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CERTIFIED
ISO 9001
KSQ 9100:2018

www.3rwave.com

3Rwave

Robust | Reliable | Rational

**Your Reliable Business Partner.
Robust Products out of Rational Mind of 3Rwave.**

Distribution
Partner

 **Richardson
Electronics**
POWER & MICROWAVE
TECHNOLOGIES



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630.208.2200



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History

- 2012 February 3Rwave established
May Registered as a venture company
- 2013 March ISO9001 certified
September ISO14001 certified
October Registered as a partner company of KITECH
- 2014 October Completed an R&D project sponsored by Industrial Administration. (2013.8~2014.10)
- 2016 September A certified R&D Center Established
- 2017 January Filter and Passive business launched
October Completed an Innovative R&D project sponsored by Industrial Administration. (2015.10~2017.10)
- 2018 October RF Module & Amplifier business launched
November Relocated to the new location in Suwon, Korea
- 2019 May Registered as a Inno-Biz Company
- 2020 October Completed an R&D project sponsored by Industrial Administration. (2019.06~2020.10)
December Certified as a Promising Exporting Small and Medium Enterprise by Ministry of SME
- 2021 November Certified as a specialized company in materials, parts, equipment by KEIT
December Relocated to the new location in Seoul, Korea
- 2022 May Presently holding 12 patents (Korea, USA & China)



| About us

Your committed Business Partner

3Rwave is specialized in microwave devices and modules such as circulators, filters, and amplifiers in various frequency ranges from DC to 100GHz. Thanks to strong engineering background of our engineers in design and manufacturing of microwave devices and modules, 3Rwave can provide robust and reliable products. The invisible high technologies of 3Rwave incorporated in Microwave Applications can help customers be comfortable in all aspects. The future will be completed with the cutting-edge technologies of 3Rwave.

| Core value



| Application



Telecommunication

3Rwave holds a strong manufacturing capability to satisfy customers' needs in quality and quantity.



Space

3Rwave holds the capability to predict and resolve problems that may be occurred in extreme environments.



Military

3Rwave holds integrated knowledge on various reliability tests and qualification programs.



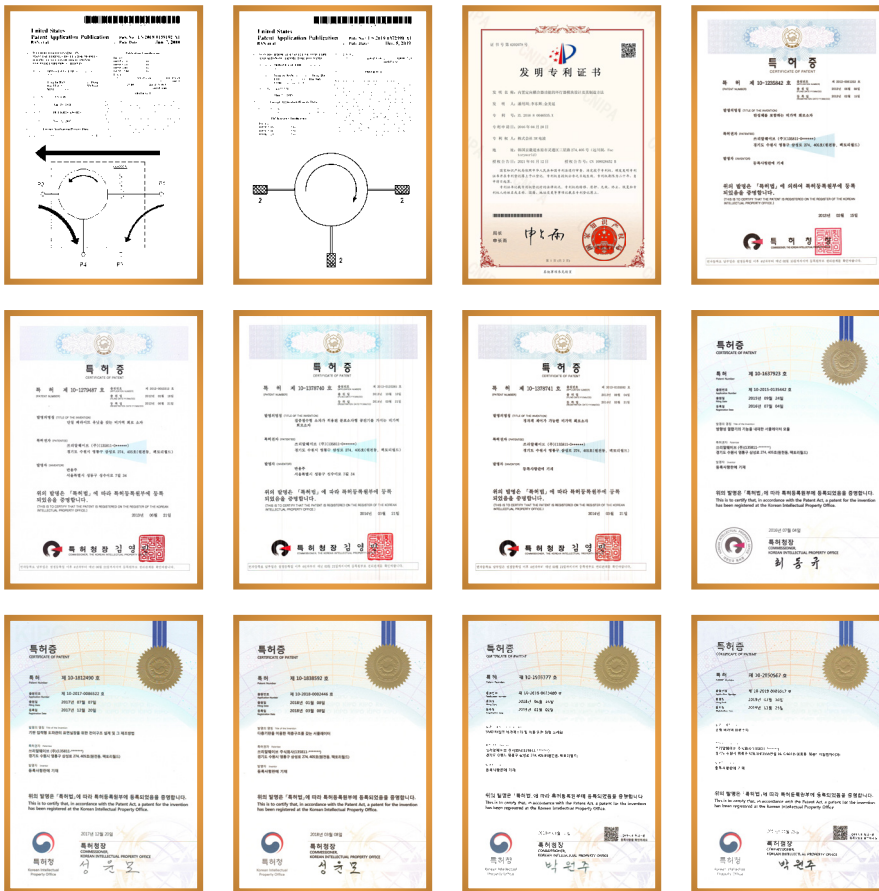
Industrial

3Rwave holds know-how accumulated from various experiences in carrying high power at various microwave devices and modules.

Certificates



Patents



| Product List



Isolator

Drop-in
Microstrip
SMD
Waveguide

Circulator

Coaxial
Drop-in
Microstrip
SMD
WaveGuide

Filter

BRF
HPF
LPF
Duplexer
Multiplexer
BPF

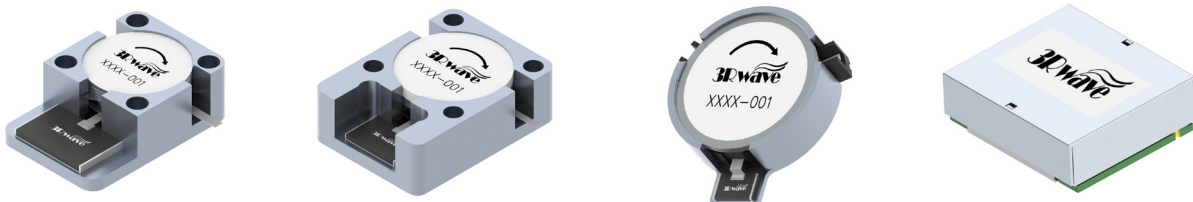
Active

Amplifiers
- SSPA
- LNA
Modules
- Switch Module
- Up-Down Converter module
Devices
- FEM
- PLL
- VCO
- PA-Packaged
- Switch-Packaged

Passive

Resistive
Couplers
Divider

Isolator



Drop-In

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max (dB)	Isolation min (dB)	Return Loss min (dB)	Forward Power Max (W)	Reverse Power Max (W)	Size
IBA040043AA	0.4	0.43	0.3	20	20	300	100	1.5inch
IDA044045HB	0.44	0.45	0.35	20	20	200	100	1.25inch
IBA045051KA	0.45	0.51	0.4	20	20	300	100	1.5inch
IDA046048HB	0.46	0.48	0.35	20	20	300	150	1.25inch
IFA053054AQ	0.53	0.54	0.4	20	20	50	50	1inch
IHA061065AQ	0.61	0.65	0.45	20	20	30	100	0.75inch
IFA069074KQ	0.69	0.74	0.3	20	20	200	100	1inch
IHA069080UQ	0.69	0.8	0.5	18	18	200	100	0.75inch
IHA071072AK	0.71	0.72	0.35	21	21	100	10	0.75inch
IFA075077AA	0.75	0.77	0.27	23	23	200	80	1inch
IHA075080AQ	0.75	0.8	0.3	21	21	150	100	0.75inch
IFA079082AA	0.79	0.82	0.25	22	22	250	100	1inch
IHA080081AK	0.8	0.81	0.3	22	22	100	10	0.75inch
IFA082084AA	0.82	0.84	0.25	22	22	200	100	1inch
IHA085085AK	0.85	0.85	0.32	21	21	100	10	0.75inch
IHA085086AK	0.85	0.86	0.3	22	22	100	10	0.75inch
IFA085087AA	0.85	0.87	0.25	22	22	250	100	1inch
IFA085089UA	0.85	0.89	0.25	22	22	250	100	1inch
IFA085094AQ	0.85	0.94	0.35	20	20	200	100	1inch
IFA086089AA	0.86	0.89	0.25	23	23	250	100	1inch
IHA086096AQ	0.86	0.96	0.35	20	20	200	100	0.75inch
IHA088089AK	0.88	0.89	0.3	22	22	100	10	0.75inch
IFA088091KA	0.88	0.91	0.25	22	22	400	150	1inch
IHA090092AK	0.9	0.92	0.25	22	22	100	10	0.75inch
IHA092096AK	0.92	0.96	0.3	21	21	100	10	0.75inch
IFA097110HA	0.97	1.1	0.3	20	20	200	150	1inch
IHA110120KQ	1.1	1.2	0.35	20	20	200	150	0.75inch
IHA116130UB	1.16	1.3	0.35	18	18	200	100	0.75inch

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max (dB)	Isolation min (dB)	Return Loss min (dB)	Forward Power Max (W)	Reverse Power Max (W)	Size
IHA120125AB	1.2	1.25	0.35	21	21	200	100	0.75inch
IHA130140AB	1.3	1.4	0.35	21	21	200	100	0.75inch
IHA143153AB	1.43	1.53	0.3	21	21	175	100	0.75inch
IHA150170UB	1.5	1.7	0.4	18	18	175	100	0.75inch
IHA171178AB	1.71	1.78	0.25	22	22	200	100	0.75inch
IHA180188AB	1.8	1.88	0.25	22	22	200	100	0.75inch
IFA180200KB	1.8	2	0.3	21	21	250	150	1inch
IFM193199KB	1.93	1.99	0.25	22	22	400	150	1inch
IFM211217KB	2.11	2.17	0.25	22	22	400	150	1inch
IFM250257KB	2.5	2.57	0.3	22	22	250	150	1inch
IHM267300HB	2.67	3	0.35	18	18	200	150	0.75inch
IHM290330HB	2.9	3.3	0.3	20	20	200	100	0.75inch
IHM325385HB	3.25	3.85	0.35	18	18	250	150	0.75inch
IMM330380AA	3.3	3.8	0.3	21	21	100	100	0.5inch
IMM340360AA	3.4	3.6	0.25	21	21	100	100	0.5inch
IMM380420AA	3.8	4.2	0.3	20	20	100	100	0.5inch
IMM440500AA	4.4	5	0.35	21	20	100	100	0.5inch
IMA440585TH	4.4	5.85	0.6	17	17	30	20	0.5inch
IQA510570AA	5.1	5.7	0.45	20	20	20	20	0.4inch
IMM515585AH	5.15	5.85	0.5	15	17	150	100	0.5inch
IMA920960TH	9.2	9.6	0.5	18	18	20	20	0.5inch
IQA09701030AA	9.7	10.3	0.5	15	18	60	20	0.4inch

· Microstrip

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max (dB)	Isolation min (dB)	Return Loss min (dB)	Forward Power Max (W)	Reverse Power Max (W)	Size
IAT35003650AA	35	36.5	0.9	17	19	15	4	5mm
IAT35003650AS	35	36.5	0.8	19	19	15	4	5mm

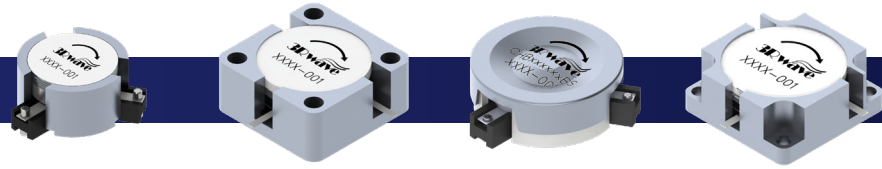
· SMD

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max (dB)	Isolation min (dB)	Return Loss min (dB)	Forward Power Max (W)	Reverse Power Max (W)	Size
IQL024025AA	0.249	0.251	1.2	13	13	5	5	0.4inch
IQL033033AA	0.335	0.337	1	17	17	8.5	5	0.4inch
IDB042042AA	0.42	0.42	0.3	20	20	130	80	1.25inch
IDB045047AA	0.45	0.47	0.3	20	20	130	80	1.25inch
IFB075080AC	0.75	0.8	0.25	22	22	100	80	1inch
IFB075080AC	0.75	0.8	0.3	21	21	100	100	1inch
IHB180188AC	1.8	1.88	0.25	22	22	100	100	0.75inch
IHB211220AC	2.11	2.2	0.25	22	22	100	100	0.75inch

· Waveguide

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max (dB)	Isolation min (dB)	Return Loss min (dB)	Forward Power Max (W)	Reverse Power Max (W)	Size
WI240250W2	2.4	2.5	0.2	19	19	6	6	
WI19202020A1	19.2	20.2	0.15	20	20	1	1	
WI27003100A1	27	31	0.3	19	19	20	20	
WI27253025A1	27.25	30.25	0.25	20	20	50	50	

Circulator



· Coaxial

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max(dB)	Isolation min(dB)	Return Loss min(dB)	Handling Power Max (W)	Size
CYC008008WE1	0.08	0.08	0.5	15	15	6000	
CVC032033WE1	0.32	0.32	0.3	20	20	6000	

· Drop-In

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max(dB)	Isolation min(dB)	Return Loss min(dB)	Handling Power Max (W)	Size
CYA012012EB	0.123	0.123	0.3	20	20	2000	
CTA014014AH	0.14	0.14	0.5	18	18	500	3inch
CSA022023AB	0.22	0.23	0.4	18	18	200	2inch
CTA032033AA	0.32	0.33	1	20	20	1500	3inch
CSA042044AQ	0.42	0.44	0.25	20	20	1000	2inch
CSA043043AB	0.43	0.43	0.3	21	21	1500	2inch
CBA047051AA	0.47	0.51	0.3	21	21	300	1.5inch
CFA061065AQ	0.61	0.65	0.35	20	20	100	1inch
CFA069074AQ	0.69	0.74	0.3	20	20	200	1inch
CFA071078AQ	0.71	0.78	0.3	20	20	100	1inch
CFA075077AA	0.75	0.77	0.3	21	21	200	1inch
CHA075080AQ	0.75	0.8	0.3	21	21	100	0.75inch
CFA079082AA	0.79	0.82	0.3	21	21	250	1inch
CHA085086AC	0.85	0.86	0.25	22	22	120	0.75inch
CFA085091AQ	0.85	0.91	0.3	21	21	200	1inch
CHA086089AC	0.86	0.89	0.28	22	22	120	0.75inch
CDA090093HB	0.9	0.93	0.25	21	21	1000	1.25inch
CHA092096AC	0.92	0.96	0.28	22	22	175	0.75inch
CDA096121HB	0.96	1.21	0.3	20	20	300	1.25inch
CFA100110AH	1	1.1	0.25	22	22	100	1inch
CHA110120AQ	1.1	1.2	0.35	20	20	200	0.75inch
CFA110130AQ	1.1	1.3	0.35	19	19	350	1inch
CDA120140HB	1.2	1.4	0.3	20	20	700	1.25inch
CBA129131AB	1.29	1.31	0.2	23	23	1000	1.5inch
CHA130140AB	1.3	1.4	0.35	21	21	200	0.75inch
CMA142145AA	1.42	1.45	0.35	22	22	100	0.5inch
CDM149150HB	1.49	1.5	0.25	20	20	1100	1.25inch
CHA150170AB	1.5	1.7	0.5	20	20	300	0.75inch
CHA171173AB	1.71	1.73	0.27	22	22	200	0.75inch
CHM180188AB	1.8	1.88	0.25	22	22	300	0.75inch
CHA193199AB	1.93	1.99	0.3	22	22	100	0.75inch
CMA211217AA	2.11	2.17	0.25	22	22	100	0.5inch
CMA225230AA	2.25	2.3	0.25	22	22	100	0.5inch
CMA230240AA	2.3	2.4	0.25	22	22	100	0.5inch
CFM240250AC	2.4	2.5	0.2	20	20	800	1inch
CHM240250HB	2.4	2.5	0.25	22	22	300	0.75inch
CMA240250AA	2.4	2.5	0.25	22	22	100	0.5inch
CMA257262AA	2.57	2.62	0.25	23	23	100	0.5inch
CHM262269AB	2.62	2.69	0.25	22	22	300	0.75inch
CHM270310AB	2.7	3.1	0.25	22	22	250	0.75inch
CHM290330HB	2.9	3.3	0.3	20	20	150	0.75inch
CMM290330AA	2.9	3.3	0.25	20	20	100	0.5inch

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max(dB)	Isolation min(dB)	Return Loss min(dB)	Handling Power Max (W)	Size
CHM299300HB	2.99	3	0.25	22	22	400	0.75inch
CMM310350AA	3.1	3.5	0.25	20	20	100	0.5inch
CHM330380AB	3.3	3.8	0.3	19	19	250	0.75inch
CMM340360AA	3.4	3.6	0.25	22	22	100	0.5inch
CMM360380AA	3.6	3.8	0.25	22	22	100	0.5inch
CMM370398AA	3.7	3.98	0.3	21	21	100	0.5inch
CMM370410AA	3.7	4.1	0.3	22	22	100	0.5inch
CMM400410AA	4	4.1	0.25	22	22	100	0.5inch
CMM440500AA	4.4	5	0.35	21	21	100	0.5inch
CMM490520AA	4.9	5.2	0.35	20	20	100	0.5inch
CMM515540AH	5.15	5.4	0.5	20	20	50	0.5inch
CMM547585AH	5.47	5.85	0.35	19	19	100	0.5inch
CMM599600AA	5.99	6	0.3	21	21	100	0.5inch
CMA850900AH	8.5	9	0.45	20	20	50	0.5inch
CMA940950AQ	9.4	9.5	0.4	20	20	30	0.5inch

· Microstrip

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max(dB)	Isolation min(dB)	Return Loss min(dB)	Handling Power Max (W)	Size
CLT09001000AA	9	10	0.4	18	18	10	7mm
CAT15001700AA	15	17	0.6	17	17	10	5mm
CAT19002100AA	19	21	0.9	17	17	2	5mm
CAT34003600AA	34	36	0.9	17	17	2	5mm
CAT34253575AA	34.25	35.75	0.8	17	17	2	5mm

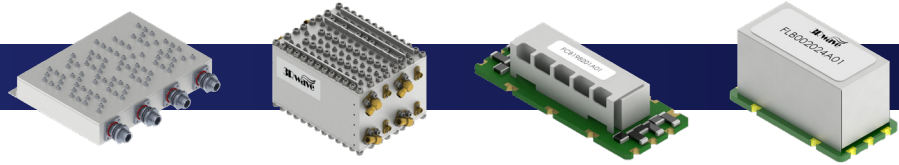
· SMD

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max(dB)	Isolation min(dB)	Return Loss min(dB)	Handling Power Max (W)	Size
CKB135144AS	1.35	1.44	0.4	21	21	50	0.65inch
CKB147151AS	1.47	1.51	0.35	21	21	100	0.65inch
CQB193199AS	1.93	1.99	0.4	20	20	30	0.4inch
CQB211220AS	2.11	2.2	0.4	20	20	30	0.4inch
CQB262269AS	2.62	2.69	0.4	20	20	50	0.4inch
CQB310330AS	3.1	3.3	0.35	22	22	30	0.4inch
CQB325345AS	3.25	3.45	0.3	22	22	30	0.4inch
CQB330380AS	3.3	3.8	0.4	18	18	80	0.4inch
CQB340360AS	3.4	3.6	0.3	20	20	30	0.4inch
CQB350360AS	3.5	3.6	0.3	20	20	60	0.4inch
CQB360410AS	3.6	4.1	0.4	18	18	30	0.4inch
CQB370400AS	3.7	4	0.3	20	20	30	0.4inch
CQB440500AS	4.4	5	0.4	20	20	30	0.4inch
CQB450460AS	4.5	4.6	0.3	20	20	30	0.4inch
CKB520590AS	5.2	5.9	0.45	20	20	80	0.65inch
CPB525555AA	5.25	5.55	0.4	20	20	30	0.4inch
CQB572665AB	5.72	6.65	0.45	18	18	50	0.4inch
CQB600610AS	6	6.1	0.6	20	20	30	0.4inch

· WaveGuide

3Rwave PN	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss Max(dB)	Isolation min(dB)	Return Loss min(dB)	Handling Power Max (W)	Size
WC09801060A1	9.8	10.6	0.35	20	20	30	
CFW29503050WR28A	29.5	30.5	0.4	20		30	1inch

Filter



· BRF

Design Type	Connection method	LTE BAND	Freq.	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss (max.)	Handling Power (CW)	Dimensions (mm)	Remark
LC	SMD		DC ~174MHz / 240MHz ~ 1000MHz	DC	1	6.0dB	2W	18.8 x11.18 x 6.8	
Air Cavity	Coxial		450MHz~ 1000MHz 1650MHz ~ 2700MHz	0.45	2.7	0.6dB	100W	353.0X121.0X42.0	
Air Cavity	Coxial		20MHz~ 9.4GHz 12.4GHz ~13.0GHz	0.02	13	1.2dB	500W	145.0 X 31.0 X 31.0	
Air Cavity	Coxial		9KHz~ 3.56GHz 3.84 ~ 12.75GHz	0.009	12.75	4.5dB	50W	133.0 x 51.0 x 37.0	
Air Cavity	Coxial		1.3~2.6GHz	1.3	2.6	3.5 dB	1W	413.0 x 52.0 x 58.0	
Ceramic	SMD		DC ~ 859MHz 894MHz~1100MHz	DC	1.1	3.0dB	2W	7.6 x 7.6 x 3.75	
LC	SMD		"DC ~85MHz 111MHz ~ 200MHz	DC	0.2	3.1dB	2W	12 x 19x 12.0 max	

· HPF

Design Type	Connection method	LTE BAND	Freq.	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss (max.)	Handling Power (CW)	Dimensions (mm)	Remark
LC	SMD		DC ~ 130MHz, 250MHz~350MHz	DC	0.35	2.0dB	5W	30.0 x 60.0 x 19.0	
LC	SMD		130MHz ~ 250MHz	0.13	0.25	3.5dB	5W	12.0 x 23.0 x 12.0	
LC	SMD		350MHz ~ 500MHz	0.35	0.5	3.5dB	5W	12.0 x 23.0 x 12.0	
LC	SMD		2270MHz ~ 2320MHz	2.27	2.32	0.8dB	10W	25.4 x 12.7 x 7.5	
LC	SMD		2400MHz ~ 2500MHz / 5100MHz ~ 6000MHz	2.5	5.1	2.0dB	1W	18.8 x 11.2 x 6.8	
LC	SMD		2400MHz ~ 5800MHz	2.4	5.8	2.5dB	1W	18.8 x 11.2 x 6.8	
Air Cavity	Coxial		13800MHz ~ 18000MHz	13.8	18	1.0dB	100W	73.0 x 23.0x18.0 Max	

· LPF

Design Type	Connection method	LTE BAND	Freq.	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss (max.)	Handling Power (CW)	Dimensions (mm)	Remark
LC	SMD		1.5MHz ~ 30MHz	0.0015	0.03	1.0dB	1600W	12.0 x 23.0 x 12.0	
LC	SMD		20MHz ~ 500MHz	0.02	0.5	1.5dB	1500W	60.0 x350.0 x 30.0	
Air Cavity	Coxial		500MHz ~ 1000MHz	0.5	1	0.4dB	1800W	76.0x190x30	

· Duplexer

Design Type	Connection method	LTE BAND	Freq.	RX		TX		Insertion Loss (max.)	Handling Power (CW)	Dimensions (mm)
				Freq. Start (GHz)	Freq. Stop (GHz)	Freq. Start (GHz)	Freq. Stop (GHz)			
Air Cavity	Coxial		3600 ~ 3899.155MHz 3900.845 ~ 4100MHz	3.6	3.899	3.9	4.1	2.3dB	10W	170.0 x 136.0 x 58.0 Max
Air Cavity	Coxial		4500MHz ~ 4600MHz 4900MHz ~ 5000MHz	4.5	4.6	4.9	5	2.0dB	2W	123.0 x 61.0 x 22.0 Max
Air Cavity	Coxial		900MHz ~ 915MHz 945MHz ~ 960MHz 1960MHz ~ 2170MHz	0.9	0.96	1.96	2.17	0.8dB	40W	170.0 x 116.0 x 62.0
Air Cavity	Coxial	B03	1710MHz ~1785MHz 1805MHz ~1880MHz	1.71	1.785	1.805	1.88	1.2dB	20W	120 x 117 x 42.0 Max
Air Cavity	Coxial	B05	824MHz ~849MHz 869MHz ~894MHz	0.824	0.849	0.86	0.894	1.0dB	20W	120 x 117 x 42.0 Max
Air Cavity	Coxial		791.25 ~ 820.75MHz 832.25 ~ 861.75MHz	0.791	0.82	0.832	0.861	1.25dB	10W	314 x 235 x 51.0Max
Air Cavity	Coxial		4.4GHz ~4.9GHz 5.25GHz ~5.85GHz	4.4	4.9	5.25	5.85	0.6 dB	50W	75.0 x 73.5 x 25.0 Max
Ceramic	SMD	B12	699 ~ 715MHz 729 ~ 745MHz	0.699	0.715	0.729	0.745	2.6dB	6W	61.4 x 18.7 x 10.9
Ceramic	SMD	B05	824 ~ 849MHz 869 ~ 894MHz	0.824	0.849	0.864	0.894	2.7dB	6W	61.4 x 18.7 x 10.9

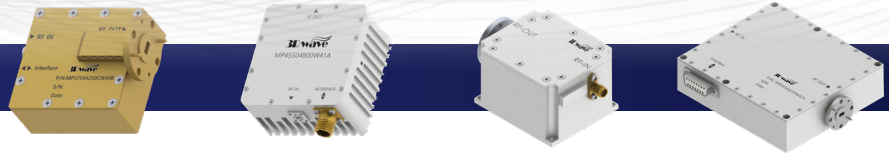
· Multiplexer

Design Type		LTE BAND	Freq.	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss (max.)	Handling Power (CW)	Dimensions (mm)	Remark
Ceramic	SMD		801~851 MHz 925~960 MHz 1805~1880 MHz 2110~2170 MHz 2400~2700 MHz	0.801	2.7	3.0dB	10W	130.0x 35.0 x 22.0	4 PATH
Ceramic	SMD	B03, B08	880MHz ~ 915MHz 925MHz ~ 960MHz 1805MHz ~ 1880MHz 1710MHz ~ 1785MHz	0.88	1.88	3.7dB	10W	109.0 x 26.0 x 9.5	5 PATH
Air Cavity	Coxial		824MHz ~ 849MHz 869MHz ~ 894MHz 779MHz ~ 804MHz 1693MHz ~ 1743MHz	0.824	1.743	2.0dB	100W	265.0 x 274.0 x 64.0	4 PATH
Air Cavity	Coxial		880MHz ~ 915MHz 925MHz ~ 960MHz 835MHz ~ 870MHz 1805MHz ~ 1880MHz	0.88	1.88	1.6dB	100W	431.0 x 336.0 x 64.0	4 PATH
Air Cavity	Coxial		1920MHz ~ 1980MHz 2110MHz ~ 2170MHz 1710MHz ~ 1785MHz 4030MHz ~ 4150MHz	1.92	4.15	1.0dB	100W	254.0 x 236.0 x 39.0	4 PATH
Air Cavity	Coxial		2500MHz ~ 2570MHz 2620MHz ~ 2690MHz 2380MHz ~ 2450MHz 5120MHz ~ 5260MHz	2.5	5.26	1.3dB	100W	281.5x 274.0 x 39.0	4 PATH
LC	SMD	B03, B08	880MHz ~ 915MHz 925MHz ~ 960MHz 1805MHz ~ 1880MHz 1710MHz ~ 1785MHz	0.88	1.785	3.7dB	10W	109.0 x 26.0 x 9.5	4 PATH
Air Cavity	Coxial	B05, B40	869MHz ~ 894MHz 824MHz ~ 849MHz 2300MHz ~ 2400MHz 2300MHz ~ 2400MHz	0.869	2.4	1.5dB	15W	110.0 x 168.0 x 44.0	4 PATH
Air Cavity	Coxial	B08, B40	925MHz ~ 960MHz 880MHz ~ 915MHz 2300MHz ~ 2400MHz 2300MHz ~ 2400MHz	0.925	2.4	1.5dB	15W	110.0 x 168.0 x 44.0	4 PATH
Air Cavity	Coxial	B01, B08	940MHz ~ 960MHz 895MHz ~ 915MHz 2100MHz ~ 2170MHz 1920MHz ~ 1980MHz	0.94	1.98	1.5dB	15W	110.0 x 184.0 x 44.0	4 PATH

· BPF

Design Type		LTE BAND	Freq.	Freq. Start (GHz)	Freq. Stop (GHz)	Insertion Loss (max.)	Handling Power (CW)	Dimensions (mm)	Remark
Air Cavity	Coxial		11000MHz~12800MHz	11	12.8	1.5dB	1W	118.0 x 21.0 x 13.0 Max	
Air Cavity	Coxial		10000MHz~ 11800MHz	10	11.8	1.5dB	1W	118.0 x 21.0 x 13.0 Max	
Air Cavity	Coxial		9000MHz~ 10800MHz	9	10.8	1.5dB	1W	118.0 x 21.0 x 13.0 Max	
Air Cavity	Coxial		8000MHz~ 9800MHz	8	9.8	1.5dB	1W	118.0 x 21.0 x 13.0 Max	
Air Cavity	Coxial		6000MHz~ 7800MHz	6	7.8	1.5dB	1W	118.0 x 21.0 x 13.0 Max	
Air Cavity	Coxial		7000MHz~ 8800MHz	7	8.8	1.5dB	1W	118.0 x 21.0 x 13.0 Max	
Ceramic	SMD		3100MHz~3300MHz	3.1	3.3	3.0dB	1W	16.0x11.0 x 6.2	
Ceramic	SMD		3100MHz~3300MHz	3.1	3.3	2.0dB	1W	10.0x6.5 x 3.8	
Ceramic	SMD		3100MHz~3500MHz	3.1	3.5	1.5dB	1W	10.8x22.7 x 8.1	
Ceramic	SMD		3100MHz~3500MHz	3.1	3.5	1.5dB	5W	6.7x5.0 x 2.5	
Ceramic	SMD		3100MHz~3500MHz	3.1	3.5	2.0dB	2W	8.0x5.0 x 4.0	
Ceramic	SMD		3100MHz~3500MHz	3.1	3.5	1.2dB	5W	6.7x5.0 x 4.0	
Ceramic	SMD		3100MHz~3500MHz	3.1	3.5	1.2dB	5W	6.7x5.0 x 2.5	
Ceramic	SMD		3100MHz~3700MHz	3.1	3.7	1.2dB	1W	20.0x11.0 x 9.0	
Ceramic	SMD		3300MHz~3500MHz	3.3	3.5	2.0dB	2W	10.8x6.4 x 4.0	
LC	SMD		88 ~ 108MHz	0.088	0.108	4.5dB	1W	121.0 x 31.0 x 10.5	
LC	SMD		20MHz ~ 240MHz	0.02	0.24	1.2dB	2W	12.0 x 23.0 x 12.0	
LC	SMD		20 MHz~ 500 MHz	0.02	0.5	3.0dB	2W	30.0 x 60.0 x 19.0	

Amplifiers



SSPA

Part Number	Start Freq. (GHz)	Stop Freq. (GHz)	Gain (dB)	Psat (dBm)	NF (dB)	Drain Voltage (V)	Consumption Current(A) @ Psat	Efficiency (%) @ Psat	Size	Input/Output Connector Type	Description
MP00980103P55A	0.098	0.103	45	55		43	10.85	55	70 x 190 x 35mm ³	Pallet	98-103MHz pallet type 300W power amplifier
MP34003600KW40B	34.0	36.0	50	40	-	28	2.1	17	80 x 59 x 30mm ³	2.92mm/WR22	34.0-36.0GHz 10W power amplifier
MP37504250CW40B	37.5	42.5	48	38	-	12	4	13	50 x 54.7 x 37.18mm ³	2.92mm/WR22	37.5-42.5GHz 6W power amplifier
MP37504250W42A	37.5	42.5	40	42.5	-	12	12.5	11.8	89 x 98.8 x 30mm ³	2.92mm/WR22	37.5-42.5GHz 18W power amplifier
MP47505020W47A	47.5	50.2	46	47	-	24	21	10	210 x 300 x 150mm ³	WR22/WR22	47.5-50.2GHz 50W power amplifier

LNA

Part Number	Start Freq. (GHz)	Stop Freq. (GHz)	Gain (dB)	Psat (dBm)	NF (dB)	Drain Voltage (V)	Consumption Current(A) @ Psat	Efficiency (%) @ Psat	Size	Input/Output Connector Type	Description
ML00100400S24A	0.1	4.0	45	23	1.5	12	230	7	(45.02 x 50.08 x 40.58)mm ³	SMA(F)/SMA(F)	0.1-4.0GHz Wide band Low Noise Amplifier
ML34003600WKA	34.0	36.0	25	13	3.5	15	110	-	(45 x 55 x 27)mm ³	WR22/2.92mm	Ka band Low Noise Amplifier

Modules

Switch Module

Part Number	Start Freq. (GHz)	Stop Freq. (GHz)	Insertion Loss (dB)	Maximu Input Power(W)	Isolation (dB)	Switching Speed (nsec)	Input Voltage (V)	Control Voltage (V)	Consumption Current (mA)	Size	Description	Input/Output Connector Type
MS01001800S2JA	1	18	5.5	2	30	2usec	11.5-12.5	+5/0	25	Refer to Spec. Sheet	1-18GHz SPDT RF Switch Module	K-type/2.92mm

Up-Down Converter module

Part Number	Input Freq. Range(GHz)	Output Freq. Range(GHz)	Conversion Gain(dB)	Psat (dBm)	NF(dB)	Input Voltage(V)	Consumption Current(A) @ Psat	Size	Input/Output Connector Type	Description
MBDC02400900S30A	2.4025-2.4075	0.9135-0.9185	50	30	4.5	12	0.9	(70 x 90 x 19)mm ³	SMA(F)/SMA(F)	2.4GHz to 0.9GHz Down Converter
MBUC09000240S20A	0.9135-0.9185	2.4025-2.4075	90	20	4.5	12	1	(70 x 90 x 19)mm ³	SMA(F)/SMA(F)	0.9GHz to 2.4GHz Up Converter

Devices

· FEM

Part Number	Path	Start Freq. (GHz)	Stop Freq. (GHz)	Gain (dB)	Psat (dBm)	NF (dB)	Input Voltage(V)	Consumption Current(mA) @ Psat	Size	Input/Output Connector Type	Description
FEM02400250ZBS22A	Tx	2.4	2.5	24	22.5	-	3.3	100	3 x 3mm ² QFN	SMD	2.4GHz ISM band Front-End Module
	Rx	2.4	2.5	15	-8	3.2	3.3	9			
FEM03000500S20A	Tx	3.0	5.0	24	20	-	3.3	45	3 x 3mm ² QFN	SMD	3.0-5.0GHz Front-End Module
	Rx	3.0	5.0	13.5	-13	2.0	3.3	10			
FEM03400400S25A	Tx	3.4	4.0	33	25	-	5	95	25.4 x 25.4mm ²	SMD	3.4-4.0GHz Front-End Module
	Rx	3.4	4.0	19	17	2.0	5	50			

· PLL

Part Number	Start Freq. (GHz)	Stop Freq. (GHz)	Output Power (dBm)	Phase Noise(dBc/Hz) @ 10KHz	Input Voltage (V)	Consumption Current(A)	Size	Input/Output Connector Type	Description
MPL04850800HPN00A	4.85	8	0	-99	3.3	600	(19.1 x 19.1 x 3.6)mm ³	SMT	4.85 -8.0GHz PLL

· VCO

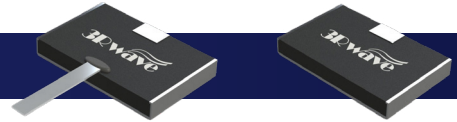
Part Number	Start Freq. (GHz)	Stop Freq. (GHz)	Output Power (dBm)	Phase Noise(dBc/Hz) @ 10KHz	Input Voltage (V)	Control Voltage(V)	Consumption Current(A)	Size	Input/Output Connector Type	Description
MVC3215KES03A	3.11	3.32	3	-95	8	0.5-5.0	40	(12.7 x 12.7 x 4.0)mm ³	SMT	3.11 to 3.32GHz VCO
MVC3500MHES00A	3.45	3.75	0	-95	5	0.0-5.0	40	(12.7 x 12.7 x 4.0)mm ³	SMT	3.45 to 3.75GHz VCO
MVC3500MS03A	3.2	3.8	3	-93	10	0.5-15.0	50	(12.7 x 12.7 x 4.0)mm ³	SMT	3.2 to 3.8GHz VCO
MVC3670MS03A	3.36	3.98	3	-95	10	0.5-15.0	50	(12.7 x 12.7 x 4.0)mm ³	SMT	3.36 to 3.98GHz VCO
MVC5200M03A	5.1	5.3	7	-88	5	0.5-4.5	50	(12.7 x 12.7 x 4.0)mm ³	SMT	5.1 to 5.3GHz VCO
MVC5788M03A	5.725	5.85	3	-70	5	0.4-2.4	50	(12.7 x 12.7 x 4.0)mm ³	SMT	5.725 to 5.85GHz VCO
MVC6790M00A	6.74	6.84	0	-85	5	0.4-2.4	50	(12.7 x 12.7 x 4.0)mm ³	SMT	6.74 to 6.84GHz VCO

· PA-Packaged

Part Number	Start Freq. (GHz)	Stop Freq. (GHz)	Gain (dB)	Psat (W)	Drain Voltage(V)	Consumption Current(A) @ Psat	Efficiency(%) @ Psat	Technology	Operation	Description
PD00030100P53A	0.03	1.0	17	200	28	11.9	60	LD MOS FET		0.03-1.0GHz 200W Un-Matched LD MOS FET
PD03100350P40C	3.1	3.5	16	17	28	0.88	72.6	GaN FET		3.1-3.5GHz Eared Type 17W GaN FET
PD03100350P56A	3.1	3.5	15	400	48	28.5	50	GaN FET	Pulse	3.1-3.5GHz Eared Type 400W GaN FET
PD05000600P48B	5.0	6.0	30	63	28	6.42	35	GaN FET	Pulse	5.0-6.0GHz 63W GaN FET
PD08001200P47A	8.0	12.0	23	50	28	5.1	35	GaN FET	Pulse	8.0-12.0GHz 50W GaN FET
PDF04900590S29A	4.9	5.9	22	29.5	5	-	-	InGaP/GaAs	CW	4.9-5.9GHz WLAN Amplifier

· Switch-Packaged

Part Number	Start Freq. (GHz)	Stop Freq. (GHz)	Insertion Loss (dB)	Maximu Input Power(W)	Isolation (dB)	Switching Speed (nsec)	Input Voltage (V)	Control Voltage (V)	Consumption Current (mA)	Size	Description	Input/Output Connector Type
MS4T01000600S44A	1	6	0.85	30	15	500	5	+5/0	200	(40 x 40 x 4.5)mm ³	1-6GHz SP4T RF Switch	SMT
MS00000600S5T	0	6	1.1	10	15	0.2msec	5	+5/0	100	(36 x 36 x 9.0)mm ³	DC-6GHz SP5T RF Switch	SMT



Resistive

3Rwave PN	Category	Freq. Band	Freq. (GHz)	Handling Power (W)	Type	Resistance	Attenuation
AS010S10A	Attenuator	S	2.5	10	SMD	50	10
AS010S30A	Attenuator	S	2.7	10	SMD	50	30
AS100C20A	Attenuator	S	3	100	Chip	50	20
AS100F10A	Attenuator	S	4	100	Flanged	50	10
AS100F20A	Attenuator	S	3	100	Flanged	50	20
AS100F30A	Attenuator	S	2.7	100	Flanged	50	30
AS100L30A	Attenuator	S	2.7	100	Flangeless	50	30
AS150C30A	Attenuator	S	2.5	150	Chip	50	30
AS150C30B	Attenuator	S	2.7	150	Chip	50	30
RH250F100PA	Resistor	H	0.15	250	Flanged	100	
RH250F50P0A	Resistor	H	0.15	250	Flanged	50	
RH400F100PA	Resistor	H	0.15	400	Flanged	100	
RH400F50P0A	Resistor	H	0.15	400	Flanged	50	
RH800F100PA	Resistor	H	0.15	800	Flanged	100	
RH800F50P0A	Resistor	H	0.15	800	Flanged	50	
RS001S50P0A	Resistor	S	3	1	SMD	50	
RS003S50P0A	Resistor	S	3	3	SMD	50	
RS010F50P0A	Resistor	S	3	10	Flanged	50	
RS020F50P0A	Resistor	S	3	20	Flanged	50	
RS020S50P0A	Resistor	S	3	20	SMD	50	
RS030S50P0A	Resistor	S	3	30	SMD	50	
RS100L50P0A	Resistor	S	3	100	Flangeless	50	
TC015CA	Termination	C	6	15	Chip	50	
TC050SA	Termination	C	6	50	SMD	50	
TF500FA	Termination	F	0.95	500	Flanged	50	
TS005SA	Termination	S	2.7	5	SMD	50	
TS010CA	Termination	S	4	10	Chip	50	
TS010SA	Termination	S	3	10	SMD	50	
TS015CA	Termination	S	3	15	Chip	50	
TS016SA	Termination	S	4	16	SMD	50	
TS020SA	Termination	S	3	20	SMD	50	
TS030CA	Termination	S	4	30	Chip	50	
TS030CB	Termination	S	3	30	Chip	50	
TS030SA	Termination	S	3	30	SMD	50	
TS050CA	Termination	S	3	50	Chip	50	
TS050LA	Termination	S	4	50	Flangeless	50	
TS100CA	Termination	S	3	100	Chip	50	
TS100LA	Termination	S	3	100	Flangeless	50	
TS100SA	Termination	S	3	100	SMD	50	
TS150CA	Termination	S	3	150	Chip	50	
TS150LA	Termination	S	3	150	Flangeless	50	
TS150LF	Termination	S	4	150	Flangeless	50	
TS150SA	Termination	S	4	150	SMD	50	
TS250LA	Termination	S	2.5	250	Flangeless	50	
TS275LA	Termination	S	2.5	275	Flangeless	50	
RS100F100PA	Resistor	S	3	100	Flanged	100	
TC100FA	Termination	C	6	100	Flanged	50	

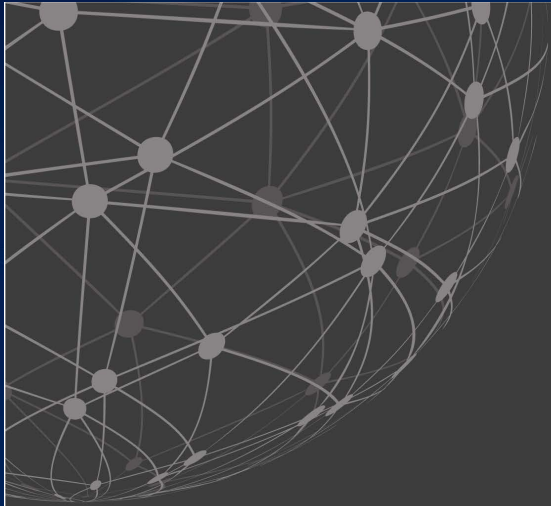
3Rwave PN	Category	Freq. Band	Freq. (GHz)	Handling Power (W)	Type	Resistance	Attenuation
TS300FA	Termination	S	4	300	Flanged	50	
TS200FA	Termination	S	2.5	200	Flanged	50	
TS100FB	Termination	S	3	100	Flanged	50	
TS150FA	Termination	S	4	150	Flanged	50	

Couplers

3Rwave PN	Category	Product Type	Freq. Start (GHz)	Freq. Stop (GHz)	Coupling Value (dB)	Directivity (dB)	Isolation (dB)	Handling Power (W)
DC200600A20A	Directional Coupler	Coaxial	2	6	20	15		20
DC003040N50A	Directional Coupler	Coaxial	0.03	0.4	50	15		200
DC010100N30A	Directional Coupler	Coaxial	0.1	1	30	20		300
DC040130A01	Directional Coupler	Coaxial	0.4	1.3	35	20		350
DC100200N30A	Directional Coupler	Coaxial	1	2	30	22		300
DC100300N40A	Directional Coupler	Coaxial	1	3	40	20		200
DC200300N30A	Directional Coupler	Coaxial	2	3	30	21		300
DC200600A20A	Directional Coupler	Coaxial	2	6	20	15		20
DC300600N30A	Directional Coupler	Coaxial	3	6	30	20		300
DC490705W30A	Directional Coupler	Waveguide	4.9	7.05	30	30		100
DC00501800W10A	Directional Coupler	Coaxial	0.5	18	10	13		50
DC00501800W40A	Directional Coupler	Coaxial	0.5	18	40	10		200
HC200400NA	Hybrid Coupler	Coaxial	2	4			18	400
HC200600NA	Hybrid Coupler	Coaxial	2	6			18	50
HC200600NB	Hybrid Coupler	Coaxial	2	6			18	100
WDC27253025A30	Directional Coupler	Waveguide	27.25	30.25	30	20		100
WDC27253025A40	Directional Coupler	Waveguide	27.25	30.25	40	20		100

Divider

3Rwave PN	# of Dividing	Product Type	Freq. Start (GHz)	Freq. Stop (GHz)	Isolation (dB)	Handling Power (W)
PD020300S10W	2 way	Coaxial	0.2	3	15	10
PD040130A01	2 way	Coaxial	0.4	1.3	15	350
PD050600A01	2 way	Coaxial	0.5	6	18	100
PD050600A02	4 way	Coaxial	0.5	6	18	100
PD050600A05	3 way	Coaxial	0.5	6	20	10
PD050600A03	8 way	Coaxial	0.5	6	18	100
PD050600S10W2A	2 way	Coaxial	0.5	6	20	10
PD050600S10W2B	2 way	Coaxial	0.5	6	17	10
PD050600S10W4A	4 way	Coaxial	0.5	6	18	10
PD050600S10W4B	4 way	Coaxial	0.5	6	15	10
PD096124N150W2B	2 way	Coaxial	0.96	1.24	15	150
PD150300S20W16B	16 way	Coaxial	1.5	3	20	20
PD050400A01	2 way	Coaxial	0.5	4	15	10
PD800850S20W4B	4 way	Coaxial	0.8	8.5	18	20
PD800850S20W6B	6 way	Coaxial	8	8.5	20	20
PD20004000A01	2 way	Coaxial	20	40	16	20
PD10005000A01	4 way	Coaxial	10	50	16	20
PD18004000A01	6 way	Coaxial	18	40	17	10
PD18004000A02	8 way	Coaxial	18	40	17	10
PD20005000A01	2 way	Coaxial	20	50	18	10



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