

BTUM Description and Specifications

For FCC registration

Abstract

This document describes the intended use and overall specification of the BTUM product.

Application

The document is intended for application and registration of the BTUM at FCC. Its user are employees at FCC, 7-Layers, Motorola and Teleca related to the scope of the subject.

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1 Introduction

The BTUM product of Motorola will be launched at the USA market. Hence it needs to receive a certificate by the FCC authorities.

1.1 Purpose

This document is aimed to be an overall product description of the BTUM product together with basic specifications

1.2 Terminology

This chapter explains the abbreviations and terms used in the document.

TBD	To Be Defined
BT	Bluetooth®

1.3 Revision history

<u>Rev</u>	<u>Date</u>	<u>Issued by</u>	<u>Changes</u>
A	2005-01-17	MOd	First release

2 BTUM Description and Specifications

2.1 System Overview

The vehicle's telephone system can be upgraded with the BTUM, a Bluetooth module that enable wireless interaction with the end-users Bluetooth equipped mobile phone. His/her mobile phone must be 'paired' with the vehicle system before use. Once paired, the mobile phone can be operated via a keypad and phone buttons on the audio panel or touch-screen of the vehicle. The mobile phone doesn't need to be physically connected to the vehicle. System can be used for answering or rejecting incoming calls, making outgoing calls or alter the call volume. The system does not support SMS text messages.

The BTUM is the link between the Bluetooth technology and the previous audio/data interface of the telephone system. It consists of a interface for audio data based on FortéMedia Audio DSP FM1073B and a UART interface based on Reprogrammable Connectivity Processor CP3BT26 with Bluetooth, USB, and CAN interfaces for initialization and control. The Bluetooth radio portion is made up from a National Semiconductor Bluetooth chip (LMX5252).

The CP3BT26 is also clocking master of the P2K audio interface towards the telephony system, having 120-3400Hz bandwidth for 8KHz sample rate 78dB SNR.

2.2 General product description:

Bluetooth is a short-range radio link intended to be a cable replacement between portable and/or fixed electronic devices.

Bluetooth operates in the unlicensed ISM Band at 2.4 GHz. In the US a band of 83.5 MHz width is available. In this band, the Bluetooth technology defines 79 RF channels spaced 1 MHz (2402 - 2480 MHz). The actual RF channel is chosen from a pseudo-random hopping sequence through the 79 channels. A channel is occupied for a defined amount of time slots, with a nominal slot length of 625 μ s. The maximum dwell time on one channel is defined by the packet type and is 0.625 ms for DH1 packets, 1.875 ms for DH3 and 3.125 ms for DH5. The nominal hop rate is 1600 hops/s for DH1, 1600/3 for DH3 and 1600/5 for DH5. All frequencies are equally used. The maximum nominal average time of occupancy is 0.4 s within a period of 79*0.4 seconds.

Frequency range (2.402 GHz - 2.480 GHz)
Output power 0dBm (maximum)
RF data format (Gaussian Frequency Shift Key)
Voltage Type: DC
Voltage level: 6.0 V
Op. temp range: -40 to +85 C

3 Clocks Overview

The BTUM product contains two different clock sources;

1. Crystal to the Bluetooth radio with a frequency of 12.000 MHz.

Brand: KDS
Type: DSX321G-12.000M-10-22
Op. temp range: -40 to +85 C
Frequency drift: -21 to +21 PPM (over op.temp range)
Load capacitance: 10pF

2. Crystal to the Digital Signal Processor of Forte Media with a frequency of 18.432 MHz.

Brand: KDS
Type: DSX530GA-18.432M-10-130
Op. temp range: -40 to +85 C
Frequency drift: -21 to +21 PPM (over op.temp range)
Load capacitance: 10pF

Refer to schematic and layout documents of BTUM for implementation information.

4 Power Supply

The BTUM product is fed with 6,4VDC from the Phone System of the car. Out from this BTUM creates a 2,7VDC system supply by an internal voltage regulator;

Regulator: LDO-type, linear voltage regulation.
Brand: National Semiconductor
Type: LP2953IMX SO16
Input spec: Nominal 6,4V, range 5,3V - 6,6V
Output spec: Nominal 2,71V, range 2.65V – 2.75V
Protection: Overvoltage (26V zener diode) and reverse polarity (schottky diode).
No current limitation on board (Voltage source is limited).
Temp range: -40 to +85 C

Refer to schematic and layout documents of BTUM for implementation information.