

INCH-POUND

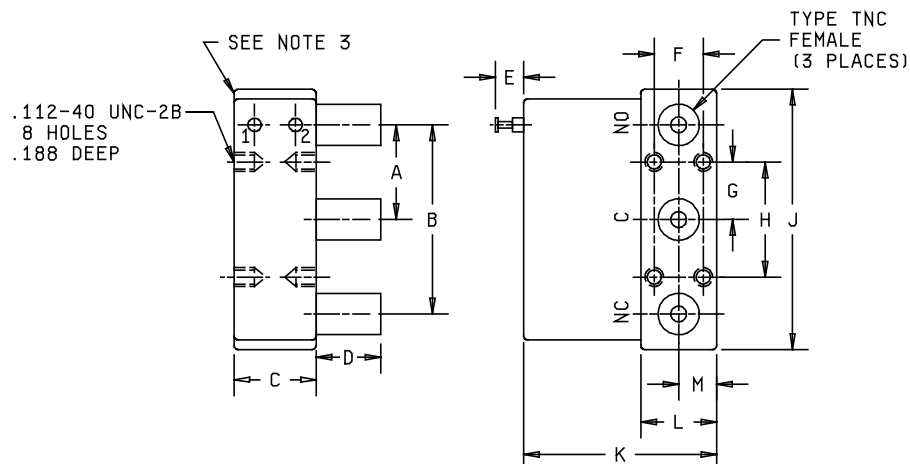
MIL-DTL-3928/20E
w/AMENDMENT 1
16 July 2020
SUPERSEDING
MIL-DTL-3928/20E
15 February 2011

DETAIL SPECIFICATION SHEET

SWITCHES, RADIO-FREQUENCY
TRANSMISSION LINE (COAXIAL) (ELECTRICALLY OPERATED)
CLASS 4, 1P2T

This specification is approved for use by all Departments
and Agencies of the Department of Defense.

The requirements for acquiring the switch described herein
shall consist of this specification and [MIL-DTL-3928](#).



Dimensions									
Letter	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	.885	.865	22.48	21.97	G	.526	.506	13.36	12.85
B	1.78	1.72	45.2	43.7	H	1.042	1.022	26.47	25.96
C	.78	.72	19.8	18.3	J	2.41	2.35	61.2	59.7
D	.65	.59	16.5	15.0	K	1.72	1.66	43.7	42.2
E	.28	.22	7.1	5.6	L	.78	.72	19.8	18.3
F	.572	.552	14.53	14.02	M	.385	.365	9.78	9.27

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Round corners of case may be squared.
4. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.

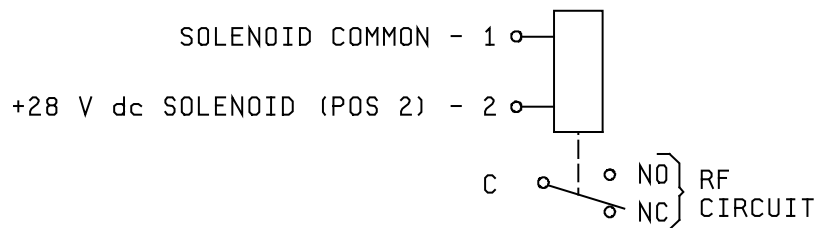
FIGURE 1. [PIN M3928/20-02](#).

AMSC N/A

FSC 5985



MIL-DTL-3928/20E
w/AMENDMENT 1



- Position 1. (Deenergized or failsafe position),
C connects to NC connector.
NO is open circuit.
- Position 2. (Energized position).
C connects to NO connector.
NC is open circuit.

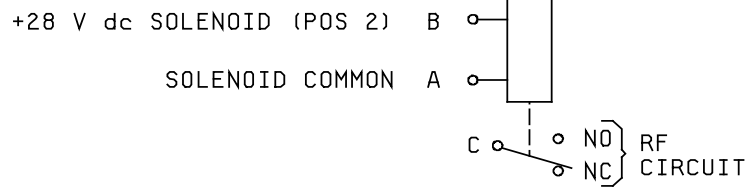
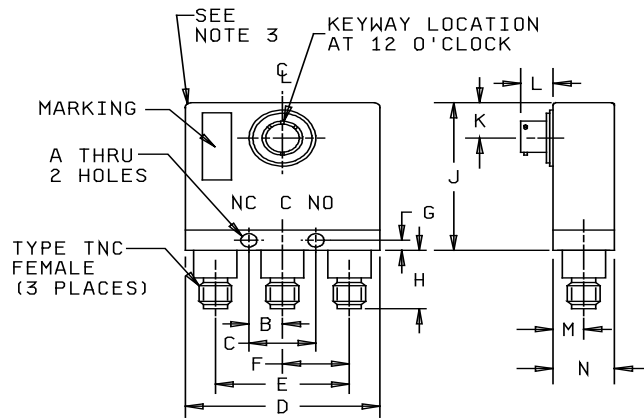
SCHEMATIC (SHOWN IN POSITION 1)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Round corners of case may be squared.
4. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.

FIGURE 1. PIN M3928/20-02 - Continued.

MIL-DTL-3928/20E
w/AMENDMENT 1



Position 1. (Deenergized or failsafe position), C connects to NC connector.
NO is open circuit.
Position 2. (Energized position). C connects to NO connector. NC is open circuit.
SCHEMATIC (SHOWN IN POSITION 1)

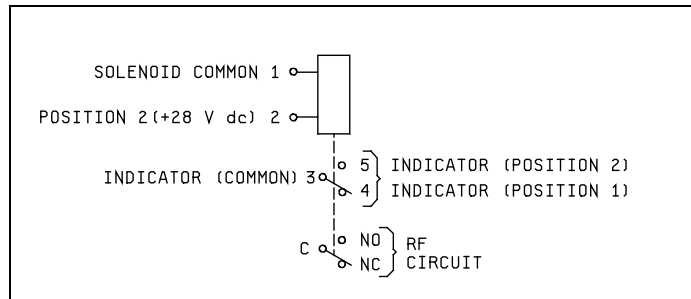
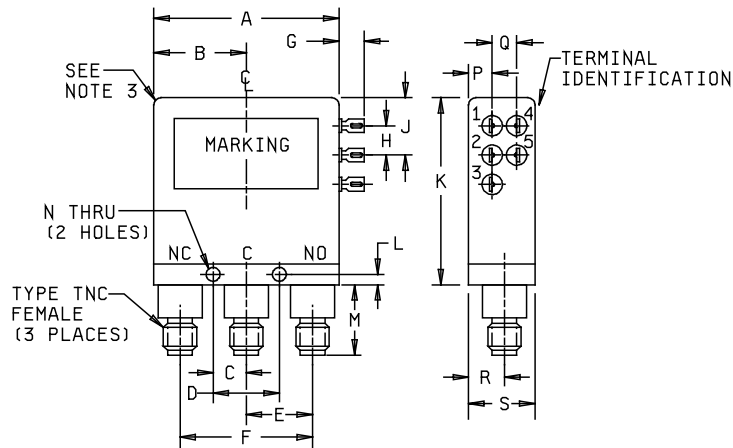
Dimensions									
Letter	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	.213 dia	.193 dia	5.41 dia	4.90 dia	H	.56	---	14.2	---
B	.452	.432	11.48	10.97	J	2.07	---	52.6	---
C	.895	.875	22.73	22.22	K	.43	.37	10.9	9.4
D	2.65	---	67.3	---	L	.65	---	16.5	---
E	1.780	1.760	45.21	44.70	M	.541	.521	13.74	13.23
F	.895	.875	22.73	22.23	N	1.09	---	27.7	---
G	.210	.190	5.33	4.83					

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Round corners of case may be squared.
4. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.

FIGURE 2. PIN M3928/20-03.

MIL-DTL-3928/20E
w/AMENDMENT 1



Position 1. (Deenergized or failsafe position). C connects to NC connector.
NO is open circuit.

Position 2. (Energized position). C connects to NO connector. NC is open circuit.

SCHEMATIC (SHOWN IN POSITION 1)

Letter	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	1.83	1.77	46.5	45.0	K	1.80	---	45.7	---
B	.93	.87	23.6	22.1	L	.12	.06	3.0	1.5
C	.328	.308	8.33	7.82	M	.66	---	16.8	---
D	.646	.626	16.4	15.9	N	.130 dia	.110 dia	3.30 dia	2.79 dia
E	.646	.626	16.4	15.9	P	.21	.15	5.3	3.8
F	1.30	1.24	33.0	31.5	Q	.32	.26	8.1	6.6
G	.35	---	8.9	---	R	.340	.320	8.64	8.13
H	.28	.22	7.1	5.6	S	.69	.63	17.5	16.0
J	.59	.53	15.0	13.5					

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Round corners of case may be squared.
4. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.

FIGURE 3. PIN M3928/20-04.

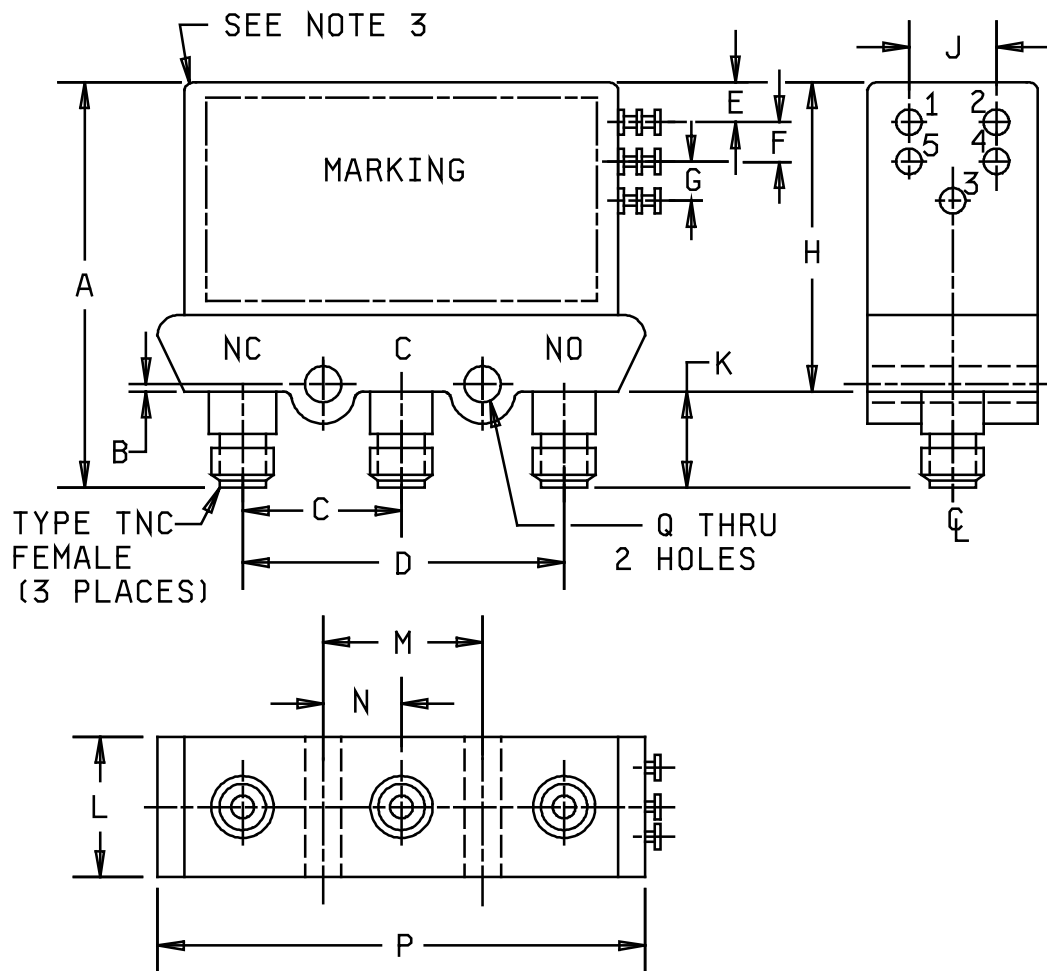
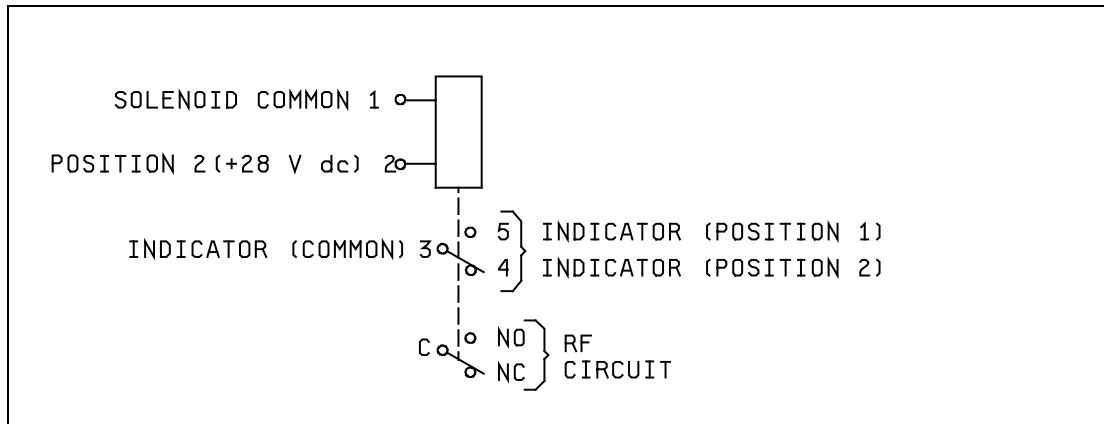


FIGURE 4. PIN M3928/20-05.

MIL-DTL-3928/20E
w/AMENDMENT 1



Position 1. (Deenergized or failsafe position). C connects to NC connector.
NO is open circuit.

Position 2. (Energized position). C connects to NO connector. NC is open circuit.

SCHEMATIC (SHOWN IN POSITION 1)

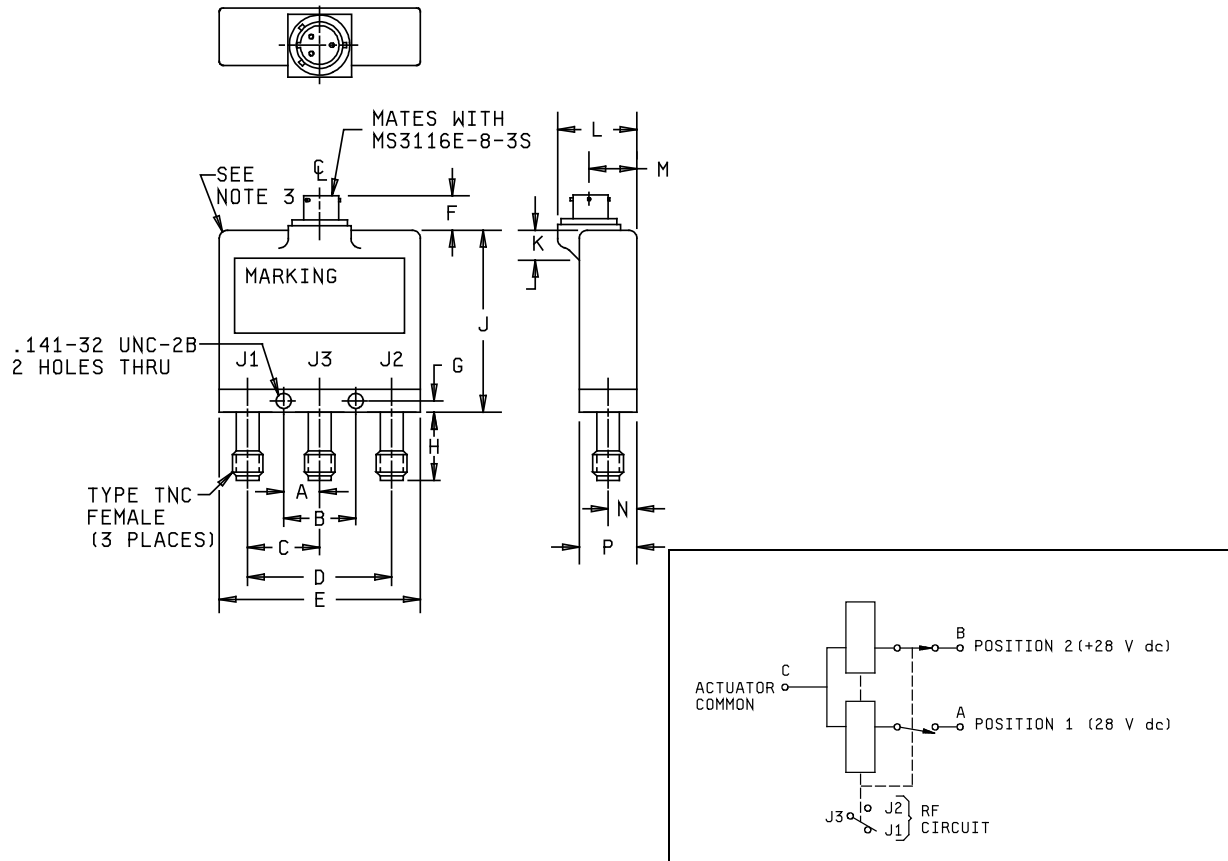
Dimensions									
Lette	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	2.23	2.17	56.6	55.1	H	1.70	---	43.2	---
B	.013	.007	0.33	0.18	J	.310	.290	7.87	7.37
C	.890	.870	22.61	22.10	K	.50	---	12.7	---
D	1.770	1.750	44.96	44.45	L	.90	---	22.9	---
E	.310	.290	7.87	7.37	M	.910	.890	23.11	22.61
F	.260	.240	6.60	6.10	N	.460	.440	11.68	11.18
G	.260	.240	6.60	6.10	P	2.75	---	69.8	---
					Q	.151 dia	.131 dia	3.84 dia	3.33 dia

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Round corners of case may be squared.
4. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.

FIGURE 4. PIN M3928/20-05 - Continued.

MIL-DTL-3928/20E
w/AMENDMENT 1



Position 1. Energize pin A. J3 connects to J1, J2 is open circuit.
Position 2. Energize pin B. J3 connects to J2, J1 is open circuit.

SCHEMATIC (SHOWN IN POSITION 1)

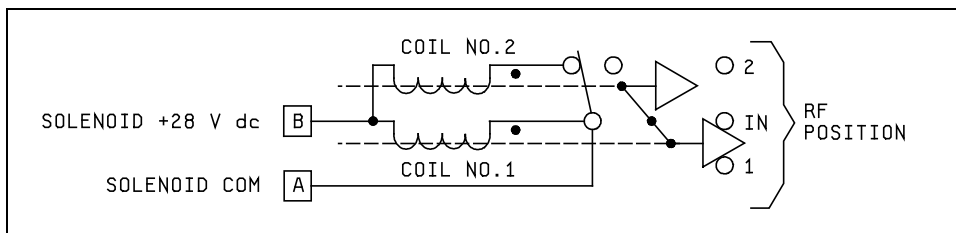
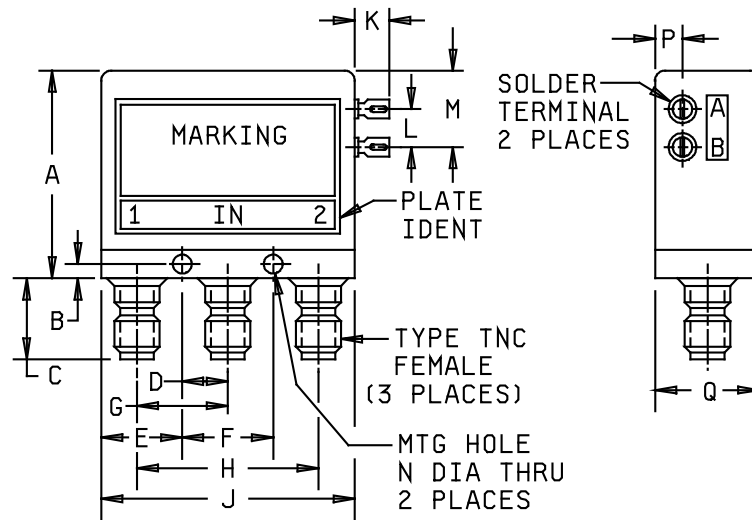
Dimensions									
Letter	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	.328	.308	8.33	7.82	H	.66	---	16.8	---
B	.646	.626	16.41	15.90	J	1.80	---	45.7	---
C	.646	.626	16.41	15.90	K	.30	---	7.6	---
D	1.30	1.24	33.0	31.5	L	.78	.72	19.8	18.3
E	1.83	1.77	46.5	45.0	M	.43	.37	10.9	9.4
F	.55	.49	14.0	12.4	N	.340	.320	8.64	8.13
G	.12	.06	3.0	1.5	P	.69	.63	17.5	16.0

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Round corners of case may be squared.
4. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.

FIGURE 5. PIN M3928/20-06.

MIL-DTL-3928/20E
w/AMENDMENT 1



Shown in failsafe position (position 1)
Energized term B to connect in to 2 (position 2).

FIGURE 6. PIN M3928/20-07

MIL-DTL-3928/20E
w/AMENDMENT 1

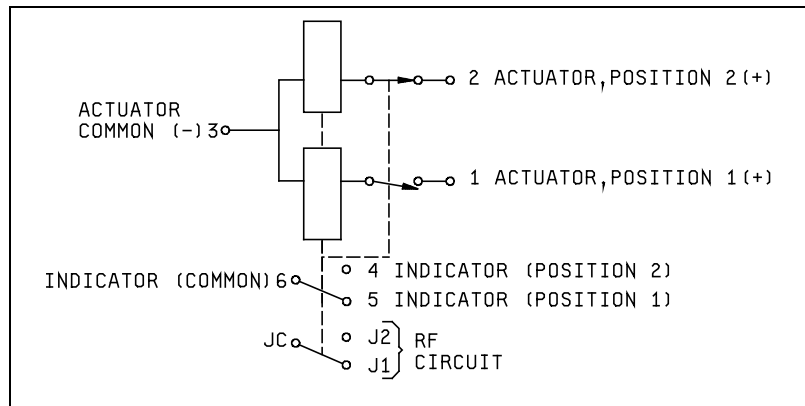
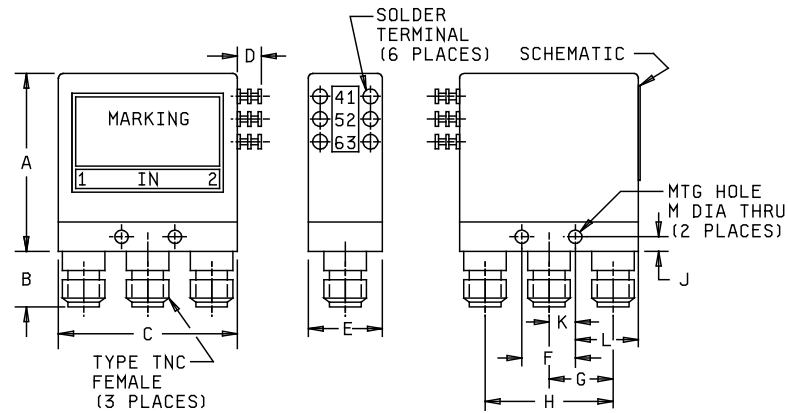
Dimensions									
Letter	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	2.07	---	52.6	---	J	2.65	---	67.3	---
B	.210	.190	5.33	4.83	K	.32	---	8.1	---
C	.59	.53	15.0	13.5	L	.38	.32	9.7	8.1
D	.452	.432	11.48	10.97	M	.73	.67	18.5	17.0
E	.880	.860	22.35	21.84	N	.213 dia	.193 dia	5.41 dia	4.90 dia
F	.895	.875	22.73	22.23	P	.27	.21	6.9	5.3
G	.895	.875	22.73	22.23	Q	1.09	---	27.7	---
H	1.780	1.760	45.21	44.70					

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.
4. Round corners of case may be squared.

FIGURE 6. PIN M3928/20-07. Continued.

MIL-DTL-3928/20E
w/AMENDMENT 1



Position 1. Energize terminal 1. JC connects to J1, J2 is open circuit.
Position 2. Energize terminal 2. JC connects to J2, J1 is open circuit.
Schematic (shown in position 1)

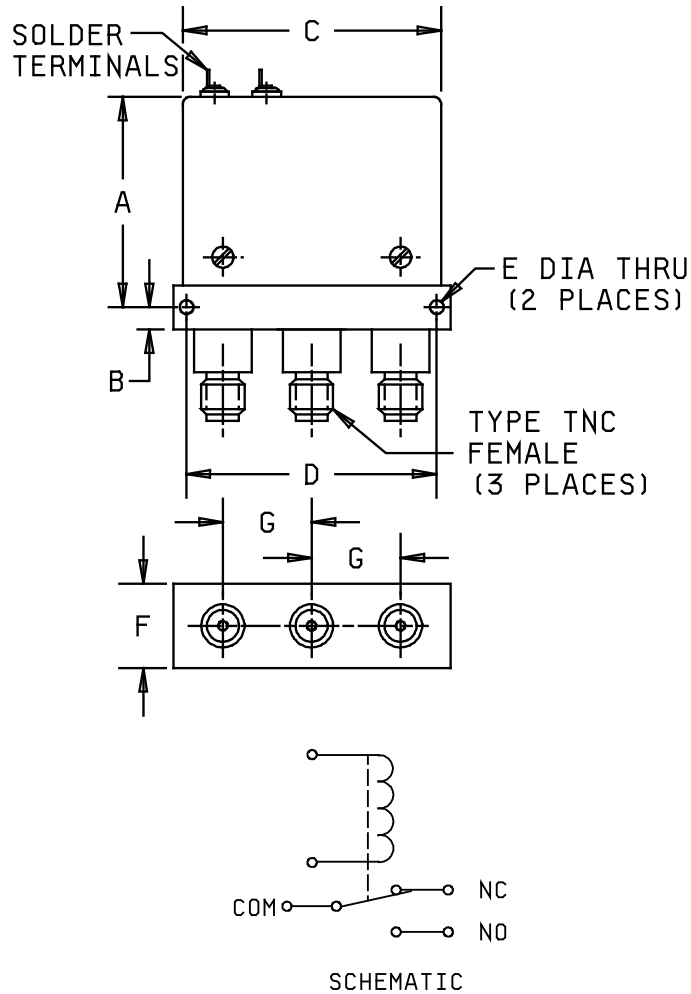
Dimensions									
Letter	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	2.07	---	52.6	---	G	.895	.875	22.73	22.23
B	.59	.53	15.0	13.5	H	1.780	1.760	45.21	44.70
C	2.65	---	67.3	---	J	.210	.190	5.33	4.83
D	.32	---	8.1	---	K	.452	.432	11.48	10.97
E	1.09	---	27.7	---	L	.880	.860	22.35	21.84
F	.895	.875	22.73	22.23	M	.213 dia	.193 dia	5.41 dia	4.90 dia

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.
4. Round corners of case may be squared.

FIGURE 7. PIN M3928/20-08.

MIL-DTL-3928/20E
w/AMENDMENT 1



Dimensions									
Letter	Inches		Millimeters		Letter	Inches		Millimeters	
	Max	Min	Max	Min		Max	Min	Max	Min
A	2.135	2.115	54.23	53.72	E	.190 dia	.170 dia	4.83 dia	4.32 dia
B	.369	.349	9.37	8.86	F	1.03	.97	26.2	24.6
C	2.698	2.678	68.53	68.02	G	.885	.865	22.48	21.97
D	2.385	2.365	60.58	60.07					

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only (1.00 inch = 25.4 mm).
3. Unless otherwise specified, tolerances are $\pm .010$ (± 0.25 mm) for three place decimals and $\pm .03$ (± 0.8 mm) for two place decimals.
4. Round corners of case may be squared.

FIGURE 8. Switch configuration and schematic, PIN M3928/20-09.

TABLE I. Electrical and performance characteristics. 1/

PIN M3928/20-	Fig. No.	Hous- ing	Frequen- cy range dc to GHz	VSWR	Insertion loss (dB)	Isolation (dB)	Switch time (ms)	Position indication circuit and rating	Life cycles x 1000	Fail-safe or latching	Operating current (A) <u>2/</u>	Holding current (A) <u>2/</u>	Nominal operating voltage	Pickup voltage	Dropout voltage	Power and indicator connector	Weight (oz)
				<u>Max</u>	<u>Max</u>	<u>Min</u>	<u>Max</u>				<u>Max</u>	<u>Max</u>					<u>Max</u>
02N, S	2	E	6	15:1	0.3	50	25	None	1000	F	0.12	0.12	28 V dc	20 V dc	5 V dc	Solder terminals	4
03N, S	3	E	11	1.4:1	0.4	60	20	None	100	F	0.8	0.4	28 V dc	18 V dc	5 V dc	MS3113- 8-2P	10
04N, S <u>4/</u>	4	E	11.25	1.4:1	0.5	50	20	0.2A at 40 V dc	100	F	0.28	0.28	28 V dc	22 V dc	5 V dc	Solder terminals	4
05N, S	5	E	0.4	1.2:1	0.15	60	25	2A at 28 V dc	1000	F	0.25	0.25	28 V dc	20 V dc	5 V dc	Solder terminals	6
06N, S <u>3/</u> <u>4/</u>	6	E	12.4	1.5:1	0.5	50	20	None	1000	L	0.56	0	28 V dc	24 V dc	---	Mates with MS3116E-	4
07N, S	7	E	12.4	1.5:1	0.5	60	20	None	100	F	0.80	0.40	28 V dc	20 V dc	10 V dc	8-3S Solder terminals	9.5
08N, S <u>3/</u> <u>5/</u>	8	E	12.4	1.5:1	0.5	50	20	0.1A at	100	L	0.56	---	28 V dc	20 V dc	---	Solder terminals	4
09N, S	9	E	at 1.57 12.4	1.2:1 1.5:1	0.15 .50	60 60	30 15	28 V dc None	1000	F	0.12	0.12	28 V dc	20 V dc	8 V dc	Solder terminals	7

1/ M3928/20-01 has been deleted.

2/ At 28 V dc and 20 ° C.

3/ Transient interference (RFI).

4/ Sequence: Make-before-break.

5/ RF power handling capacity: 80 watts minimum at sea level and 10-5 through 10-10 torr.

MIL-DTL-3928/20E
w/AMENDMENT 1

REQUIREMENTS:

Dimensions and configurations: See figures 1 through 8.

RF connectors: Female connectors (3 places) shall meet the requirements of [MIL-PRF-39012](#) and shall mate with TNC type male connectors in accordance with [MIL-PRF-39012/26](#).

Electrical and performance characteristics: See table I.

RF power handling capability (average): 50 watts (minimum).

Nominal impedance: 50 ohms.

Termination: Open.

Vibration: [MIL-STD-202-204](#) Method I.

Operating temperature: -55° C to +85 °C.

Part or Identifying Number (PIN): M3928/20- (and dash number from [table I](#)).

Referenced documents: In addition to [MIL-DTL-3928](#), this document references the following

[MIL-STD-202-204](#)
[MIL-PRF-39012](#)
[MIL-PRF-39012/26](#)
[MS3113](#)
[MS3116](#)

Amendment notations. The margins of this specification sheet are marked with vertical lines to indicate modifications generated by this amendment. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Custodians:
Army - CR
Navy - EC
Air Force - 85
DLA - CC

Preparing activity:
DLA - CC

(Project 5985-2020-007)

Review activities:
Army - MI
Navy - AS, MC, OS, SH
Air Force - 19

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.