

## Viking Series

10/100/1000Base-T/SX, Auto MDI/MDIx, Autonegotiable MIL-DTL-38999, Unmanaged Ethernet Switch

### 6 Port (4+2), Flange Mounted

#### FEATURES

- 4x10/100/1000Base-T nonblocking wire speed copper Ethernet ports per IEEE 802.3:2005
- 2x1000Base-SX fiber Ethernet ports per IEEE 802.3:2005
- Electrical cable links up to 100 Meters (EIA/TIA Cat-5E)
- Fiber optic link distances up to 550 Meters per IEEE 802.3
- Operating temperature range from -40°C to +85°C
- Jumbo frame support in all speeds (10/100/1000 Mbps)
- Full duplex flow control per IEEE Std 802.3x and half duplex back pressure, symmetric and asymmetric
- Shock, vibration and immersion resistant per MIL-STD-810
- OD-CD, NI or ZN-NI plating options for enhanced corrosion resistance
- Aluminum connector shells and housing are strong, durable and light weight
- Auto sensing of half or full duplex operation

#### APPLICATIONS

Viking series 4+2 port Ethernet switches enable high speed network communications in harsh environments.

- Civil and military vehicle networking
- Aerospace and naval platform networks
- Unmanaged Ethernet switch applications

The MIL-DTL-38999, Series III connectors provide a sealed interface that is water-tight to Mil-Std-810 when mated.



D38999In-Line4+2Port10/100/1000Base-T/SXEthernetSwitch

#### DESCRIPTION

Viking series 10/100/1000Base-T/SX unmanaged Ethernet switches consist of 4x10/100/1000Base-T ports plus 2x1000Base-SX ports in a wall or floor mounted inline MIL-DTL-38999 connector assembly.

The Viking series Ethernet switch offers two separate D38999 Ethernet connector interfaces. One interface is a D38999/19-35 with 4x10/100/1000Base-T Ethernet ports compliant with IEEE-802.3U:2005 plus the 28VDC interface. The other interface is a D38999/19-11 with 2x1000Base-SX Ethernet fiber optic ports per IEEE-802.3U:2005.

The Viking 4+2 port Ethernet switch is a highly integrated and extremely rugged solution for vehicle and mobile networking applications. Its small size, light weight and low power requirements make it an excellent fit for next generation networks.

Viking series 10/100/1000Base-T/SX Ethernet switches are vibration isolated, environmentally hardened components designed for use in harsh environment applications.

- Sealed against liquid and solid contaminants
- Shock and vibration resistant

#### ORDERING INFORMATION

Application	Product Number
10/100/1000Base-T/SX - 28VDC	V42F-6SAT-FW

See Appendix A2 for more part number options

# Facilitating Secure Communications in Harsh Environments

## Six Port (4+2) Viking Series D38999, 10/100/1000Base-T / SX Unmanaged Ethernet Switch

### ABSOLUTE MAXIMUM RATINGS

Absolute maximum limits mean that no catastrophic damage will occur if the product is subjected to these ratings for short periods, provided each limiting parameter is in isolation and all other parameters have values within the performance specification. It should not be assumed that limiting values of more than one parameter can be applied to the product at the same time.

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Storage Temperature	$T_s$	-55		+100	°C

### RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Operating Temperature	$T_A$	-40		+85	°C
Supply Voltage	$V_{CC}$	+18.0	28.0	+36.0	V
Power Supply Noise (p-p)	$N_p$			200	mV

### INTERFACE SPECIFICATIONS COMPLIANCE

Requirement	Feature	Condition	Notes
MIL-STD-883	ESD	Class II	2200V
MIL-STD-810	Vibration	3.8g <sup>2</sup> /Hz	43G rms
MIL-STD-810	Shock	40.0g	6-9mS
MIL-STD-810	Immersion	1.0 meter	2.0Hours
MIL-STD-1344	Flame Resistance	Method 1012	30 Seconds
MIL-STD-1344	Damp Heat	10 Cycles	24 Hours
FDA / CDRH / IEC-825-1	Eye Safety	Class 1	No Safety Interlocks Required

### MATERIALS

Item	Detail	Notes
Shell and housing	Aluminum Alloy	
Plating	OD-CD, NI or ZN-NI	
Insert	Thermoplastic	
Interfacial Seal	Elastomer	
Alignment Sleeves	Composite Polymer	

# Facilitating Secure Communications in Harsh Environments

Six Port (4+2) Viking Series D38999,  
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## OPTICAL TRANSMITTERS $T_A$ = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Output Power	$P_o$	-9.5		-4.0	dBm
Optical Output Wavelength	$\lambda_{OUT}$	830	850	860	nM
Spectral Width	$\Delta\lambda_{RMS}$			0.85	nM

## OPTICAL RECEIVERS $T_A$ = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Optical Sensitivity	$P_i$	-17.0		-2.0	dBm
Optical Wavelength	$\lambda_{IN}$	830	850	860	nM

## POWER SUPPLY CURRENT $T_A$ = Operating Temperature Range

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Current per Port @ 28VDC	$I_{CCT}$		150	200	mA

## OPTICAL LINK DISTANCES

Protocol	Cable Specification	Distance
Gigabit Ethernet - IEEE-802.3:2005 - 1000BASE-SX	62.5/125 $\mu$ 200MHz*Km	275M
	50/125 $\mu$ 500MHz*Km	550M

## COPPER LINK DISTANCES

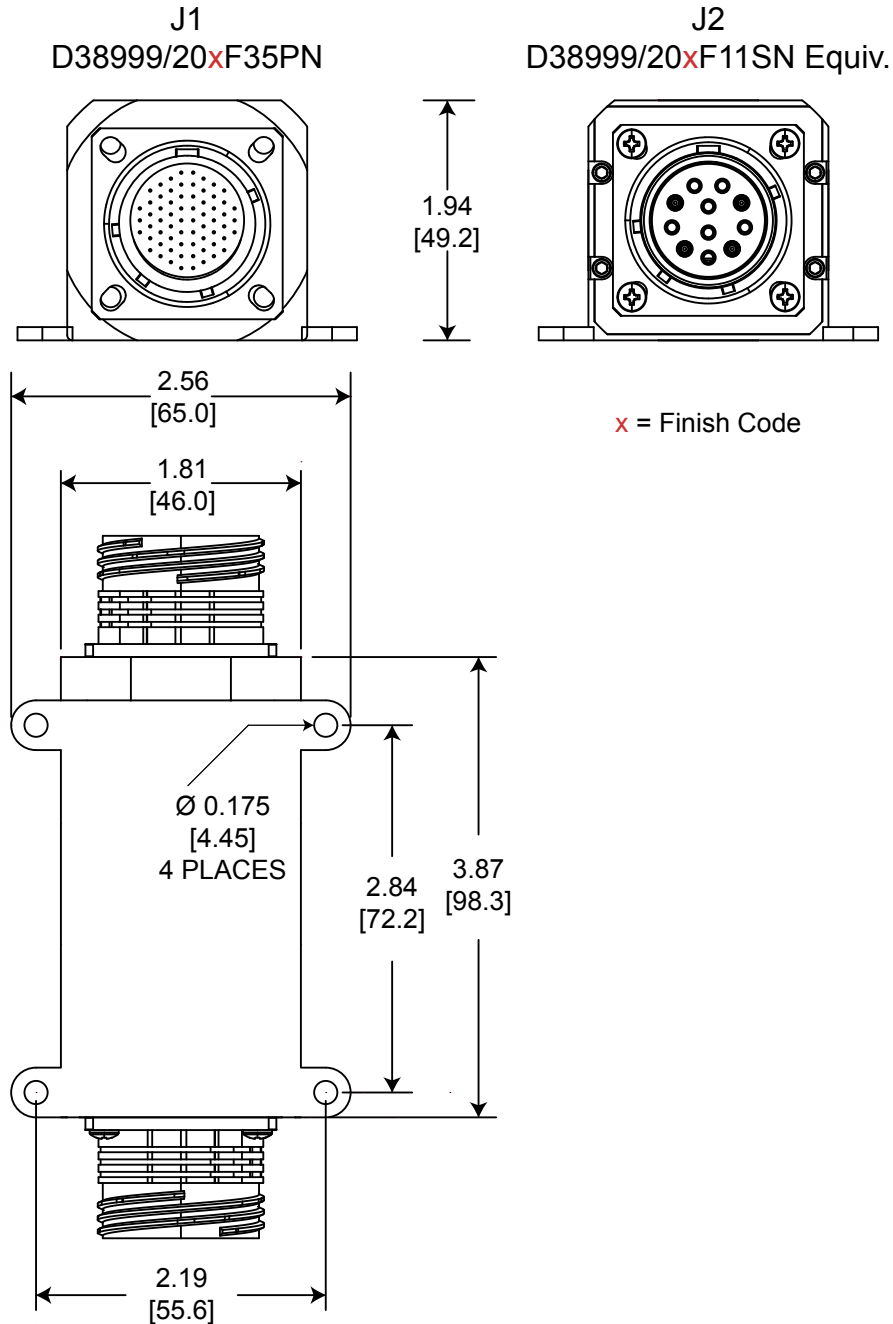
Protocol	Cable Specification	Distance
Gigabit Ethernet - IEEE-802.3:2005 - 1000BASE-T	TIA/EIA-568-B Cat 5E - for other transmission media, please consult the factory	100M

# Facilitating Secure Communications in Harsh Environments

Six Port (4+2) Viking Series D38999,  
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## OUTLINE DRAWING

Dimensions are shown as: inches (mm)



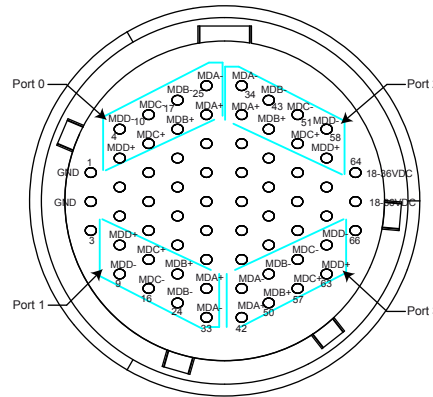
## PORT / FUNCTION ASSIGNMENTS

Port #	Function
J1	4x10/100/1000Base-T + 28VDC
J2	2x1000Base-SX or 100Base-FX

Six Port (4+2) Viking Series D38999,  
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## J1 PIN FUNCTIONS ETHERNET PORT AND PIN ASSIGNMENTS

TOP



Front view of the J1 connector shown  
- mating cable plug opposite - see J1 D38999 Pin  
Function Chart for details

PORT #	PIN #	FUNCTION	PORT #	PIN #	FUNCTION
0	26	MDA+	2	35	MDA+
	25	MDA-		34	MDA-
	18	MDB+		44	MDB+
	17	MDB-		43	MDB-
	11	MDC+		52	MDC+
	10	MDC-		51	MDC-
	5	MDD+		59	MDD+
	4	MDD-		58	MDD-
1	32	MDA+	3	42	MDA+
	33	MDA-		41	MDA-
	23	MDB+		50	MDB+
	24	MDB-		49	MDB-
	15	MDC+		57	MDC+
	16	MDC-		56	MDC-
	8	MDD+		63	MDD+
	9	MDD-		62	MDD-

# Facilitating Secure Communications in Harsh Environments

Six Port (4+2) Viking Series D38999,  
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## J1 / D38999/20xF35PN ELECTRICAL PIN FUNCTIONS - Continued on next page

Pin #	Port #	Function	RJ-45 Eq. Pin #	Logic Family
1	N/A	GND	N/A	Isolated From Case GND
2	N/A	GND	N/A	Isolated From Case GND
3	N/A	N/C	N/A	Do Not Connect - Factory Use Only
4	0	MDD-	8	IEEE-802.3.2005 10/100/1000Base-T
5	0	MDD+	7	IEEE-802.3.2005 10/100/1000Base-T
6	N/A	N/C	N/A	Do Not Connect - Factory Use Only
7	N/A	N/C	N/A	Do Not Connect - Factory Use Only
8	1	MDD+	7	IEEE-802.3.2005 10/100/1000Base-T
9	1	MDD-	8	IEEE-802.3.2005 10/100/1000Base-T
10	0	MDC-	5	IEEE-802.3.2005 10/100/1000Base-T
11	0	MDC+	4	IEEE-802.3.2005 10/100/1000Base-T
12	N/A	N/C	N/A	Do Not Connect - Factory Use Only
13	N/A	N/C	N/A	Do Not Connect - Factory Use Only
14	N/A	N/C	N/A	Do Not Connect - Factory Use Only
15	1	MDC+	4	IEEE-802.3.2005 10/100/1000Base-T
16	1	MDC-	5	IEEE-802.3.2005 10/100/1000Base-T
17	0	MDB-	6	IEEE-802.3.2005 10/100/1000Base-T
18	0	MDB+	3	IEEE-802.3.2005 10/100/1000Base-T
19	N/A	N/C	N/A	Do Not Connect - Factory Use Only
20	N/A	N/C	N/A	Do Not Connect - Factory Use Only
21	N/A	N/C	N/A	Do Not Connect - Factory Use Only
22	N/A	N/C	N/A	Do Not Connect - Factory Use Only
23	1	MDB+	3	IEEE-802.3.2005 10/100/1000Base-T
24	1	MDB-	6	IEEE-802.3.2005 10/100/1000Base-T
25	0	MDA-	2	IEEE-802.3.2005 10/100/1000Base-T
26	0	MDA+	1	IEEE-802.3.2005 10/100/1000Base-T
27	N/A	N/C	N/A	Do Not Connect - Factory Use Only
28	N/A	N/C	N/A	Do Not Connect - Factory Use Only
29	N/A	N/C	N/A	Do Not Connect - Factory Use Only
30	N/A	N/C	N/A	Do Not Connect - Factory Use Only
31	N/A	N/C	N/A	Do Not Connect - Factory Use Only
32	1	MDA+	1	IEEE-802.3.2005 10/100/1000Base-T
33	1	MDA-	2	IEEE-802.3.2005 10/100/1000Base-T
34	2	MDA-	2	IEEE-802.3.2005 10/100/1000Base-T

# Facilitating Secure Communications in Harsh Environments

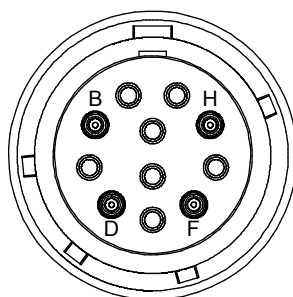
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## J1 / D38999/20xF35PN ELECTRICAL PIN FUNCTIONS - Continued from previous page

Pin #	Port #	Function	RJ-45 Eq. Pin #	Logic Family
35	2	MDA+	1	IEEE-802.3.2005 10/100/1000Base-T
36	N/A	N/C	N/A	Do Not Connect - Factory Use Only
37	N/A	N/C	N/A	Do Not Connect - Factory Use Only
38	N/A	N/C	N/A	Do Not Connect - Factory Use Only
39	N/A	N/C	N/A	Do Not Connect - Factory Use Only
40	N/A	N/C	N/A	Do Not Connect - Factory Use Only
41	3	MDA-	2	IEEE-802.3.2005 10/100/1000Base-T
42	3	MDA+	1	IEEE-802.3.2005 10/100/1000Base-T
43	2	MDB-	6	IEEE-802.3.2005 10/100/1000Base-T
44	2	MDB+	3	IEEE-802.3.2005 10/100/1000Base-T
45	N/A	N/C	N/A	Do Not Connect - Factory Use Only
46	N/A	N/C	N/A	Do Not Connect - Factory Use Only
47	N/A	N/C	N/A	Do Not Connect - Factory Use Only
48	N/A	N/C	N/A	Do Not Connect - Factory Use Only
49	3	MDB-	6	IEEE-802.3.2005 10/100/1000Base-T
50	3	MDB+	3	IEEE-802.3.2005 10/100/1000Base-T
51	2	MDC-	5	IEEE-802.3.2005 10/100/1000Base-T
52	2	MDC+	4	IEEE-802.3.2005 10/100/1000Base-T
53	N/A	N/C	N/A	Do Not Connect - Factory Use Only
54	N/A	N/C	N/A	Do Not Connect - Factory Use Only
55	N/A	N/C	N/A	Do Not Connect - Factory Use Only
56	3	MDC-	5	IEEE-802.3.2005 10/100/1000Base-T
57	3	MDC+	4	IEEE-802.3.2005 10/100/1000Base-T
58	2	MDD-	8	IEEE-802.3.2005 10/100/1000Base-T
59	2	MDD+	7	IEEE-802.3.2005 10/100/1000Base-T
60	N/A	N/C	N/A	Do Not Connect - Factory Use Only
61	N/A	N/C	N/A	Do Not Connect - Factory Use Only
62	3	MDD-	8	IEEE-802.3.2005 10/100/1000Base-T
63	3	MDD+	7	IEEE-802.3.2005 10/100/1000Base-T
64	ALL	VCC	N/A	18-36VDC
65	ALL	VCC	N/A	18-36VDC
66	N/A	N/C	N/A	Do Not Connect - Factory Use Only

Six Port (4+2) Viking Series D38999,  
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## J2 PIN FUNCTIONS ETHERNET PORT AND PIN ASSIGNMENTS TOP



Front view of the D38999 optical  
insert shown, fiber optic cable plug  
opposite - see Appendix A1 for details

### MIL-DTL-38999 OPTICAL INTERFACE

PORT NUMBER	TX	RX
4	H	F
5	B	D



Six Port (4+2) Viking Series D38999,  
10/100/1000Base-T / SX Unmanaged Ethernet Switch

## APPENDIX A1

### MIL-DTL-38999 FIBER OPTIC CABLE PLUG / MIL-T-29504 PIN TERMINI

\*See DSCC or SAE QPL for Approved Suppliers

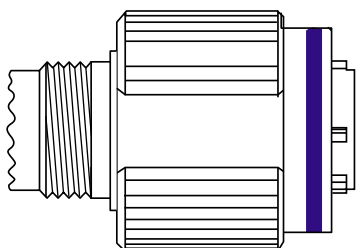
<http://www.dsccl.dla.mil/programs/qmlqpl/QPLdetail.asp?QPL=38999>

#### \*D38999 PLUG - PIN INSERT

##### MIL-DTL-38999 CABLE PLUG

MS PLUG P/N

\*D38999/26WF11PN

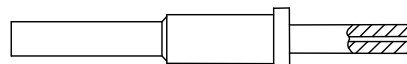


#### \*FIBER OPTIC PIN TERMINUS

##### MIL-T-29504 PIN TERMINUS

MS PIN TERMINUS P/N

\*M29504/04-xxxx\*\*



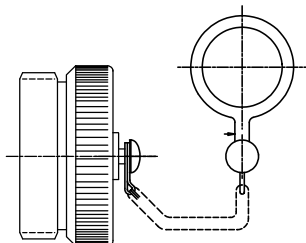
\*\*defined by fiber optic cable configuration

#### \*CABLE PROTECTION CAP

##### D38999/32 PLUG PROTECTION CAP

MS PLUG CAP P/N

\*D38999/32W19N

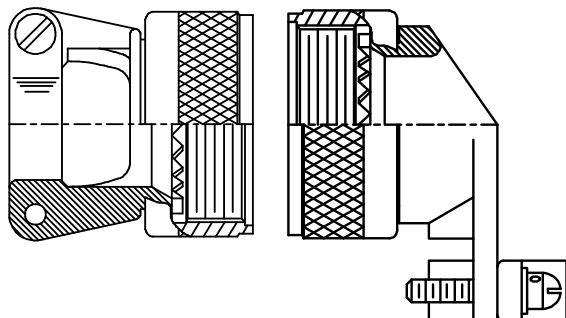


#### \*CABLE BACKSHELL

##### MIL-C-85049 CABLE BACKSHELL

MS BACKSHELL P/N

\*MS85049/xxxxxx\*\*

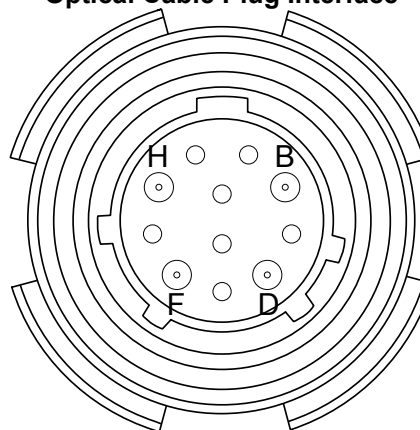


\*\*Straight or angled backshell - defined by application / mounting configuration

#### D38999 PLUG PORT FUNCTIONS

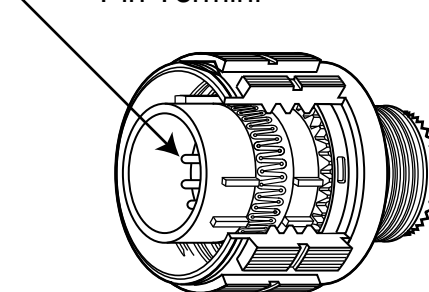
PORT NUMBER	TX	RX
4	H	F
5	B	D

TOP  
Optical Cable Plug Interface



Front face of the optical cable plug pin insert shown. Transceiver insert opposite.

Pin Termini

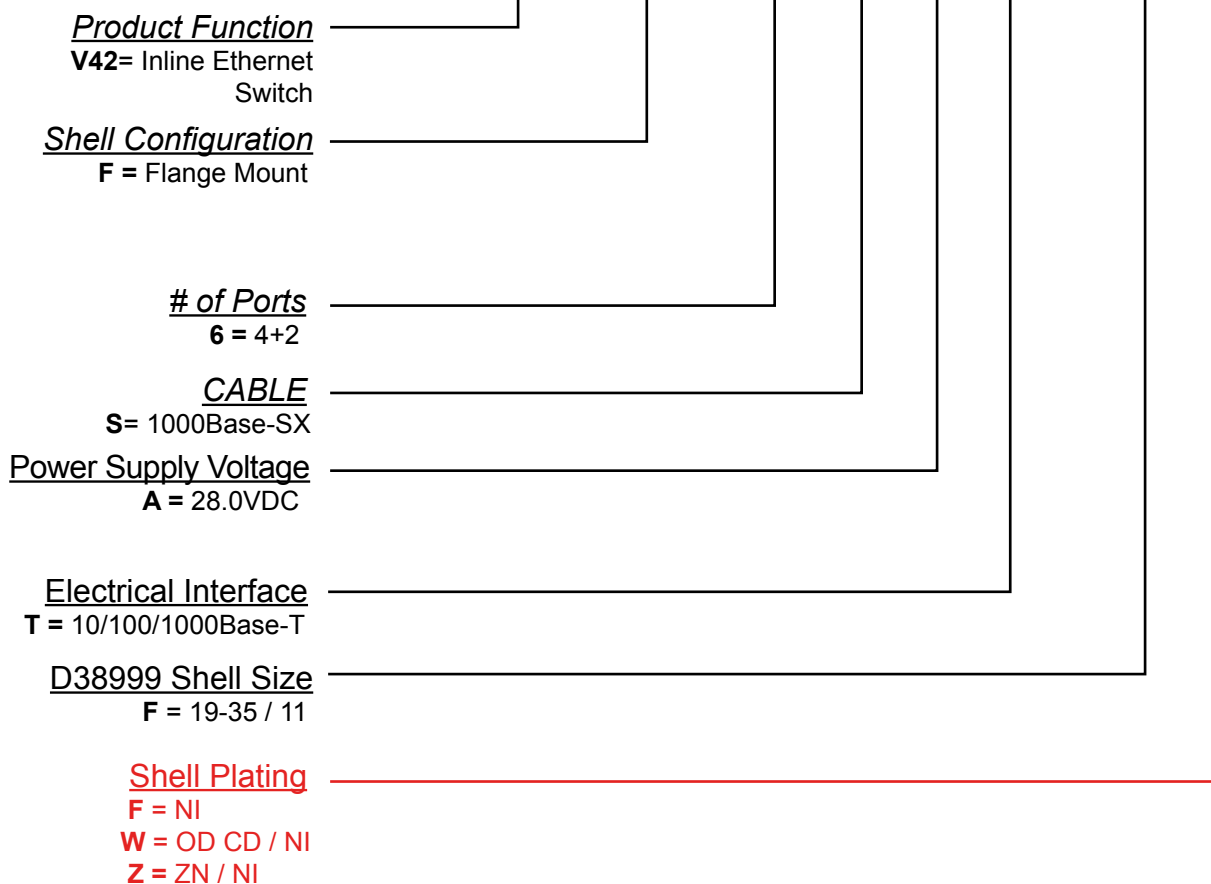


Six Port (4+2) Viking Series D38999,  
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## APPENDIX A2 PART NUMBER OPTIONS

In-Line, Six (4+2) Port, 10/100/1000Base-T / SX, Unmanaged Ethernet Switch

**V42 F - 6 S A T - F X**



Other mounting and interface options are available.  
Please consult the Protokraft website for alternate configurations.