Qnnect

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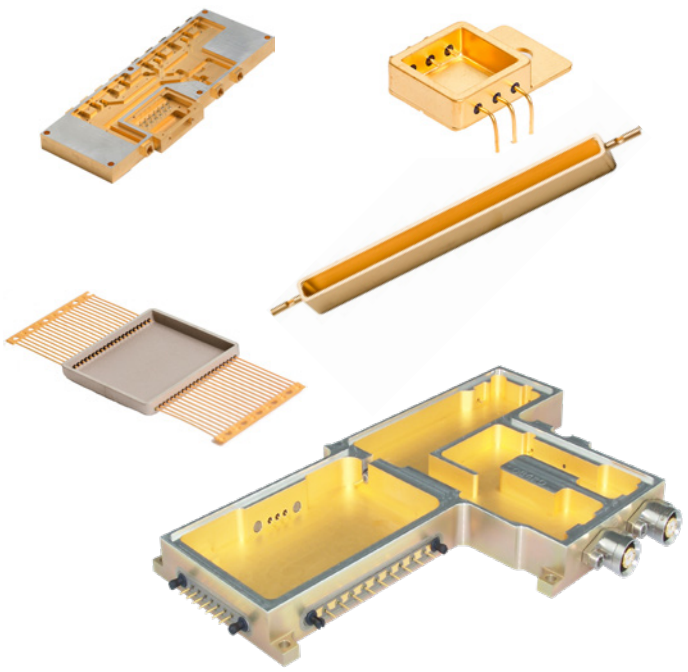
Hermetic Electronic Packaging

Overview

Qnnect specializes in the design, manufacture, and integration of ultra-rugged, hermetic electronic packaging for use in extreme environments.

Whether it's integrating hermetic components that protect satellites deep in space or producing hermetic packages for oil-drilling tools that bore deep below the earth's surface, electronic packaging from Qnnect delivers high levels of reliability under the harshest conditions.



Technical Advantages

Turn-key Electronic Packaging Solutions

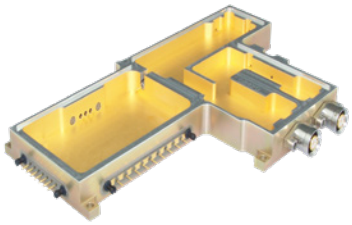
Qnnect brings our customers' designs to life by precision machining hermetic electronic packages out of aluminum, titanium, stainless steel, Kovar, and other materials.

Packages can be configured with a number of options including: direct glass-to-metal seals, ceramic-to-metal seals, bulk-head DC connectors, Nano-/Micro-/Sub-D connectors and RF/microwave connectors (SMA, SSMA, GPO, GPPO, OSSP, OSM) as well as custom interface connectors.

Laser Weld Construction

We give customers the option to integrate interconnect components via state-of-the-art laser welding processes, or the traditional solder integration method. Our laser-welded connectors and packages deliver a hermetic leak rate of <1x10-9 He at 1 ATM even through harsh thermal cycling. As an added benefit, laser weld integration means packages can be easily re-worked (even in a populated state).

Custom Machined Packages

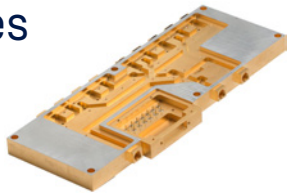


Qnnect is capable of precision machining custom hermetic electronic packages out of aluminum (forapplications that require light weight), titanium (for low CTE applications), and other materials.

We also manufacture and integrate high-performance interconnect components such as: Nano-, Micro-, and Sub-D connectors; RF/Microwave connectors; sight or wave-guide windows and custom electrical feed-thrus.

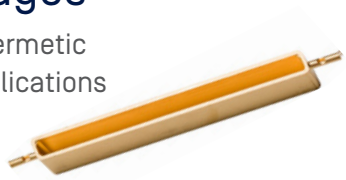
Our unique brazing capabilities give us the ability to also produce Ti packages with CuMo heat-sinks integrated in strategic locations. See our Ti Composite Packaging data sheet for more information.

Microwave Packages



Qnnect offers standard 'drop-in' and custom machined packages. We have open tooling for all standard drop-in microwave modules including: 'bolt channels,' 'pill packages' and rectangular 2-, 3- and 5-pin modules (.246" width). In addition, Qnnect can manufacture virtually any custom machined configuration in a variety of materials and feed-thru options.

Fiber Optic Packages



Qnnect produces custom hermetic packages for a range of applications including: WADM modules, modulators, attenuators, pump lasers, switches and amplifiers.

Custom, Microwave and Fiber Optic Package Configuration Options (Some Examples Below):

Housing Material	TCE (ppm/°C)	Base Material	Thermal Conductivity (W/M °K)	TCE (ppm/°C)	Density (lbs./cu.in.)	Glass Material	Lead Material
Kovar	5.9	Kovar	17	5.9	0.3020	7052/7070	Kovar
		Cu/W (15/85)	180	7.3	0.5925		
		AlSi (CE7)	120	7.0	0.1048		
		Moly.	140	5.1	0.3663		
		Cu/Mo/Cu	244	6.8	0.3490		
		Cu/Mo (15/85)	165	6.8	0.3610		
Invar	2.3	Same Base Options as Kovar (Composite Material Ratios May Differ).					
42 Alloy	5.3						
46 Alloy	7.0						
49 Alloy	8.8						
Al 6061	23.6	N/A	170	23.6	.0975	Varies	Varies
Titanium	9.2	N/A	16.4	9.2	.163	Varies	Varies

Our fiber optic and microwave packages are designed and tested per the following specifications: MIL-PRF-38534, MIL-STD-883, JEDEC STD 9 and are Hermetic to 1x10-8 atm cc/sec He.

Power Packages

Qnnect offers a wide variety of open tooling options in addition to custom capabilities for any size of power package including all the JEDEC outlines, such as TO-254, -257, -258, -259, -265, 267 and MO-078, -079. All versions of these JEDEC standard packages are available and we can also produce custom power packages. With optional ceramic seals, these power packages which offer the highest reliability for space and other stringent environmental applications.

Power Package Configuration Options

Base Material	Thermal Conductivity (W/M °K)	TCE (ppm/°C)	Density (lbs/cu./in.)	Frame Material	TCE (ppm/°C)	Insulator Material	Lead Material	Braze Material	Braze Temp.
Copper*	390	17.7	0.3230	Steel	11.7	Glass	52 Alloy CC ₸	BT(721)	780°C
GlidCop*	365	16.9				Ceramic	GlidCop		
						Glass	52 Alloy CC ₸		
						Ceramic	52 Alloy CC		
Cu/Mo/Cu	244	6.8	0.3490	Kovar	5.9	Glass	Kovar	Au/Ge	356°C
E-60	240	6.1	0.0744	46 Alloy	7.0				
E40	232	7.5	0.0831						
Cu/W 15/85**	230	6.6	0.5925	Steel	11.7	Ceramic	GlidCop	BT(721)	780°C
				Kovar	5.9		GlidCop		
				Gold	16.9		Copper		
				Copper			52 Alloy CC		
AlSi (CE7)	120	7.0	0.1048	46 Alloy	7.0	Glass	Kovar	Au/Ge	356°C
				49 Alloy	8.8				
				Kovar	5.9				
				42 Alloy	5.3				
Moly.*	140	5.1	0.3663	Kovar	5.9				
Steel	45	11.7	0.2900	Steel	11.7		52 Alloy CC ₸	BT(721)	780°C
Kovar*	17	5.6	0.3020	Kovar	5.9		Kovar	Copper	1083°C

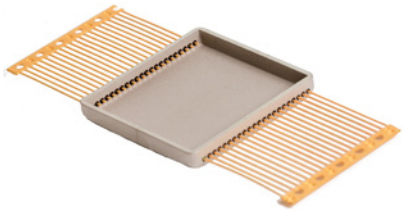
* Yield strength expressed in KSI after brazing@1000°C: Copper=8, GlidCop=48+, Kover=50, Molybdenum=81
** Copper/Tungsten is also available in 10/90 composition
₸ 52 Alloy CC on Kovar leads are also available with copper butt brazed extensions. The brazing process of DBC/BeO; DBC/Al203; thick film BeO substrate is available along with ground/drain clip attachment .

Power Package w/Ceramic Seals Configuration Options

Base Material	Thermal Conductivity (W/M °K)	TCE (ppm/°C)	Frame Material	TCE (ppm/°C)	Insulator Material	Lead Material	Braze Temp. (°C)
Copper	390	17.7	Copper	17.7	Ceramic	52 Alloy CC	>750
GlidCop	365	16.9				GlidCop	>750
Cu/Mo/Cu	244	6.8					>350
GlidCop	365	16.9	Steel	11.7			>750
Cu/W (18/82)*	185	7.2	Kovar	5.9			>750
Cu/W (18/82)*	185		Copper	17.7		Copper**	>750
Cu/W (18/82)*	185					52 Alloy CC	>750
AlSi (CE7)	120	7.0	49 Alloy	8.8			>250
AlSi (CE7)	120	7.0	Kovar	5.9		GlidCop	>250

* Copper Tungsten is also available in 15/85 or 10/90 composition. Thermal conductivity and thermal expansion vary slightly depending on material composition.
** 52 Alloy CC leads are also available with copper butt brazed extensions.
The brazing process of DBC/BeO; DBC/Al203 moly manganese or tungsten metallization/BEO substrate is available along with ground/drain clip.

Hybrid Packages



Qnnect produces standard flatpacks, plug-ins and platforms in all industry common configurations. Our integrated manufacturing capabilities enable us to accommodate virtually any custom packaging requirement. We can support both high- and low-volume requirements thanks to our CNC machining capabilities and power presses.

Package type options include : HTP - Hybrid Tub Plug-ins, HPP - Hybrid Platform Packages, HFF - Hybrid Frame Flatpacks. HMP - Hybrid Machine Plug-in, HTF - Hybrid Tub Flatpacks, and HMF - Hybrid Machine Flatpacks

Hybrid Package Configuration Options

Base Material	Thermal Conductivity (W/M °K)	TCE (ppm/°C)	Density (lbs/cu in.)	Frame Material	TCE (ppm/°C)	Insulator Material	Lead Material	Braze Material	Braze Temp (°C)
Cu/Mo/Cu	244	6.8	0.3490	Kovar	5.9	Glass	Kovar	Au/Ge	356
E-60	240	6.1	0.0744	46 Alloy	7.0				
E-40	232	7.5	0.0831						
Cu/W (15/85)	230	6.6	0.5925	Kovar	5.9			BT(721)	780
AlSi (CE7)	120	7.0	0.1048	46 Alloy	7.0			Au/Ge	356
				49 Alloy	8.8				
				Kovar	5.9				
				42 Alloy	5.3				
Molybdenum	140	5.1	0.3663	Kovar	5.9				
Kovar	17	5.9	0.3020	Kovar				Copper	1083

Sort sequence: Base thermal conductivity characteristics.
Kovar leads are also available with copper butt brazed extensions.

PA&E A Qnnect Company
LITRON A Qnnect Company
Sinclair A Qnnect Company

For Product Info:
hermeticsolutions.com
For Company Info:
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