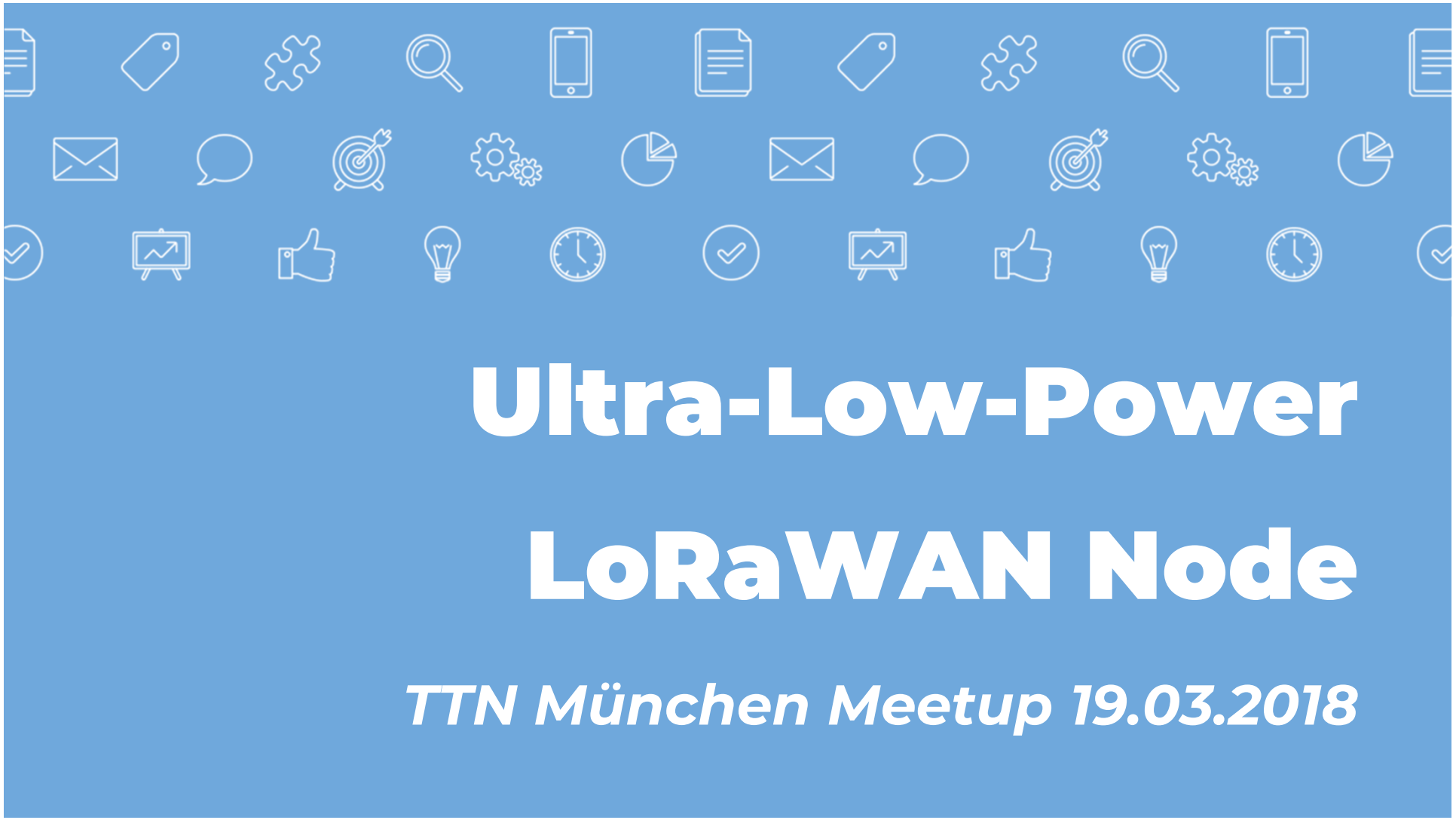
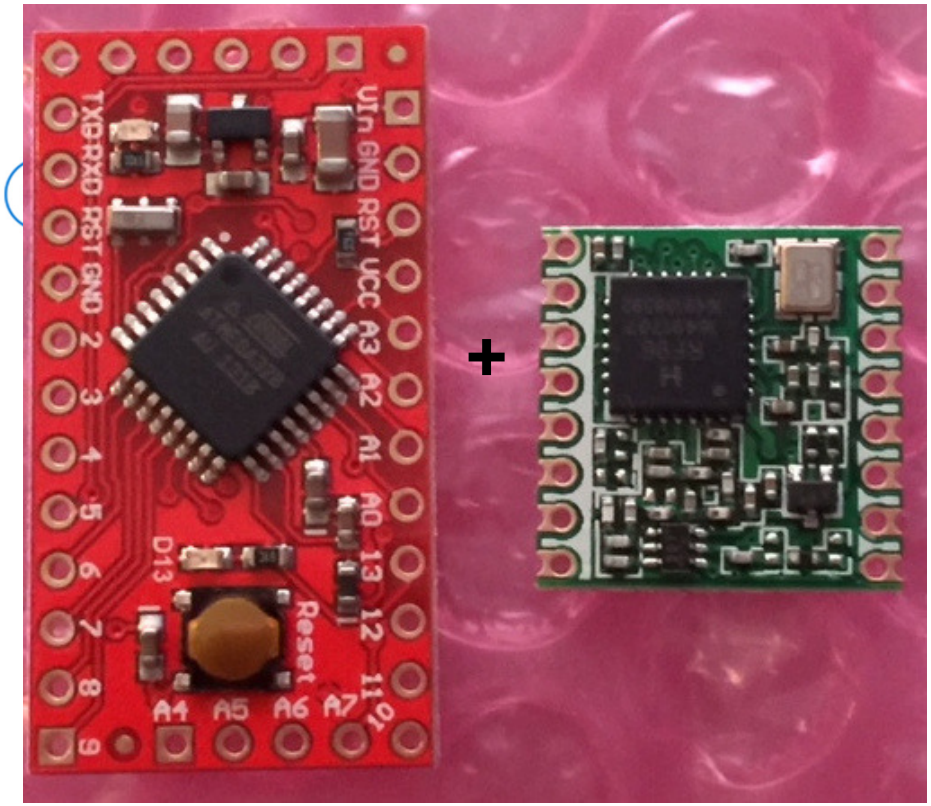

Ultra-Low-Power
LoRaWAN Node
TTN München Meetup 19.03.2018

2 Heute

- ~ 30kB Speicher für Programm
- 2KB SRAM, 1 KB EEPROM
- Power-LED (mA)
- LDO (~ 80µA, MIC5209)



Arduino Nano + RFM95W

3 Wunsch

- >> 30kB Speicher für Programm
- < 1µA im Sleep Mode

4 Möglichkeiten

- ATMEL (Microchip) ATmega644P, 1284P, 2561V
  Architektur: ATMEL AVR
- STM32Lx
  Architektur: ARM Cortex M0

5 Möglichkeiten

ATMEL (Microchip) ATmega644P, 1284P, 2561V

Chip	Package	EEPROM	SRAM	EEPROM
644P	TQFP44	64KB	8KB	4KB
1284P	TQFP44 / TQFP64	128KB	8KB	4KB
2561V	TQFP64	256KB	8KB	4KB

6 Möglichkeiten

STM32Lx

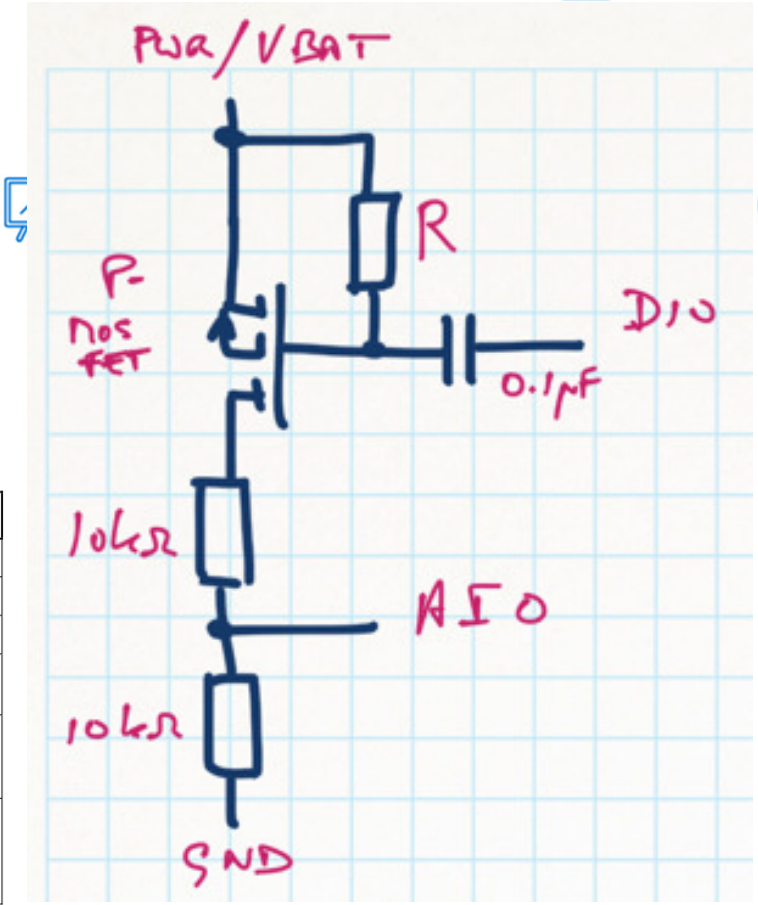
Chip	Package	EEPROM	SRAM	EEPROM
STM32L071	LQFP32/LQFP48/LQFP64	192KB	20KB	6KB
STM32L476xx	LFP64 /LQFP100	256KB/512KB/1024KB	128KB	-

7 Vergleich

Chip	Package	IDE	Codebasis	Technologie
ATmega644P ATmega1284P ATmega2561V	TQFP44 / TQFP64	Arduino	**bekannt**	**bekannt**
STM32Lxxx	LQFP32/LQFP48/LFP64 /LQFP100	STM	**neu**	**neu**

8 Strom sparen

- Zero-Power-Measurement
- RFM95W in den Sendepausen abschalten



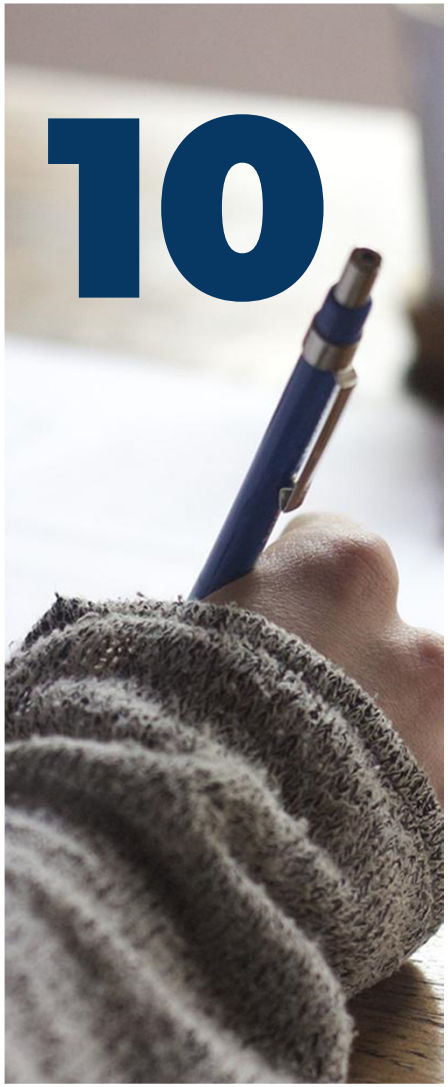
2.4.1. Power Consumption

Table 51 Power Consumption Specification

Symbol	Description	Conditions	Min	Typ	Max	Unit
IDDSL	Supply current in Sleep mode		-	0.2	1	uA
IDDIDLE	Supply current in Idle mode	RC oscillator enabled	-	1.5	-	uA
IDDST	Supply current in Standby mode	Crystal oscillator enabled	-	1.6	1.8	mA
IDDFS	Supply current in Synthesizer mode	FSRx	-	5.8	-	mA
IDDR	Supply current in Receive mode	*LnaBoost* Off, higher bands *LnaBoost* On, higher bands Lower bands	- - -	10.8 11.5 12.1	- - -	mA
IDDT	Supply current in Transmit mode with impedance matching	RFOP = +20 dBm, on PA_BOOST RFOP = +17 dBm, on PA_BOOST RFOP = +13 dBm, on RFO_LF/HF pin RFOP = + 7 dBm, on RFO_LF/HF pin	- - - -	120 87 29 20	- - - -	mA mA mA mA

Links:

http://jeelabs.org/2013/05/17/zero-powe-battery-measurement/



Dankeschön!

Noch Fragen?

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