It's NFC

Smart NFC choice for your life

3ALogics

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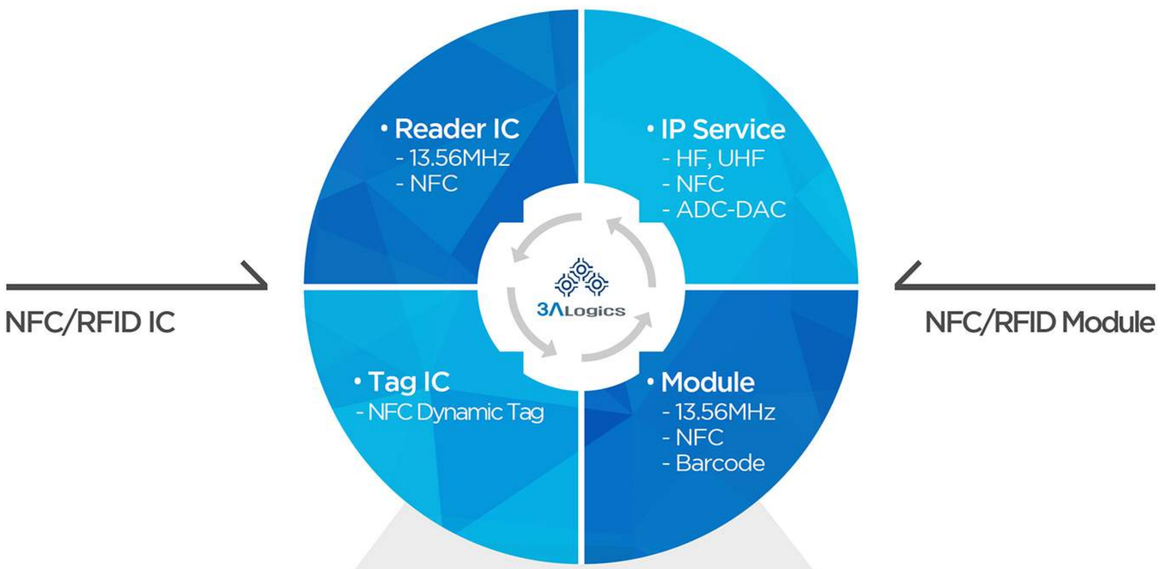
Business Area



Convergence IC & Module

NFC & Touch Sensor One Chip / Beacon & NFC Module
Wireless charger module

Smart NFC choice for your life

NFC Reader, Digital Door Lock, Access Control, Contactless Payment Terminal, Transport Terminal, Mobile Phone, Mobile Terminal, POS Terminal, Medical, Product Authentication Healthcare device, IoT Sensor

CEO Message

NFC has become a core technology in making the Ubiquitous World a reality. With extensive IT SoC experiences, 3ALogics is dedicated in development of NFC IC & Dynamic Tag IC and making the IoT-World (BLE, Wireless power) a part of our lives.
With our focus in NFC & IoT, 3ALogics is taking necessary steps to become a global leader in NFC SoC development.

Technology is changing quite rapidly turning yesterday's technology into an useless item overnight.
NFC technology is the same. Therefore, all our executives and employees are constantly updating technology movements while maintaining creativity in our new technology development and making efforts.
In addition, 3ALogics puts customer satisfaction the number one priority, believing that each customer's success is our own success story, therefore, emphasizing customer technical service.

Moreover, 3ALogics has implemented an internal management system to track business ethics for both executives and employees.
Corporate profits that transparently turns to profits for both employees and stockholders that is the system that I believe is a key success factor in making 3ALogics a global leader in NFC SoC.
Thank you.

Best Regards,
3ALogics Inc.
Co-representative
Pyeong-Han Lee, Kwang-Beom Park

Products Line-up

P6 RFID Reader IC
TRH031M-S / TRH033M-S

P8 NFC Reader IC
TNR100 / TNR200 / TNR300

NFC Bridge IC (Dynamic Tag)
TNB131M / TNB132M / TNB133M / TNB134M

P9 RFID Reader Module
TRM-500 / TRM-700

P10 NFC Module
TRM-800N / TRM-900N

NFC Bridge Module
NBM-100N / NBM-100A / NBM-100Dongle

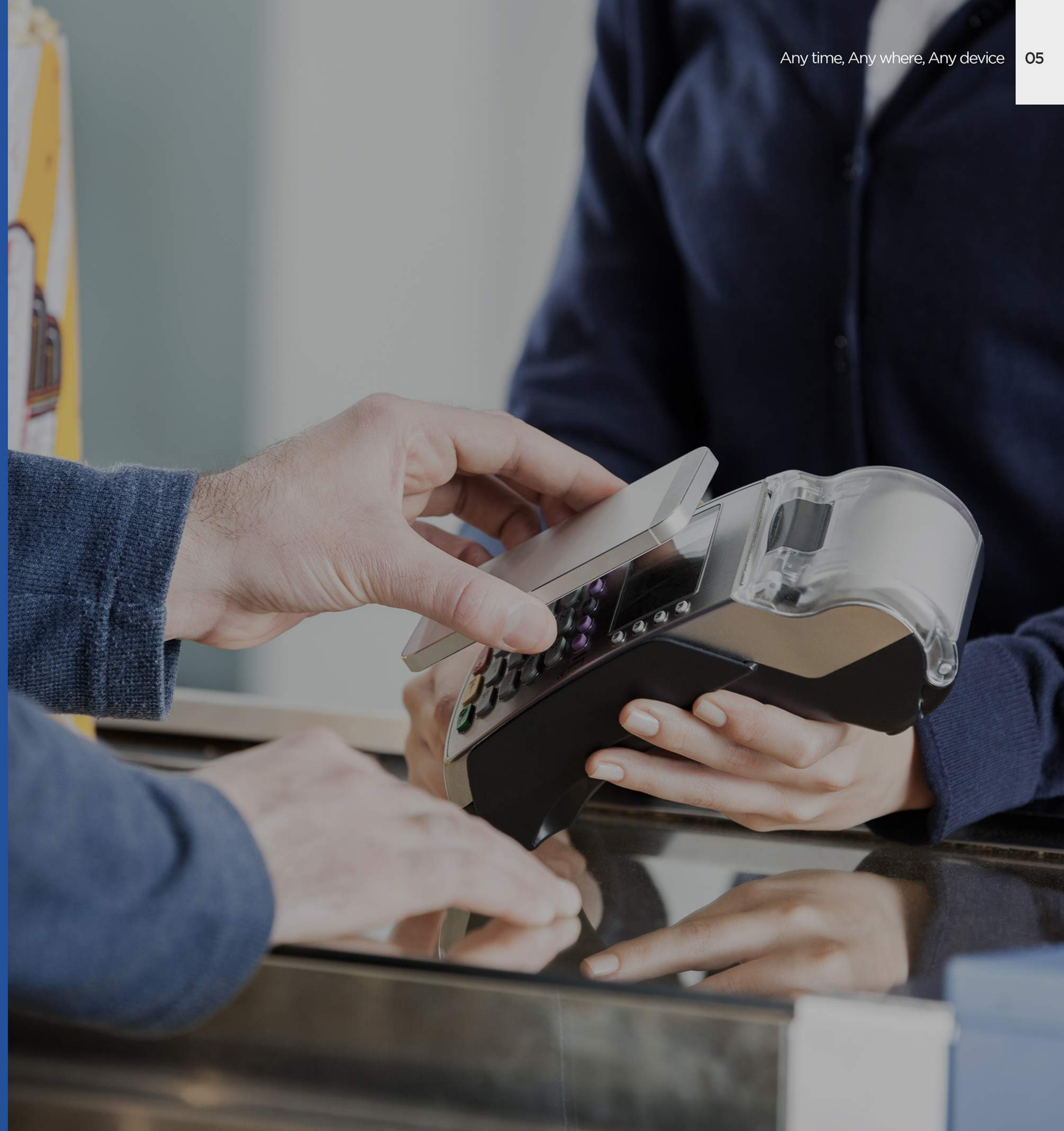
P11 NFC / RFID Study Kit
RSK-100 / RSK-300 / RSK-400L / NSK-300

P12 NFC Bridge Study Kit
NBK-100EH / NBK-100Dongle

P13 NFC/RFID System
JBR-Series / Ski-Gate

P14 TEST JIG System
NTJ-100 / APTJ-100

P15 Wireless Charger
TWT-100 / TWT-200 / TWR-100



[RFID Reader IC / 13.56MHz]

TRH031M-S 13.56MHz RFID Reader Chip

Specifications		Applications
Frequency	13.56MHz	• Digital Door-Lock / Entrance Management
Protocol	ISO/IEC 14443 A/B, 15693, Tag-it Protocols	• E-cash Reader
Modulation	ASK 5~35% & ASK 100%	• Public Transport Terminals
Operating Range	Up to 10cm	• Handheld Terminals
Supply Voltage	2.9V ~ 3.6V	• On Board Units
Package Size	7.0 mm x 7.0 mm	• Contactless PC Terminals
Package	LQFP (32pin)	

Features

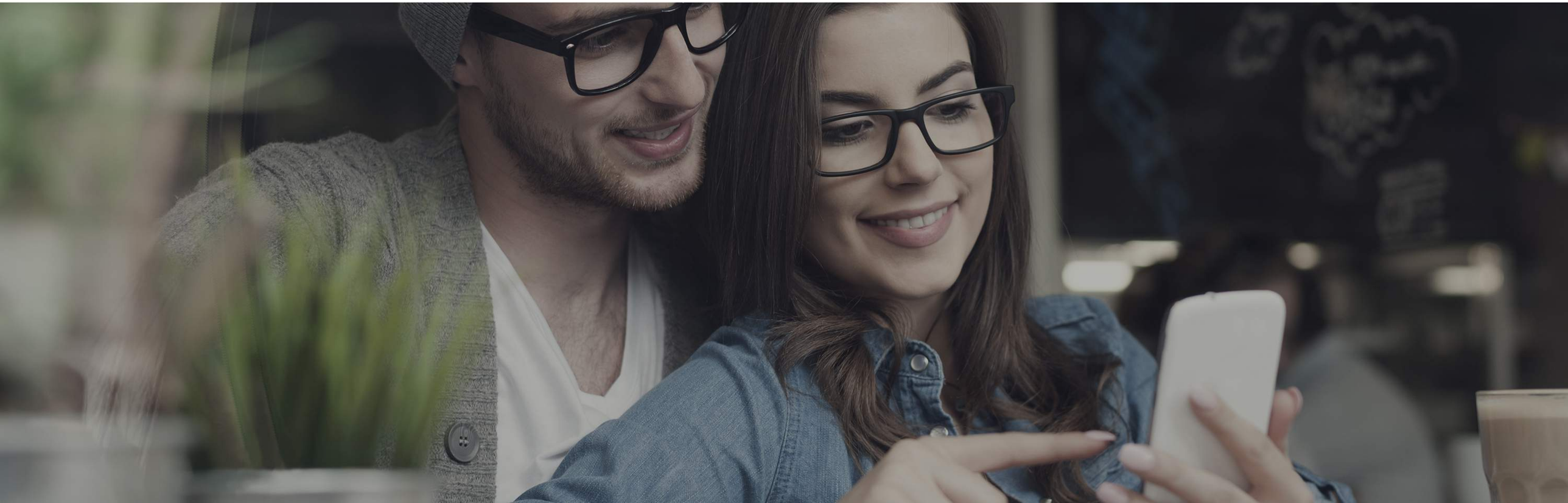
- Performs Analog and Digital mixed operations as standards indicated
- Power consumption minimization
- Hardware/Software power down function
- Minimized leakage and stand-by current
- Functions for microprocessor interface
- 128bytes FIFO buffer for immediate data storage
- 4 type of Parallel interface and SPI Serial interface
- Programmable Transmission Current Drivability up to 150mA
- Two Transmit driver can be configured
- Analog Receiver auto Calibration function
- Transmit power and modulation index configuration
- Adjustable receiver sensitivity depends on noise condition
- Data rate and pulse width configuration according to protocol standards

TRH033M-S 13.56MHz Super-Plus RFID Reader Chip

Specifications		Applications
Frequency	13.56MHz	• Digital Door-Lock / Entrance Management
Protocol	ISO/IEC 14443 A/B, 15693, Tag-it Protocols	• E-cash Reader
Modulation	ASK 5~35% & ASK 100%	• Public Transport Terminals
Operating Range	Up to 10cm	• Handheld Terminals
Supply Voltage	2.9V ~ 3.6V	• On Board Units
Package Size	7.0 mm x 7.0 mm	• Contactless PC Terminals
Package	LQFP (32pin)	

Features

- Performs Analog and Digital mixed operations as standards indicated
- Power consumption minimization
- Hardware/Software power down function
- Minimized leakage and stand-by current
- Functions for microprocessor interface
- 128bytes FIFO buffer for immediate data storage
- 4 type of Parallel interface and SPI Serial interface
- Internal Card detector (Include internal Oscillator: 50kHz)
- Supported Active communication
- Programmable Transmission Current Drivability up to 150mA
- Two Transmit driver can be configured
- Analog Receiver auto Calibration function
- Transmit power and modulation index configuration
- Adjustable receiver sensitivity depends on noise condition



[NFC Reader IC / 13.56MHz]

TNR100 NFC IC

Specifications

Frequency	13.56MHz
Temperature	-25 ~ 85°C
Protocol	ISO/IEC 14443 A/B, 15693 Standards I-CODE, Tag-It, Felica, Jewel Protocols, ISO/IEC 18092
Modulation Type	ASK 5~35% & ASK 100%
Operating Range	Up to 10cm depending on tag type
Supply Voltage	1.8 ~ 3.3V TX Power 1.8V analog and logic power
Integrated TAG	Yes
AFE Low Power	Yes
mode Integrated	Yes
LDO Package	32pin QFN (5.0mm x 5.0mm)

TNR200 NFC IC

Specifications

Frequency	13.56MHz
Temperature	-25 ~ 85°C
Protocol	ISO/IEC 14443 A/B, 15693 Standards I-CODE, Tag-It, Felica, Jewel Protocols, ISO/IEC 18092
Modulation Type	ASK 8 ~ 100%
Operating Range	Up to 10cm depending on tag type
Supply Voltage	1.62 ~ 3.6V
Calibration	RFID RX offset calibration
Memory	E-Flash 64Kbyte, SRAM 5KByte
MCU LDO ESD	Flip80251-typhoon, 1.8V output, HBM 2kV
Package	64PIN QFN (9.0mm x 9.0mm) / 64PIN TQFP (10.0mm x 10.0mm)

TNR300 NFC IC

Specifications

Frequency	13.56MHz	Calibration	RFID RX offset calibration, Touch channel auto calibration
Temperature	-25 ~ 85°C	Memory	E-Flash 64Kbyte, SRAM 5Kbyte
Protocol	ISO/IEC 14443 A/B, 15693 Standardsl-CODE, Tag-It Felica, Jewel Protocols, ISO/IEC 18092	Touch Channel	16Ch.
		Touch Method	Delay Reference Mask capacitive Sensing
Modulation Type	ASK 8 ~ 100%	MCU LDO ESD	Flip80251-typhoon, 1.8V output, HBM 2kV
Operating Range	Up to 10cm depending on tag type	Package Type	64PIN QFN (9.0mm x 9.0mm) / 64PIN TQFP (10.0mm x 10.0mm)
Supply Voltage	1.62 ~ 3.6V		

[NFC Bridge IC(Dynamic Tag) / 13.56MHz]

TNB131M

Specifications

Frequency	13.56Mhz
Operating Temp.	-40 ~ 85°C
Support protocol	ISO/IEC 18092 JIS 6319-4
Data Rate	212/424kbps
Supply Voltage	1.62V ~ 3.6V
P2P Passive Target mode	NFCIP-1 target
Tag Emulation mode	NFC Forum Type 3 Tag
Host Interface	SPI / I2C (400kHz)
Memory	256byte RAM
Package	QFN16 (3 x 3mm)

TNB132M

Specifications

Frequency	13.56Mhz
Operating Temp.	-40 ~ 85°C
Support protocol	NFC Forum Type 3 Tag JIS 6319-4
Data Rate	212/424kbps
Supply Voltage	1.62V ~ 3.6V
Host Interface	SPI / I2C (400kHz)
Memory	1Kbyte EEPROM
Package	QFN16 (3 x 3mm)
ETC Information	Internal LDO

TNB133M

Specifications

Frequency	13.56Mhz
Operating Temp	-40~ 85°C
Support protocol	NFC Forum Type 3 Tag JIS 6319-4
Data Rate	212kbps
Supply Voltage	1.62V ~ 3.6V
Em-MCU	Flip8051-Cyclone
Host Interface	UART/I2C
Memory	6Kbyte EEPROM, 2Kbyte RAM
Package	QFN28 (4 x 4mm)
ETC Information	Em-8051 MCU, Em-12bit ADC, Sensor Interface, Internal LDO

TNB134M

Specifications

Frequency	13.56Mhz
Operating Temp	-40~ 85°C
Support protocol	NFC Forum Type 3 Tag JIS 6319-4
Data Rate	212kbps
Supply Voltage	1.62V ~ 3.6V
Em-MCU	Flip8051-Cyclone
Host Interface	UART/I2C
Memory	6Kbyte EEPROM, 2Kbyte RAM
Package	QFN32 (5 x 5mm)
ETC Information	Em-10bit ADC, Internal LDO, Temperature Sensor

[RFID Reader Module]

TRM-500

Specifications

Frequency	13.56MHz
Protocol	ISO/IEC 14443 A & B, ISO/IEC 15693, Felica
Size	39 x 20 (mm)
DC Power	5V
TX driver Power	Max. 80mA
Antenna	HF Loop antenna, 42 x 27 (mm) Antenna cable 200 mm
Interface	RS232
Operating Range	Up to 70mm
Operating Temperature	-20 ~ 65°C

Features

- Supports Protocol
- ISO/IEC 14443 A,B, ISO/IEC 15693, Felica
- 13.56MHz RFID Reader module
- Based on the TRH033M-S
- Microcontroller – 8k byte Flash, 1K byte SRAM, 512byte EEPROM
- Separated antenna with board
- RS-232 Serial interface

TRM-700

13.56MHz Multi-Protocol Reader module

Specifications

Frequency	13.56MHz
Protocol	ISO/IEC 14443 A / B, ISO/IEC 15693, Felica
Size	30 X 50 X 11 (mm)
DC Power	5V
TX driver Power	Max. 80mA
Antenna	HF Loop antenna, 28 x 48 (mm)
Interface	RS232
Operating Range	Up to 50mm
Operating Temperature	-20 ~ 65°C

Features

- Supports Protocol
- ISO/IEC 14443 A,B, ISO/IEC 15693, Felica
- 13.56MHz RFID Reader module
- Based on the TRH033M-S
- Microcontroller – 8k byte Flash, 1K byte SRAM, 512byte EEPROM
- On board HF Loop antenna
- RS-232 Serial interface

[NFC Module]

TRM-800N

NFC Reader Module
(Support ISO/
IEC 18092-active P2P)

Specifications		Features
Frequency	13.56MHz	• Based on the TRH033M-S
Size	52 x 67 (mm)	• Separated antenna with board
DC Power	5V Max.	• Supports Protocol
TX Driver Power	80mA	- ISO/IEC 14443 A,B, ISO/IEC 15693, Felica,
Antenna	HF Loop antenna, 50 x 37 (mm)	Topaz, ISO/IEC 18092 (Active P2P)
	Antenna cable 200 mm	• Support ISO/IEC 18092 (NFCIP-1) / ECMA 340
Interface	USB	- RFID Reader and Writer mode
Operating Range	Up to 70mm	- Peer to Peer mode
Operating Temperature	-20 ~ 65°C	• Support all NFC Forum tags (Type1 , 2, 3, 4)
		• Active initiator and Active/Passive target mode according to ISO/IEC 18092
		• Microcontroller– 8k byte Flash, 1K byte SRAM, 512byte EEPROM

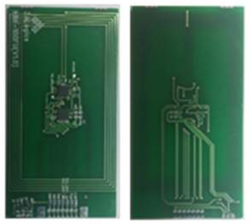
TRM-900N

NFC Reader Module
(Support ISO/
IEC 18092-active P2P)

Specifications		Features
Frequency	13.56MHz	• Based on the TRH033M-S
Size	64 x 84 (mm)	• On board HF Loop antenna
DC Power	5V Max.	• Supports Protocol
TX Driver Power	100mA	- ISO/IEC 14443 A,B, ISO/IEC 15693, Felica,
Antenna	HF Loop antenna	Topaz, ISO/IEC 18092 (Active P2P)
	56 x 62 (mm)	• Support ISO/IEC 18092 (NFCIP-1) / ECMA 340
Interface	USB	- RFID Reader and Writer mode
Operating Range	Up to 50mm	- Peer to Peer mode
Operating Temperature	-20 ~ 65°C	• Support all NFC Forum tags (Type1 , 2, 3, 4)
		• Active initiator and Active/Passive target mode according to ISO/IEC 18092
		• Microcontroller– 8k byte Flash, 1K byte SRAM, 512byte EEPROM

NBM-100A

UART interface N-bridge module



Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 18092 (JIS 6319-4)
Operating Temperature	-40 ~ 85°C
Power	1.6 ~ 3.6V
Host interface	UART or GPIO 3port (9600~115200 bps)
Board	32mm x 61mm x 1.75mm
Antenna Size	5 turn, 31mm x 52mm L = 2.47μH
NFC mode	Type 3 tag emulation *NFCIP-1 passive target
Modulation	Load modulation
MCU	8bit Ultralow power MCU
Memory	Flash 8Kbyte, SRAM 1.5Kbytes, EEPROM 2Kbytes
Data rate	212 / 424kbps

NBM-100Dongle

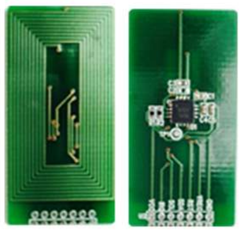
USB interface N-bridge module

Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 18092 (JIS 6319-4)
Operating Temperature	-40 ~ 85°C
Power	1.6 ~ 3.6V
Host interface	USB 2.0 Full Speed (Virtual Serial port)
Board	32mm x 65mm x 3.7mm
Antenna Size	5 turn, 31mm x 52mm L = 2.47μH
NFC mode	Type 3 tag emulation *NFCIP-1 passive target
Modulation	Load modulation
MCU	ARM-based 32bit MCU
Memory	Flash 64Kbyte, SRAM 20Kbytes
Data rate	212 / 424kbps

[NFC Bridge Module]

NBM-100N

I2C interface N-bridge module



Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 18092 (JIS 6319-4)
Operating Temperature	-40 ~ 85°C
Power	1.6 ~ 3.6V
Host interface	I2C (up to 400kHz)
Board	15mm x 30mm x 1.75mm
Antenna Size	10 turn, 14mm x 26mm L = 2.25μH
NFC mode	Type 3 tag emulation *NFCIP-1 passive target
Modulation	Load modulation
Memory	SRAM 256bytes
Data rate	212 / 424kbps
Special feature	Host Wake-up interrupt by External RF field

[NFC/RFID Study Kit]

RSK-100

13.56MHz Multi-Protocol Reader Kit /
TRH031M-S Evaluation Kit

Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 14443 A/B, 15693, Tag-it
Reader Size	Standards 110 x 74mm (L x W)
Antenna Size	80 x 53mm (L x W)
DC Power	5V (DC jack)
Interface	RS232
Operating Range	Up to 10cm depending on tag type

RSK-300

13.56MHz Multi-Protocol Reader Kit / TRH033M-S Evaluation Kit

Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 14443 A/B, 15693 Standards I-CODE, Tag-It, Felica, Jewel Protocols
Reader Size	110 x 74mm (L x W)
Antenna Size	80 x 53mm (L x W)
Balun Module Size	20 x 20mm (L x W)
DC Power	5V (DC jack)
Interface	RS232
Operating Range	Up to 10cm depending on tag type

RSK-400L

13.56MHz RFID Long range Reader Kit

Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 15693 Standard, (NXP SL2 ICS20, I-CODE)
Size	220 x 125 x 80mm - Housed
Baud Rate	1.6/26.5 Kbps
Anti-collision	Available
DC Power	24V DC adapter
TX Power	Max. 3W
Antenna	TRA-400L, 50ohm External antenna, RF Coaxial Cable type, 350 x 420 x 45mm
Interface	RS232 / 485
Operating Range	Up to 50cm depending on tag type

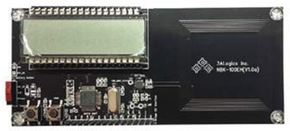
NSK-300 NFC Study Kit

Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 14443 A/B, 15693 Standards I-CODE, Tag-It, Felica, Jewel, HCE protocols
Size	112 x 62 x 15mm (L x W x H)
DC Power	5V (USB)
Interface	USB
Operating Range	Up to 10cm depending on tag type

[NFC Bridge Study Kit]

NBK-100EH

NFC Bridge IC Application Kit / Energy Harvesting Application



Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 18092 (JIS 6319-4)
Operating Temp	0 ~ 85°C
DC Power	No Battery (2.0 ~ 3.0V harvesting)
	Or 3.0V Battery
Operating current	Typ. 2mA (@3.0V)
Operating range	Up to 2.0cm
Size	PCB - FR4, 1.6T
	52mm x 120mm x 22.1mm
Application	Energy Harvesting

NBK-100Dongle

NFC Bridge IC Evaluation Kit / NB131M EV Kit

Specifications	
Frequency	13.56MHz
Protocol	ISO/IEC 18092 (JIS 6319-4)
Operating Temp	-40 ~ 85°C
Power	1.65 ~ 3.6V
Host interface	USB 2.0 full speed interface
	*Virtual COM (Serial communication)
Host interface Protocol	N-Bridge Command / Protocol (proprietary)
Board	PCB - FR4, 1.0T
	32mm x 65mm x 4mm
Antenna Size	5 turn, 30mm x 52.5mm L = 2.9μH
NFC mode	Type 3 tag emulation
	*NFCIP-1 passive target
Modulation	Load modulation
Data rate	212 / 424kbps (Selective data rate)
Microcontroller	STM32F103C8 (ARM-based 32bit MCU)
Memory / Type	Flash/RAM
Memory / Size	64Kbyte/20Kbyte

Component

[NBK-100 Dongle KIT Component]

- NBM-100 Dongle Board 1 EA
  : Main Board – SDK
- TNB131M IC 5 EA
- NBK-100EH Board 1 EA
  : Energy Harvesting Application Board
- NBM-100DL Board 1 EA
  : Data logger Application Board (with Temperature sensor)

[NFC/RFID System]

JBR-Series

NFC 1D 2D

Specifications	
Functions	1D & 2D CMOS Imager Models (optional)
models	JBR-100 (1D), JBR-200 (2D), JBR-300 (2D+NFC)
Bluetooth	Class2 Bluetooth with HID/SPP Profiles
Operating Range	-20 ~ 60°C
Display	65K OLED, 4Colors LED
User Alarm	Beep sound, Vibration
Power	3.7V Rechargeable Li-Ion Battery operation, 5V USB Charger
IP grade	IP-54

Ski-Gate

NFC Entrance Management Ski gate

Specifications	
NFC Frequency	13.56MHz
NFC Protocol	ISO/IEC 15693 Standard, (NXP SL2 ICS20, I-CODE)
Operating Range	Up to 50cm
Display	7" TFT LCD, 3Color LED
OS	MS Windows XP, 7
Entrance Control	Bipod Turnstile bar
	Electro-mechanical motor Rotation
	Positive locking operation for one person at a time
Power	24V DC SMPS 250W x 2

[TEST JIG System]

NTJ-100

NFC Antenna TEST JIG

Specifications		Component
Frequency	13.56MHz	[NTJ-100 Component]
NFC Protocol	ISO/IEC 14443 A type (Type2) ISO/IEC 15693	• NFC/RFID Reader Board 1EA • Acrylic Mount Board 1 EA
Power	5.0V USB Power	• Antenna Matching Board 5 EA
TEST Antenna Inductance range	0.5μH ~ 5μH	0.5μH ≤ Lant ≤ 0.7μH Board 1EA 0.7μH ≤ Lant ≤ 1.0μH Board 1EA 1.0μH ≤ Lant ≤ 1.5μH Board 1EA 1.5μH ≤ Lant ≤ 2.5μH Board 1EA 2.5μH ≤ Lant ≤ 5.0μH Board 1EA
NFC IC	Based on TRH033M-S	• Antenna Connector Board 10EA
Dimension	NFC Reader Board 65mm x 100mm x 12mm Matching Board 65mm x 50mm x 10mm Antenna interface Board 15mm x 15mm x 5mm NTJ-100 95mm x 305mm x 40mm	• Reference Antenna 2EA (2Type) • Reference ISO/IEC 14443 A TAG 1EA ISO/IEC15693 TAG 1EA • Adjustment tool 1EA
Special Feature	• 4 LED indicator • 1 Buzzer • Antenna impedance matching adjustment : 2 trimmer - Shunt/Series • Receiver signal dynamic range adjustment : variable resistor	

APTJ-100

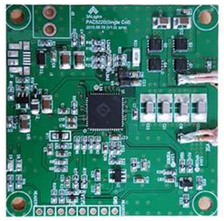
A4WP Power Receiving Unit TEST JIG

Specifications		Component
Frequency	6.78MHz ± 15kHz	[APTJ-100 Component]
Specification	A4WP Wireless Power Transfer System Baseline System Specification (BSS) V1.2.1	• Measurement Board 1EA • Antenna Matching Board 1EA • Antenna Reference Matching Board 1EA
PRU Antenna	Category 3	• Antenna Interface Board 10EA
PRU Application	Smart phone	• PRU Reference Category3 Antenna(RF4) 1EA
Dimension	Measurement Board 65mm x 70mm x 10mm Matching Board 65mm x 70mm x 10mm Reference Matching Board 65mm x 70mm x 10mm Reference Antenna Board 65mm x 80mm x 6mm Antenna Interface Board 65mm x 20mm x 6mm	• PRU Category3 Flexible Antenna 10EA • Adjustment tool 1EA • Acrylic supporter (5mm ~ 100mm) • Acrylic Mount Board 1 EA
Special Feature	- Separated 3 Part Board • Power Measurement Board • Matching Board • Antenna & Antenna interface Board - Output Current Range 1.5A - Output Voltage Range 38V - 7LED Receive indicator (5V, 10V, 15V, 20V, 24V, 30V, 36V)	

[Wireless Charger]

TWT-100

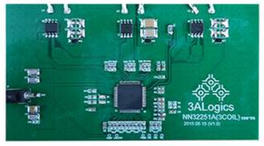
WPC Wireless Charger Transmitter



Specifications	
Standard	WPC1.1 Compliant
Tx Coil	Type A11 Single
Input Power	5V/2A
Efficiency	75% max
Operation Frequency	112 ~ 205kHz
FOD	Including Foreign Object Detection
DPL	Dynamic Power Limiting For USB
OVP,OCP	Over Voltage Protection, Over Current Protection
LED	Charging/End/Fault
Size	52 x 52 x 6.7 (PBA)

TWT-200

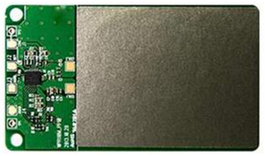
WPC Wireless Charger Transmitter



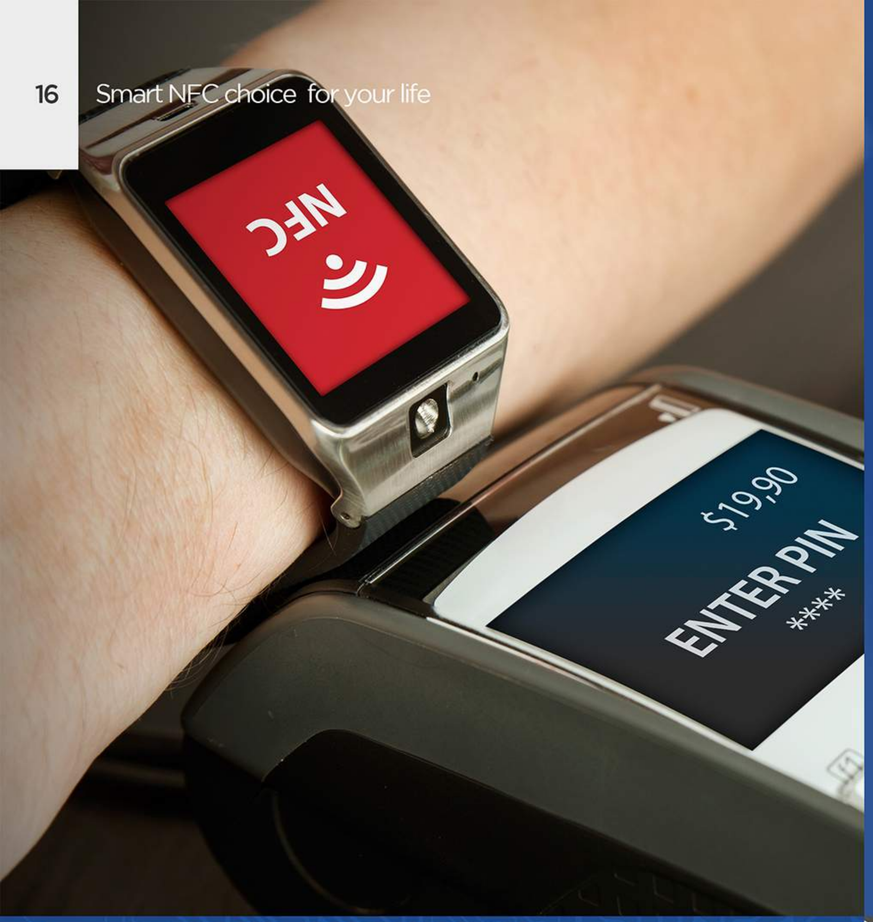
Specifications	
Standard	WPC1.1 Compliant
Tx Coil	Type A6, Triple
Input Power	5V/2A
Efficiency	75% max
Operation Frequency	112 ~ 205kHz
FOD	Including Foreign Object Detection
DPL	Dynamic Power Limiting For USB and Limited Source Operation
OVP,OCP	Over Voltage Protection, Over Current Protection
LED	Charging/End/Fault
Size	106 x 55 x 7.9 (PBA)

TWR-100

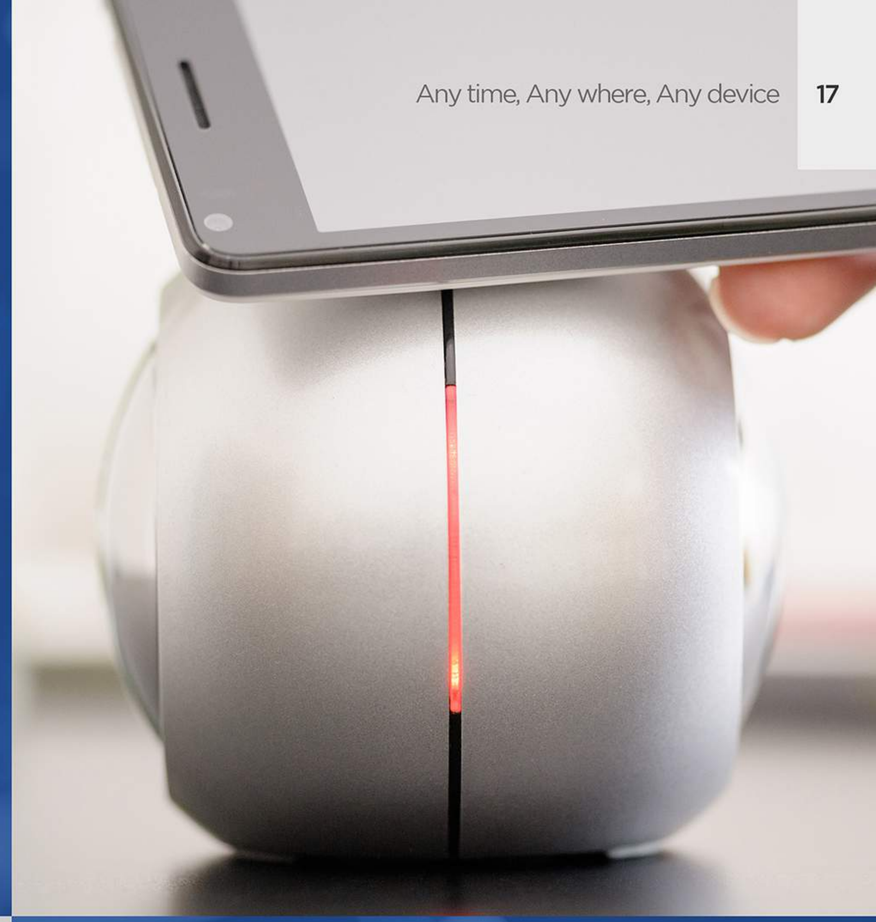
WPC Wireless Charger Receiver



Specifications	
Standard	WPC1.1 Compliant
Rx Coil	PCB pattern
Output Power	5V/1A (MAX)
Efficiency	73% max
Operation Frequency	112~205kHz
OVP,OCP	Over Voltage Protection, Over Current Protection
Size	39 x 71 x 0.7 (PBA)



NFC Dynamic Tag



NFC Reader IC

RFID Reader Module

Main Business

- Developing Core SoC of NFC/RFID Reader IC & NFC Dynamic Tag IC
- Developing NFC/ RFID Reader Module& tag
- Developing NFC/RFID Systems
- Bluetooth Barcode Scanner
- Ski-gate
- Wireless Charger

CEO

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