

icana®

RF Components for
**Wireless
Infrastructure**

About iCana

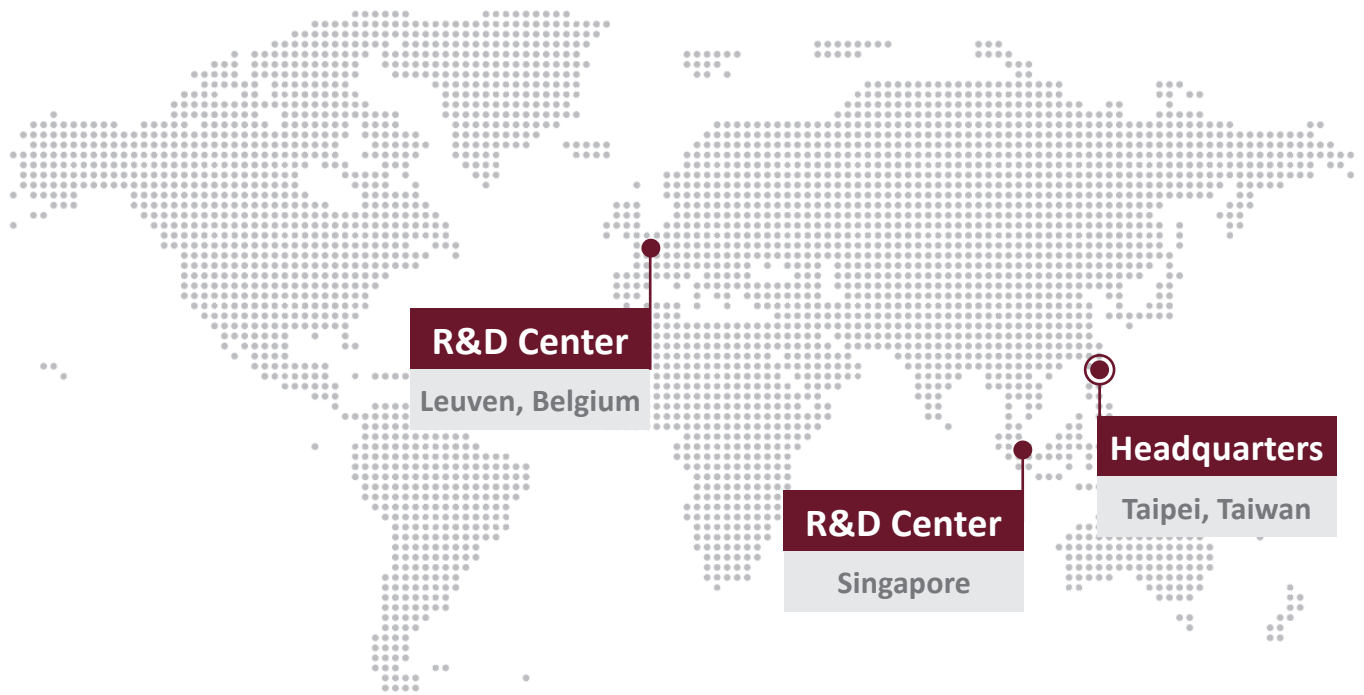
iCana is a fabless semiconductor component supplier specializing in design and manufacturing of RF components for wireless communication. We focus on RF products for 5G sub-6 GHz and mmWave wireless infrastructure. By managing the end-to-end process from IC design through mass production, we are committed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

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

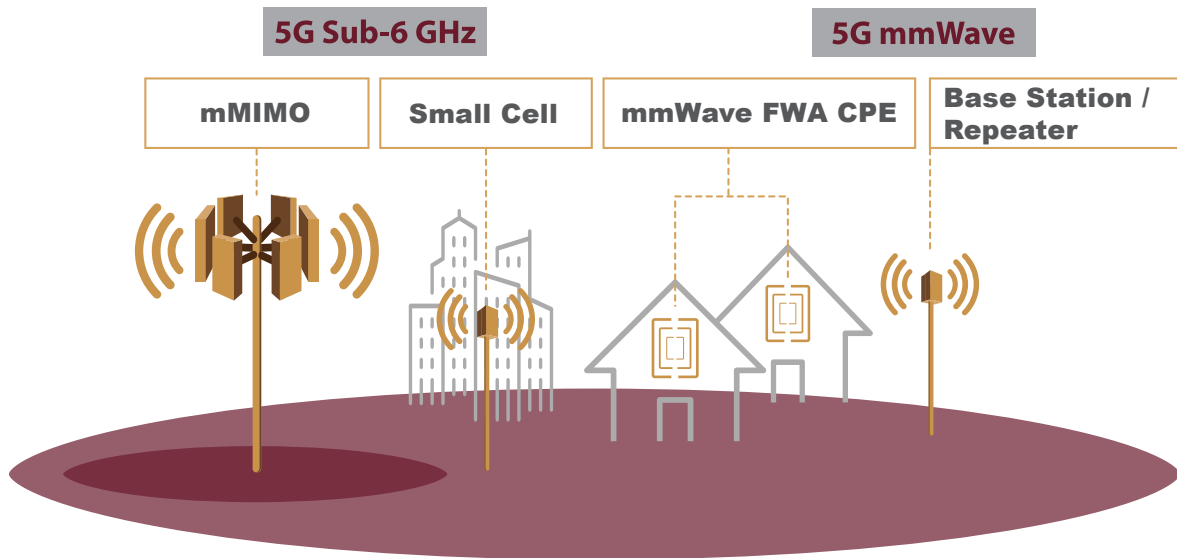
At iCana, we are dedicated to providing cutting-edge RF components needed to create robust and efficient 5G networks. Our components offer wide bandwidth, high power efficiency and high linearity, making them ideal for use in a range of applications covering all major 5G frequency bands in the 5G NR FR1 (Sub-6 GHz) and FR2 (mmWave) frequency ranges.

5G Sub-6 GHz

Our products include all the active RF components used in small cell front-end designs including power amplifiers, differential gain amplifiers, switches, and receiver front-end modules. Reference designs that include our full sub-6 GHz RF front-end that pair with key transceiver and baseband partners designs are available.

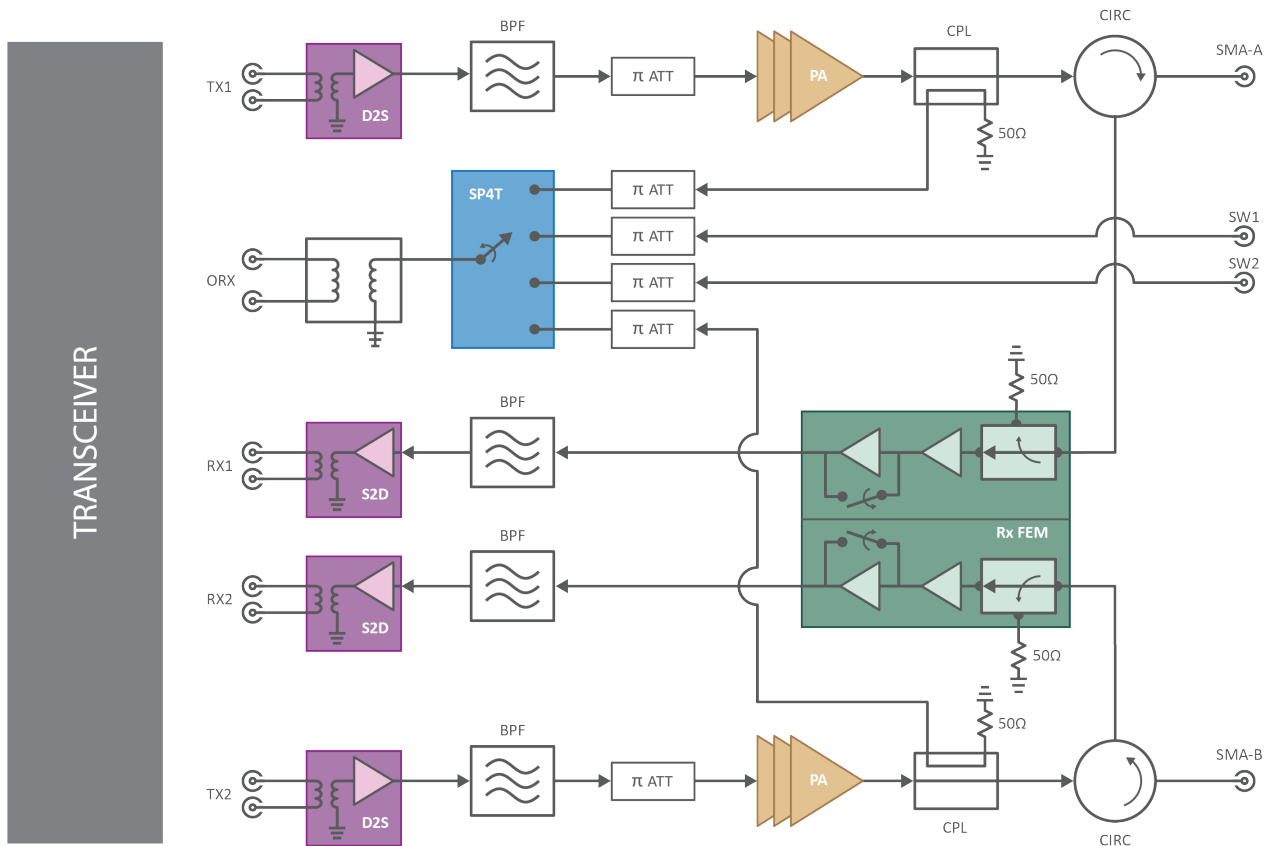
5G mmWave

Our 5G mmWave beamforming and up/down converter ICs are highly integrated and cost-effective. They are designed to meet the demands of complex wireless infrastructure systems.



5G Sub-6 GHz RF Front-End Solution








iCana's sub-6 GHz products portfolio is comprised of high-efficiency power amplifiers, differential gain amplifiers, switches, 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
- SP4T switch for the DPD feedback path

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, single and dual-channel receiver front-end module and switches.

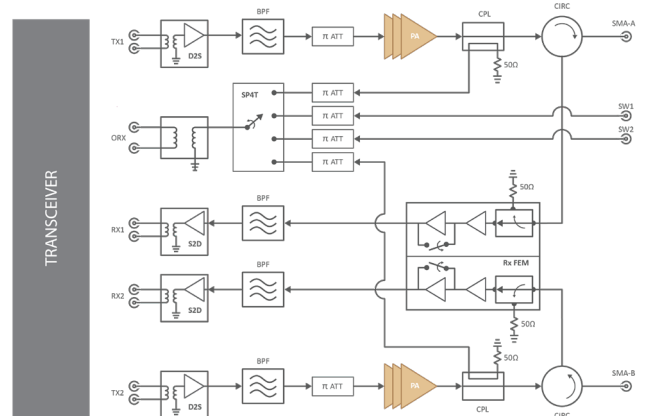
	*Average Power	n3	n1	n40	n7/n41
	2 W Power Amplifier				
	1 W Power Amplifier				
	1/2 W Power Amplifier	ARQSP1819-4	ARQSP2122-4	ARQSP2324-4	ARQSP2527-4
	Gain Amplifier	ICASD1721-D2S		ICASD2328-D2S	
		ICASD1721-S2D		ICASD2328-S2D	
	Single Channel Rx FEM				
	Dual Channel Rx FEM	ARQSF1828-RX-A			
	SP4T Switch	ICASS1050-4T			

n77		n78		n79		
ICASP3338-20A		ICASP3542-20A		ICASP4450-20A		2 W Power Amplifier
ICASP3338-8		ICASP3542-8		ICASP4450-8		1 W Power Amplifier
ARQSP3336-4		ARQSP3437-4		ARQSP3740-4		1/2 W Power Amplifier
ICASD3338-D2S		ICASD3338-S2D		ICASD4450-D2S		Gain Amplifier
				ICASD4450-S2D		
ARQSF2442-RX-B		ARQSF3753-RX-B				Single Channel Rx FEM
ARQSF2442-RX-A		ARQSF3753-RX-A				Dual Channel Rx FEM
ICASS1050-4T						SP4T Switch

Power Amplifiers

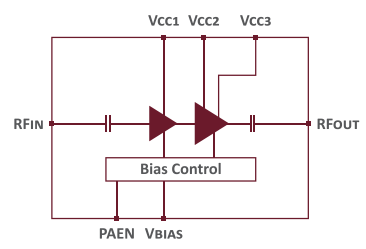
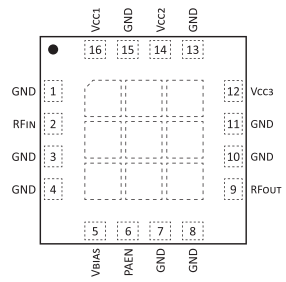
5G Sub-6 GHz

- **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

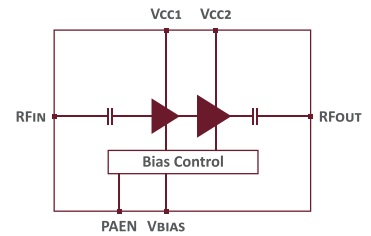
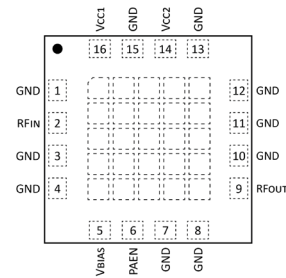
- 28 dBm (0.6 W) average output power at 8.5 dB PAR
- Ultra rugged: can withstand 10:1 VSWR
- -50 dBc ACLR with DPD (28 dBm, 8.5 dB PAR)
- Excellent PAE with wide IBW
- 5V operation (GaAs)
- 5x5 mm² pin-to-pin compatible package for 1/2 W and 1 W PA families
- 50 Ω in/out



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	36.5	36	30	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
ARQSP3740-4	3.7-4.0 GHz	n77	37	35.5	20	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 mm² package pin-to-pin compatible between iCana 1/2 W and 1 W PA families
- 50 Ω in/out

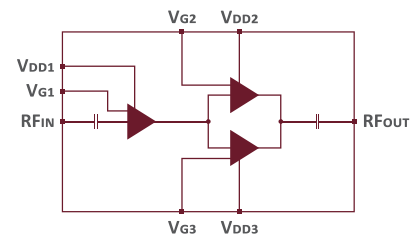


Part Number	Frequency	Band	Gain (dB)	Psat (dBm)	PAE (%)	iBW (MHz)
ICASP3338-8*	3.3-3.8 GHz	n48 (CBRS), n77, n78	36	39	25	400
ICASP3542-8*	3.45-4.2 GHz	n77, n78	36	39	25	400
ICASP4450-8*	4.4-5.0 GHz	n79	36	39	24	400

*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 mm² package pin-to-pin compatible family
- 50 Ω in/out



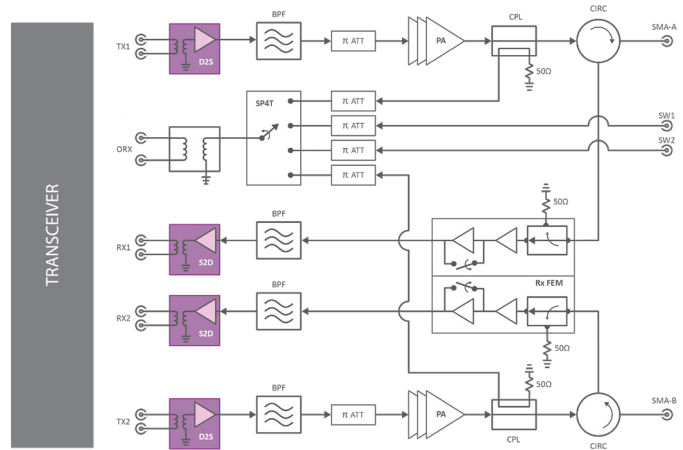
Part Number	Frequency	Band	Gain (dB)	Psat (dBm)	PAE (%)	iBW (MHz)
ICASP3338-20	3.3-3.8 GHz	n48 (CBRS), n77, n78	28	45	30	100
ICASP3338-20A*	3.3-3.8 GHz	n48 (CBRS), n77, n78	30	43	40-45	400
ICASP3542-20A*	3.45-4.2 GHz	n77, n78	30	43	40-45	400
ICASP4450-20A*	4.4-5.0 GHz	n79	30	43	40-45	400

*Coming soon

Gain Amplifiers

5G Sub-6 GHz

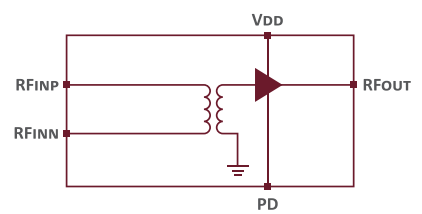
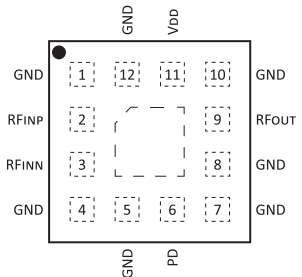
- **Differential to single-ended (D2S) and Single-ended to differential (S2D)**
 - Integrated balun design reduces component count, PCB size, and BOM cost
 - Differential interface compatible with common transceivers
- **Small footprint**
2x2 mm² pin-to-pin compatible family



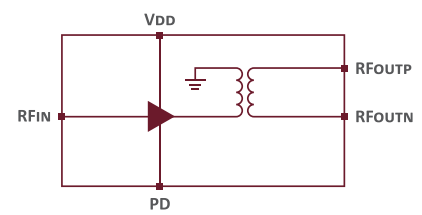
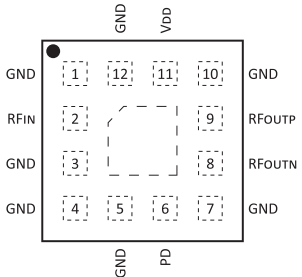
D2S / S2D Gain Amplifiers

- Transmit chain (D2S): 100 Ω in / 50 Ω out
- Receive chain (S2D): 100 Ω in / 50 Ω out
- Integrated balun reduces BOM complexity and PCB footprint
 - No external choke inductor needed
- 5 V operation (GaAs)
- 2x2 mm² pin-to-pin compatible family

D2S



S2D

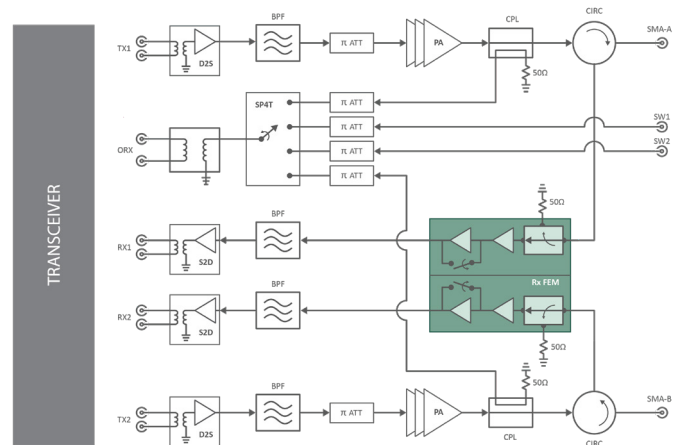


Part Number	Configuration	Frequency	Band	Gain (dB)	OP1dB (dBm)	OIP3 (dBm)	NF (dB)
ICASD1721-D2S	D2S	1.7-2.1 GHz	n1, n2, n3, n25, n39	18.5	19	30	2.4
ICASD2328-D2S	D2S	2.3-2.8 GHz	n7, n30, n38, n40, n41	18.3	19	32.4	2.6
ICASD3338-D2S	D2S	3.3-3.8 GHz	n48 (CBRS), n77, n78	17.5	18	34	2.7
ICASD4450-D2S	D2S	4.4-5.0 GHz	n79	16.5	17	33	3.6
ICASD1721-S2D	S2D	1.7-2.1 GHz	n1, n2, n3, n25, n39	19	17.5	30	1.5
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

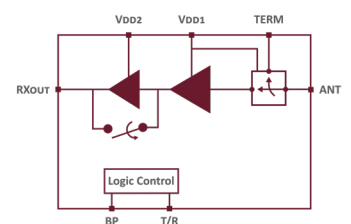
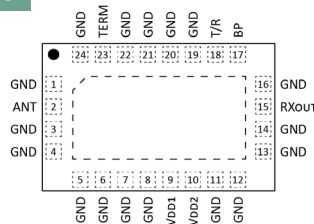
- Single and dual channel FEMs**
 Intergrated bypass switch for optimized gain
 Single channel for optimized isolation and simplified routing
 Dual channel for reduced board size and BOM cost
- High channel isolation in dual design**
 40 dB channel isolation in a small footprint
- High power handling**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



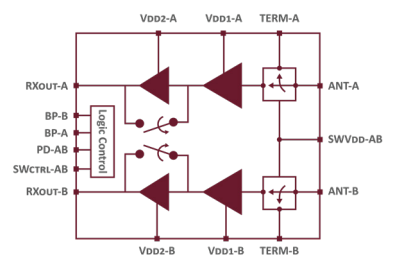
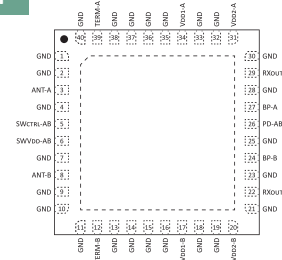
Single and Dual Channel Receiver Front-End Modules

- 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
- Single: 5x3 mm² package
- Dual: 6x6 mm² package
- Pin-to-pin compatible families
- 50 Ω in/out

Single



Dual

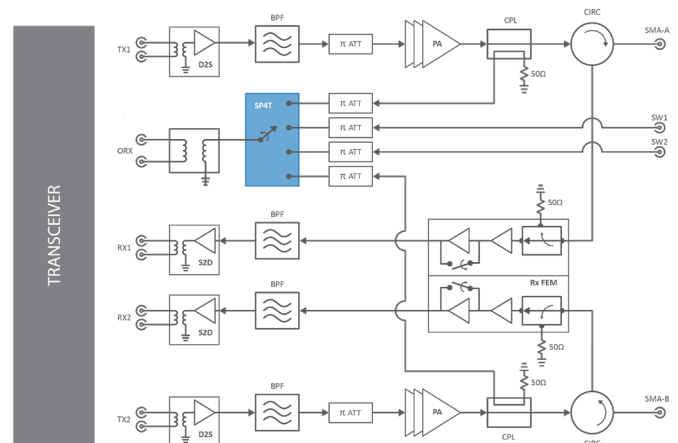


Part Number	Configuration	Frequency	Band	Gain (dB)		OIP3 (dBm)		NF (dB)	
				HG	LG	HG	LG	HG	LG
ARQSF2442-RX-B	Single	2.4-4.2 GHz	n41, n48 (CBRS), n77, n78	36.1	15.6	29.4	22.5	1.6	1.5
ARQSF3753-RX-B	Single	3.7-5.3 GHz	n77, n79	36.4	15.1	28.7	23	1.6	1.6
ARQSF1828-RX-A	Dual	1.8-2.8 GHz	n1, n2, n3, n7, n41	38	18	33	27	1.5	1.4
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

Switch

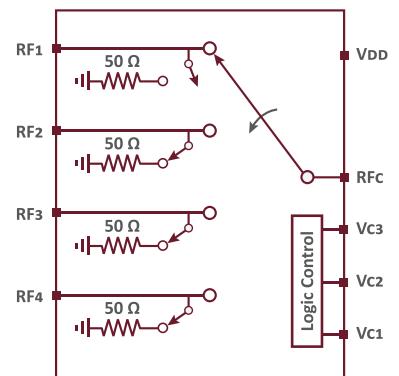
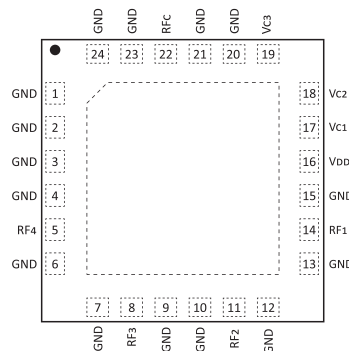
5G Sub-6 GHz

- **Major 3GPP band coverage**
Covers all Sub-6 GHz bands from 1 to 5 GHz
- **High performance**
 - Low insertion loss, excellent isolation, and fast switching
 - Handles signal power levels up to 33 dBm
- **Supports up to 4T4R**
SP4T is ideal for transceiver Observation Receiver (ORx) operation for DPD linearization
- **Fully matched 50 Ω input and output**



SP4T Switch

- Absorptive SP4T switch for DPD transceiver Observation Receiver (ORx) path
- High performance
 - Low insertion loss of 0.7 dB
 - Excellent isolation of 40 dB
 - Low DC current of 140 μA
- Fast switching time
- 4x4 mm² package
- 50 Ω in/out

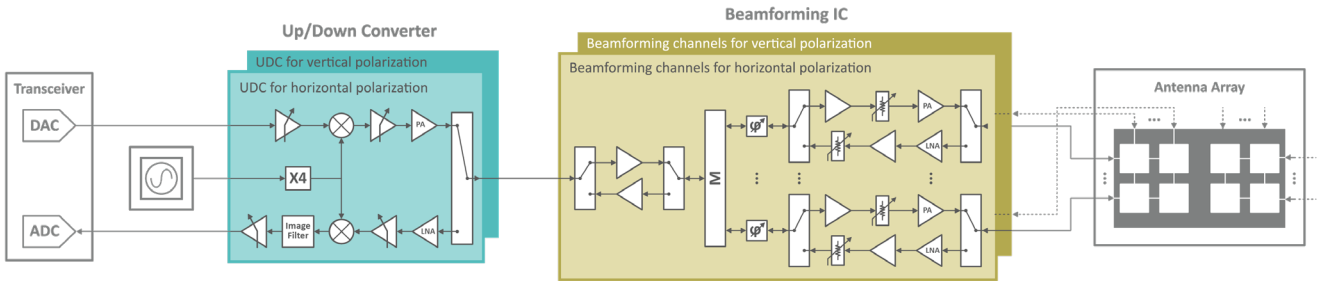


Part Number	Frequency	Insertion Loss (dB)	Return Loss (dB)	Isolation (dB)
ICASS1050-4T	1-5 GHz	0.7	20	40



5G mmWave RF Front-End Solution

iCana's portfolio of mmWave products includes beamforming ICs and up/down converters.



Dual-Channel Up/Down Converter
 Supports horizontal and vertical polarization
 Drives up to 16 BFICs without external amplification

8 Channel Beamforming IC
 4 paths x 2 polarities
 To steer the antenna array in both horizontal and vertical polarization

5G mmWave Products

iCana's 5G mmWave product lineup includes beamforming ICs and up/down converters that cover all key 5G mmWave frequency bands.

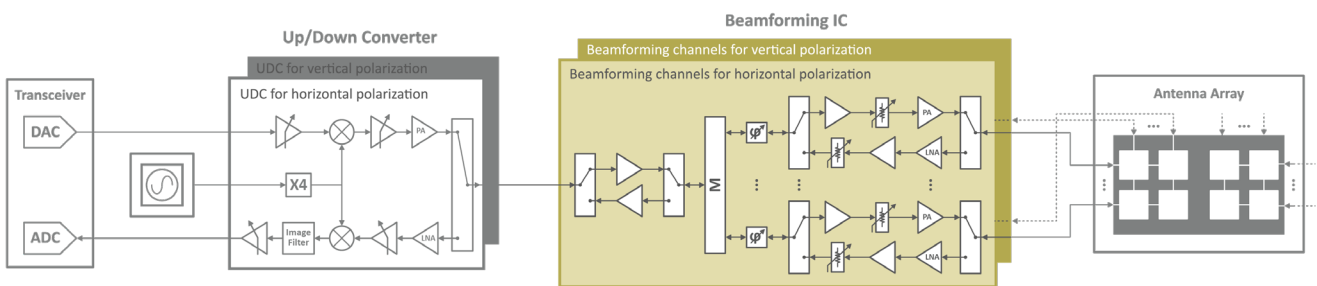


	24.25 to 29.5 GHz		37 to 43.5 GHz	
	n258	n257 & n261	n260	n259
Beamforming IC		ICAMB2629-A	ICAMB3743-A	
	ICAMB2430-A			
Up/Down Converter	ICAMU2430-A		ICAMU3743-A	

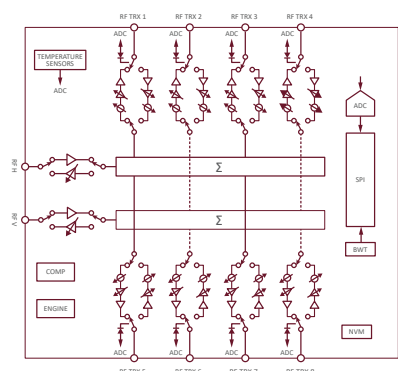
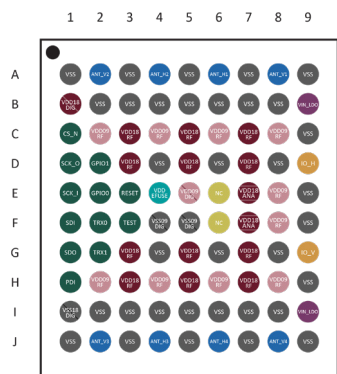
Beamforming IC

5G mmWave

iCana's beamforming ICs are highly-integrated and cost-effective. These ICs offer industry-leading performance across 8 channels with independent control for each channel in both transmit and receive paths. The IC includes high tunability and reconfigurability, allowing for optimal configuration of the antenna phased array. On-chip calibration circuitry enables consistent performance across various operating conditions, using built-in digital control circuitry, large on-chip memory, and sensor interface that monitors temperature, RF power, and power consumption.



- 8 single-polarization or 4 dual-polarization configurations
- Designed in CMOS for cost effectiveness
- Best-in-class phase and gain accuracy
 - 6-bit phase resolution (5.6° phase step)
 - Common gain range of 20 dB with 1 dB step
 - Channel gain range of 7 dB with 0.5 dB step
- Simple 2-point phase and gain calibration
- Large 2048 memory for shared Tx and Rx fast beam switching
- Automatic temperature compensation
- Low Noise Figure < 4.2 dB
- Low Rx power consumption: 70mW per channel



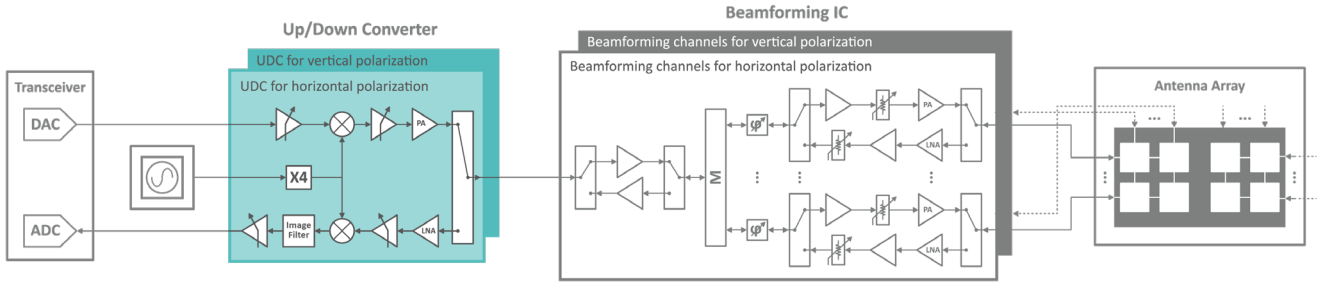
Part Number	Frequency	Band	Gain (dB)	Pavg (dBm)	OP1dB (dBm)
ICAMB2429-A	26.5-29.5 GHz	n257, n261	27	10	15.5
ICAMB2430-A	24.25-29.5 GHz	n257, n258, n261	27	13	20
ICAMB3743-A*	37.0-43.5 GHz	n259, n260	27	12	19

* Coming soon

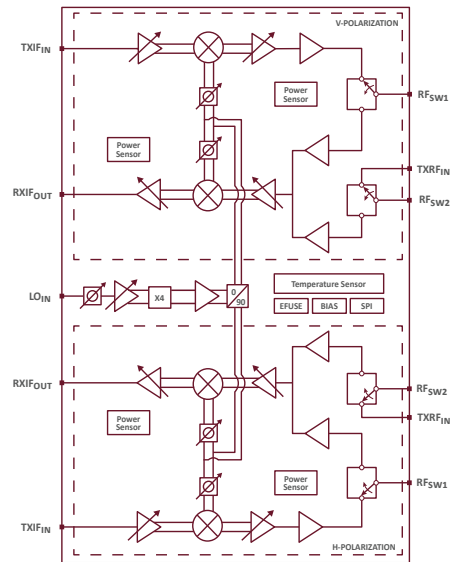
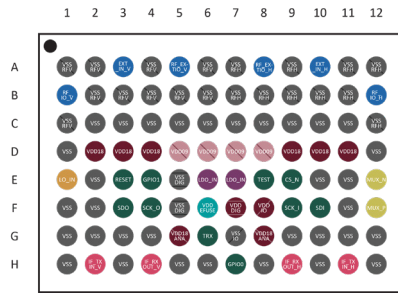
Up/Down Converter

5G mmWave

iCana's up/down converters are highly-integrated frequency-conversion ICs that enable a low-cost, high-performance 5G phased-array when combined with iCana beamforming ICs.



- Designed in CMOS for cost effectiveness
- Dual channel supports both vertical and horizontal polarizations
 - RF frequency range: 24-30 GHz
 - IF frequency range: 3-7 GHz
- High image rejection of -45 dBc to reduce signal interference
- High sideband rejection of -45 dBc
- Can drive up to 16 BFICs with no additional BOM
 - External PA path to increase the number of BFICs that can be driven
- High up/down conversion gain of 30 dB
- I/Q imbalance optimization



Part Number	Frequency	Band	Gain (dB)	Pavg (dBm)	NF (dB)
ICAMU2430-A	24-30 GHz	n257, n258, n261	30	7	12
ICAMU3743-A*	37.0-43.5 GHz	n259, n260	30	7	12

* Coming soon



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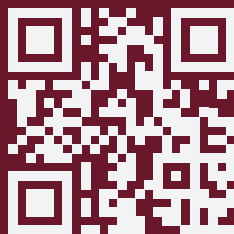
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