

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Response to Call for Preliminary Proposal in IEEE802.15.4d Task Group]

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Re: [15-07-0860-02-004d-call-proposals.doc]

Abstract: [Response to Call for Preliminary proposal in IEEE802.15.4d Task Group. Our proposal focuses on low cost and low power consumption.]

Purpose: [To show our preliminary proposal and discuss in IEEE802.15.4d Task Group.]

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Agenda

- Japanese Consultation of 950MHz
- Our approach to IEEE802.15.4d Task Group
- Preliminary proposal for IEEE802.15.4d Task Group

Japanese consultation overview (1/3)

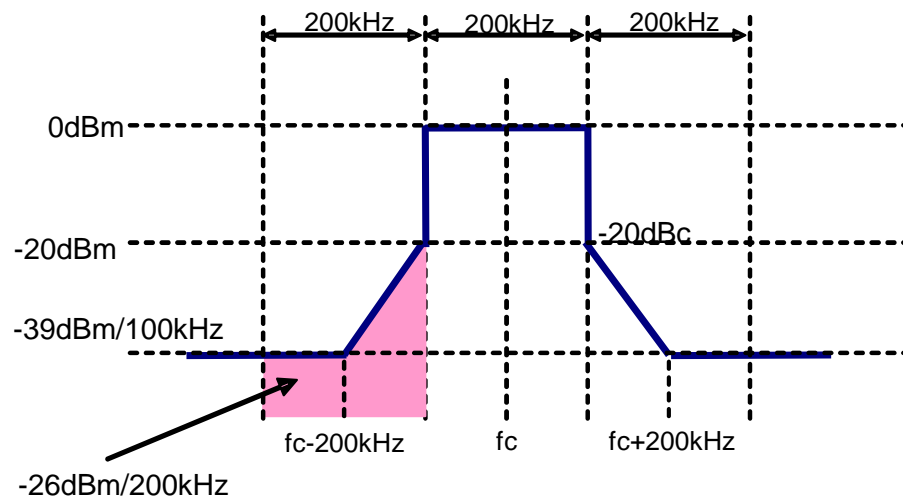
- Frequency band
 - 950.8MHz-955.8MHz (5.0MHz)
- Channel bandwidth
 - $(200 \times n)$ kHz (n is integer from 1 to 3)
- Antenna power
 - 1mW or less for all of unit radio channel
 - 10mW or less for unit radio channels from 954MHz to 955MHz

Japanese consultation overview (2/3)

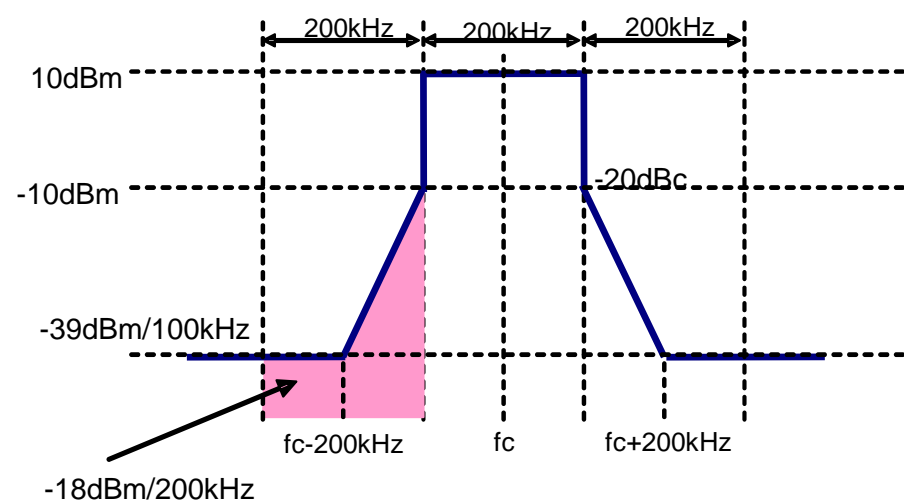
PSD mask

- Level of channel edge: 20dBc
- Power of adjacent channel: less than -18dBm (10mW)
less than -26dBm (1mW)

1mW



10mW

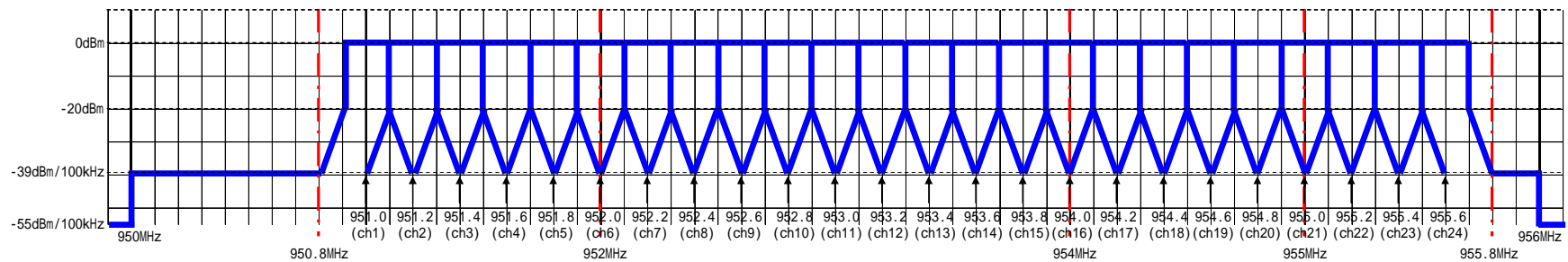


Japanese consultation overview (3/3)

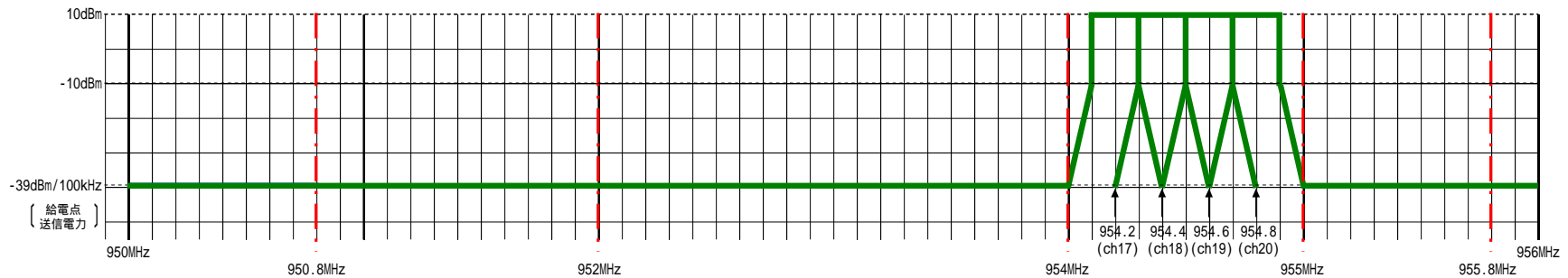
Channel allocation

(200kHz channel allocation)

Antenna power = 1mW



Antenna power = 10mW



Our approach to 802.15.4d

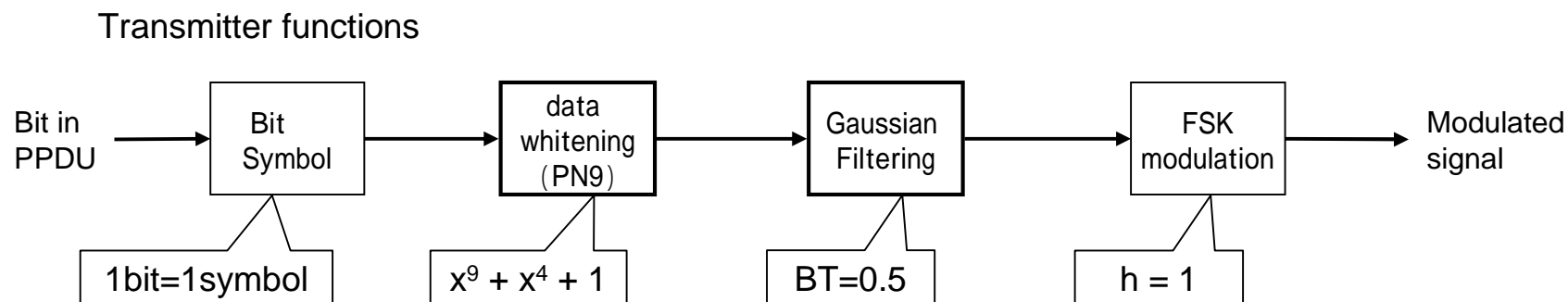
- 802.15.4d is a new PHY for Japanese WPAN that is used by low cost and low power sensor network.
- Low cost and low power consumption have the highest priority.
- Requirement
 - Low cost & Low power consumption
 - Low cost and low power consumption are more important than high data rate
 - Appropriate number of available channels
 - For sensor network applications.
 - Not only 1mW channels but also 10mW channels
 - Requirement of some applications

Preliminary Proposal for TG4d (1/3)

PHY

Modulation parameters					
Channel Bandwidth	Bit Rate (kbit/s)	Symbol Rate (k sym/s)	Modulation type*	BT	Modulation Index (h)
400kHz	100	100	GFSK	0.5	1

(*Our proposal does not use spread spectrum technology)



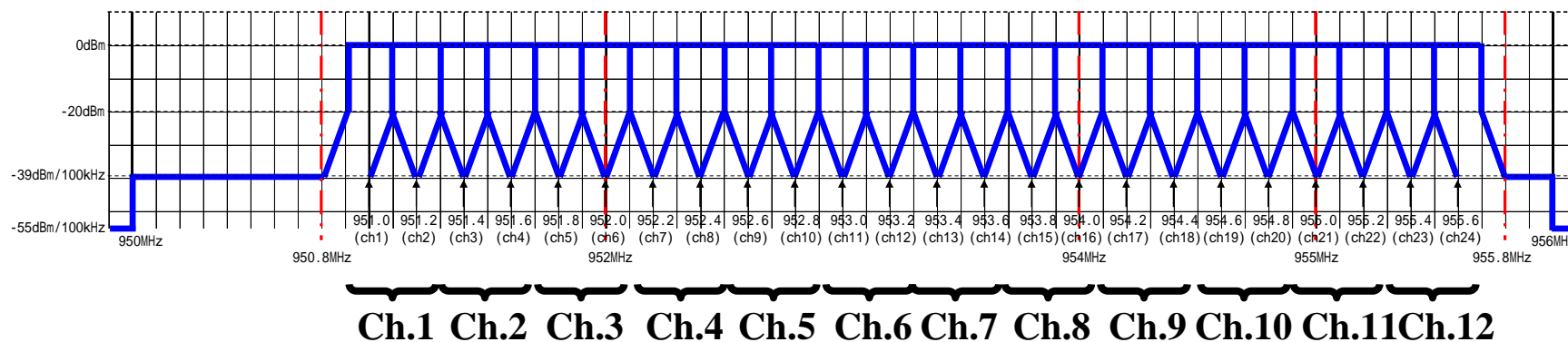
Preliminary Proposal for TG4d (2/3) Preamble & SFD

- Preamble and SFD compatible with 802.15.4b
 - Preamble; 4 bytes
 - SFD; 1byte (11100101b)

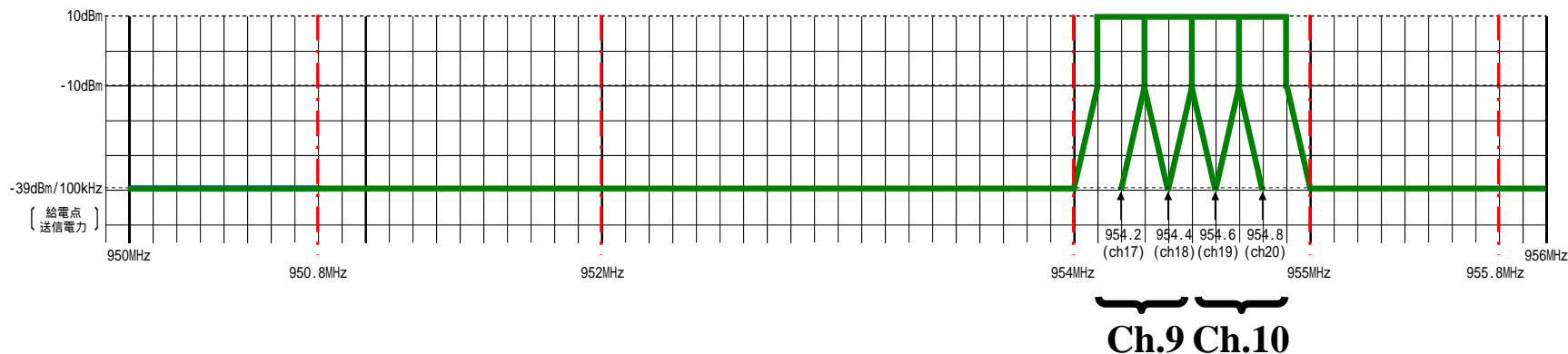
Preliminary Proposal for TG4d (3/3)

Channel plan

Antenna power = 1mW



Antenna power = 10mW



Summary

- Our proposal is a new PHY for the Japanese WPAN that is suitable for low cost and low power consumption sensor networks.
- Low cost and low power consumption have the highest priority.
- Our approach to the 802.15.4d
 - Low cost and low power consumption
 - Modulation = GFSK (BT=0.5), modulation index = 1
 - Appropriate number of available channels
 - Not only 1mW channels but also 10mW channels
 - Bandwidth = 400kHz
 - Data rate = 100Kbps