# icana®

# RF Components for Wireless Infrastructure

## **About iCana**

## iCana's Global Support Network

iCana is a fabless semiconductor component supplier specializing in design and manufacturing of RF components for wireless communication. We focus on RF products for 5G sub-6 GHz wireless infrastructure. By managing the endto-end process from IC design through mass production, we are committed to providing exceptional performance, quality and reliability. Headquartered in Taiwan, we have R&D centers in Taiwan and Singapore.





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#### **Partnership**

We understand that partnership and collaboration are key to success in the fast-paced 5G era. For this reason, iCana collaborates with multiple global partners to deliver its differentiated products.

Contact us at sales@icana-rf.com if you would like to explore opportunities for working and creating value together.

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### Wireless Infrastructure

At iCana, we are dedicated to providing cutting-edge RF components needed to create robust and efficient 5G networks. Our components offer wide bandwidth, high efficiency and high linearity, making them ideal for use in a range of applications covering all major 5G frequency bands in the 5G NR FR1 (Sub-6 GHz) frequency range.

used in small cell front-end designs including power

# 5G Sub-6 GHz RF Front-End Solution

iCana's sub-6 GHz product portfolio is comprised of high-efficiency power amplifiers, differential gain amplifiers, and receiver front-end modules.



High-efficiency power amplifiers for maximum power savings



Differential gain amplifiers to interface directly with the transceiver



Receiver front-end modules for low noise amplification of the incoming signal

# **5G Sub-6 GHz Products**

iCana offers a wide range of 5G sub-6 GHz products for wireless infrastructure, including 28, 30, and 33 dBm high-efficiency power amplifiers, differential gain amplifiers, and dualchannel receiver front-end modules.



## **Power Amplifiers** 5G Sub-6 GHz

• Average output powers of 28, 30, and 33 dBm

Targeted for indoor and outdoor small-cells from 24 dBm (0.25 W) to 30 dBm (1 W) at the antenna port

- Extremely rugged Withstands output VSWR mismatch of up to 10:1 for safe continuous operation
- High linearity and efficiency Excellent ACLR of -50 dBc with commercially available DPD platforms
- Pin-to-pin compatibility Pin-to-pin compatibility between 28 dBm and 30 dBm PA families

### **1/2 W High-Efficiency Power Amplifiers**

- 28 dBm (0.6 W) average output power at 8.5 dB PAR
- Ultra rugged: can withstand 10:1 VSWR
- -50 dBc ACLR with DPD (28 dBm, 8.5 dB PAR)
- Excellent PAE with wide IBW
- 5V operation (GaAs)
- 5×5 mm<sup>2</sup> pin-to-pin compatible package for 1/2 W and 1 W PA families
- 50 Ω in/out



# VCC1 GND VCC2 GND 16 15 14 13 5 6 7 8 'BIAS PAEN GND GND



| Part Number | Frequency   | Band                 | Gain (dB) Psat (dBm) |      | PAE (%) | iBW (MHz) |
|-------------|-------------|----------------------|----------------------|------|---------|-----------|
| ARQSP1819-4 | 1.8-1.9 GHz | n3, n39              | 39.5                 | 36   | 30      | 60        |
| ARQSP2122-4 | 2.1-2.2 GHz | n1                   | 38                   | 36.2 | 32      | 60        |
| ARQSP2324-4 | 2.3-2.4 GHz | n30, n40             | 40                   | 35.4 | 31      | 100       |
| ARQSP2527-4 | 2.5-2.7 GHz | n7, n38, n41, n90    | 37.1                 | 35.5 | 35.2    | 100       |
| ARQSP3336-4 | 3.3-3.6 GHz | n77, n78             | 38.1                 | 35.2 | 21.2    | 100       |
| ARQSP3437-4 | 3.4-3.7 GHz | n48 (CBRS), n77, n78 | 37.6                 | 35.4 | 23.9    | 100       |
| ARQSP3742-4 | 3.7-4.2 GHz | n77                  | 37                   | 35.6 | 20.5    | 100       |
| ARQSP4450-4 | 4.4-5.0 GHz | n79                  | 32.7                 | 34.6 | 22.8    | 100       |

#### **1** W High-Efficiency Power Amplifiers

- 30 dBm (1 W) average output power at 9.5 dB PAR
- Ultra rugged: can withstand 10:1 VSWR
- -50 dBc ACLR with DPD (30 dBm, 9.5 dB PAR)
- Wide bandwidth: 400 MHz IBW
- High efficiency: > 25% PAE
- 5V + 12 V operation (GaAs)
- 5×5 mm<sup>2</sup> package pin-to-pin compatible between iCana 1/2 W and 1 W PA families
- 50 Ω in/out

| Part Number  | Frequency    | Band                 | Gain (dB) | Gain (dB) Psat (dBm) |    | iBW (MHz) |  |
|--------------|--------------|----------------------|-----------|----------------------|----|-----------|--|
| ICASP3338-8* | 3.3-3.8 GHz  | n48 (CBRS), n77, n78 | 36        | 39                   | 25 | 400       |  |
| ICASP3542-8* | 3.45-4.2 GHz | n77, n78             | 36        | 39                   | 25 | 400       |  |
| ICASP4450-8* | 4.4-5.0 GHz  | n79                  | 36        | 39                   | 24 | 400       |  |

\*Coming soon

### **2** W High-Efficiency Power Amplifiers

- 33 dBm (2 W) average output power at 9.5 dB PAR
- Ultra rugged: can withstand 10:1 VSWR
- -50 dBc ACLR with DPD (33 dBm, 9.5 dB PAR)
- Wide bandwidth: 400 MHz IBW
- High efficiency: > 40% PAE
- 28 V operation (GaN)
- 6×10 mm<sup>2</sup> package pin-to-pin compatible family
- 50 Ω in/out

| Part Number    | Frequency    | Band                 | Gain (dB) | Psat (dBm) | PAE (%) | iBW (MHz) |  |
|----------------|--------------|----------------------|-----------|------------|---------|-----------|--|
| ICASP3338-20   | 3.3-3.8 GHz  | n48 (CBRS), n77, n78 | 28        | 45         | 30      | 100       |  |
| ICASP3338-20A* | 3.3-3.8 GHz  | n48 (CBRS), n77, n78 | 30        | 43         | 40-45   | 400       |  |
| ICASP3540-20A* | 3.45-4.0 GHz | n77, n78             | 30        | 43         | 40-45   | 400       |  |
| ICASP4450-20A* | 4.4-5.0 GHz  | n79                  | 30        | 43         | 40-45   | 400       |  |

\*Coming soon





# **Gain Amplifiers** 5G Sub-6 GHz

- Differential to single-ended (D2S) and Single-ended to differential (S2D)
- Integrated balun design reduces component count, PCB size, and BOM cost
- Differencial interface compatible with common transceivers
- Small footprint 2x2 mm<sup>2</sup> pin-to-pin compatible family



#### D2S / S2D Gain Amplifiers

- Transmit chain (D2S):  $100 \Omega$  in /  $50 \Omega$  out
- Receive chain (S2D):  $100 \Omega$  in /  $50 \Omega$  out
- Integrated balun reduces BOM complexity and PCB footprint - No external choke inductor needed
- 5 V operation (GaAs)
- 2x2 mm<sup>2</sup> pin-to-pin compatible family





| Part Number   | Configuration | Frequency   | Band                   | Gain<br>(dB) | OP1dB<br>(dBm) | OIP3<br>(dBm) | NF<br>(dB) |
|---------------|---------------|-------------|------------------------|--------------|----------------|---------------|------------|
| ICASD2328-D2S | D2S           | 2.3-2.8 GHz | n7, n30, n38, n40, n41 | 18.3         | 19             | 32.4          | 2.6        |
| ICASD3338-D2S | D2S           | 3.3-3.8 GHz | n48 (CBRS), n77, n78   | 17.5         | 18             | 34            | 2.7        |
| ICASD4450-D2S | D2S           | 4.4-5.0 GHz | n79                    | 16.5         | 17             | 33            | 3.6        |
| ICASD2328-S2D | S2D           | 2.3-2.8 GHz | n7, n30, n38, n40, n41 | 19           | 17.5           | 33            | 1.6        |
| ICASD3338-S2D | S2D           | 3.3-3.8 GHz | n48 (CBRS), n77, n78   | 18.8         | 17             | 33            | 1.8        |
| ICASD4450-S2D | S2D           | 4.4-5.0 GHz | n79                    | 18           | 15.8           | 27            | 2.0        |

# **Receiver Front-End Module** 5G Sub-6 GHz

- Dual channel FEMs Intergrated bypass switch for optimized gain Dual channel for reduced board size and BOM cost
- High channel isolation 40 dB channel isolation in a small footprint
- High power handling 41 dBm average input power handling for small cells and mMIMO
- Fully matched 50 Ω input and output Pin-to-pin compatible product families

### **Dual Channel Receiver Front-End Modules**

- Includes a silicon SPDT switch and a two-stage GaAs LNA with bypass
- High Gain (HG) and Low Gain (LG) modes
- 5 V operation with 1.8/3.3 V control
- 6×6 mm<sup>2</sup> package
- Pin-to-pin compatible families
- 50 Ω in/out

| Part Number    | Configuration | Frequency   | Band                      | Gain (dB) |      | OIP3 (dBm) |      | NF (dB) |     |
|----------------|---------------|-------------|---------------------------|-----------|------|------------|------|---------|-----|
|                |               |             |                           | HG        | LG   | HG         | LG   | HG      | LG  |
| ARQSF2442-RX-A | Dual          | 2.4-4.2 GHz | n41, n48 (CBRS), n77, n78 | 37        | 16.5 | 34         | 25   | 1.4     | 1.3 |
| ARQSF3753-RX-A | Dual          | 3.7-5.3 GHz | n77, n79                  | 37        | 16   | 29.5       | 28.5 | 1.6     | 1.6 |







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