



SERIES BMA

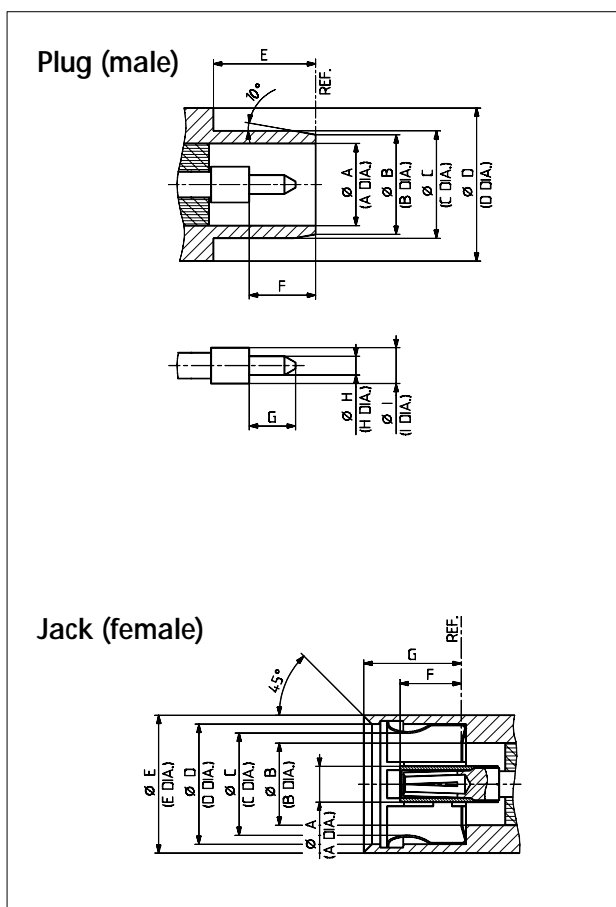
SUBMINIATURE BLIND MATE CONNECTORS

Description

SUHNER BMA blind mate connectors open up special dimensions in microwave applications up to 22 GHz. SUHNER offers a range of connectors for fixed as well as "floating" configurations with any axial or radial misalignment taken out by the outer contact of the jacks.

The BMA series presents an outstanding range of products featuring high reliability and ease of assembly.

Interface dimensions



Interface Dimensions in mm / inches

	Plug		Jack	
	min.	max.	min.	max.
A	4.09 / .161 <i>nom.</i>		1.78 / .070 <i>nom.</i>	
B	4.88 / .192 <i>nom.</i>		4.09 / .161 <i>nom.</i>	
C	5.31 / .209	5.35 / .211	---	5.08 / .200
D	7.62 / .300 <i>nom.</i>		5.71 / .225	---
E	5.03 / .198	---	7.37 / .290	---
F	3.25 / .128	---	3.05 / .120	3.23 / .127
G	2.29 / .090 <i>nom.</i>		---	5.03 / .198
H	0.90 / .035	.094 / .037		
I	1.78 / .070 <i>nom.</i>			

Interface dimensions conformable to the Standards:

USA: MIL-STD-348A/321

Compatibility

The SUHNER range of BMA connectors is fully compatible with the OSP connector series.

Technical Data

ELECTRICAL DATA	REQUIREMENTS	
Cable type	RG 402/U	RG 405/U
Impedance	50 Ω	
Frequency range	DC ... 8 GHz	
VSWR (typical values) - DC ... 18 GHz - 18 ... 22 GHz	(mated connector pair) ≤ 1.02 + 0.005 f (GHz) ≤ 1.02 + 0.008 f (GHz)	(mated connector pair) ≤ 1.05 + 0.005 f (GHz) ≤ 1.05 + 0.009 f (GHz)
RF-leakage (fully mated)	≥ 90 dB - f (GHz) ¹⁾	
Dielectric withstanding voltage (at sea level)	1.5 kV rms, 50 Hz	1.0 kV rms, 50 Hz
RF-testing voltage (at sea level)	1.0 kV rms, 5 MHz	670 V rms, 5 MHz
Insulation resistance	≥ 5 · 10 ³ MΩ	
Contact resistance - centre contact - outer contact	≤ 2 mΩ ≤ 2 mΩ	
Admissible power (at sea level and room temperature)	≤ 300 W at 3 GHz	

1) measured at interface with reference planes being in true alignment.

MECHANICAL DATA	REQUIREMENTS
Engagement force	≤ 13.5 N
Disengagement force	≥ 2 N
Contact captivation	≥ 27 N
Durability (matings)	≥ 1000

ENVIRONMENTAL DATA	TEST CONDITIONS
Temperature range	- 65° C ... + 125° C / - 85° F ... + 257° F
Thermal shock	MIL-STD-202, Method 107, Condition B
Moisture resistance	MIL-STD-202, Method 106
Corrosion	Saltspray test acc. to MIL-STD-202, Method 101, Condition B
Vibration	MIL-STD-202, Method 204, Condition D
Shock	MIL-STD-202, Method 213, Condition I

MATERIAL DATA

CONNECTOR PART	STANDARDS	MATERIAL	PLATING
Bodies	QQ-C-530 QQ-S-763	beryllium-copper, hardened stainless steel	gold
Centre contacts	QQ-C-530	beryllium-copper, hardened	gold
Spring basket	QQ-C-530	beryllium-copper	gold
Springs (floating connectors)		stainless steel	passivated
Insulators		PTFE or PFA	
Gaskets		EPDM, 40 shore A	

Some connectors may have a specification that differs from the above mentioned data.

BMA Connector Applications

Quick and reliable engagement and disengagement of multiple microwave transmission lines, high packaging density of flexible and rigid coaxial lines and cable free connection of modules to motherboard are some needs of modern microwave systems.

SUHNER BMA connectors offer an economical solution for the most demanding interconnector applications found today in civil and military microwave circuits.

To help ensure a problem free, reliable long term operation the following guidelines should be used.

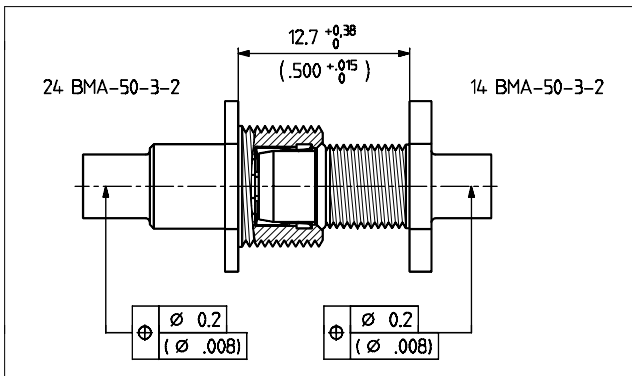
Assembly hints

Radial and axial misalignments can be accommodated with the spring outer contacts of the SUHNER BMA connector.

These misalignments are due to the build up of tolerances with the major contributions coming from: Axial direction: mounting plate distances and plate distortions.

Radial direction: mounting hole positions and concentricity, plate distortion and misalignment.

Rigid Mounting



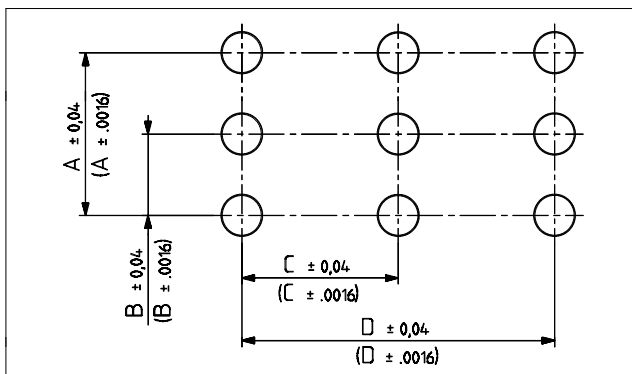
Maximum misalignment

Axial: 0.38 mm / .015 in. *

Radial: 0.20 mm / .008 in.

* For applications with reduced specifications 0.76 mm / .030 in. is allowable.

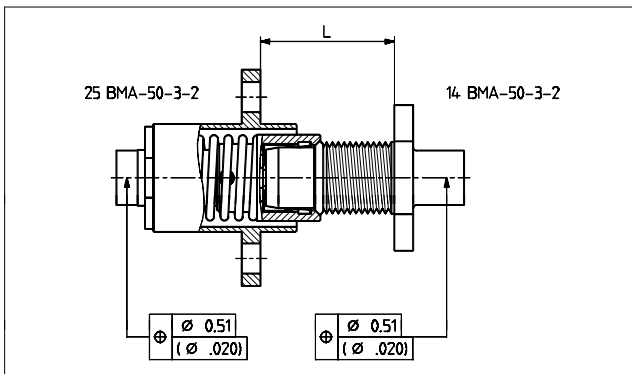
Hole Dimensions



To avoid tolerances build up all mounting holes must be toleranced from a single datum point.

It is also important that both of the mounting plates are properly affixed and correctly positioned.

Floating Assembly



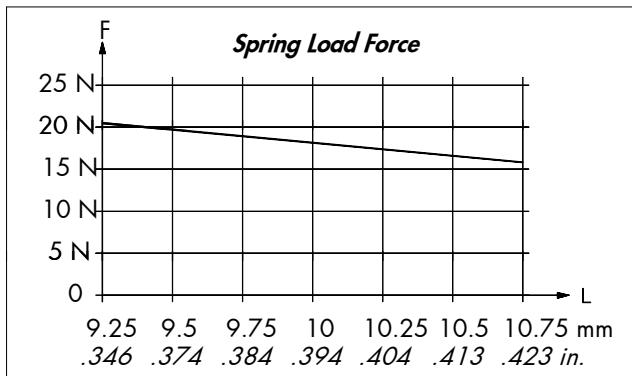
The increased tolerance correction of the connector is achieved by using an extra spring system.

This allows the centre assembly of the connector to move freely within the flange body.

Recommended maximum tolerances:

Axial: 1.52 mm / .060 in.

Radial: 0.51 mm / .020 in.



The adjacent diagram shows the relationship between the connector preloading force and the separation distance "L" between the mounting reference planes for a typical connector pair (25 BMA-50-3-2 and 14 BMA-50-3-2).

To ensure optimum contact under extreme radial misalignment the following points must be considered:

A:

The maximum misalignment tolerances must not be exceeded. Any possible bending of the mounting plate due to the spring preloading of the individual connectors must be taken into account.

If distortion occurs the following steps should be taken to minimize the effect:

- re-dimensioning
- bracing of the mounting plate
- reduction of maximum connector preloading force which will result in the limitation of length L.

B:

A minimum preloading force of 16 N must be ensured for each connector pair so that the maximum engaging force will be exceeded. This represents the upper limit of separation. For the example above this is a length L of maximum 10.65 mm / .419 in.

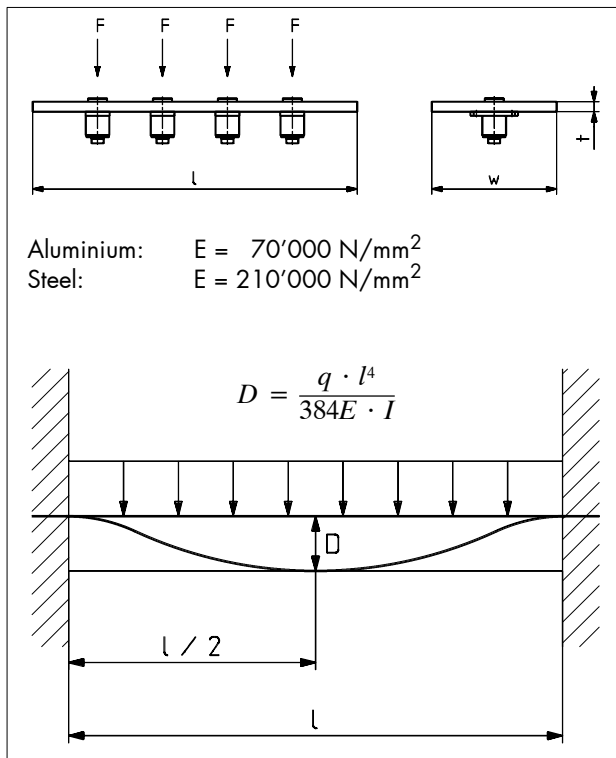
Data on other connector combinations available on request.

For the dimensioning of the holes the same points must be considered as for the rigid assembly.

Mounting Plate Bending

For an array of BMA connectors to be mounted on a chassis, the forces on the connectors must be taken into account and in the case of a floating assembly the preloading forces must be considered.

For a simplified calculation the mounting plate can be considered as a beam under deflection, thus the bending is:



Legend:

D	Deflection
E	Modulus of Elasticity
F	Preloading force
I	moment of beam
l	length of panel
n	number of connectors
q	resultant force per unit length
t	thickness of panel
w	width of panel

Example:

4 Connectors of type 25 BMA-50-3-2, each with a preloading force F , of 20 N:

$$I = \frac{w \cdot t^3}{12}$$

$$q = \frac{Fn}{l} = \frac{4 \cdot 20}{l}$$

$$D = \frac{4 \cdot 20 \cdot l^3}{384E \cdot I}$$

Using the resulting bending value it can be seen if the maximum tolerances will be exceeded.