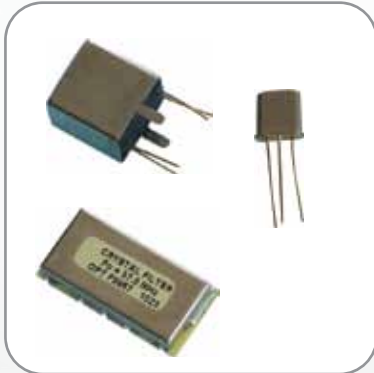


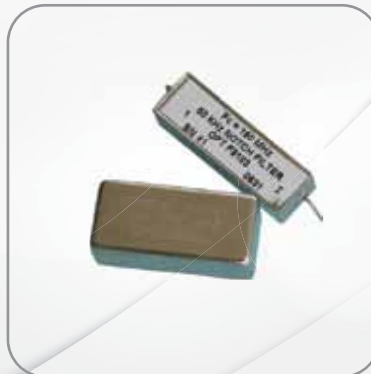
opt HELLAS

Custom RF Filter & Frequency Control Solutions

The *opt*_{imum} Choice
for custom designs
since 1980 in



● Monolithic Crystal Filters



● Discrete Crystal Filters



● LC Filters



● Switch Filter assemblies



● Oscillators

INDUSTRIES

- Defence
- Avionics
- Medical
- Telecom



OPT HELLAS was established in 1980 and is located outside of Athens, Greece near the International Airport. Over the years, OPT HELLAS, has developed a broad line of CUSTOM DESIGN Frequency Control Products for various applications such as, Military, Avionics, Commercial, Medical and Instrumentation.

OPT HELLAS is very well known internationally for the ability to provide the Highest Quality CUSTOM Crystal Filters (Monolithic and Discrete) LC Filters of all Types, Bank filters and Oscillators.

Most customer requirements are essentially unique to their particular applications, requiring custom design products. Such products are available with the cost and delivery benefits of standard products without sacrificing design flexibility. This is made possible utilizing advanced concepts in filter network theory coupled with the latest and most advanced software utilized in computer design (CAD).

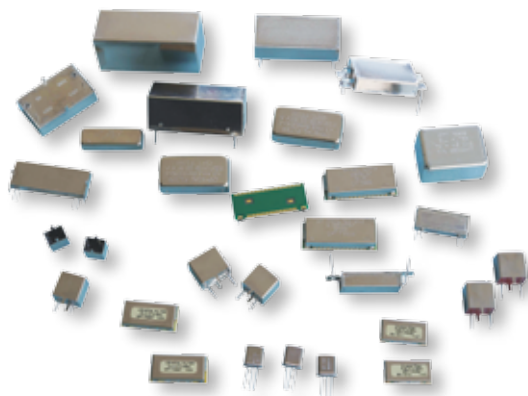
OPT HELLAS general capabilities are:

- Monolithic Crystal Filters in all polynomials and package configuration, fundamentals and overtones from 4.0 MHz to 140 MHz with fractional bandwidths of 0.01 % to 0.3 %
- Discrete Crystal Filters in all polynomials and package configurations, fundamental and overtone from 1.4 MHz to 250 MHz with fractional bandwidths of 0.01% to 2 %
- Lumped Elements (LC) Filters in all polynomials and package configurations from 1 KHz to 3000 MHz with fractional bandwidth of 2% to more than 100 %
- Custom crystal Oscillators of high performance and tight tolerance for various timing applications are available at frequency range of 1 MHz to 100 MHz in SMD or thru hole packages.
- High Performance VCO of Narrow and Wide band designs of frequency range of 600 MHz to 6.0 GHz

OPT HELLAS offers complete in House capability for the production of our filters and oscillators. These capabilities benefit our customers as follows:

- An Engineering team that combines many years of experience in developing the most effective solutions for the application of each of our customers.
- Strict in house design procedures, material selection, manufacturing procedures and automated Testing procedures provide our customers with the highest Quality and reliability products.
- In House manufacturing of crystals, coil and filter packages provide precise control of all critical specified parameter.
- Our total in House capability enables OPT HELLAS to reduce delivery times for prototypes and production needs.
- Our Quality Assurance Procedures are compliance with ISO-9001/2008 MIL-STD-202 and MIL-I-45208.

In our business, the key to success is our experienced and dedicated personnel. All people working at OPT HELLAS have at least 20 years of experienced in designing and manufacturing of all our products. All new specifications are computer modeled with our in HOUSE developed computer software. Given the unique design requirements for telecommunication filters we use the most advanced computerized design software and equipment available.

**Monolithic Designs**

- Frequency Range 4 to 150 MHz
- Relative Bandwidth 0.01 % to 0.1 %
- Shape Factor 2:1 and higher
- Number of poles 2 to 12

Package Configurations

- Through Hole
- Connectorized
- SMD

Operating Temperatures

- -20 °C to + 70 °C
- - 40 °C to + 85 °C
- - 50 °C to + 90 °C

Discrete Designs

- Frequency Range 1.4 to 200 MHz
- Relative Bandwidth 0.01 % to 0.2 %
- Shape Factor 1.5:1 & higher
- Number of poles 2 to 12

The Crystal Filters listed below are REPRESENTATIVE of the many filters designed and manufactured during the past years at OPT HELLAS, **not all filters that have been designed can be listed here**. New filters are designed by engineering and manufactured on regular basis. **Therefore, if the desired frequency and specifications are not listed below, please contact the local OPT representative or the factory. e-mail: sales@ophellas.com**

Monolithic Designs

OPT Model	Center Frequency (MHz)	Pass Band		Ripple max (db)	Insertion Loss (db)	Stop Band		Ultimate min (db)	Zin / Zout (Ω)	Filter Package Dimensions L X W X H	Filter Package Type
		(db)	(Khz)			(db)	(Khz)				
F9164	10.000	3	+/- 10	1	4	70	+/- 20	80	50 / 50	59.8 X20.3 X 16	SMD - mm
F5404	10.700	1 6	+/- 9.5 min +/- 13 min	1	6	60	+/- 24	80	4000 / 4000 / 12pf	2.37"X1.02"X1.05"	Thru Hole - in
F9875	10.700	3	+/- 16	1.5	4	80	+/- 40	80	50 / 50	38.4 X 18.2 X 13	Thru Hole -mm
F9822	11.000	3 6	+/-12 min +/- 15 max	2	4	80	+/- 25	70	1000 / 1000 / 30pf	38.4 X 18.2 X 13	Thru Hole -mm
F9939	12.500	3	+/- 9	0.5	2.5	60	+/- 28	80	50 / 2800	1.63" X 0.625" X 0.42"	in -SMD
F9762	14.500	3	21.5 +/- 1.5	0.5	3.5	80	+/- 32	90	50 / 230	40 X 20 X 11	Thru Hole -mm
F9976	20.025	6	+/- 3.6	1	3.5	60	+/- 6.3	80	50 / 50	2.25" X 0.75" X 0.50"	Thru Hole - in
F9654	20.125	6	+/- 8.5	1	8	60	+/- 15	80	50 / 50	2.32" X 0.66" X 0.305"	Thru Hole - in
F5313	20.050	3	+/- 16	1	2.5	30	+/- 45	60	50 / 50	1.0" X 0.60" X 0.47"	Thru Hole - in
F5361	20.050	3	+/- 15	2	4	60	+/- 33	80	50 / 100	1.36" X 0.66" X 0.31"	in -PINS-SMD
F9841	21.400	6	+/- 10.050	1	4	60	+/- 17.5	100	50 / 50	38.2 X 18.2 X 13	Thru Hole -mm
F9783	21.400	6	+/- 18	2	3	60	+/- 30	80	50 / 50	1.525"X0.725"X0.50"	Thru Hole - in
F9151	21.400	6	+/- 25	0.5	2.0	80	+/- 80		50 / 50	36 X 16 X 8	Thru Hole -mm
F5369	25.000	6	+/- 19	2	4	60	+/- 42.5	80	2000 / 2000	1.75" X 0.23" X 0.63"	Thru Hole - in
F5370	25.500	6	+/- 19	2.5	4	60	+/- 31	80	2700 / 2700	2.25" X 0.91 " X 0.85 "	Thru Hole - in
F5350	26.250	6	+/- 19	2	4	80	+/- 100	70	50 / 50	1.86 " X 0.50" X 0.34 "	SMD-pins-mm
F5349	28.875	6	+/- 10	2	4	50	+/- 50	70	50 / 50	1.86 " X 0.50" X 0.34 "	SMD-pins-mm
F5376	30.000	1 6	+/- 5.5 min +/- 8 min	1.5	4	60	+/- 15	70	50 / 50	2.0" x 0.80" x 0.50"	Thru Hole - in
F5380	32.768	6	+/- 3.78	0.3	6	40	+/- 16	50	50 / 50	1.10" X 0.40" X 0.47	Thru Hole - in
F9967	37.500	6	+/- 35	1.5	3	45	+/- 150	60	50 / 50	30.5 X 15 X 5	SMD - mm
F9858	43.500	1	+/- 10	1	3.5	40	+/- 27	65	50 / 50	25.1 X 14.1 X 9	Thru Hole -mm
F5351	45.050	6	+/- 21	2	4	80	+/- 100	70	50 / 50	1.86" X 0.50" x 0.335"	SMD-pins-mm
F5418	141.55776	0.5 3	+/- 3.2 min +/- 8 min	0.5	4.5	40 60	+/- 50 +/- 100	60	200 / 200	1.70" x 0.65" x 0.55"	Thru Hole - in

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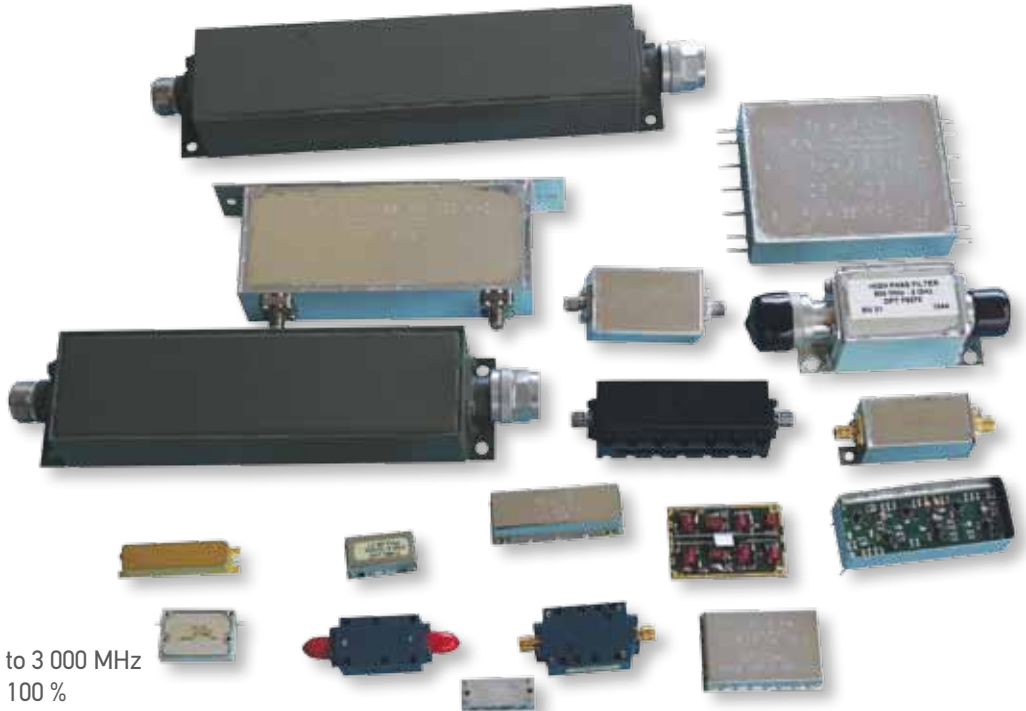
Discrete Crystal Filter Designs

OPT Model	Center Frequency (MHz)	Pass Band		Ripple max (db)	Insertion Loss (db)	Stop Band		Ultimate min (db)	Zin / Zout (Ω)	Filter Package Dimensions L X W X H	Filter Package Type
		(db)	[KHz]			(db)	[KHz]				
F9312	1.400	3	+/- 0.400	0	6	50	+/- 2.50	60	50 / 50	2.37"X1.0"X1.05"	Thru Hole - in
F5335	3.600	6	1.350 min 1.600 max	1	4	60	+/- 4	60	5000 / 175	2.0 X 0.75 X 0.77	Thru Hole - in
F9248	7.168	3	0.150 min 0.300 max	0.5	6	60	+/- 0.750	70	600 / 600	61.2 X 25.4 X 22	Thru Hole -mm
F9127	10.700	3	+/- 50	1	8	60	+/- 140	60	50 / 50	1.5" X 0.75" X 0.60"	Thru Hole - in
F9256	10.700	3	+/- 25	1.5	4	90	+/- 100	90	5600 / 5600	38.4 X 18.2 X 13	Thru Hole -mm
F9109	20.000	3	+/- 50	0.5	6	40	+/- 400	40	50 / 50	38.4 X 18.2 X 13	Thru Hole -mm
F9980	21.400	3	+/- 150	1	6	30	+/- 300	40	50 / 50	1.58"X0.50" X 0.52 "	Thru Hole -mm
F5403	25.500	6	+/- 34.5	1	5	60	+/- 80	60	3000 / 3000	2.10" X 0.77" X 0.65 "	Thru Hole - in
F9199	38.000	3	+/- 4	1	4	60	+/- 17	40	50 / 50	38.5 X 18.6 X 22.5	Thru Hole -mm
F5405	45.000	1 3	+/- 30 +/-55	1	3.5	40	+/- 200	50	50 / 100	1.86" X 0.50" X 0.34 "	SMD-pins-mm
F9135	50.000	3	+/- 5	1	3	30	+/- 50	50	50 / 50	56 X 20.4 X 16	mm-SMA-SMD
F5356	63.078	3	+/- 6 min +/- 12 max	0.5	6	60	+/- 22	60	50 / 50	55 X 20 X 22	Thru Hole -mm
F5325	69.800	0.5 3	+/- 4 min +/- 17 max	0.5	4.5	60	+/- 300	60	50 / 50	1.43" X 0.88" X 0.39"	Thru Hole - in
F9970	70.000	3	+/- 100	0.3	6	60	+/- 500	60	50 / 50	1.75" X 0.60" X 0.60"	in-PINS-SMD
F9949	70.000	1	+/- 170	1	6	30	+/- 400	80	50 / 50	40 X 18 X 9	Thru Hole -mm
F9991	71.5625	3	+/- 25	1	5	80	+/- 100	80	50 / 50	38 X 18 X 14	SMD-pins-mm
F5353	75.000	6	+/- 11	1	6	80	+/- 170	60	50 / 50	2.0" X 0.50" X 0.45 "	PINS-SMD-in
F9776	94.050	3	+/- 65	1.5	9	60	+/- 650	40	50 / 50	56 X 19 X 9.5	Thru Hole -mm
F9154	100.896	0.5	+/- 5	0.5	3	30	+/- 96	43	50 / 50	25.2 X 16 X 10.6	Thru Hole -mm
F9828	100.7983	0.2 3	+/- 2 min +/- 15 max	0.2	3	20 30	+/- 30 +/- 100	40	50 / 50	25 X 16 X 10.6	Thru Hole -mm
F9160	109.344	1	+/- 6	1	6	60	+/- 50	80	50 / 50	36 X 11.5 X 8	Thru Hole -mm
F9747	109.350	1	+/- 5	1	6	50	+/- 50	55	50 / 50	36 X 11.5 X 8	Thru Hole -mm
F9184	124.800	3 6	+/- 35 min +/- 50 max	0.5	4	30 40	+/- 120 +/- 150	70	50 / 50	36 X 16.5 X 13.3	Thru Hole -mm
F5469	124.800	3	+/- 35	1	4	60 70	+/- 400 +/- 768	60	50 / 50	25.2 X 15.8 X 10.2	Thru Hole -mm
F9226	124.800	3	+/- 16	0.5	6	23 33	+/- 100 +/- 200	60	50 / 50	25.2 X 16 X 13.3	Thru Hole -mm
F5372	141.55776	0.5 3	+/- 3.2 min +/- 8 max	0.5	4.5	40 60	+/- 50 +/- 100	60	200 / 200	1.70" x 0.65" x 0.55"	Thru Hole - in

Notes: OPT does not carry product in stock. The specifications listed above may not represent your requirements, please contact the local rep of OPT or the factory direct for pricing and delivery and for any other custom specifications that you may need. e-mail: sales@opthellas.com

Lumped Element (LC) Filters

Low Pass | Band Pass | High Pass | Band Reject
Diplexers



- Frequency Range 1 KHz to 3 000 MHz
- Relative Bandwidths 2 % to 100 %
- Power up to 1000 Watts
- Package Configurations
 - Through Hole
 - Connectorized
 - SMD

OPT HELLAS utilizes modern dynamic CAD and CAE software to successfully design LC filters in the frequency range of 1 KHz to 3 GHz. Using these design tools we can generate transfer functions specific to particular applications. OPT HELLAS offers all standard design types, that is: Chebyshev, butterworth, Elliptic, Causian and Bessel functions.

The LC filters listed below are REPRESENTATIVE of many filters designed and manufactured during the past years. If the desired frequency and specifications either electrical or mechanical are not suitable for your application please contact the local representative of OPT or contact the factory direct, e-mail : sales@ophellas.com

Low Pass Filter Type

OPT Model	Cut-off frequency (MHz)	Operating Frequency (MHz)	Insertion Loss (db max)	Rejection Band		Zin / Zout (Ω)	VSWR	Power Watts	Filter Package Dimensions L X W X H	Connector Type & units
				db	Frequency (MHz)					
F9920	43	30 to 43	0.6	47	60	50 / 50	1.35 : 1	70	78.2 X 63.5 X 18.8	SMD - mm
	61.5	43 to 61.5	0.6	47	86	50 / 50	1.35 : 1	70		
	88	61.5 to 88	0.6	47	123	50 / 50	1.35 : 1	70		
F9225	30	2 to 30	0.5	60 70	40 to 1000 1000 to 3000	50 / 50	1.5 : 1	200	170 X 44.5 X 29	N - Type - mm
F9575	400	225 to 400	0.5	30 60	450 to 500 500 to 2000	50 / 50	1.4 : 1	200	135 X 50 X 25	SMA - MM
F9186	400	220 to 400	0.5	45 60	at 450 at 500	50 / 50	1.4 : 1	300	109 X 99 X 29	N - Type - mm
F5481-HP	1764	1800 to 4000	1.5	50	at 1000	50 / 50	1.5 : 1	30 dbm	25.4 X 9.7 X 9.7	Thru Hole - mm
F5476	3060	20 to 3000	1.5	40 55	at 3784 at 4700	50 / 50	1.5 : 1	30 dbm	25.4 X 9.7 X 9.7	Thru Hole - mm

06 Band Pass LC Filter Type

OPT Model	Center Frequency (MHz)	Pass Band		Ripple (db max)	Insertion Loss (db max)	Stop Band		Ultimate (db min)	Zin / Zout (Ω)	VSWR	Filter Package Dimensions L X W X H	Filter Package Type
		(db)	Frequency (MHz)			(db)	Frequency (MHz)					
F5415	2.25	3	+/- 0.200	0.5	2.5	50	+/- 0.320	50	50 / 50	1.5 : 1	2.35" X 0.95" x 0.62"	Thru Hole - in
F5448	10.7	3	+/- 0.100	0.5	14	60	+/- 0.290	60	500 / 500		3.2" X 1.2" X 1.2"	Thru Hole - in
F5453	21.4	3	+/- 0.500	1	5	60	+/- 4.0	70	50 / 50	1.7 : 1	1.75" X 0.60" X 0.50"	Thru Hole - in
F9978	21.4	3	+/- 6.0	1	4	60	+/- 21	60	50 / 50	1.5 : 1	1.58" X 0.50" X 0.52"	Thru Hole - in
F5379	30	3	+/- 0.430	1	11	50	+/- 2.25	50	75 / 75		2.50" X 1.00" X 0.625"	Thru Hole - in
F9224	59	1.5	+/- 29	1.5	1.5	80 85	at 25 at 225	85	50 / 50	1.5 : 1	195 X 44.5 X 29	N-type , 100 W
F9131	70	3	+/- 5.5	0.5	4.5	43	45 to 58	40	50 / 50	1.5 : 1	1.80" X 0.50" X 0.25"	SMD - pins -in
F5400	110	3	+/- 2	1.5	5.25	50	80 to 15	50	50 / 50	2.1 : 1	1.45" X 0.50" X 0.45 "	Thru Hole - in
F5399	113	3	+/- 5	2.3	3.5	50	78 to 165	50	50 / 50	2.6 : 1	1.45" X 0.50" X 0.45 "	Thru Hole - in
F9912	121.5	3	+/- 3	1	5	65	at 42.8	65	50 / 50		25.4 X 13.5 X 10.7	SMD - mm
F9101	160	1	+/- 20	0.6	3	60	at 50	60	50 / 50	1.5 : 1	1.63" X 0.625" X 0.35"	SMD - in
		3	+/- 25			60	at 250					
F5472	250	3	+/- 5	0.5	5	80 65	at 125 at 500	50	50 / 50	2 : 1	0.90" X 0.40" X 0.35 "	SMD - in
F5477	1 000	3	+/- 25	0.5	1.5	75 55	at 500 at 1500	50	50 / 50	1.5 : 1	20 X 16 X 6	Pins -mm
F5479	2500	3	+/- 37.5	0.5	1.5	60 55	at 2000 at 3000	50	50 / 50	1.5 : 1	20 X 16 X 6	Pins -mm
F5480	3000	3	+/- 50	0.5	1.5	70 60	at 2000 at 4000	50	50 / 50	1.5 : 1	20 X 16 X 6	Pins -mm
F5443	59	3	+/- 3	1.0	3.5	35	+/- 12	40	50 / 50	1.8 : 1	1.65" X 1.10" X 0.40"	SMD - in DIPLEXER
	91	3	+/- 3	1.0	3.5	35	+/- 12	40	50 / 50	1.8 : 1		

Notes: OPT does not carry product in stock. The specifications listed above may not represent your requirements , please contact the local rep of OPT or the factory direct for pricing and delivery and for any other custom specifications that you may need. e-mail: sales@opthellas.com

Custom RF Assemblies

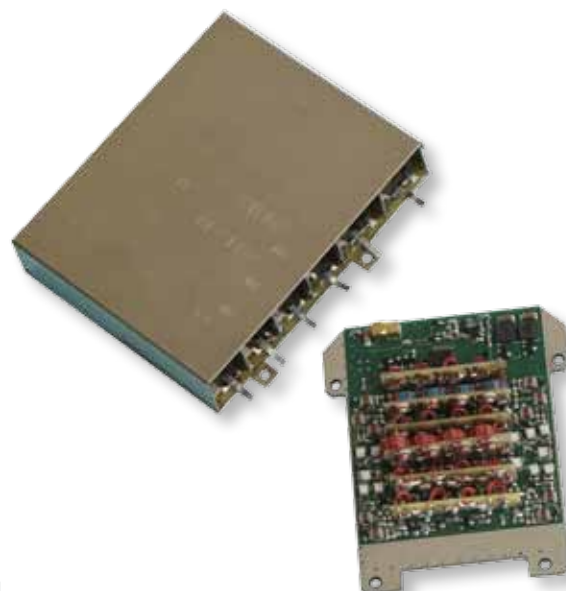
OPT HELLAS offers custom RF Assemblies that integrate RF filters with active switches and LNA components.

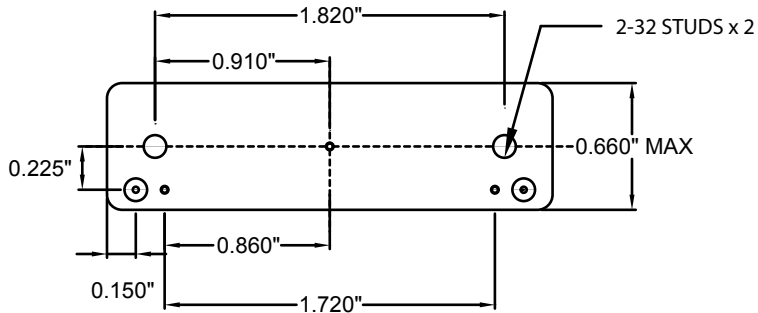
Example: BANK filter Module 30 to 512 MHz.

The Bank Filter module operates in the frequency range of 30 to 512 MHz which can be used both in Transmitting and Receiving mode. Transmitting mode works as a 6 channel Harmonic filter where each band is selected automatically. In the receiving mode the module operates as a gain block providing High Linearity and Low noise operation.

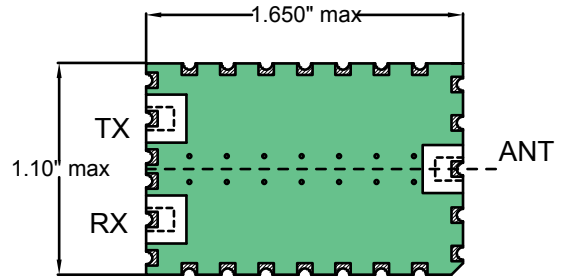
- Frequency Range 30 to 512 MHz
- Number of Channels 6
- Power Handling 10 Watts
- Insertion Loss 2.3 db max
- VSWR 1.5 : 1
- Zin = Zout 50 Ω
- Switching time $\leq 50 \mu\text{sec}$.

For complete DATA SHEET please contact the local rep of OPT or contact the factory direct.
e-mail: sales@opthellas.com

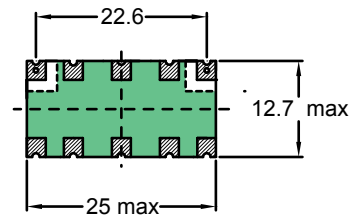




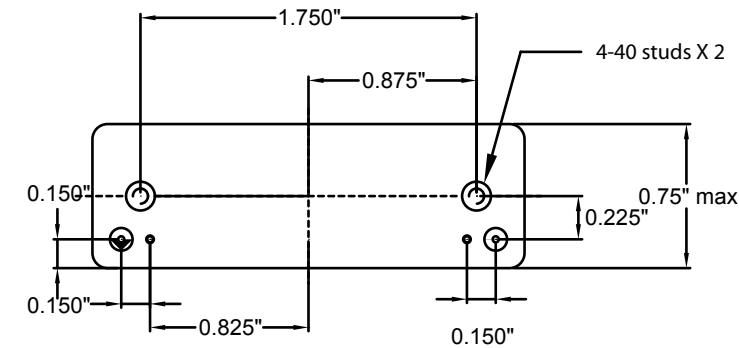
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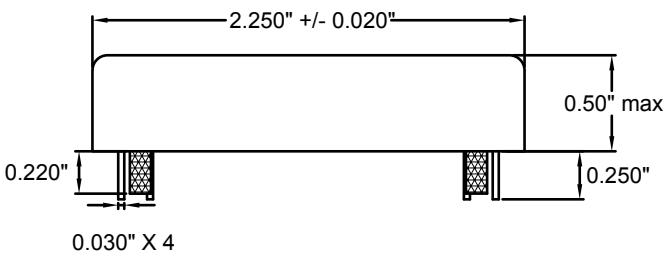
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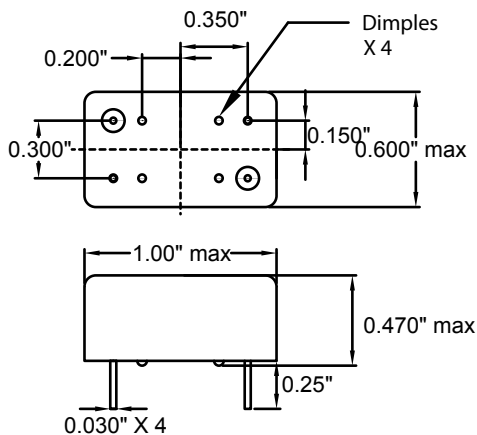
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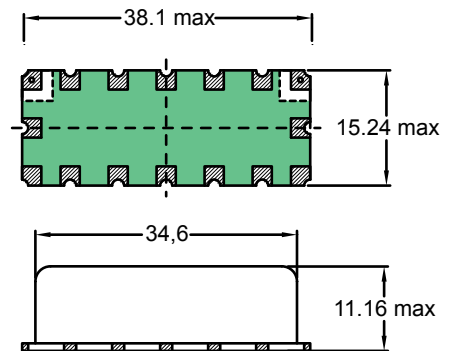
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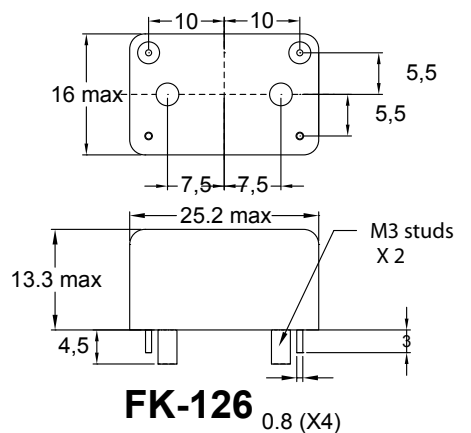
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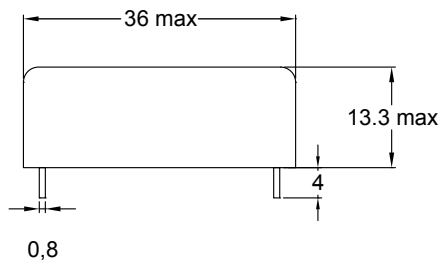
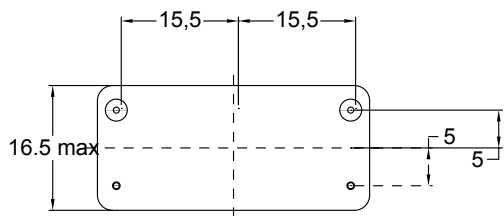
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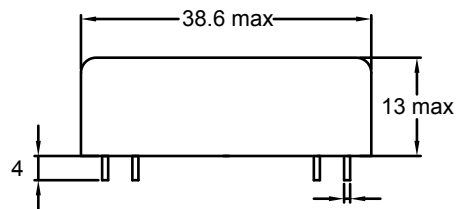
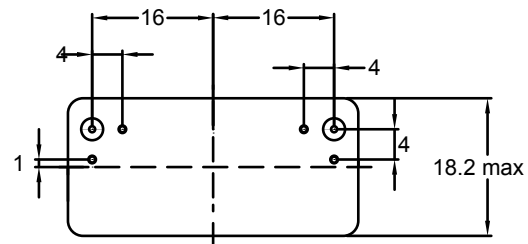
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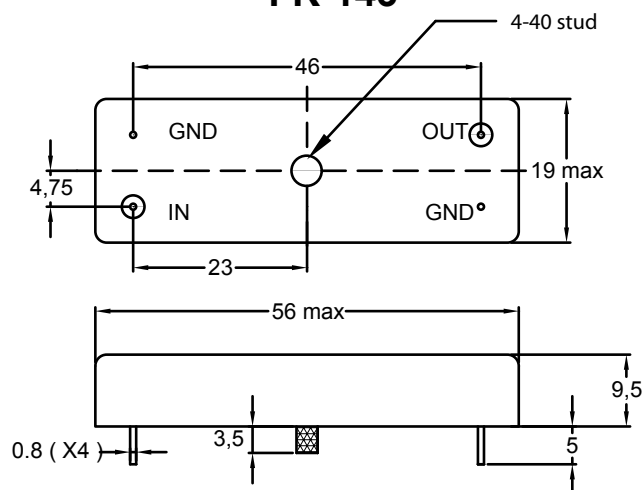
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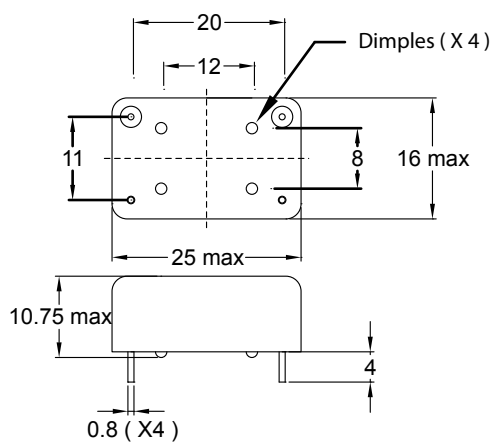
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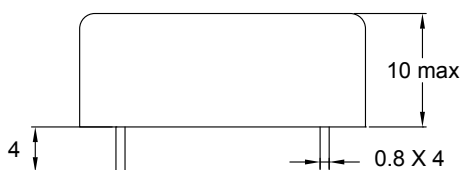
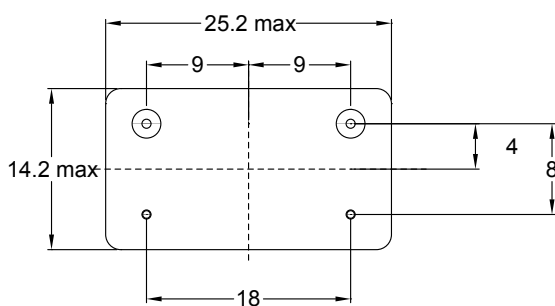
FK-141 0.8 (X 6)



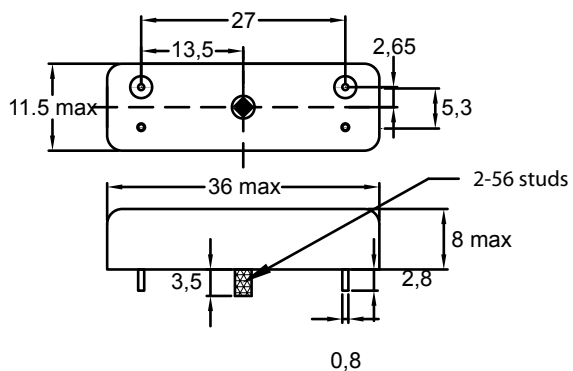
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FK-254



FK-140

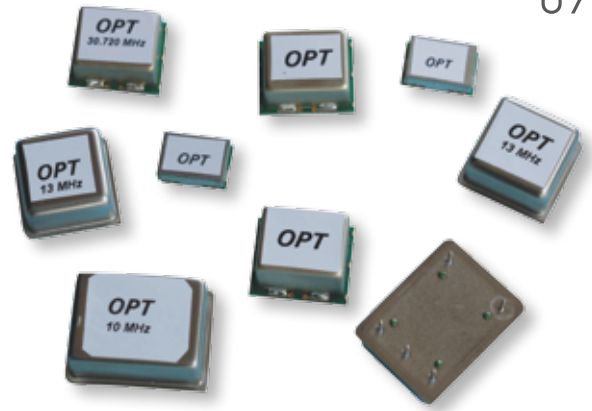


FK-147

OPT introduces a new line of custom, high performance, tight tolerance oscillators for various timing applications, from tactical radios, to telecom and SATCOM.

Our products deliver frequency stability in parts per million (PPM), excellent phase noise and jitter performance, and many standard frequencies. Standard pin feedthru or SMD packages exist as well as custom designs or legacy packages.

In addition, we offer multiple output logic options (LVDS, PECL, HCOMS, Clipped Sine) as well as different power supply options.



OPT High Performance OCXO Solutions

Our OCXO Series, Oven Controlled Crystal Oscillators, are designed to meet the increasing demand for high performance reference solutions where phase noise and other parameters are critical.

Products features include low power, fast warm up, relatively small packages as well as as highly stable DOXCO's dual oven products.

Please see below a representative selection.

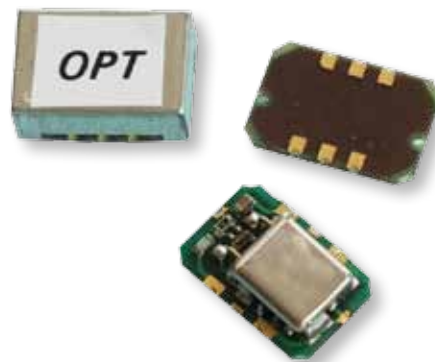


OCXO's	Frequency Range	Output Type	Phase Noise (dBc/Hz): Typical	Frequency Stability	Supply Voltage and Current	Package (Max. Dimensions)	Product Features
OPT-OX1207-10MHz-A	10 MHz	HCMOS	At 10 Hz -122 ; At 100 Hz -145	+/- 10 ppb	5V +/- 5%	20.60 x 20.60 x 11.00 mm	Offers High Stability in low profile package
			At 1KHz -150 ; At 10KHz -152	From -40C to +70C	500 mA max. at Turn-on		Offers 1.1 Watt max. steady state power at 25C
OPT-OX1206-10MHz-A	10 MHz	6 dBm sine	At 10 Hz -125 ; At 100 Hz -145	+/- 3.0 ppb	5V +/- 5%	20.40 x 20.40 x 14.60 mm	Smallest Double Oven
			At 1KHz -155 ; At 10KHz -163	From -40C to 85C	850 mA max. at Turn-on		With 50% Less Power ; 1 Watt at 25C typ.
OPT-OX1201-100MHz-A	100 MHz	8 dBm sine	At 10 Hz -98 ; At 100 Hz -128	+/- 100 ppb	5V +/- 5%	20.50 x 15.10 x 10.00 mm	45 seconds warm-up within pull range
			At 1KHz -150 ; At 10KHz -160	From -40C to 85C	220 mA max.; 50 mA max. ss		smallest low noise, low power 100MHz OCXO
OPT-OX1202	5 to 50 MHz	HCMOS only	At 10 Hz -125 ; At 100 Hz -145	+/- 50 ppb	5.0V or 3.3V options	15.90 x 15.10 x 10.00 mm	45 seconds warm-up within pull range
			At 1KHz -155 ; @ 10MHz	From -40C to 85C	220 mA max.; 50 mA max. ss		smallest low noise, low power 5 to 50 MHz OCXO

OPT Introduces a line of high performance, low jitter TCXO's (temperature control crystal oscillators) in standard SMD or integrated assembly packages.

Products designed to minimize Bit Error rates in high performance telecommunication systems.

Please see below for a typical selection.



TCXO's	Frequency Range	Output Type	Phase Noise (dBc/Hz) Typical	Frequency Stability	Supply Voltage and Current	Package (Max. Dimensions)	Product Features
OPT-TX1205-9.6MHz-X	9.6MHz	Low Noise Clipped sine	100 Hz -123 ; 1000 Hz -140	+/- 0.120 ppm to +/- 0.280 ppm	5V +/- 5%	7.10 x 5.10 x 2.00 mm	Ultra-Stable Precision VCTCXO
			10 KHz -150 ; 100 KHz -153		1.35 mA typical	SMD Ceramic	Multiple Stability Options
				Ref. to (Fmax. + Fmin.)/2 From -40C to 85C	3.50 mA max.		Very Good Phase Noise
							+/- 1.0 ppm Aging Projection over 20 years
OPT-TX1206	5 to 26 MHz	HCMOS / Clipped Sine	@ 12.8 MHz HCMOS ; 100 Hz -120	+/- 0.280 ppm	3.3V or 5.0V options	5.20 x 3.40 x 1.65 mm	Ultra-Stable Precision TCXO or VCTCXO
			1KHz -140 ; 10KHz -148	Ref. to (Fmax. + Fmin.)/2	3.5 mA max. with clipped sine	SMD Ceramic	+/- 2.5 ppm Aging Projection over 20 years
				From -40C to 85C	6 mA max. with cmos		with Very Good Phase Noise
OPT-TX1212-50MHz-A	50 MHz	Very Low Noise HCMOS	10 Hz -97 ; 100 Hz -129	+/- 2.500 ppm	3.3V +/- 5%	11.40 x 9.60 x 1.85 mm	Best in Class Phase Noise for 50MHz TCXO
			1KHz -149 ; 10KHz -159	From -20C to 70C	10 mA max.	SMD	Using Low Noise Thermistor Based Analog Compensation
OPT-TX1217-100MHz-B	100 MHz	Low Noise 3 dBm sine	100 Hz ; -118	+/- 2.000 ppm	5V +/- 5%	20.80 x 13.20 x 10.00 mm	Best in Class Phase Noise for 100 MHz VCTCXO
			1KHz -138 ; 10KHz -148	From -40C to 65C	30 mA max.	Leaded DIP Housing	Using Low Noise Thermistor Based Analog Compensation
OPT-TX1221-20MHz-A	20 MHz	HCMOS	100 Hz -125 ; 1000 -150	+/- 50 ppb	3.3V +/- 5%	36.07 x 27.00 x 13.26 mm	Best in Class Frequency Stable VCTCXO
			10KHz -155 ; 100KHz -158	Ref. (Fmax - Fmin)/(Fmax + Fmin)	15 mA max.	Euro-case Industry Standard	Using Patented Compensation Technologies and Processing
				From -55C to 85C			TypicWal G-sensitivity of 2.5 ppb / G ;
				Extended Temperature to 95C available			Less than 0.7 ppb / G available with 100% screening
OPT-TX1222	10 to 50 MHz	HCMOS / Clipped Sine	@ 10 MHz: 100 Hz -120 ; 1000 -140	+/- 2.000 ppm	3.3V +/- 5%	5.00 x 3.20 x 2.00 mm	Extreme Shock and Vibration
			10KHz -150 ; 100KHz -155		3.5 mA max. with clipped sine		Typical G-sensitivity of 2.5 ppb / G ;
				From -55C to 95C	6 mA max. with cmos	SMD Ceramic	Less than 0.7 ppb / G available with 100% screening

OPT High Performance VCO (Voltage Controlled Oscillator) Solutions

OPT Introduces a line of standard and custom VCO's for a diverse range of applications such as Test and Measurement, SATCOM, Telecom and Digital Mobile Radio.

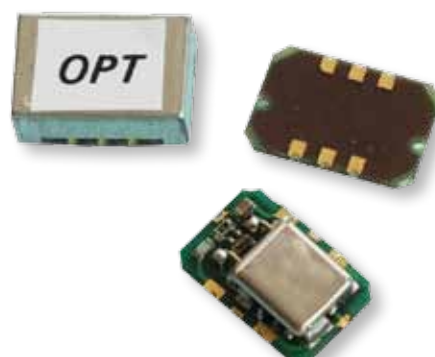
Both Narrow and Wideband designs exist. Parts are screened for all critical parameters like phase noise and tuning sensitivity across full operating temperature.



VCO's	Frequency (MHz)	Output Type	Phase Noise (dBc/Hz typ.)	Tuning Sensitivity (MHz / Volt)	Tuning Voltage Range	Supply Voltage & Current	Package Size	Product Features
OPT-VCO3360	665 to 685	5 dBm sine min	@ 10KHz offset	10 typ	0V to 5V	5V	12.70 x 12.70 x 3.90 mm	Low Phase Noise, Linear Tuning
			-119			27 mA typ		Low Pushing, Low Pulling
OPT-VCO3361	825 to 930	3 dBm sine min	@ 10KHz offset	30 typ	0V to 5.5V	5V	12.70 x 12.70 x 3.90 mm	Low Phase Noise, Linear Tuning
			-105			25 mA typ		Low Pushing, Low Pulling
OPT-VCO4448	4400 to 4800	3 dBm sine typ.	@ 10KHz offset	40 typ	0.5V to 18.0V	10V	12.70 x 12.70 x 3.90 mm	Low Phase Noise, Linear Tuning
			-93			40 mA typ		Low Pushing, Low Pulling
OPT-VCO5558	5500 to 5815	0 dBm sine typ.	@ 10KHz offset	100 typ	0.5V to 4.5V	5V	12.70 x 12.70 x 3.90 mm	Low Phase Noise, Linear Tuning
			-90			30 mA typ		Low Pushing, Low Pulling
OPT-VCO1680	800 to 1600	6 dBm sine typ.	@ 10KHz offset	200 typ	0V to 5.0V	5V	12.70 x 12.70 x 3.90 mm	Low Phase Noise, Linear Tuning
			-100			25 mA typ		Low Pushing, Low Pulling
OPT-VCO5636	3600 to 5600	2 dBm sine typ.	@ 10KHz offset	70 to 280 typ	1.0V to 18.0V	5V	12.70 x 12.70 x 3.90 mm	Low Phase Noise, Linear Tuning
			-78			50 mA typ		Low Pushing, Low Pulling
OPT-VCO1000	2000 to 4000	5 dBm sine typ.	@ 10KHz offset	100 to 235 typ	0.5V to 16.0V	5V	12.70 x 12.70 x 3.90 mm	Low Phase Noise, Linear Tuning
			-90			50 mA typ		Low Pushing, Low Pulling

OPT XO (crystal oscillator) Solutions

OPT introduces a line of standard 5 x 7 ceramic package SMD clock oscillators for various timing applications. Both LVDS and PECL logic outputs exist as well as several power supply options.





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