 2.1091 exceeded = MPE tests
    - Use correct MPE limit
  - SAR Tests Missing/Incomplete
    - SAR plots
    - SAR test set-up photos
    - Probe calibration data provided
    - Power drift – conducted power vs. time for length of SAR tests provided

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## TCB Excluded Devices

- Devices Excluded from TCB Approval
  - Cell Phones w/HAC capability (Pt 22/24)
  - EPIRB Equipment (Pt 80)
  - Implanted Transmitters
  - Learned Transmitters (Pt 15)
  - MIMO & Smart Antenna Transmitters (Pt 15)
  - SDR
  - UWB (pt 15)
  - UNII w/DFS Capability (Pt15)

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## Summary

- Technical Problems with TCB Filings
  - Inconsistencies in Filings
  - Unfamiliar with Rules
  - Unfamiliar with Policies

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## Summary

- Technical Problems with TCB Filings
  - What to do?
    - Carefully review test reports for inconsistencies & correct info before submission
    - Reread FCC Rules and review TCB training materials
    - Review material available from TCB council and FCC knowledge databases
    - When in doubt, ask the FCC; don't assume we will catch a mistake!

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# Questions and Answers

**Thanks!**

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