



# 3GPP eCall in-band modem Qualcomm, Incorporated

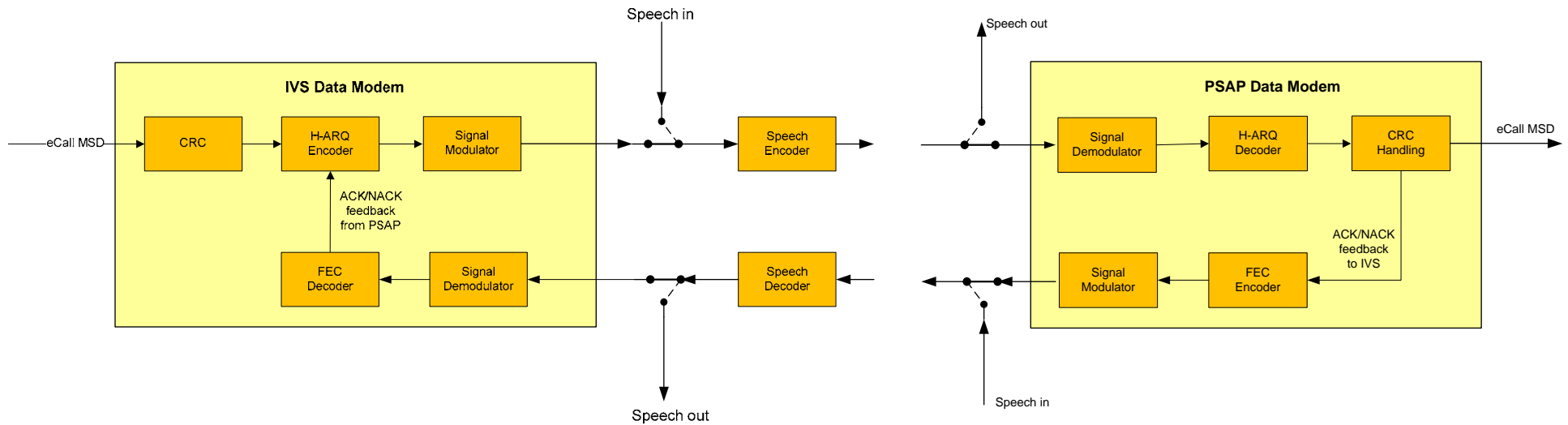
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# Qualcomm eCall Modem

- Endorsed for standardization by 3GPP
- Designed in Qualcomm Germany (Nürnberg)





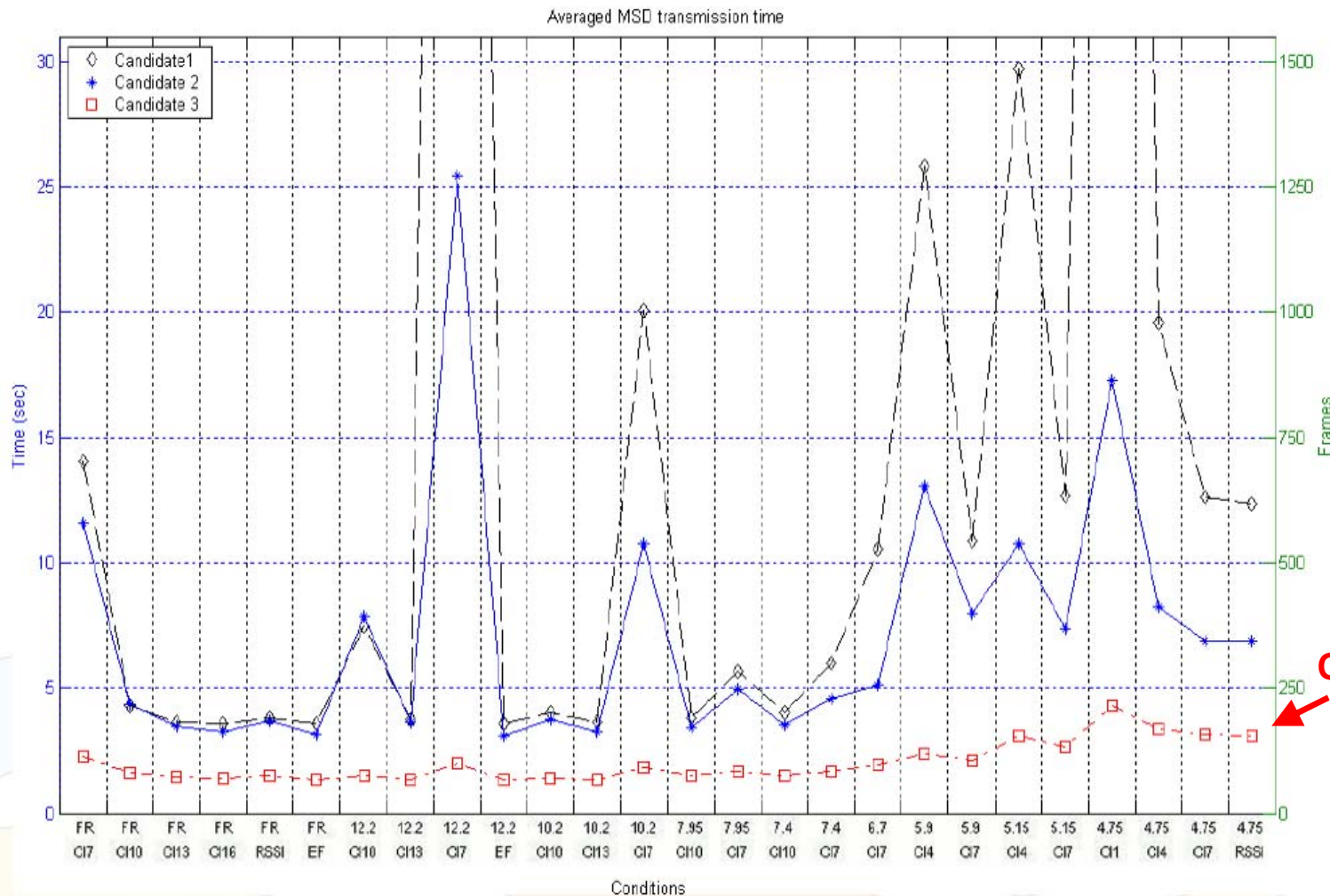
## Qualcomm eCall Modem

- **Designed for high reliability**
  - **Uses Hybrid ARQ and Incremental Redundancy techniques**
    - **Rapidly adapts redundancy to a wide variety of radio conditions to provide error free transmission of MSD**
    - **Adaptive design does not rely on optimal or near-optimal radio conditions to achieve successful transmission**
    - **Techniques are well-proven and used in deployed wireless communications protocols such as WCDMA (3G)**
  - **High-speed modulation through wireless voice channel enables fast transmission and fast adaptation to channel conditions**



# Designed for Reliability

## SUMMARY OF RESULTS



**QUALCOMM modem**



## Reliable and Fast Transmission

- **Consistently reliable and fast performance across all 26 radio and codec test scenarios**
  - Operates over a wide range of radio conditions without failure or long transmission delays
- **No timeout/transmission failures in 2600 test runs performed by independent host laboratory**
  - Our additional test runs have shown no failures and consistently fast MSD transmission times
- **Fast MSD transmission time**
  - Very short interruption in any voice conversation between PSAP operator and accident victims
    - 2.04s average transmission time over all tested channel and codec conditions
    - Only one test condition had average transmission time above 4s at 4.29s



# Answers to Six Prepared Questions



## Question 1

- *What is the projected cost of implementing your technological solution for the transmission of the eCall MSD to the PSAP? (i.e., equipment needed –HW, SW, maintenance approach, etc.)*
- **Our solution is a very low complexity solution for today's hardware**
  - 65 instances of the eCall modem software can operate simultaneously on a single laptop PC running at 1.86 GHz with 1.5 GB RAM
  - If distributed modems and terminals are required, the eCall modem can easily run on an individual PC along with other functions (e.g., presenting the MSD to the operator)
- **Furthermore, since the software for our eCall solution will be publicly available in a 3GPP specification (as ANSI-C reference code) we expect multiple vendors to be able to provide low-cost implementations on various platforms.**
- **Once the 3GPP specification is complete any bug fixes to the software are handled via the 3GPP process.**



## Question 2

- *What would be the time-frame when your technology would be ready to be tested and deployed for the PSAPs, if selected?*
- With the key specifications being completed in December, 2008, we expect that development and interop testing with PSAP server equipment vendors can begin soon afterwards.
  - This specification provides reference software that can be used for rapid product development and interop testing.
- We are in active discussions with the automotive and telematics services industry to enable PSAP server development and deployment.



## Question 3

- *What would happen to those PSAPs not upgraded in case they will receive an eCall with the MSD being sent with your technology (i.e., risk of blocking the call, incompatibility, PSAP operator listening a beep during X seconds.)*
- **There is no risk of blocking the call or incompatibility.**
- **No eCall tones will be transmitted or heard by the PSAP operator or automobile passenger**
  - **The IVS eCall modem listens for a very distinct request message from the PSAP before transmitting the MSD. PSAPs that are not upgraded will not make such a request.**
  - **However if there is a requirement to force the IVS to send the MSD without a PSAP request then the PSAP operator could hear eCall tones for 2 – 3 seconds.**



## Question 4

- *What would be the cost of implementing your technological solution for the transmission of the eCall MSD to the in-vehicle system (IVS)? (i.e., equipment needed –HW, SW, maintenance approach, etc.) Will be there any particular constraint regarding HW?*
- Our eCall in-band modem can be implemented as software on any common DSP device in the IVS.
- The IVS modem is simple enough to implement as software on our existing wireless modems.
- Furthermore, since the software for our eCall solution will be publicly available in a 3GPP specification (as ANSI-C reference code) we expect multiple vendors to be able to provide low-cost implementations on various platforms.
- Once the 3GPP specification is complete any bug fixes to the software are handled via the 3GPP process.

## Question 5

- *What would be the time-frame when your technology would be ready to be tested and deployed within the vehicles if selected?*
- **With the key specifications being completed in December, 2008, we expect that development and interop testing with IVS vendors can begin soon afterwards.**
  - **This specification provides reference software that can be used for rapid product development and interop testing.**
- **We are in active discussions with the automotive and telematics industry to enable quick development and deployment of IVS modem products.**
- **Qualcomm will be providing more details on our own eCall modem product plans to IVS vendors shortly**

## Question 6

- ***Please describe your licensing policy (IVS and PSAPs)***
- **In recognition of the important public safety aspects of this work and to accelerate the deployment of the eCall solution, Qualcomm will provide the following licensing policy**
  - ***PSAP Equipment***
    - **Subject to certain standard terms and conditions, Qualcomm will not charge royalties on sales of in-band voice-channel modem equipment that implements the current eCall specification and is located in the PSAP or core network, but solely when and to the extent such equipment is used for emergency communications.**
  - ***In-Vehicle System Devices***
    - **Subject to certain standard terms and conditions, Qualcomm will not charge royalties for a license under patents that are essential to implementation of the current eCall specification with respect to In-Vehicle System (IVS) devices that implement the current eCall specification, but solely when and to the extent such eCall-enabled devices are used for eCall emergency communications between the PSAP and such device. For clarity, the above does not apply to, and eCall does not include, cellular modem functionality or any other functionality in a handset or device.**

## Summary of Qualcomm eCall solution

- **Endorsed by 3GPP for standardization**
  - eCall design and software scheduled to be publicly available for product development and implementation by December, 2008
  - Enables multiple vendors and competitive pricing for products
- **Best Performance**
  - High Reliability
  - Shortest interruption to voice conversation with PSAP operator
- **Favorable Licensing terms**
  - Enables fast deployment and competitive pricing for products



**We are looking forward to further collaboration  
with the eCall community to accelerate the  
deployment of this important service.**

**Thank You!**

**For more questions please contact  
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