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SIM5360_USB_AUDIO_Application_Note_V1.01

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Version History

Version	Chapter	Comments
V1.00		New Version
V1.01	2.3/2.4	Add 2) in 2.3/2.4

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1. Introduction

1.1 Overview

This document gives the usage of SIM5360 USB AUDIO functions. User can get useful information about the SIM5360 USB AUDIO functions quickly through this document.

The USB AUDIO functions are provided in AT command format, and they are designed for customers to design their software PCM applications easily. User can access the USB AUDIO AT commands through UART/ USB interface which communicates with SIM5360 module.

SIM5360 USB AUDIO features:

- Basic software PCM data transferring on USB DIAG port
- MO call of USB AUDIO flow
- MT call of USB AUDIO flow

1.2 References

The present document is based on the following documents:

[1] SIM5360_PCM_Application_Note_V1.xx.DOC.

1.3 Terms and Abbreviations

For the purposes of the present document, the following abbreviations apply:

- AT ATtention; the two-character abbreviation is used to start a command line to be sent from TE/DTE to TA/DCE
- TA Terminal Adaptor; e.g. a data card (equal to DCE)
- TE Terminal Equipment; e.g. a computer (equal to DTE)
- UMTS Universal Mobile Telecommunications System
- URC Unsolicited Result Code
- USB AUDIO A method used for external MPU and the module to transferring software PCM data
- USIM Universal Subscriber Identity Module
- WCDMA Wideband Code Division Multiple Access

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2. USB AUDIO transferring method

2.1 Basic USB AUDIO description

The USB AUDIO function is used to help customer to develop PCM applications using software instead of using hardware audio connection. When using USB AUDIO, two USB virtual serial ports (USB AT port and USB DIAG port) are needed. The USB AT port is used to run AT commands, while the DIAG port is used to transfer the software PCM data.

Following is the basic diagram for USB AUDIO:

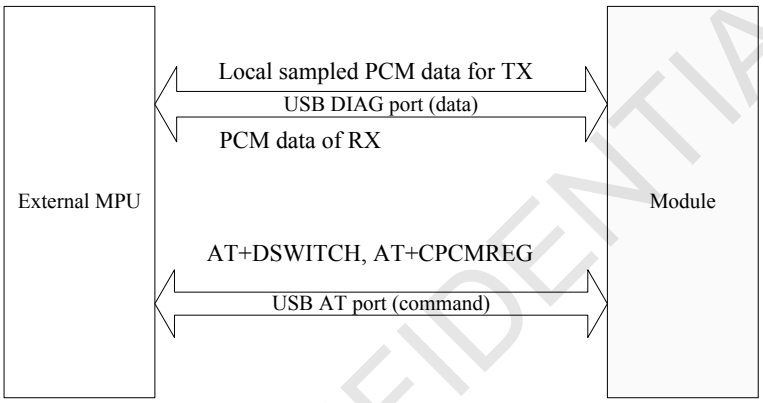

Diagram 1 USB AUDIO diagram

2.2 Configure CODEC

Currently USB AUDIO only supports 8K sample rate, so the **AT+CODEC=31,3** needs to be set before using USB AUDIO function. This AT command only needs to be set one time, and it shall save to flash and take effect on next power cycle.

2.3 USB AUDIO flow of MO call

The following commands give an example of MO call for USB AUDIO:

1) External MPU runs "AT+DSWITCH=1" command on the USB AT port to switch the module USB DIAG port to DATA mode.

AT+DSWITCH=1

2) External MPU write data "AT\0\0\3\0\0\0\0\0\0" to data port, and read "AT\0\0\3\0\0\0\1\0\0" from data port.

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*char *pre_data="AT\0\0\3\0\0\0\0\0\0";*
bytes=write(tty_fd, pre_data, 11);

3) External MPU runs "ATD…" command to dial the destination phone number

ATD 10086;

4) Module reports "VOICE CALL: BEGIN" to indicate that the voice call is connected now. External MPU runs "AT+CPCMREG=1" command to begin the PCM data transferring on the USB DIAG port.

VOICE CALL: BEGIN
AT+CPCMREG=1

5) Now the external MPU and the module can exchange software PCM data until the call is hung up.

6) When the voice call is hung up, the USB AT port should report "VOICE CALL: END:" , and then the external MPU may run "AT+CPCMREG=0" command to stop transferring the software PCM data on the USB DIAG port.

VOICE CALL: END:
AT+CPCMREG=0

7) When the USB AUDIO mode is not needed, external MPU can run "AT+DSWITCH=0" to switch the USB DIAG port back to the original mode.

Following is the USB AUDIO flow diagram of MO call.

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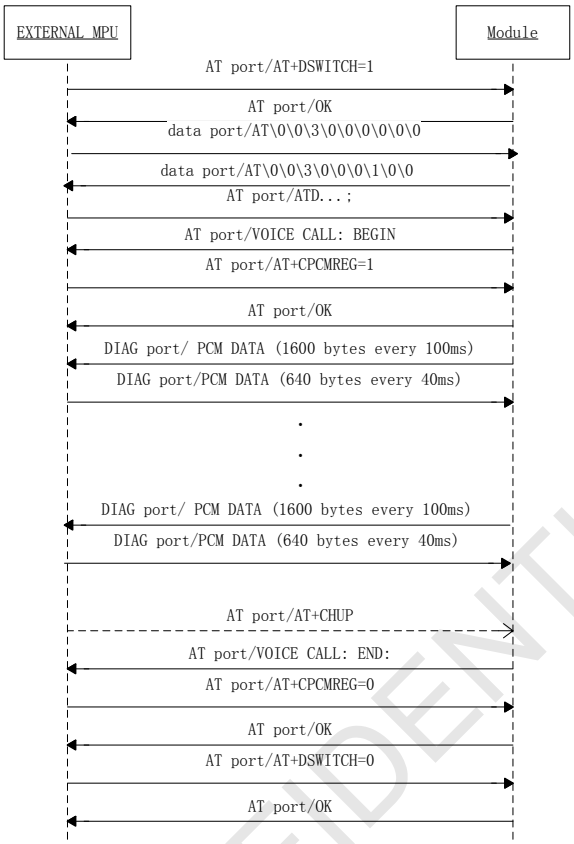

Diagram 2 USB AUDIO flow of MO call

2.4 USB AUDIO flow of MT call

The following commands give an example of MT call for USB AUDIO:

1) External MPU runs "AT+DSWITCH=1" command on the USB AT port to switch the module USB DIAG port to DATA mode.

AT+DSWITCH=1

2) External MPU write data "AT\0\0\3\0\0\0\0\0\0" to data port, and read "AT\0\0\3\0\0\0\1\0\0" from data port.

```
char *pre_data="AT\0\0\3\0\0\0\0\0\0";
bytes=write(tty_fd, pre_data, 11);
```

3) Module reports " VOICE CALL: ALERTING " to indicate that the voice call is connected now. External MPU runs "AT+CPCMREG=1" command to begin the PCM data transferring on the USB DIAG port.

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VOICE CALL: ALERTING

AT+CPCMREG=1

4) Now the external MPU and the module can exchange software PCM data until the call is hung up.

5) When the voice call is hung up, the USB AT port should report "VOICE CALL: END:" , and then the external MPU may run "AT+CPCMREG=0" command to stop transferring the software PCM data on the USB DIAG port.

VOICE CALL: END:

AT+CPCMREG=0

6) When the USB AUDIO mode is not needed, external MPU can run "AT+DSWITCH=0" to switch the USB DIAG port back to the original mode.

Following is the USB AUDIO flow diagram of MO call.

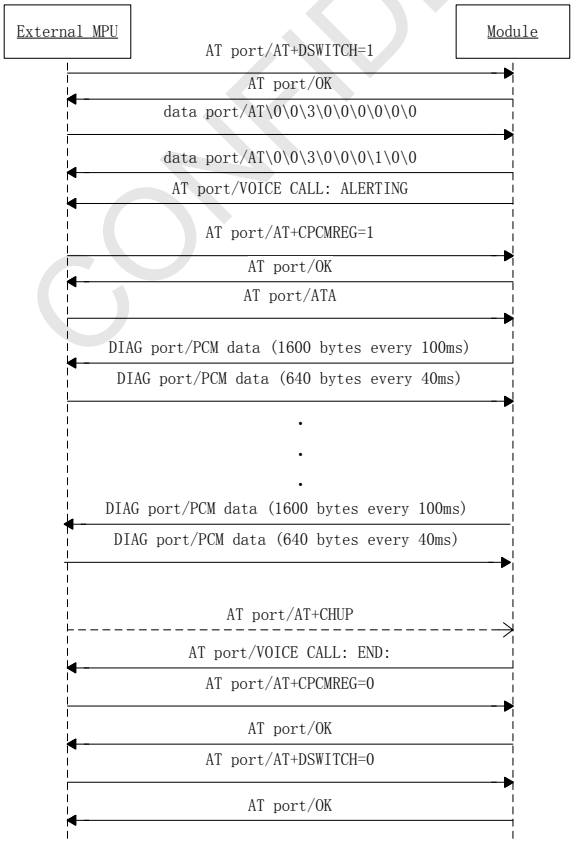

Diagram 3 USB AUDIO flow of MT call

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2.5 USB AUDIO PCM data format

Module to external MPU direction: On USB AUDIO mode, every 100 milliseconds，the module should send a packet of 1600 bytes PCM data to the external MPU, this packet contains 800 PCM samples and each sample occupies 16 bits.

External MPU to Module direction: On USB AUDIO mode, every 40 milliseconds，the external MPU should send a packet of 640 bytes PCM data to the module, this packet contains 320 samples and each sample occupies 16 bits.

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