# 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]
**Date Submitted:** [6-Jan-2008]
**Source:** [Kiyoshi Fukui, Yasutaka Kawamoto] Company [Oki Electric Industry Co., Ltd.]
Address [2-5-7 Hommachi, Chuo-ku, Osaka 541-0053, Japan]
Voice:[+81-6-6260-0700], FAX: [+81-6-6260-0770],
E-Mail:[fukui535@oki.com kawamoto728@oki.com]

**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.]

# Agenda

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

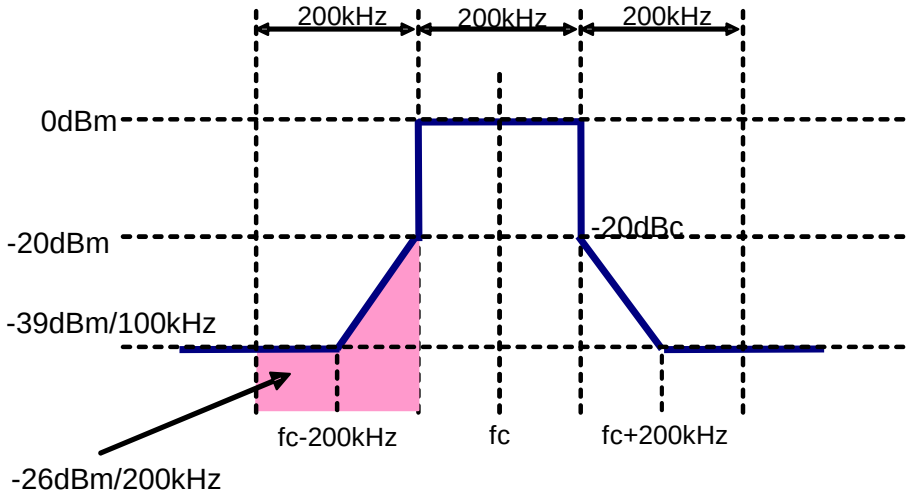
# Japanese consultation overview (1/3)

- Frequency band
  - 950.8MHz-955.8MHz (5.0MHz)
- Channel bandwidth
  - (200 x *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

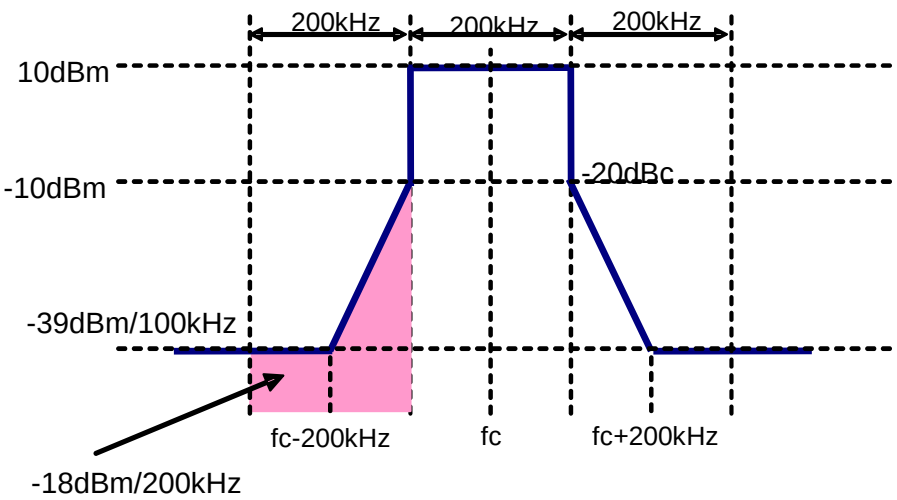
# Japanese consultation overview (2/3)
# PSD mask

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

**1mW**



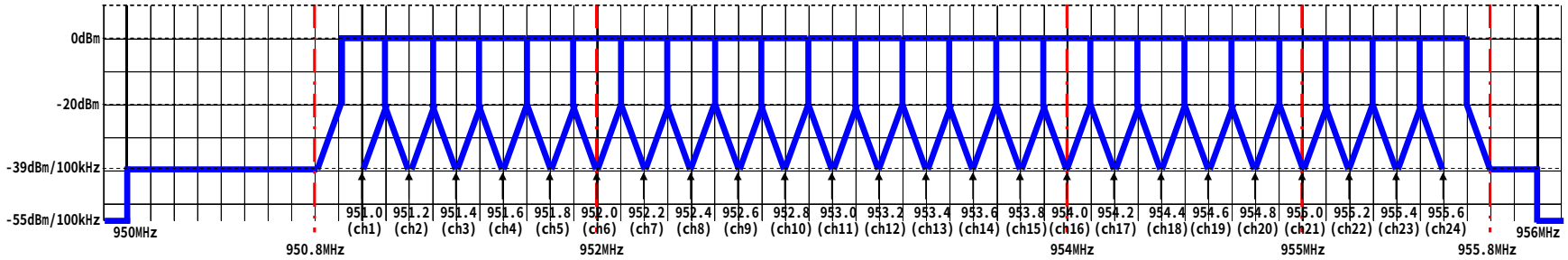

**10mW**



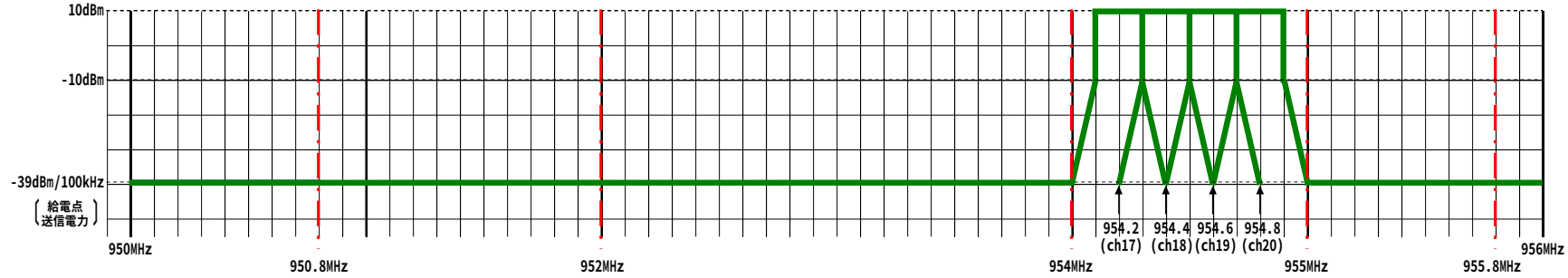
# Japanese consultation overview (3/3)
# Channel allocation

(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.

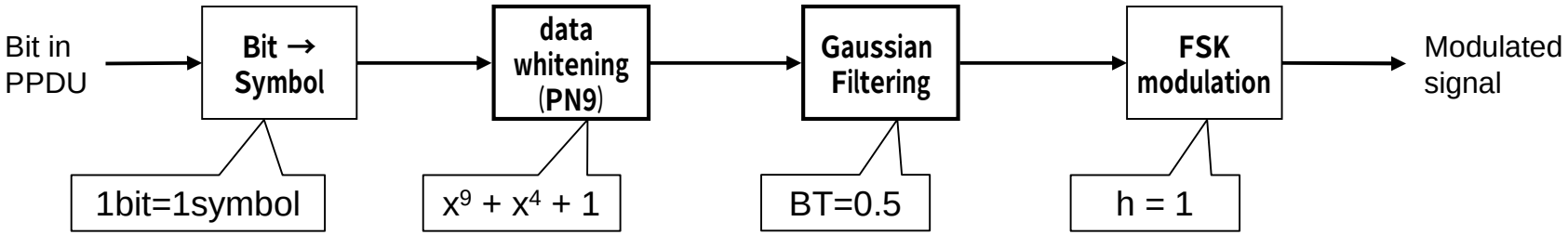
- Requirement
  - Low cost & Low power consumption
    - Low cost and low power consumption are more important than high data rate
  - Appropriate number of available channels
    - For sensor network applications.
  - Not only 1mW channels but also 10mW channels
    - Requirement of some applications

# Preliminary Proposal for TG4d (1/2) 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 |

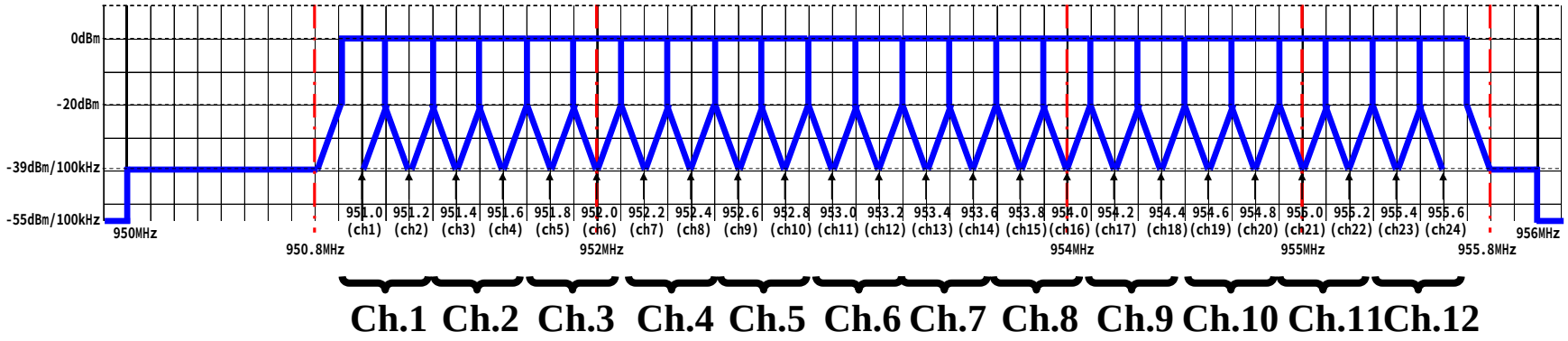
(*Our proposal does not use spread spectrum technology)

Transmitter functions

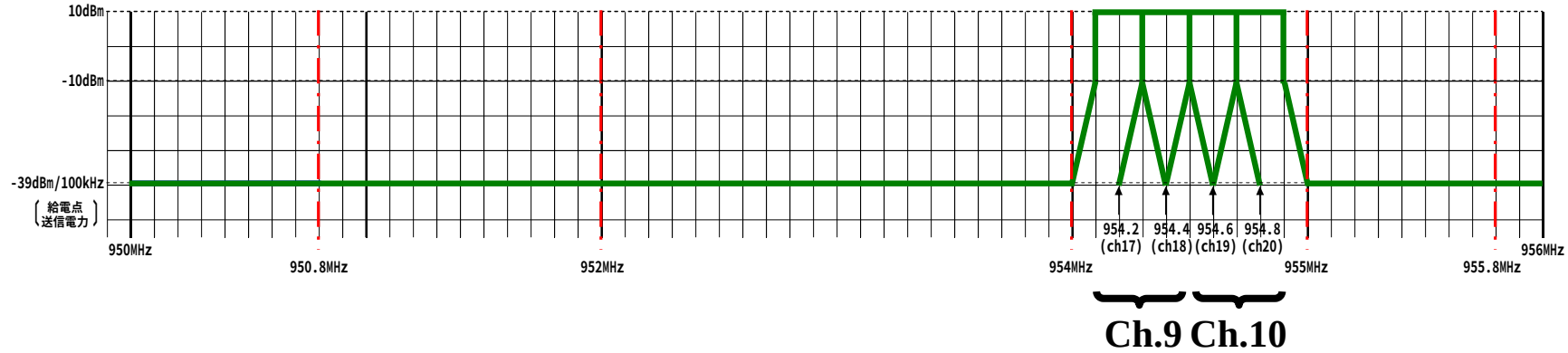


# Preliminary Proposal for TG4d (2/2)
# Channel plan

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