

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

Submission Title: [ZES UWB Band Plan Proposal]

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Re: [Band Plan Proposal for UWB RFID PHY.]

Abstract: [This document proposes a simple band plan that allows a single tag to be used throughout North America, the EU, and China, with an alternate band for Korea and other countries that require frequencies above 7 GHz.]

Purpose: [To resolve outstanding issues on the current baseline proposal]

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UWB PHY Band Proposal

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Background

- This presentation is provided to foster further discussions introduced in documents
802.15-10-0147-00-004f and
802.15-10-0148-00-004f

Goals

- Primary
 - Compliance with regional radio law
 - Maximize value of new, and changes to, regional radio law
 - Provide cost effective approach to promote accelerated growth to UWB in RFID/RTLS industry
 - Co-exist with current standards
- Additional Goals
 - Allow 802.15.4a interoperability with minimal performance trade-offs
 - Provide path to lowest cost tag

Consistency with Regional Radio Law

- Compliance Only Possible in Regions that have Defined Laws
- “Early Adopter” Countries Serve As Models For Countries Which Do Not Yet Have Rules
 - ETSI and FCC standards serve as guides to many countries regulatory agencies
- Standards Influence Changes in Local Radio Law
 - Japan adopted 2.400-2.483 GHz after IEEE 802.11 was published
 - Move from 2.470-2.497 GHz
 - South Korea adopted “Wide Band” DSSS rules allowing 80 MHz DSSS after publication of ISO 24730-2
 - Expansion from maximum bandwidth of 26 MHz

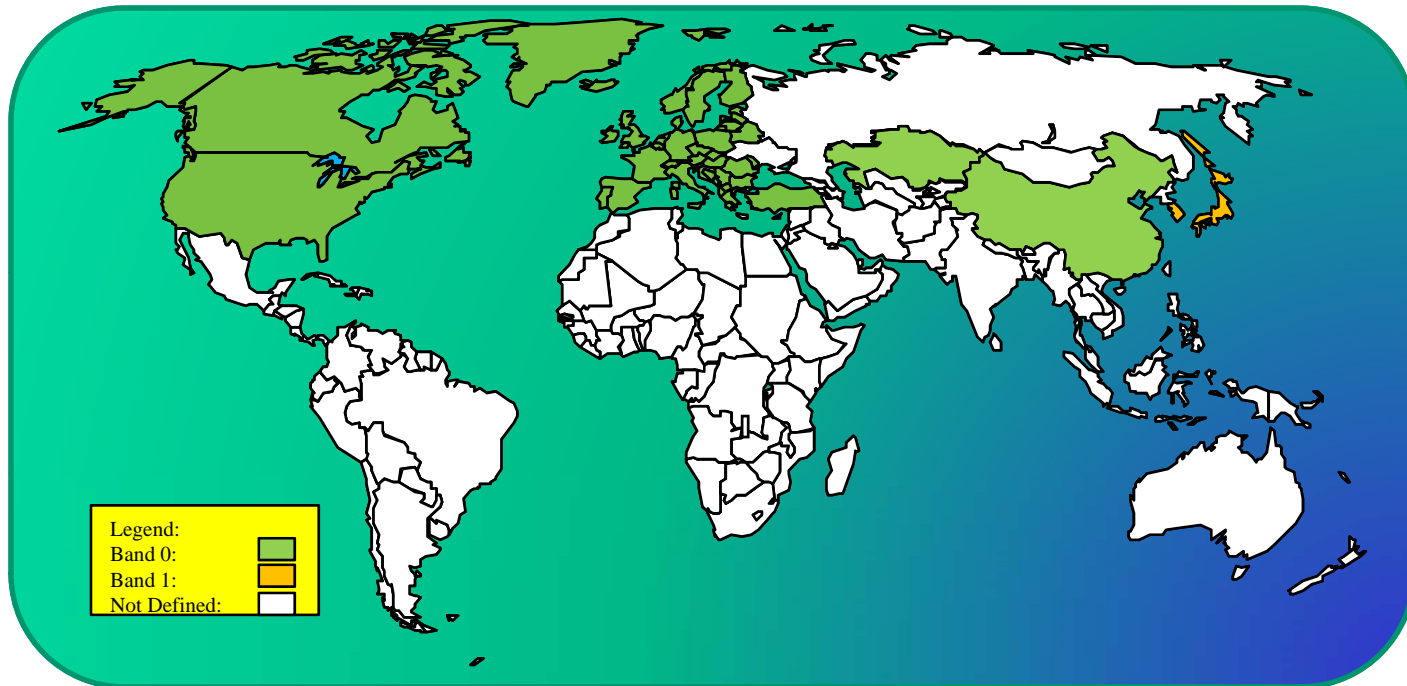
Maximize Value of Changes in Radio Law

- New Rules Provide the Ability to Find “Sweet Spots” of Commonality
- During Development of 4a
 - EU rules were not yet set
 - Chinese Rules were not yet set
 - Canadian rules were not yet set
- The Establishment Of These Rules Afford An Opportunity That Was Not Available To Members Of The 4a Committee

Accelerate Growth of UWB in RFID/RTLS Industry

- Key Premises
 - Standardization is conducive to market growth
 - RFID Standards that allow passage across international boundaries have widest applicability and desirability
 - Key 4f goal is to foster international adoption of RFID devices for rapid market growth
 - Low cost tags are a vital component to rapid market growth
- Cost Components
 - High volume, single product manufacturing is key to low cost
 - Multiple bands requires multiple products or higher cost multiple frequency transmitters
 - Lowest cost tags are single frequency devices
- Key Assertions
 - Single frequency tags are not conducive to remote frequency changes
 - PHY standards with multiple bands have less value than single band standards
 - 1 Band would be optimal, but is not attainable at this time
 - ...But 2 is better than 3 and provides a potential path to 1
 - International adoption of a single frequency will be hampered by more bands
 - Single frequency, high volume product is less costly than a filter

Commonality Possible with 2 Bands



- ~ 37.5% of World Population has UWB Regulations Defined
- ~ 35% of World Population can be accommodated by 1 Band
- 93 % of Currently Available Market by Population Can Use 1 Band

Band Plan Recommendation

- Band 0 – 6.55 GHz CF, 570 MHz -10 dB Bandwidth
 - Allows single tag that provides maximum compliance compatibility – NA, EU, China
 - Filtering can be achieved at very low cost
 - Filtering assures minimum interference to 802.15.4a UWB systems
 - > 500 MHz Band width assures compatibility with efforts to redefine UWB in EU as minimum of 500 MHz
- Band 1 – 7.75 GHz CF, 570 MHz -10 dB Bandwidth
 - Lowest common frequency for maximum range
 - Would no Require DAA in the EU
 - Allows single tag that can be compatible throughout Asia and the EU
 - + Items 2-4 from above