FOXCONN NXP NPC300 Module NFC Near Field Communication User Manual

Home » foxconn » FOXCONN NXP NPC300 Module NFC Near Field Communication User Manual

Contents

1 FOXCONN NXP NPC300 Module NFC Near Field Communication
2 Product Information
3 Product Usage Instructions
4 Hardware block diagram
5 Electrical Characteristics
6 Function timing characteristics
7 NFC contactless standard conformance
8 Marking Information
9 Packing information
10 Reliability Test plan
11 Federal Communication Commission Interference Statement
12 DETACHABLE ANTENNA USAGE
13 Documents / Resources
  13.1 References
14 Related Posts

FOXCONN NXP NPC300 Module NFC Near Field Communication

T77H747
REV.0 GP
V005

Product Information

Specifications

- **Product Name:** NFC (NXP NPC300) Module 5.0
- **Manufacturer:** HongFuJin Precision Industry Co., LTD
- **Manufacture Site:** ChongQing
- **Supported RF protocols:** NFC Forum, NCI, ISO/IEC 14443, ISO/IEC 15693
- **Frequency**: 13.56MHz

Product Usage Instructions

Introduction

The T77H747.10 is an NFC module designed for integration in computer or portable equipment and consumer devices compliant with NFC standards (NFC Forum, NCI, ISO/IEC 14443 and ISO/IEC 15693) etc. This module is based on NXP NPC300 solution, which is a highly integrated transmission module for contactless communication at 13.56MHz.

Scope

The NFC module RF protocols supported:

- NFC Forum
- NCI
- ISO/IEC 14443
- ISO/IEC 15693

Function

(Remark: Regulatory Certification is not started at this phase)

- **PCB Pattern of NFC Module**

  The NFC module has a specific PCB pattern for component placement. Please refer to the user manual for detailed information on PCB component placement and stack up.

- **Bill of Materials (BOM) of NFC Module**
  The BOM provides a list of all the materials required for the NFC module. Refer to the user manual for the complete BOM.
- **Marking Information**
  The marking information section provides details on labeling and identification of the NFC module. Refer to the user manual for the specific marking information.
- **Packing Information**
  The packing information section provides details on how the NFC module is packaged for shipping and storage. Refer to the user manual for the specific packing information.

FAQ (Frequently Asked Questions)

1. **Q: What are the supported RF protocols?**
   A: The NFC module supports NFC Forum, NCI, ISO/IEC 14443, and ISO/IEC 15693.
2. **Q: What is the frequency of the NFC module?**
   A: The NFC module operates at a frequency of 13.56MHz.

NFC
(Near Field Communication)
NXP NPC300 Module

Project Name	NFC (NXP NPC300) Module
Document Rev.	5.0
FOXCONN Part No.	T77H747.10
Module Rev.	005
FRU Part No.	01AX745
Customer Part No.	SW10K97523
FOXCONN Label Rev	00S0

Prepared by	Reviewed by	Approved by
Bandy.Jiang	Wei.Liao	Chang-Fu Lin

Revision History

Revision	Date	Originator	Comment
1.0	2016/01/28	Smile. Ming	Initial release
2.0	2016/04/20	Bandy.Jiang	1> Add pin 1 marking for mechanical drawing. 2> Add SM bus support in addition to I2C bus. (in page 4,5) 3> Add description of pin9 (TX_PWR_REQ) signal with active high 1.8V level output. (in page 15) 4> Change the PN of antenna connector from BM05B-ACHSS-A-GAN-ETF(LF)(SN) to BM05B- ACHKS-A-GAN-ETF(HF) 5> Update material in shielding drawing. 6> Following the latest schematic, update the material description into BOM 7> Add Tray ID label, Carton label, Pallet label into label information 8> Update packing information
3.0	2016/04/26	Bandy.Jiang	1> Update Module picture in page 18 2> Update packing information in page 23~24 3> Update vendor PN of host interface connector in page 15
4.0	2016/06/24	Bandy.Jiang	1> Remove R5 from BOM. 2> Change Foxconn project name from T77H747.00 to T77H747.10 3> Change FRU part No. from 00JT548 to 01AX745. 4> Based on above change list, update module picture, BOM, label contents and packing information.
5.0	2016/06/28	Bandy. Jiang	1> Change Host JST part number from ACHR-05V- A-S to ACHR-05V-A-K(HF) in page 14

- T77H747.10 is made in China,
- Manufactured by HongFuJin Precision Industry Co., LTD Manufacture Site: ChongQing
- http://www.foxconn.com

Introduction

The T77H747.10 is an NFC module designed for integration in computer or portable equipment and consumer devices compliant with NFC standards (NFC Forum, NCI, ISO/IEC 14443 and ISO/IEC 15693) etc. This module is based on NXP NPC300 solution, which is a highly integrated transmission module for contactless communication at 13.56MHz.

Scope

The NFC module RF protocols supported

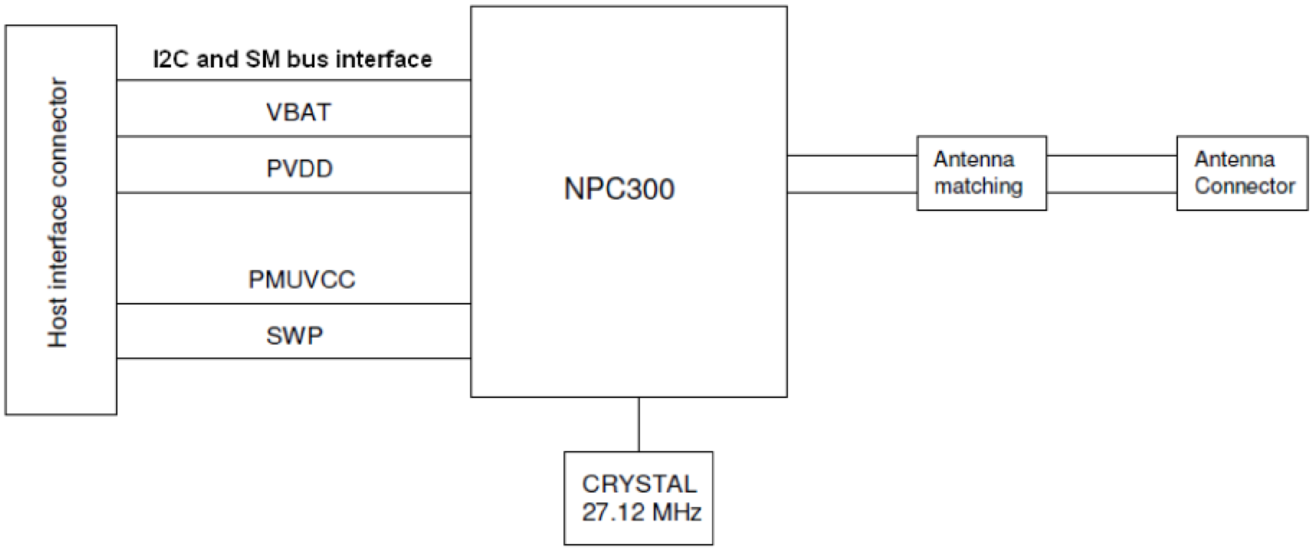
- NFCIP-1, NFCIP-2 protocol
- NFC Forum device 1.3
- ISO/IEC 14443A, ISO/IEC 14443B
- ISO/IEC 15693/ICODE VCD mode
- FeliCa PCD mode/PICC mode
- MIFARE PCD encryption mechanism(MIFARE 1K/4K)
- MIFARE PICC mode
- NFC Forum tag (type 1/type 2/type 3/type 4/type V)

Function

- NFC Features
    - Reader & Writer mode
    - Peer-to-Peer Communication mode
    - Card emulation mode
- • I2C-bus and SM-bus compatible for host Interface
- • Windows 8 Logo Device Requirement compliant
    - NFC Forum Wave1 Certification
    - LLCP
    - SNEP
- • Windows 10 Logo system Requirement compliant
    - Peer to Peer Communication over 2cm distance less than 10cm
- • Modular certification
    - FCC
    - CE
    - UL/CB
    - meet other regulatory requirements (as defined by 108 countries)
    - **(Remark:** Regulatory Certification is not started at this phase)
- Support Intel Windows 7/8.x/10 platform
- RoHS and Green Compliant

Hardware block diagram

- The T77H747.10 NFC module is based on NXP NPC300 solution with includes ARM microcontroller core, EEPROM, demodulator and decoder, power management unit, host
- interface. This module is powered from the host (5V) and interfaces to the host with I2C -bus compatible signals, on-board 27.12 MHz XTAL. Also includes on board low profile FPC/FFC 12pin connector for host interface and 5pin WTB antenna connector for antenna interface. Form factor: 20.0mm x13.0mm x 2.1mm (typical) NFC module
    - **Host Interface:** I C and SM bus compatible interface with 12-pin FPC connector
    - **PCB:** 4-layers HDI design
- The functional block diagram is shown as below


Host interface connector
I2C and SM bus interface
VBAT
PVDD
PMUVCC
SWP
NPC300
Antenna matching
Antenna Connector
CRYSTAL 27.12 MHz

Electrical Characteristics

- **operating conditions**
    - Absolute Maximum Rating

Symbol	Condition	Min.	Typ.	Max	Unit
VBAT	Respect to GND	—	5.0	6.0	V
PVDD	Respect to GND	—	3.3	4.35	V
ESD Limit Level	HBM	—	—	+/-1.0	KV
	CDM	—	—	+/-500	V
Operating Temperature	—	0	+25	+70	℃
Storage Temperature	—	-20	+25	+85	℃
Storage Humidity	—	0	—	+85	%

Recommended Operating Condition

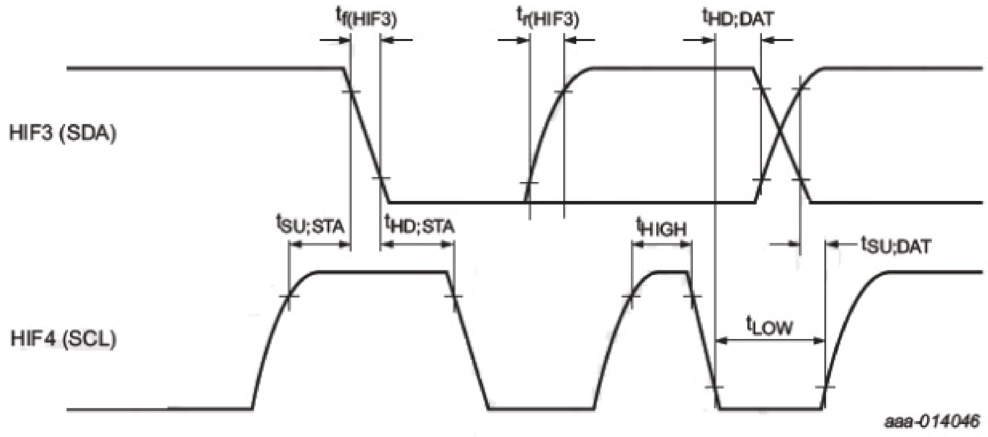
Symbol	Condition	Min.	Typ.	Max	Unit
VBAT	Respect to GND	4.5	5.0	5.5	V
PVDD	Respect to GND	3.0	3.3	3.6	V
PMUVCC	Respect to GND	1.62	1.8	1.98	V
VDD	Respect to GND	1.65	1.8	1.95	V
VDD(SIM)	Respect to GND	1.62	1.8	1.98	V

Power Consumption

Condition		Min.	Typ.	Max	Unit
Power consumption	Reader mode (PCD active)	—	130	—	mA
	Reader mode (PCD standby)	—	50	—	uA
	Peer to peer mode (active)	—	130	—	mA
	Peer to peer mode (standby)	—	50	—	uA
	Continue TX mode	—	130	—	mA
	Hard Power Down mode	—	10	—	uA

Host interface characteristics

- I2C-bus Interface
- The I2C-bus Interface implements a slave I2C-bus interface with integrated shift register, shift timing generation and slave address recognition.
- I2C-bus Standard mode (100 KHz SCL), Fast mode (400 KHz SCL) and High-speed mode (3.4 MHz SCL) are supported.
- I2C-bus timings
- Here below are timings and frequency specifications.


$t_{f(HIF3)}$
$t_{r(HIF3)}$
$t_{HD;DAT}$
HIF3 (SDA)
$t_{SU;STA}$
$t_{HD;STA}$
t_{HIGH}
$t_{SU;DAT}$
HIF4 (SCL)
t_{LOW}
aaa-014046

I^2C-bus timings

High-speed mode I2C-bus timing specification

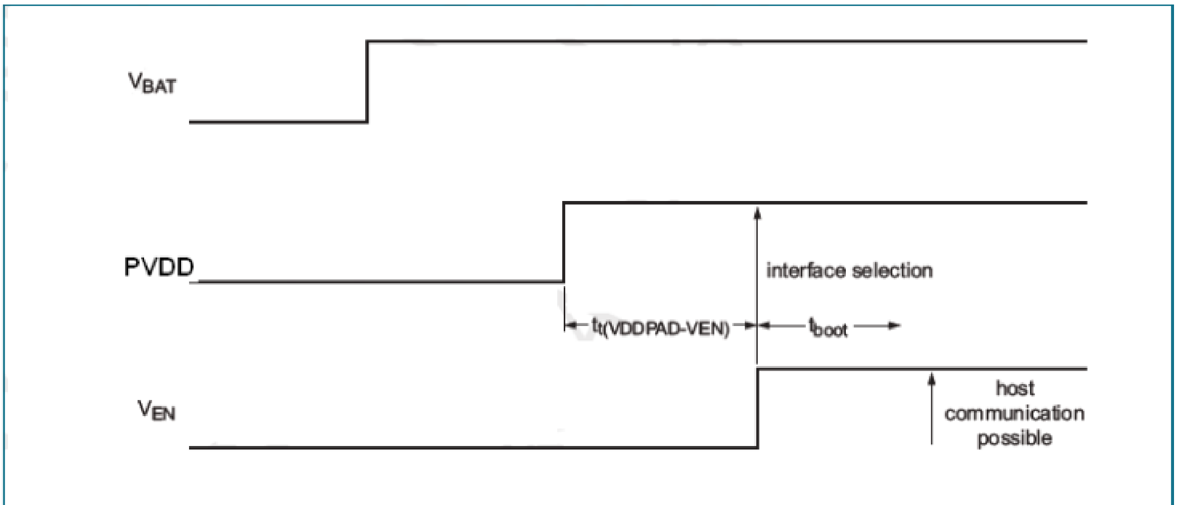
Symbol	Parameter	Conditions	Min	Max	Unit
fCLK(HIF 4)	Clock frequency on pin HIF4	I C-bus SCL; Cb <100pF	0	3.4	MHz
tSU;STA	Set-up time for a repeated START condition	C_b<100pF	160	–	ns
tHD;STA	Hold time(repeated) START condition	C_b<100pF	160	–	ns
tLOW	LOW period of the SCL clock	C_b<100pF	160	–	ns
tHIGH	HIGH period of the SCL clock	C_b<100pF	60	–	ns
tSU;DAT	Date set-up time	C_b<100pF	10	–	ns
tHD;DAT	Data hold time	C_b<100pF	0	–	ns
tr(HIF3)	Rise time on pin HIF3	I C-bus SDA; C <100pF b	10	80	ns
tf(HIF3)	Fall time on pin HIF3	I C-bus SDA; C <100pF b	10	80	ns
Vhys	Hysteresis voltage	Schmitt trigger inputs; C_b<100pF	0.1*VPVD D	–	V

Fast mode I2C-bus timing specification

Symbol	Parameter	Conditions	Min	Max	Unit
fCLK(HIF 4)	Clock frequency on pin HIF4	I C-bus SCL; Cb <400pF	0	400	KHz
tSU;STA	Set-up time for a repeated START condition	C_b<400pF	600	–	ns
tHD;STA	Hold time(repeated) START condition	C_b<400pF	600	–	ns
tLOW	LOW period of the SCL clock	C_b<400pF	1.3	–	ns
tHIGH	HIGH period of the SCL clock	C_b<400pF	600	–	ns
tSU;DAT	Date set-up time	C_b<400pF	100	–	ns
tHD;DAT	Data hold time	C_b<400pF	0	900	ns
Vhys	Hysteresis voltage	Schmitt trigger inputs; C_b<400pF	0.1* VPVD D	–	V

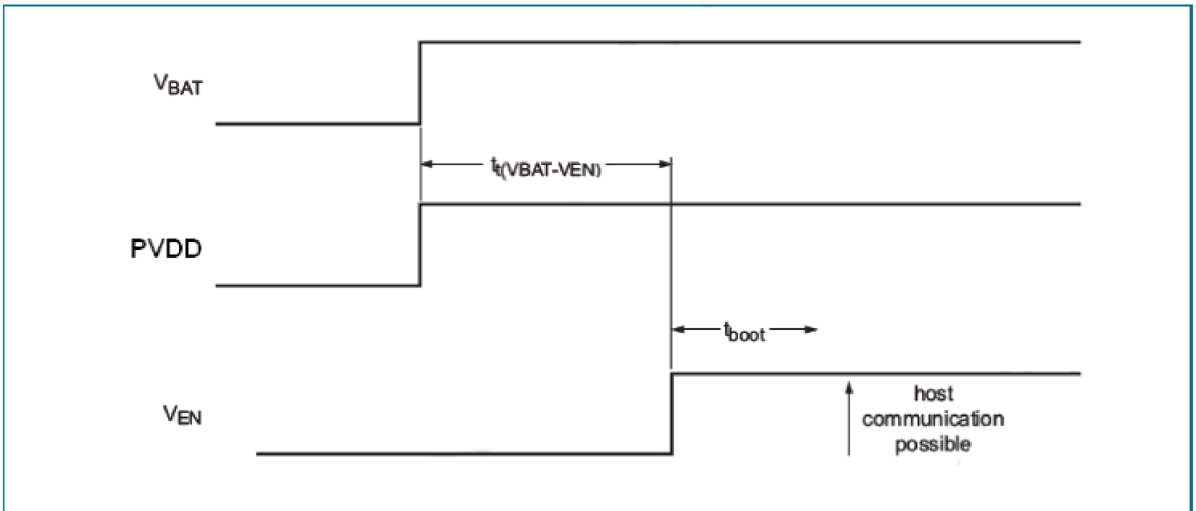
Power-up sequence

- There are 2 different supplies for module which allows set up independently, therefore different power-up sequences have to be considered. 1> VBAT is set up before PVDD
- This is at least the case when VBAT pin is directly connected to the battery and when module VBAT is always supplied as soon the system is supplied.
- As VEN pin is referred to VBAT pin, VEN voltage shall go high after VBAT has been set.


VBAT
PVDD
interface selection
tt(VDDPAD-VEN)
tboot
VEN
host communication possible

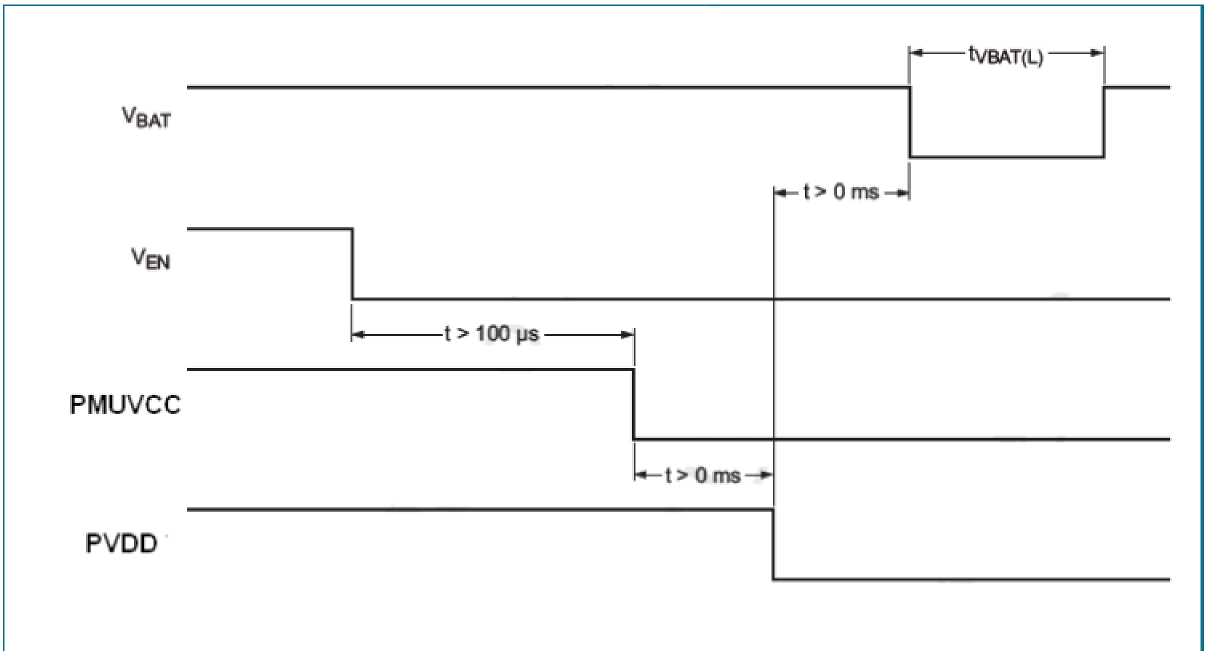
VBAT is set up before PVDD

- 2> PVDD and VBAT are set up in the same time
- It is at least the case when VBAT pin is connected to a PMU/regulator which also supplies PVDD.


VBAT
tt(VBAT-VEN)
PVDD
tboot
VEN
host communication possible

PVDD and VBAT are set up in the same time

Power-down sequence


tVBAT(L)
VBAT
t > 0 ms
VEN
t > 100 µs
PMUVCC
t > 0 ms
PVDD

power-down sequence

Function timing characteristics

Reset timing

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
tW(VEN)	VEN pulse width	To reset	10	–	–	us
tboot	Boot time		–	–	2.5	ms

Power-up timings

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
tt(VBAT – VEN)	Transition time from pin VBAT to pin VEN	• VBAT,VEN • Voltage=HIGH	0	0.5	–	ms
tt(VPVDD – VEN)	Transition time from pin PVDD to pin VEN	• PVDD,VEN • Voltage=HIGH	0	0.5	–	ms
tt(VBAT – VPVDD)	Transition time from pin VBAT to pin PVDD	• VBAT,PVDD • Voltage=HIGH	0	0.5	–	ms

Power-down timings

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
tVBAT(L)	Time V_{BAT} LOW		20	–	–	ms

Download mode timings

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Tt(DWL_REQ-VEN)	Transition time from pin DWL_REQ to pin VEN	• DWL_REQ,VEN • voltage=HIGH	0	0.5	–	ms

NFC contactless standard conformance

Frequency interoperability

- When in communication, NFC module is generating some RF frequencies. It is also sensitive to some RF signals as it is looking from data in the field.

- In order to avoid interference with others RF communication, it is required to tune the antenna matching for antenna board.
- **(Remark:** The antenna matching tuning is responsible for antenna vendor)
- It must limit the RF frequency dispersion to 13.56MHz +/-50ppm.

Supported smart card types

Card Types	Read CSN (Card Serial Number)	Read/Write application data area	Supported baud rates
NFC Forum Type1 Tag	Yes	Yes	106 kbps
NFC Forum Type2 Tag	Yes	Yes	106 kbps
NFC Forum Type3 Tag	Yes	Yes	212, 424 kbps
NFC Forum Type4 Tag	Yes	Yes	106 kbps
NFC Forum TypeV Tag	Yes	Yes	106 kbps
ISO/IEC 14443 Type A compliance cards	Yes	Yes (with application)	106 kbps
Mifare Classics 1K,4K	Yes	Yes (with application)	106 kbps
Mifare DESFire	Yes	Yes (with application)	106 kbps
Mifare Ultralight	Yes	Yes (with application)	106 kbps
Mifare Plus	Yes	Yes (with application)	106 kbps
(Mifare) SmartMX	Yes	Yes (with application)	106 kbps
ISO/IEC 14443 Type B compliance cards	Yes	Yes (with application)	106 kbps
FeliCa general card	Yes	Yes (with application)	212, 424 kbps
FeliCa Edy card	Yes	Yes (with application)	212, 424 kbps
FeliCa Suica card	Yes	Yes (with application)	212, 424 kbps
FeliCa PKI Option card	Yes	Yes (with application)	212, 424 kbps
HID iCLASS Seos	Yes	Yes (with application)	106 kbps

Contactless interface unit

- The NFC module supports various communication modes at different transfer speeds and modulation schemes. The following chapters give more detailed overview of selected communication modes.
- 1> Reader/Writer communication modes

Generally 5 reader/writer communication modes are supported:

- 1> Reader/Writer communication modes
- Generally 5 reader/writer communication modes are supported:
    - PCD reader/writer for ISO/IEC 14443A/MIFARE
- The transfer speed includes 106 kbit/s, 212 kbit/s, 424 kbit/s and 848 kbit/s.
    - PCD reader/writer for ISO/IEC 14443B
- The transfer speed includes 106 kbit/s, 212 kbit/s, 424 kbit/s and 848 kbit/s.
    - PCD reader/writer for Jewel/Topaz tags
- The transfer speed includes 106 kbit/s, 212 kbit/s, 424 kbit/s and 848 kbit/s.
    - PCD reader/writer for FeliCa cards
- The transfer speed includes 212 kbit/s, 424 kbit/s.
    - VCD reader/writer for ISO/IEC 15693/ICODE
- The transfer speed includes 1.65 kbit/s, 26.48 kbit/s.
- 2> Peer to Peer communication modes
    - (ISO/IEC 18092, Ecma 340 NFCIP-1 communication modes)

An NFCIP-1 communication takes place between 2 devices

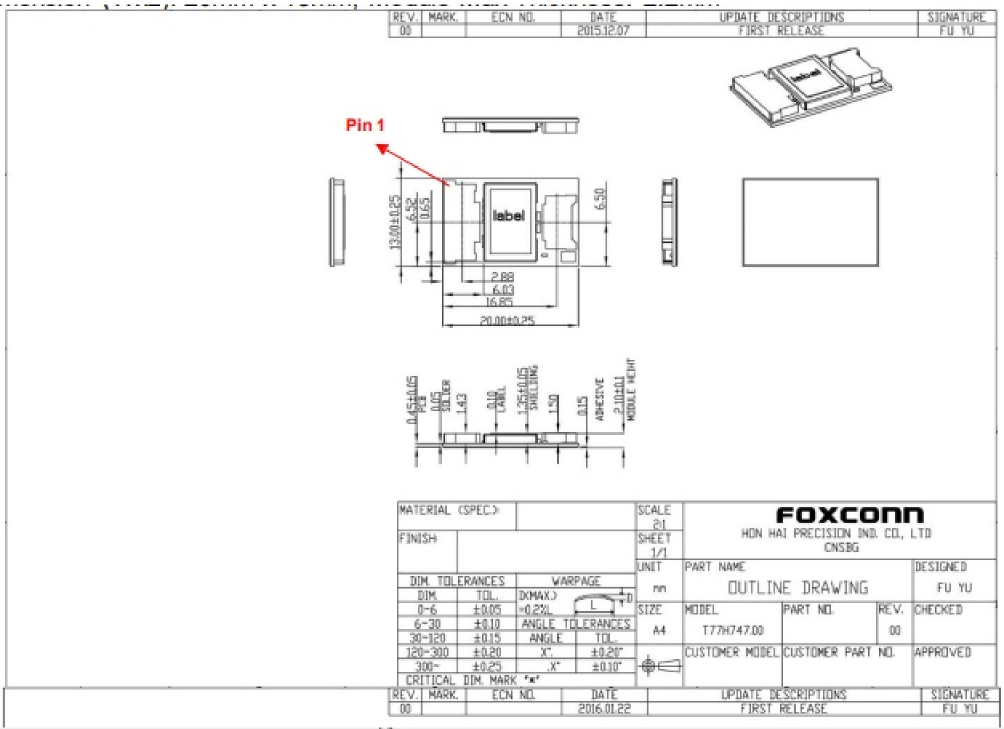
- **NFC initiator:** generates RF field at 13.56 MHz and starts the NFCIP-1communication.
- **NFC Target:** responds to NFC initiator command either in a load modulation scheme in Passive communication mode or using a self-generated and self-modulated RF field for
- Active communication mode.
    - The NFCIP-1 communication differentiates between Active and Passive communication modes.
    - Active communication mode means both the NFC initiator and the NFC target are using their own RF field to transmit data
    - Passive communication mode means that the NFC target answers to an NFC initiator command in a load modulation scheme. The NFC initiator is active is terms of generating the RF field.
- The NFC module supports the Active Target, Active Initiator, Passive Target and Passive Initiator communication modes at the transfer speeds 106 kbit/s, 212 kbit/s and 424 kbit/s.

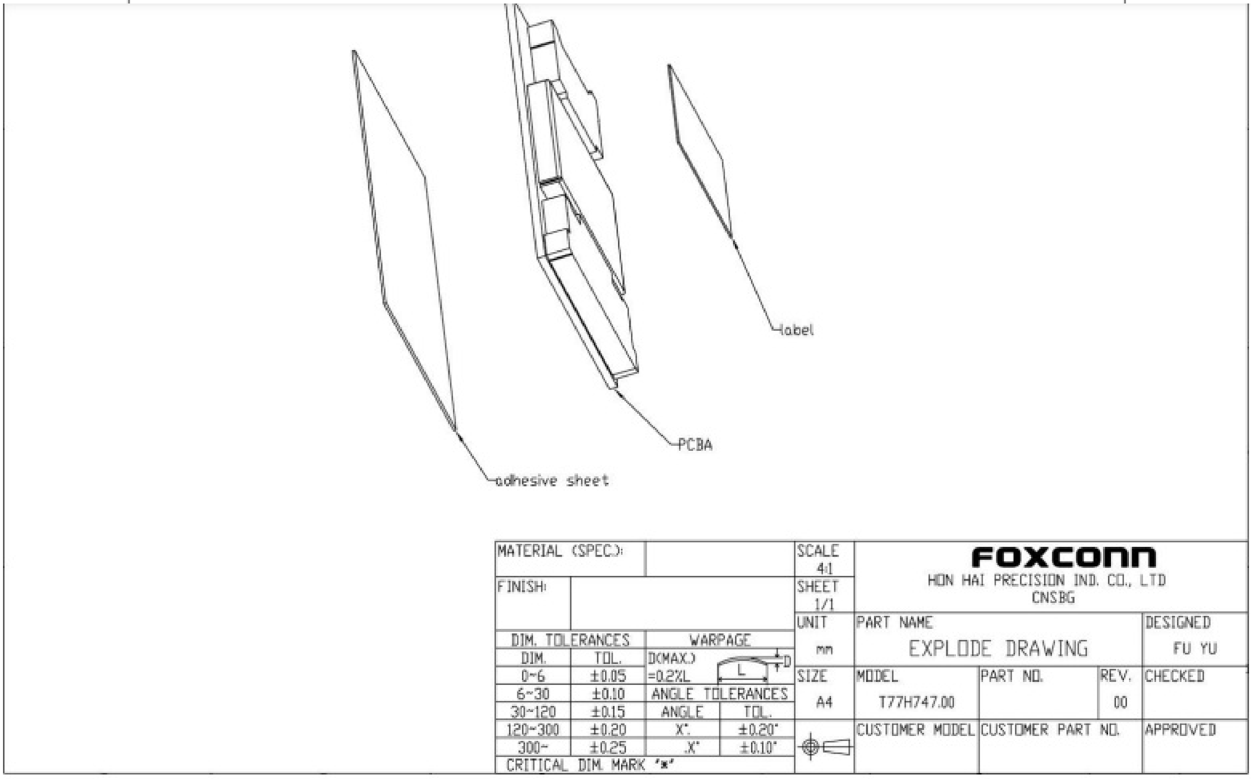
3> Card communication modes

- The NFC module can be addressed as an ISO/IEC 14443A or ISO/IEC 14443B cards. This means that NFC module can generate an answer in a load modulation scheme.
- The transfer speed includes 106 kbit/s, 212 kbit/s and 424 kbit/s.

Mechanical Architecture

- Module Mechanical Drawing
    - **Dimension (WxL):** 20mm x 13mm,
    - **Module Max Thickness:** 2.2mm


REV. MARK. ECN NO. DATE UPDATE DESCRIPTIONS SIGNATURE
00 2015.12.07 FIRST RELEASE FU YU
Pin 1
label
13.00±0.25
6.52
0.65
6.50
2.88
6.03
16.85
20.00±0.25
0.45±0.05 PCB
0.05 SOLDER
1.43
0.10 LABEL
1.25±0.05 SHIELDING
1.50
0.15 ADHESIVE
2.10±0.1 MODULE HEIGHT
MATERIAL (SPEC.):
FINISH:
DIM. TOLERANCES
DIM. TOL.
0~6 ±0.05
6~30 ±0.10
30~120 ±0.15
120~300 ±0.20
300~ ±0.25
WARPAGE
D(MAX.) =0.2%L
ANGLE TOLERANCES
ANGLE TOL.
X°. ±0.20°
.X° ±0.10°
CRITICAL DIM. MARK "*"
SCALE 2:1
SHEET 1/1
UNIT mm
SIZE A4
FOXCONN
HON HAI PRECISION IND. CO., LTD
CNSBG
PART NAME
OUTLINE DRAWING
DESIGNED FU YU
MODEL T77H747.00
PART NO.
REV. 00
CHECKED
CUSTOMER MODEL
CUSTOMER PART NO.
APPROVED
REV. MARK. ECN NO. DATE UPDATE DESCRIPTIONS SIGNATURE
00 2016.01.22 FIRST RELEASE FU YU

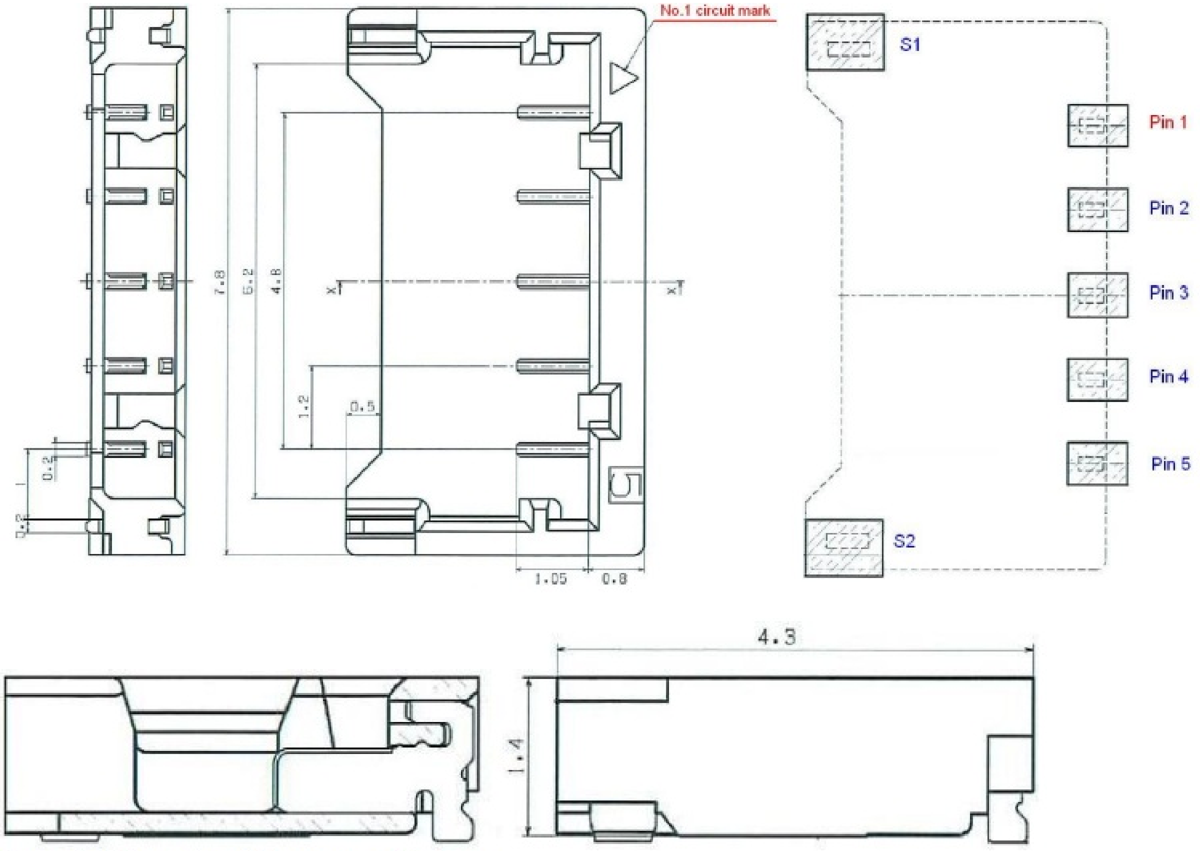

label
PCBA
adhesive sheet
MATERIAL (SPEC.):
FINISH:
DIM. TOLERANCES
DIM. TOL.
0~6 ±0.05
6~30 ±0.10
30~120 ±0.15
120~300 ±0.20
300~ ±0.25
WARPAGE
D(MAX.) =0.2%L
ANGLE TOLERANCES
ANGLE TOL.
X°. ±0.20°
.X° ±0.10°
CRITICAL DIM. MARK "*"
SCALE 4:1
SHEET 1/1
UNIT mm
SIZE A4
FOXCONN
HON HAI PRECISION IND. CO., LTD
CNSBG
PART NAME
EXPLODE DRAWING
DESIGNED FU YU
MODEL T77H747.00
PART NO.
REV. 00
CHECKED
CUSTOMER MODEL
CUSTOMER PART NO.
APPROVED

Antenna interface of NFC module

- 1> Antenna connector
- **Manufacturer:** JST Manufacturer PN: BM05B-ACHKS-A-GAN-ETF(HF)

Connector Type	Manufacture PN	Size
ACH connector SMT type with 1.2mm pitch	JST : BM05B-ACHKS-A-GAN- ETF(HF)	7.8mm x 4.3mm x 1.5mm

Connector 2D drawing


No.1 circuit mark
S1
Pin 1
Pin 2
Pin 3
Pin 4
Pin 5
S2
7.8
6.2
4.8
1.2
0.5
0.2
0.2
x
x
5
1.05
0.8
4.3
1.4

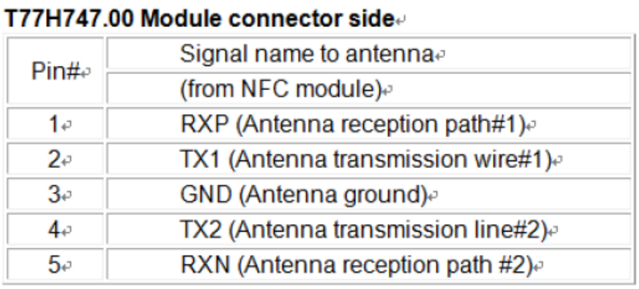
Remark: Dimension Tolerance: +/-0.3mm

Pin definition:

Pin	Symbol	I/O	Refer	Note
1	RXP	I	VDD	Positive receiver input
2	TX1	O	VDD	Antenna output1
3	GND	G	N/A	Ground
4	TX2	O	VDD	Antenna output2
5	RXN	I	VDD	Negative receiver input
S1	GND	G	N/A	Ground
S2	GND	G	N/A	Ground

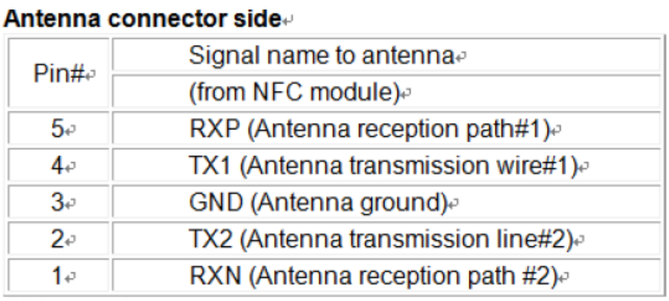
- **Remark:**
- P = power supply,
- G = ground,
- I = input,
- O = output, I/O = input/output

2> Recommend Antenna cable design.



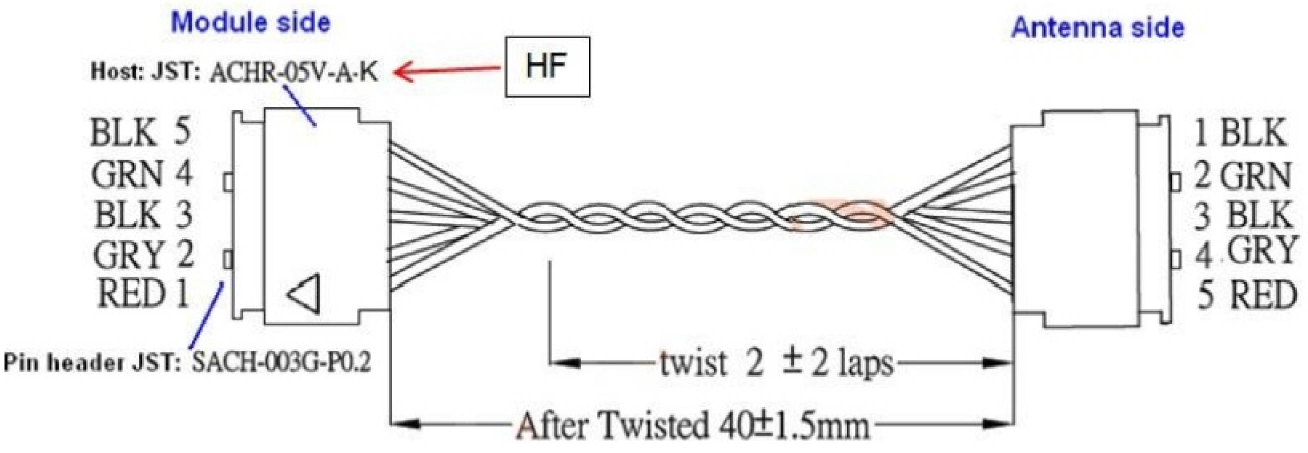
T77H747.00 Module connector side

Pin#	Signal name to antenna (from NFC module)
1	RXP (Antenna reception path#1)
2	TX1 (Antenna transmission wire#1)
3	GND (Antenna ground)
4	TX2 (Antenna transmission line#2)
5	RXN (Antenna reception path #2)



Antenna connector side

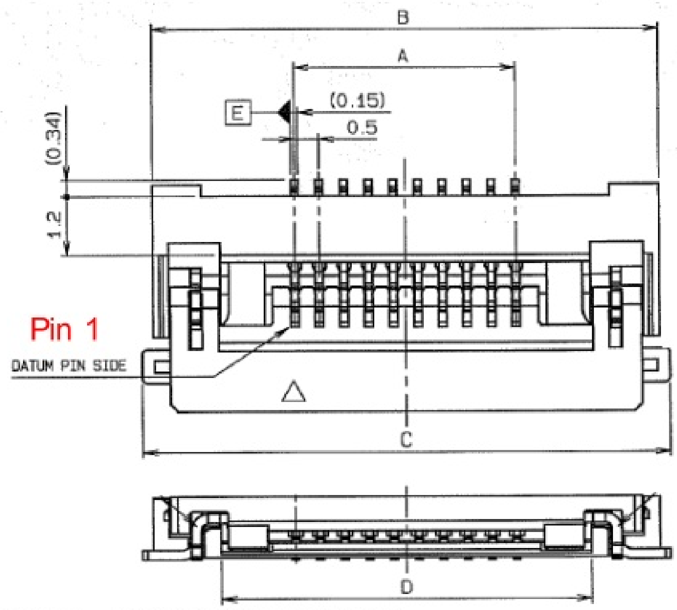
Pin#	Signal name to antenna (from NFC module)
5	RXP (Antenna reception path#1)
4	TX1 (Antenna transmission wire#1)
3	GND (Antenna ground)
2	TX2 (Antenna transmission line#2)
1	RXN (Antenna reception path #2)


Module side
Host: JST: ACHR-05V-A-K
HF
BLK 5
GRN 4
BLK 3
GRY 2
RED 1
Pin header JST: SACH-003G-P0.2
Antenna side
1 BLK
2 GRN
3 BLK
4 GRY
5 RED
twist 2 ±2 laps
After Twisted 40±1.5mm

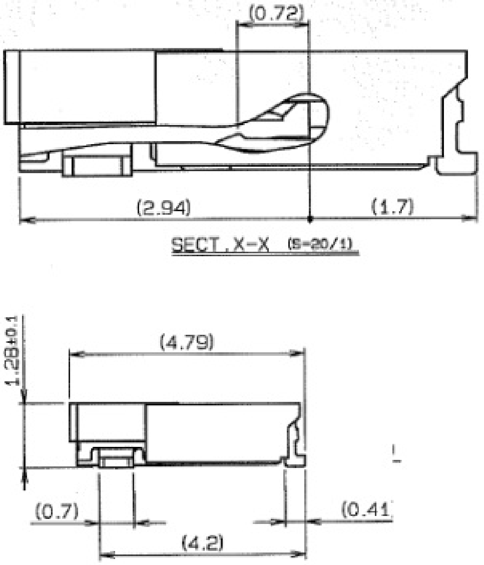
Host interface of NFC module

- 1> Host interface connector
- **Manufacturer:** KYOCERA Manufacturer PN: 046811612000846 +

Connector	Manufacture PN	Size
FPC/FFC connector SMT type with 0.5mm pitch	**KYOCERA:** 046811612000846+	11.73mm x 4.79mm x 1.28mm


B
A
E
(0.15)
0.5
(0.34)
1.2
Pin 1
DATUM PIN SIDE
C
D

NO.OF POS.	A	B	C	D
12	5.5	11.3	11.73	8.52


(0.72)
(2.94)
(1.7)
SECT. X-X (S=20/1)
(4.79)
1.28±0.1
(0.7)
(4.2)
(0.41)

Remark: The connector is bottom conduct with golden plating of FPC cable

Pin	Symbol	Pin Type	Refer	Description
1	VBAT	Input Power	N/A	Power supply from system (4.5V – 5.5V)
2	PVDD	Input Power	N/A	Power supply to I/O (3.0V – 3.6V)
3	I2C_SDA	I/O	PVDD	I2C data
4	I2C _SCL	I	PVDD	I2C clock
5	GND	G	N/A	Ground
6	IRQ	O	PVDD	Interrupt from NFC module to the host (Host_Wake)
7	NFC_Presence	G	N/A	Connect to ground for NFC module presence bit (Low active)
8	VEN	I	VBAT	Reset pin. Set the device in Hard Power Down
9	TX_PWR_REQ	O	VDD	• (External TX power supply request) (Active high 1.8V level output) • Indicates NFC busy state during NFC communication to touchpad.
10	PMUVCC	Input Power	N/A	Power supply to UICC(1.78V~3.3V)
11	SWIO_UICC	I/O	VDD(SIM)	SWP data connection to SIM
12	DWL_REQ	I	PVDD	Firmware download control pin
S1	GND	G	N/A	Ground
S2	GND	G	N/A	Ground

Remark: P = power supply, G = ground, I = input, O = output, I/O = input/output

- 2> Pin characteristics
- VEN input pin characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VIH	HIGH-level input voltage		1.1	–	VBAT	V
VIL	LOW-level input voltage		0	–	0.4	V
IIH	HIGH-level input current	VEN voltage=V_{BAT}	–	–	1	µA
IIL	LOW-level input current	VEN voltage=0V	1	–	–	µA
C_i	Input capacitance		–	5	–	pF

Remark: P = power supply, G = ground, I = input, O = output, I/O = input/output

2> Pin characteristics

VEN input pin characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VIH	HIGH-level input voltage		1.1	–	VBAT	V
VIL	LOW-level input voltage		0	–	0.4	V
IIH	HIGH-level input current	VEN voltage=V_{BAT}	–	–	1	µA
IIL	LOW-level input current	VEN voltage=0V	1	–	–	µA
C_i	Input capacitance		–	5	–	pF

Pin characteristics for IRQ, and TX_PWR_REQ

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VOH	HIGH-level output voltage	I_{OH}<3mA	–	–	–	–
		IRQ and CLK_REQ pin	V_{PVDD} -0.4	–	VPVDD	V
		TX_PW R_REQ pin	V_{DD}-0.4	–	VDD	V
VOL	LOW-level output voltage	I_{OL}<3mA	0	–	0.4	V
C_L	Load capacitance		–	–	20	pF
t_f	Fall time	C_L=12pF max				
		High speed	1	–	3.5	ns
		Low speed	2	–	10	ns
t_r	Rise time	C_L=12pF max				
		High speed	1	–	3.5	ns
		Low speed	2	–	10	ns
Rpd	Pull-down resistance	IRQ and CLK_REQ pins [1]	0.35	–	0.85	MΩ
		TX_PW R_REQ pin [1]	55	–	120	kΩ

Activated in HPO and Monitor states.

Input pin characteristics for DWL_REQ

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VIH	HIGH-level input voltage	V_{PVDD}=1.8V	0.65*V_{PVDD}	–	–	V
VIL	LOW-level input voltage	V_{PVDD}=1.8V	–	–	0.35*V_{PVDD}	V
VIH	HIGH-level input voltage	V_{PVDD}=3V	2	–	–	V
VIL	LOW-level input voltage	V_{PVDD}=3V	–	–	0.8	V
IIH	HIGH-level input current		–	–	1	µA
IIL	LOW-level input current		1	–	–	µA
C_i	Input capacitance		–	5	–	pF
Rpd	Pull down resistance	Extra pull-down	0.35	–	0.85	MΩ

Pin characteristics for HIF3(used as I2C-bus SDA) and HIF4(used as I2C-bus SCL)

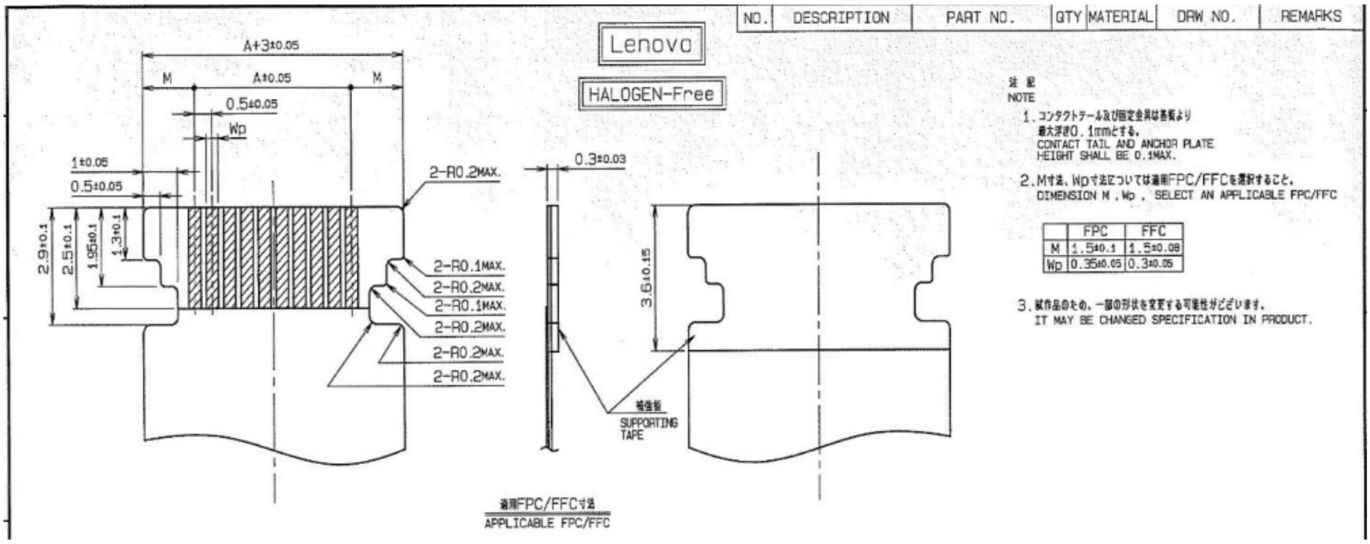
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VOL	LOW-level output voltage	IOL<3mA [1]	0	–	0.4	V
C_L	Load capacitance		–	–	10	pF
t_f	Fall time	- C_L=100 pF; [1] - $R_{pull-up}$=2kΩ; Standard and Fast mode	30	–	250	ns
		- C_L=100 pF; [1] - $R_{pull-up}$=1kΩ; High-speed mode	80	–	110	ns
t_r	Rise time	- C_L=100 pF; [1] - $R_{pull-up}$=2kΩ; Standard and Fast mode	30	–	250	ns
		- C_L=100 pF; [1] - $R_{pull-up}$=1kΩ; High-speed mode	10	–	100	ns
VIH	HIGH-level input voltage		0.7 *V_{PVDD}	–	VPVDD	V
VIL	LOW-level input voltage		0	–	0.3*V_{PVDD}	V
IIH	HIGH-level input current	V_I= V_{PVDD}; high impedance	–	–	1	µA
IIL	LOW-level input current	V_I=0V; high impedance	-1	–	–	µA
C_i	Input capacitance		–	5	–	pF

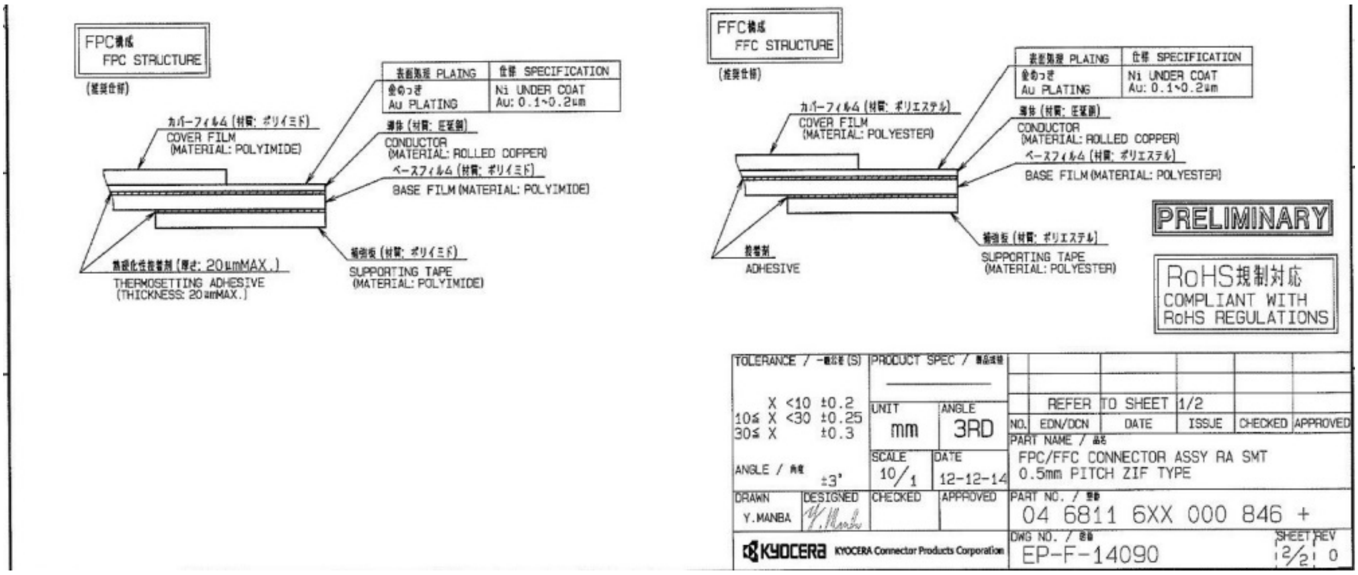
Only for pin HIF3(I2C-bus SDA), HIF4(I2C-bus SCL) is only used as input.

SWIO_UICC pin characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
VOH	HIGH-level output voltage	• I_{IH}=1mA; [1] • IDD(SIM)=50mA; • VDD(SIM_PMU)=2.75V; • VDD(SIM_PMU) in class B	1.4	–	–	V
VOH	HIGH-level output voltage	• ISIM_SWIO=1mA; [1] • IDD(SIM)=30mA; • VDD(SIM_PMU)=1.67V; • VDD(SIM_PMU) in class C	0.85 VDD(SIM)	–	–	V
VOH	HIGH-level output voltage	• I_{IH} =1mA; [1] • IDD(SIM)=5mA; • VDD(SIM_PMU)=0V; • VDD(SIM)-VDDD	0.85 VDD(SIM)	–	–	V
VOL	LOW-level output voltage	0µA<I_{IL}<20Ma [1]	–	–	0.15VDD(SIM)	V
I[I1H] To allow	HIGH-level output voltage		–¯0.3V and V	300	–	µA

3> Recommend FPC cable


NO.
DESCRIPTION
PART NO.
QTY
MATERIAL
DRW NO.
REMARKS
Lenovo
HALOGEN-Free
A+3±0.05
M
A±0.05
M
0.5±0.05
Wp
1±0.05
0.5±0.05
2.9±0.1
2.5±0.1
1.95±0.1
1.3±0.1
2-R0.2MAX.
2-R0.1MAX.
2-R0.2MAX.
2-R0.1MAX.
2-R0.2MAX.
2-R0.2MAX.
2-R0.2MAX.
0.3±0.03
3.6±0.15
補強板
SUPPORTING TAPE
適用FPC/FFC寸法
APPLICABLE FPC/FFC
注記
NOTE
1. コンタクトテール及び固定金具は基板より最大浮き0.1mmとする。
CONTACT TAIL AND ANCHOR PLATE HEIGHT SHALL BE 0.1MAX.
2. M寸法、Wp寸法については適用FPC/FFCを選択すること。
DIMENSION M , Wp , SELECT AN APPLICABLE FPC/FFC
FPC
FFC
M 1.5±0.1 1.5±0.08
Wp 0.35±0.05 0.3±0.05
3. 試作品のため、一部の形状を変更する可能性がございます。
IT MAY BE CHANGED SPECIFICATION IN PRODUCT.


FPC構成
FPC STRUCTURE
(推奨仕様)
表面処理 PLAING
仕様 SPECIFICATION
金めっき
Au PLATING
Ni UNDER COAT
Au: 0.1~0.2µm
カバーフィルム (材質: ポリイミド)
COVER FILM
(MATERIAL: POLYIMIDE)
導体 (材質: 圧延銅)
CONDUCTOR
(MATERIAL: ROLLED COPPER)
ベースフィルム (材質: ポリイミド)
BASE FILM (MATERIAL: POLYIMIDE)
熱硬化性接着剤 (厚さ: 20µmMAX.)
THERMOSETTING ADHESIVE
(THICKNESS: 20µmMAX.)
補強板 (材質: ポリイミド)
SUPPORTING TAPE
(MATERIAL: POLYIMIDE)
FFC構成
FFC STRUCTURE
(推奨仕様)
表面処理 PLAING
仕様 SPECIFICATION
金めっき
Au PLATING
Ni UNDER COAT
Au: 0.1~0.2µm
カバーフィルム (材質: ポリエステル)
COVER FILM
(MATERIAL: POLYESTER)
導体 (材質: 圧延銅)
CONDUCTOR
(MATERIAL: ROLLED COPPER)
ベースフィルム (材質: ポリエステル)
BASE FILM (MATERIAL: POLYESTER)
接着剤
ADHESIVE
補強板 (材質: ポリエステル)
SUPPORTING TAPE
(MATERIAL: POLYESTER)
PRELIMINARY
RoHS規制対応
COMPLIANT WITH
RoHS REGULATIONS

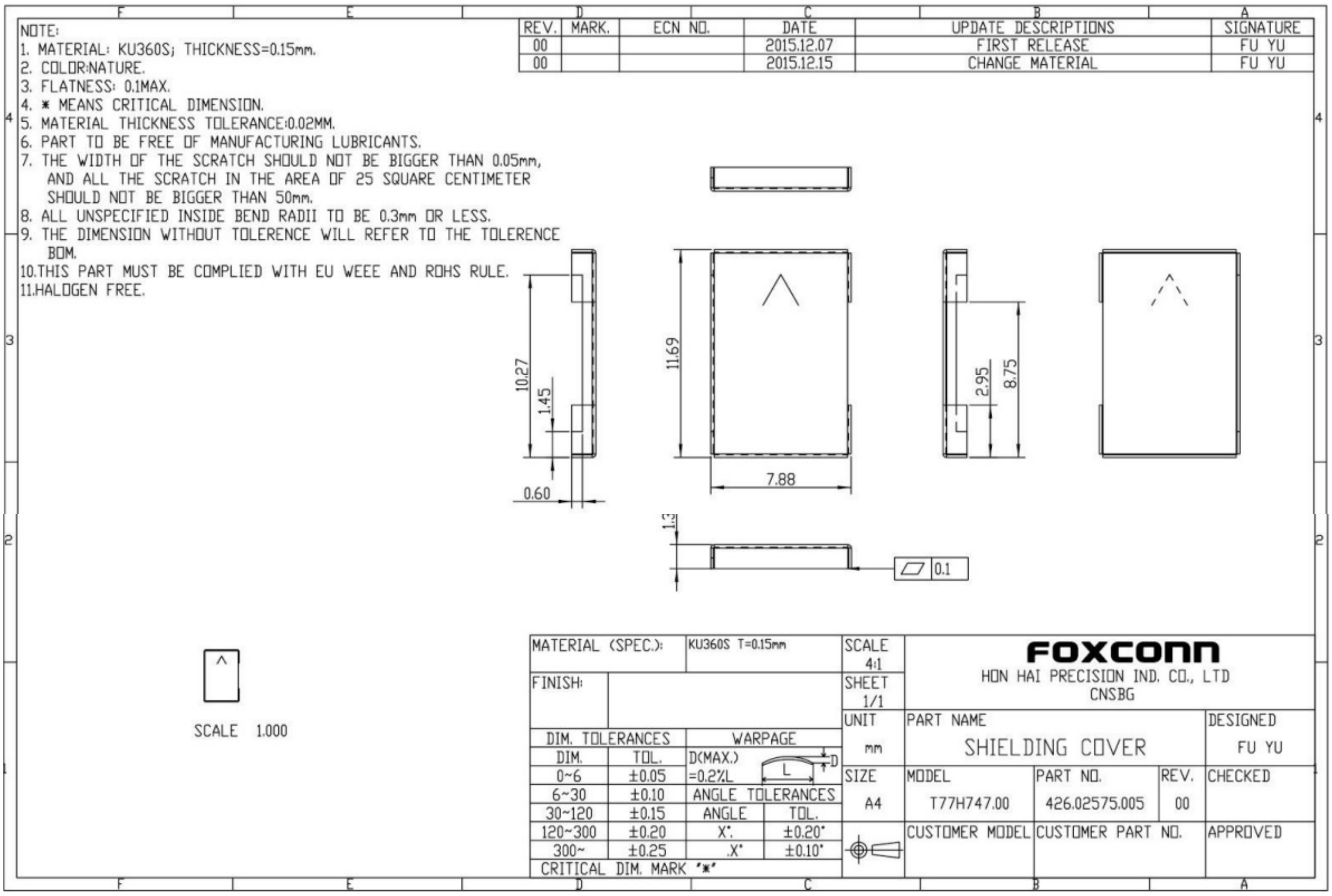
TOLERANCE / 一般公差(S)
X <10 ±0.2
10≦ X <30 ±0.25
30≦ X ±0.3
ANGLE / 角度 ±3°
PRODUCT SPEC / 製品規格
UNIT mm
ANGLE 3RD
SCALE 10/1
DATE 12-12-14
DRAWN Y.MANBA
DESIGNED Y.Manba
CHECKED
APPROVED
REFER TO SHEET 1/2

NO.	EDN/DCN	DATE	ISSJE	CHECKED	APPROVED

PART NAME / 品名
FPC/FFC CONNECTOR ASSY RA SMT
0.5mm PITCH ZIF TYPE
PART NO. / 品番
04 6811 6XX 000 846 +
DWG NO. / 図番
EP-F-14090
SHEET 2/2
REV 0
KYOCERA KYOCERA Connector Products Corporation

Shielding Cover of NFC module

- **Dimension** (L x W x H): 11.69mm x 7.88mm x 1.35mm,
- **Thickness:** 0.15mm
- **Materials:** KU360S


F
E
D
C
B
A
4
3
2
1
10.27
1.45
0.60
11.69
7.88
2.95
8.75
1.3
0.1
SCALE 1.000

NOTE:
1. MATERIAL: KU360S; THICKNESS=0.15mm.
2. COLOR:NATURE.
3. FLATNESS: 0.1MAX.
4. ✱ MEANS CRITICAL DIMENSION.
5. MATERIAL THICKNESS TOLERANCE:0.02MM.
6. PART TO BE FREE OF MANUFACTURING LUBRICANTS.
7. THE WIDTH OF THE SCRATCH SHOULD NOT BE BIGGER THAN 0.05mm, AND ALL THE SCRATCH IN THE AREA OF 25 SQUARE CENTIMETER SHOULD NOT BE BIGGER THAN 50mm.
8. ALL UNSPECIFIED INSIDE BEND RADII TO BE 0.3mm OR LESS.
9. THE DIMENSION WITHOUT TOLERENCE WILL REFER TO THE TOLERENCE BOM.
10. THIS PART MUST BE COMPLIED WITH EU WEEE AND ROHS RULE.
11. HALOGEN FREE.

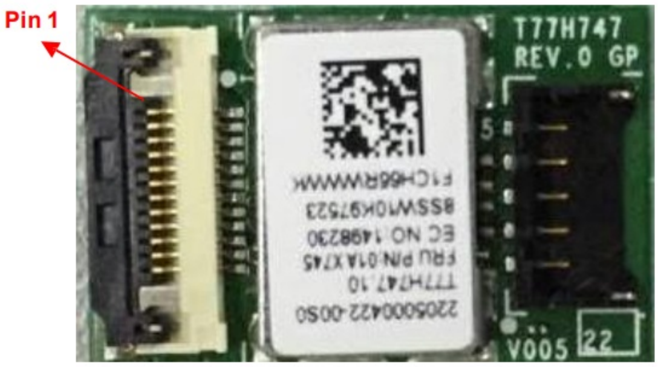
REV.	MARK.	ECN NO.	DATE	UPDATE DESCRIPTIONS	SIGNATURE
00			2015.12.07	FIRST RELEASE	FU YU
00			2015.12.15	CHANGE MATERIAL	FU YU

MATERIAL (SPEC.): KU360S T=0.15mm
FINISH:
SCALE 4:1
SHEET 1/1
UNIT mm
SIZE A4
FOXCONN
HON HAI PRECISION IND. CO., LTD
CNSBG
PART NAME SHIELDING COVER
DESIGNED FU YU
MODEL T77H747.00
PART NO. 426.02575.005
REV. 00
CHECKED
CUSTOMER MODEL
CUSTOMER PART NO.
APPROVED

DIM. TOLERANCES		WARPAGE	
DIM.	TOL.	D(MAX.) =0.2%L	
0~6	±0.05		
6~30	±0.10	ANGLE TOLERANCES	
30~120	±0.15	ANGLE	TOL.
120~300	±0.20	X°.	±0.20°
300~	±0.25	.X°	±0.10°

CRITICAL DIM. MARK "✱"

Picture of NFC module

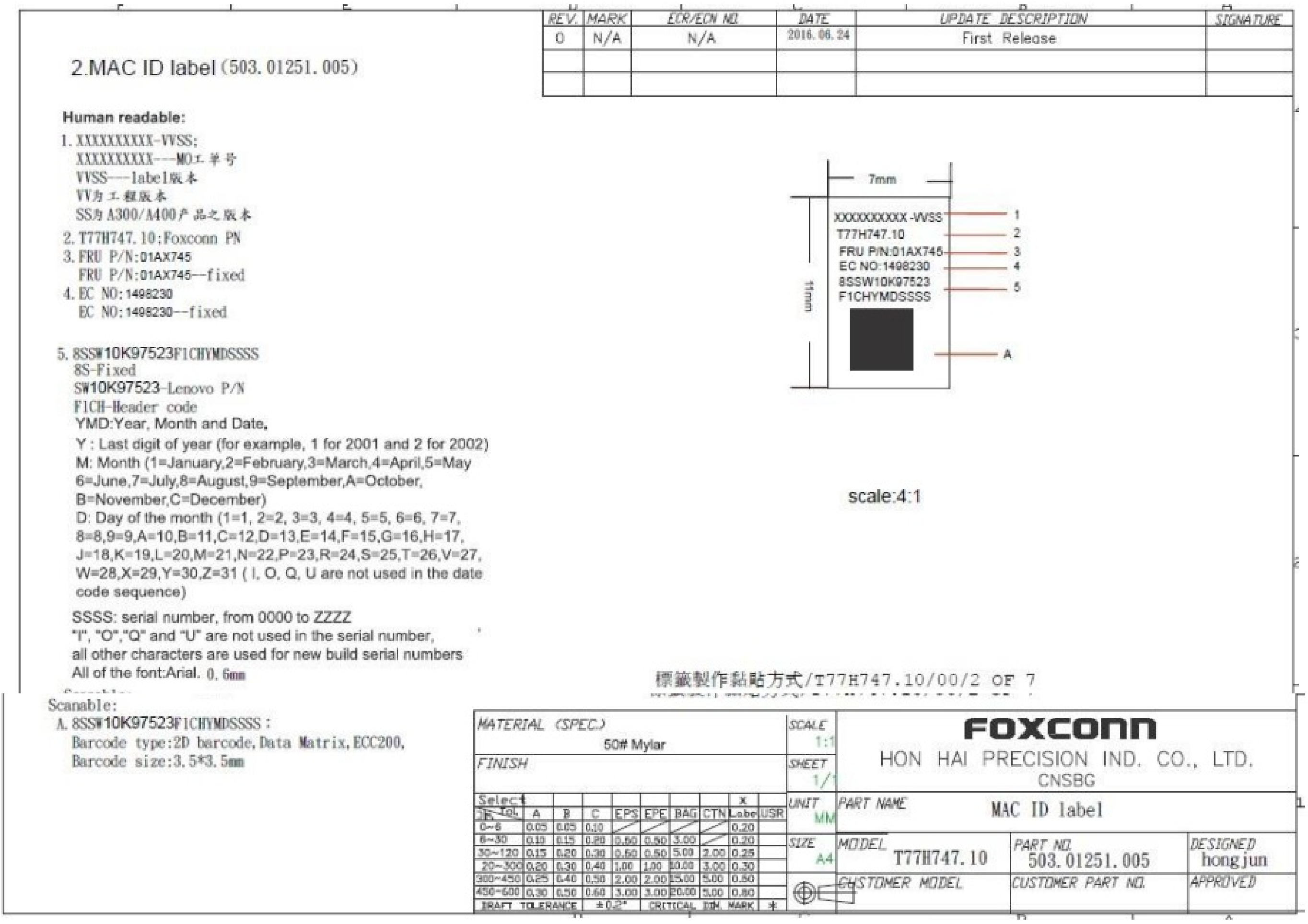


(Top view)

(Bottom view)

Marking Information

Label information



REV.	MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
0	N/A	N/A	2016.06.24	First Release	

2.MAC ID label（503.01251.005）

Human readable:

1. XXXXXXXXXX-VVSS;
   XXXXXXXXXX---MO工单号
   VVSS---label版本
   VV为工程版本
   SS为A300/A400产品之版本
2. T77H747.10:Foxconn PN
3. FRU P/N:01AX745
   FRU P/N:01AX745--fixed
4. EC NO:1498230
   EC NO:1498230--fixed

5. 8SSW10K97523F1CHYMDSSSS
   8S-Fixed
   SW10K97523-Lenovo P/N
   F1CH-Header code
   YMD:Year, Month and Date.
   Y : Last digit of year (for example, 1 for 2001 and 2 for 2002)
   M: Month (1=January,2=February,3=March,4=April,5=May 6=June,7=July,8=August,9=September,A=October, B=November,C=December)
   D: Day of the month (1=1, 2=2, 3=3, 4=4, 5=5, 6=6, 7=7, 8=8,9=9,A=10,B=11,C=12,D=13,E=14,F=15,G=16,H=17, J=18,K=19,L=20,M=21,N=22,P=23,R=24,S=25,T=26,V=27, W=28,X=29,Y=30,Z=31 (I, O, Q, U are not used in the date code sequence)

   SSSS: serial number, from 0000 to ZZZZ
   "I", "O","Q" and "U" are not used in the serial number,
   all other characters are used for new build serial numbers
   All of the font:Arial. 0.6mm

scale:4:1

Scanable:
A. 8SSW10K97523F1CHYMDSSSS :
   Barcode type:2D barcode, Data Matrix, ECC200,
   Barcode size:3.5*3.5mm

標籤製作黏貼方式/T77H747.10/00/2 OF 7

MATERIAL (SPEC.)	50# Mylar
FINISH	
SCALE	1:1
SHEET	1/1
UNIT	MM
SIZE	A4

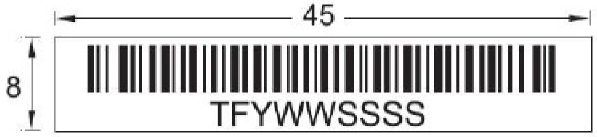
Select Tol.	A	B	C	EPS	EPE	BAG	CTN	X Label	USR
0~6	0.05	0.05	0.10					0.20	
6~30	0.10	0.15	0.20	0.50	0.50	3.00		0.20	
30~120	0.15	0.20	0.30	0.50	0.50	5.00	2.00	0.25	
20~300	0.20	0.30	0.40	1.00	1.00	10.00	3.00	0.30	
300~450	0.25	0.40	0.50	2.00	2.00	15.00	5.00	0.50	
450~600	0.30	0.50	0.60	3.00	3.00	20.00	5.00	0.80	
DRAFT TOLERANCE		±0.2°		CRITICAL DIM. MARK				*	

FOXCONN
HON HAI PRECISION IND. CO., LTD.
CNSBG

PART NAME: MAC ID label		
MODEL: T77H747.10	PART NO.: 503.01251.005	DESIGNED: hongjun
CUSTOMER MODEL:	CUSTOMER PART NO.:	APPROVED:

.Tray ID label

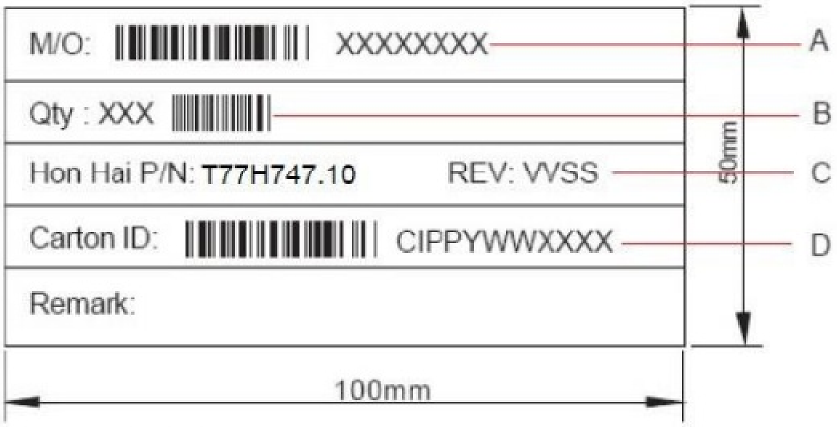
Foxconn PN: 503.00090.005, size: 45*8mm


45
8
TFYWWSSSS

Human readable:
TFYWWSSSS
Font: TRIUMVIRATE COND.（打印機自帶字體），height：6pt

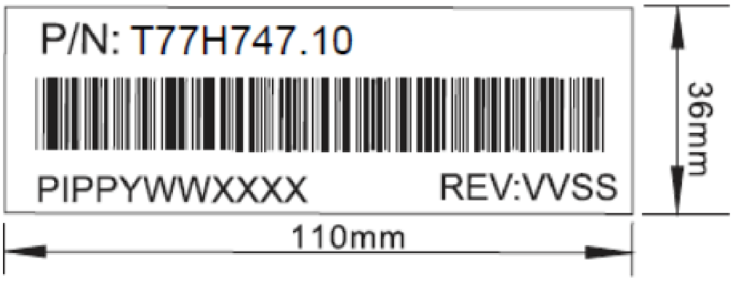
Scannable:
1. Barcode type: code128
2. Barcode height: 2.96mm
3. Barcode content: TFYWWSSSS
T---Tray

Carton label: P/N:503.00098.005


M/O:
XXXXXXXX
A
Qty : XXX
B
Hon Hai P/N: T77H747.10
REV: VVSS
C
Carton ID:
CIPPYWWXXXX
D
Remark:
50mm
100mm

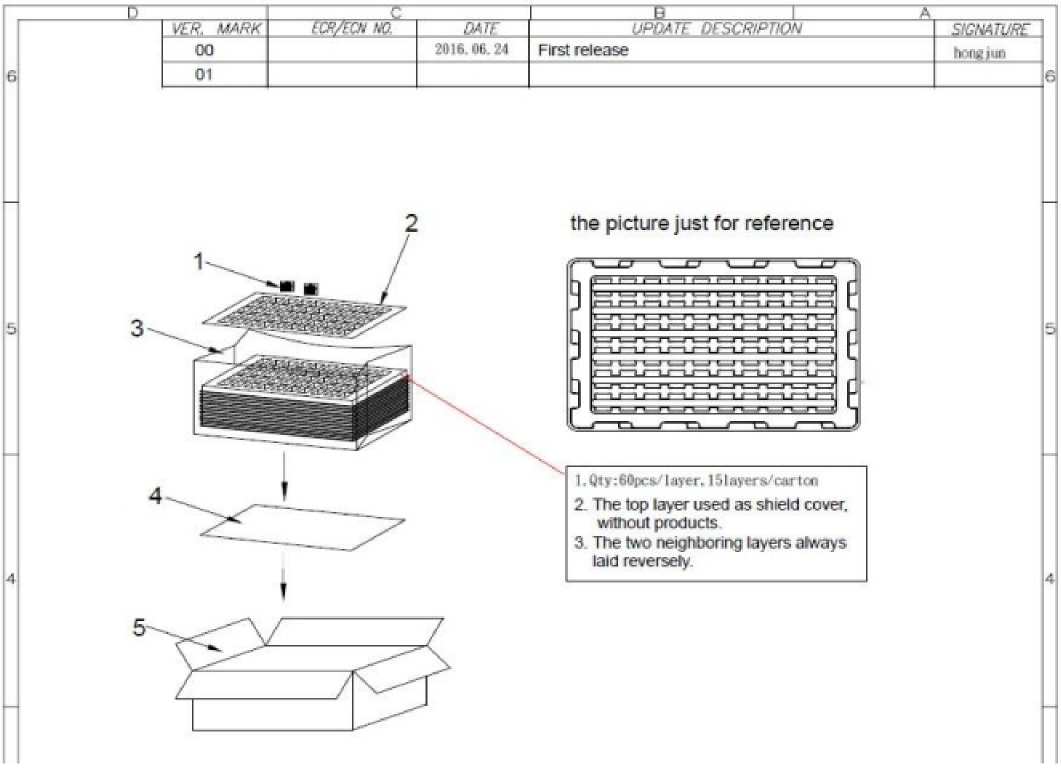
- **A.XXXXXXXX**: the Foxconn MO(I. 473)
- **B.Qty** : XXX XXX the quantity of product in carton(carton? Magnet at)
- **Barcode content:** The quantity of product in carton (carton abraham)
- **C.REV**:WSS W:the engineering version(refer to Foxconn label Rev column in the cover of the MFG document) SS:the version of A300/A400 product(refer to Doc Rev.in the cover of MFG document)
- D.CIPPYWWXXXX C+ production location + production line + production year + production week + Serial Number(Base on 36)
- **C:** carton I: production location(refer to attachment of the last page)
- **PP**:Production line
- **YWW:** Production year & production week
- **XXXX**: Serial number(Base on 36, every two week reset to 0001)

Pallet label: P/N:503.00089.005



- **Follow Foxconn standard PIPPYWWXXXX:** P+ production location + production line + production year + production week + Serial Number(Base on 36)
- **P:** Pallet
- **I:** Production location (refer to attachment on page 3)
- **PP:** production line Y: the last digital of production year
- **WW:** production week
- **XXXX:** Serial number(Base on 36,every two week reset to 0001)
- **VSS: W**: the engineering version (refer to Foxconn label Rev column in the cover of the MFG document)
- **SS:** the version of A300/A400 product (refer to Doc Rev.in the cover of MFG document)

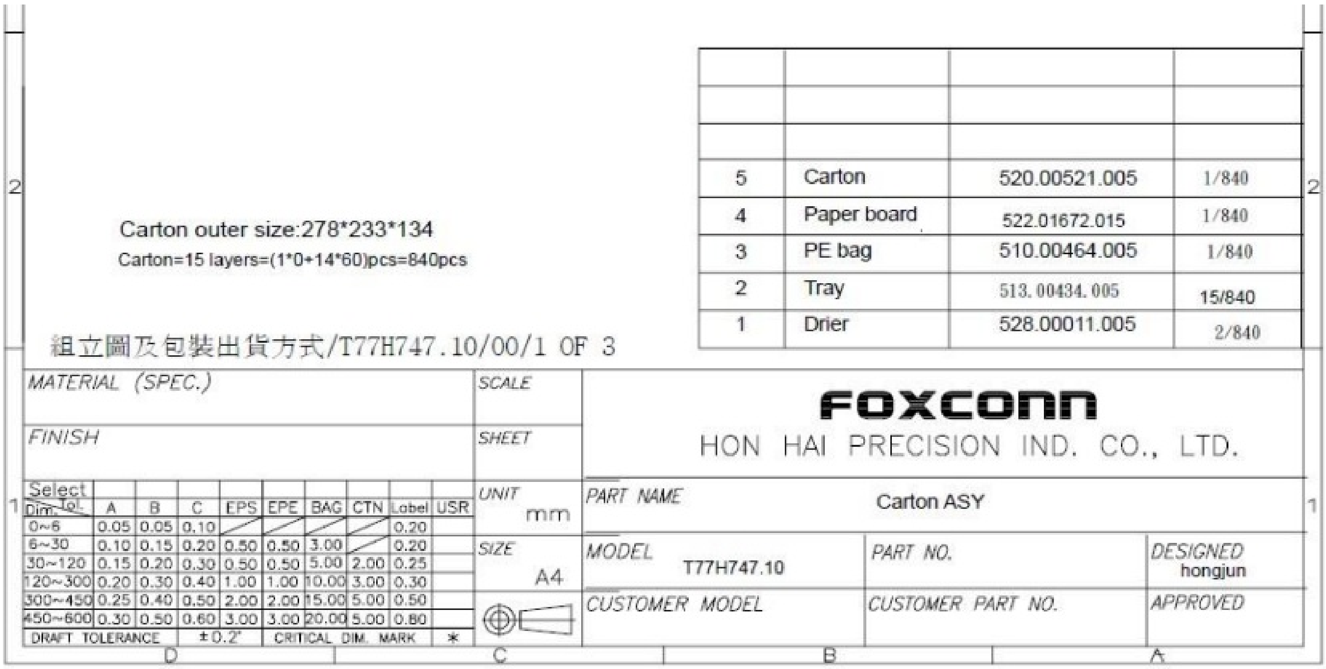
Packing information



VER. MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
00		2016. 06. 24	First release	hong jun
01				

the picture just for reference

1. Qty:60pcs/layer, 15layers/carton
2. The top layer used as shield cover, without products.
3. The two neighboring layers always laid reversely.



Carton outer size:278*233*134

Carton=15 layers=(1*0+14*60)pcs=840pcs

5	Carton	520.00521.005	1/840
4	Paper board	522.01672.015	1/840
3	PE bag	510.00464.005	1/840
2	Tray	513.00434.005	15/840
1	Drier	528.00011.005	2/840

組立圖及包裝出貨方式/T77H747.10/00/1 OF 3

MATERIAL (SPEC.)

FINISH

SCALE

SHEET

UNIT mm

SIZE A4

FOXCONN

HON HAI PRECISION IND. CO., LTD.

PART NAME Carton ASY

MODEL T77H747.10

PART NO.

DESIGNED hongjun

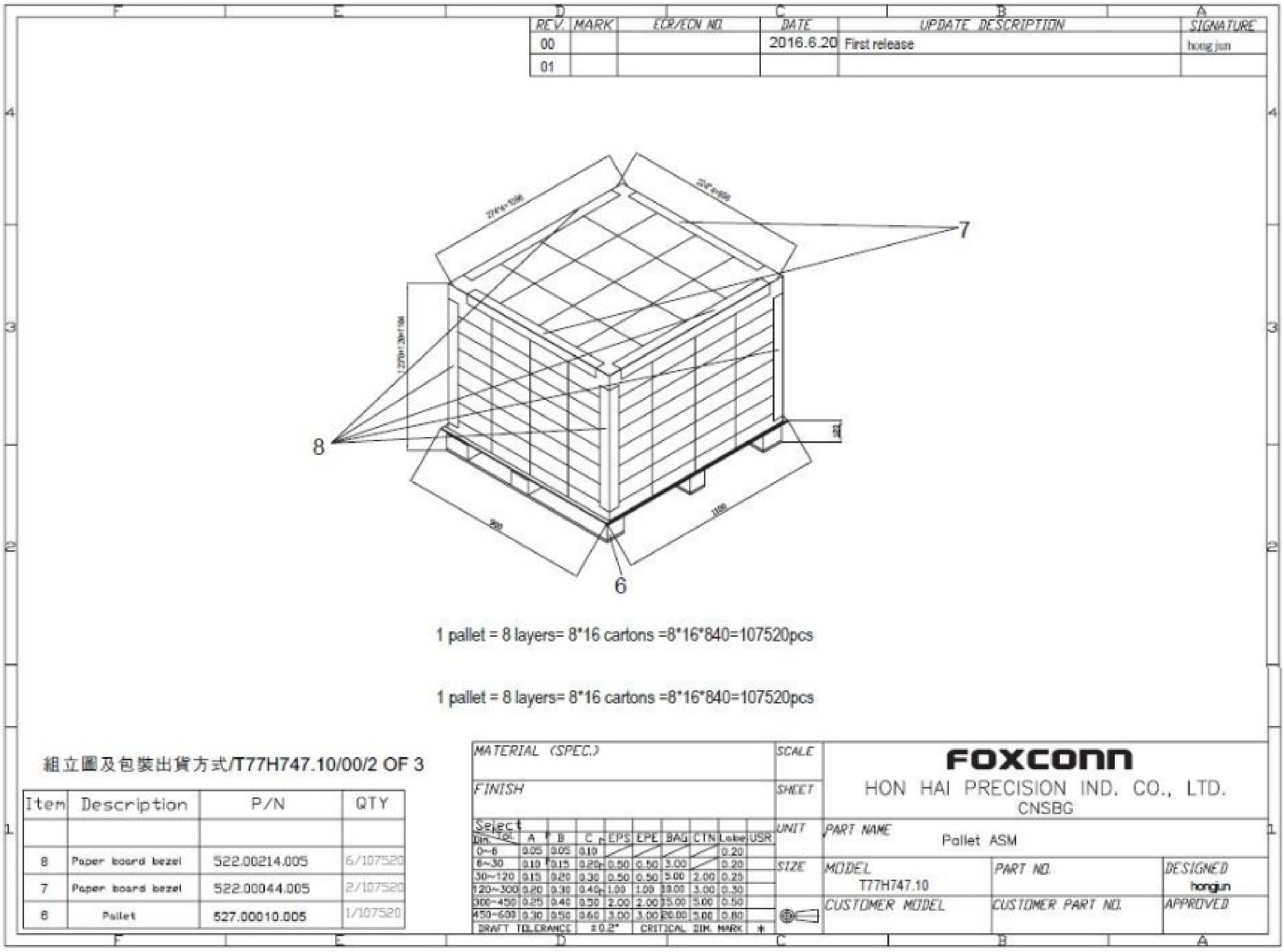
CUSTOMER MODEL

CUSTOMER PART NO.

APPROVED

Select Dim. Tol.	A	B	C	EPS	EPE	BAG	CTN	Label	USR
0~6	0.05	0.05	0.10					0.20	
6~30	0.10	0.15	0.20	0.50	0.50	3.00		0.20	
30~120	0.15	0.20	0.30	0.50	0.50	5.00	2.00	0.25	
120~300	0.20	0.30	0.40	1.00	1.00	10.00	3.00	0.30	
300~450	0.25	0.40	0.50	2.00	2.00	15.00	5.00	0.50	
450~600	0.30	0.50	0.60	3.00	3.00	20.00	5.00	0.80	

DRAFT TOLERANCE ±0.2° CRITICAL DIM. MARK *



REV.	MARK	ECR/ECN NO.	DATE	UPDATE DESCRIPTION	SIGNATURE
00			2016.6.20	First release	hong jun
01					

1 pallet = 8 layers= 8*16 cartons =8*16*840=107520pcs

1 pallet = 8 layers= 8*16 cartons =8*16*840=107520pcs

組立圖及包裝出貨方式/T77H747.10/00/2 OF 3

Item	Description	P/N	QTY
8	Paper board bezel	522.00214.005	6/107520
7	Paper board bezel	522.00044.005	2/107520
6	Pallet	527.00010.005	1/107520

MATERIAL (SPEC.)

FINISH

SCALE

SHEET

UNIT

SIZE

FOXCONN

HON HAI PRECISION IND. CO., LTD.

CNSBG

PART NAME Pallet ASM

MODEL T77H747.10

PART NO.

DESIGNED hongjun

CUSTOMER MODEL

CUSTOMER PART NO.

APPROVED

Select Dim. Tol.	A	B	C	EPS	EPE	BAG	CTN	Label	USR
0~6	0.05	0.05	0.10					0.20	
6~30	0.10	0.15	0.20	0.50	0.50	3.00		0.20	
30~120	0.15	0.20	0.30	0.50	0.50	5.00	2.00	0.25	
120~300	0.20	0.30	0.40	1.00	1.00	10.00	3.00	0.30	
300~450	0.25	0.40	0.50	2.00	2.00	15.00	5.00	0.50	
450~600	0.30	0.50	0.60	3.00	3.00	20.00	5.00	0.80	

DRAFT TOLERANCE ±0.2° CRITICAL DIM. MARK *

Reliability Test plan

No	Item	Test Condition	Qty	Criteria	Result
1	Pull test & Cross Section (2pcs) Cross Section: 1pcs Pull Test: 1pcs	1. Visual inspection: All locations 2. Cross section: BGA/Connector/PTH Hole/Via Hole (SMT/PIH) 3. Pull strength: 0.4mm/0.5mm pitch QFP		1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. Function test Pass; 3. Cross section - No separation - Allowable Crack Length: Max. 25% of pad diameter 4. Pull test - 800g for 0.4mm pitch QFP, 1kg for 0.5mm pitch QFP	TBD
2	Low Temperature Test	4. Power on; 5. Temp.= -40 ; 6. Test Period = 240hrs.	2	Pls refer to ATC	TBD
3	Hot Start Test	1.Power Off , 2.Temperature=100 3.Test period=96 Hours 4.Power on 3times	2	1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. Function test Pass.	TBD
4	Cold Start Test	1.Power Off 2.Temperatu[illegible] 3.Test perio[illegible] Hours 4.Power on [illegible]	2	1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. Function test Pass.	TBD
5	Temperature-Humidity Bias (THB)	1. Power On(apply core voltage to PCBA) 2. Temp.= 85 & Humi.= 85%R.H 3. Test period= 400 Hours	2	Pls refer to ATC	TBD
6	Accelerated Thermal Cycles (ATC)	ATC: 1.Power off 2.Ta=85 for [illegible]5mins 3.Ta=85 to [illegible] for 7.5mins 4.Ta=-40 for 7.5mins 5.Ta=-40 to 85 for 7.5mins 6.Repeat 630cycles Cross Section(both Bright & Dark): BGA/CONNECTOR/PTH Hole/ Via Hole (SMT/PIH)	2	1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. Function test Pass; 3. Cross section (AFTER 630 cycles) - No separation - Allowable Crack Length: Max. 25% of pad diameter	TBD
7	Sine Vibration(Unpackaged)	1. Frequency = 5 ~ 500 ~ 5 HZ; 2. Acceleration = 1 G; 3. Sweep time: 3mins/cycle; 4. Each of x, y, z axis/ 30 min; 5. Power on and continuously ping AP/SG./Golden(AP for WLAN, SG for WWAN, Golden for BT) 6. Product need to be connected with the mating connector which used in laptop.	2	1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. Function test Pass; 3. No disconnect between device & AP/SG /Golden during the test .	TBD
8	Shock Test(Unpackaged)	1. Half-Sine wave ,50G , 11msec 2. Test +/- x, y, z axes 3. Three shock per axes, total 18 shocks. 4. Product need to be connected with the mating connector which used in laptop. 5. Detect by an electrical discontinuity monitor.	2	1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. No electrical discontinuity is greater than 1 microsecond.	TBD
9	Sine Vibration(Packaged)	1. Frequency = 5 ~ 500 ~ 5 HZ; 2. Acceleration = 2 Grms; 3. Each of x, y, z axis/ 30 mins.	1 Carton	1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. Function test Pass.	TBD
10	Shock Test(Packaged)	1. Sine wave ,230G , 3msec ; 2. Test +/- x, y, z axes	1 Carton	1. Visual Inspection – Compliance with IPC-A-610D Class 3 & 39T0261; 2. Function test Pass.	TBD
11	Tin Wisker	1. Power off 60/95%RH for 2000hrs; 2. Room Temperature 2000hrs.	10	Whisker Length <50um	TBD

Notice

- **Operating Temperature Conditions**
  - The product shall be capable of continuous reliable operation when operating in ambient temperature of 0°C to 70°C.
- **Non-Operating Temperature Conditions**
  - Neither subassembly shall be damaged nor shall the operational performance be degraded when restored to the operating temperature when exposed to storage temperature in the range of -20°C to

    +85°C.

- **Operating Humidity Conditions**
  - The product shall be capable of continuous reliable operation when subjected to relative humidity in the range of 0% and 85% non-condensing.
- **Handling Environment**
  - Please make sure to avoid mechanical shock and vibration for this module.
  - Please do not drop the module.
  - Please do not clean the module.

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

- If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:
  - Reorient or relocate the receiving antenna.
  - Increase the separation between the equipment and receiver.
  - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
  - Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate this equipment.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Radiation Exposure Statement
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body.

Radiation Exposure Statement

- The product complies with the FCC portable RF exposure limit set forth for an uncontrolled environment and is safe for intended operation as described in this manual. Further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such a function is available.
- This device is intended only for OEM integrators under the following conditions

- The antenna must be installed such that 20 cm is maintained between the antenna and users, and The transmitter module may not be collocated with any other transmitter or antenna.
- As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed
- **IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

- This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains FCC ID:MCLT77H747”. The grantee’s FCC ID can be used only when all FCC compliance requirements are met.

Manual Information To the End User

- The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.
  The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada statement

This device complies with ISED’s licence-exempt RSSs.

Operation is subject to the following two conditions

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Radiation Exposure Statement

- This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment.
- This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Radiation Exposure Statement

The product complies with the Canada portable RF exposure limit set forth for an uncontrolled environment and is safe for intended operation as described in this manual. Further RF exposure reduction can be achieved if the product can be kept as far as possible from the user’s body or by setting the device to lower output power if such a function is available.

1. The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2. The transmitter module may not be co-located with any other transmitter or antenna.

3. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

IMPORTANT NOTE

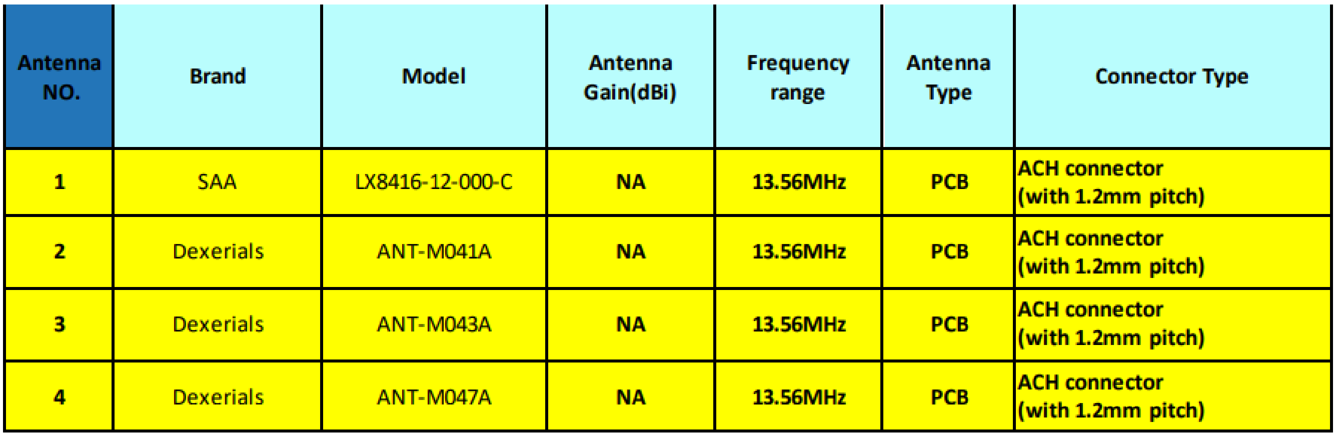
- In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.
- **End Product Labeling**
  This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: “Contains IC: 2878D-T77H747”

Manual Information To the End User

- The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user’s manual of the end product which integrates this module.
- The end user manual shall include all required regulatory information/warning as show in this manual.
- This radio transmitter (IC: 2878D-T77H747, Model: T77H747) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

DETACHABLE ANTENNA USAGE

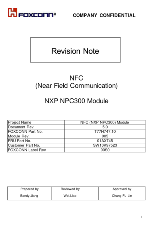
- This radio transmitter (IC: 2878DT77H747 / Model: T77H747) has been approved by ISED to operate with the antenna type listed below with maximum permissible gain indicated.
- Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.



Antenna NO.	Brand	Model	Antenna Gain(dBi)	Frequency range	Antenna Type	Connector Type
1	SAA	LX8416-12-000-C	NA	13.56MHz	PCB	ACH connector (with 1.2mm pitch)
2	Dexerials	ANT-M041A	NA	13.56MHz	PCB	ACH connector (with 1.2mm pitch)
3	Dexerials	ANT-M043A	NA	13.56MHz	PCB	ACH connector (with 1.2mm pitch)
4	Dexerials	ANT-M047A	NA	13.56MHz	PCB	ACH connector (with 1.2mm pitch)

5	SAA	LX7828-12-000-C	**NA**	**13.56MHz**	**PCB**	**ACH connector (with 1.2mm pitch)**
6	Lenovo Japan	FLANBPA-0715	**NA**	**13.56MHz**	**PCB**	**ACH connector (with 1.2mm pitch)**
7	**Huizhou Speed Wireless Technology Co., Ltd**	**F-0W-JV-0191-001-K0**	**NA**	**13.56MHz**	**PCB**	**ACH connector (with 1.2mm pitch)**

Documents / Resources



COMPANY CONFIDENTIAL

Revision Note

NFC
(Near Field Communication)

NXP NPC300 Module

Project Name	NFC (NXP NPC300) Module
Document Rev.	5.0
FOXCONN Part No.	T77H747.10
Module Rev.	005
FRU Part No.	01AX745
Customer Part No.	SW10K97523
FOXCONN Label Rev	00S0

Prepared by	Reviewed by	Approved by
Bandy.Jiang	Wei.Liao	Chang-Fu Lin

FOXCONN NXP NPC300 Module NFC Near Field Communication [pdf] User Manual
NXP NPC300 Module NFC Near Field Communication, NXP NPC300, Module NFC Near Field Communication, NFC Near Field Communication, Field Communication, Communication

References

-
-
- User Manual

Manuals+, Privacy Policy