

# **GSM** Module Audio Design Guide

**GSM/GPRS Series**

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# 4 Appendix A

**Table 2: Reference Document**

NO.	Name	Remark
[1]	M1x_AT_Commands_Manual	AT Commands Manual
[2]	Mxx_Hardware_Design	Hardware Design

**Table 3: Description of ECHO and TDD noise**

Noun	Explanation
ECHO	<p>Talking quality can be obviously affected when echo problem is present. Description of ECHO issue: The far end could hear its own voice from the module side (the near end) is talking.</p> <p>ECHO issue can be caused by the near end of some reasons, such as receiving circuit coupling to the microphone circuit, unsealed mechanical structure, high SPK loud voice, or high sensitivity microphone. ECHO issue has a negative effect on talking.</p>
TDD noise	<p>TDD noise could be present at the far end of the near end while talking. RF power aptitude generates a burst keeping 576us in every 4.615ms. It could be coupling to audio circuit. The envelope curve of the RF burst could be present due to filtering effect and make a noise in the audio circuit path as a constant pulse at 217Hz and its harmonic frequencies. Another of the reason is from the power supply. The burst consumption of current can cause obvious ripple at the supply voltage at 217Hz. If the ripple at the supply voltage conducts to audio circuit through power supply or ground, TDD noise could be present at the far end or the near end.</p>