Abstract—A wearable MP3 player system on a multi-layered common fabric patch is proposed for an unobtrusive usage in daily life. An inductive coupling transceiver is proposed as a wearable wireless connector, and it reduces power consumption below to 185.6μW in total. Also it compensates for the dynamic variation caused by user’s activities within 3.96μs in worst case. The complete system is implemented on a 2-layer fabric substrate, and the music playback process is fully demonstrated.

I. INTRODUCTION

Recently, wearable electronics become popular for healthcare and multimedia applications. To achieve more wearability and easy integration into clothes, a flexible electronics technology named P-FCB is proposed, which is a circuit board technology implemented on the plain fabric patch [1].

In this work, differently from the previous healthcare application of P-FCB, wearable MP3 player system using P-FCB is implemented at the first time. To prevent the system break down during physical attachment and detachment of memory cards, a wearable wireless connector using inductive coupling connection is proposed. Since the previous transceiver already accomplishes the real-time compensation for dynamic variations caused by user [2], it is just modified to achieve higher data rate without more energy consumption in this work.

II. DEMONSTRATION DESCRIPTION

Fig. 1 shows the overall architecture of the proposed wearable MP3 player system. It consists of a microcontroller, MP3 decoder, audio amp, memory card, and the inductive coupling transceiver. One micro SD card is used for data storage. In order to prevent the physical attachment and detachment of the micro SD card which is occurred whenever the file is added or removed, the inductive coupling transceiver is adopted. Real implementation of the proposed system is also shown. The equipment will include only the complete system on P-FCB. In the test system, the music file is added and stored to the micro SD card through the wearable inductive coupling channel. And the songs are played by a microcontroller, MiDAS 2.1, and a MP3 decoder with audio amp, VS1011e. Two speakers are integrated into the system, so the system operation can be demonstrated by auditory sense.

III. VISITOR EXPERIENCE

The proposed system shows the first implementation of the multimedia system on multi-layered P-FCB. With this system, a visitor can play and stop the music, see and touch the P-FCB, and understand what P-FCB is.

IV. CONCLUSION

This demonstration presents a wearable MP3 player system implemented on the multi-layered P-FCB for unobtrusive usage in daily life. The system includes the real-time compensated inductive coupling transceiver as a wearable wireless interface of the memory card with external PC. It can eliminate the physical attachment and detachment of the memory card so that enhance the system reliability. The music playback process of the proposed system is fully demonstrated.

V. TRACK SELECTION

This demonstration would be related to the following topics:

- Circuits and Systems for Wearable Computing
- Multimedia Systems and Applications

REFERENCES
