

Front-end Module (FEM)

RichWave offers a broad line of front-end modules (FEMs) for WiFi connectivity solutions covering the spectrum from AP routers and consumer PCs/laptops to mobile/portable phones.

RichWave FEM products enable customers to achieve cost-effective, small form-factor solutions by:

- leveraging multi-process technologies, including GaAs/SiGe/SOI CMOS, to optimize EVM performance as well as providing the best and most cost-effective solution
- offering advanced MCM (multi-chip-module) packaging and IPD (integrated passive device) process to achieve an on-chip harmonic filter as well as a substrate-free assembly
- providing a wide variety of RX FEM (LNA/SW) and full FEM (PA/LNA/SW) solutions to meet WiFi 802.11a,b,g,n,ac,ax,be requirements in medium power (+21dBm and lower) and high power (over +21dBm) applications

WiFi 7 FEM - 6GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
	II	II	II	II	II	II	II	II	II
RTC77601	PA	LNA	SW	LPF	5925-7125	17 18	5	16L QFN 3.0x3.0x0.90	PDF
RTC77601E	PA	LNA	SW	LPF	5925-7125	17.5 19	5	16L QFN 3.0x3.0x0.90	PDF
RTC66923	PA	LNA	SW	LPF	5925-7150	14.5/16.5 16/18	3.85	16L QFN 2.0x2.0x0.55	PDF
RTC66927	PA	LNA	SW	LPF	5925-7125	17/19 16/18	5 4.2	24L QFN 3.0x5.0x0.9	PDF

WiFi 7 FEM - 5GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
	II	II	II	II	II	II	II	II	II
RTC66572	PA	LNA	SW	LPF	5150-5925	17/20 15/17	5 4.2	24L QFN 3.0x5.0x0.90	PDF
RTC77501E	PA	LNA	SW	LPF	5150-5925	18.5 19.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC77501	PA	LNA	SW	LPF	5150-5925	17/18 16/17.5 15/16	5 4.2 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC77502	PA	LNA	SW	LPF	5150-5925	19.5 20.5	5	16L QFN 3.0x3.0x0.90	PDF

WiFi 7 FEM - 2.4GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
	II	II	II	II	II	II	II	II	II
RTC77201	PA	LNA	SW	LPF	2400-2500	19/20 17/17.5 16/16.5	5 4.2 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC77201E	PA	LNA	SPDT	LPF	2400-2500	20 21	5	16L QFN 3.0x3.0x0.90	PDF
RTC66272	PA	LNA	SPDT-SP3T	LPF	2400-2500	16 17.5	3.85	18L QFN 2.4x2.0x0.66	PDF
RTC66273	PA	LNA	SPDT-SP3T	LPF	2400-2500	16 17	3.8	16L QFN 2.0x2.0x0.29	PDF
RTC66274	PA	LNA	SPDT	LPF	2400-2500	18.5/20.5 18.5/19	5 4.2	24L QFN 3.0x5.0x0.90	PDF

WiFi 7 Nonlinear PA FEM - 6GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
	II	II	II	II	II	II	II	II	II
RTC66905E	PA	LNA	SPDT	LPF	5150-7125	18.5/21 17/19	5 3.85	16L QFN 2.0x2.0x0.65	PDF
RTC66941	PA	LNA	SPDT	LPF	5925-7125	20 21	5	24L QFN 3.0x5.0x0.90	PDF
RTC66937	PA	LNA	SPDT	LPF	5925-7125	19 21	5	16L QFN 3.0x3.0x0.90	PDF
RTC66937L	PA	LNA	SPDT	LPF	5925-6425	18.5 20	5	16L QFN 3.0x3.0x0.90	PDF

WiFi 7 Nonlinear PA FEM - 5GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
	II	II	II	II	II	II	II	II	II
RTC66583	PA	LNA	SPDT	LPF	5150-5925	18.5/19 19/20	4.2 5	16L QFN 3.0x3.0x0.90	PDF
RTC66583P	PA	LNA	SPDT	LPF	5150-5925	20 21	5	16L QFN 3.0x3.0x0.90	PDF
RTC66583E	PA	LNA	SPDT	LPF	5150-5925	19 20	5	16L QFN 3.0x3.0x0.90	PDF
RTC66591	PA	LNA	SPDT	LPF	5150-5925	19.5 20.5	5	24L QFN 3.0x5.0x0.90	PDF

WiFi 7 Nonlinear PA FEM - 2.4GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
	II	II	II	II	II	II	II	II	II
RTC66254	PA	LNA	SPDT	LPF	2400-2500	22 22.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC66284E	PA	LNA	SPDT	LPF	2400-2500	23 23.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC66291	PA	LNA	SPDT	LPF	2400-2500	20 20.5	4.2	24L QFN 3.0x5.0x0.90	PDF

WiFi 6E FEM - 6GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (mm, typ) II	PDF
	II	II	II	II	II	II	II	II	II
RTC66903	PA	LNA	SPDT	LPF	5925-7125	19 20.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC66904	PA	LNA	SPDT	LPF	5925-7125	21	5	24L QFN 3.0x5.0x0.90	PDF
RTC66905	PA	LNA	SPDT	LPF	5150-7125	18 19	5	16L QFN 3.0x3.0x0.90	PDF
RTC66914	PA	LNA	SPDT	LPF	5925-7125	19.5 21.5	5	24L QFN 3.0x5.0x0.90	PDF
RTC66915	PA	LNA	SPDT	LPF	5925-7125	17 18	3.3	16L QFN 3.0x3.0x0.90	PDF
RTC66916	PA	LNA	SPDT	LPF	5150-7125	16 18	3.8	16L QFN 2.0x2.0x0.60	PDF
RTC66918	PA	LNA	SPDT	LPF	5150-7125	15 17.5	3.85	16L QFN 2.0x2.0x0.67	PDF
RTC66930	PA	LNA	SPDT	LPF	5150-7125	16.5 18	3.8	16L QFN 2.0x2.0x0.65	PDF

WiFi 6 FEM - 5GHz

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
	II	II	II	II	II	II	II	II	II
RTC7658	PA	LNA	SPDT	LPF	5150-5850	16.5/18 17/18	3.45 3.6	10L QFN 2.0x1.7x0.305	PDF
RTC7676D-1	PA	LNA	SPDT	LPF	5150-5925	20 21.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC7678K	PA	LNA	SPDT	LPF	5150-5850	20.5 22	5	24L QFN 3.0x5.0x0.90	PDF
RTC7679O	PA	LNA	SPDT	LPF	5150-5850	20.5 23	5	24L QFN 3.0x5.0x0.90	PDF
RTC66504HE	PA	LNA	SPDT	LPF	5150-5925	21 23	5	24L QFN 3.0x5.0x0.90	PDF
RTC66506	PA	LNA	SPDT	LPF	5150-5925	20/22 17/18.5	5 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC66532	PA	LNA	SPDT	LPF	5150-5925	18.5 20.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC66537E	PA	LNA	SPDT	LPF	5150-5925	16/17 17/18.5	3.3 3.85	16L QFN 2.0x2.0x0.67	PDF
RTC66539KA	PA	LNA	SPDT	LPF	5150-5925	18/19.5 17.5/18.5	3.6 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC66544	PA	LNA	SPDT	LPF	5150-5850	20.5 22	5	16L QFN 3.0x3.0x0.90	PDF
RTC66546	PA	LNA	SPDT	LPF	5150-5850	21.5 23	5	16L QFN 3.0x3.0x0.90	PDF

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (typ. mm) II	PDF
RTC68547	PA	LNA	SPDT	LPF	5150-5850	20.5 22.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC68547HS	PA	LNA	SPDT	LPF	5150-5850	21 23	5	16L QFN 3.0x3.0x0.90	PDF
RTC68544K	PA	LNA	SPDT	LPF	5150-5925	20/22 16.5/18	5 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC68568HE	PA	LNA	SPDT	LPF	5150-5925	20/21.5 17/18	5 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC68588	PA	LNA	SPDT	LPF	5150-5850	21.5 23	5	16L QFN 3.0x3.0x0.90	PDF

WiFi 6 Nonlinear - PA FEM

Part No.	PA II	LNA II	SW II	LPF II	Freq (MHz) II	Pout (dBm) II	Vcc (V) II	Package (mm, typ) II	PDF
RTC68533	PA	LNA	SPDT	LPF	5950-5925	21.5 22.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC68231	PA	LNA	SPDT	LPF	2400-2500	20 21	5	16L QFN 3.0x3.0x0.90	PDF

WiFi 6 Dual FEM- 5GHz

Part No.	PA II	LNA II	SW II	LPF II	Pout(dBm) II	Vcc (V) II	Package (mm, typ) II	PDF
RTC68532	PAx2	LNAx2	SPDT	LPF	16.5 19	3.85	34L QFN 4.0x3.0x0.70	PDF

WiFi 5 FEM- 5GHz

Part No.	PA II	LNA II	SW II	LPF II	Pout (dBm) II	Vcc (V) II	Package (mm, typ) II	PDF
RTC5638HE	PA	LNA	SPDT	LPF	21 18.5	5 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC5639E	PA	LNA	SPDT	LPF	21 18.5	5 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC7635	PA	LNA	SPDT	LPF	21	5	12L QFN 2.0x2.0x0.75	PDF
RTC7637S	PA	LNA	SPDT	LPF	18 18.5 19.5	3.3 3.7 4.2	16L QFN 2.3x2.3x0.96	PDF
RTC7639	PA	LNA	SPDT	LPF	18.5	3.7	10L QFN 2.0x1.7x0.55	PDF

WiFi 4/5/6 RX-FEM- 5GHz

Part No.	PA II	LNA II	SW II	LPF II	Vcc (V) II	Package (mm, typ) II	PDF
RTC7630	--	LNA	SPDT	--	3.3	16L QFN 2.3x2.3x0.55	PDF
RTC7650	--	LNA	SPDT	--	3.3	8L QFN 1.5x1.5x0.45	PDF
RTC7670	--	LNA	SPDT	--	3.3	6L QFN 1.2x1.4x0.31	PDF

WiFi 6 FEM- 2.4GHz

Part No.	PA II	LNA II	SW II	LPF II	Pout (dBm) II	Vcc (V) II	Package (mm, typ) II	PDF
RTC7628	PA	LNA	SP3T	LPF	16 18.5	3.45	16L QFN 2.0x2.0x0.29	PDF
RTC7644	PA	LNA	SPDT	LPF	20/23.5 18.5/20	5 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC7649HJ	PA	LNA	SPDT	LPF	21 23.5	5	16L QFN 3.0x3.0x0.90	PDF
RTC7647CH	PA	LNA	SPDT	LPF	23 25.5	5	24L QFN 3.0x5.0x0.90	PDF
RTC7689	PA	LNA	SPDT	LPF	17.5/20 20/22	3.3 4.2	16L QFN 2.5x2.5x0.75	PDF
RTC68204HE	PA	LNA	SPDT	LPF	22 24	5	24L QFN 3.0x5.0x0.90	PDF
RTC68218	PA	LNA	SPDT	LPF	18 20	3.3	16L QFN 3.0x3.0x0.90	PDF
RTC68226	PA	LNA	SPDT	LPF	18.5 20.5	5 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC68230	PA	LNA	SPDT	LPF	21 23	5	16L QFN 3.0x3.0x0.90	PDF
RTC68232	PA	LNA	SPDT	LPF	21.5 23.5	5	16L QFN 2.5x2.5x0.75	PDF
RTC68237	PA	LNA	SPDT+SP3T	LPF	19.5 21	3.8	16L QFN 2.0x2.0x0.31	PDF
RTC68238	PA	LNA	SPDT+SP3T	LPF	18 20.5	3.8	16L QFN 2.0x2.0x0.65	PDF
RTC68268	PA	LNA	SPDT+SP3T	LPF	18.5 22	3.85	16L QFN 2.4x2.0x0.65	PDF

WiFi 6 Dual FEM- 2.4GHz

Part No.	PA II	LNA II	SW II	LPF II	Pout(dBm) II	Vcc (V) II	Package (mm, typ) II	PDF
RTC68222	PAx2	LNAx2	SPDT SP3T	LPF	18.0 19.5	3.85	34L QFN 4.0x3.0x0.67	PDF

WiFi 4/5 FEM- 2.4GHz

Part No.	PA II	LNA II	SW II	LPF II	Pout (dBm) II	Vcc (V) II	Package (mm, typ) II	PDF
RTC7625H	PA	LNA	SP3T	LPF	21 19	5 3.3	16L QFN 3.0X3.0X0.90	PDF
RTC7629HE	PA	LNA	SPDT	LPF	21.5/ 22.5 17.5/ 18.5	5 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC7629HE-1	PA	LNA	SPDT	LPF	21 21 19	5 4.2 3.3	16L QFN 3.0x3.0x0.90	PDF
RTC7626H	PA	LNA	SP3T	LPF	21 18.5	5 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC7626H-1	PA	LNA	SP3T	LPF	21 18.5	5 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC7626HE	PA	LNA	SP3T	LPF	22.9/ 23.5 18/ 19	5 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC7626HS	PA	LNA	SP3T	LPF	21 18.5	5 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC7626HS-1	PA	LNA	SP3T	LPF	21 18.5	5 3.3	16L QFN 2.5x2.5x0.75	PDF
RTC7662	PA	LNA	SPDT	LPF	23 24	5	24L QFN 3.0x5.0x0.9	PDF
RTC7655A	PA	LNA	SPDT	LPF	18	3.3	16L QFN 2.5x2.5x0.75	PDF
RTC7665B	PA	LNA	SPDT	LPF	22.5	5	16L QFN 2.5x2.5x0.75	PDF
RTC7667	PA	LNA	SP3T	LPF	19.5	3.7	16L QFN 2.3x2.3x0.96	PDF
RTC7682	PA	LNA	SP3T	LPF	21	3.7	16L QFN 2.0x2.0x0.55	PDF
RTC68202	PA	LNA	SP3T	LPF	20	3.3	16L QFN 2.3x2.3x0.55	PDF
RTC68236	PA	LNA	SPDT	LPF	19 22	5	16L QFN 2.5x2.5x0.75	PDF

WiFi 4/5/6 RX-FEM- 2.4GHz

Part No.	PA II	LNA II	SW II	LPF II	Vcc (V) II	Package (mm, typ) II	PDF
RTC7620	--	LNA	SP3T	--	3.3	12L QFN 2.0x2.0x0.45	PDF
RTC7620T	--	LNA	SP3T	--	3.3	12L QFN 2.0x2.0x0.45	PDF
RTC7663	--	LNA	SP3T	--	3.3	16L QFN 2.3x2.3x0.55	PDF
RTC7680	--	LNA	SP3T	--	3.3	8L QFN 1.5x1.5x0.31	PDF