BUREAU OF INDIAN STANDARDS
DRAFT FOR COMMENTS ONLY
DRAFT AMENDMENT NO. 1:2023
TO

ISO/IEC 14443-2:2020 Cards and security devices for personal identification — Contactless proximity objects Part 2: Radio frequency power and signal interface

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Identification & Data capture techniques, Cards and Security Devices Sectional Committee, (LITD 16)

This draft amendment No.1 is identical with Technical Corrigendum 1 and Technical Corrigendum 2 of ISO/IEC 14443-2:2020 "Cards and security devices for personal identification — Contactless proximity objects Part 2: Radio frequency power and signal interface" published in 2021 and 2023 respectively, issued by the International Organization Standardization (ISO) and International Electrotechnical Commission (IEC).

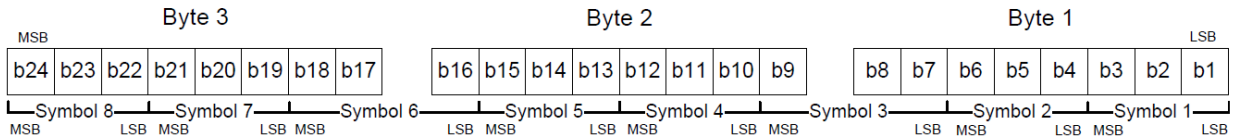
Technical Corrigendum 1

Page 19, 8.1.3.3

At the beginning of 8.1.3.3 insert the first paragraph of 9.1.3.2 and Figure 29 and the third and the fourth paragraphs of 9.1.3.2:
"

For bit rates 3fc/4 and 3fc/2 binary information shall be transmitted from PCD to PICC in units of 8 logic levels, building an information symbol of 3 bits. The 8 logic levels are represented by 8 NPs. The formation of 3-bit symbols from bytes is illustrated in Figure Cor.1.

Figure Cor.1 — Binary information from PCD to PICC transmission for bit rates 3fc/4 and 3fc/2

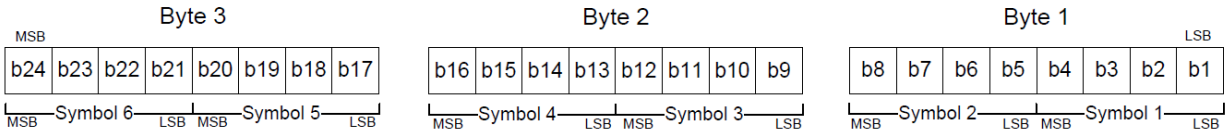


If the last transmitted symbol is incomplete, it shall be stuffed with one or two (0) b.
For end of communication, the PCD shall generate a sequence of 8 NPs of -180°. After the end of communication, the PCD shall generate an unmodulated RF carrier with a NP of 0°.
“

Page 19, 8.1.3.4
At the beginning of 8.1.3.4 insert the second paragraph of 9.1.3.2 and Figure 30 and the fourth paragraph of 9.1.3.2:
“

For bit rates fc and 2fc binary information shall be transmitted from PCD to PICC in units of 16 logic levels, building an information symbol of 4 bits. The 16 logic levels are represented by 16 NPs. The formation of 4 bit symbols from Bytes is illustrated in Figure Cor.2.

Figure Cor.2 — Binary information from PCD to PICC transmission for bit rates fc and 2fc



For end of communication, the PCD shall generate a sequence of 8 NPs of -180°. After the end of communication, the PCD shall generate an unmodulated RF carrier with a NP of 0°.
“

Page 41, 9.1.3
Delete the entire subclause 9.1.3.2.
Add the following new subclause 9.1.3.2:
“

9.1.3.2 Bit representation and coding for bit rates of 3fc/4 and 3 fc/2
See 8.1.3.3.
“

Add the following new subclause 9.1.3.3:
“

9.1.3.3 Bit representation and coding for bit rates offc and 2 fc
See 8.1.3.4.
“

Technical Corrigendum 2

Page 25, 8.2.2.3

Replace all of the text in the subclause before Figure 13 by the following:

For each subcarrier period:

— $Ø_{LM}$ is defined as the argument of all differences between sections in the occurrence of MS1 and the corresponding sections in the occurrence of MS2 in the same subcarrier period, as illustrated in Figure 13;

— there is an absolute maximum and an absolute minimum of $Ø_{LM}$; $Ø'_{LM}$ is defined as the one which occurs first in time, $Ø''_{LM}$ is the one which occurs secondly, then

$$\Delta Ø_{LM} = Ø''_{LM} - Ø'_{LM};$$

— with $Ø_{LM}$-left being the maximum absolute difference between $Ø'_{LM}$ and any $Ø_{LM}$ occurring before $Ø'_{LM}$ in time and $Ø_{LM}$-right being the maximum absolute difference between $Ø''_{LM}$ and any $Ø_{LM}$ occurring after $Ø''_{LM}$ in time

$$Ø_{LM\ second} = \max (Ø_{LM\text{-}left}; Ø_{LM\text{-}right});$$

— if $(Ø_{LM\ second} / abs(\Delta Ø_{LM})) > 0{,}8$ then $\Delta Ø_{LM\text{-}E}$ is defined as the absolute maximum phase variation and $\Delta Ø_{LM}$ is set to 0; else $\Delta Ø_{LM}$ is defined as the signed maximum phase variation and $\Delta Ø_{LM\text{-}E}$ is set to 0.

Figure 14 illustrates $Ø_{LM,}$ $Ø'_{LM}$, $Ø''_{LM}$, $\Delta Ø_{LM}$, $Ø_{LM\ second}$ and $\Delta Ø_{LM\text{-}E.}$

The intrastate phase drift is defined as:

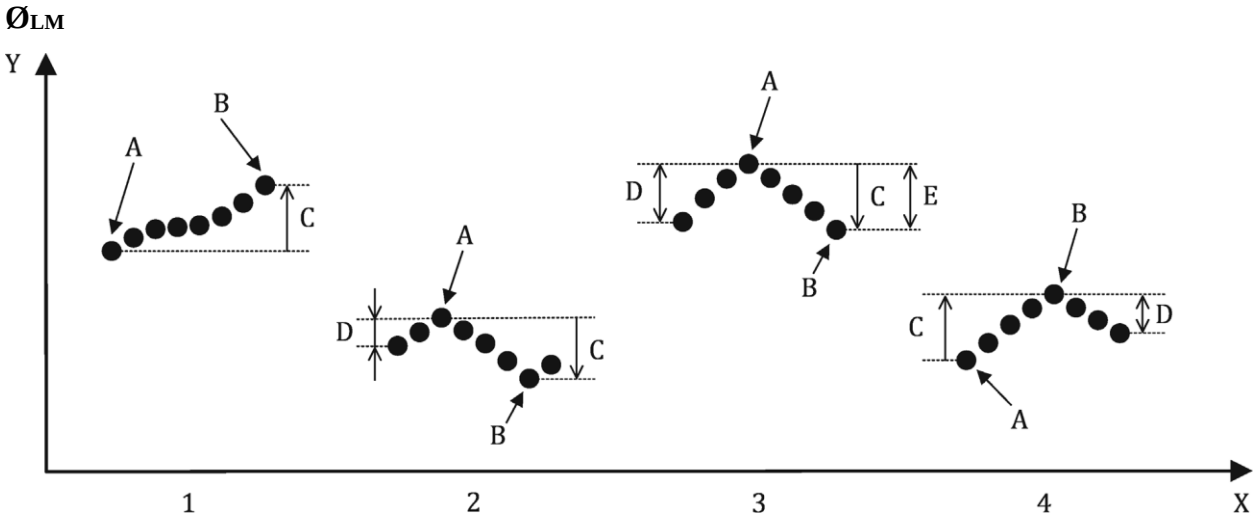
— $Ø_{LM,\ INTRA} = \max(\max(\max(\Delta Ø_{LM}); 0) - \min(\min(\Delta Ø_{LM}); 0); \max(\Delta Ø_{LM\text{-}E}))$

where $\max(\Delta Ø_{LM})$ and $\min(\Delta Ø_{LM})$ are the maximum and minimum of $\Delta Ø_{LM}$ computed over all occurrences of all subcarrier periods, respectively.

Page 26, 8.2.2.3

Replace Figure 14 with the following:

Figure 14 — Time domain plot during part of the PICC response, depicting



Key

X subcarrier cycles (transitions between modulated states are not considered)

Y $Ø_{LM}$ (one dot represents one section of $Ø_{LM}$)

A $Ø'_{LM}$

B $Ø''_{LM}$

C $\Delta Ø_{LM}$

D $Ø_{LM\ second}$

E $\Delta Ø_{LM\text{-}E}$

Page 28, 8.2.5.1

Replace Table 24 by the following:

Table 24 — Load modulation amplitude limits for PCD reception

PICC Class	$V_{LMA,\ min,\ PCD}$ mV (peak)	$V_{LMA,\ max,\ PCD}$ mV (peak)	Subcarrier frequency	Reference PICC	Test PCD assembly
1	$20/H^{0,5}$	110 mV	$f_c/16$ $>f_c/16$	Active Reference PICC 1 Reference PICC 1	Test PCD assembly 1
2	Min(12,5 ; $20/H^{0,5}$)	100 mV	$f_c/16$	Active Reference PICC 2	Test PCD assembly 1
			$>f_c/16$	Reference PICC 2	
3	Min(12,5 ; $20/H^{0,5}$)	90 mV	$f_c/16$	Active Reference PICC 3	Test PCD assembly 1
			$>f_c/16$	Reference PICC 3	
4 (optional)	Min(16 ; $36/H^{0,5}$)	110 mV	$f_c/16$ $>f_c/16$	Active Reference PICC 4 Reference PICC 4	Test PCD assembly 2
5 (optional)	Min(13 ; $31/H^{0,5}$)	100 mV	$f_c/16$	Active Reference PICC 5	Test PCD assembly 2
			$>f_c/16$	Reference PICC 5	
6 (optional)	Min(6 ; $23/H^{0,5}$)	90 mV	$f_c/16$	Active Reference PICC 6	Test PCD assembly 2
			$>f_c/16$	Reference PICC 6	

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