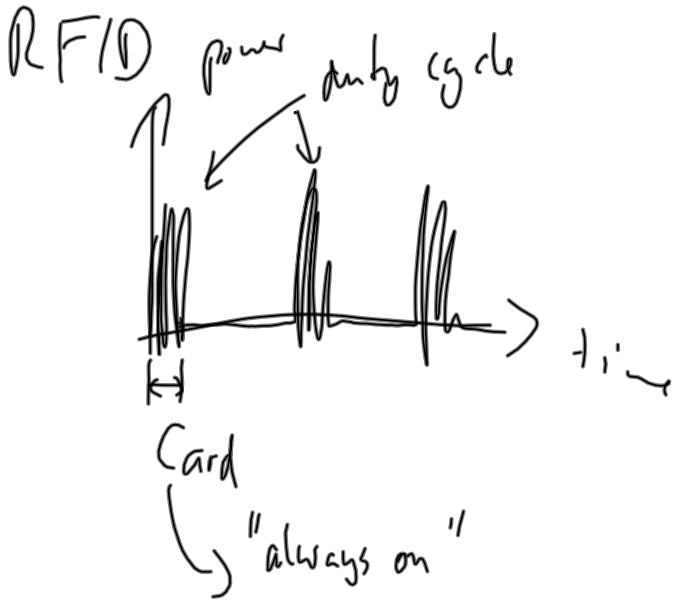
784


RFID power
duty cycle
time
Card
"always on"

Active RFID

$f = 5.8\ GHz$

Norway: Bomstasjoner

Device (Brikke) in the car ~ 3-5 years

Failure in time to market for NFC

- Customer requirements:
  bus ticket in phone } 2006 → new protocoll
  single wire protocoll
  NFC modem → SIM card
- new SIM card standard
- Business model { Telecom → SIM .fr .no
  handset
  bank
  TSM nordic

Questions

- Security
- EIRP $\leftrightarrow$ P_r
- application

Origo ID

Smart Card

- grab NFC energy
- start fingerprint reading
- confirms fingerprint for access & payment

3.8	4-4 PIN
28%	0000
	1111
	1234

NFC range

0 ... 10 cm

$f = 13.56\,MHz$ $\lambda/2\pi$ range $\ll 5\,m$

$\lambda = 30\,\frac{cm}{GHz} = 30\,\frac{cm}{1E-2}$

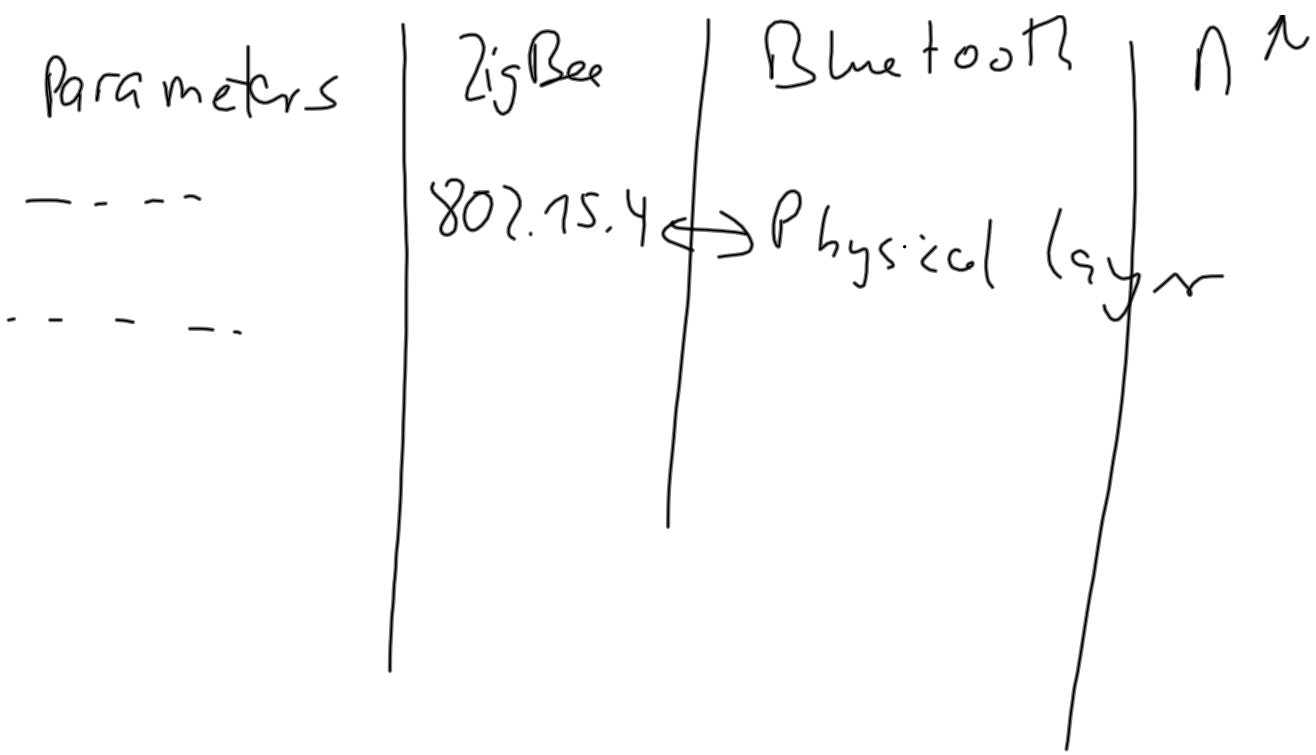
$\lambda = 3000\,cm$

inductive coupling in NFC

$\vec{H} \sim \frac{1}{r^3}$ $P \sim \frac{1}{r^6}$

in operation: electromagnetic

$\vec{E}, \vec{H} \sim \frac{1}{r}$ $P \sim \frac{1}{r^2}$


Parameters
ZigBee
Bluetooth
802.15.4
Physical