SERIES SMT MMCX
MICROMINIATURE COAXIAL CONNECTORS

Description

SUHNER SMT MMCX connectors form a new generation of coaxial connectors. They fully meet today's SMT (Surface Mounted Technology) requirements with superior design, material selection and packaging.
The SMT MMCX incorporates all the advantages of the well-proven MMCX interface:
- high quality of a traditional PCB connector
- excellent reproducibility of electrical characteristics up to 6 GHz
- outstanding mechanical characteristics due to the superior MMCX snap-on mechanism
- wide MMCX product range with many choices of cable type, connector style and adaptors.

The combination design is capable of both vertical and horizontal mounting. This allows stocking of only one part number for customers who load their own SMT magazines.
SUHNER SMT connectors are suitable for all reflow-soldered SMT-PCBs where impedance matching or screened signal transmission is necessary.

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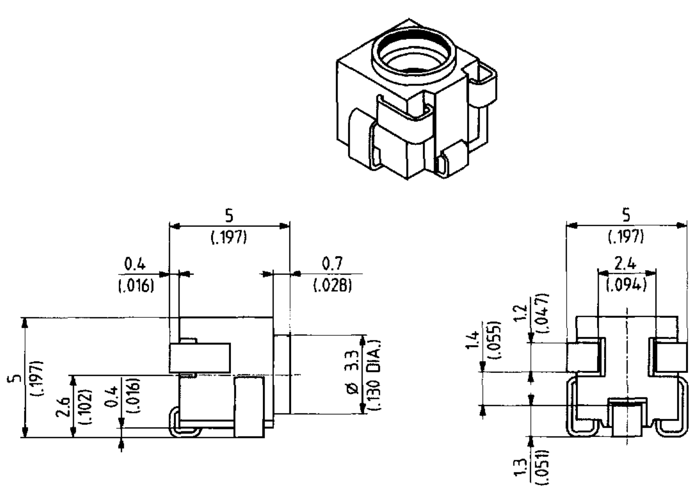
Dimensions



Technical Data

ELECTRICAL DATA	CECC 22000	TEST REQUIREMENTS
Impedance		50 Ω
Frequency range		DC ... 6 GHz (see also Appendix page 436)
VSWR (mated pair) – up to 4 GHz – 4 up to 6 GHz		 ≤ 1.15 ≤ 1.40
Dielectric withstanding voltage (at sea level)	4.4.5	500 V rms, 50 Hz
Working voltage (at sea level)		≤ 170 V rms, 50 Hz
Insulation resistance	4.4.4	≥ 500 MΩ
Contact resistance – center conductor – outer conductor	 4.4.2 4.4.3	 ≤ 10 mΩ ≤ 5 mΩ

MECHANICAL DATA	CECC 22000	TEST REQUIREMENTS
Engagement force	4.5.4	≤ 15 N / *3.4 lbs*
Disengagement force	4.5.4	6 N ... 15 N / *1.4 ... 3.4 lbs*
Contact captivation	4.5.2	≥ 10 N / *2.3 lbs*
Durability (matings)	4.7.1	≥ 500

ENVIRONMENTAL DATA	CECC 22000 TEST CONDITIONS	EQUIVALENT MIL TEST CONDITIONS
Temperature range		– 40°C ... + 90°C / *– 40°F ... + 194°F*
Climatic class acc. to IEC	4.6.5 → 40 / 90 / 21	
Temperature shock	4.6.7	MIL–STD–202, Method 107, – 40°C/ *– 40°F* and + 90°C/ *+ 194°F*, 30 min. each
Humidity	4.6.6	MIL–STD–202, Method 103, Condition B
Vibration	4.6.3	3 cycles in 3 opposite directions 10–150 Hz, 10–60 Hz: 0.75 mm/*.030 in.*, 60–150 Hz: 10 g
Mechanical shock	4.6.4	MIL–STD–202, Method 213, Condition B

PROCESSING DATA	CECC 00802	TEST
Soldering method (excluding wave soldering)	6.2 class A	7.2.4. a), cat. 1 and 3
Resistance to soldering heat	7.2.2	7.2.4. a), cat. 1
Solderability	7.2.1	7.2.4. b)
Leaching	7.2.3	7.2.4. b), 10 s
Adherent to the print – bending of PCB – shearing – pulling (vertical to PCB)	 7.3.2 7.3.3	 1 mm/*.040 in.*, 30 s 40 N/*9.0 lbs*, 10 s 60 N/*13.5 lbs*, 10 s

MATERIAL DATA

CONNECTOR PART	STANDARDS	MATERIAL	PLATING
Leads Contact socket	ASTM–B–103	phosphor bronze	tinned gold
Outer conductor	QQ–B–626	brass	gold
Body / insulator		LCP (liquid crystal polymer)	

SMT MMCX Connectors

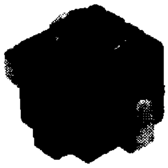
SMT combination jack

bulk packaging 100 pcs.

SUHNER TYPE	Ident. no.	PCB-Layout	Weight	Notes
90 MMCX-S50-0-51	650505	see application notes	0.20 g/.007 oz.	

SMT jack for straight (vertical) applications

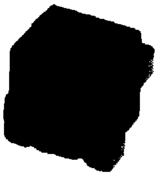
tape-and-reel packaging



SUHNER TYPE	Ident. no.	PCB-Layout	Weight	Notes
82 MMCX-S50-0-51	650299	see application notes	0.20 g/.007 oz.	blister tape containing 750 pcs.
82 MMCX-S50-0-51	650504	see application notes	0.20 g/.007 oz.	blister tape containing 1500 pcs.

SMT jack for right angle (horizontal) applications

tape-and-reel packaging



SUHNER TYPE	Ident. no.	PCB-Layout	Weight	Notes
85 MMCX-S50-0-51	650298	see application notes	0.20 g/.007 oz.	blister tape containing 750 pcs.
85 MMCX-S50-0-51	650503	see application notes	0.20 g/.007 oz.	blister tape containing 1500 pcs.

cable groups see pages 36 assembly tools see page 403 mounting holes see page 441

Packaging

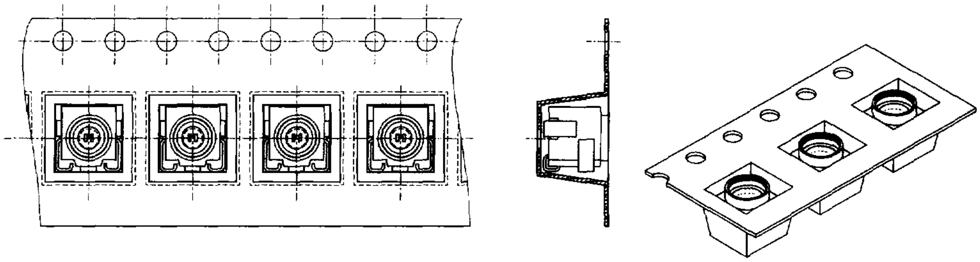
Blister tape supply in accordance with IEC 286–3/EIA–481

For automated placement the connectors can be supplied on industry standard tape-and-reel. Depending on the application, they are packaged uniformly either for vertical or horizontal mounting.

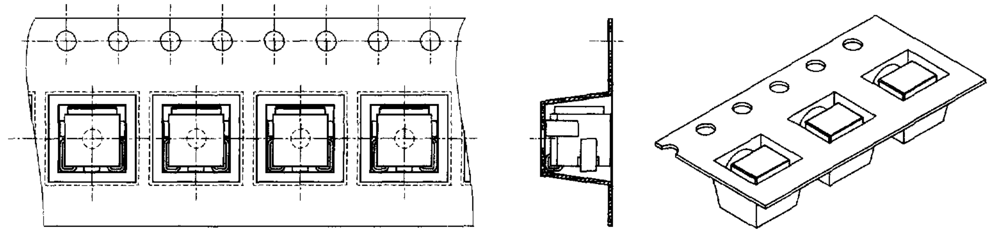
Bulk supply in bags of 100 pcs.

(90 MMCX–S50–0–51)

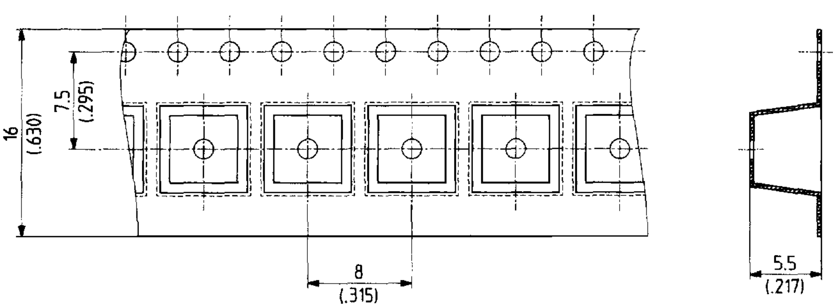
This delivery form supports vertical or horizontal applications of the SMT MMCX connector.
It is suitable for manual or automated tube fed pick-and-place assembly.



1. straight (vertical) application (82 MMCX–S50–0–51)



2. right angle (horizontal) application (85 MMCX–S50–0–51)

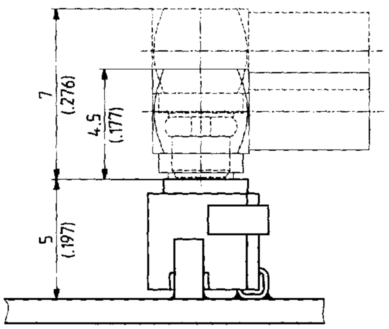


Dimensions of blister carrier tape

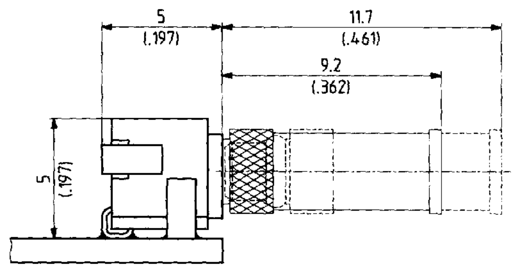
The 16 mm/*.63 inches* blister tape is delivered on reels of 330 mm/*13 inches* diameter and in tough cardboard boxes.

Application Notes

Dimensions of mated pair and clearance for mating



Vertical mounting together with a right angle cable connector (can be rotated by 360°)



Horizontal mounting together with a straight cable connector

Appropriate operation

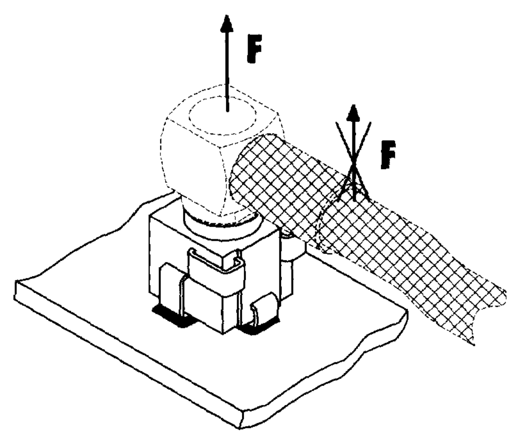
Surface-mounted electronic components exhibit a lower adherence force to the PCB than through-hole components.
The solder joints act as a mechanical fixation to the board and also function as the electrical contact.
Therefore the following has to be considered:

- Avoid forces from the cable of the mating connector to the surface mount connector.
  Fix the cable sufficiently and in several places.
- Apply only axial forces during the mating and demating of the connector parts.

Non-axial forces — such as improper pulling at the cable entry or the cable portion of right angle mating connector — may cause excessive torque forces, which could result in damage to the solder joints.

Recommendation:
Application of the assembly tools 74 Z-0-0-225 or 74 Z-0-0-272 when disengaging right angle connectors. The tool 74 Z-0-0-272 can simultaneously be used as a mating support for straight connectors.

Warning:
force must not be applied to this region

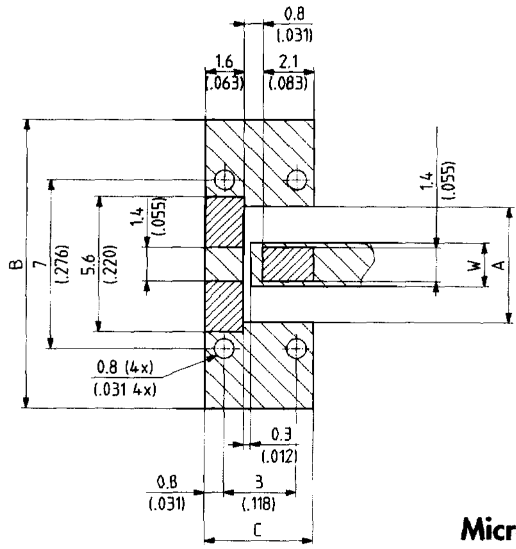


Recommended mounting pattern

MATERIAL FR 4 (ε_r = 4.6)

pattern

land (free of solder mask)



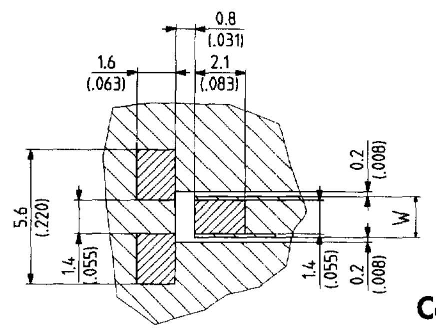
Microstrip line

PCB thickness	W	A	B	C
1.0 mm / *.039 in.*	1.8 / *.071*	2.4 / *.094*	12 / *.472*	4.5 / *.177*
1.6 mm / *.063 in.*	2.8 / *.110*	4.8 / *.189*	16 / *.630*	5.0 / *.197*

MATERIAL FR 4 (ε_r = 4.6)

pattern

land (free of solder mask)



Coplanar line

PCB thickness	W
0.8 mm / *.031 in.*	1.85 mm / *.037 in.*
1.0 mm / *.039 in.*	1.70 mm / *.067 in.*
1.2 mm / *.047 in.*	1.60 mm / *.063 in.*
1.6 mm / *.063 in.*	1.50 mm / *.059 in.*

Data valid for PCB material FR 4 (εr = 4.6)

Automated pick-and-place

The SMT MMCX connectors can be processed on all state-of-the-art pick-and-place machines.

Application hints:

- Position of the connectors in the carrier tape

For the uniform orientation of the connectors refer to the figures in section "Packaging" (see page 56).

- Connector pick up by suction tip

1. Vertical mounting (82 MMCX–S50–0–51)
   You have the choice between the contact of the suction tip on the outer edge of the outer conductor sleeve (convenient circular or square standard tip) or the insertion of a special tip into the connector interface.
   When using an insertion tip consider that the outer conductor sleeve is only centered along one axis.
   A chuck alignment is possible only along this axis, which however is fully sufficient.
2. Horizontal mounting (85 MMCX–S50–0–51)
   The suction tip meets an even surface and can be a suitable standard one:

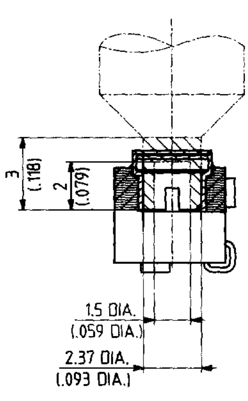
- Vision system alignment inspection
  The optical alignment inspection of the SMT MMCX connector is supported by its asymmetrical contour in vertical as well as horizontal applications.
- Placement
  For placing the connectors, the special arrangement of the leads must be considered. When applying a suction tip, the eccentricity of the outer conductor sleeve has to be taken into account.

Soldering

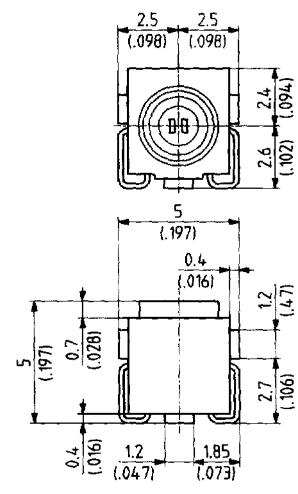
SMT MMCX connectors are compatible with reflow soldering methods.
Infrared soldering (IR, IC – max. 260 °C/*500 °F*, 10 s) and vapour phase soldering (215 °C/ *419 °F*, max. 30 s) are recommended.
Normal "eutectic" solder pastes (63% tin, 37% lead, metal content 85 – 90%) can be used with a thickness of 0.20 mm/*.008 inches* to 0.25 mm/ *.010 inches* if stencilled or screened in accordance with our recommended mounting pattern. The stand-off of 0.4 mm/*.016 inches* enables an easy visual inspection of the soldered joint.

Cleaning

The stand-off also allows effective cleaning after soldering, if necessary. It is especially advantageous when applying aqueous solutions.
Because of the material used, SMT MMCX connectors withstand solvents such as alcohols, halogenated hydrocarbons and azeotropic solutions, as well as water mixed with alkaline saponifiers (refer to CECC 00802).



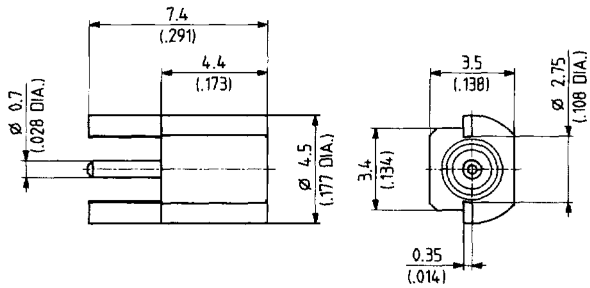
recommendation for an insertion tip

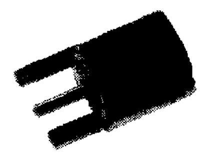


SMT MMCX Connectors (Edge Mount)

For the electrical data and temperature range of edge mount types, please see the MMCX standard specifications page 44.

SMT jack for horizontal applications





SUHNER TYPE	Ident. no.	PCB–Layout	Weight	Notes
82 MMCX-S50-0-2	648789	see application note	0.20 g/.007 oz.	
82 MMCX-S50-0-2	649680	see application note	0.20 g/.007 oz.	bulk packaging 100 piece
82 MMCX-S50-0-2	649679	see application note	0.20 g/.007 oz.	blister tape containing 750 pcs./tape-and-reel
82 MMCX-S50-0-2	650668	see application note	0.20 g/.007 oz.	blister tape containing 1500 pcs./tape-and-reel

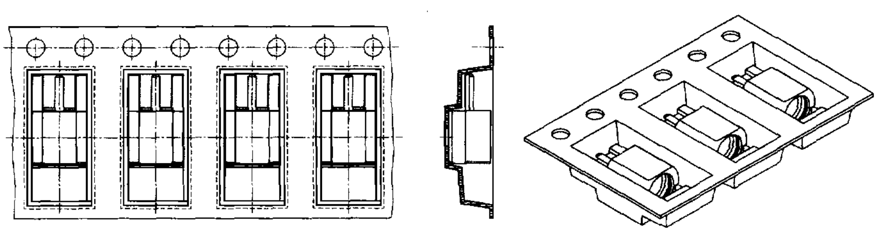
Packaging

Blister tape supply in accordance with IEC 286–2/EIA–481

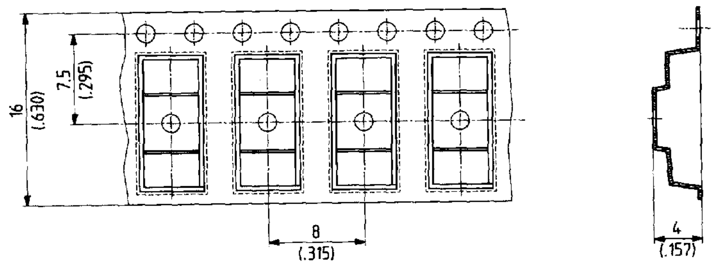
For automated placement the connectors can be supplied on industry standard type-and-reel.

Bulk supply in bags of 100 pcs.

It is suitable for manual or automated tube fed pick-and-place assembly.



straight (horizontal) application

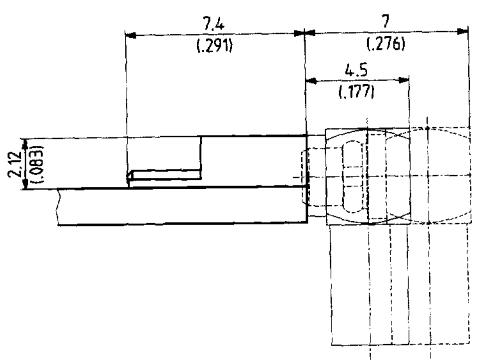


dimensions of blister carrier tape

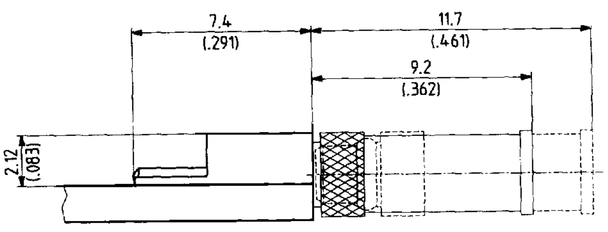
The 16 mm/*.63 inches* blister tape is delivered on reels of 330 mm/*13 inches* diameter, in a tough cardboard box.

Application Notes

Dimensions of mated pair and clearance for mating



Horizontal mounting together with a right angle cable connector



Horizontal mounting together with a straight cable connector

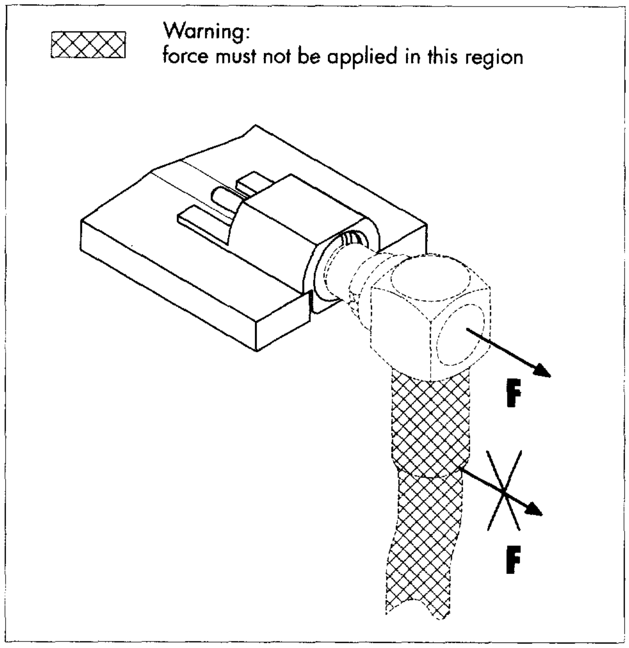
Appropriate operation

For appropriate operation the following has to be considered:

- Avoid forces from the cable of the mating connector to the surface mount connector.
  Fix the cable sufficiently and in several places.
- Apply only axial forces during the mating and demating of the connector parts.

Non-axial forces — such as improper pulling at the cable entry or the cable portion of a right angle mating connector — may cause excessive torque forces, which could result in damage to the solder joints.

For further information about soldering or cleaning, please see page 59.

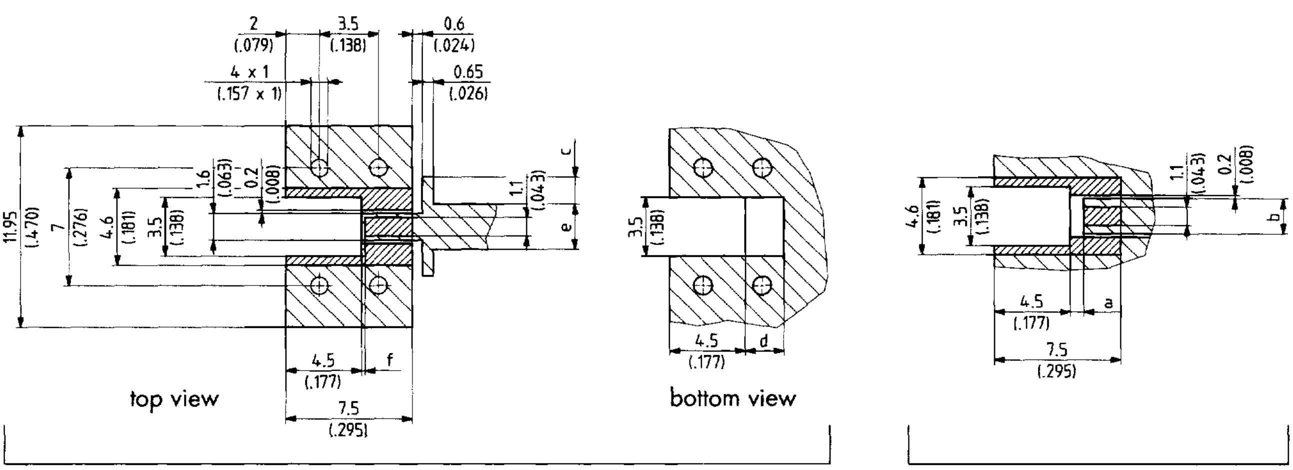


Recommended mounting pattern

Material FR 4 (ε_r = 4.6)

pattern

land (free of solder mask)



Microstrip line **Coplanar line**

PCB thickness	a	b	c	d	e	f
0.8 mm / *.031 in.*	1.6 / *.063*	1.90 / *.075*		1.1 / *.043*	1.4 / *.055*	1.0 / *.039*
1.0 mm / *.039 in.*	1.4 / *.055*	1.75 / *.069*	0.3 / *.012*	1.2 / *.047*	1.8 / *.071*	0.9 / *.035*
1.6 mm / *.063 in.*	0.8 / *.031*	1.55 / *.061*	1.6 / *.063*	2.3 / *.091*	2.8 / *.110*	0.4 / *.016*

Automated pick-and-place

Instructions for automated pick-and-place process see page 58.