PEDLMK70-01

OKI Semiconductor

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MK70 Series

Preliminary

Bluetooth™ Module

GENERAL DESCRIPTION

The MK70 series are modules for use in 2.4GHz band Bluetooth systems. The modules incorporate the Oki Bluetooth baseband and RF transceiver ICs, 4 Megabit flash memory and TCXO.
Bluetooth data/voice communications in users' products can be realized with shortest possible design-in time.

FEATURES

- Conforms to Bluetooth Specification Version 1.1
- HCI full module includes Bluetooth Baseband IC & RF transceiver IC, Flash Memory and TCXO
- RF output power: Class 2
- Selectable RF I/O: Internal Chip Antenna or RF Coaxial Connector
- Interfaces: UART, USB and PCM

ABSOLUTE MAXIMUM RATINGS

Items	Specification	Notes
Absolute Maximum Supply Voltage	DC +3.6V	-
Storage Temperature	-20 ~ +70°C	-
Operating Temperature	0 ~ +50°C	-

GENERAL SPECIFICATIONS

Items	Specification	Notes
Conforming Standards	Bluetooth Specification Version 1.1	-
Power Class	Class 2	-
Frequency Range	2402 ~ 2480MHz	-
Number of Channels	79	-
Channel Spacing	1MHz	-
Modulation Systems	GFSK	BT=0.5
Bit Rate	1Mbps	-
Operating Voltage Range	DC +3.3V ±5%	-

MECHANICAL CHARACTERISTICS

Items	Specification
Dimensions	18mm × 39mm × 2.7mm typ. (See Figure-1)
Weight	3.4g typ. (Internal Antenna Type)
Terminal Assignment	See Figure-1

ELECTRICAL CHARACTERISTICS

Current Consumption

Items	Specification	Notes
ACL connection with DH1	105 mA average	-
SCO connection with HV1	115 mA average	-
Inquiry/Paging scan	72 mA average	-
Stand-by mode	3 mA maximum	-

Transmitter Characteristics

Items	Specification	Notes
Output Power 0 ~ +35°C 0 ~ +50°C	 -6 to +4 dBm -7 to +4 dBm	FH off, Burst on Packet type = DH5 Payload = PRBS9, full-length
Frequency Accuracy 0 ~ +50°C	 ±20ppm max.	FH off, Burst on Packet type = DH1 Payload = PRBS9, full-length
Modulation Characteristics Δf1avg:payload=11110000 Δf2max:payload=10101010 Δf2avg/Δf1avg	 140kHz ~ 175kHz 115kHz min. 80% min.	FH off, Burst on Packet type = DH5 Payload = full-length
In-band Spurious Emissions Freq. offset = ±500kHz Freq. offset = ±2MHz Freq. Offset = ±3MHz	 -20dBc max. -20dBm max. -40dBm max.	FH off, Burst on Packet type = DH1, Payload = PRBS9, full-length
Out-band Spurious Emissions 30MHz to 1GHz 1GHz to 12.75GHz 1.8GHz to 1.9GHz 5.15GHz to 5.30GHz	 -36dBm max. -30dBm max. -47dBm max. -47dBm max.	FH off, Burst on Packet type = DH1, Payload=PRBS9, full-length

Receiver Characteristics

Items	Specification	Notes
Sensitivity 0 ~ +50°C	 -70dBm max.	Wanted Signal Setting = see *1 at BER=0.1%
C/I Performance		Wanted Signal Setting = see *1 Interference Signal Setting = see *2 at BER=0.1%
Co Channel	11dB max.	Wanted Signal Level = -60dBm
Adjacent C/I=1MHz	0dB max.	
Adjacent C/I=2MHz	-30dB max.	
Adjacent C/I=3MHz	-40dB max.	Wanted Signal Level = -67dBm
Image Frequency	-9dB max.	
Adjacent 1MHz to In-band Image Frequency	-20dB max.	
Out-of-band Blocking 30MHz to 2000MHz 2000MHz to 2399MHz 2498MHz to 3000MHz 3000MHz to 12.75GHz	 -10dBm min. -27dBm min. -27dBm min. -10dBm min.	Wanted Signal Setting = see *1 Wanted Signal Level = -67dBm Interference Signal Setting = see *2 at BER=0.1%
Intermodulation Characteristics	-39dB min.	Wanted Signal Setting = see *1, Wanted Signal Level = -64dB, Interference Signal f1, f2 Setting, Freq.:2f1-f2=Wanted Signal, |f1-f2| = 3, Mod.:f1= Static Sin Wave, f2 = see *2 at BER=0.1%
Maximum Input Level Input Level = -20dBm	 BER=0.1% max.	-
RX Spurious Emissions 30MHz to 1GHz 1GHz to 12.75GHz	 -57dBm max. -47dBm max.	FH off, Burst on

(*1) Wanted Signal Setting

- FH = off, Burst=on, DH1 packet, Payload = PRBS9 full-length
- Modulation :System = GFSK, Index = 0.32±1%, BT = 0.5±1%
  Bit Rate = 1Mbps±1ppm
- Frequency Accuracy = better than±1ppm

(*2) Interference Signal Setting

- Modulation : System = GFSK, Index = 0.32±1%, BT = 0.5±1%
  Bit Rate = 1Mbps±1ppm, Data = PRBS9
- Frequency Accuracy = better than±1ppm

COVERED FUNCTIONALITY

Baseband as defined in Part B of the Bluetooth Core Specification Ver1.1 including all mandatory features and all optional features, excluding;

- 23channel hopping mode
- SCO links from different Masters
- Optional paging scan modes 1, 2 and 3
- Paging mode R2
- Scatternet

Link Manager as defined in Part C of the Bluetooth Core Specfication Ver1.1 including all mandatory features and all optional features, excluding;

- PARK mode
- Power control
- Channel quality driven data rate
- RSSI
- Broadcast encryption
- Requesting and accepting page mode and page scan mode

INTERFACE DESCRIPTION

RF I/O

- Selectable RF interfaces

RF I/O System	Material
RF Coaxial Connector	U.FL-R-SMT / HRS
Internal Chip Antenna	ANCM12G45 / Murata

Interface Terminal

- Interface Connector

Built-in the Board to Board Connector:

Interface System	Material
Board-to-Board Connector	AXK6F20345 / Panasonic

The connector mating with the above is AXK5F20545 from Panasonic.

- Terminal Description

Name	I/O	Pin No.	Feature
Vdd	-/-	5, 6, 7	DC Power Supply Input DC +3.3V±5%
GND	-/-	15, 16	Ground
UART_RTS	O	1	UART Ready To Send
UART_CTS	I	19	UART Clear To Send
UART_TD	O	2	UART Transmit Data
UART_RD	I	20	UART Receive Data
USB_D+	I/O	12	USB Data +
USB_D-	I/O	9	USB Data -
PCM_OUT	O	4	PCM Data Output
PCM_IN	I	17	PCM Data Input
PCM_CLK	I/O	3	PCM Clock (256kHz)
PCM_SYNC	I/O	18	PCM Sync. Signal (8kHz)
HIC_SEL	I	13	HCI Transport Selection: H: Use USB for HCI Transport L: Use UART for HCI Transport
RESET	I	8	Reset Signal Input Reset = L
XCLK	I	14	Sub-Clock Input 32kHz
N.C.	-/-	10, 11	No Connection

- Terminal Assignment

Please refer to Board Dimensions.

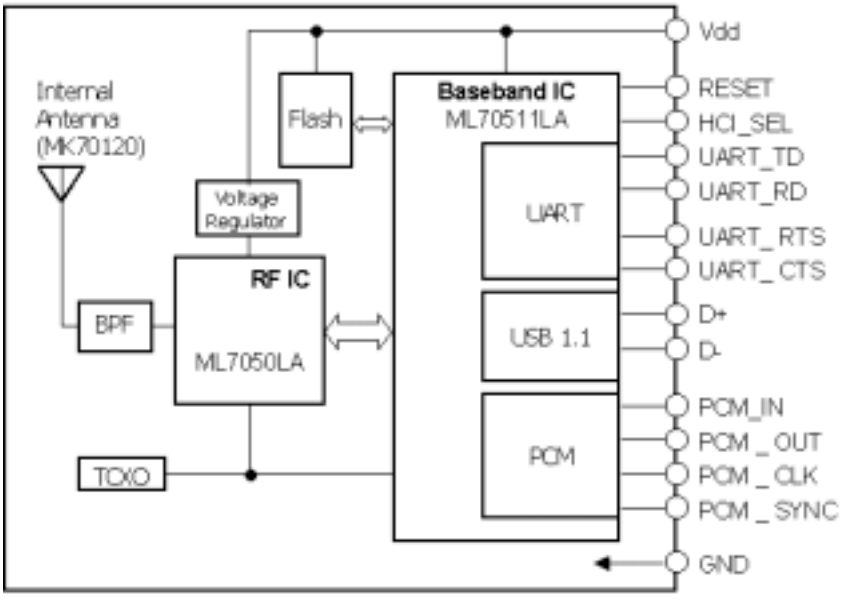
UART/USB/PCM Interface Description

- UART Interface
  Programmable Baud Rate Generator (1200bps to 921.6kbps)

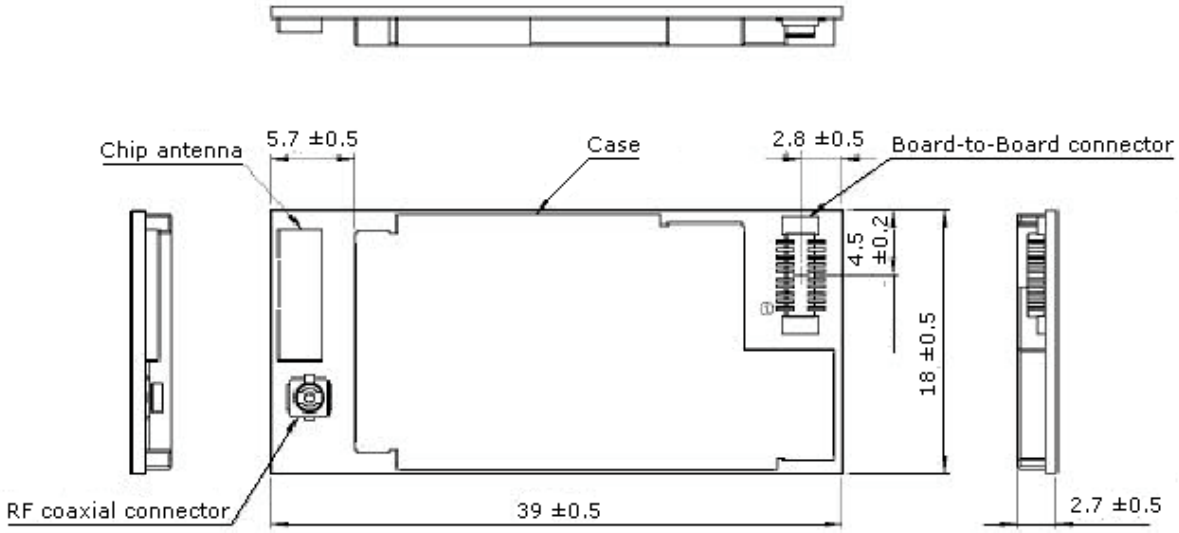
- USB Interface
  Conforms to USB standard Ver1.1
  Supports 12Mbps transfer speed

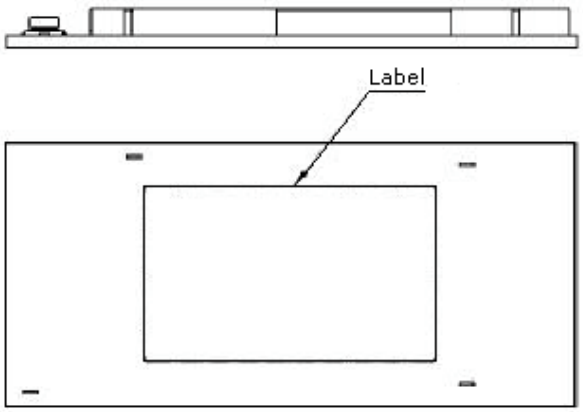
- PCM Interface
  Application-side format:
  PCM linear (8, 16bits/sample, 64kHz sampling frequency) / A-law / μ-law
  Bluetooth-side format:
  CVSD / A-law / μ-law

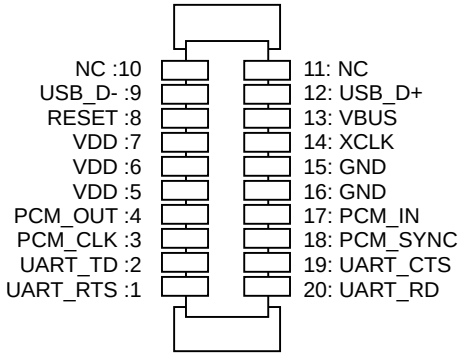
BLOCK DIAGRAM



BOARD DIMENSIONS







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