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PAN4561

SNAP®

The PAN4561 is an extended range 2.4GHz, ISM, RF module. Modules may be configured from simple point-to-point proprietary devices to complex mesh networks by choosing from different firmware options. Optional Synapse SNAP firmware provides a highly flexible, industry leading solution for mesh networking with a complete network development environment. The module uses the same FreeScale eight bit GT60 processor as Panasonic's popular PAN4555 making the two products application compatible. The PAN4561 has 55 pins allowing access to the full functionality of the MC13213 SOC. Low noise and power amplifiers have been added to the PAN4561 for extended range. With a maximum transmit power of 20dBm and receive sensitivity of -105dBm this module has a link margin of 125dBm, giving it the best range in its class.

Multiple antenna options are available including, ceramic antenna, SMD pad output, and U.FL connector. This module will comply to EN300328, FCC CFR Part 15 and ARIB STD-T66. FCC and IC certifications are pending.

NEW!

Product Performance:

- Small Size: 35mm X 15mm X 3.5mm
- 3 Antenna Options: Single Port 50Ω, Ceramic Antenna or SMD Output
- 16 Selectable Channels With 250 Kbps In The 2.4 Ghz Band
- Low Power Modes For Increased Battery Life
- High Sensitivity: -105 dBm Typical At 1% Packet Error Rate
- 20 dBm Typical Output Power Programmable Over 30 dB Range
- Low Supply Voltage: 2.7 V To 3.3 V, 3.0 V Typical
- Operating Temperature Range: -40°C To +85°C
- Link Quality And Clear Channel Assessment Capability
- 60k Flash And 4k RAM Memory
- Two UARTs And One I^{2}C Bus
- 8 Channel A/D Converter With 10 Bit For Fast And Easy Conversion From Analog Inputs (Temperature, Pressure And Fluid Levels) To Digital Values.
- 5 Channel 16 Bit Timer/Pulse Width Modulation (Tpm) Outputs
- BDM Port For Direct Download Programming
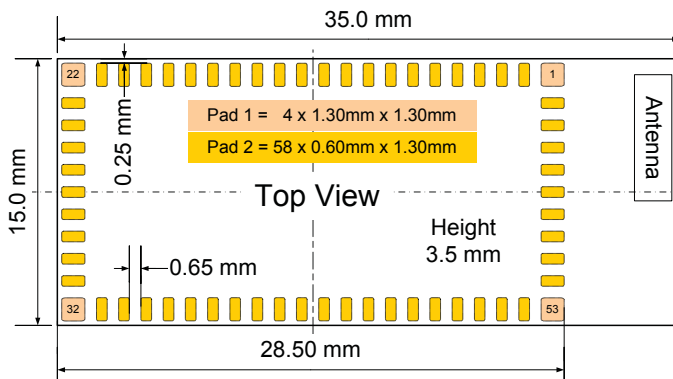- 33 Digital I/O Lines With Programmable Pull-Ups And Several With High-Current Driver

Part Numbers:

Part Number	Description
ENWC9A22A1EF	8 bit, LNA, PA, with Ceramic Antenna, No SW
ENWC9A22C1EF	8 bit, LNA, PA, with RF Out on SMD Pads, No SW
ENWC9A22B1EF	8 bit, LNA, PA, with U. FL Ant Connector, No SW
ENWC9A22A2EF	8 bit, LNA, PA, Ceramic Ant, SN55 FW
ENWC9A22B2EF	8 bit, LNA, PA, U.FL Connector, SN55 FW
ENWC9A22C2EF	8 bit, LNA, PA, SMD RF Out, SN55 FW
ENWC9A22A4EF	8 bit, LNA, PA, Ceramic Ant, SNAP FW
ENWC9A22C4EF	8 bit, LNA, PA, SMD RF Out, SNAP FW
ENWC9A22B4EF	8 bit, LNA, PA, U.FL Connector, SNAP FW
EVAL_PAN4561	Evaluation Kit For The PAN4561 Module

Applications:

- Factory Automation
- Home Automation
- Motor/Lighting Control
- Inventory Management
- Remote Control And Wire Replacement For Industrial Systems (Wireless Sensor Networks)

- RFID Tagging
- Automated Meter Reading
- Monitoring (Environmental, Patient, Fitness)

Dimensions & Pin Layout:

```
                35.0 mm
       Pad 1 =  4 x 1.30mm x 1.30mm
       Pad 2 = 58 x 0.60mm x 1.30mm
            Top View
                        Height
                        3.5 mm
       0.65 mm
            28.50 mm
```

15.0 mm
0.25 mm
Antenna

Note:
The pin names of the module and the internal MC1321x names fit to each other.
All unmentioned pins are not connected and must be left open.

Pin No.	Pin Name	Pin No.	Pin Name
1, 22, 32, 56 to 62	GND	23 / 24	Vcc
		25 / 26	32 kHz Xtal
2 to 5	TPM2CH1-4 (PTD4-7)	27	/Reset
		28	CLKO
6	TPM2CH2 (PTD2)	30	BKGD/MS (PTG0)
8	UART2 TxD (PTC0)	33	VDDA
9	UART2 RxD (PTC1)	34 to 41	KBI0-7 (PTA0-7)
10	I^{2}C SDA (PTC2)	42 to 45	PTC7-4
11	I^{2}C SCL (PTC3)	46	UART1 TxD (PTE0)
12 to 19	ADC7-0 (PTB7-0)	47	UART1 RxD (PTE1)
		52	/PA_PwrDn
20	ADC Ref. H	53 to 54	GND
21	ADC Ref. L	55	50 Ohm RF

Technical Specifications:

Parameter	Value	Condition / Notes
Receiver Sensitivity	-105 dBm typ.	For 1% Packet Error Rate
Output Power	20 dBm	Maximal
Power Supply	2.7 V ~ 3.3 V	Single Supply, 3.0 V Typ.
Power Control Range	30 dB	
Maximum Data Rate	250 kbps	Over The Air
Current Consumption Receive Mode Transmit Mode Idle Mode Doze Mode Hibernate Mode Off Mode	 45 mA typ. 202 mA typ. 1.6 mA typ. 50 μA typ. 16 μA typ. 2 μA	 Output Power Nominal Value No CLKO
Operating Temperature Range	-40°C to +85°C	

Notes:
All parameters are valid for VDD = 2.7V and Tamb = 25°C.

Freescale's MC13213 is included with the module, SMAC, MAC or Freescale Bee-Stack. There is no additional license fee per module by using the Freescale Bee-Stack, only a one time general support fee ($500) for the Bee-Stack to be paid to Freescale.

Mode Definitions and Transition Times for saving battery life can be seen in the data sheet MC1321x. The derivative MC13212 and MC13211 as well as a non-PA/LNA version are available on request.

Maximum ratings shown for Tx power and Rx sensitivity, typical ratings may be lower.