

# ISO/IEC 14443-2:2020 (E)

## Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface

---

### Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Symbols and abbreviated terms
5	General considerations
5.1	Initial dialogue
5.2	Compliance
5.2.1	PICC compliance
5.2.2	PCD compliance
5.2.2.1	General
5.2.2.2	PCD supporting PICCs of particular class(es)
6	Power transfer
6.1	General
6.2	Frequency
6.3	Operating field strength
7	Signal interface
8	Communication signal interface Type A
8.1	Communication PCD to PICC
8.1.1	Bit rate
8.1.2	Modulation
8.1.2.1	General
8.1.2.2	Modulation for a bit rate of $f_c/128$
8.1.2.3	Modulation for bit rates of $f_c/64$ , $f_c/32$ , and $f_c/16$
8.1.2.4	Modulation for bit rates of $f_c/8$ , $f_c/4$ , and $f_c/2$
8.1.2.5	Modulation for bit rates of $3f_c/4$ , $f_c$ , $3f_c/2$ , and $2f_c$
8.1.3	Bit representation and coding
8.1.3.1	Bit representation and coding for bit rates of $f_c/128$ , $f_c/64$ , $f_c/32$ , and $f_c/16$
8.1.3.2	Bit representation and coding for bit rates of $f_c/8$ , $f_c/4$ , and $f_c/2$
8.1.3.3	Bit representation and coding for bit rates of $3f_c/4$ and $3f_c/2$
8.1.3.4	Bit representation and coding for bit rates of $f_c$ and $2f_c$
8.2	Communication PICC to PCD
8.2.1	Bit rate
8.2.2	PICC load modulation transmission
8.2.2.1	General
8.2.2.2	Amplitude Requirements
8.2.2.3	Phase requirements
8.2.3	Subcarrier
8.2.3.1	General
8.2.3.2	Subcarrier for bit rates of $f_c/128$ , $f_c/64$ , $f_c/32$ , and $f_c/16$
8.2.3.3	Subcarrier for bit rates of $f_c/8$ , $f_c/4$ , and $f_c/2$
8.2.4	Subcarrier modulation
8.2.5	PCD load modulation reception

8.2.5.1	Amplitude requirements
8.2.5.2	Phase requirements
8.2.6	Bit representation and coding
8.2.6.1	Bit representation and coding for a bit rate of $fc/128$
8.2.6.2	Bit representation and coding for bit rates of $fc/64$ , $fc/32$ , $fc/16$ , $fc/8$ , $fc/4$ , and $fc/2$
<b>9</b>	<b>Communication signal interface Type B</b>
9.1	Communication PCD to PICC
9.1.1	Bit rate
9.1.2	Modulation for bit rates of $fc/128$ , $fc/64$ , $fc/32$ , $fc/16$ , $fc/8$ , $fc/4$ , and $fc/2$
9.1.3	Bit representation and coding
9.1.3.1	Bit representation and coding for bit rates of $fc/128$ , $fc/64$ , $fc/32$ , $fc/16$ , $fc/8$ , $fc/4$ , and $fc/2$
9.1.3.2	Bit representation and coding for bit rates of $3fc/4$ , $fc$ , $3fc/2$ , and $2fc$
9.2	Communication PICC to PCD
9.2.1	Bit rate
9.2.2	PICC load modulation transmission
9.2.3	Subcarrier
9.2.4	Subcarrier modulation
9.2.5	PCD load modulation reception
9.2.6	Bit representation and coding
<b>10</b>	<b>Electromagnetic disturbance levels</b>
10.1	PCD limits
10.2	PICC limits
<b>Annex A (informative) Complex envelope and constellation diagram</b>	
<b>Annex B (informative) Inter symbol interference</b>	

Page count: 47