The industry's first* to support 1,000-device mesh networks

Wi-SUN FAN Wireless Communication Module

BP35C5

*ROHM January 2021 study

ROHM SEMICONDUCTOR

Enables configuration of 1,000-device Sub-GHz mesh networks
- Supports large-scale mesh networks ideal for smart cities
- Sub-GHz wireless provides long-distance communication with low power consumption

Robust transmission • Achieves high reliability wireless communication
- Integrated automatic communication path and channel hopping functions ensure stable, high reliability wireless transmission

Certified modules allow for quick and easy development
- Certification under both "Wi-SUN" and "FCC & Japan's Radio Law" significantly reduces customer development load, enabling immediate evaluation with comprehensive support
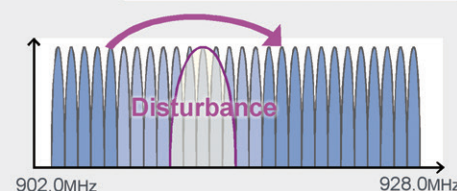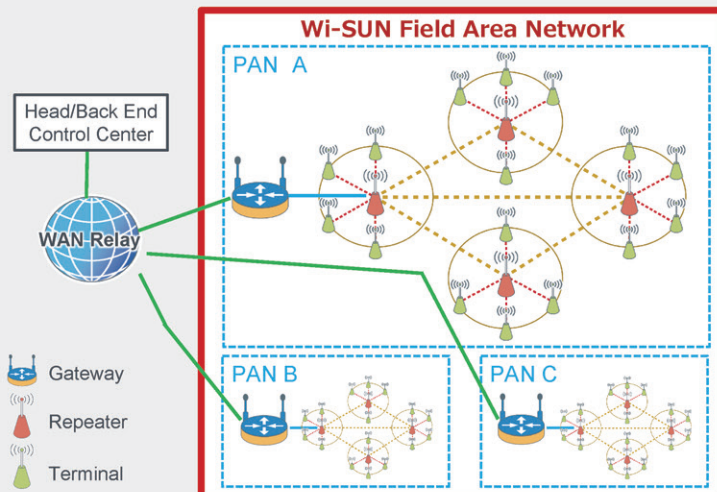

BP35C5

■ Wi-SUN FAN

- Large-Scale Mesh Networks

Automatic communication path optimization function achieves high reliability wireless transmission

Wi-SUN Field Area Network

PAN A

Head/Back End Control Center

WAN Relay

PAN B   PAN C

Gateway

Repeater

Terminal

- Channel Hopping — Improved resistance against noise and interference

Disturbance

902.0MHz   928.0MHz

- High Data Rate — Low power consumption minimizes radio wave interference

LPWA Data Comparison

0.1kbps, etc.   50kbps   150kbps   300kbps

Other LPWA   **Wi-SUN FAN**

■ Usage Cases

- Smart Cities
  Streetlamps
  Traffic lights
  Smart meters
  Solar panels
  Parking lots
  Bicycle lots
  Other infrastructure

- Smart Buildings
  AC control
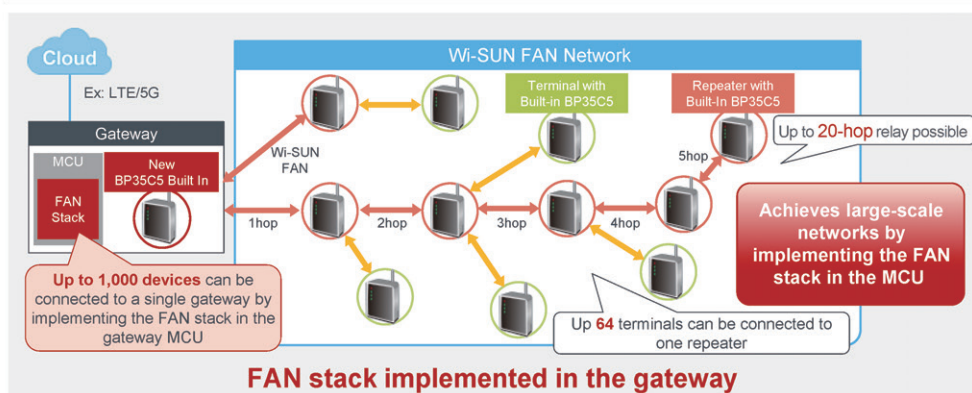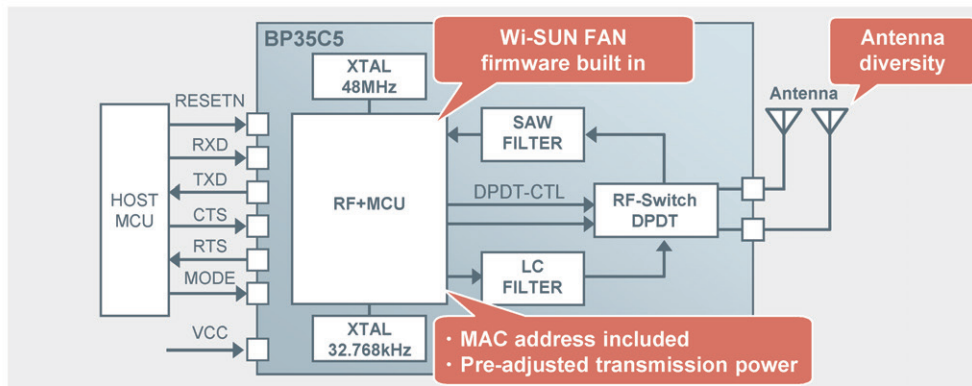 Lighting control
  Building maintenance

- Smart Logistics
  Automated warehouses
  Forklifts
  AGV (Automated Guided Vehicles)
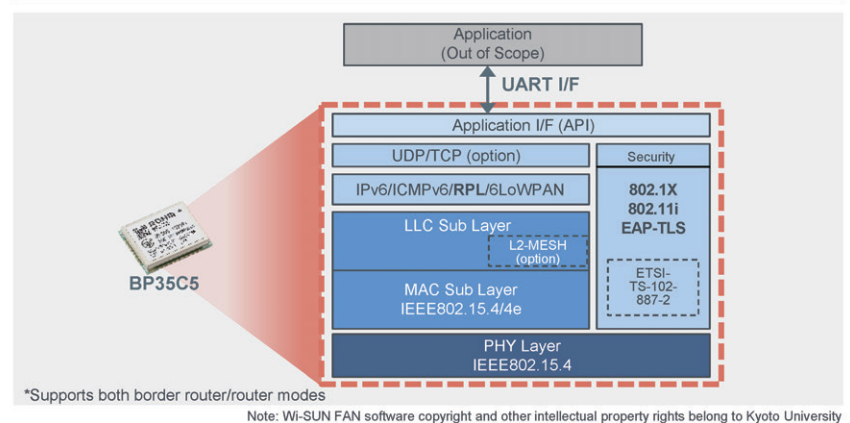
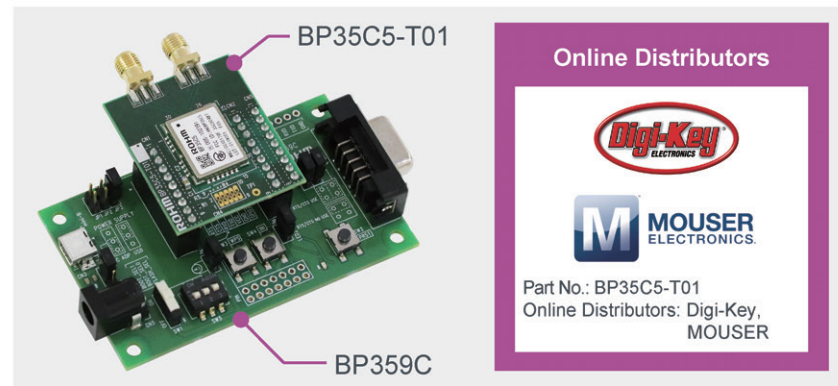## ■ Solutions for Large-Scale Systems (1,000 Devices)

Cloud
Ex: LTE/5G

Gateway
MCU | FAN Stack | New BP35C5 Built In

Wi-SUN FAN Network

Terminal with Built-in BP35C5
Repeater with Built-In BP35C5

Up to **20-hop** relay possible

Wi-SUN FAN
1hop 2hop 3hop 4hop 5hop

Achieves large-scale networks by implementing the FAN stack in the MCU

Up to 1,000 devices can be connected to a single gateway by implementing the FAN stack in the gateway MCU

Up **64** terminals can be connected to one repeater

FAN stack implemented in the gateway

■ Software Stack

Application (Out of Scope)

UART I/F

BP35C5

Application I/F (API)		
UDP/TCP (option)		Security
IPv6/ICMPv6/**RPL**/6LoWPAN		**802.1X** **802.11i** **EAP-TLS**
LLC Sub Layer	L2-MESH (option)	
MAC Sub Layer IEEE802.15.4/4e		ETSI-TS-102-887-2
PHY Layer IEEE802.15.4		

*Supports both border router/router modes

Note: Wi-SUN FAN software copyright and other intellectual property rights belong to Kyoto University

■ Block Diagram

BP35C5

XTAL 48MHz

Wi-SUN FAN firmware built in

Antenna diversity

Antenna

HOST MCU
RESETN / RXD / TXD / CTS / RTS / MODE / VCC

RF+MCU

SAW FILTER
DPDT-CTL
RF-Switch DPDT
LC FILTER

XTAL 32.768kHz

• MAC address included
• Pre-adjusted transmission power

■ Evaluation Board

BP35C5-T01

BP359C

Online Distributors

Digi-Key ELECTRONICS
MOUSER ELECTRONICS

Part No.: BP35C5-T01
Online Distributors: Digi-Key, MOUSER

■ Wi-SUN Communication Modules Lineup

Part No.	Supply Voltage (V)	Wi-SUN Profile	Frequency (MHz)	Antenna	Mounting Type	Interface	Radio Law Compliance	Operating Temp (℃)	Size (mm)
BP35A1	2.7 to 3.6 (Single power supply)	B Route	922.5 to 927.5	Built-in	Connector	UART	ARIB STD-T108 (Japan)	-20 to +80	22.0×33.5×3.9
BP35C0	2.6 to 3.6 (Single power supply)	B Route/HAN	922.5 to 927.5	—	Surface mount	UART	ARIB STD-T108 (Japan)	-30 to +85	15.0×19.0×2.6
BP35C2	4.5 to 5.5 (Single power supply)	B Route/HAN	922.5 to 927.5	Built-in	USB	USB	ARIB STD-T108 (Japan)	-20 to +50	21.4×49.7×8.5
BP35C0-J11	2.6 to 3.6 (Single power supply)	B Route/Enhanced HAN	922.5 to 927.5	—	Surface mount	UART	ARIB STD-T108 (Japan)	-30 to +85	15.0×19.0×2.6
New BP35C5	2.6 to 3.6 (Single power supply)	FAN	902.0 to 928.0	—	Surface mount	UART	ARIB STD-T108 (Japan), FCC_15C (North America)	-30 to +85	15.0×19.0×2.6

The content specified in this document is correct as of January 1st, 2021.

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