

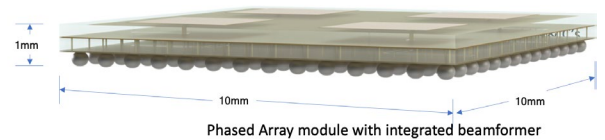
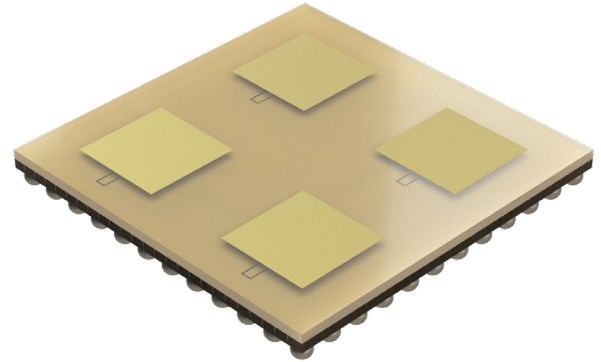


# System-in-Package 28GHz Phased Array Module

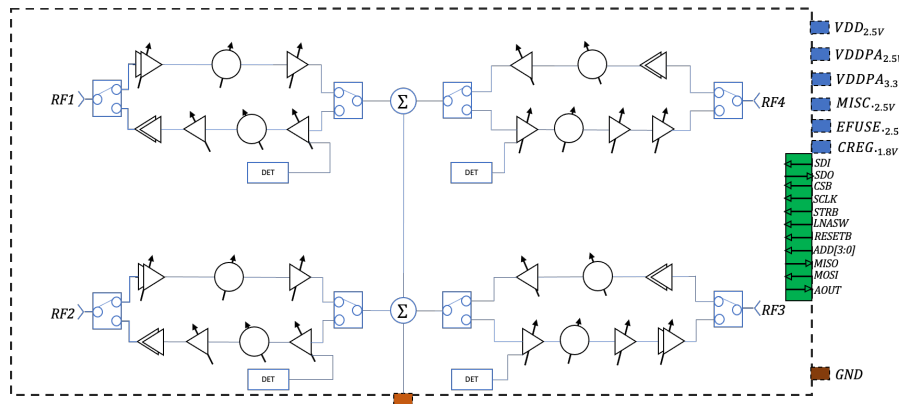
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**OVERVIEW** The Phased Array Module (PAM) is a System-in-Package. The PAM integrates 2 x 2 radiating elements with Renesas F5288 beamforming Half-Duplex transceiver for n257 band applications. The core IC has highly flexible gain and phase control on each channel to achieve fine beam steering and gain compensation between radiating channels. The PAM includes a standard SPI protocol that operates up to 65MHz with fast beam switching and fast beam-state loading.

The PAM is a flip chip BGA package that removes PCB complexity and drives down the phased array system cost.



## FUNCTIONAL BLOCK DIAGRAM



## APPLICATIONS

- 5G Single Polarization Phased-Array Antenna System, Beam Steering, and similar applications

## FEATURES

- 5G NR n257 operation
- 4 radiation channels
- 100ns typical TX/RX mode switching time
- 20ns typical gain and phase settling time
- 1.4° (chip) typical phase error
- 0.2dB typical RMS gain error
- 30.5dB gain attenuation range
- Integrated PTAT, PTAT2, and Bandgap generator
- Internal temperature sensor and power detector
- 4-bit chip address (hard-wired/programmable)
- Up to 65MHz SPI control
- 2048 on-chip programmable beam states
- Analog supply voltage: +2.4V to +2.6V
- Dedicated PA supply voltage: selectable between +2.4V to +2.6V and +3.0V to +3.3V
- 10 x 10 x 0.5 mm, glass package
- -40°C to +95°C operating temperature range

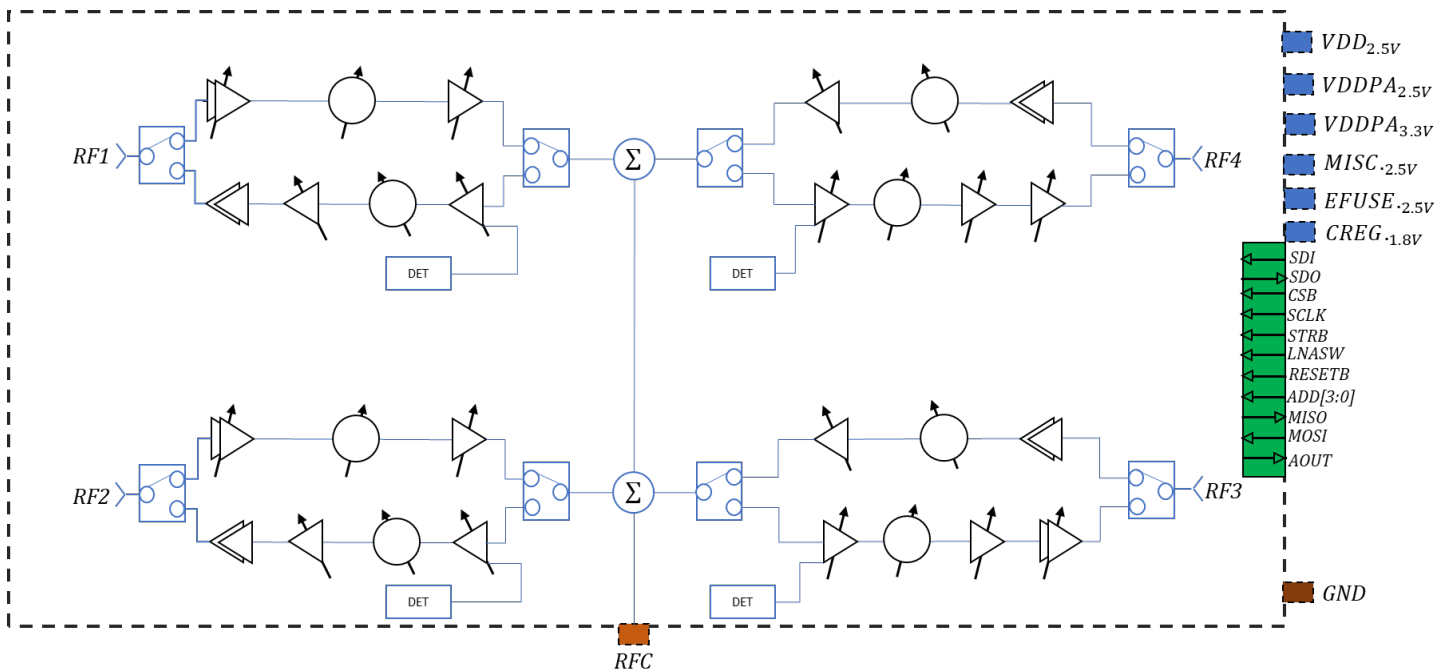


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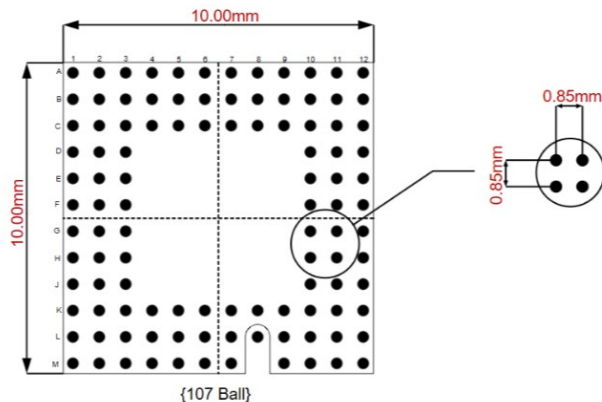
## PRIMARY DIFFERENTIATORS

- High TX linear output power for 5G NR waveforms
- Low RX noise figure across the frequency band
- Low power consumption
- Fast switching, flexible beam state programming and loading with high beam state memory count
- Fast switching

## Functional Block Diagram



## Footprint



## Notes:

For more details on beamforming capabilities, please refer to F5288-Datasheet-v300 rev0.14 from Renesas.