RF interfaces 6.1 HF interface (13.56 MHz)

Overview

The HF interface antenna is part of the standard HID external antenna for the OK5127CK Reader Core. Certain RF tuning components are included on the antenna PCB.

HF antenna characteristics

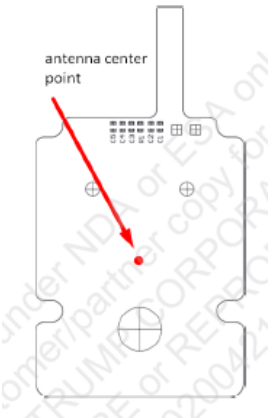
The following table shows the HF characteristics of the standard HID antenna for the OK5127CK Reader Core. It can also be used to help specify the characteristics of an alternative custom designed antenna should there be a need for a different shape or differently positioned antenna. Use of an alternative physical antenna design/location is possible, provided it complies with the following parameters under the same conditions, and meets the required performance, including applicable tests. Where a combined HF and LF antenna is used, the combined pair must be used when measuring the relevant characteristics and when testing. Testing must always be performed in situ1 in a representative final product.

Parameter	Min	Typ	Max	Unit
HF antenna input impedance in situ [1]		50 + j0		ohms
Current drawn by the OK5127 Reader Core[2] with HF in constant carrier mode, LF off (for reference)			350	mA
Target Q (for reference) (ISO 14443A 106 kbps)	20	25	35	
Voltage at antenna (for reference)		±30		V
Recommended antenna inductance range (for reference)	0.8	1	1.8	µH

1. "In situ" means when assembled with the LF antenna, and in the specified position relative to the OK5127 Reader Core main PCB and without any credential at the reader.
2. Exceeding the maximum figure may degrade or damage the product.
"For reference" indicates a design goal or limitation for an alternative antenna.

Modulation waveforms

The modulation waveforms were tested in accordance to ISO/IEC10373-6. The recorded waveforms are shown below. The measurement reference position on the antenna assembly is also shown below. Measurements were made with the reader board attached to the antenna using the spacer component from the development toolkit. A credential communication rate of 106 kbps is recommended.



LF interface (125 kHz)

Overview

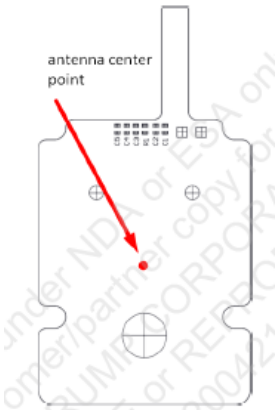
The LF interface is constructed with a wire wound antenna incorporated onto the external custom antenna.

LF antenna characteristics

The following table shows LF characteristics of the standard HID antenna for the OK5127CK Reader Core. It
can be used to help specify the characteristics of an alternative antenna design, where a differently shaped or located antenna is required.
Use of an alternative physical antenna design/location is possible, provided it complies with the following parameters under the same conditions, and meets the required performance, including applicable tests.
Where a combined HF and LF antenna is used, the combined pair must be used when measuring the relevant characteristics and when testing. Testing must always be carried out in situ in a representative final product.
LF antenna tuning components are included in the OK5127CK Reader Core main board. Therefore, inductance and DC resistance setting of the LF antenna is accomplished by careful choice of the size, shape, wire gauge, and number of turns of the antenna. The on-board tuning capacitors total 2200 pF and are ±1%, C0G, 100 V, 0805 type, in series with the output antenna drive. There is no series resistance in line with the antenna drive path on the board.

Parameter	Min	Typ	Max	Unit
LF antenna DC resistance		41		Ohms
LF antenna impedance @125 kHz (for Q of 8) in situ[1]		72		Ohms
Current into the OK5127 Reader Core[2], permanent/constant LF carrier enabled (for reference)[3]			200	mA (DC)
Current into the OK5127 Reader Core[2], LF carrier 1:4 on/off-ratio, t_{on} <400 ms (for reference)			400	mA (DC)
LF antenna inductance (1% tolerance) @125 kHz, in situ[1]		737		µH
Target Q, covering ASK, PSK & FSK (for reference)	5	8	12	
Voltage at antenna (for reference)		±60		V
HID OK5127CK Reader Core LF antenna wire gauge (can be different for a custom antenna)		38		AWG

1. In situ means when assembled with the HF antenna, and in the specified position relative to the OK5127 Reader Core main PCB.
2. Exceeding the maximum figure may degrade or damage the product.
3. 'For reference' indicates a design goal or limitation for an alternative antenna.


antenna center
point