

# Outstanding Real-Time Performance RX66N MCU GROUP



RX66N Product Info

This 32-bit microcontroller is ideal for real-time applications such as general-purpose inverters and IoT gateways. RX66N delivers outstanding real-time performance with the RXv3 core operating at 120MHz and has industry's largest and fastest class on-chip memory. Hence, RX66N supports various functions such as HMI, networking, and security required for industrial and consumer equipment on a single chip, contributing to smaller enclosure and shortened development time.

## Features

- 120MHz RXv3 core, Double-precision FPU, Register bank save function accelerating interrupt response
- 4MB flash memory (120MHz read access, Dual bank function), 1MB SRAM
- 182 general-purpose input/output (GPIO) ports
- Ethernet, SD host I/F, USB 2.0 full speed, 3ch CAN, QSPI
- TFT LCD controller supporting WVGA, 2D drawing engine, Serial sound I/F, CMOS camera I/F
- Encryption engine (AES, TDES, RSA, ECC, SHA, TRNG), Key management, Flash memory protection function

## Benefits

- Industry's fastest class on-chip flash memory contributes to higher real-time performance
- Industry's largest class on-chip memory and high pin-count package for smaller enclosures
- Realize equipment control and networking function with a single chip
- HMI functions for improved exterior design and operability
- Security functions protecting data communications and programs

## Applications

- AC servo driver
- General-purpose inverter
- PLC (Programmable Logic Controller)
- Industrial robot
- Motion controller
- Remote I/O
- HVAC controller
- Smart meter
- Smart speaker

### CPU

120MHz RXv3  
Double-precision FPU  
Register Bank Save Function

### Memory

4MB Code Flash Memory  
32KB Data Flash Memory  
1MB SRAM

### Package

100, 144, 176-pin LFQFP  
176, 224-pin LFBGA  
145-pin TFLGA

### Networking & Advanced Connectivity

Ethernet  
SD Host I/F  
USB 2.0 Full Speed  
3ch CAN  
QSPI

### Motor Control

PWM Timers  
2-phase Encoder Pulse Inputs  
12-bit A/D Converters

### HMI

TFT LCD Controller  
2D Drawing Engine  
Serial Sound I/F  
CMOS Camera I/F

### Security

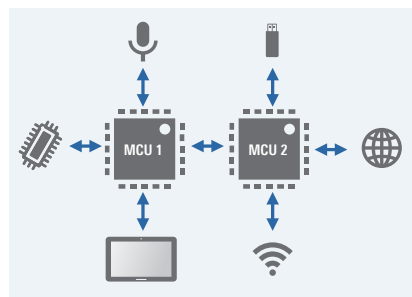
Encryption Engine  
(AES, TDES, RSA, ECC,  
SHA, TRNG)  
Key Management  
Flash Memory Protection

**RX66N**

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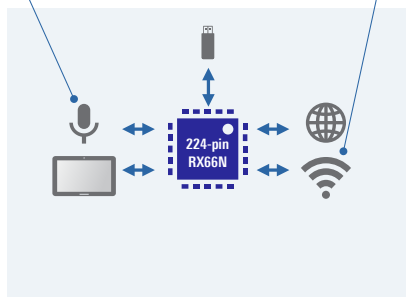
## Usage Example and Benefits

### Board Miniaturization



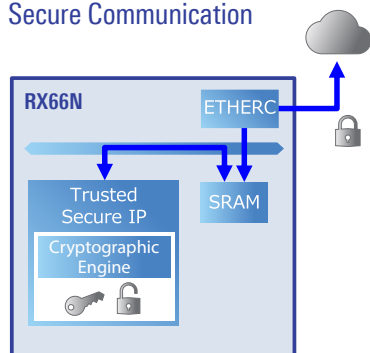
TFT LCD control and voice recognition in parallel

Support both wired/wireless networking



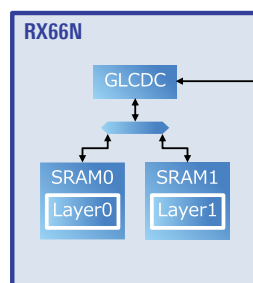
- Enable multiple functions on a single chip with outstanding real-time performance, large on-chip memory, and 182 GPIOs
- Contribute to smaller enclosure and shortened development time by eliminating sub MCUs and external memory

### Secure Communication



- Encrypt data for secure communications
- High-speed encryption/decryption by cryptographic engine

### High-resolution TFT-LCD Control



WVGA  
800x480  
8-bit color

- Control WVGA LCD without external memory
- Smooth drawing by two-layer configuration

\* 16-bit colors WQVGA LCD can also be controllable

## Ordering References

### Flash Memory: 4MB, SRAM: 1MB

\* For 105°C product, please change the third last alphabet from D to G.

| With Trusted Secure IP    | R5F566NNHDFP       | R5F566NNHDFB | R5F566NNHDLK | R5F566NNHDFC | R5F566NNHDBG | R5F566NNHDBD |
|---------------------------|--------------------|--------------|--------------|--------------|--------------|--------------|
| Without Trusted Secure IP | R5F566NNDDFP       | R5F566NNDDFB | R5F566NNDDLK | R5F566NNDDFC | R5F566NNDDBG | R5F566NNDDBD |
| Pin Counts                | 100                | 144          | 145          | 176          | 176          | 224          |
| Package                   | LFQFP              | LFQFP        | TFLGA        | LFQFP        | LFBGA        | LFBGA        |
| Package Size              | 14mm x 14mm        | 20mm x 20mm  | 7mm x 7mm    | 24mm x 24mm  | 13mm x 13mm  | 13mm x 13mm  |
| Pitch                     | 0.5mm              |              |              |              | 0.8mm        |              |
| Operating Temperature     | Ta = -40°C to 85°C |              |              |              |              |              |

### Flash Memory: 2MB, SRAM: 1MB

\* For 105°C product, please change the third last alphabet from D to G.

| With Trusted Secure IP    | R5F566NDHDFP       | R5F566NDHDFB | R5F566NDHDLK | R5F566NDHDFC | R5F566NDHDBG | R5F566NDHDBD |
|---------------------------|--------------------|--------------|--------------|--------------|--------------|--------------|
| Without Trusted Secure IP | R5F566NDDDFP       | R5F566NDDDFB | R5F566NDDDLK | R5F566NDDDFC | R5F566NDDDBG | R5F566NDDDBD |
| Pin Counts                | 100                | 144          | 145          | 176          | 176          | 224          |
| Package                   | LFQFP              | LFQFP        | TFLGA        | LFQFP        | LFBGA        | LFBGA        |
| Package Size              | 14mm x 14mm        | 20mm x 20mm  | 7mm x 7mm    | 24mm x 24mm  | 13mm x 13mm  | 13mm x 13mm  |
| Pitch                     | 0.5mm              |              |              |              | 0.8mm        |              |
| Operating Temperature     | Ta = -40°C to 85°C |              |              |              |              |              |