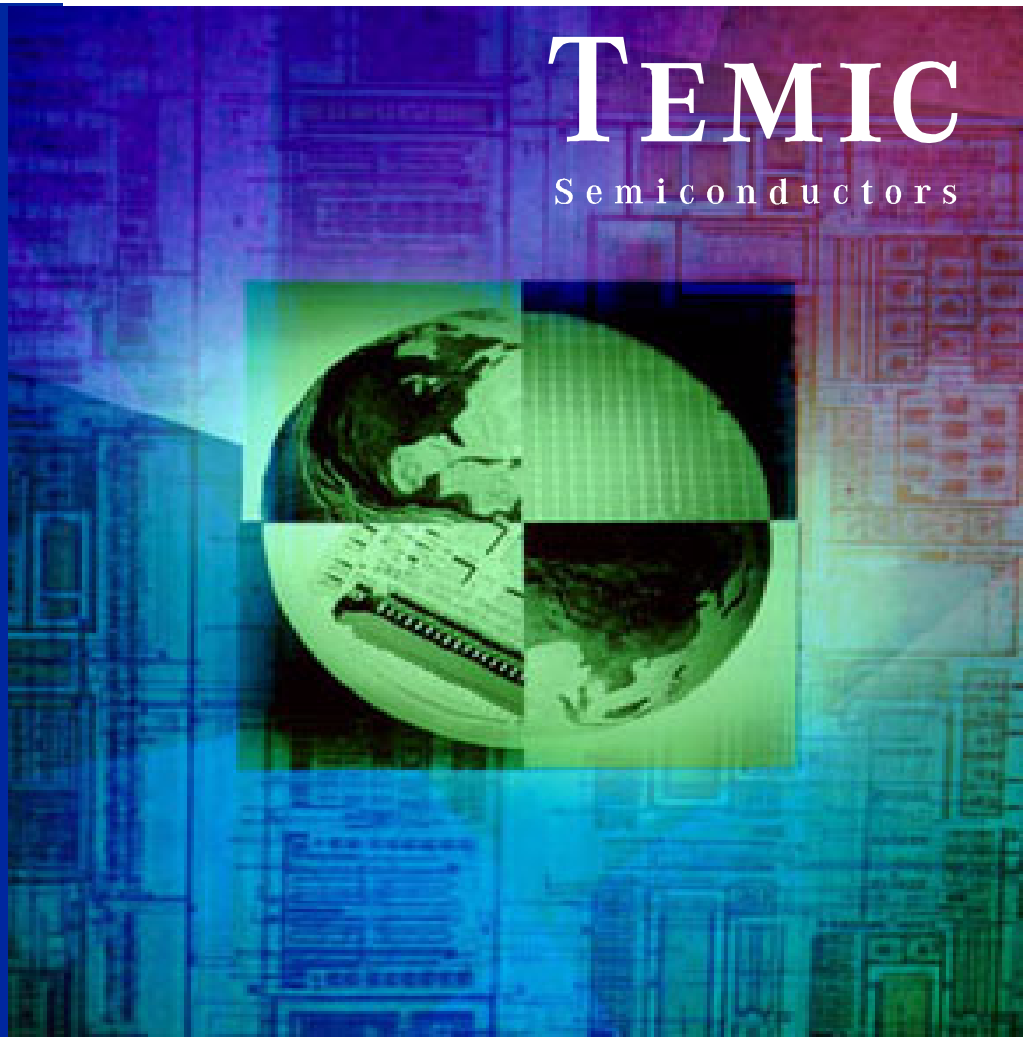
Identification ICs

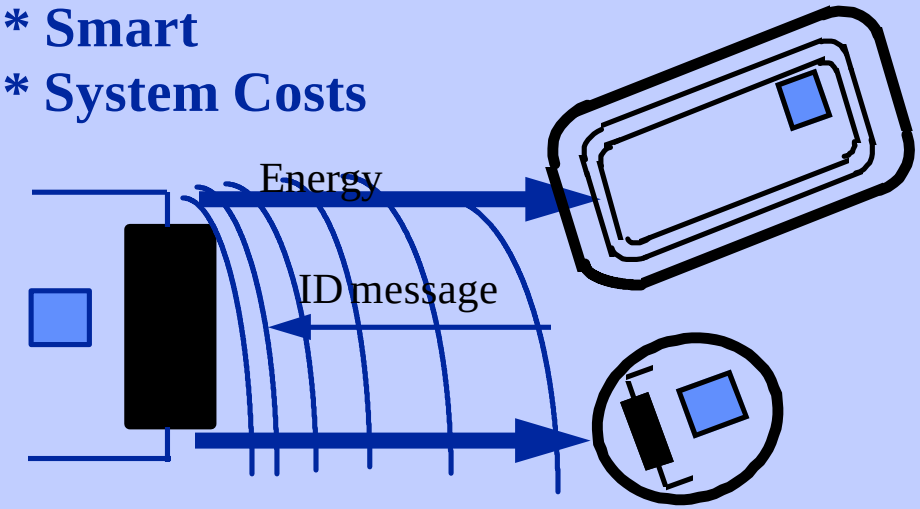
System Components to identify Objects and Persons



IDENTIFICATION

System Components to identify Objects and Persons

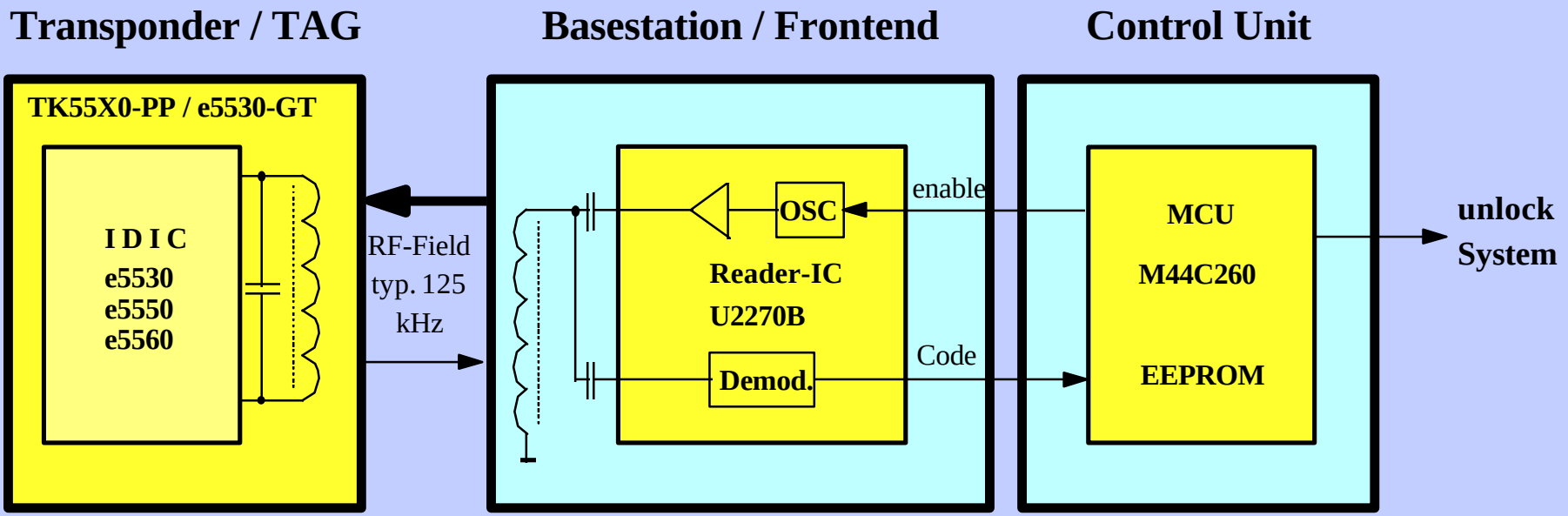
* Short ID-codes
* Mobile data carrier (no battery !)
* Contactless
* Data Integrity & Safety
* Flexibility
* Smart
* System Costs



Customers Design Priority:

R / W Base Station

IDentification IC

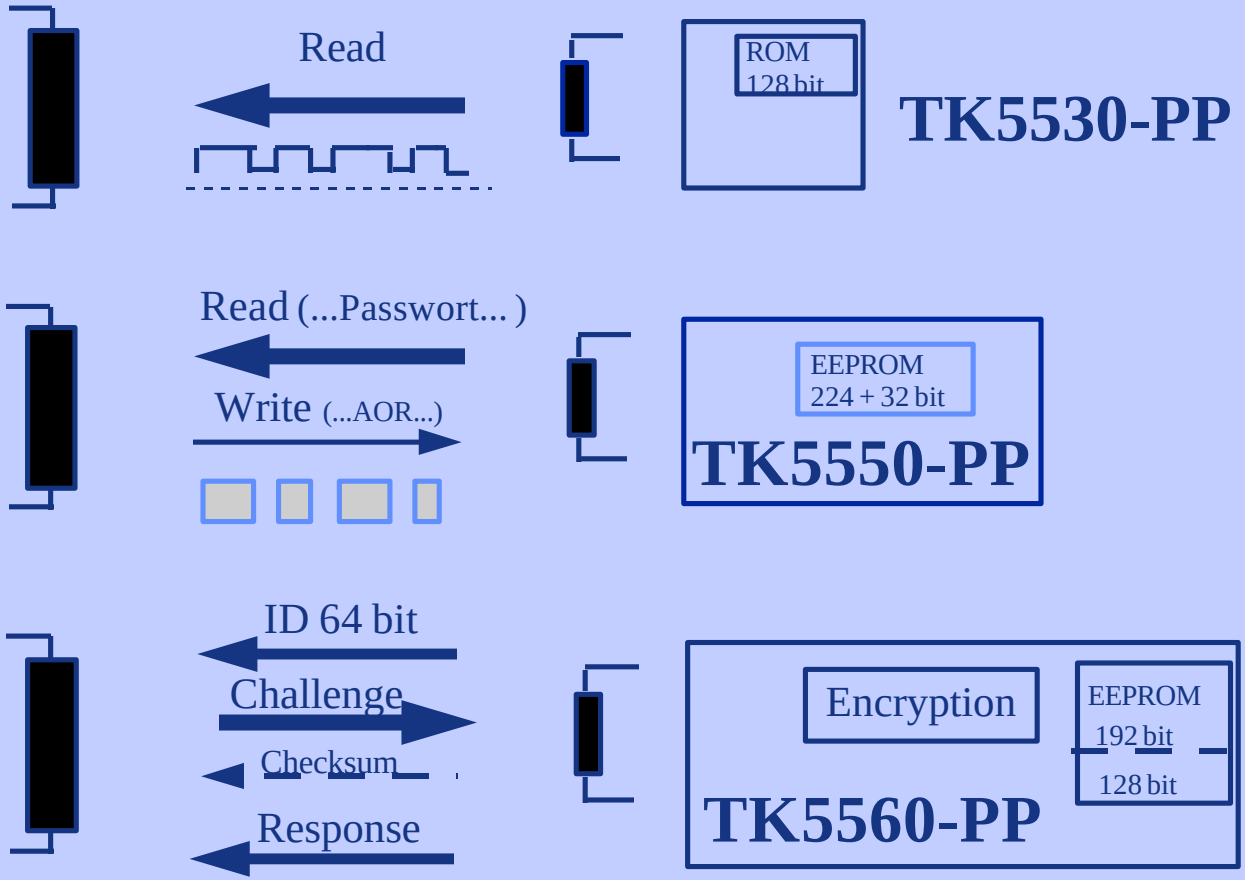


IDentification IC - Transponder -

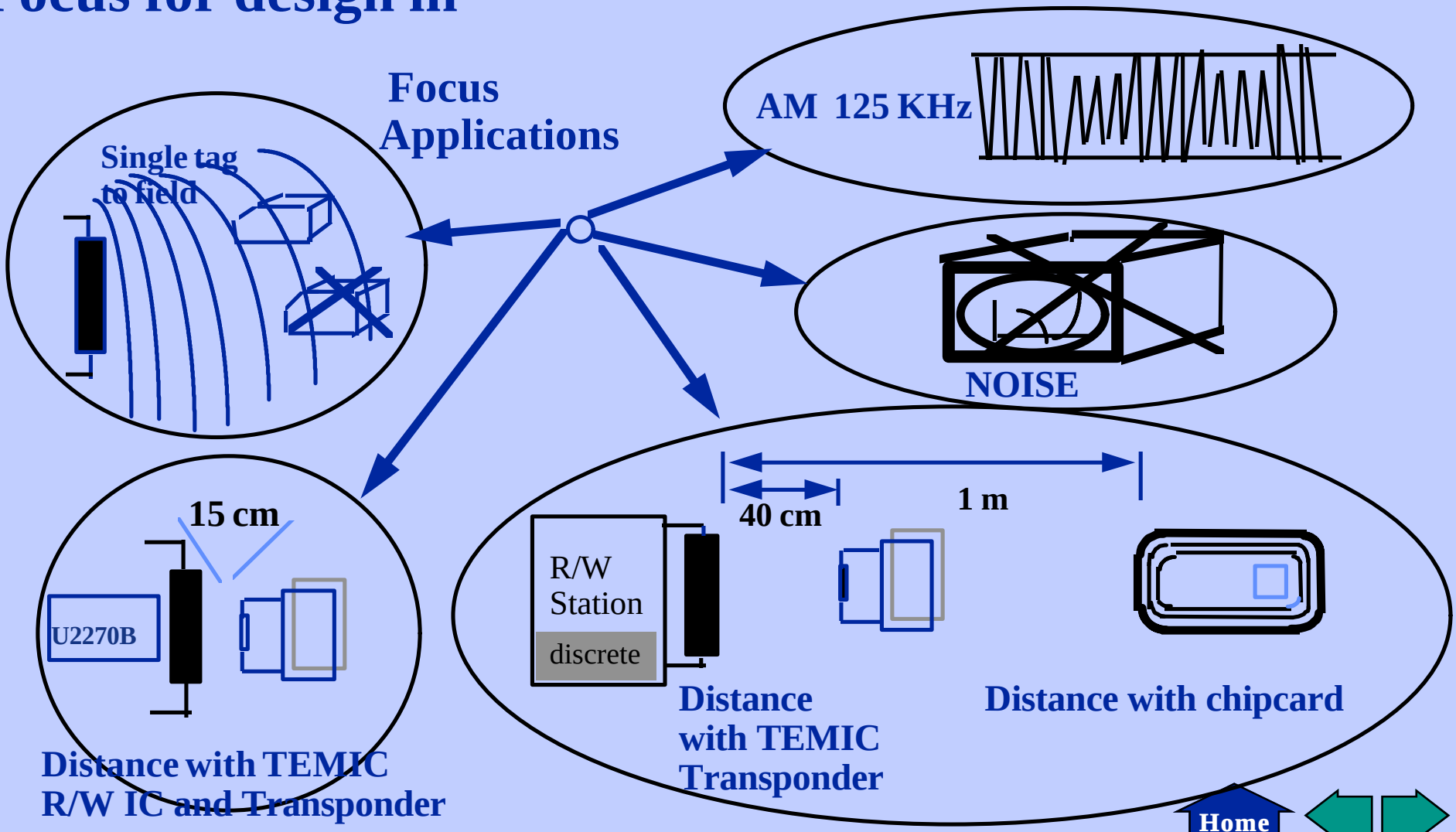
- **Plastiktransponder**
  - size: 12,05 x 5,9 x 3 mm
  - frequency: 125 kHz
  - automotive applications
  - larger read distance
  - production > 1 M pcs with TK 5530 now
  - carries e5530 / e5550 / e5560
  - all samples available in-line with IDIC (IC)
  - high volume production line in preparation

- **Glastransponder**
  - size: 12 x 2,12 mm
  - smallest size on the market!
  - frequency: 125 kHz
  - animal and automotive application
  - > 3 Mill. pieces manufactured
  - qualified for automotive
  - carries e5530 IDIC

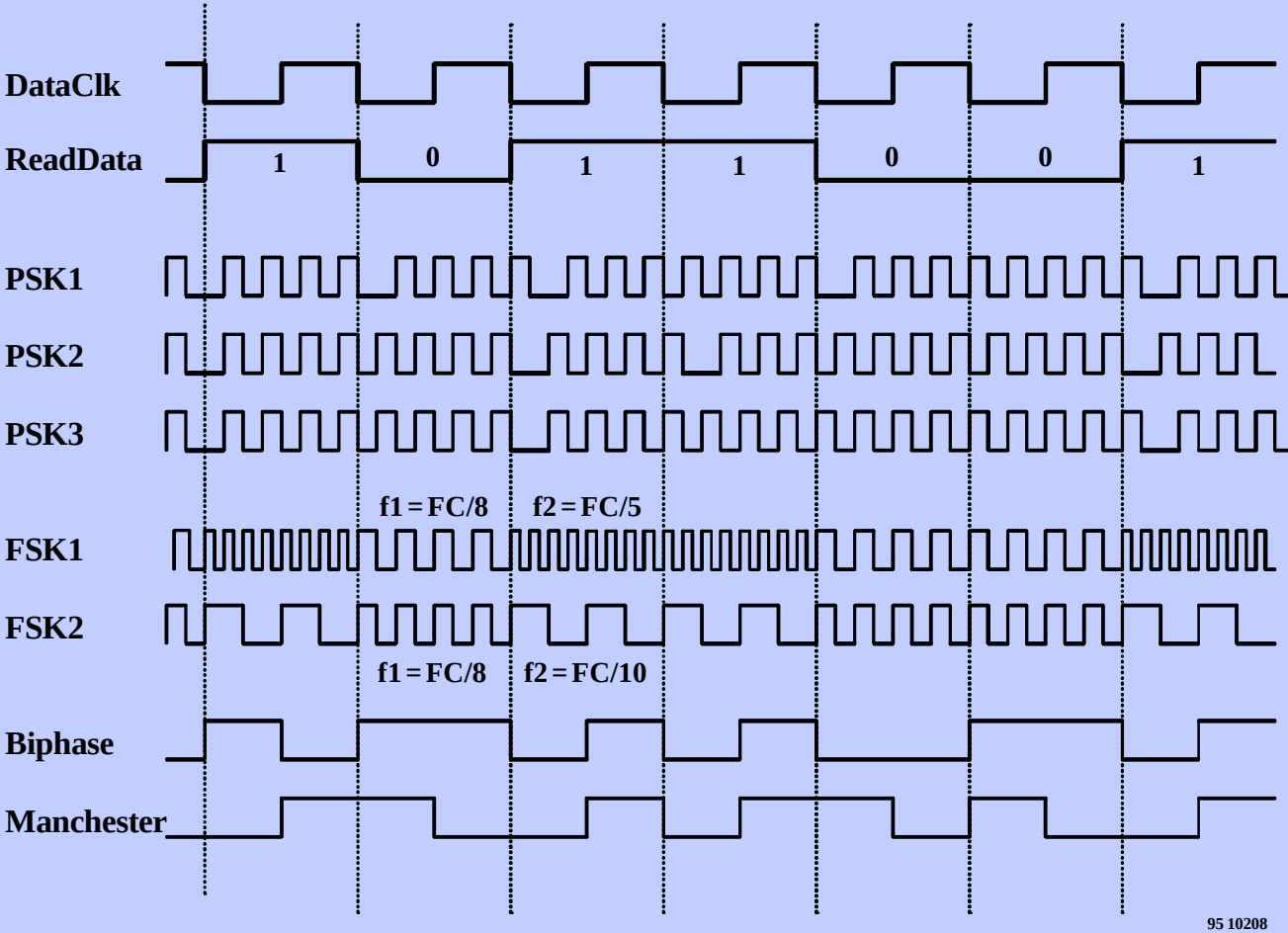
Transponder : Basic Features



Focus for design in

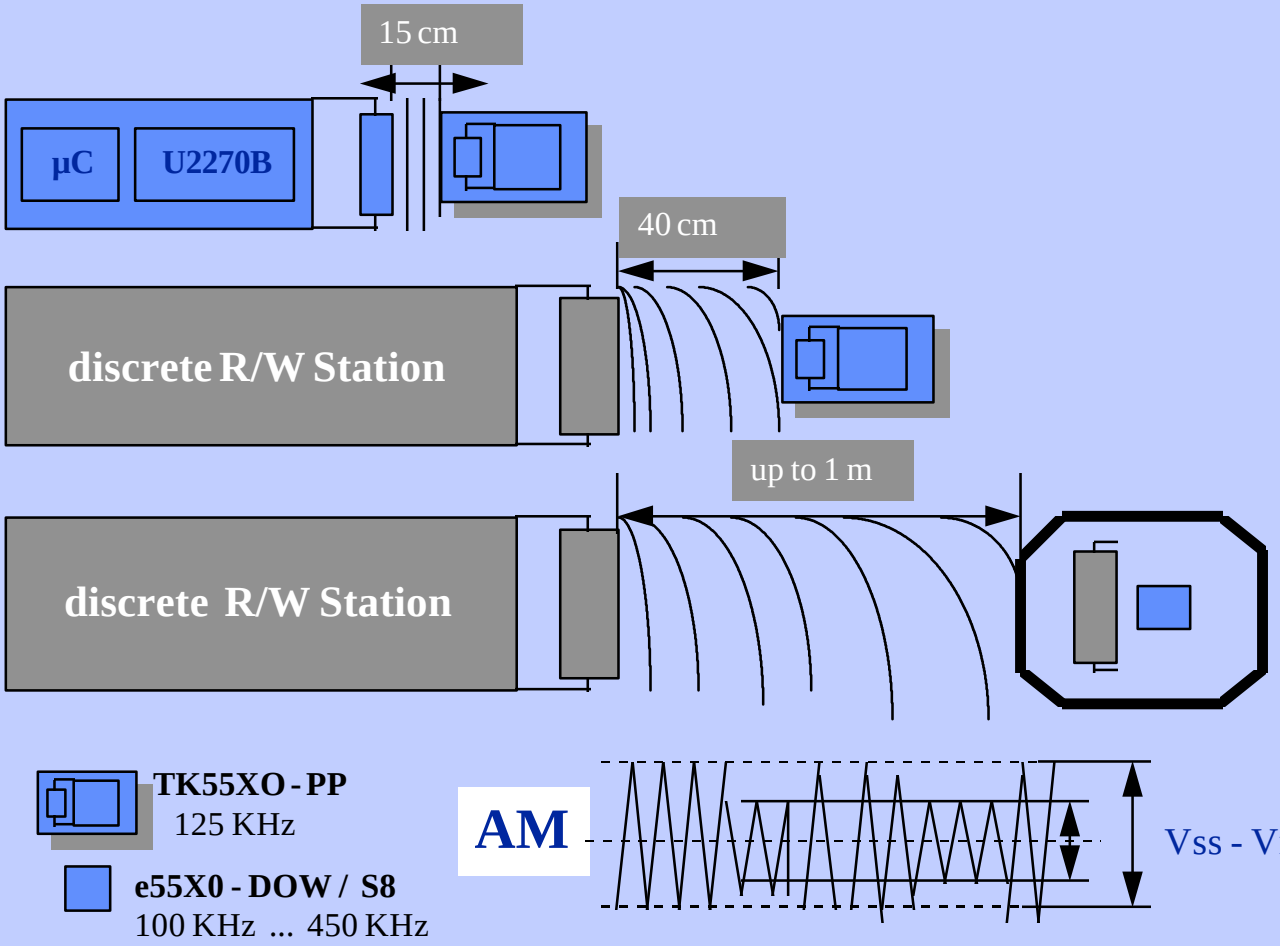


Modulation modes



	5530	5550	5560	U2270
PSK1, PSK2, PSK3	X	X		
FSK1, FSK2	X	X		
Biphase	X	X	X	X
Manchester	X	X	X	X

System design: R / W Distance



System design: Recommendations

- 125KHz VLF System - most penetrated in the market
- AM system: well suitable for low cost systems
- Optimized distance by improved reader parameters
- Long distance - extensive solutions
- For anticollision avoidance use e5550 AOR mode

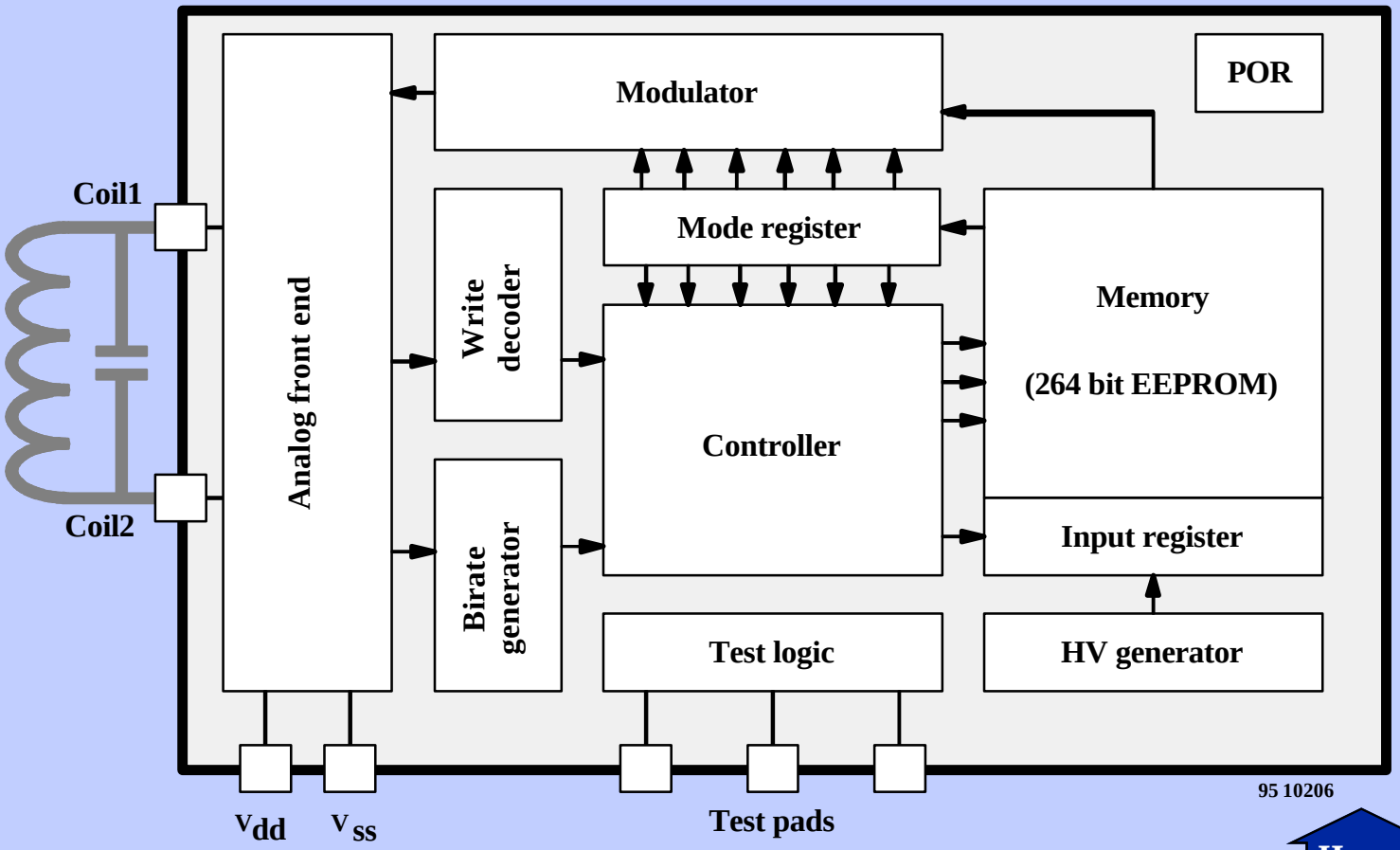
TK 55X0-PP Key Features

- Read only and R/W
- 128 bit - 224 bit user programmable
- Optimized data integrity (header, checksum, lockbit)
- Write protection (Password mode, Lockbit) *
- Answer on request - makes transponder unique *
- Different security level
- Automotive approved *

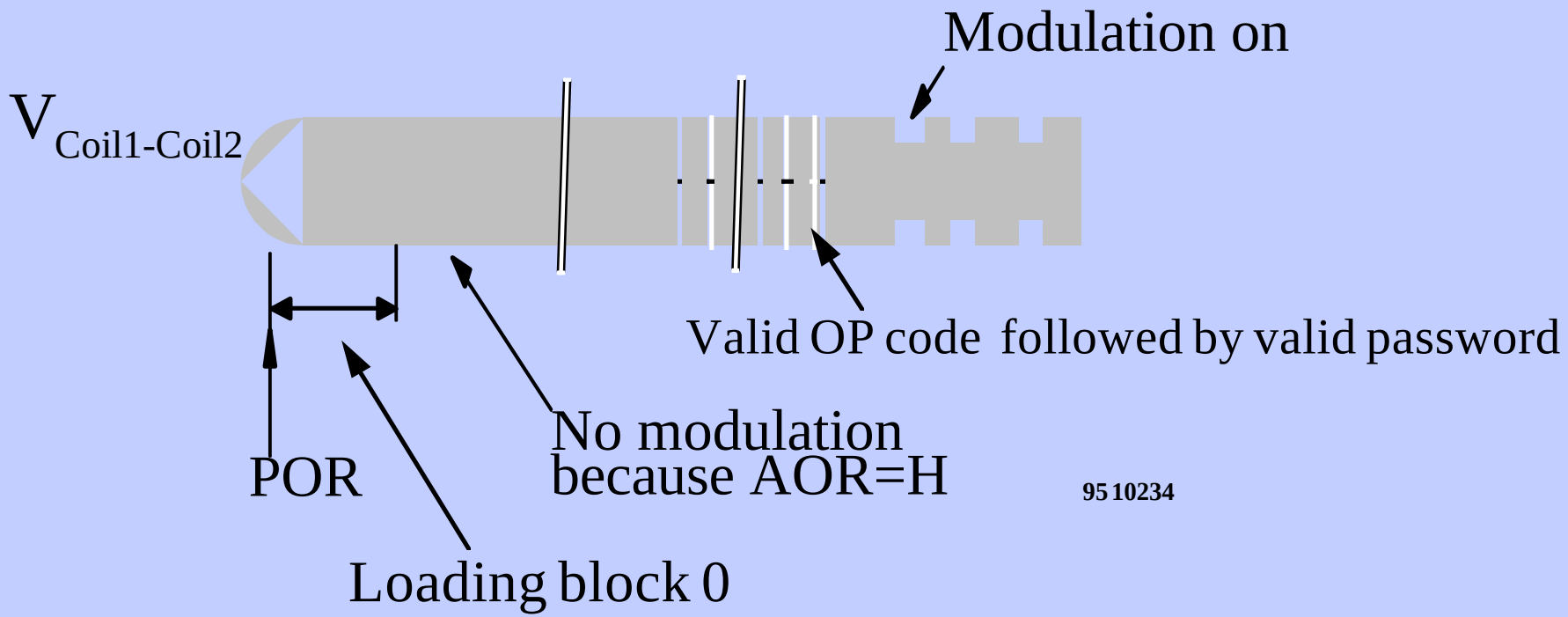
IDentification IC - Product Survey -

IC	e5530	e5550	e5560	U2270B
Status	production	production	production	production
Operation	read-only 100 - 350 KHz	read/write low power 100 - 350 KHz	read/write encryption low power 100 - 350 KHz	basestation IC antenna driver 100-150 kHz osc. receiver/filter
Memory	4 x 32 bit laser fusable ROM	8 x 32 bit EEPROM 8 lock bits	10 x 32 bit EEPROM incl. lock bits	
Application	object ID	object ID datacom	object ID high security	frontend basestation

TK 5550 Block diagramm



TK5550 Answer on request mode (AOR)



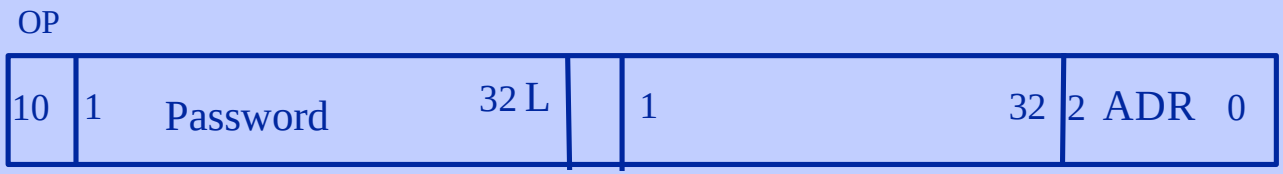
Modulation enabled only after valid signal from base station

TK5550 : Security Modes

Standard Write

PWD

Write Access



AOR

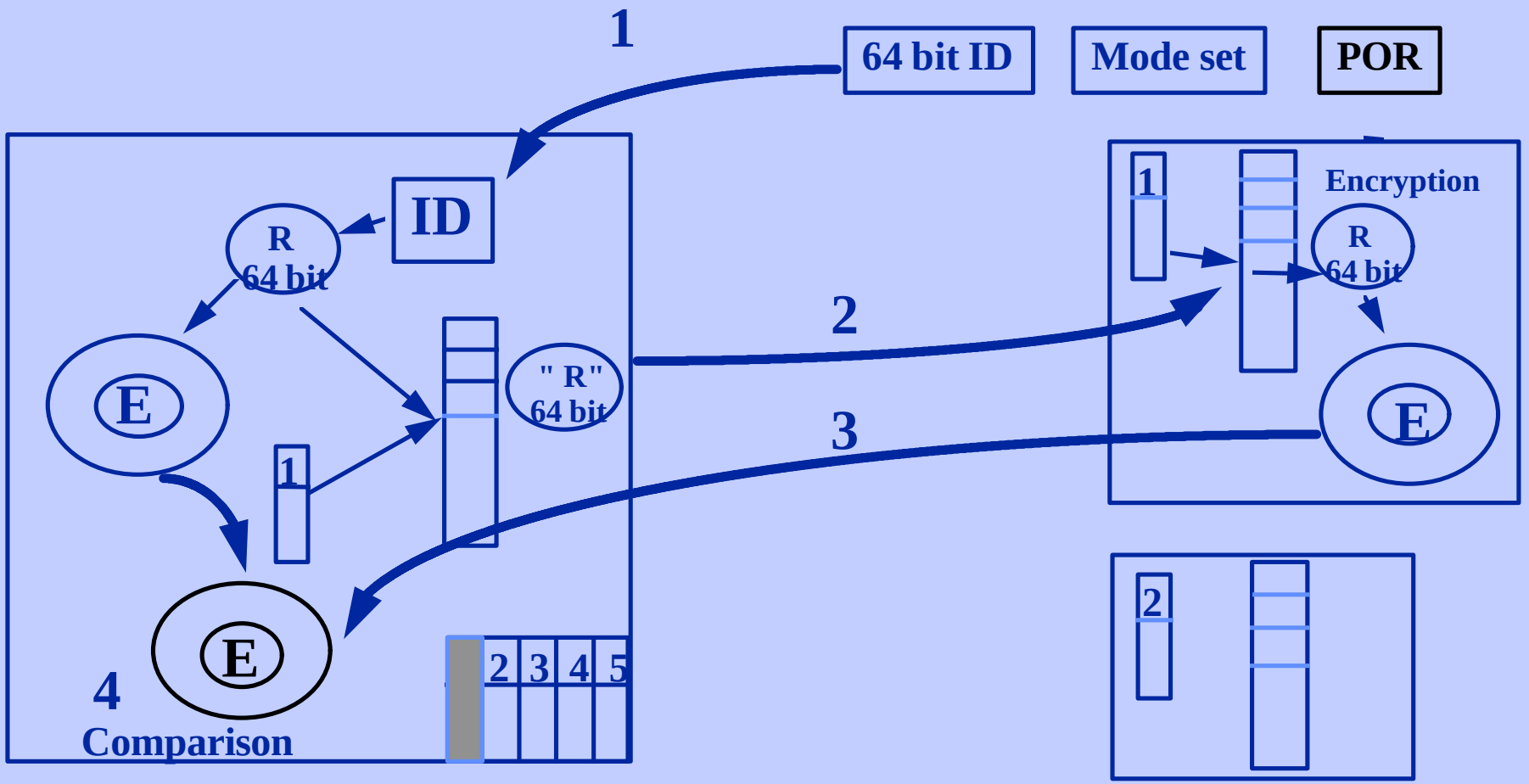
"Tag is here"

Anticollision avoidance

TK55X0-PP Protection features

Protection against		TK5550-PP	TK5560-PP
Crypto	Read out	-	X
Passwort	Overwrite	X	X
AOR	Modulation enabling	X	-
UV / X-ray	Reprogramming	-	X
Lockbit	Manipulation	X	X
		blockwise	block 1 - 4 ID code block 5 - 8 Cryptokey block 9 Password block 0/1/5 bit 1-8

TK5560-PP: Basic Encryption Procedure



TK 5560-PP Key benefits

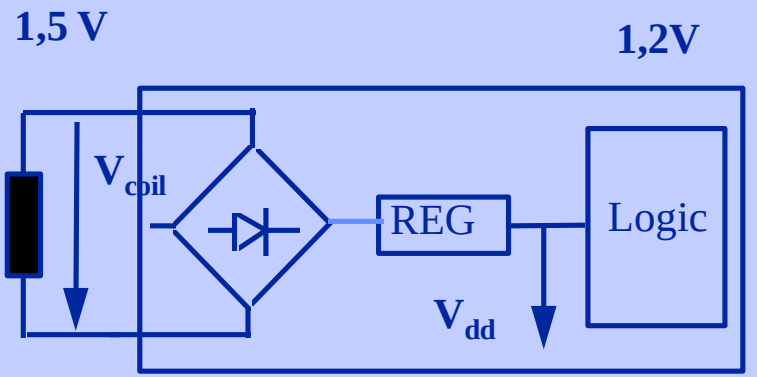
1,5 Low Voltage
10 uW Low Power

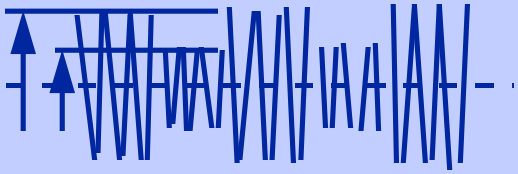
Low internal voltage drop V_{coil} - V_{cc}

Maximum possible modulation depth

Self adaption f_{syst} Distance optimized

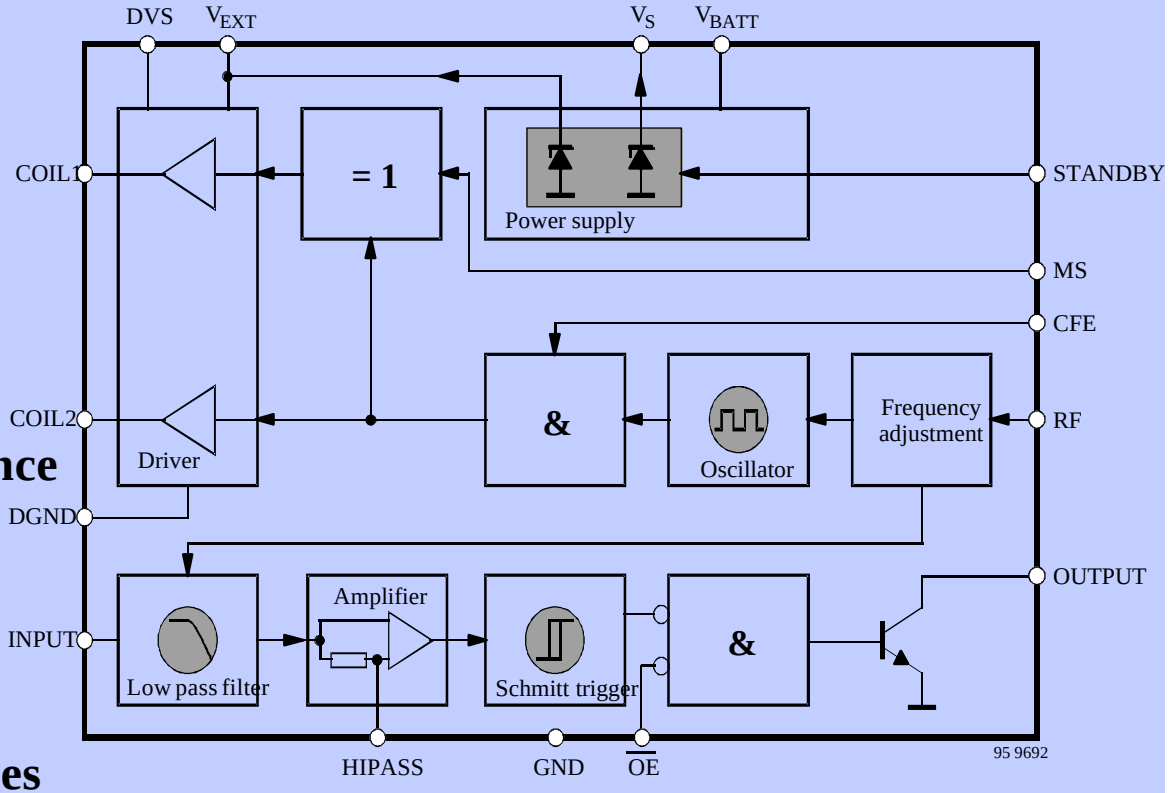
Time optimized protocoll



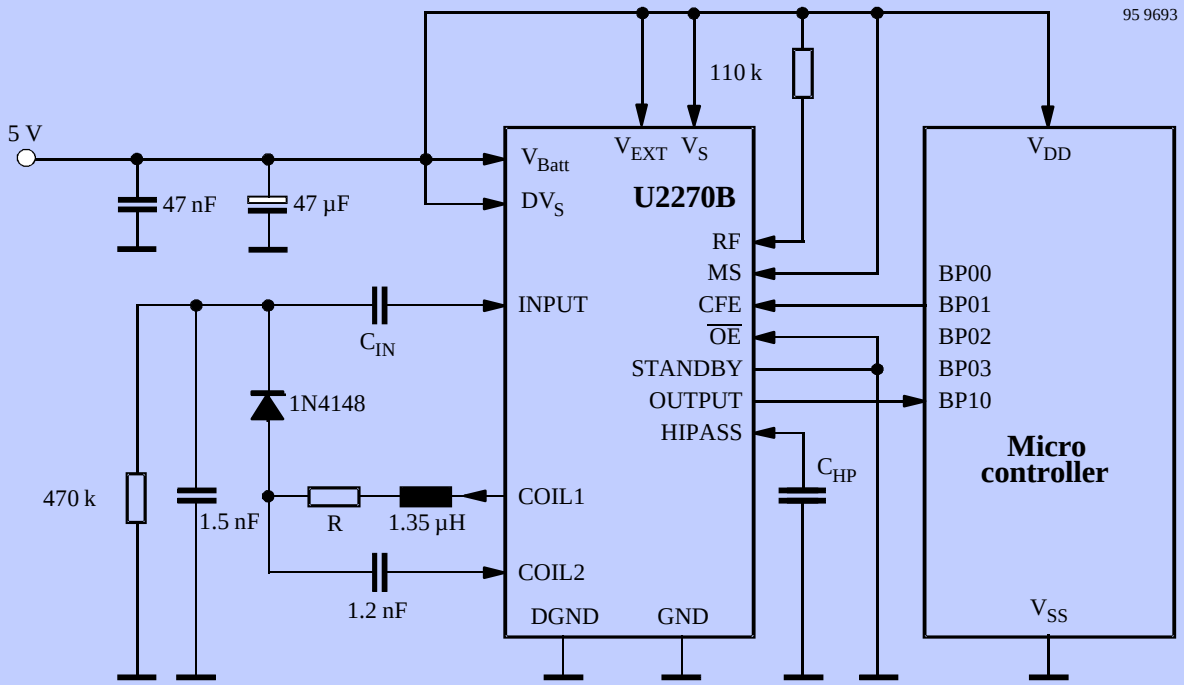


U2270B Reader IC Key Features

- Supplies energy for RF - field
- Proceeding of AM signal
- Encoded signal to the micro
- 100 kHz - 150 kHz
- Reduced periphery for short distance
- Control loop externally
- Tuning capability
- Applications for extended distances

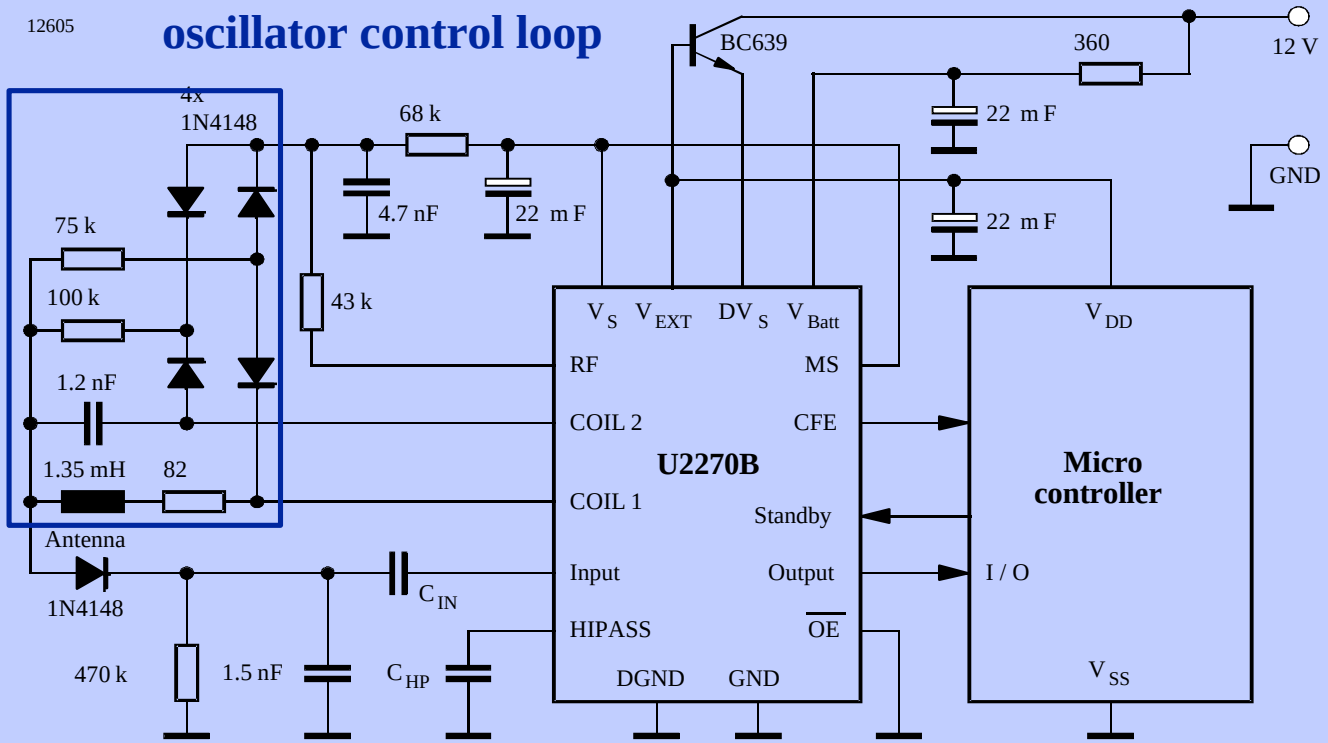


R/W Basestation U2270B: Application (1)



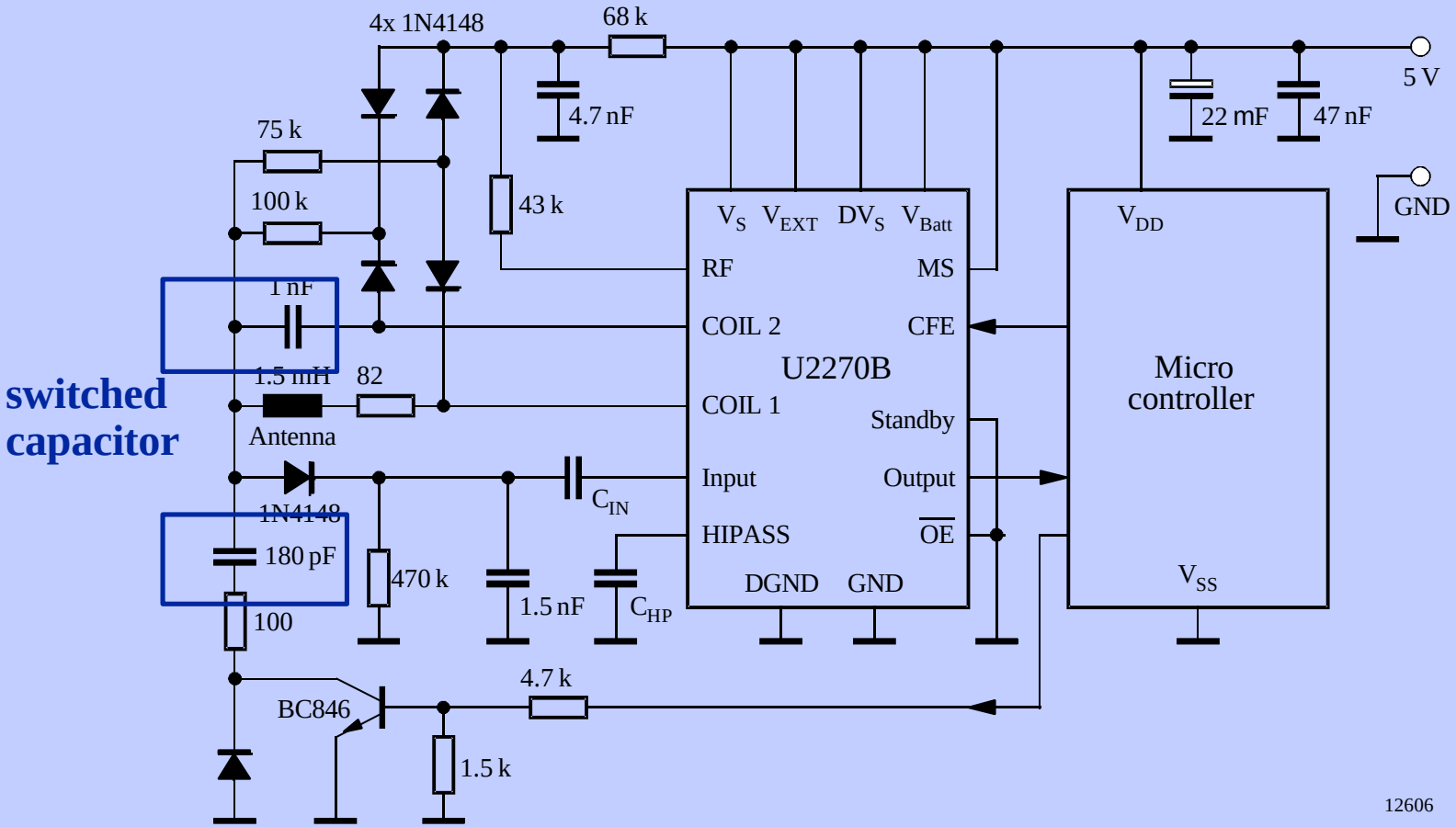
Basic Application for high magnetic coupling

R/W Basestation U2270B: Application (2)



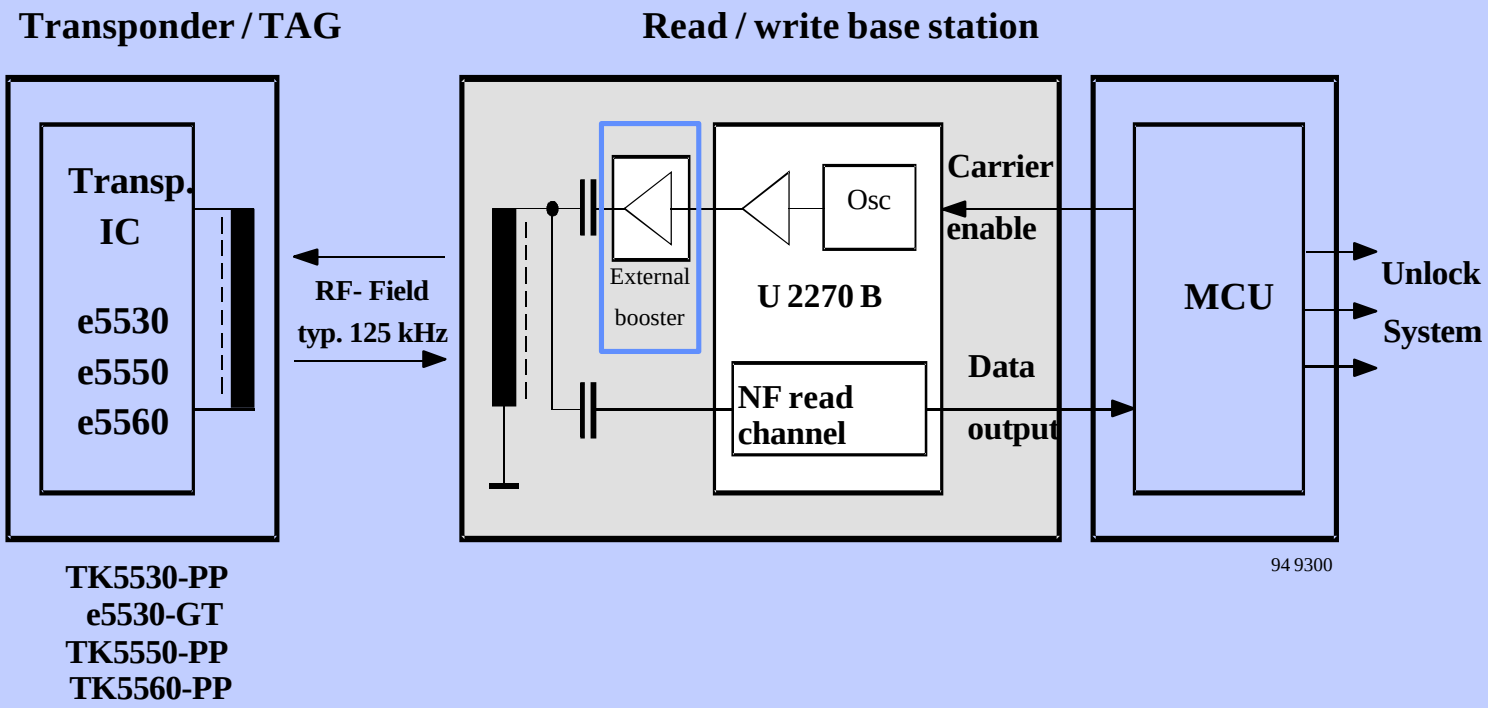
Application for extended R/W distance

R/W Basestation U2270B: Application (3)



Maximum distance by alternating frequency

R/W Basestation U2270B: Application (4)

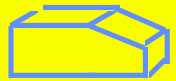
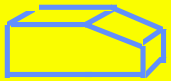


Extended R / W distance

Automotive Applications

TK 5530 - PP	Read only	Immobilizer Seat detection Car radio
TK 5550K-PP	Read Write	Service Book Convenience Logistics
TK 5560-PP	Read Write Crypto	Immobilizer

Standard Components Availability

Type	Package	Basic Features		Function
e5530H-232 (-230)	DOW / S8	Manch **Rf /32** (Rf/40)	R	Tag - IC 
e5530H-230	GT	Manch Rf /40	R	G-Transp 
TK5530HM-232 (-230)	PP	Manch **Rf /32** (Rf/40)	R	P-Transp 
e5550 K (.....H)	DOW / S8	All modulation **Rf /8 /32 /50 /100** (Rf/50 /64 /100 /128)	R / W	Tag - IC 
TK5550K (.....H)	PP	All modulation **Rf /8 /32 /50 /100** (Rf/50 /64 /100 /128	R / W	P-Transp 
U2270B-A	FP	Manch / Biphase Rf /32 /40 /50/ 64	R / W	Base station IC