

# Cannon Combo D®

Combination D Subminiature connectors for the advantages of an industry standard shield I/O interconnect, with the flexibility of a customized special, designed for any application.

This connector system is ideal for applications that require optimization of space while improving overall shielding. Combo D® accomplishes this by combining multiple interconnect types into one fully shielded product, decreasing the number I/O interfaces and reducing the possibility of EMI/RFI leakage.

## Applications

- Video Coaxial Transmission (75 Ω)
- RF and Telecom Transmission (50 Ω)
- Power interconnects (Up to 40 A)

## Product Features

- Standard and European Footprints
- Pre-installed 75 Ω / 50 Ω Coaxial or High Power contacts (One Part Number)
- Vertical Standoffs or 90° Brackets
- 90° or Straight PCB
- PC Boards up to 3,2 (.125) Thick
- PCB Variants Available with Boardlocks and/or Screw Locks (#4-40 or M3)
- Fiber Optics (PhD)
- High Voltage up to 2800 VAC

## Specifications

### Standard materials & finishes

Temperature Rating	-55°C to 125°C	Coaxial VSWR	Less than 1.40 + .03F for F up to 1GHz
Signal Contact Current Rating	7.5 A current capacity	Coaxial Insertion Loss	.2dB loss at 1 GHz
Signal Contact Resistance	55 millivolt max. at 7.5 test current	High Power current Rating	Up to 40 A
Signal Contact Dielectric Withstanding Voltage	1250 VAC at Sea Level	High Power Dielectric Withstanding Voltage	1000 VAC at Sea Level
Coaxial Current Rating	5 A	High Voltage Current Rating	5 A
Coaxial Dielectric Withstanding Voltage	1000 VAC at Sea Level	High Voltage Contact Dielectric Withstanding Voltage	2800 V at Sea Level
Coaxial Impedance	75 Ω or 50 Ω		

## Materials and Finishes

### Connector Assembly

Description	Material	Finish/Treatment
Shell	Carbon Steel	Tin-Nickel (Industrial), Chromate/Zinc (Military)*
Insulator	Black Polyester, UL 94V-0	None
Pin Contact	Copper Alloy	Gold over Nickel
Socket Contact	Copper Alloy	Gold over Nickel
Standoff	Steel	Trivalent Chromate over Zinc
Bracket	Steel	Tin
Rivnut	Steel	Tin
Boardlock	Copper Alloy	Tin

### Coaxial/High Power/High Voltage Contact Assemblies

Contacts and outer shells	Copper Alloy	Gold over Nickel
Ring, Retaining	Copper Alloy	Nickel
Insulator (Coaxial only)	Teflon	None
Insulator (High Voltage only)	Thermoplastic	none

\* Cadmium and Stainless Also Available



Dimensions shown in mm  
Specifications and dimensions subject to change

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**Materials and Finishes**

**Connector Assembly (Shells- Gold over Copper) (Modifier NMBK52)**

Shell	Brass per QQ-B-613	Gold 50 microinches min., thickness per MIL-G-45204, Type II, Class1 over copper per MIL-C-14550
Insulator	Polycyclohexle Dimethyl, Terephthalate or Polyphenylene, Sulfide co-polymer per MIL-DTL-24308 white or black in color	None
Float Mount, Brackets, Captive Nuts Hardware	Brass	Gold

**Coaxial/High Power/High Voltage Contact Assemblies**

Outer Coaxial Shell	Copper Alloy	Gold microinches min.thickness per MIL-G-45204, Type II, Class 1 over copper per MIL-C-14550
Center Coaxial Contact	Copper Alloy	Gold microinches min.thickness per MIL-G-45204, Type II, Class 1 over copper per MIL-C-14550
Insulator (Coaxial only)	Teflon	None
Insulator (Coaxial Only)	Teflon	None
Retaining Ring	Copper alloy	Gold
High Power Contact	Copper alloy	Gold microinches min.thickness per MIL-G-45204, Type II, Class 1 over copper per MIL-C-14550

**Connector Assembly (Shells- Yellow Chromate over Cadmium) (Modifier "NMB")**

Shell	Brass per QQ-B-613	Yellow chromate over cadmium QQ-P-46, Type II, Class 2
Insulator	Polycyclohexle Dimethyl, Terephthalate or Polyphenylene, Sulfide co-polymer per MIL-DTL-24308 white or black in color	None
Contact	Copper Alloy	Gold 50 microinches min. thickness per MIL-G-45204, Type II, Class 1 over copper per MIL-C-14550
Float Mount, Brackets, Captive Nuts Hardware	Brass	Yellow chromate over cadmium QQ-P-416, Type II, Class 2

For Crimp, Solder Cup and PCB Type Combo-D's

Typical Part Number:

DBM C 13C3 S J A197

**Product Family Designator**

- D\*M = Solder Cup Industrial & Space/Non-Magnetic Version
- D\*MM = Military/Hi-Rel Solder Cup version (50 micro-inch gold contact plating)
- D\*A = Crimp Version

**\*\*Hardware Modifier**

- = 0.120" (3,05mm) Through Hole
- C = 90° Metal Bracket, 4-40 Fastener, & Boardlock
- D = 90° Metal Bracket, 4-40 Fastener and 4-40 Screwlock
- E = 4-40 Clinchnut
- G = 90° Metal Bracket, 4-40 Fastener, 4-40 Screwlock, Boardlock
- H = .300" (7.6mm) Standoff, 4-40 Screwlock
- J = 90° Metal Bracket, Fastener, M-3 Fastener, Boardlock
- K = 0.162" (4,11mm) Through Hole
- L = 90° Metal Bracket, M-3 Fastener, Boardlock
- N = .300" (7.6mm) Standoff, 4-40 Screwlock, Boardlock
- O = 90° Metal Bracket, Fastener, M-3 Screwlock
- P = 90° Metal Bracket, 4-40 Fastener
- Q = .300" (7.6mm) M-3 Standoff
- S = 90° Metal Bracket, M-3 Fastener
- T = .300" (7.6mm) M-3 Standoff
- U = .300" (7.6mm) Standoff, M-3 Screwlock, Boardlock
- V = .300" (7.6mm) 4-40 Standoff
- W = .300" (7.6mm) Standoff, M-3 Screwlock
- X = M-3 Clinchnut
- Y = Dual Float Mount
- Z = .300" (7.6mm) 4-40 Standoff, Boardlock
- \* = Shell Sizes are E, A, B, C, D
- \*\* = Hardware Modifier not allowed with Non-Magnetic, Low Outgassing Combo-D

**Shell Modifier (Standard)**

- = Carbon steel, yellow chromate over zinc
- A197 = Carbon steel, tin-nickel plating (receptacles only) (RoHS)
- K87 = Carbon steel, tin-nickel plating (plugs only) (RoHS)
- F225 = Stainless steel shells
- NMBK52 = Space/Non-Magnetic version, gold plated
- A101 = Carbon Steel, Cadmium plating

**PC Tail Modifier (Standard)**

- = Solder cup (D\*M/D\*MM; Crimp, D\*A)
- J = 90° Std. PCB signal contact (.170" lg by .030" )
- N = Straight Std. PCB signal contact (.178 lg by .030" )
- V = 90° Euro PCB signal contact (.157" lg by .024" )
- Y = Straight Euro PCB signal contact (.178" lg by .024" )

**Gender**

- P = Male Plug, Pin
- S = Female Receptacle, Socket

**Layouts Combo-D**

- E- 5W1, 2W2, 2WK2
- A- 3W3, 3WK3, 7W2, 11W1
- B- 5W5, 9W4, 13W3, 17W2, 21W1
- C- 8W8, 13W6, 17W5, 21WA4, 25W3, 27W2
- D- 24W7, 36W4, 43W2, 47W1

**Combo-D Size 8 Contact Designators:**

- W\*\* = w/o Contacts (letters below denote with contacts)
- C = 75 Ohm Coax Contacts Installed
- X = 50 Ohm Coax Contacts Installed
- H = High Power Installed (US Standard)
- P = High Power Installed (European)
- V = High Voltage Installed (Cable and PCB only)
- R = Mini Hi Power 90° installed

\*\* All cable side connectors use the "W" designation (without contacts) for ordering and have size and contacts ordered separately



Combo D European Versions

Typical Part Number: **DBM E- 9C4 P-P00-1A5N- A191-K87-146**

**Product Family Designator**

D\*M = Combo D  
 = shell size E, A, B, C and D

**Hardware Modifier**

without code = 3.05mm" (.120 in.) Through Hole  
 E = 4-40 Clinchnut, solder cup, solder pin straight and 1A0N  
 N = 7.66 mm (.300 in.) with 4-40 post and pushfit, only OL4  
 Q = 7.66 mm (.300 in.) M3 with pushfit, only OL4  
 T = 7.66 mm (.300 in.) M3 standoff, only OL4  
 U = 7.66 mm (.300 in.) M3 post and pushfit, only OL4  
 V = 7.66 mm (.300 in.) 4-40 with pushfit, only OL4  
 X = M-3 Clinchnut, solder cup, solder pin straight and 1A0N  
 Y = Dual Float Mount, only solder cup  
 Z = .7.66 mm (.300 in.) 4-40 with pushfit, only OL4

**Layout (Total # of contacts + # of Size 8 Cavities)**

without code = Non Combo (9, 15, 25, 37, 50)  
 W = Empty size 8 Cavities  
 C = 75 Ohm Coax installed (straight or 90°)  
 X = 50 Ohm Coax installed (straight or 90°)  
 H = High power installed (straight)  
 P = High power installed (Euro, 90° only)  
 V = High voltage installed (available in straight PC only)  
 G = Guide pin or guide socket installed

**Gender**

P = Male (plug, pin)  
 S = Female (receptacle, socket)

**Code only applicable for Pressfit High power #8 contacts**

P00 = Pressfit High power PCB dia 2,9 mm  
 P01 = Pressfit High power PCB dia 3,1 mm  
 P02 = Pressfit High power PCB dia 3,5 mm

**PCB Mounting Method**

146 = Pushfit for PCB hold diameter 3.0, 90° version only  
 162 = Pushfit for PCB hold diameter 3.2, 90° version only

**Plating Modification**

without code = Tellow chromate over zinc on shells  
 A197 = Tin on shells  
 K87 = Tin with dimples on shells (pin only)

**Contact Finishes**

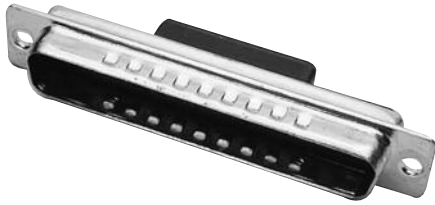
without code = performance class 3 (50 mating cycles)  
 A191 = performance class 2 (200 mating cycles) Euro standard  
 A190 = performance class 1 (500 mating cycles)

**Tail Modifier**

[OL2] = No standard, please call factory  
 = Solder cup (size 8 contacts not loaded on these versions)  
 OL4 = Solder pin straight  
 1A0N = without mouting bracket, hole dia. 3.05 mm  
 1A5N = plastic bracket with bushing dia. 3.05 mm  
 1A6N = plastic bracket with post 4-40  
 1A7N = metal bracket and captive nut 4-40  
 1A8N = metal bracket with post 4-40  
 1A9N = metal bracket and captive nut M3  
 1ADN = plastic bracket with grounding bracket and bushing dia. 3.05 mm  
 1AFN = metal bracket with bushing dia. 3.05 mm  
 1AGN = plastic bracket with grounding bracket and post M3  
 1AHN = metal bracket with post M3  
 1AJN = plastic bracket with grounding bracket and post 4-40  
 1APN = plastic bracket with post M3  
 1ATN = plastic bracket and captive nut M3  
 1AUN = plastic bracket and captive nut 4-40  
 1AVN = plastic bracket with grounding bracket and captive nut M3  
 1AWN = plastic bracket with grounding bracket and captive nut 4-40  
 1AEN = 90° low profile metal bracket captive nut M3  
 1AAN = 90° low profile metal bracket captive nut 4-40  
 1ABN = 90° low profile metal bracket post M3  
 1ACN = low profile metal bracket post 4-40  
 1ALN = low profile metal bracket with buhing dia. 3.05 mm

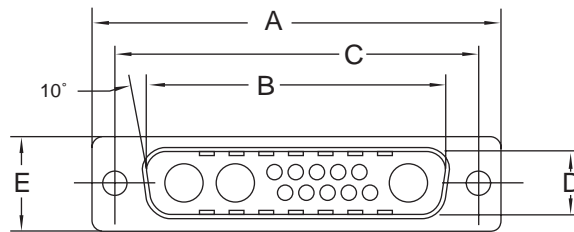
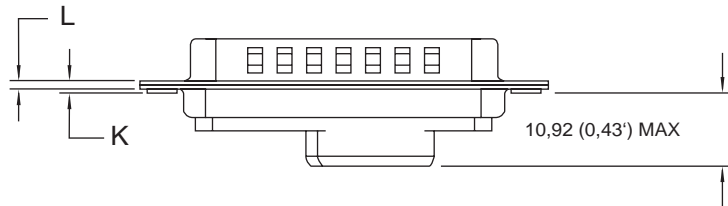
Plug, Crimp cable connectors without contacts, sizes DE– DD

Plug



- For contact cavity arrangements, see page 61.
- For crimp contacts size 20, see pages 39-40.
- For mounting methods, see pages 59-60.

Shell size	Layout	INDUSTRIAL	MILITARY/HI-REL	NON-MAGNETIC/LOW OUTGASSING**
		Part number	Part number	Part number
DE	2W2	DEA2W2PK87FO	DEA2W2PFO	DEA2W2PNMBK47FO
DE	2WK2	DEA2WK2PK87FO	DEA2WK2PFO	DEA2WK2PNMBK47FO
DA	7W2	DAA7W2PK87FO	DAA7W2PFO	DAA7W2PNMBK47FO
DA	11W1	DAA11W1PK87FO	DAA11W1PFO	DAA11W1PNMBK47FO
DA	3W3	DAA3W3PK87FO	DAA3W3PFO	DAA3W3PNMBK47FO
DA	3WK3	DAA3WK3PK87FO	DAA3WK3PFO	DAA3WK3PNMBK47FO
DB	5W5	DBA5W5PK87FO	DBA5W5PFO	DBA5W5PNMBK47FO
DB	9W4	DBA9W4PK87FO	DBA9W4PFO	DBA9W4PNMBK47FO
DB	13W3	DBA13W3PK87FO	DBA13W3PFO	DBA13W3PNMBK47FO
DB	17W2	DBA17W2PK87FO	DBA17W2PFO	DBA17W2PNMBK47FO
DB	21W1	DBA21W1PK87FO	DBA21W1PFO	DBA21W1PNMBK47FO
DC	8W8	DCA8W8PK87FO	DCA8W8PFO	DCA8W8PNMBK47FO
DC	21WA4	DCA21WA4PK87FO	DCA21WA4PFO	DCA21WA4PNMBK47FO
DD	24W7	DDA24W7PK87FO	DDA24W7PFO	DDA24W7PNMBK47FO
DD	36W4	DDA36W4PK87FO	DDA36W4PFO	DDA36W4PNMBK47FO
DD	43W2	DDA43W2PK87FO	DDA43W2PFO	DDA43W2PNMBK47FO



Dimensions

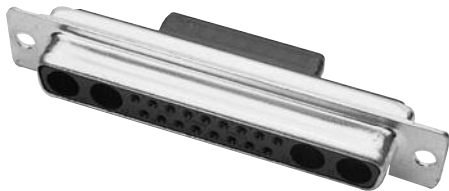
Shell size	A	B	C	D	E	F	W	W	K	K	L
	± 0,38 (.015)	± 0,13 (.005)	± 0,13 (.005)	± 0,13 (.005)	± 0,38 (.015)	± 0,25 (.010)	± 0,368 (.0145)	± 0,41 (.016)	± 0,317 (.0125)	± 0,25 (.010)	± 0,25 (.010)
DE	30,81 (1.213)	16,92 (.666)	24,99 (.984)	8,36 (.329)	12,55 (.494)	10,72 (.422)	6,693 (.2635)	—	1,206 (.0475)	—	0,76 (.030)
DA	39,14 (1.541)	25,25 (.994)	33,32 (1.312)	8,36 (.329)	12,55 (.494)	10,72 (.422)	6,693 (.2635)	—	1,206 (.0475)	—	0,76 (.030)
DB	53,04 (2.088)	38,96 (1.534)	47,04 (1.852)	8,36 (.329)	12,55 (.494)	10,82 (.426)	—	6,84 (.269)	—	1,52 (.060)	0,99 (.039)
DC	69,32 (2.729)	55,42 (2.182)	63,50 (2.500)	8,36 (.329)	12,55 (.494)	10,82 (.426)	—	6,84 (.269)	—	1,52 (.060)	0,99 (.039)
DD	66,93 (2.635)	52,81 (2.079)	61,11 (2.406)	11,07 (.436)	15,37 (.605)	10,82 (.426)	—	6,84 (.269)	—	1,52 (.060)	0,99 (.039)

Dimensions shown in mm  
Specifications and dimensions subject to change

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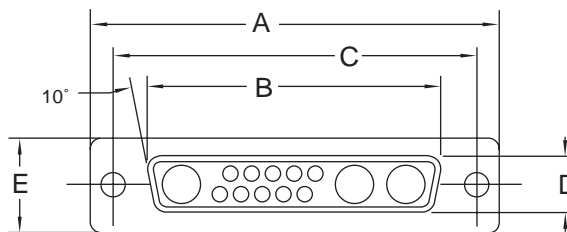
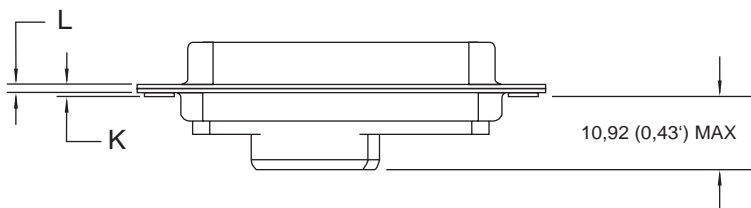
Receptacle



Receptacle, Crimp cable connectors without contacts, sizes DE-DD

Shell size	Layout	INDUSTRIAL	MILITARY/HI-REL	NON-MAGNETIC/LOW OUTGASSING**
		Part number	Part number	Part number
DE	2W2	DEA2W2SA197FO	DEA2W2SFO	DEA2W2SNMBK47FO
DE	2WK2	DEA2WK2SA197FO	DEA2WK2SFO	DEA2WK2SNMBK47FO
DA	7W2	DAA7W2SA197FO	DAA7W2SFO	DAA7W2SNMBK47FO
DA	11W1	DAA11W1SA197FO	DAA11W1SFO	DAA11W1SNMBK47FO
DA	3W3	DAA3W3SA197FO	DAA3W3SFO	DAA3W3SNMBK47FO
DA	3WK3	DAA3WK3SA197FO	DAA3WK3SFO	DAA3WK3SNMBK47FO
DB	5W5	DBA5W5SA197FO	DBA5W5SFO	DBA5W5SNMBK47FO
DB	9W4	DBA9W4SA197FO	DBA9W4SFO	DBA9W4SNMBK47FO
DB	13W3	DBA13W3SA197FO	DBA13W3SFO	DBA13W3SNMBK47FO
DB	17W2	DBA17W2SA197FO	DBA17W2SFO	DBA17W2SNMBK47FO
DB	21W1	DBA21W1SA197FO	DBA21W1SFO	DBA21W1SNMBK47FO
DC	8W8	DCA8W8SA197FO	DCA8W8SFO	DCA8W8SNMBK47FO
DC	21WA4	DCA21WA4SA197FO	DCA21WA4SFO	DCA21WA4SNMBK47FO
DD	24W7	DDA24W7SA197FO	DDA24W7SFO	DDA24W7SNMBK47FO
DD	36W4	DDA36W4SA197FO	DDA36W4SFO	DDA36W4SNMBK47FO
DD	43W2	DDA43W2SA197FO	DDA43W2SFO	DDA43W2SNMBK47FO

- For contact cavity arrangements, see page 62
- For crimp contacts size 20, see page 39-40.
- For mounting methods, see pages 59-60.



Dimensions

Shell size	A ± 0,38 (.015)	B ± 0,13 (.005)	C ± 0,13 (.005)	D ± 0,13 (.005)	E ± 0,38 (.015)	F ± 0,25 (.010)	W ± 0,38 (.015)	K ± 0,317 (.0125)	L ± 0,25 (.010)
DE	30,81 (1.213)	16,33 (.643)	24,99 (.984)	7,90 (.311)	12,55 (.494)	10,90 (.429)	6,94 (.273)	1,206 (.0475)	0,76 (.030)
DA	39,14 (1.541)	24,65 (.971)	33,32 (1.312)	7,90 (.311)	12,55 (.494)	10,90 (.429)	6,94 (.273)	1,206 (.0475)	0,76 (.030)
DB	53,04 (2.088)	38,38 (1.511)	47,04 (1.852)	7,90 (.311)	12,55 (.494)	10,90 (.429)	6,94 (.273)	1,206 (.0475)	0,76 (.030)
DC	69,32 (2.729)	54,84 (2.159)	63,50 (2.500)	7,90 (.311)	12,55 (.494)	10,90 (.429)	6,94 (.273)	1,206 (.0475)	0,76 (.030)
DD	66,93 (2.635)	52,42 (2.064)	61,11 (2.406)	10,74 (.423)	15,37 (.494)	10,90 (.429)	6,94 (.273)	1,206 (.0475)	0,76 (.030)



Dimensions shown in mm  
Specifications and dimensions subject to change

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