



The international CETECOM group

AECS – eCall Cellular Frequency Overview

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Content

- CETECOM
- Cellular frequencies in different countries
- Versions of wireless automotive modules
- Antenna requirements
- Conclusion

CETECOM

- Testhouse wireless telecommunication devices
- Mobile phones, smartphones or wireless radio modules
- Radio in various parts (2G,3G, 4G, WLAN, BT)
- In 2013 we hostet the 3rd european ERTICO eCall testfest

Cellular frequency overview

Europe

GSM: 900;1800 MHz

UMTS: 900;2100 MHz

America

GSM: 850;1900 MHz

UMTS: 850;1700/2100;1900 MHz

Asia

GSM: 900 MHz (China, India)
1800 MHz (Hong Kong, India)

UMTS: 2100 MHz (China, Korea, India)
1700/2100 MHz (Japan)

cellular frequencies "worldwide"

one „frequency“ \neq for the whole „world“

Current Versions **of wireless automotive modules**

- **Wireless module manufacturer** usually provides **products for different markets**

- **European “only” version**
GSM 900, 1800 MHz
UMTS 900, 2100 MHz

- **“World” version**
GSM 850, 900, 1800, 1900 MHz
UMTS 850, 900, 1700/2100 MHz

Coverage of cellular frequency

Europe

GSM: 900;1800 MHz

UMTS: 900;2100 MHz

America

GSM: 850;1900 MHz

UMTS: 850;1700/2100;1900 MHz

Asia

GSM: 900 MHz (China, India)
1800 MHz (Hong Kong, India)

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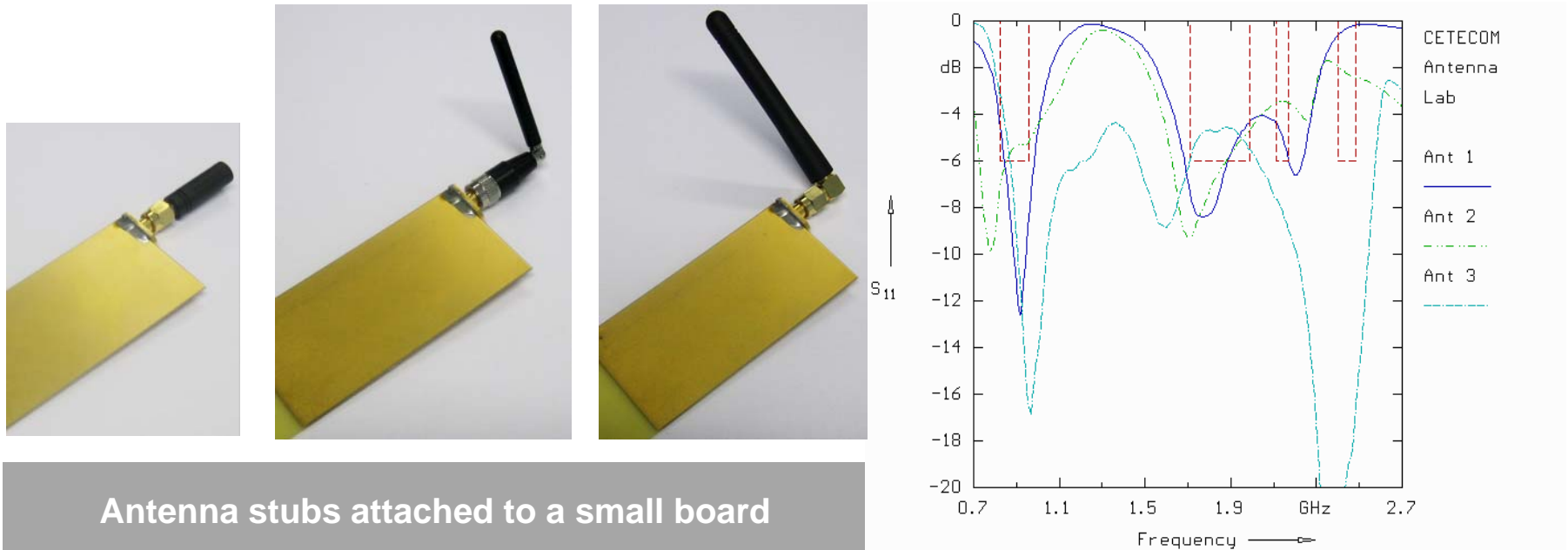
**GSM/UMTS
module „world“
(example)**

[cellular coverage](#)

Antenna remarks

- different cellular module versions
 - ➔ different antenna designs
- The **antenna** of the car needs to cover all of the **requested frequencies**
 - “Local” versions are cheaper than “world” versions
- A so called **quad band antenna** may cover the requested **frequencies from 800 to 2100 MHz**
 - But the **quality** of the antenna is **not the same** in between the whole **frequency range**

Quality examples of cellular Antennas



matching of external stub antennas depends e.g. on ground plane size

Conclusion

- If a **global coverage** of worldwide used GSM/UMTS frequencies is required:
 - **both the module and the antenna should support the dedicated frequencies**
 - To make sure that the **eCall** is possible **at any time and in any case**

- Taking the above into account:
 - Where is the **best place** for the antenna (cellular and navigation)?
 - What are **minimum performance** requirements for the **antennas**?

Thank you very much for your attention ...

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