

Demonstrating Voice Preprocessing on the EVMK2G

TIDEP-0088: <http://www.ti.com/tool/TIDEP0088>

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EP Catalog Processor Applications

Overview

Audio Preprocessing Demo Flow

8 mic CMB



I2S



BF+ASNR+MSS+DRC



K2G EVM

Headphone

Line out



Headphones

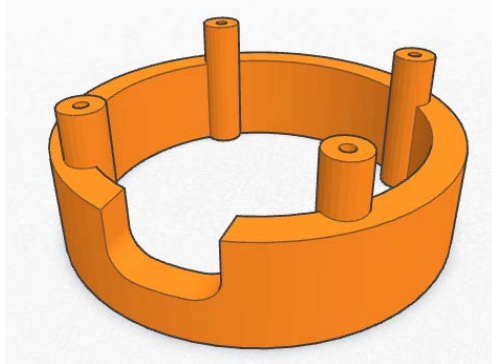


Audacity® audio editing software:
Split L & R channels to listen to clean and
unclean audio

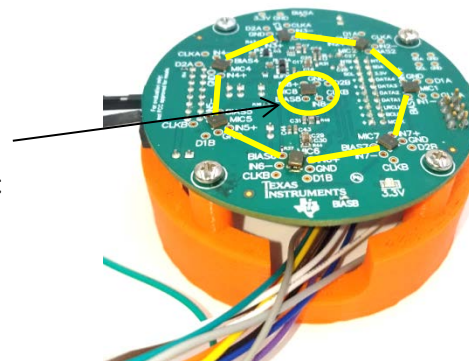
Hardware

Circular Microphone Board (CMB)

- Features 7 microphones around periphery and center (reference) mic. Knowles SPH1642HT5H-1 mic
- 8 microphones feed 2 x PCM1864 Audio ADC
4 channels, 103dB SNR, programmable gain control
- I2S communication to the DSP
- 3D Printer .STL file available for stand-off

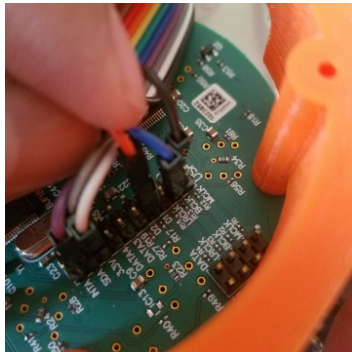


Center
(Reference) Mic

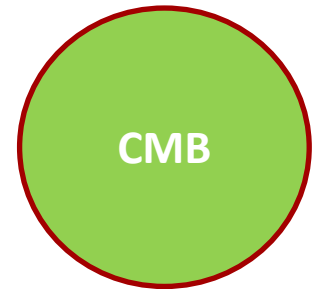


Hardware

K2G EVM connections to the CMB (8 mics)



Header/Pin	Pin
JP1 - 100	GND
JP1 - 10	3.3V
JP1 - 97	I2C SCL
JP1 - 98	I2C SDA
JP1 - 33	Bit Clock
JP1 - 41	Frame Clock
JP1 - 29	Data 1
JP1 - 36	Data 2
JP1 - 47	Data 3
JP1 - 40	Data 4
JP1 - 48	MCLK



CMB Jumper Settings

- J3 – ON
- J10 – ON
- J11 – ON
- J8 (Pins 1&2) – ON
- J8 (Pins 3&4) – OFF

Software

Software Components:

- **K2G Processor SDK RTOS v3.03**
- Located at C:\ti\processor_sdk_rtos_k2g_3_03_00_00\demos\audio-preprocessing

Dependencies:

- **DSP Components: AER 17.0.0.0 (C64P/C55x)**
 - Beamforming (BF)
 - Adaptive Spectral Noise Reduction (ASNR)
 - Dynamic Range Compression (DRC)
- **VOLIB 2.1.0.1 (C64P, C66x, C55x): Multi-Source Selection (MSS)**

Software

Building and Running K2G Real-time Demo

- Setenv.bat in PRSDK.
- Building K2G RT demo.
- Running the demo in CCS.
- Capture of audio and analysis in Audacity



K2G_BF_demo_blds2.mp4

For more information

- TIDEP-0088: <http://www.ti.com/tool/TIDEP0088>
- Training: Voice Processing Tools and Software for K2G and C5517 Designs: <https://training.ti.com/voice-processing-tools-software-k2g-c5517>
- Software downloads:
 - Processor SDK RTOS for K2G: http://software-dl.ti.com/processor-sdk-rtos/esd/K2G/latest/index_FDS.html
 - AER: http://software-dl.ti.com/libs/aer/latest/index_FDS.html
 - VOLIB: http://software-dl.ti.com/sdoemb/sdoemb_public_sw/volib/latest/index_FDS.html
- RTOS Software Developer Guide: Building The SDK: http://processors.wiki.ti.com/index.php/Processor_SDK_RTOS_Building_The_SDK
- Code Composer Studio (CCS) Training: http://processors.wiki.ti.com/index.php/Category:CCS_Training
- Audacity® Audio analysis tool: <http://www.audacityteam.org/>
- CMB 3D printer stand-off file: http://software-dl.ti.com/public/download/CMB_Enclosure.zip
- For questions about this training, refer to the E2E Community Forums: <http://e2e.ti.com>