IEEE P802.11
Wireless LANs

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| LB258: Resolution for CID 6037 |
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This submission includes the resolution for CID 6037 on initial SA ballot on P802.11-REVme D4.0. The baseline document is P802.11-REVme D4.1.

##### Revision history:

##### R0 – initial version

R1 – revised version with detailed explanations on duplication of STF, CEF and SIG for CBW1080MHz transmission and with revised/provided values of , , and .

R2 – some editorial changes made. Replace “SC mode chip time” with “SC chip time” in 25.3.5.2 and 25.3.5.3.

**CID: 6037**

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| --- | --- | --- | --- | --- | --- | --- |
| CID | Clause | Page | Line | Comment | Proposed Change | Proposed resolution |
| 6037 | 25.3.3 | 3759 | 20 | [YX] The value of T\_CSTF and T\_STF specified as 14 T\_seq (~8145.5 ns) in Table 25.3-Timing-related parameters is not in agreement with the definition of STF of control mode (which is composed of 50 repetitions of ZCZ sequence of length 32) and the definition of STF of SC and OFDM mode (which is composed of 17 repetitions of ZCZ sequence of length 32). | 1) modifiy the T\_CSTF value in Table 25-3 as 50x32xTc (~3636.8 ns); 2) modifiy the T\_STF value in Table 25-3 as 17x32xTc (~1236.5 ns); | REVISEDTGm editor: Please revise the text in subclauses 25.3.3 in 802.11REVme D4.1as suggested in 11-23/2048r1. |

***Discussion:***





In addition to the incorrect values of the STF duration for control mode and the STF duration for SC/OFDM mode as commented in CID#6037, there exist several other issues in Table 25-3, which require to be clarified and/or resolved as well.

1. ***In CMMG, there are two BW values specified, i.e., CBW540 MHz and CBW1080 MHz, resulting in two SC chip time values. The chip time value used for definition of preamble durations and SIG duration for control/SC/OFDM mode in Table 25-3 should be clarified.***

As defined in 25.3.5 CMMG PHY preamble,



Duplication transmission on a 1080 MHz channel is specified in 25.3.10.



As shown in Table 25-3, the SC chip time for CBW1080 MHz is one half of the SC chip time for CBW540 MHz. However, due to the duplication operation for CBW1080 MHz transmission, the durations of the STF, CEF and SIG fields for CBW1080 MHz transmission are equivalent to those for CBW540 MHz transmission.

Therefore, the durations of the STF, CEF and SIG fields for CBW1080 MHz and CBW540 MHz are specified based only on the SC chip time or the OFDM sample time for CBW540 MHz. This should be clarified in Table 25-3.

1. ***The values of STF durations for control mode and SC/OFDM mode in Table 25-3 are incorrect (as commented in CID#6037) and need to be revised.***

In 25.3.5.2 (CMMG Short Training field), the STF of control mode, and the STF of SC and OFDM mode are defined, in which the STF of control mode is composed of 50 repetitions of the sequence Z(n) of length 32, while the STF of SC and OFDM mode is composed 17 repetitions of the sequence Z(n) of length 32. A resolution is to revise the values of T\_CSTF and T\_STF in Table 25-3 (Timing-related parameters) which correspond to 50 and 17 repetitions of the sequence Z(n) of length 32, respectively.

Subclause 25.3.5.2 is shown as below:



Based on the definition of STF in 25.3.5.2, the SFT durations for control mode and SC/OFDM mode are proposed to be revised as:

* STF duration for control mode ns
* STF duration for SC/OFDM mode ns

where is the SC chip time for CBW540 MHz.

Note – For DMG, as shown in Table 20-4 (Timing-related parameters) in P802.11-REVme D4.1 (see below), the control mode STF duration and the SC mode STF duration are also defined as ~3636.8 ns and ~1236.5 ns, respectively.



1. ***The ZCZ block duration is defined in Table 25-3 for the duration of ZCZ sequences of length 256. It should be clarified that the value of shown in Table 25-3 is calculated based on the SC chip time for CBW540 MHz.***
* ZCZ block duration ns

where is the SC chip time for CBW540 MHz.

1. ***In Table 25-3 in 802.11REVme D4.0, only one value is defined for the duarion of SIG field. However, based on the descriptions in 25.4.4 (CMMG control mode SIG transmission), 25.5.5 (CMMG SC mode SIG transmission) and 25.6.5. CMMG OFDM mode SIG fields, different durations of SIG fields for control, SC and OFDM modes are required to be specified in Table 25-3.***

25.3.9 (CMMG SIG) specifies a common CMMG SIG structure (80 bits in the CMMG SIG field), encoding/rate-matching (1024 encoded bits) and modulation (-BPSK) of the SIG field for all control, SC and OFDM modes.

**(4.1) CMMG control mode SIG duration**

As specified in 25.4.4.6 (Spreading) (see below), the modulated symbols of the control mode SIG field is spread using the Barker sequence with the speading factor of 13.



Therefore, the SIG duration for control mode is:

 ~30258.2 ns

where is the SC chip time for CBW540 MHz.

**(4.2) CMMG SC mode SIG duration,**

25.5.5.4.5 (CMMG SC mode SIG transmission) specifies the operations of symbol blocking, CSD and GI insertion after encoding and modulation of SC mode SIG field. Note that as specified in 25.3.9 (CMMG SIG), after encoding and modulation a SIG field results in 1024 modulated symbols.





As defined above, each of four SC symbol blocks of the encoded and modulated SIG field with cyclic prefix has 256+64=320 symbols. Therefore, the SIG duration for SC mode is:

 ~2909.4 ns

where is the SC chip time for CBW540 MHz.

**(4.3) CMMG OFDM mode SIG duration,**

As specified in 25.6.5 (CMMG OFDM mode SIG fields), the procedure of encoding, modulation, symbol blocking, CSD and GI insertion for the SIG field in OFDM mode is the same as that in SC mode. The difference compared to the SC mode is that in the OFDM mode the symbols are transmitted in the OFDM sample rate ( is defined in Table 25-3) (see Figure 25-23 – Transmitter block diagram for CMMG OFDM mode SIG field).

Therefore, the SIG duration of OFDM mode is:

 ~1939.2 ns

where is the OFDM smaple time for CBW540 MHz.

*TGm Editor: please revise Table 25-3 (Timing-related parameters) in P3885L20 and P3885L23 in P802.11-REVme D4.1 as suggested in 11-23/2048r2 as following:*

**Table 25-3 – Timing-related parameters**

|  |  |  |  |
| --- | --- | --- | --- |
| Parameter | CBW540MHz | CBW1080MHz | Descpription |
|  |  |  |
|  |  |  |
|  | 256 (~581.8 ns) | ZCZ block duration (see NOTE) |
|  |  (~3636.8 ns) | Short training field duration for CMMGControl mode(see NOTE) |
|  |  (~1236.5 ns) | Short training field duration *-*for CMMG SC/OFDM mode(see NOTE) |
|  |  (~2327.3 ns) | Channel estimation field duration for CMMG control/SC/OFDM mode (see NOTE) |
|  | ~30258.2 ns) | SIG field duration for CMMG control mode |
|  (~2909.4 ns) | SIG field duration for CMMG SC mode (see NOTE) |
|  (~1939.2 ns) | SIG field duration for CMMG OFDM mode (see NOTE) |
|  |  (~484.8 ns) | Duration of each OSTF |
|  |  (~484.8 ns) | Duration of each OCEF |

NOTE – Since the construction of the STF, CEF and SIG field for transmissions over CBW1080 MHz are based on the duplication operation on the STF, CEF and SIG field for transmissions over CBW540 MHz (see 25.3.10), the durations of the STF, CEF and SIG field for CBW1080 MHz are equivalent to those for CBW540 MHz. The durations of STF and CEF of CMMG control mode, CMMG SC mode and CMMG OFDM mode and the durations of SIG fields for CMMG control mode and CMMG SC mode are calculated based on the SC chip time for CBW540 MHz transmission. The durations of the CMMG OFDM mode SIG field, the CMMG OFDM mode Short Training Field (OSTF) and the CMMG OFDM mode Channel Estimation Field (OCEF) are calculated based on the OFDM sample time for CBW540 MHz transmission.

*TGm Editor: please modify “” to “SC chip time” in P3890L15 in P802.11-REVme D4.1 as suggested in 11-23/2048r2.*

*TGm Editor: please modify “” to “SC chip time” in P3890L30 in P802.11-REVme D4.1 as suggested in 11-23/2048r2.*

*TGm Editor: please modify “” to “SC chip time” in P3891L1 in P802.11-REVme D4.1 as suggested in 11-23/2048r2.*

*TGm Editor: please modify “” to “SC chip time” in P3891L49 in P802.11-REVme D4.1 as suggested in 11-23/2048r2.*