

SERIES MCX 50 Ω MICROAX CONNECTORS

Description

MCX miniature snap-on connectors from SUHNER offer you an excellent blend of size, weight, durability and performance for applications such as GPS, wireless communication and Test + Measurement. The SUHNER MCX connectors show an essential space reduction of 30% when compared with the Series SMB. MCX connectors can be used in applications up to 6 GHz.

SUHNER's MCX connectors are sure to fit most applications where space, weight, size, performance and ease of assembly are required.

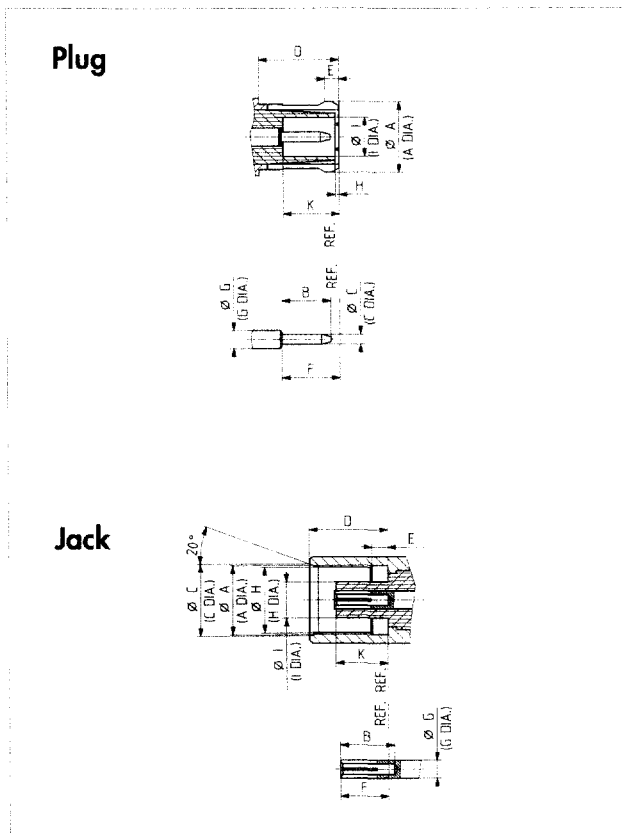
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MCX

Interface Dimensions



Interface Dimensions in mm / inches

	Plug		Jack	
	min.	max.	min.	max.
A	3.72/.146*	3.80/.150*	3.60/.142	3.70/.146
B	2.49/.098	2.59/.102	2.80/.110	—
C	0.48/.019	0.53/.021	3.75/.148	3.85/.152
D	4.15/.163	—	4.00/.157	4.12/.162
E	0.70/.028	0.75/.030	0.75/.030	0.85/.033
F	2.80/.110	3.20/.126	2.30/.091	2.80/.110
G	0.95/.037 nom.		0.95/.037 nom.	
H	—	0.30/.012	3.42/.135	3.48/.137
I	2.00/.079	2.07/.081	1.80/.071	1.98/.078
K	2.80/.110	3.20/.126	2.60/.102	2.80/.110

* prior to slotting

Approvals

SUHNER MCX connectors are approved in accordance with **CECC 22220** and mentioned in the Qualified Product List of CECC/UAHAG.

Technical Data

ELECTRICAL DATA	CECC 22220	REQUIREMENTS
for cable groups:		U1, Y2, Y11 U2, U4, Y3, Y12
Impedance		50 Ω
Frequency range		DC ... 6 GHz (see also Appendix page 436)
VSWR	4.4.1	see table below
RF-leakage (measured at 1 GHz)		
- connectors for flexible cables	4.4.8	≥ 60 dB
- connectors for semi-rigid cables		≥ 70 dB
Dielectric withstanding voltage (at sea level)	4.4.5	750 rms, 50 Hz 1.0 kV rms, 50 Hz
Working voltage (at sea level)		
- unmated		see table next page
Working voltage (at 21 000 m / 70 000 ft.)		
- unmated		see table next page
Insulation resistance	4.4.4	≥ 10 ⁴ MΩ
Contact resistance		
- centre contact	4.4.2	≤ 5 mΩ
- outer contact	4.4.3	≤ 1 mΩ

TYPICAL VSWR	FREQUENCY RANGE			CABLE GROUP
	1 GHZ	2.5 GHZ	6 GHZ	
straight connectors	1.09	1.18	1.25	Y3, Y11
	1.18	1.40	1.65	U1
	1.07	1.16	1.22	U2, U4
right angle connectors	1.04	1.05	1.11	Y3, Y11
	1.11	1.22	1.38	U1
	1.04	1.06	1.09	U2, U4

Other connectors and cables on request

MECHANICAL DATA	CECC 22220	REQUIREMENTS
Engagement force	4.5.4	≤ 25 N / 5.6 lbs
Disengagement force	4.5.4	8 N ... 20 N / 1.8 lbs ... 4.5 lbs
Contact captivation	4.5.2	≥ 10 N / 2.3 lbs
Cable retention force ¹⁾	4.5.5	see pages 36 - 41
Durability (matings)	4.7.1	≥ 500

1) value considers maximum load of the cables without irreversible variations of specifications.

WORKING VOLTAGE

CONNECTOR TYPE	Cable Group (Semi-rigid)	At sea level	At 21'000 m/ 70'000 ft.
11 MCX-50-1-3	Y3	≤ 170	≤ 45
11 MCX-50-2-3	Y11	≤ 250	≤ 65
16 MCX-50-1-3	Y2	≤ 170	≤ 45
16 MCX-50-2-3	Y3	≤ 250	≤ 65
24 MCX-50-1-3	Y2	≤ 170	≤ 45
24 MCX-50-2-3	Y11	≤ 250	≤ 65
CONNECTOR TYPE	Cable Group (flexible cables)	At sea level	At 21'000 m/ 70'000 ft.
11 MCX-50-1-10	U1	≤ 170	≤ 45
11 MCX-50-2-10	U2, U4	≤ 335	≤ 85
11 MCX-50-2-11	U2, U4	≤ 335	≤ 85
16 MCX-50-1-5	U1	≤ 170	≤ 45
16 MCX-50-2-1	U2	≤ 170	≤ 45
16 MCX-50-2-5	U2	≤ 335	≤ 85
16 MCX-50-2-6	U2	≤ 335	≤ 85
21 MCX-50-1-10	U1	≤ 170	≤ 45
21 MCX-50-2-10	U2, U4	≤ 335	≤ 85
21 MCX-50-2-11	U4	≤ 335	≤ 85
24 MCX-50-1-10	U1	≤ 170	≤ 45
24 MCX-50-2-10	U2	≤ 335	≤ 85
24 MCX-50-2-11	U2	≤ 335	≤ 85

ENVIRONMENTAL DATA	CECC 22220 TEST CONDITIONS	EQUIVALENT MIL TEST CONDITIONS
Temperature range		- 65° C ... + 165° C / 85°F ... + 329°F
Climatic category acc. to IEC	4.6.5 → 55 / 155 / 21	
Thermal shock	4.6.7 → IEC 68-2-14 Na	MIL-STD-202, Method 107, Condition C
Moisture resistance	4.6.6 → IEC 68-2-3 Ca	MIL-STD-202, Method 106
Corrosion	4.6.10 → IEC 68-2-11 Ka	Saltspray test acc. to MIL-STD-202, Method 101, Condition B
Vibration	4.6.3 → IEC 68-2-6 Fc	MIL-STD-202, Method 204, Condition D

MATERIAL DATA

CONNECTOR PART	STANDARDS	MATERIAL	PLATING
Bodies, pin contact	QQ-B-626	brass	gold
Outer contacts (resilient) Socket contact	QQ-C-530	beryllium-copper, hardened	gold
Crimp ferrules	SUHNER® specification	copper	gold
Insulators	ASTM-D-1457, BS 4271, Grade B	PTFE	

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

SUHNER® MCX: Miniaturization without compromising on reliability

SUHNER MCX connectors are not simply a scaled-down version of an existing miniature connector design. They are the result of a new design principle; all functionally essential parts like inner contacts, insulators and cable entry components are taken from the well proven series SMB (MIL-C-39012).

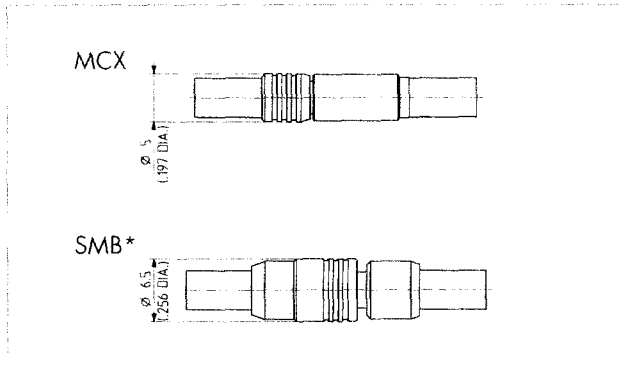
The micro-miniaturization is achieved exclusively by optimally dimensioned piece parts and by a new design of the connector housing and coupling mechanism, thus eliminating all functionally non-essential piece parts.

The result is a microminiature connector of the same reliability as SMB at considerably reduced size and weight.

Small outside, grown-up inside

MCX connectors and SMB connectors use identical inner contact and insulator dimensions. Despite of this, MCX requires much less space than SMB.

Outer diameter reduced by 30%

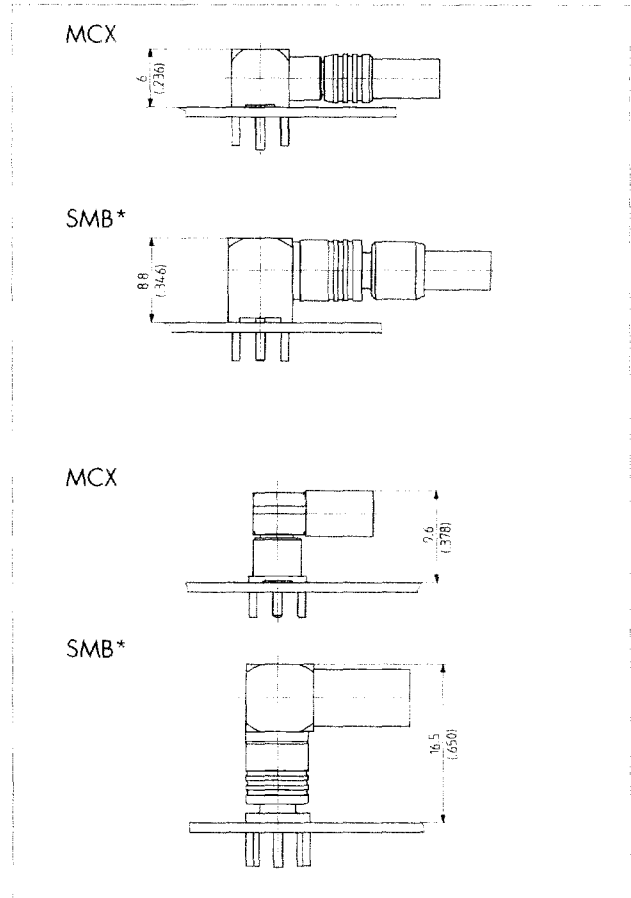


Very often the absolute outside dimensions of connectors are less important than the actual mounting profile achieved after installation inside an instrument.

Low mounting profile

The specific design of MCX connectors results in a very low mounting profile and space requirement of installed connector pairs and allows for flat wiring parallel to mounting panels and printed circuit boards.

PCB-mounting



* The smallest SMB connectors known have been used for comparison. Most commercially available SMB connectors are larger.

Connectors for Semi-Rigid Cables

straight plugs

- > cable entry soldered
- > centre contact soldered

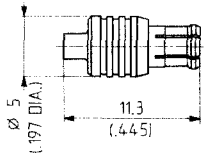


Fig. 1

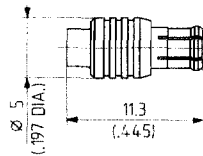
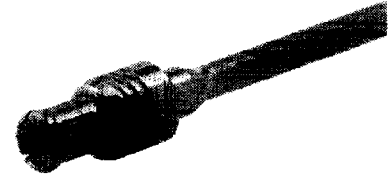


Fig. 2



SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Assembly instruction	Weight	Fig.	Notes
11 MCX-50-1-3	640163	Y2 (EZ 47)	801-01	3100	1.0 g/.035 oz.	1	
11 MCX-50-2-3	640165	Y3, Y11 (EZ 86)	801-02	3100	1.0 g/.035 oz.	2	

right angle plugs

- > cable entry soldered
- > centre contact soldered

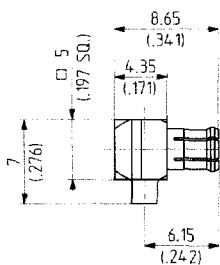


Fig. 1

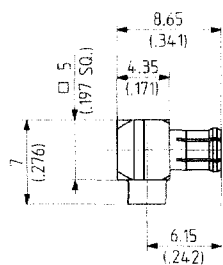
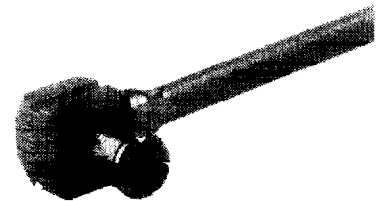


Fig. 2



SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Assembly instruction	Weight	Fig.	Notes
16 MCX-50-1-3	• 640167	Y2 (EZ 47)	802-01	9000	0.90 g/.032 oz.	1	
16 MCX-50-2-3	• 640169	Y3, Y11 (EZ 86)	802-02	9000	0.90 g/.032 oz.	2	

Assembly tool 74 Z-0-0-30

- centre contact captivated

bulkhead jacks

- > cable entry soldered
- > centre contact soldered

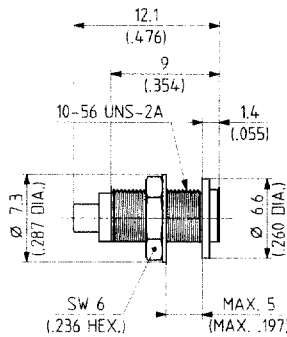


Fig. 1

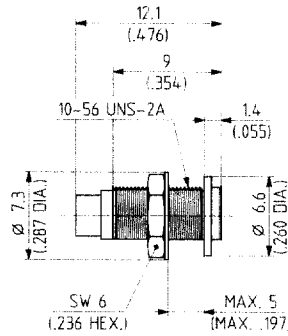


Fig. 2



SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Assembly instruction	Weight	Fig.	Notes
24 MCX-50-1-3	641648	Y2 (EZ 47)	803-01	3100	1.10 g/.039 oz.	1	rear or front mounting
24 MCX-50-2-3	543580	Y3, Y11 (EZ 86)	803-02	3100	1.10 g/.039 oz.	2	rear or front mounting

mounting hole ML 11

PCB cable terminators

(for semi-rigid and SUCOFORM® cables)

- > cable entry soldered

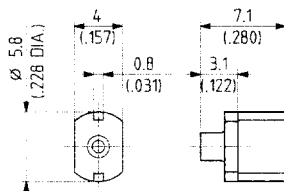


Fig. 1

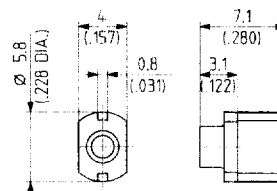
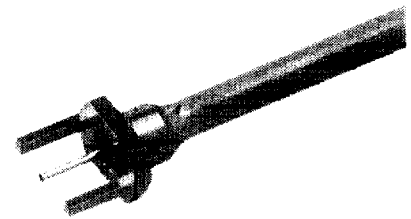


Fig. 2

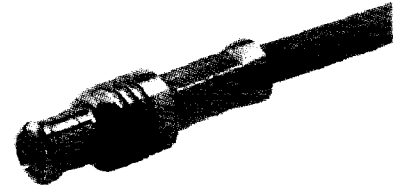
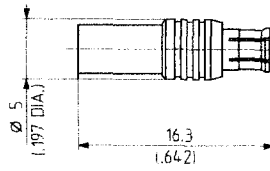


SUHNER TYPE	Ident. no.	Cable group (example)	Assembly instruction	Mounting hole	Weight	Fig.	Notes
83 MCX-0-1-1	544513	Y2 (EZ 47)	9001	ML 45	0.30 g/.011 oz.	1	without stand-offs
83 MCX-0-2-1	640912	Y3, Y11 (EZ 86)	9001	ML 45	0.30 g/.011 oz.	2	without stand-offs

Connectors for Flexible Cables

straight plugs

- > SUHNER® full crimp
- > taper sleeves see page 423

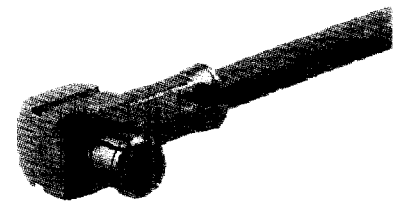
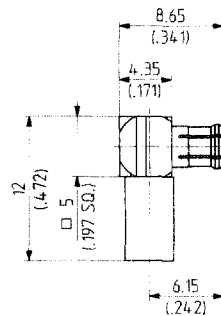


MCX 50

SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Crimp insert	Assembly instruction	Weight	Notes
11 MCX-50-1-10	640164	U1 (RG 178 B/U)		1 A	3097	1.40 g/ .049 oz.	
11 MCX-50-2-10	• 640166	U2 (RG 316/U)	810-02	1 A	3097	1.30 g/ .046 oz.	
11 MCX-50-2-11	• 640880	U4 (K 02252 D)	810-03	1 A	3097	1.30 g/ .046 oz.	

right angle plugs

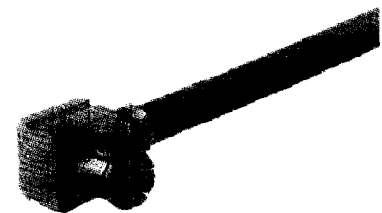
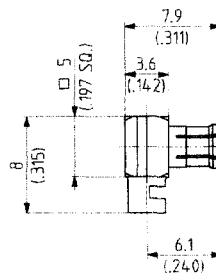
- > cable entry crimp
- > centre contact soldered



SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Crimp insert	Assembly instruction	Weight	Notes
16 MCX-50-1-5	• 640168	U1 (RG 178 B/U)	813-01	A	3098	1.40 g/ .049 oz.	
16 MCX-50-2-5/111	• 640170	U2 (RG 316/U)	813-02	A	3098	1.30 g/ .046 oz.	gold plated
16 MCX-50-2-5/133	• 641721	U2 (RG 316/U)		A	3098	1.30 g/ .046 oz.	SUCOPLATE®
16 MCX-50-2-6/111	• 543794	U4 (K 02252 D)	813-03	A	3098	1.30 g/ .046 oz.	gold plated
16 MCX-50-2-6/133	• 648476	U4 (K 02252 D)		A	3098	1.30 g/ .046 oz.	SUCOPLATE®

assembly tool 74 Z-0-0-30

- > low profile
- > soldered (outer and centre contact)



SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Assembly instruction	Weight	Notes
16 MCX-50-2-1/111	• 641125	1)	814-01	9095	0.80 g/ .028 oz.	gold plated
16 MCX-50-2-1/133	• 643279	1)		9095	0.80 g/ .028 oz.	SUCOPLATE®

assembly tool 74 Z-0-0-30

1) suitable for use with several cable diameters (cable groups U1, U2, U5)

• centre contact captivated

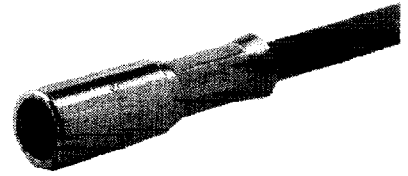
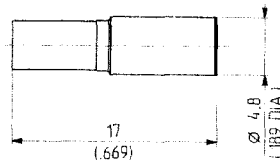
cable groups see page 36

assembly tools see page 403

mounting holes see page 441

straight jacks

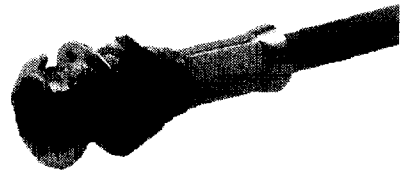
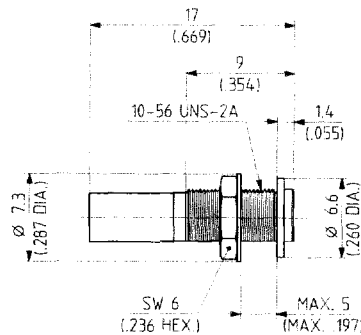
- > SUHNER® full crimp
- > taper sleeves see page 423



SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Crimp insert	Assembly instruction	Weight	Notes
21 MCX-50-1-10	543576	U1 (RG 178 B/U)		1 A	3097	1.50 g/.053 oz.	
21 MCX-50-2-10	• 543577	U2 (RG 316/U)	811-02	1 A	3097	1.40 g/.049 oz.	
21 MCX-50-2-11	• 543578	U4 (K 02252 D)	811-03	1 A	3097	1.40 g/.049 oz.	

bulkhead jacks

- > SUHNER® full crimp
- > taper sleeves see page 423

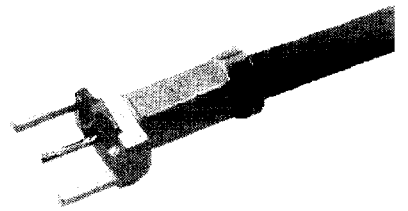
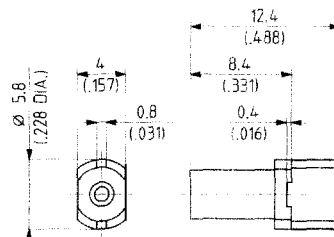


SUHNER TYPE	Ident. no.	Cable group (example)	CECC 22 221-	Crimp insert	Assembly instruction	Weight	Notes
24 MCX-50-1-10	543579	U1 (RG 178 B/U)		1 A	3097	1.50 g/.053 oz.	rear or front mounting
24 MCX-50-2-10	• 543581	U2 (RG 316/U)	812-02	1 A	3097	1.40 g/.049 oz.	rear or front mounting
24 MCX-50-2-11	• 543582	U4 (K 02252 D)	812-03	1 A	3097	1.40 g/.049 oz.	rear or front mounting

mounting hole ML 11

PCB cable terminators

- > cable entry crimp



SUHNER TYPE	Ident. no.	Cable group (example)	Crimp insert	Assembly instruction	Mounting hole	Weight	Notes
83 MCX-0-1-5	640875	U1 (RG 178 B/U)	A	3099	ML 45	0.80 g/.028 oz.	
83 MCX-0-2-5	640799	U2 (RG 316/U)	A	3099	ML 45	0.70 g/.025 oz.	
83 MCX-0-2-6	641650	U4 (K 02252 D)	A	3099	ML 45	0.70 g/.025 oz.	

- centre contact captivated

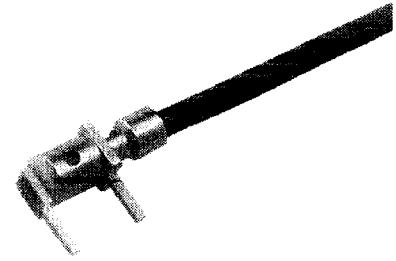
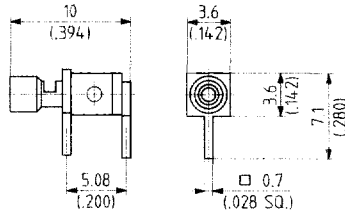
cable groups see page 36

assembly tools see page 403

mounting holes see page 441

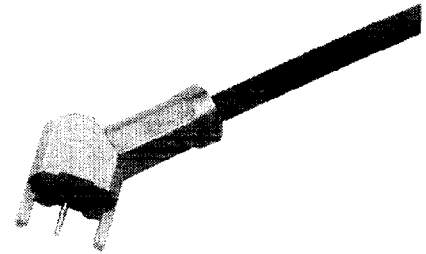
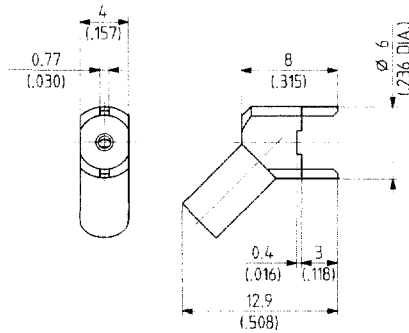
right angle PCB cable terminators

> cable entry soldered



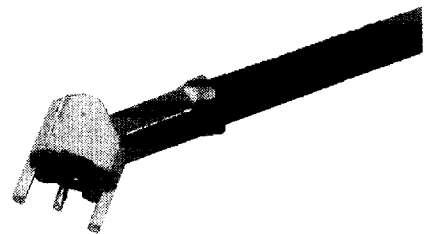
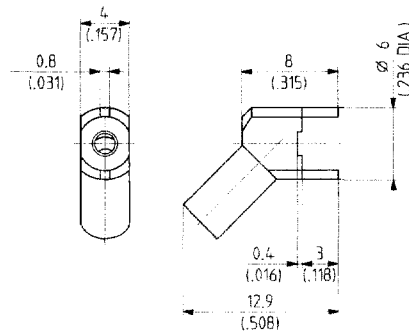
SUHNER TYPE	Ident. no.	Cable group (example)	Assembly instruction	Mounting hole	Weight	Notes
86 MCX-0-1-1	641749	U1 (RG 178 B/U)	27041	ML 100	0.40 g/.014 oz.	

> cable entry crimp



SUHNER TYPE	Ident. no.	Cable group (example)	Crimp insert	Assembly instruction	Mounting hole	Weight	Notes
86 MCX-0-1-2	649412	U1 (RG 178 B/U)	A	27039	ML 45	1.28 g/.045 oz.	

> cable entry crimp

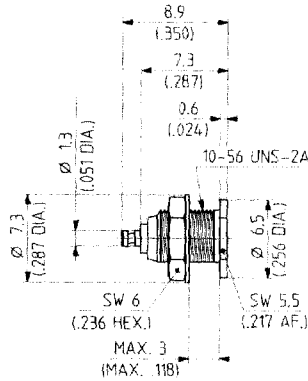


SUHNER TYPE	Ident. no.	Cable group (example)	Crimp insert	Assembly instruction	Mounting hole	Weight	Notes
86 MCX-0-2-3	649020	U4 (K 02252 D)	A	27039	ML 45	1.09 g/.038 oz.	

Receptacle with Solder End

receptacle, female

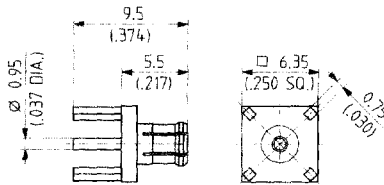
- > bulkhead mounted
- > front mounting



SUHNER TYPE	Ident. no.	Mounting hole	Weight	Notes
22 MCX-50-0-2	• 640171	ML 11	0.80 g/.028 oz.	not protruding

PCB Connectors

straight PCB plug



SUHNER TYPE	Ident. no.	Mounting hole	Weight	Notes
81 MCX-50-0-1	• 646253	ML 15	0.60 g/.021 oz.	without stand-offs

straight PCB jacks

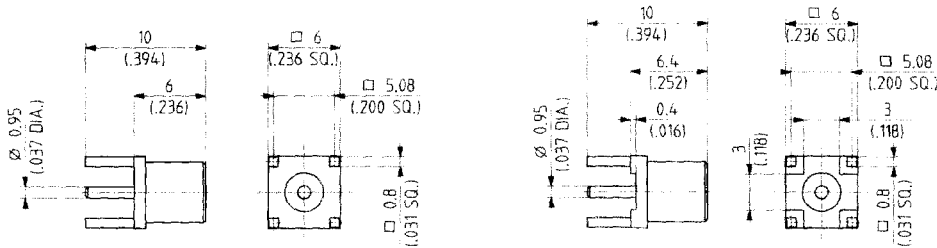


Fig. 1

Fig. 2



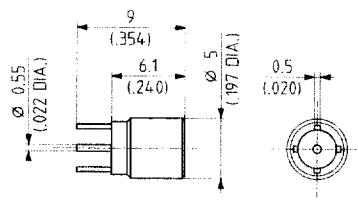
SUHNER TYPE	Ident. no.	CECC	Mounting hole	Weight	Fig.	Notes
82 MCX-50-0-1/111	• 640173	806-01	ML 15	1.00 g/.035 oz.	1	gold plated, without stand-offs
82 MCX-50-0-1/133	• 641691		ML 15	1.00 g/.035 oz.	1	SUCOPLATE [®] , without stand-offs
82 MCX-50-0-2	• 642829		ML 15	1.00 g/.035 oz.	2	

• centre contact captivated

cable groups see page 36

assembly tools see page 403

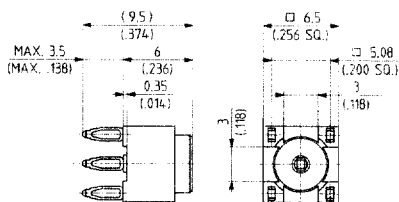
mounting holes see page 441



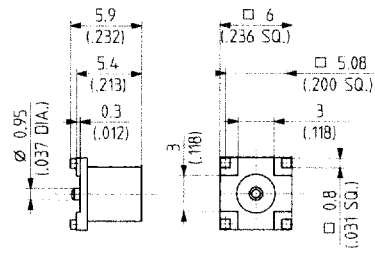
SUHNER TYPE	Ident. no.	CECC	Mounting hole	Weight	Notes
82 MCX-50-0-10	641649	22 221- 806-02	ML 44	0.80 g/.028 oz.	2.54 mm/.100 in. grid, without stand-offs

> SUHNER® PRESS-FIT

> press-in type



SUHNER TYPE	Ident. no.	Press-in tool	Mounting hole	Weight	Notes
82 MCX-P50-0-20	649717	74 Z-0-0-283	ML 87	1.40 g/.049 oz.	with stand-offs



SUHNER TYPE	Ident. no.	Mounting hole	Weight	Notes
82 MCX-50-0-5	648649	ML 15	1.40 g/.049 oz.	useable as a SMT-type

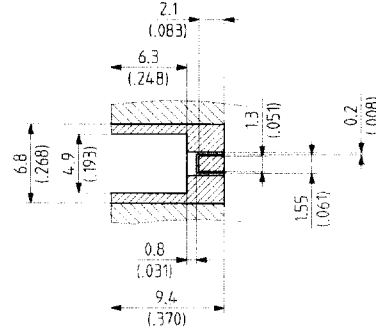
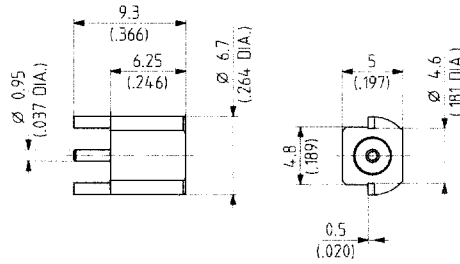
• centre contact captivated

> SMT type, edge mount

MATERIAL FR4 ($\epsilon_r = 4.6$) / PCB thickness 1.6 (.063)

☐ · ☐ = pattern

☐ lands (free of solder mask)



SUHNER TYPE	Ident. no.	Mounting hole	Weight	Notes
82 MCX-S50-0-22	• 651467	see PCB layout	1.10 g / .039 oz.	

Note: Further MCX-SMT-types on request

right angle PCB jacks

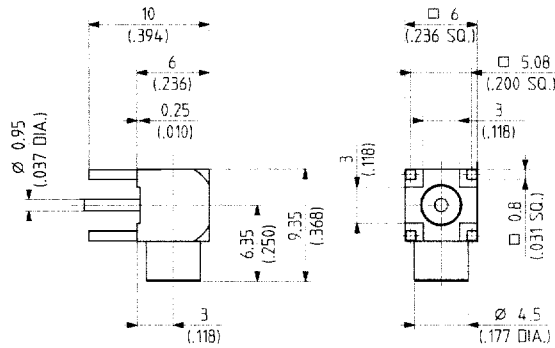


Fig. 1

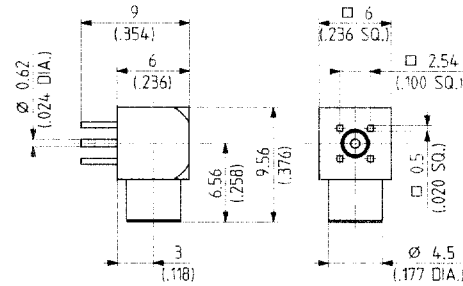


Fig. 2

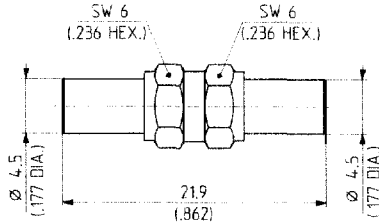
SUHNER TYPE	Ident. no.	CECC 22 221-	Mounting hole	Weight	Fig.	Notes
85 MCX-50-0-1	• 543587	807-01	ML 15	1.80 g / .063 oz.	1	
85 MCX-50-0-10	• 641651	807-02	ML 44	1.60 g / .056 oz.	2	without stand-offs

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Adaptors Within-Series

straight adaptor

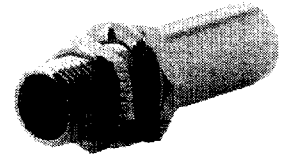
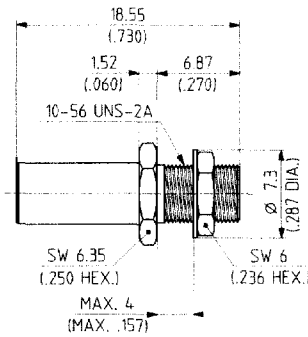
> jack to jack



SUHNER TYPE	Ident. no.	VSWR		Weight	Notes
		DC-1 GHz	1-6 GHz		
31 MCX-50-0-1	• 543558	≤ 1.05	≤ 1.22	2.70 g/.095 oz.	

bulkhead adaptor

> jack to jack

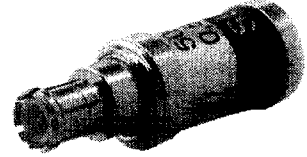
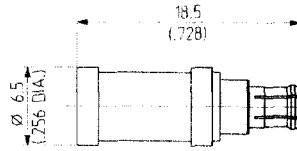


SUHNER TYPE	Ident. no.	Mounting hole	VSWR		Weight	Notes
			DC-1.5 GHz	1.5-6 GHz		
34 MCX-50-0-2	• 649868	ML 89	≤ 1.06	≤ 1.22	2.90 g/.102 oz.	

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Terminations

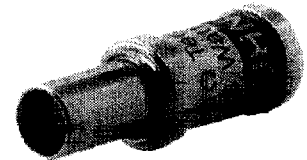
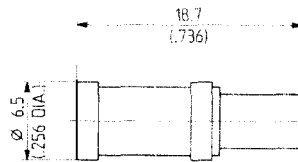
50 Ω, plug



SUHNER TYPE	Ident. no.	VSWR DC – 2 GHz	Impedance	Interface	Power	Weight	Notes
65 MCX-50-0-1	• 550162	≤ 1.2	50 Ω ± 1 Ω	plug	0.5 watt*	2.20 g/.078 oz.	

* at max. 30°C/86°F ambient temperature, derated linearly to zero watt at 130°C/266°F ambient temperature

50 Ω, jack



SUHNER TYPE	Ident. no.	VSWR DC – 2 GHz	Impedance	Interface	Power	Weight	Notes
65 MCX-50-0-31	• 550163	≤ 1.2	50 Ω ± 1 Ω	jack	0.5 watt*	2.40 g/.085 oz.	

* at max. 30°C/86°F ambient temperature, derated linearly to zero watt at 130°C/266°F ambient temperature

- centre contact captivated