



DSP Research Inc.

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# Wireless LAN Technical Requirement

A decorative graphic consisting of a vertical black line on the left side, intersecting a horizontal black line. To the left of the vertical line are three overlapping squares: a blue one at the top, a red one in the middle, and a yellow one at the bottom. The horizontal line extends across the width of the slide.

IEEE 802.11b/g/a, Bluetooth  
Technical Standard  
under the Japanese Radio Law

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## Low Power Data Comm. Sys.

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- 2.4GHz Wide-band: *802.11b/g (1-13ch), Bluetooth*
  - 2400 – 2483.5 MHz
- 2.4GHz: *802.11b (14ch)*
  - 2471 – 2497 MHz
- 5GHz: *802.11a (W52, W53)*
  - 5180, 5200, 5220, 5240 , 5260, 5280, 5300, 5320MHz



# ARIB Standard

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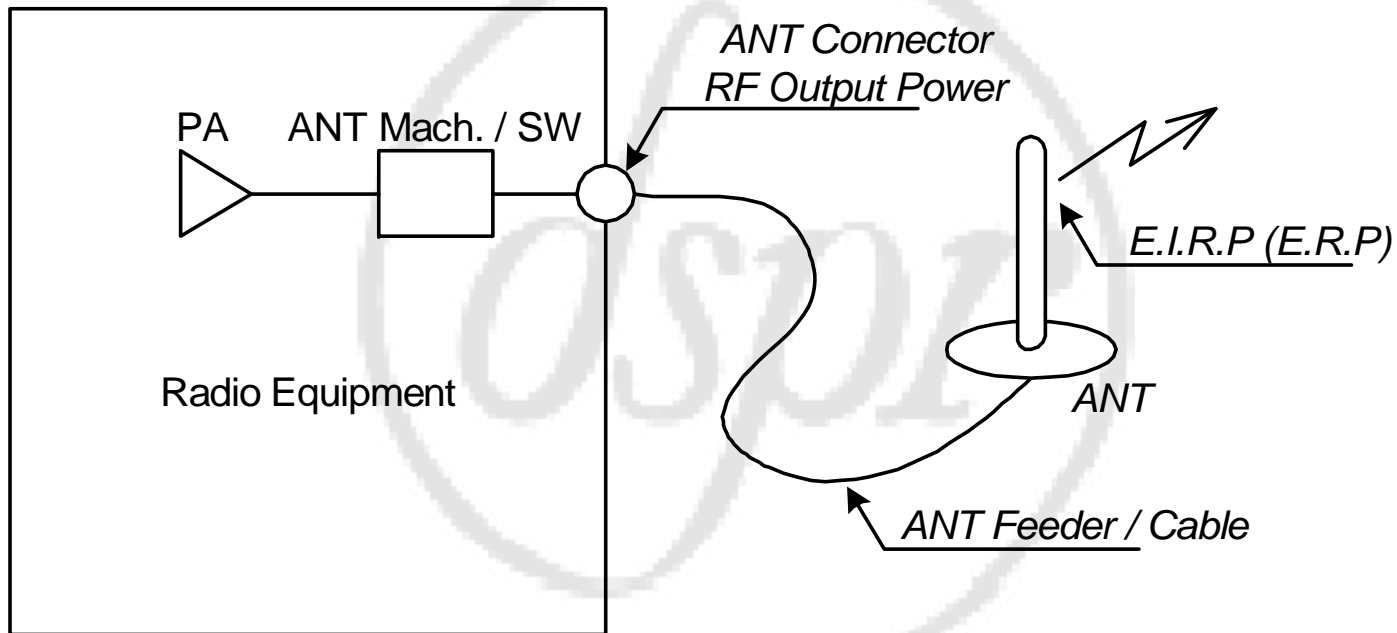
Regulation	IEEE	ARIB Std.	
2.4 GHz Wide-Band Data Comm.	802.11b/g	ARIB STD-T66	Include Bluetooth
2.4 GHz Band Data Comm.	802.11b	RCR STD-33	14ch only
5 GHz Band Data Comm.	802.11a	ARIB STD-T71	CSMA W52, W53

ARIB: Association of Radio Industries and Businesses

HiSWAN: High Speed Wireless Access Network

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# RF Output Power & E.I.R.P



E.I.R.P: Effective (Equivalent) Isotropic Radiated Power

E.R.P: Effective Radiated Power

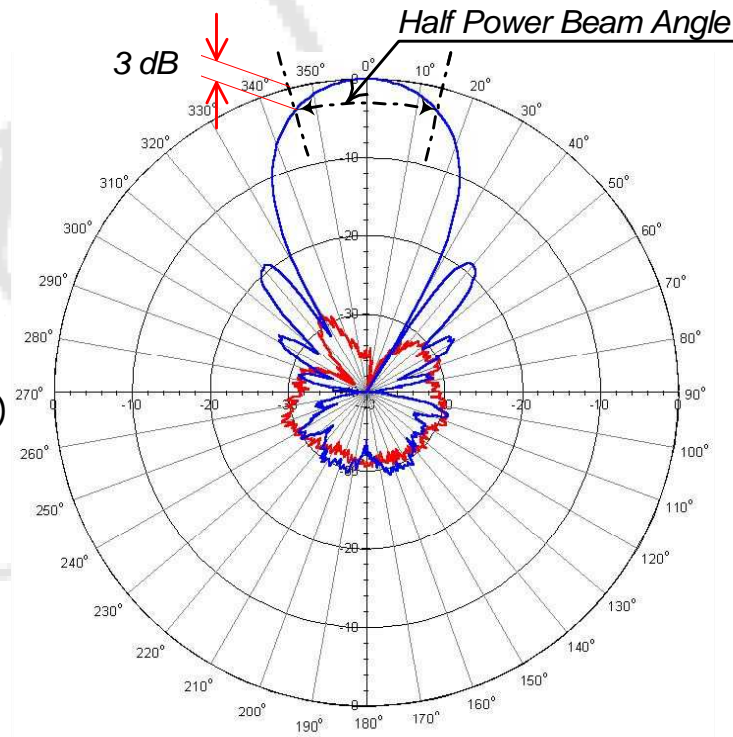
# Directional Antenna

- 2.4 GHz Wide-band Data Comm. Sys.

- E.I.R.P allowed over 12.14 dBm/MHz

$$HPBA < 360/A$$

$$A = E.I.R.P(dBm/MHz) - 12.14(dBm/MHz)$$



## 2.4 GHz Wide-band Data Comm. Sys.

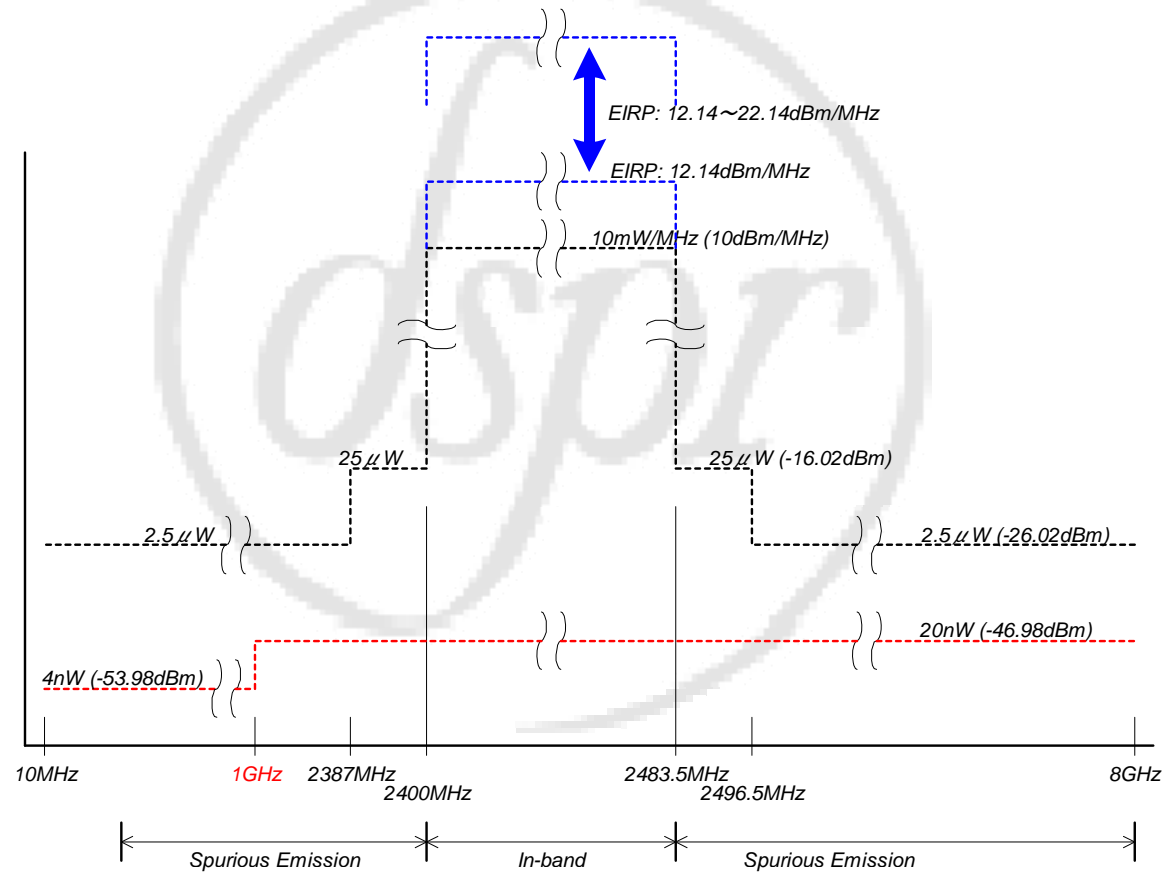
- 802.11b/g (allowed Digital Data Transmission only)

e.g. DSSS Wireless LAN (802.11b), OFDM Wireless LAN (**802.11g**), FHSS Bluetooth etc..

Allocated 2400 to 2483.5 MHz

Frequency Tolerance:	$\leq 50$ ppm	
Occupied Band Width:	$\leq 26$ MHz for DSSS or,	$\leq 83.5$ MHz for FHSS ( <b>Bluetooth</b> )
Spread Band Width:	$\geq 500$ kHz &	5 Spreading Factor
Output Power:	$\leq 10$ mW/MHz	
ERP:	$\leq 12.14$ dBm/MHz or,	$\leq 22.14$ dBm/MHz
Output Power Tolerance:	+20%, -80%	
Spurious Emission:	$\leq 2.5$ $\mu$ W	2387 MHz > f, 2496.5 MHz < f
	$\leq 25$ $\mu$ W	2387 $\leq$ f < 2400 MHz
		2483.5 < f $\leq$ 2496.5 MHz
Emitted RF wave Strength:	$\leq 4$ nW	f < 1GHz
	$\leq 20$ nW	1 GHz $\leq$ f
Dwell Time	$\leq 0.4$ sec.	for FHSS ( <b>Bluetooth</b> ) only
Carrier Sense & Identification code		

# 2.4 GHz Wide-band Data Comm. Sys.



## 2.4 GHz Band Data Comm. Sys.

- 802.11b (allowed Digital Data Transmission only)

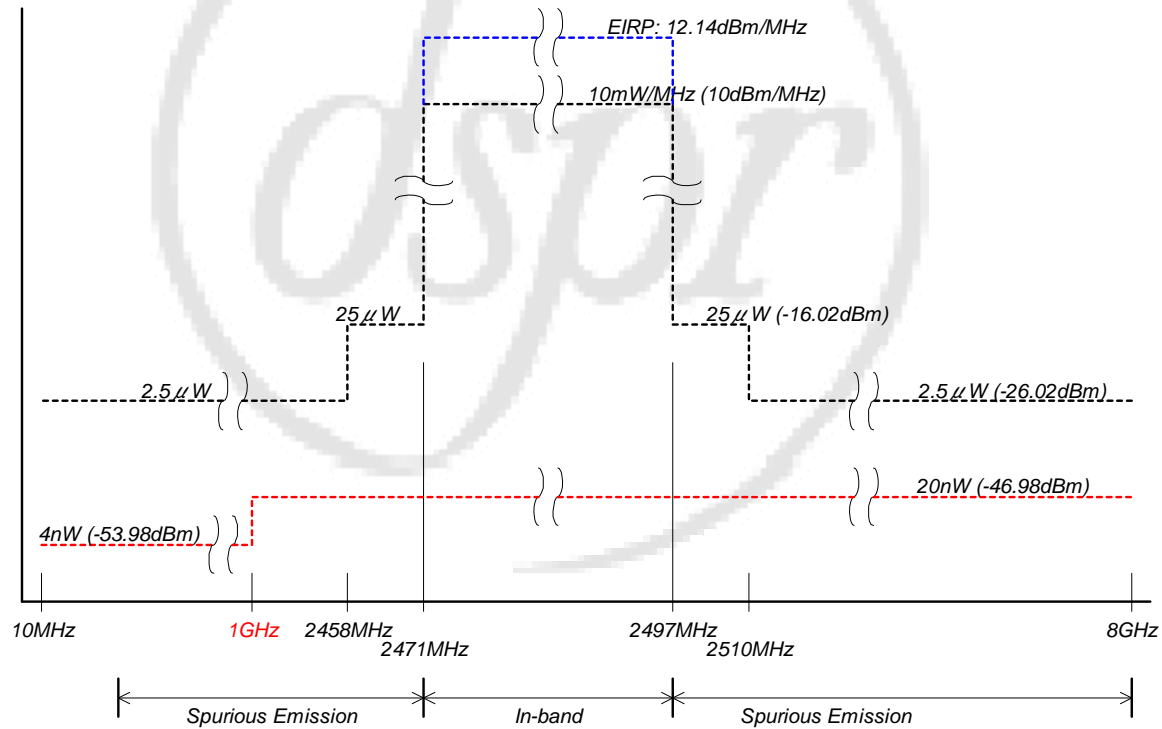
e.g. DSSS Wireless LAN (802.11b), FHSS etc..

Allocated 2471 to 2497 MHz

Frequency Tolerance:	$\leq 50$ ppm	
Occupied Band Width:	$\leq 26$ MHz	
Spread Band Width:	$\geq 500$ kHz &	<b>10 Spreading Factor</b>
Output Power:	$\leq 10$ mW/MHz	
ERP:	$\leq 12.14$ dBm/MHz	
Output Power Tolerance:	+20%, -80%	
Spurious Emission:	$\leq 2.5$ $\mu$ W	2458 MHz > f, 2510 MHz < f
	$\leq 25$ $\mu$ W	2458 $\leq$ f < 2471 MHz
		2497 < f $\leq$ 2510 MHz
Emitted RF wave Strength:	$\leq 4$ nW	F < 1 GHz
	$\leq 20$ nW	1 GHz $\leq$ f
Dwell Time	$\leq 0.4$ sec.	for FHSS only
Carrier Sense & Identification code		



# 2.4 GHz Band Data Comm. Sys.



## New 5 GHz Band Data Comm. Sys. (W52)

- 802.11a (allowed Digital Data Transmission only)

e.g. OFDM Wireless LAN (802.11a), DSSS etc..

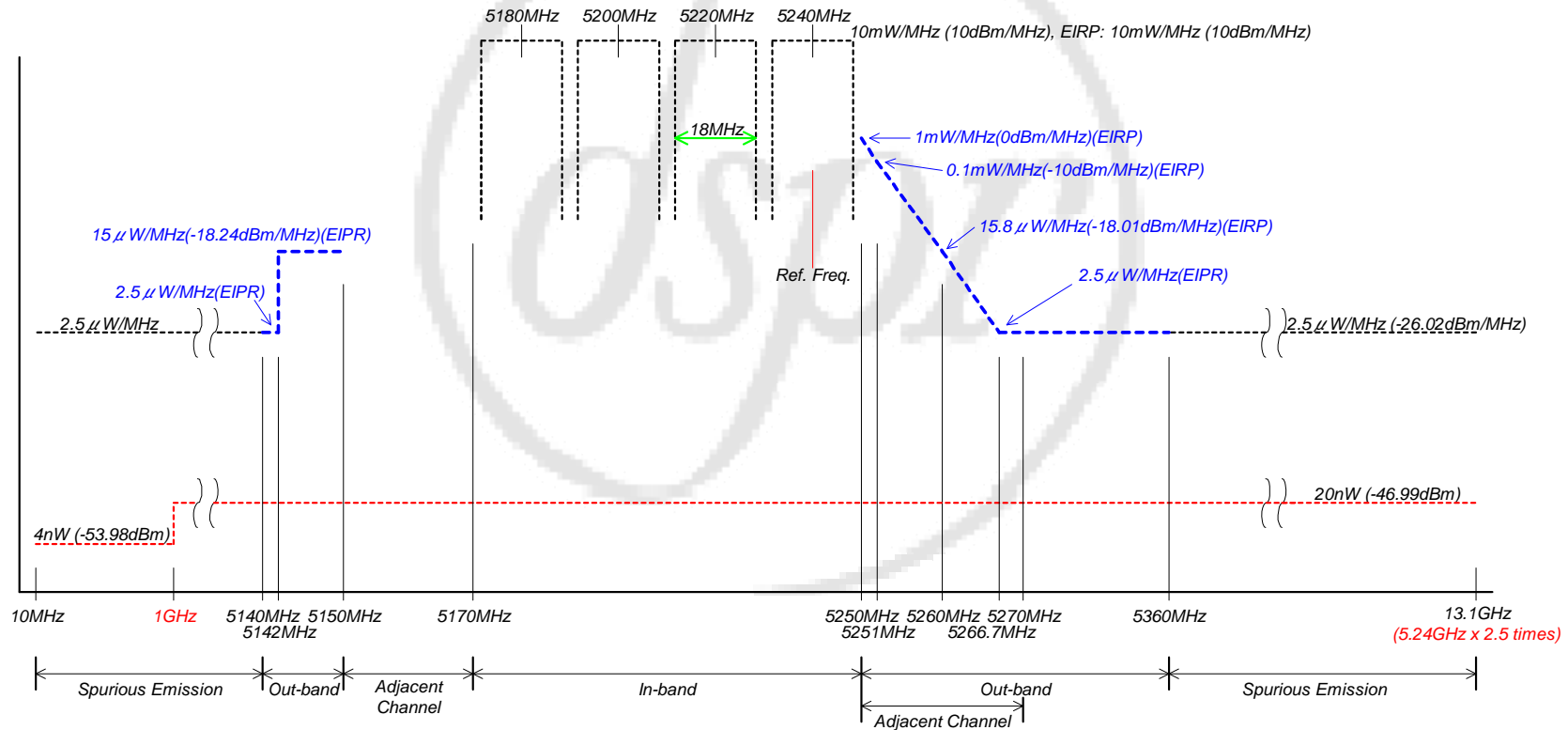
Allocated 5180, 5200, 5220, 5240 MHz

Frequency Tolerance:	$\leq 20$ ppm	
Occupied Band Width:	$\leq 18$ MHz	
Spread Band Width:	5 Spreading Factor	
Output Power:	$\leq 10$ mW/MHz	
EIRP:	$\leq 10$ mW/MHz	
Output Power Tolerance:	+20%, -80%	
Spurious Emission:	$\leq 2.5$ $\mu$ W/MHz	5140 MHz > fo, 5360 MHz < fo
Adjacent Channel Emitted Power	$\geq 25$ dB	fo $\pm$ 20 MHz (18 MHz)
	$\geq 40$ dB	fo $\pm$ 40 MHz (18 MHz)

# New 5 GHz Band Data Comm. Sys. (W52)

Out-Band Leakage Power <i>(EIRP)</i>	$\leq 2.5 \mu\text{W}/\text{MHz}$	$5140 \leq f_o \leq 5142 \text{ MHz}$
	$\leq 15.0 \mu\text{W}/\text{MHz}$	$5142 < f_o \leq 5150 \text{ MHz}$
	$\leq 10^{1-(f-9)} \text{ mW}/\text{MHz}$	$5250 \leq f_o < 5251 \text{ MHz}, 10 \leq f < 11 \text{ MHz}$
	$\leq 10^{-1-(8/90)(f-11)} \text{ mW}/\text{MHz}$	$5251 \leq f_o < 5260 \text{ MHz}, 11 \leq f < 20 \text{ MHz}$
	$\leq 10^{-1.8-(6/50)(f-20)} \text{ mW}/\text{MHz}$	$5260 \leq f_o < 5266.7 \text{ MHz}, 20 \leq f < 26.7 \text{ MHz}$
	$\leq 2.5 \mu\text{W}/\text{MHz}$	$5266.7 \leq f_o \leq 5360 \text{ MHz}$
Emitted RF wave Strength:	$\leq 4 \text{ nW}$	$f_o < 1 \text{ GHz}$
	$\leq 20 \text{ nW}$	$1 \text{ GHz} \leq f_o$
Transmission Burst Length:	$\leq 4 \text{ msec.}$	
<i>In-Door Use ONLY</i>		
Carrier Sense & Identification code		

# New 5 GHz Band Data Comm. Sys. (W52)



## New 5 GHz Band Data Comm. Sys. (W53)

- 802.11a (allowed Digital Data Transmission only)

e.g. OFDM Wireless LAN (802.11a), DSSS etc..

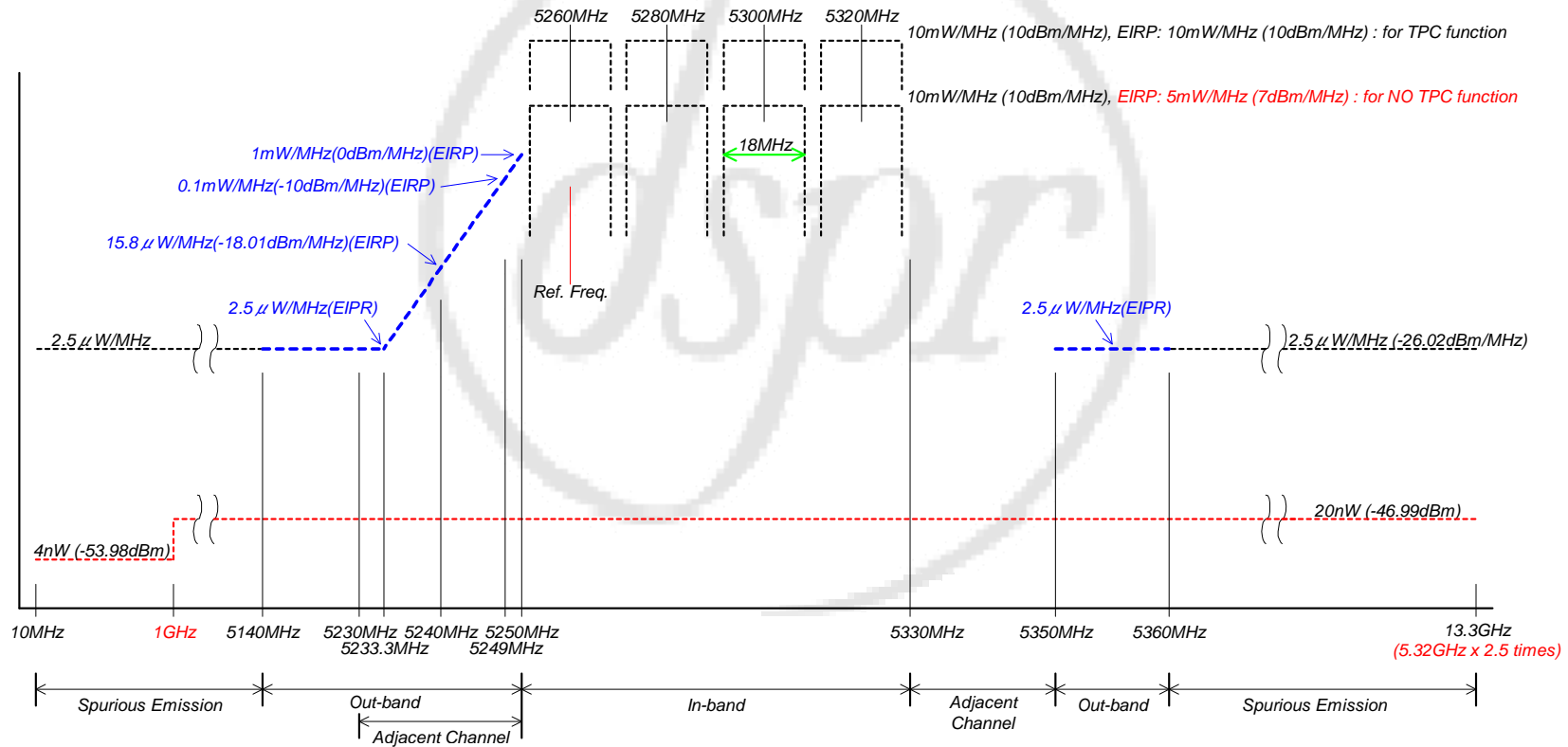
Allocated 5260, 5280, 5300, 5320 MHz

Frequency Tolerance:	$\leq 20$ ppm	
Occupied Band Width:	$\leq 18$ MHz	
Spread Band Width:	5 Spreading Factor	
Output Power:	$\leq 10$ mW/MHz	
EIRP:	$\leq 10$ mW/MHz	TPC function
	$\leq 5$ mW/MHz	No TPC function
Output Power Tolerance:	+20%, -80%	
Spurious Emission:	$\leq 2.5$ $\mu$ W/MHz	5140 MHz > fo, 5360 MHz < fo
Adjacent Channel Emitted Power	$\geq 25$ dB	fo $\pm$ 20 MHz (18 MHz)
	$\geq 40$ dB	fo $\pm$ 40 MHz (18 MHz)

# New 5 GHz Band Data Comm. Sys. (W53)

Out-Band Leakage Power <i>(EIRP)</i>	$\leq 2.5 \mu\text{W}/\text{MHz}$	$5140 \leq f_o \leq 5233.3 \text{ MHz}$
	$\leq 10^{-1.8-(6/50)(f-20)} \text{ mW}/\text{MHz}$	$5233.3 \leq f_o < 5240\text{MHz}, 20 \leq f < 26.7\text{MHz}$
	$\leq 10^{-1-(8/90)(f-11)} \text{ mW}/\text{MHz}$	$5240 \leq f_o < 5249\text{MHz}, 11 \leq f < 20\text{MHz}$
	$\leq 10^{1-(f-9)} \text{ mW}/\text{MHz}$	$5249 \leq f_o < 5250\text{MHz}, 10 \leq f < 11\text{MHz}$
	$\leq 2.5 \mu\text{W}/\text{MHz}$	$5350 \leq f_o \leq 5360\text{MHz}$
Emitted RF wave Strength:	$\leq 4 \text{ nW}$	$f_o < 1 \text{ GHz}$
	$\leq 20 \text{ nW}$	$1 \text{ GHz} \leq f_o$
Transmission Burst Length:	$\leq 4 \text{ msec.}$	
<i>In-Door Use ONLY</i>		
<b>DFS Function, Carrier Sensing Function</b> & Identification code		

# New 5 GHz Band Data Comm. Sys. (W53)





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