Project: IEEE 802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Current Status of Japanese Regulatory Changes regarding 950MHz Band]
Date Submitted: [15 Mar., 2010]
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Re: [15-09-0739-00-004g-Prospective-Institutional-Changes-regarding-Japanese-950MHz-Band]

Abstract: [Extended 950-958MHz band is about to be available and its corresponding regulatory rules are scheduled to be in effect in a few months, including revised ARIB Standard T-96 which have been discussed simultaneously. Prospective spectral addition of 958-960MHz is not scheduled yet, while the future availability is implied in the consultation document issued this time.]

Purpose: [This submission is intended as an advanced or provisional information before the issue of official ordinance, for all proposers of IEEE802.15.4g PHY amendment project.]

Prospective institutional changes regarding 950MHz band

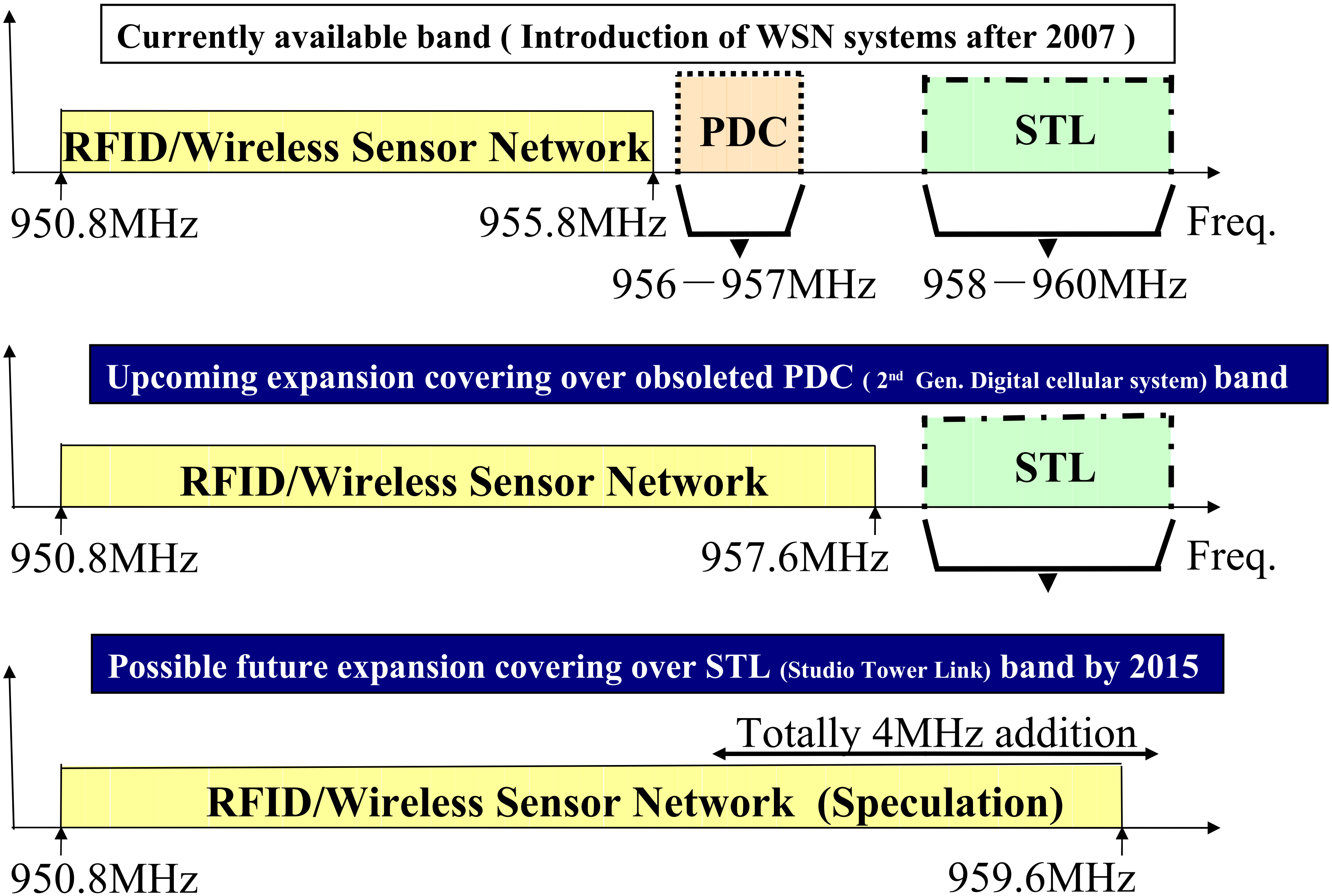
1. Expansion of Japanese 950MHz band
   - 2 step regulatory process:

     Obsolete PDC band first, and possible STL band opened up in future.

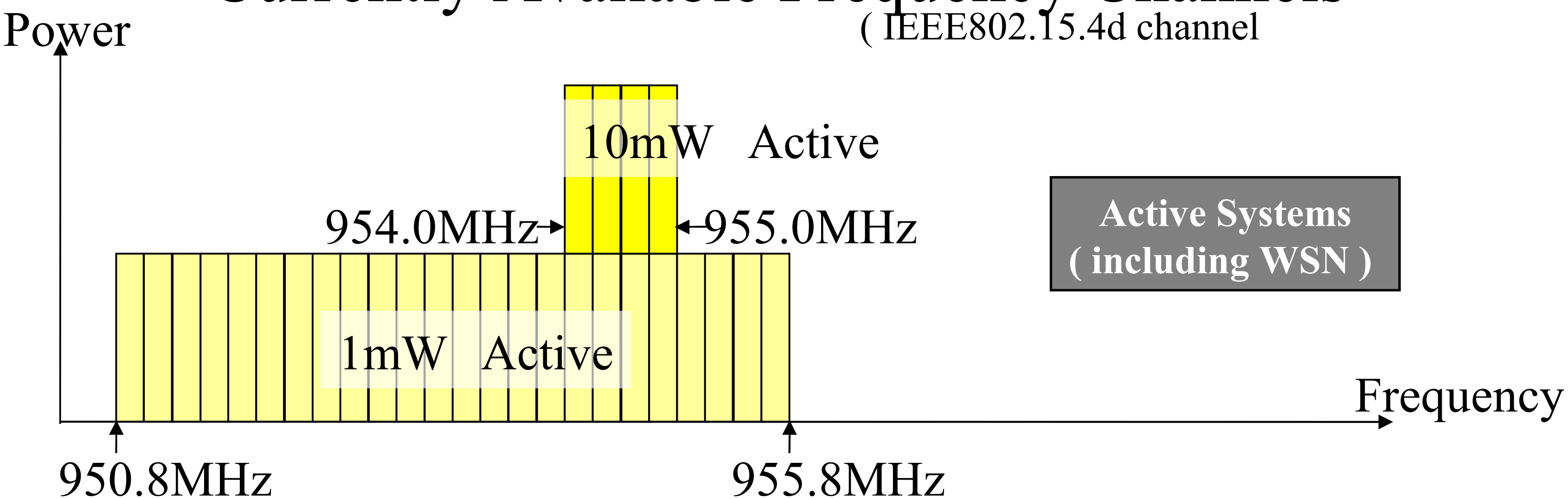
     (together with the introduction of medium power RFID system)
2. Relaxed maximum signal bandwidth
   - Currently 600kHz max. (3 × 200kHz elementary channels)

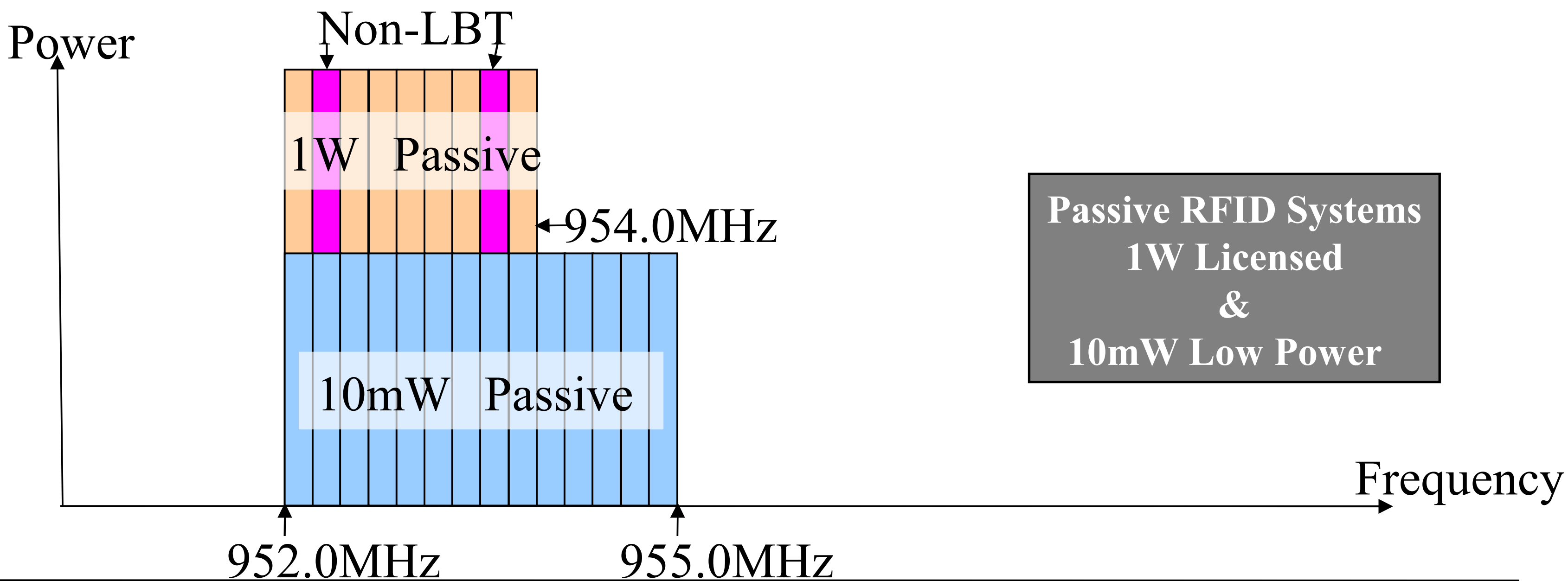
     ⇒ up to 1MHz max. (5 × 200kHz elementary channels)
3. Deregulation regarding 10mW (TX power) systems
   - Increased available channels for 10mW active systems
   - Introduction of 128 us short carrier sense with 100ms TX control
4. Reinforced Spurious Limitation within Aviation Navigation System band
5. Schedule

Expansion of Japanese 950MHz band



Currently Available Frequency Channels





Upcoming expansion of available channels

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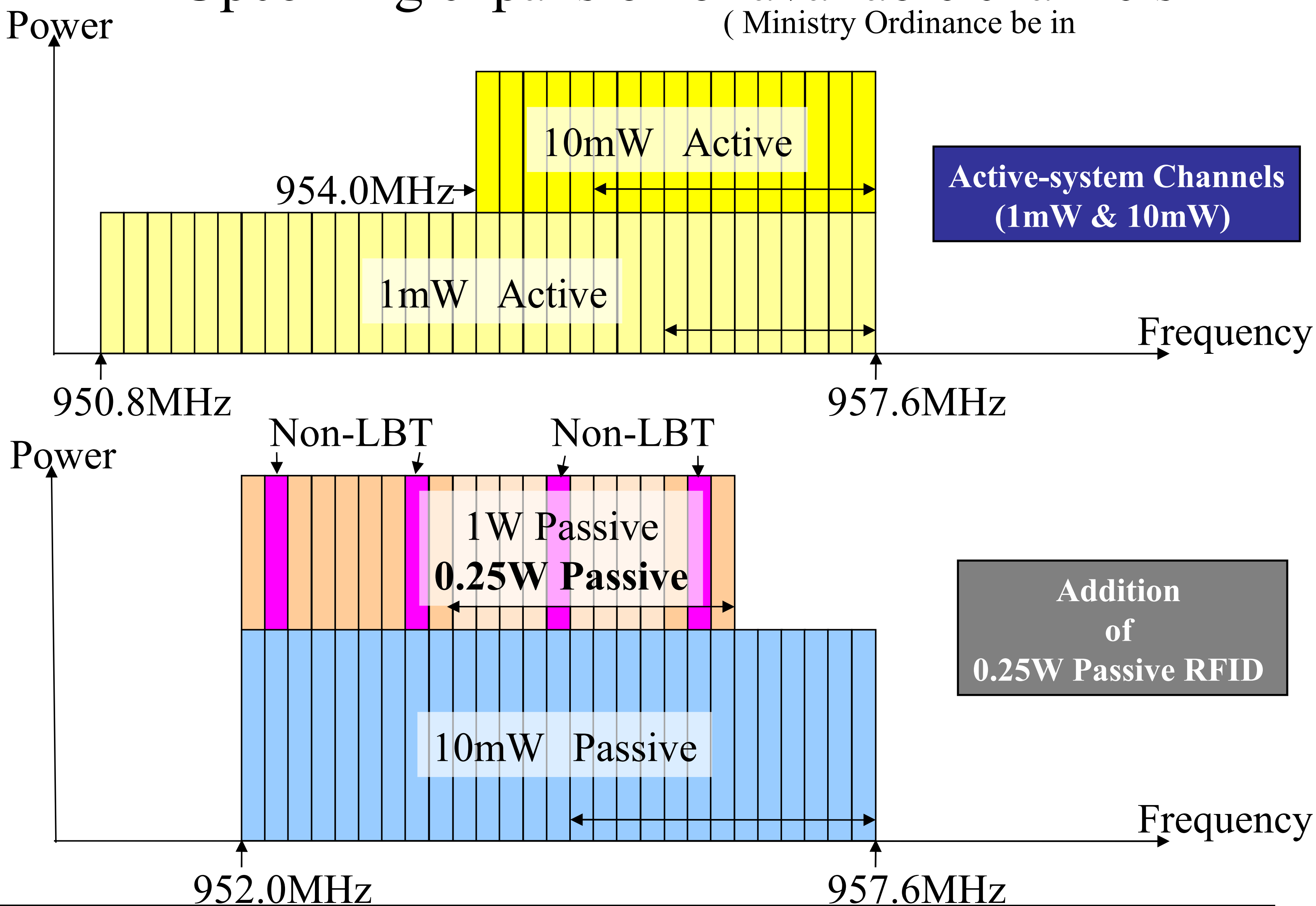
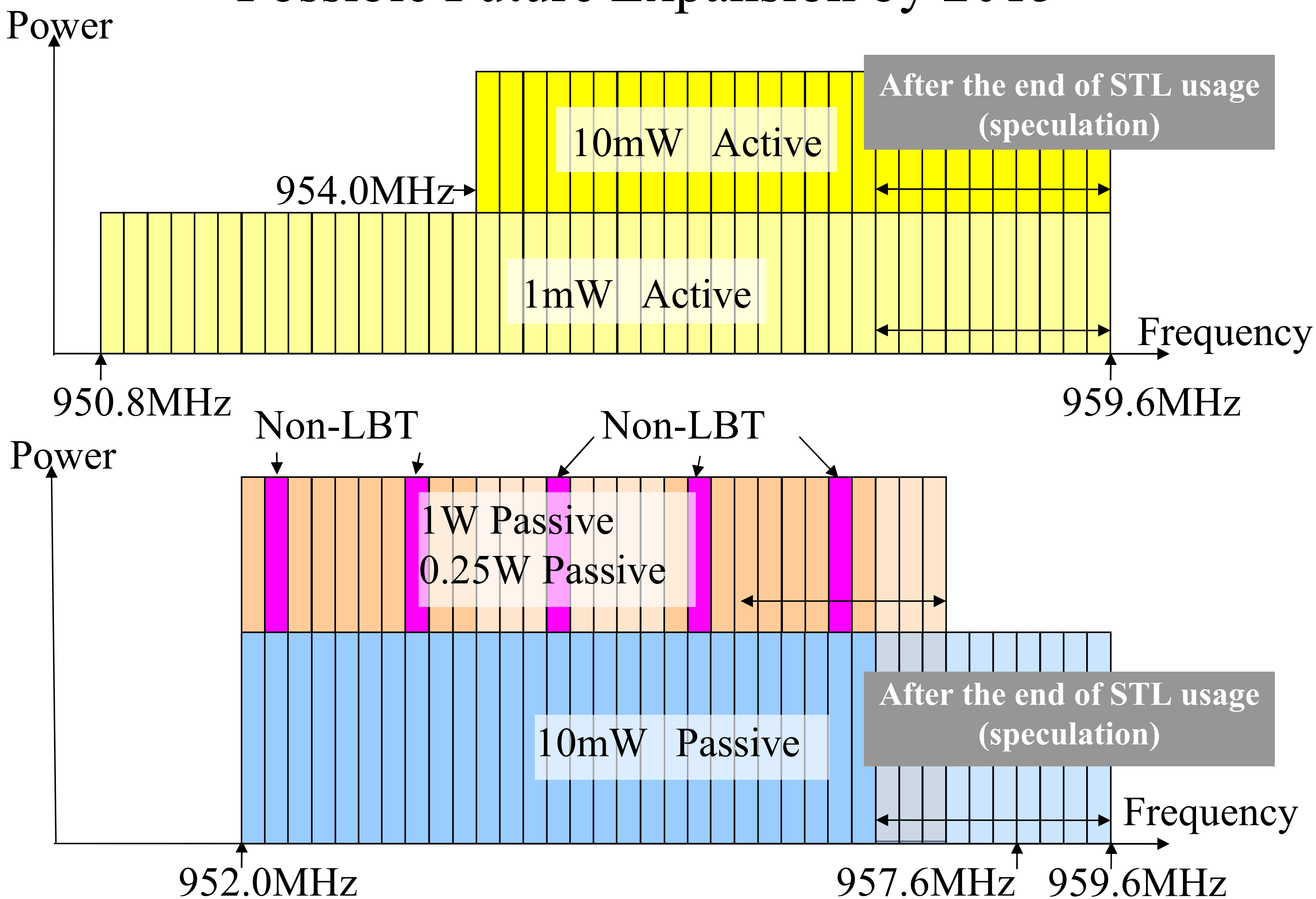


Possible Future Expansion by 2015



[Informative Detail of Channel Assignment & conditions]

Current (2007)

Element Ch (200kHz)	# Center Frequency	Active ID Sensor Net	1W Licensed Passive RFID	10mW Passive RFID
1	951.0			
2	951.2			
3	951.4			
4	951.6			
5	951.8			
6	952.0			
7	952.2			
8	952.4			
9	952.6			
10	952.8			
11	953.0			
12	953.2			
13	953.4			
14	953.6			
15	953.8			
16	954.0			
17	954.2	10mW		
18	954.4	10mW		
19	954.6	10mW		
20	954.8	10mW		
21	955.0			
22	955.2			
23	955.4			
24	955.6			
25	955.8			
26	956.0			
27	956.2			
28	956.4			
29	956.6			
30	956.8			
31	957.0			
32	957.2			
33	957.4			
34	957.6			
35	957.8			
Element Ch (200kHz)	# Center Frequency	Active ID Sensor Net	1W Licensed Passive RFID	10mW Passive RFID

Upcoming (2010)

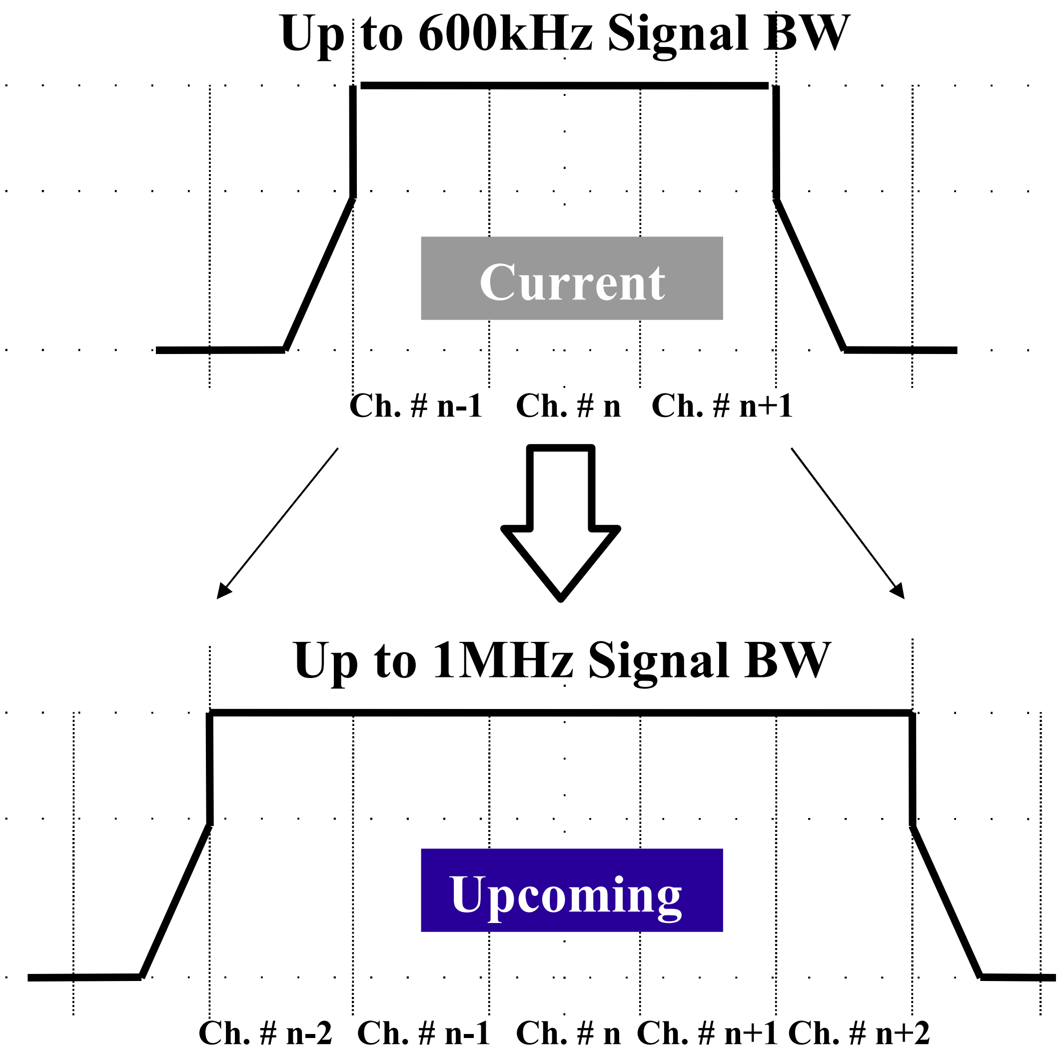
Element Ch (200kHz)	# Center Frequency	Active ID Sensor Net	1W Licensed Passive RFID	10mW Passive RFID
1	951.0			
2	951.2			
3	951.4			
4	951.6			
5	951.8			
6	952.0			
7	952.2			
8	952.4			
9	952.6			
10	952.8			
11	953.0			
12	953.2			
13	953.4			
14	953.6			
15	953.8			
16	954.0			
17	954.2	10mW		
18	954.4	10mW		
19	954.6	10mW		
20	954.8	10mW		
21	955.0	10mW		
22	955.2	10mW		
23	955.4	10mW		
24	955.6	10mW		
25	955.8	10mW		
26	956.0	10mW		
27	956.2	10mW		
28	956.4	10mW		
29	956.6	10mW		
30	956.8	10mW		
31	957.0	10mW		
32	957.2	10mW		
33	957.4	10mW		
34	957.6			
35	957.8			
Element Ch (200kHz)	# Center Frequency	Active ID Sensor Net	1W Licensed Passive RFID	10mW Passive RFID

Speculated (by 2015)

Element Ch (200kHz)	# Center Frequency	Active ID Sensor Net	1W Licensed Passive RFID	10mW Passive RFID
1	951.0			
2	951.2			
3	951.4			
4	951.6			
5	951.8			
6	952.0			
7	952.2			
8	952.4			
9	952.6			
10	952.8			
11	953.0			
12	953.2			
13	953.4			
14	953.6			
15	953.8			
16	954.0			
17	954.2	10mW		
18	954.4	10mW		
19	954.6	10mW		
20	954.8	10mW		
21	955.0	10mW		
22	955.2	10mW		
23	955.4	10mW		
24	955.6	10mW		
25	955.8	10mW		
26	956.0	10mW		
27	956.2	10mW		
28	956.4	10mW		
29	956.6	10mW		
30	956.8	10mW		
31	957.0	10mW		
32	957.2	10mW		
33	957.4	10mW		
34	957.6	10mW		
35	957.8	10mW		
36	958.0	10mW		
37	958.2	10mW		
38	958.4	10mW		
39	958.6	10mW		
40	958.8	10mW		
41	959.0	10mW		
42	959.2	10mW		
43	959.4	10mW		
Element Ch (200kHz)	# Center Frequency	Active ID Sensor Net	1W Licensed Passive RFID	10mW Passive RFID

	CS:128us/-75dBm TX:100ms with 100ms pause (10% DC). or CS:10ms/-75dBm TX:1s with 100ms pause (100%(No) DC). or without CS (0.1% DC and 1mW TX Power)
10mW (obsolete)	1mW: Same as above 10mW: CS:10ms/-75dBm TX:1s with 100ms pause.

Relaxed Maximum Signal Bandwidth



[Background]

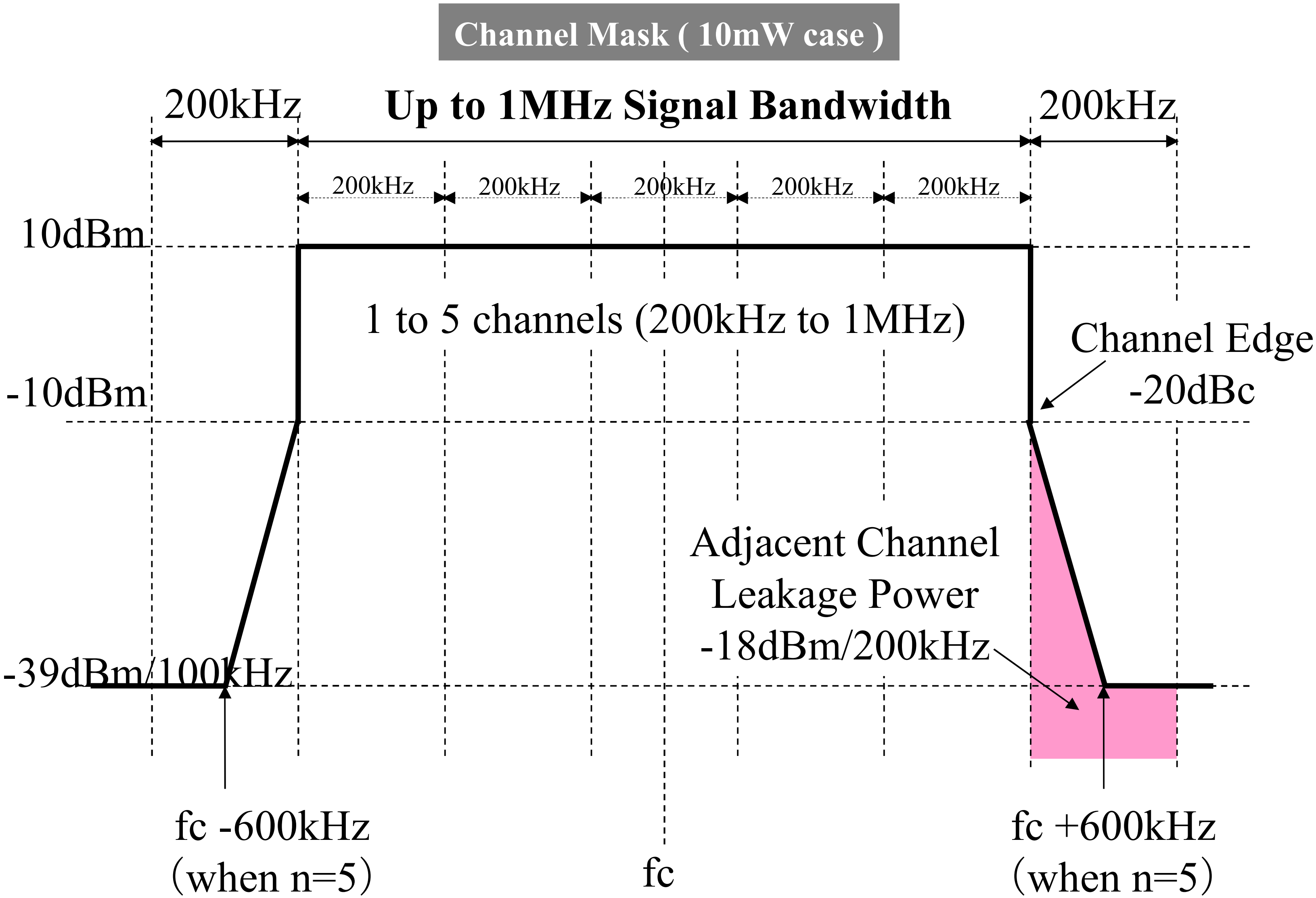
Traffic per node is small in WSN, but the commissioning stages and security provisioning phase of operation require higher link capacity.

15.4g PAR states 1500 octet payload is required to be accommodated in a frame and this facilitate the transaction of node or network authentication and the exchange of certificate and temporal keys.

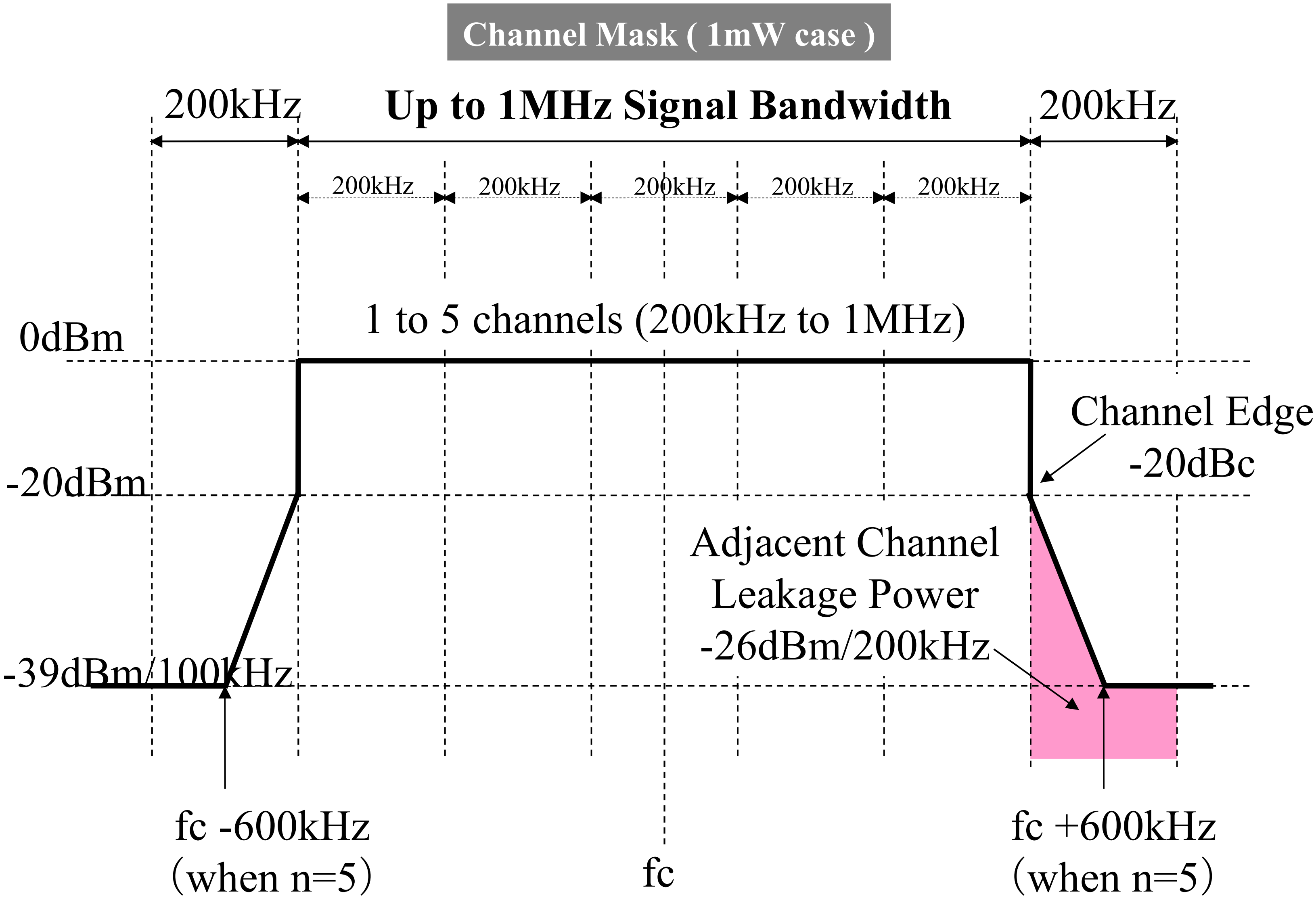
[Purpose]

Up to 1MHz signal BW is able to accommodate 1500 octet payload with realistic TX duration by using higher bit rate, and finally contributing to the security enhancement as well.

Relaxed Maximum Signal Bandwidth



Relaxed Maximum Signal Bandwidth

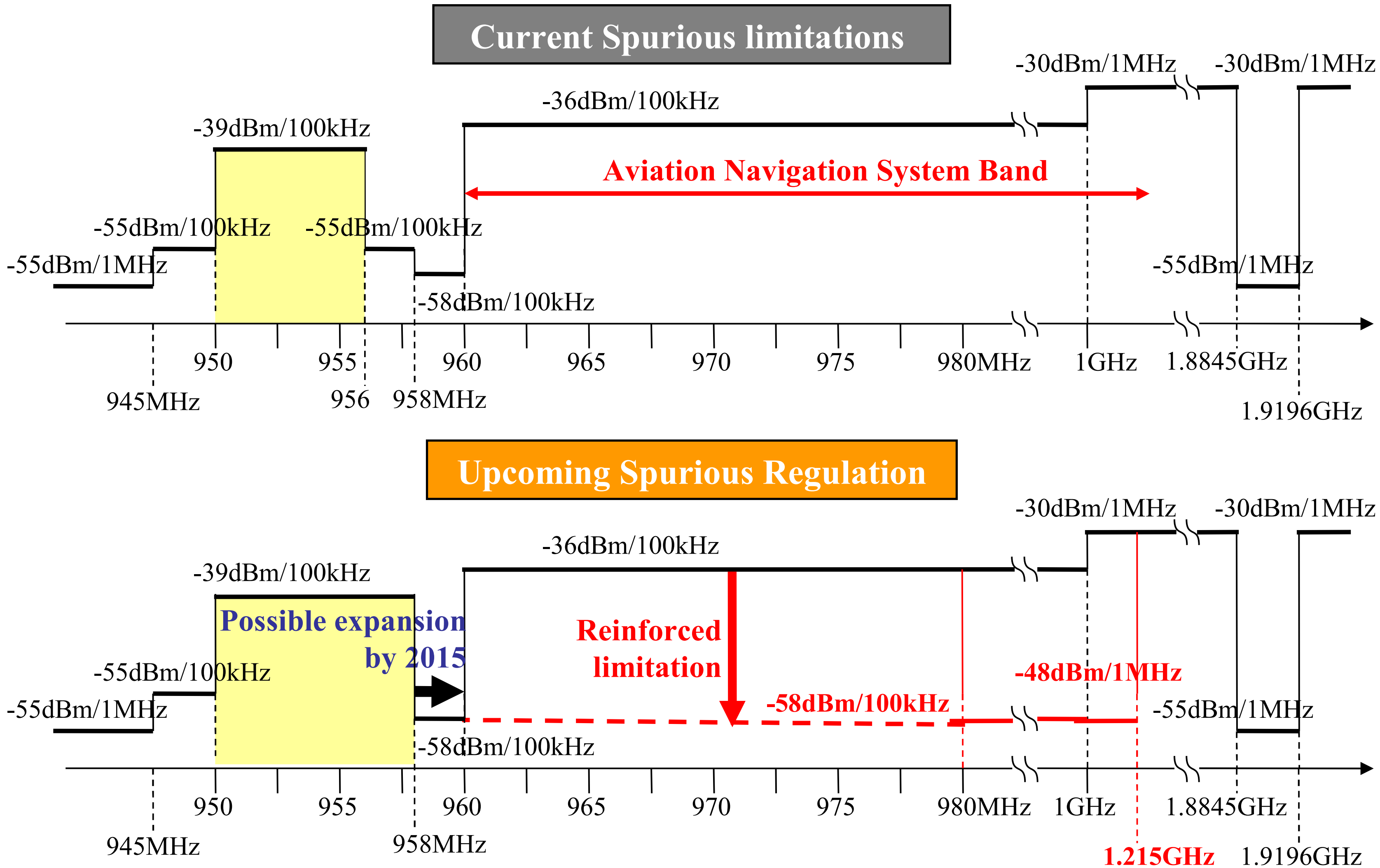


Summary of Technical Requirement

Channel Access Conditions for various system categories

System Categories	Duty Cycle Control	Carrier Sense Requirement	TX Requirement	Available Channels by law ordinance (Co-existence practice recommended by ARIB Std.)
1mW Active ID/WSN	0.1%	Not required	TX 100ms with 100ms Pause	1-33Ch. (yield 7-19, if in use)
	10%	128us -75dBm/Combined Ch.	TX 100ms with 100ms Pause	1-33Ch. (yield 7-19, if in use)
10mW Active ID/WSN	10%	128us -75dBm/Combined Ch.	TX 100ms with 100ms Pause	17-33Ch. (yield 17-19, if in use)
	100%	10ms -75dBm/Combined Ch.	TX 1s with 100ms Pause	17-33Ch. (yield 17-19, if in use)
10mW Passive RFID	10%	128us -64dBm/Combined Ch.	TX 100ms with 100ms Pause	21-33Ch.
	100%	10ms -64dBm/Combined Ch.	TX 1s with 100ms Pause	7-33Ch. (yield 7-19, if in use)
250mW Passive RFID	100%	5ms -74dBm/Combined Ch.	TX 1s with 100ms Pause	7-27Ch. (yield 19-27 as long as possible)
1W Passive RFID Registered	100%	5ms -74dBm/Combined Ch.	TX 4s with 50ms Pause	7-27Ch. (yield 19-21 as long as possible)
1W Passive RFID Licensed	100%	Not required	Without TX control	8, 14, 20, 26Ch (yield 26 as long as possible)

Reinforced Spurious Regulation



Schedule

2009 Nov. first week	MIC Telecommunication Council WG Approval (Draft consultation)	**Completed**
2009 Nov. second week	MIC Telecommunication Council Approval (Solicitation of public comments)	**Completed**
2009 Nov. 13 to Dec. 13	Submission period for Public Comments	**Completed with no objection**
2009 Dec. second week	MIC Telecommunication Council Approval (Final draft consultation)	**Completed**
2009 Dec. third week	Completion of Consultation	**Completed**
(2010 January to March)	ARIB discretionary standardization process	**Almost completed**
2010 March to April	MIC Radio Administration Council Approval (TELEC test procedure)	**Almost completed**
2010 May to June	Notification of Law Ordinance	**Scheduled on time**

END