

CABLE ORDERING INFORMATION

How to Build Custom Cable Assemblies

Using our **Cable Specification Chart** and **Connector Designation Code Chart**, you can easily develop your own part numbers for custom cable assemblies by selecting:

- 1. Cable Code**
- 2. P1 and P2 Connectors***
- 3. Length**

**Note: connector designator code is a 2- letter system. First letter is connector type and second letter is the connector configuration. For example “AM” code, “A” specifies that is a SMA connector; “M” makes it an SMA plug (male connector). Repeat process for P2.*

CUSTOM CABLE ASSEMBLY EXAMPLE:

CABLE CODE	P1 CONNECTOR	P2 CONNECTOR	LENGTH (INCHES)
TB086	AM	AM	12

RESULTING CUSTOM PART NUMBER: TB086-AMAM-12

Per our **Cable Specification Chart** and **Connector Designation Code Chart**, this custom cable assembly part number specifies an 0.086” diameter conformable cable, 12 inches in length with an SMA straight male plug on one end and an SMA straight male plug on the other end. Typical measurements are from end to end.

CONNECTOR DESIGNATION CODE CHART

ESM Connector Type	Suggested Maximum Freq (GHz)	ESM Connector Configuration Designators
A = SMA	26.5	A = N/A
B = SMB	4.0	B = Bulkhead Jack
C = BNC	4.0	BJ = Bulkhead Jack - OSP and OSSP only
D = SMC	10.0	BP = Bulkhead Plug - OSP and OSSP only
E = SSMC	12.4	C = Straight SMA Plug 0.141" w/o pin and insulator
F = F	3.0	D = Snap-In Plug
G = GPO/SMP	26.0	E = Snap-In Jack
H = SSMB	12.4	F = Straight Female
I = 7/16 DIN	7.5	G = N-Straight Plug 18 GHz
J = 3.5mm	32.0	H = N-Bulkhead Jack 18GHz
K = K (2.92mm)	40.0	I = N/A
L = C	2.0	J = N/A
M = MCX	6.0	K = N/A
N = N	11.0, 18.0	L = N/A
O = OSP	22.0	M = Straight Plug
P = OSSP	26.5	N = N/A
Q = QMA	6.0	O = N/A
R = Mini-75 Ohm SMB	2.0	P = Phase Adjustable Plug
S = SSMA	18.0	Q = 4 Hole Flange Jack
T = TNC	11.0, 18.0	R = Right Angle Plug
U = UHF	2.5	RG = Right Angle Plug 18GHz
V = 2.4mm	50.0	S = Passivated CC Straight Male/Plug
W = Mini UHF	2.5	T = 2 Hole Flange Jack
X = MMXC	6.0	U = N/A
Y = SSMP/GPPO	65.0	V = N/A
Z = SMZ-75 Ohm SMB	6.0	W = N/A
1 = MMBX	6.0	X = Reverse polarity jack (male contact)
		Y = Reverse polarity plug (female contact)
		Z = N/A

COMMON CONNECTOR CONFIGURATIONS

Conn Des	Cont Des		Connector Description
AB	=	SMA	Bulkhead Jack
AC	=	SMA	Straight Plug w/o pin and insulator
AF	=	SMA	Straight Jack
AM	=	SMA	Straight Plug
AP	=	SMA	Phase Adjustable Plug
AQ	=	SMA	4 Hole Flange Jack
AR	=	SMA	Right Angle Plug
ARG	=	SMA	18 GHz Right Angle Plug
AS	=	SMA	Passivated, CC, Straight Plug
AT	=	SMA	2 Hole Flange Jack
BB	=	SMB	Bulkhead Jack
BF	=	SMB	Straight Jack
BM	=	SMB	Straight Plug
BR	=	SMB	Right Angle Plug
CB	=	BNC	Bulkhead Jack
CF	=	BNC	Straight Jack
CM	=	BNC	Straight Plug
CR	=	BNC	Right Angle Plug
DB	=	SMC	Bulkhead Jack
DF	=	SMC	Straight Jack
DM	=	SMC	Straight Plug
DR	=	SMC	Right Angle Plug
EB	=	SSMC	Bulkhead Jack
EF	=	SSMC	Straight Jack
EM	=	SSMC	Straight Plug
ER	=	SSMC	Right Angle Plug
FF	=	F	Straight Female
FM	=	F	Straight Male
GF	=	GPO	Straight Female
GR	=	GPO	Right Angle Female
GRG	=	GPO	18 GHz Right Angle Female
GT	=	GPO	2 Hole Flange Mount Male
HB	=	SSMB	Bulkhead Jack

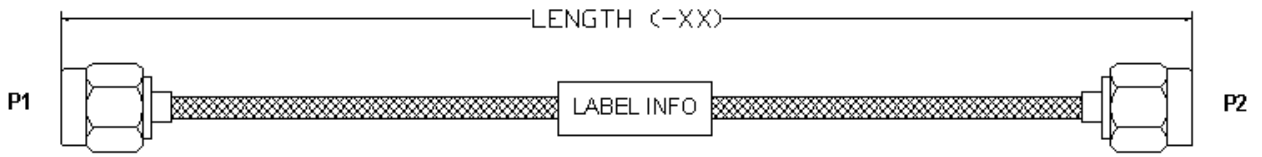
Conn Des	Conf Des		Connector Description
HF	=	SSMB	Straight Jack
HM	=	SSMB	Straight Plug
HR	=	SSMB	Right Angle Plug
IB	=	7/16 DIN	Bulkhead Jack
IF	=	7/16 DIN	Jack
IM	=	7/16 DIN	Plug
IR	=	7/16 DIN	Right Angle Plug
JB	=	3.5mm	Bulkhead Jack
JF	=	3.5mm	Straight Jack
JM	=	3.5mm	Straight Pug
KB	=	2.9mm K	Bulkhead Jack
KF	=	2.9mm K	Straight Jack
KM	=	2.9mm K	Straight Pug
MB	=	MCX	Bulkhead Jack
MF	=	MCX	Straight Jack
MM	=	MCX	Straight Plug
MR	=	MCX	Right Angle Plug
NB	=	N	Bulkhead Jack
NF	=	N	Straight Jack
NG	=	N	Straight Plug 18GHz
NH	=	N	Bulkhead Jack 18GHz
NM	=	N	Straight Plug
NQ	=	N	4 Hole Flange Jack
NR	=	N	Right Angle Plug
O BJ	=	OSP	Bulkhead Jack
O BP	=	OSP	Bulkhead Plug
OD	=	OSP	Snap-In Plug
OE	=	OSP	Snap-In Jack
PBJ	=	OSSP	Bulkhead Jack
PBP	=	OSSP	Bulkhead Plug
QB	=	QMA	Bulkhead Jack
QM	=	QMA	Straight Plug
QR	=	QMA	Right Angle Plug

Conn Des	Conf Des		Connector Description
RB	=	mini-SMB	Bulkhead Jack -75 ohms
RF	=	mini-SMB	Straight Jack - 75 ohms
RM	=	mini-SMB	Straight Plug - 75 ohms
RR	=	mini-SMB	Right Angle Plug - 75 ohms
SB	=	SSMA	Bulkhead Jack
SF	=	SSMA	Straight Jack
SM	=	SSMA	Straight Plug
SR	=	SSMA	Right Angle Plug
TB	=	TNC	Bulkhead Jack
TF	=	TNC	Straight Female
TM	=	TNC	Straight Plug
TQ	=	TNC	4 Hole Flange Jack
TR	=	TNC	Right Angle Plug
VB	=	2.4mm V	Bulkhead Jack
VF	=	2.4mm V	Straight Jack
VM	=	2.4mm V	Straight Pug
XB	=	MMCX	Bulkhead Jack
XF	=	MMCX	Straight Jack
XM	=	MMCX	Straight Plug
XR	=	MMCX	Right Angle Plug
YF	=	GPPO	Straight Female
YR	=	GPPO	Right Angle Female
ZM	=	SMZ	Straight Male/Plug
ZR	=	SMZ	Right Angle Male/Plug
1B	=	MMBX	Bulkhead Jack
1M	=	MMBX	Straight Plug
1R	=	MMBX	Right Angle Plug

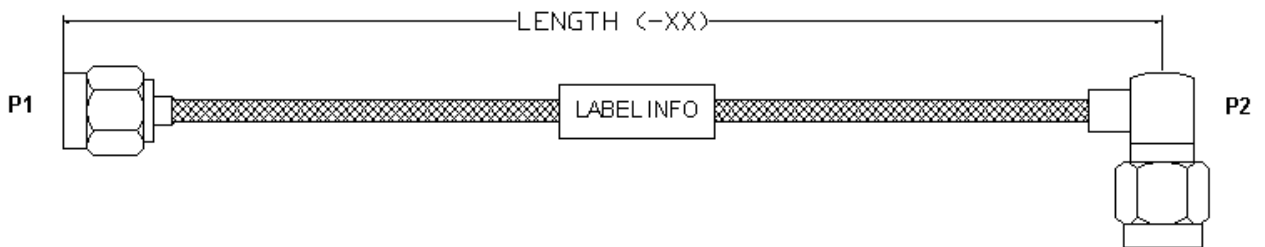
HOW TO SPECIFY LENGTH ON A CABLE ASSEMBLY:

Connector reference points:

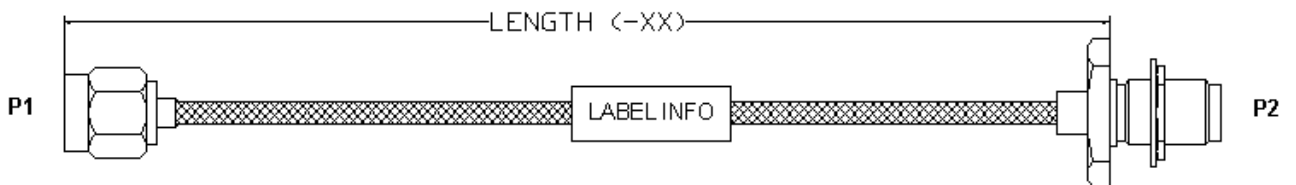
STRAIGHT CONNECTOR: To end on plugs and female connectors.



RIGHT ANGLE CONNECTOR: To centerline of contact pin on right angle.



BULKHEAD JACK: To mounting face of connector.



STANDARD LENGTH TOLERANCES

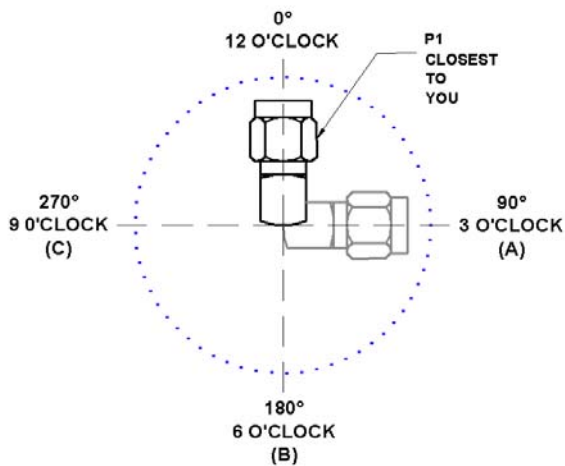
1.00" – 24.00"	= +/- 0.100"
24.00" – 60.00"	= +/- 0.250"
60.00" – 120.00"	= +/- 0.500"
120.00"-300"	= +/- 1.00"
300"-600"	= +/- 3.00"
600" – 1200"	= +/- 6.00"
1200" +	= +/- 10%

Tighter length tolerances available upon request.

ORIENTATION OF RIGHT ANGLE CONNECTORS AND D-FLATS ON BULKHEAD JACK CONNECTORS:

P2 in reference to P1 @ 12 o'clock position

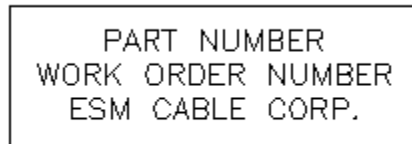
To specify on part number: Add to part number following length



Orientation	Modifier
0°	n/a
90°	a
180°	b
270°	c

CABLE LABELING:

Every cable assembly will be supplied with an identification marking consisting of a white heat shrinkable sleeving with black lettering. Labels are done in accordance with customer's specification or a standard ESM label, which will include part number, ESM specified work order number for traceability, and manufacturer name.

**LABEL INFO**

Custom labels available upon request.

CABLE BENDING:

1. Built per customer specification from drawings, sketches or wire-form.
2. Recommendations:
 - a. Make drawing to 1:1 scale
 - b. Reference all dimensions to centerline of cable
 - c. Place bends away from connectors
 - d. Use the same radius on all bends if possible
 - e. Recommended standard bend radius
 - i. 0.141" : 0.375"
 - ii. 0.086" : 0.250"
 - iii. 0.047" : 0.125" or 0.250"
 - f. Custom radius available

CABLE TESTING:

1. Standard test report is one test report representative of the entire lot. For an additional charge we can serialize cables for individualized reports.
2. Two-port vector network analyzers:
 - a. HP 8722C (50 MHz to 40 GHz with TDR)
 - b. Anritsu MS4623A (10 MHz – 6 GHz)
3. Standard measurement includes VSWR (or return loss) and insertion loss.
4. Testing options:
 - a. Electrical Delay
 - b. Electrical Phase (see *Phase Matching* for more detail).

PHASE MATCHING - MATCHING of ELECTRICAL LENGTHS ON CABLE ASSEMBLIES:

1. Standard tolerance of +/-1 degree per GHz
2. Best cable for phase matching is conformable, then semi-rigid
3. Matching options
 - a. Differential pair – matched pairs matched up within a lot.
 - b. Set – all assemblies matched to each other within a lot.
 - c. Electrical length – matched to a predetermined electrical length or time delay.
 - d. Gold standard – matched to an establish standard provided by customer or from previous lots.

ROHS COMPLIANCY

1. Standard ESM cable assemblies use Sn63Pb37 solder (non-ROHS)
2. ROHS compliant cables are available upon request by using Sn96Ag3.5C0.5 (Tin-Silver-Copper) lead-free solder.
3. Consideration when using SAC solder in comparison to Sn63Pb37.
 - a. Unknown long-term joint reliability, SAC solder has only been in the industry for about 10 years vs. 50+ years for Sn63Pb37 solder.
 - b. Susceptible to tin whisker, for more detail visit:
<http://nepp.nasa.gov/whisker/>
 - c. Higher soldering temperature required with SAC excludes soldering low-temperature materials such as polyethylene.

**Not sure which cable assembly will work best for your application?
Let an ESM Engineer help design the best assembly for the job.**

Call (209) 892-3347 or e-mail sales@esmcorp.com