

Johanson Technology Inc,
AMR: Automated Meter Reading
Passive Line Component Offering

AMR is the technology of automatically collecting consumption, diagnostic, and status data from water meter or energy metering devices (water, gas, and electric) and transferring that data to a central database for billing, troubleshooting, and analyzing. AMR technologies include handheld, mobile and network technologies based on telephony platforms (wired and wireless), radio frequency (RF), or power line transmission. [1]

Radio frequency based AMR are commonly allocated in a handheld, mobile, and fixed network. There are both two-way RF systems and one-way RF systems in use that use both licensed and unlicensed RF bands such as ISM that use different protocols such as Zigbee. The following frequencies are those that Johanson has focused on their development to cater wireless AMR applications:

- 915MHz (US)
- 2.45GHz (US, Europe, and Asia)
- 868MHz (Europe)



[1] http://en.wikipedia.org/wiki/Automatic_meter_reading

Summary of available components:

Chip Antennas:

Part Number	Frequency (MHz)	Peak Gain	Ave. Gain	Return Loss	Size (mm)
0868AT43A0020	858 - 878	-1.0 dBi typ(XZ-total)	-4 dBi typ(XZ-total)	9.5 dB min.	7.0 x 2.0
0920AT50A080	880 - 960	-0.7 dBi typ(XZ-V)	-2.6 dBi typ(XZ-V)	8.5 dB min.	11.0 x 5.0
0915AT43A0042	894 - 936	-1.0 dBi typ. (XZ-total)	-4.0 dBi typ. (XZ-total)	8.5 dB min.	7.0 x 2.0
0915AT43A0026	902 - 928	-1.0 dBi typ. (XZ-total)	-4.0 dBi typ. (XZ-total)	8.5 dB min.	
2450AT18A100	2400 - 2500	0.5 dBi typ(XZ-V)	-0.5 dBi typ(XZ-V)	9.5 dB min.	3.2 x 1.6
2450AT18A0150	2375 - 2525	0.5 dBi typ. (XZ-V)	-0.5 dBi typ. (XZ-V)	9.5 dB min.	
2450AT18B100	2400 - 2500	0.5 dBi typ(XZ-V)	-0.5 dBi typ(XZ-V)	9.5 dB min.	
2450AT42A100	2400 - 2500	0 dBi typ(XZ-V)	-1 dBi typ(XZ-V)	9.5 dB min.	5.0 x 2.0
2450AT42B100	2400 - 2500	0 dBi typ(XZ-V)	-1.5 dBi typ(XZ-V)	9.5 dB min.	
2450AT42D0100	2400 - 2500	0.5 dBi typ. (XZ-total)	-2.0 dBi typ. (XZ-total)	6.0 dB min.	
2450AT43A100	2400 - 2500	2.0 dBi typ.(XZ-V)	0.5 dBi typ(XZ-V)	9.5 dB min.	7.0 x 2.0
2450AT43B100	2400 - 2500	1.3 dBi typ.(XZ-V)	-0.5 dBi typ(XZ-V)	9.5 dB min.	
2450AT43D100	2400 - 2500	-0.5 dBi typ.	-3.6 dBi typ.	9.5 dB min.	
2450AT43F0100	2400 - 2500	2.1 dBi typ. (XZ-total)	1.0 dBi typ. (XZ-total)	---	
2450AT43H0100	2400 - 2500	2.1 dBi typ. (XZ-V)	1.0 dBi typ. (XZ-V)	9.5 dB min.	9.5 x 2.0
2450AT45A100	2400 - 2500	3.0 dBi typ(XZ-V)	1.0 dBi typ(XZ-V)	9.5 dB min.	

More info at: <http://www.johansontechnology.com/en/integrated-passives/rohs-compliant-ceramic-chip-antennas/available-rf-antennas.html>

Filters,

Low Pass:

Part Number	Frequency (MHz)	Insertion Loss (max)	Attenuation	Return Loss (min)	Case
0868LP15A020	858 - 878	0.5 dB max.	30 dB @ 2 x fo 40 dB @ 3 x fo	14.0 dB min.	0805
0869LP14A090	824 - 915	0.6 dB	20 dB @ 2xfo 15 dB @ 3xfo	10.9 dB	0603
0892LP07A136	824 - 960	0.7 dB	18 dB @ 1648 - 1920 MHz 25 dB @ 2472 - 2880 MHz 25 dB @ 3296 - 3840 MHz	9.5 dB	0402
0898LP18A035	880 - 915	0.6 dB	30 dB @ 2xfo 18 dB @ 3xfo	10.9 dB	1206
0915LP15A026	902 - 928	0.65 dB	25 dB @ 2xfo 25 dB @ 3xfo	9.5 dB	0805
0915LP15A035	902 - 928	0.65 dB	25 dB @ 2 xfo 25 dB @ 3xfo	9.5 dB	0805
0915LP15B026	902 - 928	0.5 dB	30 dB @ 2xfo 30 dB @ 3xfo	14 dB	0805

Low Pass (continued):

2450LP07A0100	2400-2500	0.45 dB max @ 25°C 0.55 dB max @ -40-85°C	21 dB @ 4800 - 5000 MHz 21 dB @ 7200 - 7500 MHz	11.7 dB	0402
2450LP14A100	2400 - 2500	0.5 dB	25 dB @ 2xFo 18 dB @ 3xFo	14 dB	0603
2450LP14B100	2400 - 2500	0.5 dB	35 dB @ 2 x fo 25 dB @ 3 x fo	14 dB	0603
2450LP15A050	2400 - 2500	0.5 dB	27 dB @ 2xFo 25 dB @ 3xFo	10.9 dB	0805
2450LP15B050	2400 - 2500	0.5 dB	32 dB @ 2 x fo 30 dB @ 3 x fo 30 dB @ 4 x fo	10.9 dB	0805

Low Pass Integrated Dual (0603):

Part Number	Frequency Range (MHz)	Insertion Loss @ BW (dB)	VSWR @ BW	Isolation In→In Out→Out (dB)	Isolation In→Out (dB)	Frequency	Attenuation (dB)
0900LD14B2450	850~950	0.70 max.	1.7 max.	27 min.	30 min.	1700~1900MHz	30 min.
						2550~2850MHz	30 min.
	2400~2500	0.70 max.	1.5 max.	30 min.	30 min.	4800~5000MHz	27 min.
						7200~7500MHz	27 min.

More info at: <http://www.johansontechnology.com/en/integrated-passives/rohs-compliant-low-pass-filters.html>

Band Pass:

Part Number	Frequency (MHz)	Insertion Loss (max)	Attenuation (dB min)	Return Loss	Case
2450BP15G0100	2400 - 2500	2.0 dB	824 - 960MHz @ 30 dB 1710 - 1910MHz @ 28 dB 1910 - 1990MHz @ 20 dB 4800 - 5000MHz @ 30 dB 7200 - 7500MHz @ 20 dB	9.5 dB	0805
2450BP15H0100	2400 - 2500	1.5 max. @ 25°C 1.8 max. @ -40 - 85°C	25 dB @ 1200 - 1300 MHz 10 dB @ 2000 MHz 12 dB @ 3000 MHz 30 dB @ 3600 - 3800 MHz 34 dB @ 4800 - 5000 MHz	9.5 dB	0805
2450BP15N0100	2400 - 2500	2.2 dB max.	25dB @ 1200-1300MHz 10dB @ 2000MHz 12dB @ 3000MHz 26dB @ 3400-3600MHz 30dB @ 3600-3800 MHz 34dB @ 4800-5000MHz	9.5 dB	0805
2450BP15P0100	2400 - 2500	1.3 dB max.	26dB @ 3.4 - 3.6 GHz 20dB @ 4.8 - 5.0 GHz	9.5 dB	0805

More info at: <http://www.johansontechnology.com/en/integrated-passives/rohs-compliant-baluns.html>

Baluns,

Common Differential Impedances:

Part Number	Frequency (MHz)	Impedance Unbal./Bal. (ohms)	Insertion Loss (max)	Return Loss (min)	Phase Difference	Amplitude Difference	Case Size
0465BL15B100	460 - 470	50/100	1.0 dB	9.5 dB	180°±10°	1.5 dB	0805
0896BL14B050	851 - 941	50/50	1.5 dB	9.5 dB	180°±10°	0.7 dB	0603
0866BL15C200	800 - 900	50/200	1.2 dB	9.5 dB	180°±10°	1.0 dB	0805
0900BL15C050	800 -1000	50/50	1.2 dB	9.5 dB	180°±10°	2.0 dB	0805
0900BL18B100	800 -1000	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	1206
0900BL18B200	800 -1000	50/200	1.0 dB	9.5 dB	180°±10°	2.0 dB	1206
0900BL15A100	900 - 1000	50/100	1.2 dB	9.5 dB	180°±10°	2.0 dB	0805
0917BL18B100	889 - 945	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	1206
2450BL07A0100	2400 - 2500	50/100	1.3 dB	9.5 dB	180°±10°	2.0 dB	0402
2450BL14B050	2400 - 2500	50/50	1.5 dB	9.5 dB	180°±10°	2.0 dB	0603
2450BL14B100	2400 - 2500	50/100	1.3 dB	9.5 dB	180°±10°	2.0 dB	0603
2450BL14C050	2400 - 2500	50/50	1.2 dB	9.5 dB	180°±10°	2.0 dB	0603
2450BL14C100	2400 - 2500	50/100	1.2 dB	9.5 dB	180°±10°	1.5 dB	0603
2450BL14C200	2400 - 2500	50/200	1.3 dB	9.5 dB	180°±10°	2 dB	0603
2450BL15B050	2400 - 2500	50/50	1.0 dB	9.5 dB	180°±10°	2.0 dB	0805
2450BL15B100	2400 - 2500	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	0805
2450BL15B150	2400 - 2500	50/150	1.0 dB	9.5 dB	180°±10°	2.0 dB	0805
2450BL15B200	2400 - 2500	50/200	1.0 dB	9.5 dB	180°±10°	2.0 dB	0805
2450BL15K050	2400 - 2500	50/50	1.2 dB	9.5 dB	180°±10°	2.0 dB	0805
2450BL15K100	2400 - 2500	50/100	1.0 dB	9.5 dB	180°±10°	2.0 dB	0805

Conjugate Match Differential Impedances/Specific Chipset:

896 MHz Balun-Filter/Matching Network for T.I. Chipset CC11XX:				Embedded LPF			
Part Number	Frequency (MHz)	Impedance Unbalanced (ohms)	Differential Balanced Imp.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case
0896BM15A0001	863 - 928	50	Conj. match to T.I. CC11XX Chipset	1.5dB max.	9.5 dB min.	180°±10°	0805

2450 MHz Balun/Matching Network for T.I. Chipset CC2430/2480:				Embedded BPF (CC2530)			
Part Number	Frequency (MHz)	Impedance Unbalanced (ohms)	Differential Balanced Imp.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case
2450BM15A0001	2400-2500	50	Conj. match to T.I. 2430/2480 Chipset	1.0 dB max.	10.0 dB min.	180°±15°	0805
2450BM15A0002	2400 - 2500	50	Conjugate match TI Chipset 2530	1.5 dB max	10.0 dB min	180°±15°	0805

Conjugate Match Differential Impedances/Specific Chipset (continued):

2450 MHz Balun-Filter/Matching Network for Atmel Chipset AT86RF230 and AT86RF231:						Embedded LPF	
Part Number	Frequency (MHz)	Impedance Unbalanced (ohms)	Differential Balanced Imp.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case
2450FB15L0001	2400-2500	50	Conj. match to AT86RF230/231 Chipset	1.5dB max.	9.5 dB min.	180°±10°	0805

2450 MHz Balun-Filter/Matching Network for Nordic Chipset nRF24L01 and nRF24L01+:						Embedded LPF	
Part Number	Frequency (MHz)	Impedance Unbalanced (ohms)	Differential Balanced Imp.	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case
2450BM14A0002	2400-2500	50	Conj. match to nRF24L01/nRF24L01+ Chipset	2.0dB max.	9.5 dB min.	160°±15°	0603

Balun-Filters,

Common Differential Impedances:

Part Number	Frequency (MHz)	Impedance Unbal./ Diff Bal. (ohms)	Insertion Loss (max)	Return Loss (min)	Phase Difference	Case Size
0892FB15A0100	863 - 928	50Ω/100Ω	1.5 dB	11.7 dB	180° ± 15	0805
0896FB15A0100	868 - 928	50Ω/100Ω	1.5 dB	11.7 dB	180° ± 15	0805
2450FB15A0100	2400-2500	50Ω/100Ω	1.5 dB	9.5 dB	180°±10	0805
2450FB15A050	2400 - 2500	50/50	1.5 dB	9.5 dB	180°±10°	0805
2450FB39A050	2400 - 2500	50Ω/50Ω	2.0 dB	9.5 dB	180°±10°	1008
2450FB39A0150	2400 - 2500	50Ω/150Ω	2.5 dB	9.5 dB	180°±10°	1008
2450FB39B100	2400 - 2500	50Ω/100Ω	2.0 dB	9.5 dB	180°±10°	1008

Capacitors, MLCC

R05S, R07S, and R14S – Series: These lines of multilayer Hi-Q capacitors have been developed for High-Q low-loss wireless applications. These MLCC's are ideal for impedance matching, decoupling, and further discrete filtering when needed.

More info at: <http://www.johansontechnology.com/en/rf-capacitors/high-q-multi-layer-capacitors-rohs.html>

Inductors, Ceramic and Wirewound

L-05, L07, and L15 – B, C, and W Series: These two series offer a mid Q and High-Q solution depending on filtering needs or spurious emissions optimization.

More info at: <http://www.johansontechnology.com/en/rf-inductors.html>