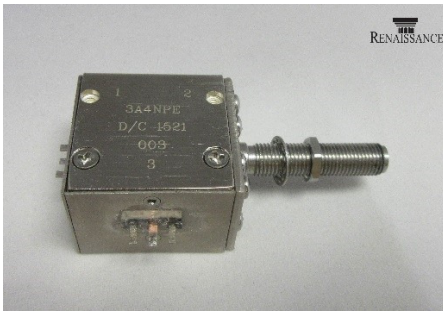
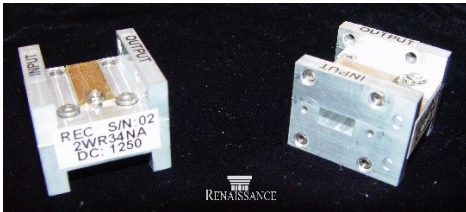


Space Qualified Products



Isolators/Circulators

- 2.2 – 2.4 GHz, Coaxial Circulator, [3A4NPF-S](#)
- 2.2 - 2.3 GHz Coaxial Isolator, [2A4NEX-S](#)
- 7.8 - 8.4 GHz, Coaxial Isolator, [2A7NFC-S](#)
- 7.8 - 8.4 GHz, Coaxial Isolator, [2A7NFD-S](#)
- 27.0 – 31.0 GHz, Coaxial Isolator, [2A9NFB-ROHS](#)
- 27.5 – 30.5 GHz, Coaxial Isolator, [2A9NGV-1](#)
- 1.116 - 1.236 GHz, Drop-In Isolator, [2H2NHI-S](#)
- 1.515 - 1.635 GHz, Drop-In Isolator, [2H3NCJ-S](#)
- 2.2 – 2.4 Medium Power Circulator, [3A4NPE](#)
- 5.014 - 5.114 GHz, Drop-In Isolator, [2H6NBR-S](#)
- 5.096 - 5.196 GHz, Drop-In Isolator, [2H6NBS-S](#)
- 6.60 - 7.32 GHz, Drop-In Isolator, [2H7NDR-S](#)
- 30.0 – 31.0 GHz, Drop-In Isolator, [2L9NDZ](#)
- 30.0 – 33.0 GHz, Drop-In Isolator, [2L9NEU-ROHS](#)
- 31.0 – 33.0 GHz, Drop-In Isolator, [2L9NFG](#)
- 17.3 – 18.6 GHz, Microstrip Isolator, [2W9NCQ-S](#)
- 18.3 – 20.2 GHz, Microstrip Isolator, [2W9NCR-S](#)
- 19.0 - 21.0 GHz, Microstrip Isolator, [2W9NCA-S](#)
- 23.1 – 23.6 GHz, Microstrip Isolator, [2W9NBW-S](#)
- 26.0 - 26.50 GHz, Microstrip Isolator, [2W9NBV-S](#)
- 27.5 - 31.0 GHz, Microstrip Isolator, [2W9NCB-S](#)
- 33.0 – 35.0 GHz, Microstrip Isolator, [2W9NCS-S](#)
- 29.5 – 31.0 GHz, Waveguide Isolator, [2WR34NA](#)

Couplers

- 5.0 – 6.0 GHz Directional Coupler, [12A7NA-40S](#)

Power Dividers

- 1 – 30 MHz Power Divider, [10A2BAD-2S](#)
- 1 – 30 MHz Power Divider, [10A2BAG-2S](#)
- 1 – 500 MHz Power Divider, [10A3BAC-2S](#)
- 220 – 450 MHz Power Divider, [10A2BAF-2S](#)
- 1.0 – 2.0 GHz 4-Channel Power Divider, [10A2NJ-4S](#)
- 1.1 – 1.5 GHz High Power Divider, [10A3NB-8S](#)
- 2.1 – 2.4 GHz 2-Channel Power Divider, [10A4NAJ-2S-S](#)
- 2.0 – 4.0 GHz 8-Channel Power Divider, [10A5BAJ-8S](#)

GPS Splitters

- 1.2 – 1.6 GHz, Unity Gain GPS Splitter, [10A4NAS-2S-1](#)
- 1.2 – 1.6 GHz, 2-Channel Unity Gain GPS Splitter, [10A4NP-2S-1](#)



- 5 level Isolators & Circulators
- 5 Level Power Dividers & Couplers
- 5 level RF switches

Renaissance Electronics & Communications, LLC (together with P&H Labs/MCCI Wireless and HXI) is a leader in the design and manufacture of 5-level qualified isolators, circulators, power dividers, couplers and RF switches. These devices are used in payloads and earth stations for signal systems and testing. Renaissance is the first in the industry to produce a fully hermetic Electro-mechanical RF switch using laser welding not glue to bond seals.

Renaissance Electronics supplies high-reliability space qualified products for leading programs including Mani Lander, Sea Launch, ICONS, Echostar, Astra 1K, Globalstar, Proxida, Sea, Telex-9, Wildblue, IP Star, DirecTV-7, COES, SIRS, TDRSS, Alphasat, TurkSat, Baneq, VSB-VIII, Ansat, DNSAT, Westar and INTELSAT VSB.

Renaissance offers innovative and unique solutions to satisfy customer requirements. The highly talented and qualified engineering team who would assist the customer from concept to product launch are supported by a state-of-the-art design center and manufacturing facility. The full-service laboratories perform comprehensive environmental, mechanical and electrical testing. Utilizing the full depth of house capability, Renaissance controls virtually all processes with in-house machining, fabrication, assembly and qualification wiring. Full performance characteristics at various temperatures and altitudes are available for each product. All the components are in full compliance with NASA specifications NSDS-1300.4.

Space compliance test processes include - Qualification Test Planning, Traceability and Process Control, Acceptance Testing for In-process, Final and Destructive Physical Analysis, to name a few.

DESCRIPTION	MIL-STD-883		MIL-STD-883	
	Method	Test Condition	Method	Test Condition
Thermal Shock	107	All	1010	All
Mechanical Shock	213	All	2002	A, B
Vibration - Sin	294	All	2007	All
Vibration - Random	214	All	2028	All
Resistance to Soldering Heat	215	All		
Thermal Vacuum	108	E		
Humidity	109			
Resistance to Solvents	219	D	2015	
Creep - High - Steel	112	C		
Flow Leak	212	A		
Controlled Atmosphere	112	C		
Stabilization Bake	112	A	1008	A, B
Wire Bond Pulling	2011			



K and Ka Band Isolators for Space Applications



Renaissance has successfully manufactured, screened and tested per MIL-PRF 38534 Class A and MIL-STD-883, the following K and Ka band isolators for Hi-Rel applications in commercial and military satellites.

REC's space heritage dates back to 90s on programs such as INMARSAT, PANAMSAT, GALAXY SB, GLOBALSTAR, IRIDIUM, GPS II, SEA LAUNCH etc.

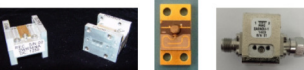
REC is the preferred supplier on many Space Programs

Devices are completely made in USA at our "state of the art" facility in Harvard, MA

Customers can directly adapt the design and qualification documents which can substantially reduce cost and delivery time.

Other frequency bands are also available

Package	Freq Min (GHz)	Freq Max (GHz)	Part Numbers
MICROSTRIP ISOLATOR	19	23	2WR34NA
MICROSTRIP ISOLATOR	23.3	23.6	2WR34NV
MICROSTRIP ISOLATOR	26.1	26.3	2WR34VW
MICROSTRIP ISOLATOR	23.5	33	2WR34XZ
MICROSTRIP ISOLATOR	33	35	2WR34YCS
COAXIAL ISOLATOR	27	33	2WR34ZDS
COAXIAL ISOLATOR	27.5	30.5	2WR34ZT
DROP IN ISOLATOR	30	33	2L9NDCZ
DROP IN ISOLATOR	30	33	2WR34NDS
DROP IN ISOLATOR	31	33	2L9NDFZ
WAVEGUIDE ISOLATOR	29.5	33	2WR34NA



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With Renaissance Electronics' acquisition of P&H Labs and MCCI Wireless, a significant portion of our broad Ferrite Products line has been qualified for both Military and Commercial Space applications. P&H Labs products have been an integral part of over 50 satellite and deep-space mission payloads, many of which have been in operational orbit for 8 to 10 years. Renaissance Electronics has been able to capture and retain the heritage processes and documentation systems needed to support 5-Level and Hi-Rel requirements. Soldering operations and inspections of our Hi-Rel Space components are in full compliance with NASA specification NHB-5300.4 and all of our Hi-Rel assemblies and inspectors are regularly tested and recertified.

Renaissance Electronics' (through P&H Labs) extensive Ferrite Device Space Program heritage includes many well-known programs such as Echostar, Astra 1K, Globalstar, PanAmSat, Telex-9, Wildblue, IP Star, DirecTV-7, COES, SIRS, TDRSS, ArabSat, TurkSat, Intelsat VSB-VIII, Ansat, Insat, Westar, and Intelsat VII.

ferrite
"Military & Commercial Space Applications"



Coastal Models

Frequency (GHz)	Qualified Designs	Frequency (GHz)	Qualified Designs
L-Band:		C-Band:	
1.670 - 1.696	3	3.70 - 4.2	3
1.877 - 1.894	1	3.80 - 4.2	1
1.2 - 1.8	1	6.00 - 6.2	7
		5.70 - 6.45	1
S-Band:		5.75 - 6.75	1
6.75 - 7.25	1	5.75 - 6.75	1
3.40 - 3.55	1	7.20 - 7.5	2
3.40 - 3.75	1	7.50 - 7.8	1
3.40 - 3.85	2	7.20 - 8.9	1
3.40 - 3.71	4	7.50 - 7.8	1
3.62 - 4.20	2		
3.65 - 3.85	2		
3.70 - 3.95	4		



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For more information about these products, contact: Renaissance/HXI Sales at 978-772-7774, sales@rec-usa.com or go online at www.rec-usa.com / www.hxi.com