20.34Mbps data communication for Contactless Smartcards & NFC
Application Area

Contactless, inductively coupled systems
ASK:

• Two-level amplitude modulation

PSK: Use circle segment to ease carrier / clock recovery and improve energy transfer
# Table of rates

<table>
<thead>
<tr>
<th>Sym rate</th>
<th>2PSK</th>
<th>4PSK</th>
<th>8PSK</th>
<th>16PSK</th>
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</thead>
<tbody>
<tr>
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<td>848</td>
<td>1695</td>
<td>2543</td>
<td>3390</td>
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<td>$f_c/8$</td>
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<td>3390</td>
<td>5085</td>
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<td>10170</td>
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<td>20340</td>
<td>27120</td>
</tr>
</tbody>
</table>

ISO 14443 amendment
VHBR Card: Physical layer design

ANALOG FRONT END

CMOS implementation

DIGITAL SIGNAL PROCESSING

FPGA implementation
Measured BER performance

BER vs magnetic field strength

Target BER

ISO limit

H [A/m] @ d=37.5mm

10.17Mbps

13.56Mbps