

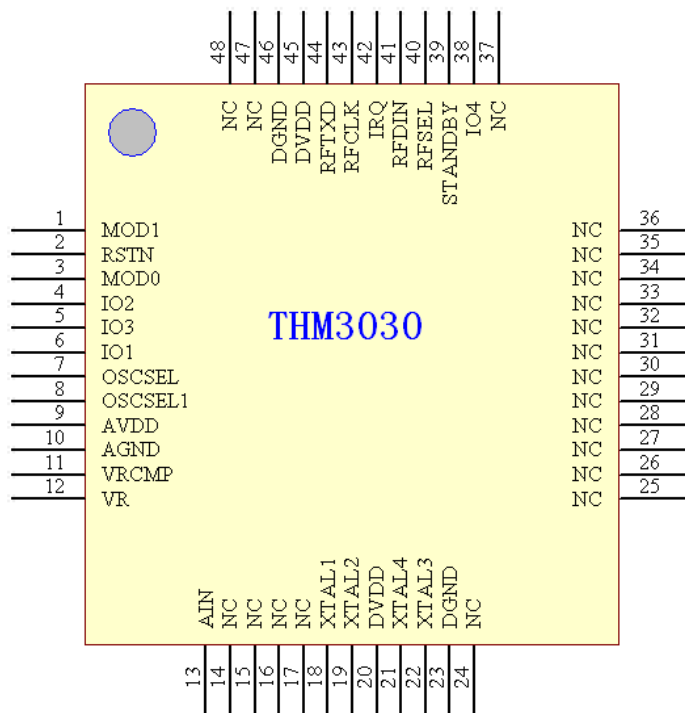
# THM3030

## Multiple Protocols Contactless Reader IC

### Features

- ✧ Compatible with ISO/IEC 14443 A
- ✧ Support ISO/IEC 14443A higher transfer speed communication up to 848 kbit/s
- ✧ Compatible with ISO/IEC 15693
- ✧ Host interface selectable: UART,SPI and “Transparent” mode
- ✧ Max frame size up to 512 bytes
- ✧ Internal oscillator to connect a 13.56 MHz crystal
- ✧ Embedded hardware CRC and receiver timer
- ✧ Integrated analog circuit for receiving
- ✧ Interrupt request output
- ✧ Standby mode
- ✧ 3.3V or 5V operation
- ✧ LQFP48 package

### Pinning Diagram





## Pin Description

Pin	Symbol	Type <sup>1</sup>	Description		
			SPI mode <sup>2</sup> UART mode      Transparent mode		
6	IO1	I/O	SCLK, Input with internal weak pullup, SPI clock	No Connect, Input with internal weak pullup	Input with internal pullup, RF protocols select
4	IO2	I/O	MOSI, Input with internal weak pullup, Master Out Slave In	No Connect, Input with internal weak pullup	Input with internal weak pullup, RF protocols select
5	IO3	O	MISO, Output, Master In Slave Out, Output high-Z when SS_N is high	TXD, Output, UART Transmit Output	RCD, Output, Receive data output
38	IO4	I	SS_N, Input, Active low, Slave Select with internal weak pullup	RXD, Input, UART Receive Input with internal weak pullup	TRD, Input, Transmit Data input with internal weak pullup
2	RSTN	I	Reset input with internal weak pullup, Active low		
18	XTAL1	I	Crystal Input		
19	XTAL2	O	Crystal Output		
1	MOD1	I	Host Interface Selection 1		
3	MOD0	I	Host Interface Selection 0		
42	IRQ	O	Interrupt Request Output		
39	STANDBY	I	Standby mode control, High for Standby mode and Low for Normal mode		
40	RF_SEL	I	Test Pin, Connected to DVDD		
41	RF_DIN	I	Test Pin, Connected to DGND		
13	AIN	I	Input of detection signal		
12	VR	I	Reference Voltage 1, connected with external de-coupling capacitor		
11	VRCMP	I	Reference Voltage 2, connect with external de-coupling capacitor		
44	RFTXD	O	Modulation Signal Output pin. When the carrier is closed, this pin is low and is the large current output pin with maximum current of 30mA.		
43	RFCLK	O	Carrier output pin. When the carrier is opened, this pin output is the 13.56MHz square wave and is the large current output pin with maximum current of 30mA.		
45	DVDD	P	Digital Power Supply		
46	DGND	P	Digital Ground		
20	DVDD	P	Digital Power Supply		

<sup>1</sup> I for Input, O for Output, P for Power

<sup>2</sup> MOD1 and MOD0 decide the host interface: SPI mode, UART mode and Transparent mode



23	DGND	P	Digital Ground
10	AGND	P	Analog Ground
9	AVDD	P	Analog Power Supply
7	OSC_SEL	I	Test Pin , Connected to DVDD
8	OSC_SEL1	I	Test Pin , Connected to DGND
22	XTAL3	O	Test Pin , No Connect
21	XTAL4	I	Test Pin , Connected to DGND



## Operating Range

Symbol	Parameter	Conditions	MIN	MAX	UNIT
DVDD	Digital Supply Voltage	AGND = DGND = 0V	3.0	5.5	V
AVDD	Analog Supply Voltage	AGND = DGND = 0V	3.0	5.5	V
TA	Ambient Temperature	--	-40	80	°C
tR	Digital Signal Input Rising Time	--		40	ns
tF	Digital Signal Input Falling Time	--		40	ns

## Absolute Maximum Ratings

Symbol	Parameter	Conditions	MIN	MAX	UNIT
DVDD	Digital Supply Voltage	DGND = 0V	-0.75	5.75	V
AVDD	Analog Supply Voltage	AGND = 0V	-0.75	5.75	V
VI	Input Voltage	DGND=AGND=0V	-0.75	5.75	V
IO	Output Current	RFTXD, RFCLK	-30	30	mA
		Other Pins	-10	10	mA
TSTG	Storage Temperature	No power supply bias	-85	150	°C
TA	Ambient Temperature	Power supply bias available	-65	135	°C

## DC Characteristics

The value in the table is effective under normal operation with temperature between 0°C and 50°C.

Symbol	Parameter	Conditions	MIN	MAX	UNIT
VIL	Input Low Voltage	DVDD = 3.3~5V	0	0.3*DVDD	V
VIH	Input High Voltage	DVDD=3.3~5V	0.7*DVDD	5.5	V
VOL	Output Low Voltage	IOL = 1.8mA , DVDD=5V	0.4	2.0	V
VOH	Output High Voltage	IOH = -1.8mA , DVDD=5V	VDD-1.0	5	V
ILI	Input Leakage Current	VI = -0.5~5.5V	-5	5	μA
CIO	I/O pin capacitance	f = 1.0MHz, TA = 25°C		5	pF
IDD	Supply current	Normal mode, AVDD=DVDD=5V	20	30	mA
		Normal mode,	12	20	mA



		AVDD=DVDD=3.3V			
		Standby mode, AVDD= DVDD=5V	5	9	μA
		Standby mode, AVDD= DVDD=3.3V	3	5	μA
		Normal mode, Including external transmission circuit AVDD=TVDD <sup>3</sup> =DVDD =5V	90	100	mA
		Normal mode, Including external transmission circuit AVDD=TVDD=DVDD =3.3V	60	70	mA

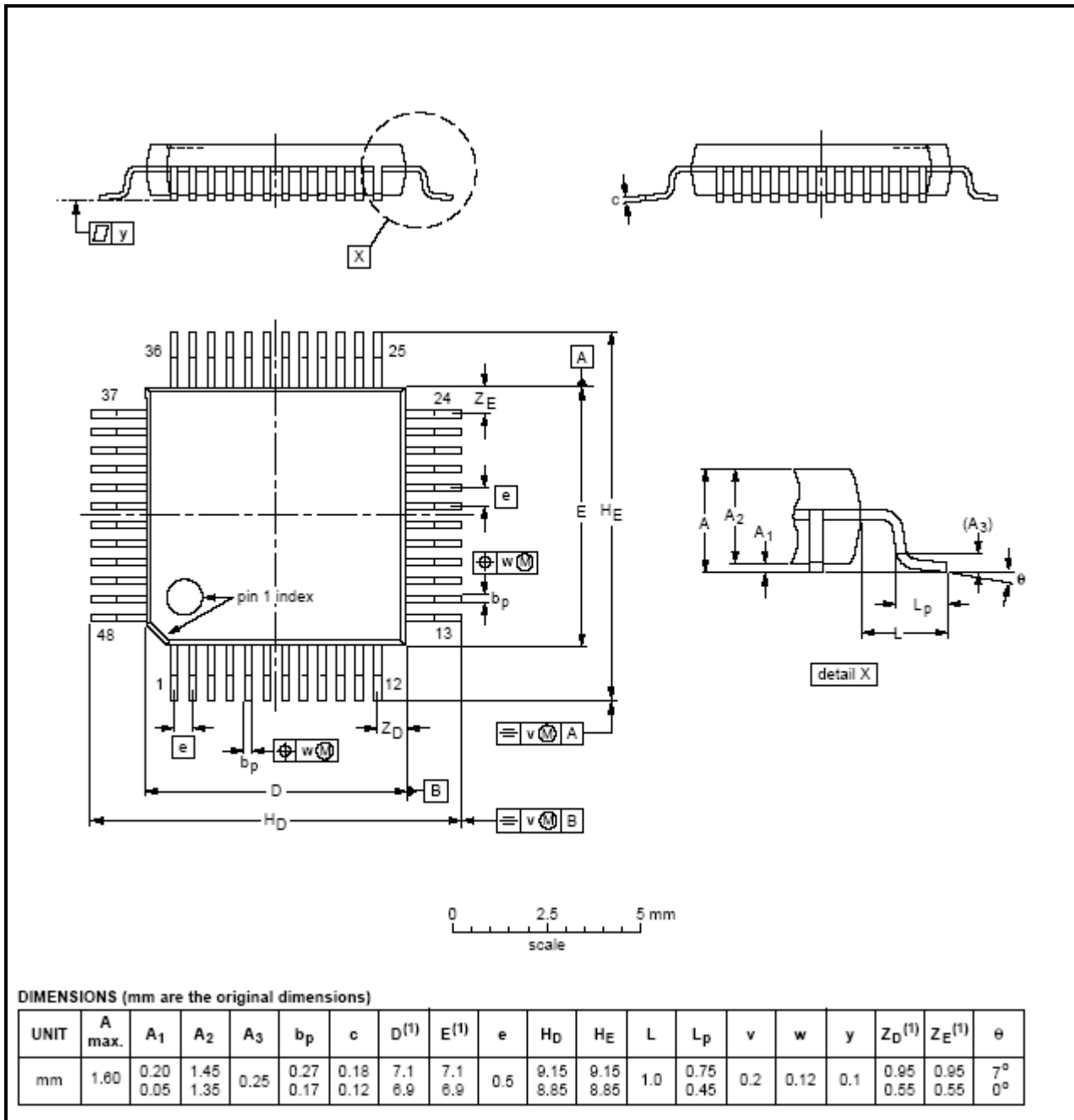
## AC Characteristics

Symbol	Parameter	MIN	MAX	UNIT
fosc	Clock Frequency	13.553	13.567	MHz
t1	RF closing time	1.0	2.0	μS
t2	RF opening time	1.0	1.5	μS

Note: This document is a Beta version, data and descriptions (including this table) cannot be a formal evidence for performance and functions of the IC.

<sup>3</sup> TVDD is the power supply of external RF amplifier

**Package ( LQFP48 )**





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