

2005 Paper 2 Question 10

Structured Hardware Design

A design is required for a battery-operated device that replays stored music through headphones.

- (a) What are the properties of EAROM memories (also known as Flash)?
[4 marks]
- (b) Given that CD quality music is sampled at 44 ksps with 16 bits per stereo channel, and that MP3 compression will be used at a ratio of about 5 to 1, and that three hours storage capacity is required, how much EAROM memory is needed?
[4 marks]
- (c) Ignoring partition of function between silicon chips, sketch a block diagram for a basic design, including any connections, controls and features that are likely to be needed.
[8 marks]
- (d) How many custom chips should be developed for this product and what other custom toolings should be used for a profitable run of 250K production units?
[4 marks]