

RFMD®

High Reliability Devices



Multiple Benefits

RFMD® has a legacy of providing frequency control products to the aerospace and defense sector for more than 40 years. RFMD has made a determined effort to continue sourcing high performance signal sources, signal processing and amplifier products that are designed into, and currently run in, numerous aerospace and defense applications.

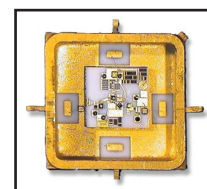
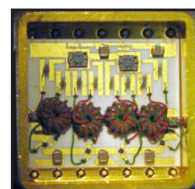


APPLICATIONS

- Milcom
- Electronic warfare
- Industrial, scientific, medical
- Aerospace avionics
- Military and civilian radar
- Satellite communications

Manufacturing Capability

RFMD's high-rel products are manufactured at our Broomfield, CO location. This world-class facility has been manufacturing high reliability devices for the aerospace and defense sector for more than 20 years. The facility and processes are AS9100-certified and products are manufactured in compliance with military standards.

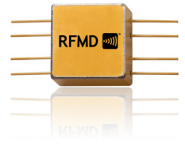


Hi-Rel VCOs

RFMD offers one of the industry's largest selections of discrete Voltage Controlled Oscillator (VCO) modules. Our product portfolio includes oscillator topologies, resonator technologies, supply voltages, and substrate materials to meet our customer's varying requirements. All RFMD—VCO modules are 100% RF tested and RoHS compliant.

FEATURES

- DOD cleared
- Bandwidths from DC—7GHz
- Low phase noise
- Optimized tuning sensitivity
- Custom-tuned products available



Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	V _{TUNE} Min (V)	V _{TUNE} Max (V)	P _{OUT} (dBm)	Phase Noise at 10KHz (dBc/Hz)	V _{SUPPLY} (V)	Package	Part Number
500	1000	1.0	20	13.5	-92	—	T08	VCO-107TC
2000	3200	1.5	18	12.5	-85	—	SMT-2	VCO-112SMT
3490	3510	0	5	0.5	-100	17	SMT-2	VCO-3500SMT
5490	5510	0	5	0.5	-96	—	T08	VCO-5500TC

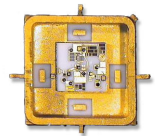
Partial product selection only. For a complete list of products in this section please visit www.rfmd.com/products/HRMSC.

Hi-Rel Mixers

RFMD's mixer family includes products with frequencies in the multi-GHz range. Product offerings also include devices with high IIP3 and with performance that is virtually insensitive to mismatches on the ports. These mixers are ideal in applications where elaborate and expensive matching networks are prohibitive.

FEATURES

- Wide bandwidth, low conversion loss
- Catalog products up to 4GHz
- Custom up to 13GHz
- Variety of packaging options



Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	IF Freq (Min) (MHz)	IF Freq (Max) (MHz)	Conversion Loss (dB)	IIP3 (dBm)	Isolation (dB)	Package	Part Number
5	1500	0	500	5.9	10	35	T08	DBM-177
10	1500	0	500	6.3	25	30	Flatpack	DBM-178
10	4000	50	1000	8.5	17	15	T08	DBM-186
50	13000	5	5000	8.0	15	25	SMA Module	DBM-1200

Partial product selection only. For a complete list of products in this section please visit www.rfmd.com/products/HRMSC.

Hi-Rel Power Dividers/Combiners

RFMD's hi-rel power divider products offer wide bandwidths to 4GHz with low insertion loss. RFMD also offers custom power divider designs with 2, 3, 4, and 8 way configurations. Contact factory for more information.

FEATURES

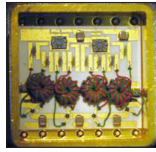
- Low insertion loss
- 2 Way up to 4GHz
- 3 and 4 Way up to 2GHz
- 6 to 9 Way up to 1GHz

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (dB)	Isolation (dB)	VSWR	Package	Part Number
1	500	0.3	30	1.3:1	Flatpack	PS-3-500F
5	1000	0.3	35	1.2:1	Flatpack	PS-2-1000F
20	4000	0.4	25	1.3:1	Flatpack	PS-2-4000F

Partial product selection only. For a complete list of products in this section please visit www.rfmd.com/products/HRMSC.

Hi-Rel Transformers

RFMD's hi-rel transformer line offers a variety of products with bandwidths to 1.0GHz, as well as custom transformer design and tuning.



FEATURES

- Balanced to Balanced
- Unbalanced to Unbalanced
- Balanced to Unbalanced
- Transformation Options
 - 50Ω to 50Ω
 - 50Ω up to 600Ω
 - 50Ω down to 12.5Ω

Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Insertion Loss (dB)	VSWR	Package	Part Number
0.01	25	0.5	1.5:1	Leaded	LF-412
0.01	50	0.5	2:1	Leaded	LF-428
1	700	1.2	1.5:1	Leaded	HF-122
0.5	1000	0.75	2.5:1	Leaded	HF-102

Partial product selection only. For a complete list of products in this section please visit www.rfmd.com/products/HRMSC.

Hi-Rel MMICs

RFMD has an extensive portfolio of MMIC products that are suitable for high reliability applications. From MMIC amplifiers and MMIC mixers to switches and VCOs, RFMD is now converting standard catalog MMIC devices into hi-rel products by packaging MMIC die in hermetic packages and providing up-screening services to guarantee product performance for military and space applications.

FEATURES

- Broadband range of catalog MMIC devices
- Small hermetic packaging 3 x 3mm
- Screened to high reliability levels
- Full program management and product tracking



Freq Range (Min) (MHz)	Freq Range (Max) (MHz)	Gain (dB)	Noise Figure (dB)	OP1dB (dBm)	OIP3 (dBm)	V _{SUPPLY} (V)	I _{SUPPLY} (mA)	Package	Part Number
50	850	20.2	3.1	19.5	40.5	5.0	86	SMT-2	SBB-2082S
50	6000	16.4	4.0	15.1	29.0	4.2	42	SMT-2	SBB-3082S
50	6000	15.5	4.5	19.0	38.0	5.0	80	SMT-2	SBB-4082S

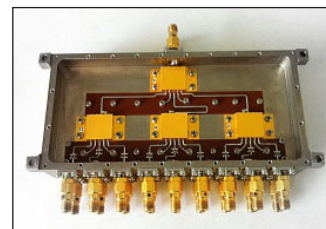
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Integrated Microwave Assemblies

RFMD's hi-rel products group also offers build-to-print services for custom integrated microwave assemblies (IMA). RFMD's engineering services team has extensive experience in analyzing customer requirements and our dedicated staff of technicians and operators provide the highest quality of workmanship, regardless of the complexity of the IMA module.

FEATURES

- Build-to-print services
- Customer module design and manufacturing
- DC-40GHz capability



Hi-Rel Product Quality Standards

RFMD's hi-rel products are manufactured in compliance with a plethora of military and aerospace standards depending on the product class and type. The table below lists the primary standards for each product type.

Standard	Application
MIL-PRF-38534 Class H and K	Hybrids
MIL-STD-883 Class S and B	Environmental Test Procedures
MIL-STD-202	Environmental Test Procedures
MIL-DTL-28837	Mixers
MIL-DTL-23971	Power Dividers
MIL-T-55631 / MIL-STD-202	Transformers
MIL-HDBK-1547	DOD Electronic Parts, Materials & Process for Space Vehicles
MIL-STD-5011	Use of Compliant Materials (Adhesives)
J-STD-001, 202/208	Soldering, Solderability

Screen	MIL-STD-883 Test Method
Gross Leak Testing	Method 1014C / MIL-STD-202, Method 112D
Fine Leak Testing	Method 1014A
Random Vibration	Method 2141
Steady State Life Test	Method 1005
Stabilization Bake	Method 1008
Temp Cycle	Method 1010B or C
Burn-in	Method 1015
Constant Acceleration	Method 2001
Solderability	Method 2003
Die Shear	Method 2019
PIND Test	Method 2020
100% Non-destructive Bond Pull Tested	Method 2023
X-Ray	Method 2012
Electrical Testing	Automatic Test Procedure / Customer Spec

