- Extreme long-range
- High power 500mW

Product Specification



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Note: Revision History

Revision	Date	Comment
V1.0	2023-9	1st Release
V1.1	2023-12	Update Dimension
V1.2	2023-12	Update part of the description
V1.3	2024-6	Update block diagram

1. Production Description

UWB3000F27 adopted Qorvo's DW3000 , designed with PCB antenna and a 500mW high power amplifier chip . UWB3000 is in line with IEEE802.15.4-2020. It can be used for two-way ranging and TDoA systems, positioning accuracy of 10 cm.

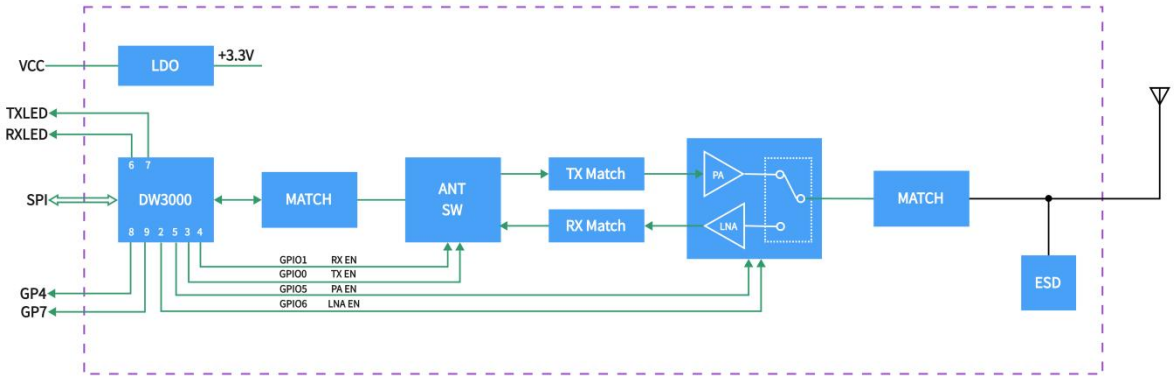
2. Feature

- IEEE802.15.4-2020 UWB
- Supports channels 5 (6489.6 MHz)
- Data rates of 850 kbps and 6.8 Mbps
- Integrated HW AES 256
- Worldwide UWB Radio
- Regulatory compliance
- Packet length up to 1023 bytes
- Supports 2-way ranging, TDoA location schemes
- Programmable output power
- Provides precision location and data transfer simultaneously
- Asset location to an accuracy of 10 cm
- Long distance communication and ranging

3. Applications

- Precision real time location systems (RTLS) using two-way ranging, TDoA schemes in a variety of markets:
  Healthcare\ Consumer\ Industrial\ Automotive
- Location aware wireless sensor networks
- Presence detection for secure entry and secure payment

4. Block Diagram



UWB3000F27

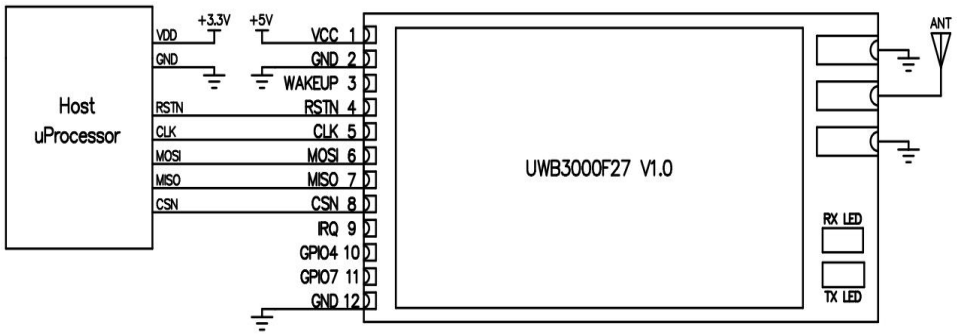
Note: To use our reference code, the internal GPIO has a transceiver switch with antenna switch and power amplifier.

5. Parameters

Parameter	Condition	Min.	Typ.	Max.	Unit
Supply Voltage		3.0	5.0	5.5	V
Operating Temperature Range		- 40	25	85	℃
Frequency Range	CH5		6489. 6		MHz
RF Data Rate		850k		6.8M	bps
Current Consumption					
Sleep Mode			< 1.3		uA
Rx	CH5		93		mA

Tx	CH5		310		mA
TX for range measurement	CH5		21		mA
Transmit parameters					
Tx Power	@VCC=3.3V	0		27	dBm
Tx Bandwidth（BW)			499.2		MHz
Receive parameters					
Rx Sensitivity	@850Kbps		-100		dBm
	@6.8Mbps		-94		dBm

6. Typical Application Circuit



7. Power and current comparison table (Vcc=4.0v pure carrier emission)

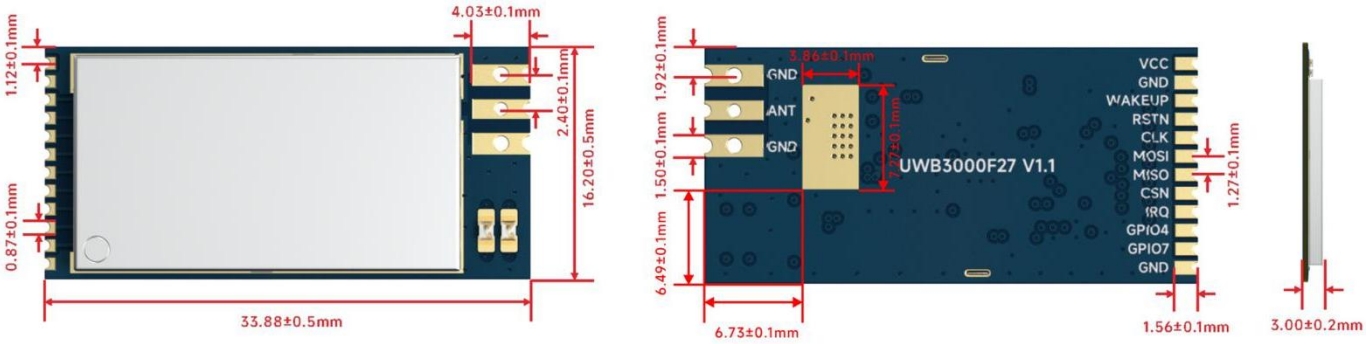
Register	Output power	Current (mA)
0x00	-5 dBm	307
0x04	-2 dBm	308
0x06	2.14 dBm	315
0x14	7.5 dBm	318
0x18	8.8 dBm	321
0x20	11 dBm	330
0x30	14 dBm	350
0x48	17 dBm	383
0x7C	20.2 dBm	449
0xFC	23.7 dBm	554
0xFF	27.7 dBm	800

8. Pin Assignment



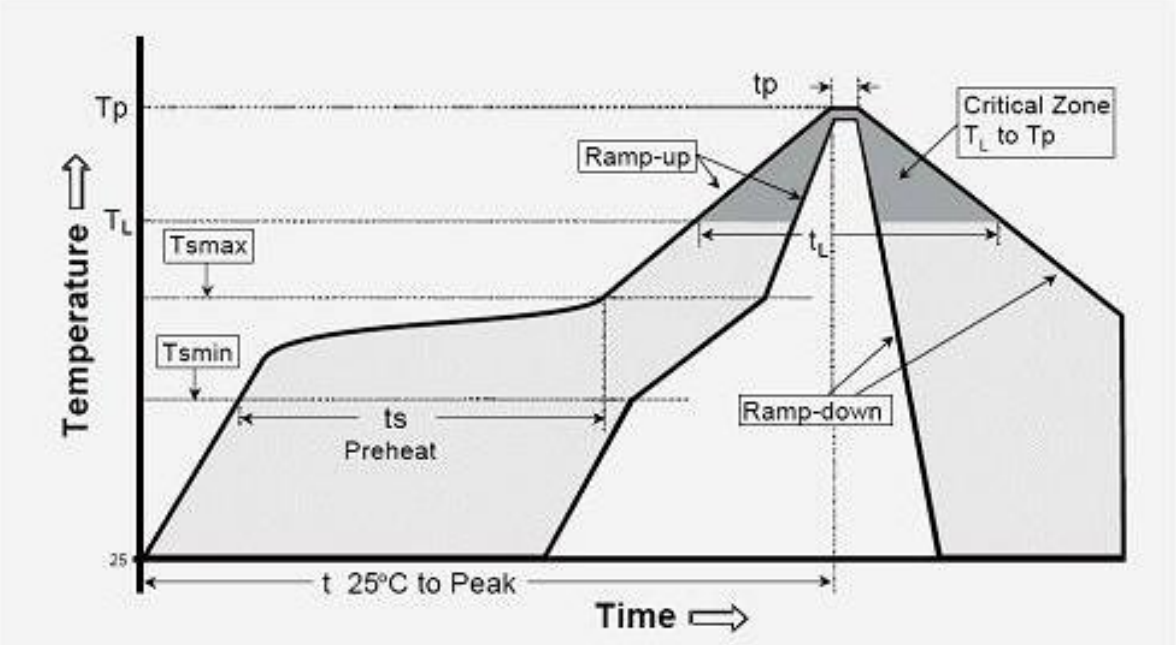
Pin No.	Pin definition	I/O	Level	Description
1	VCC			VCC (3.0-5.5V)
2,12,13,15	GND			Ground
3	WAKEUP	DI	0-3.3v	When asserted into its active high state, the WAKEUP pin brings the DW3000 out of SLEEP or DEEPSLEEP states into operational mode. This should be connected to ground if not used.
4	NRSTn	DIO	0-3.3v	Reset pin. Active Low Output. May be pulled low by external open drain driver to reset the DW3000. Must not be pulled high by external source.
5	CLK	DI	0-3.3v	SPI peripheral clock input.
6	MOSI	DI	0-3.3v	SPI peripheral data input.
7	MISO	DO	0-3.3v	SPI peripheral data output.
8	CSN	DI	0-3.3v	SPI chip select. This is an active low enable input. The high-to-low transition on SPICSn signals the start of a new SPI transaction. SPICSn can also act as a wake-up signal to bring DW3000 out of either SLEEP or DEEPSLEEP states.
9	IRQ	DI	0-3.3v	Interrupt request output from the DW3000 to the host processor. By default IRQ is an active-high output but may be configured to be active low if required. For correct operation in SLEEP and DEEPSLEEP modes it should be configured for active high operation. This pin will float in SLEEP and DEEPSLEEP states and may cause spurious interrupts on the host unless pulled low externally (100kΩ recommended). When the IRQ functionality is not being used the pin may be reconfigured as a general purpose I/O line2 , GPIO8.
10	GPIO4	DIO	0-3.3v	GPIO4 from DW3000.
11	GPIO7	DIO	0-3.3v	GPIO7 from DW3000.
14	ANT			External 50 euro antenna

9. Dimension (Unit：mm)



Appendix：Reflow Chart for SMT Technology

We recommend you should obey the IPC related standards in setting the reflow profile:



IPC/JEDEC J-STD-020B the condition for lead-free reflow soldering	big size components (thickness >=2.5mm)
The ramp-up rate (Tl to Tp)	3℃/s (max.)
preheat temperature - Temperature minimum (Tsmin) - Temperature maximum (Tsmax) - preheat time (ts)	 150℃ 200℃ 60~180s
Average ramp-up rate(Tsmax to Tp)	3℃/s (Max.)
- Liquidous temperature(TL)	217℃
- Time at liquidous(tL)	60~150 second
peak temperature(Tp)	245+/-5℃