Market Requirements Document (MRD): Digital Radio Modiale

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Agenda

• Market Focus
• Product description
• Cost Metrics
• Product Features
• References
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- What is in a MRD
- **Market Focus**
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**Market Focus**

- The primary target market for the DRM solution that will developed is for MP3 players that want to receive digital radio transmissions.
  - Estimated market size is approximately 5-7 million units per year.
- It is anticipated that the next generation cell phones may be configured to receive FM and DRM/DAB transmissions. If so...
  - The potential market size is approximately 35 million units per year.
What problem are we trying to solve?

- There is a need to transmit and receive digital music and data using existing long-, medium- and short-wave transmission systems. Transmitters in these wavelengths are accessible worldwide.
- Need to provide near-FM quality sound and the capacity to integrate data and text.

Competition

- Texas Instruments currently offers the TMS320DRM300/350 component:
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Product description

- You will generate a PRD for a DRM IP sub-system that can be integrated into a MP3 player or a 4G cell phone.
  - The hardware intellectual property will be delivered in the SystemC tools environment. This will include all components which are not available in the standard library, such as accelerators, special I/O devices, etc.
Product Benefits

• A DRM system provides the following benefits:
  ◆ Ability to receive digital music and data using existing long-, medium- and short-wave transmission systems providing near-FM quality sound available to markets worldwide.
  ◆ DRM has a small bandwidth of less than 20 kHz – easy to handle with current generation of embedded computing devices.
  ◆ The quality of DRM audio is excellent, and the improvement upon analog AM is immediately noticeable. DRM can be used for a range of audio content, including multi-lingual speech and music.

Product Benefits (cont’d)

• A DRM system provides the following benefits:
  ◆ Besides providing near-FM quality audio, the DRM system has the capacity to integrate data and text. This additional content can be displayed on DRM receivers to enhance the listening experience.
  ◆ Unlike digital systems that require a new frequency allocation, DRM uses existing AM broadcast frequency bands. The DRM signal is designed to fit in with the existing AM broadcast band plan, based on signals of 9 kHz or 10 kHz bandwidth. It has modes requiring as little as 4.5 kHz or 5 kHz bandwidth, plus modes that can take advantage of wider bandwidths, such as 18 or 20 kHz.
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**Cost Metrics**

- **Performance**
  - Utilize no more than 75 MHz of an ARM 926-EJS running at 256 MHz

- **Additional die size cost**
  - Accelerators .5 mm²
  - On board Memory - TBD

- **Advanced System and Power Management**
  - Additional system power for accelerators: < 8 mW
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Product Features

- Flexible and scalable platform based architecture.
- Standard architecture for a wide range of devices supporting a wide range of information services
- Flexibility – To be able to dynamically re-program different waveforms tailored to particular scenarios
- Portability – To be able to host third party designs on multiple independent platforms
- Potential for significant life-cycle cost reduction
- Over the air downloads of software patches, and new features and services
- Offers significant improvement in flexibility, portability and interoperability between different users
Product Features (cont)

- Frequency coverage 0-32 MHz
- Mode reception: USB, LSB, CW, AM, synchronous AM, NFM, DATA
- Advanced IP3 greater than +35 dBm
- Very high dynamic range
- >100 dB in AM mode with 7 kHz filter
- >105 dB in SSB mode with 2.2 kHz filter >110 dB in CW mode with 500 Hz filter
- Passband tuning +/-5 kHz
- Audio pitch tune in CW & DATA

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- DRM Consortium
  - http://www.drmrx.org/
  - http://www.drm.org/
- PC based software for DRM reception user manual
- WINRADiO info
  - http://www.winradio.com/