

# W53帯におけるDFSパルスパターンの暫定的な修正案

- 5GHz無線LAN作業班にて気象庁より提案したW53帯DFSパルスパターン修正案について、無線LAN各社による検証試験の結果、一部チップベンダーのDFSのアルゴリズムでは対応できないことがわかった。
- 当面、現行の気象レーダーにDFSが対応するよう暫定的なパルスパターン規格案を提案する。
- 数年後に、気象レーダーが今後使用する予定のパルスパターンにもDFSが対応できるよう、検討を求める。

## 数年後に対応が必要なW53帯DFSパルスパターンの規格案

Table D.4: Parameters of radar test signals

Radar test signal # (see note 1 to note 3)	Pulse width W (μs)		Pulse repetition frequency PRF (PPS)		Number of different PRFs	Pulses per burst for each PRF (PPB) (see note 5)
	Min	Max	Min	Max		
1'	0,5	5	200 (see note 7)	1 000 (see note 7)	1	10 (see note 8)
2'	0,5	15	200 (see note 7)	1 600 (see note 7)	1	15 (see note 8)

NOTE 1~4 (略)

NOTE 5: The total number of pulses in a burst is equal to the number of pulses for a single PRF multiplied by the number of different PRFs used.

NOTE 6: For the CAC and Off-Channel CAC requirements, the minimum number of pulses (for each PRF) for any of the radar test signals to be detected in the band 5 600 MHz to 5 650 MHz shall be 18.

NOTE 7: A modulated long pulse which width is 20 - 400 μs (which has an accuracy of ±5%) is also emitted after at least 20 μs since emitting the normal pulse. The modulation to be used is a linear (or non-linear) chirp modulation with a ±0,5 – 1,0 MHz frequency deviation. See Figure D.6.

NOTE 8: This means minimum value.

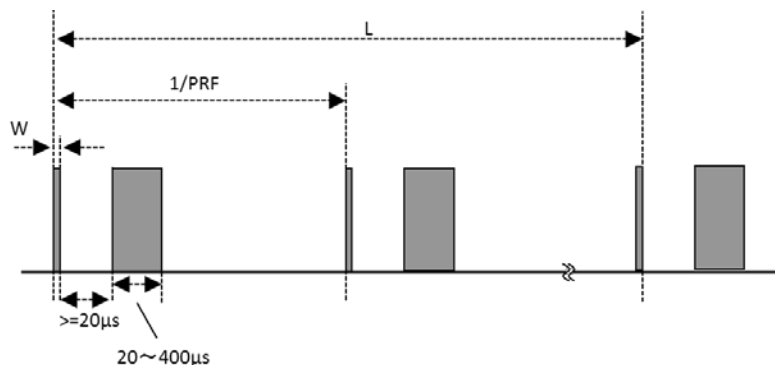


Figure D.6: General structure of a single burst/constant PRF based solid-state radar test signal

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## 暫定的なW53帯DFSパルスパターンの規格案

Radar test signal # (see note 1 to note 3)	W1		PRF		Number of different PRFs	Minimum number of <b>pairs of</b> pulses per burst for each PRF (PPB) (see note 5)	Remarks
	Pulse width ( $\mu\text{s}$ ) (see note 9)		Pulse repetition frequency (PPS)				
	Min	Max	Min	Max			
1'	0,5	5	200	1000	1	10	Short pulse only radar
2'	0,5	15	200	1600	1	15	
1''	0,5	5	200	1000	1	$\min(A1, \max(A2, \text{ceil}(S * \text{PRF})))$	(see note 7')
2''	0,5	15	200	1600	1	$\min(A1, \max(A2, \text{ceil}(S * \text{PRF})))$	
13'	0,5	1,5	1114	1118	1	30	(see note 8')
14'	0,5	1,5	928	932	1	25	
13''	0,5	1,5	886	890	1	24	
14''	0,5	1,5	738	742	1	20	

NOTE 1 ~ 4 (omitted)

NOTE 5: The total number of pulses in a burst is equal to the number of pulses for a single PRF multiplied by the number of different PRFs used.

NOTE 6: (omitted).

NOTE 7: A modulated long pulse which width W2 is 20 - 110  $\mu\text{s}$  is also emitted after emitting the normal pulse. The blank times between the normal pulse and the modulated long pulse (T1 and T2) are at least 70  $\mu\text{s}$ . The modulation to be used is a linear (or non-linear) chirp modulation with a  $\pm 0,5 - 1,0$  MHz frequency deviation. Duty (which is pulse width multiplied by PRF) is less than 10 %. W2 - W1 is at least 15  $\mu\text{s}$ . See Fig. D.6'.

The min(PPB), L, is defined per the equation where A1=30, A2=22 and S=0.026. See Fig. D.7'. However, these parameters A1, A2 and S are proposed preliminary values and the final values to be finalized by the WLAN vendors after testing is performed with 30% channel loading.

NOTE 8: A modulated long pulse which width W2 is 30 - 32  $\mu\text{s}$  (which has an accuracy of  $\pm 5\%$ ) is also emitted after emitting the normal pulse. The blank times between the normal pulse and the modulated long pulse (T1 and T2) are at least 50  $\mu\text{s}$ . The modulation to be used is a linear (or non-linear) chirp modulation with a  $\pm 0,5 - 1,0$  MHz frequency deviation. See Fig. D.6'.

NOTE 9: Pulse width is defined as transmit pulse half power width.

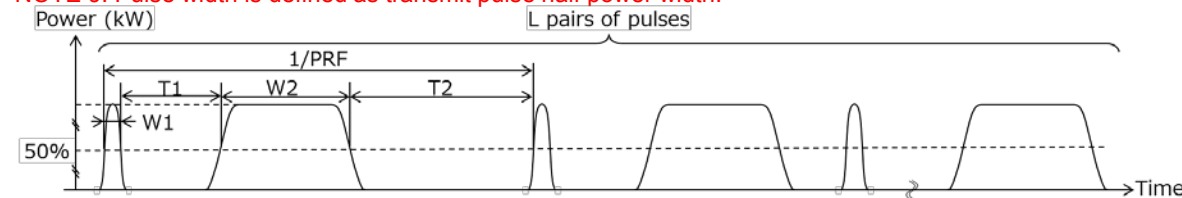


Figure D.6': General structure of a single burst/constant PRF based solid-state radar test signal

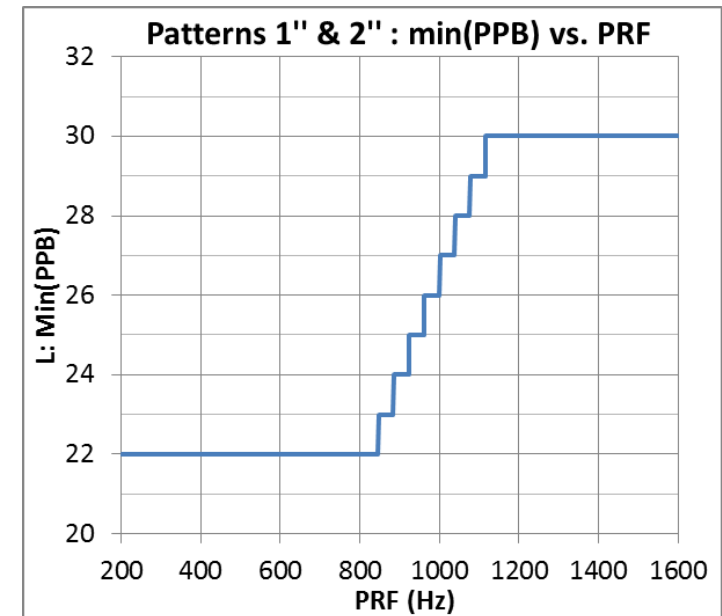


Figure D.7': Relation between PPB and PRF for test signal #1'' and #2''.

# 暫定規格案に対応して検証に使用するレーダーパターンの修正例

No.	時間[ $\mu$ s]				長パルス波形形状			パルス組数 PPB (L pairs)	PRF [Hz]	備考	PPB/PRF [sec]	Duty ratio	W2-W1 [ $\mu$ s]	Channel Loading
	短パルス幅 (W1)	ブランク1 (T1)	長パルス幅 (W2)	ブランク2 (T2)	$\alpha$	$\gamma$	B(MHz)							
1	1.0	0.0	0.0	1062.8	—	—	—	27	940	気象庁一般クライストロン	0.029	0.1%	—	30%
2	1.0	0.0	0.0	1328.8	—	—	—	21	752	気象庁一般クライストロン	0.028	0.1%	—	30%
3	1.0	0.0	0.0	1189.5	—	—	—	24	840	気象庁DRAWクライストロン	0.029	0.1%	—	30%
4	2.0	0.0	0.0	3844.2	—	—	—	10	260	国交省クライストロン	0.038	0.1%	—	30%
5	2.0	0.0	0.0	2379.0	—	—	—	15	420	国交省クライストロン	0.036	0.1%	—	30%
6	2.5	0.0	0.0	3027.8	—	—	—	10	330	気象庁一般クライストロン	0.030	0.1%	—	30%
7	1.0	0.0	0.0	891.9	—	—	—	32	1120	気象庁DRAWクライストロン	0.029	0.1%	—	30%
8	0.5	80.0	64.0	875.9	0.45	1.48	2	26	980	固体化(短い短パルス)	0.027	6.3%	63.5	30%
9	1.0	72.0	64.0	1064.9	0	1.48	1.2	23	832	気象庁DRAW固体化	0.028	5.4%	63.0	30%
10	1.0	108.0	100.0	2116.6	0	1.48	1.67	23	430	国交省固体化	0.053	4.3%	99.0	30%
11	1.0	108.0	100.0	2568.8	0	1.48	1.67	28	360	国交省固体化	0.078	3.6%	99.0	30%
12	1.0	108.0	100.0	3263.2	0	1.48	1.67	22	288	国交省固体化	0.076	2.9%	99.0	30%
13	1.1	56.2	30.5	808.7	0.89	1.48	1.63	30	1116	気象庁DRAW固体化	0.027	3.5%	29.4	30%
14	1.1	235.2	30.5	808.7	0.89	1.48	1.63	25	930	気象庁DRAW固体化	0.027	2.9%	29.4	30%
15	1.0	61.0	32.0	1032.0	1.1	1.2	2	24	888	気象庁固体化	0.027	2.9%	31.0	30%
16	1.0	61.0	32.0	1257.0	1.1	1.2	2	20	740	気象庁固体化	0.027	2.4%	31.0	30%
17	2.0	74.0	69.0	1521.7	0.45	1.48	2	22	600	固体化(長い短パルス)	0.037	4.3%	67.0	30%
18	5.0	120.0	110.0	4765.0	0.45	1.48	2	22	200	固体化(長い短/長パルス)	0.110	2.3%	105.0	30%
19	0.5	70.0	20.0	534.5	0.45	1.48	2	30	1600	固体化(短い短/長パルス)	0.019	3.3%	19.5	30%
20	1.0	72.0	64.0	824.5	0	1.48	1.2	28	1040	気象庁DRAW固体化	0.027	6.8%	63.0	30%
21	2.0	75.0	64.0	525.7	0.45	1.48	2	30	1500	固体化(長い短パルス)	0.020	9.9%	62.0	30%
22	5.0	75.0	64.0	588.6	0.45	1.48	2	30	1365	固体化(長い短パルス)	0.022	9.4%	59.0	30%
23	10.0	100.0	80.0	790.4	0.45	1.48	2	27	1020	固体化(長い短パルス)	0.026	9.2%	70.0	30%
24	15.0	120.0	110.0	4755.0	0.45	1.48	2	22	200	固体化(長い短パルス)	0.110	2.5%	95.0	30%

