

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.

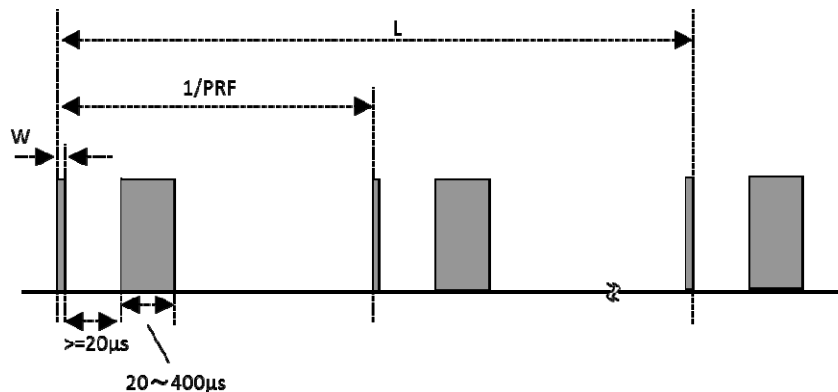


Figure D.6: General structure of a single burst/constant PRF based solid-state radar test signal

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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 Pulse width (μs) (see note 9)		PRF Pulse repetition frequency (PPS)		Number of different PRFs	Minimum number of pairs of L pulses per burst for each PRF (PPB) (see note 5)	Remarks
	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	$\min(A1, \max(A2, \text{ceil}(S * PRF)))$	(see note 7')
2"	0,5	15	200	1600	1	$\min(A1, \max(A2, \text{ceil}(S * PRF)))$	
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	

Short pulse only
radar

Short and Long
pulse combined

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 μs 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 μs. The modulation to be used is a linear (or non-linear) chirp modulation with a ±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 μs. 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 μs (which has an accuracy of ±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 μs. The modulation to be used is a linear (or non-linear) chirp modulation with a ±0,5 - 1,0 MHz frequency deviation. See Fig. D.6'.

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

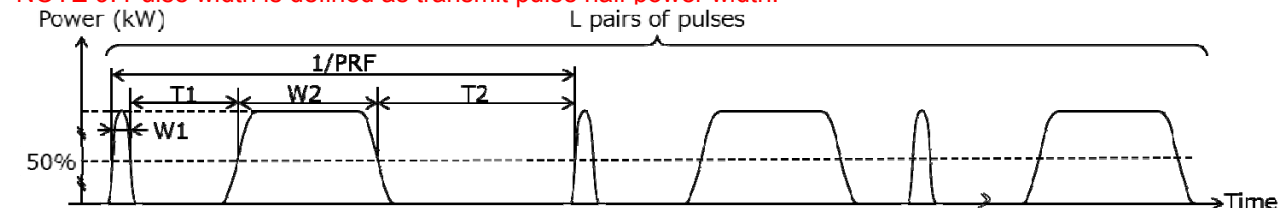


Figure D.6': General structure of a single burst/constant PRF based solid-state radar test signal

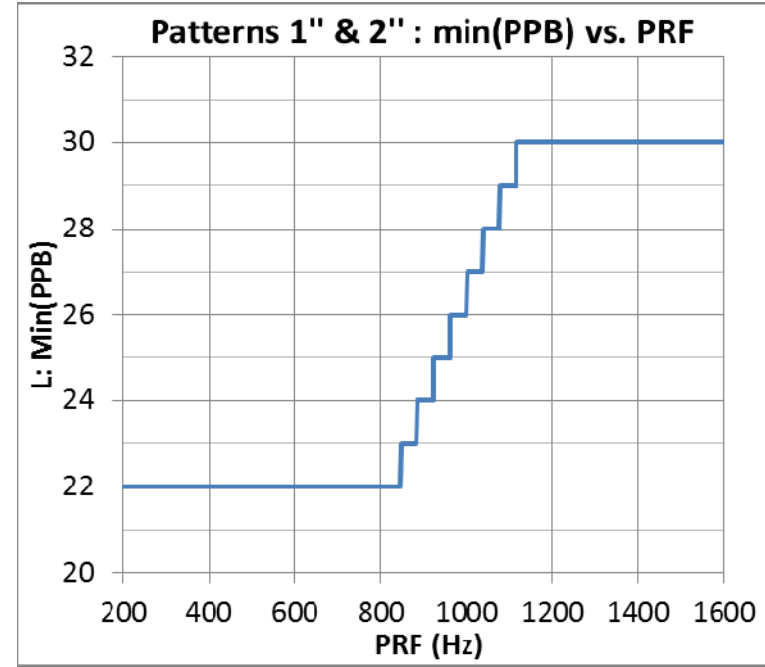


Figure D.7': Relation between PPB and PRF for test signal #1'' and #2''.

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[μs]				長パルス波形形状			パルス組数 PPB (L pairs)	PRF [Hz]	備考				
	短パルス幅 (W1)	ブランク1 (T1)	長パルス幅 (W2)	ブランク2 (T2)	α	γ	B(MHz)			タイプ	PPB/PRF [sec]	Duty ratio	W2-W1 [μs]	Channel Loading
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%

