

## SP4T Electromechanical Relay Normally Open Switch, DC to 12 GHz, up to 600W, 2M Lifecycles, 28V, Indicators, TTL, Suppression Diodes, N

The FMSW6466 is a Single Pole Four Throw (SP4T) electromechanical relay switch that operates across a wide frequency range of DC to 12 GHz and can handle up to 600 Watts of Average power in a break before make condition. The 50 Ohm design is rated for 2 million lifecycles and features a Normally Open Actuator where the selected position remains active with constant voltage, all positions are open when voltage is removed. Additional features include TTL control logic, suppression diodes which limit voltage spikes or reverse current, and indicators. Impressive typical performance includes 0.2 dB insertion loss and isolation greater than 80 dB. This switch requires +28 Vdc bias voltage and operates over a temperature range of -25°C to +65°C. The rugged and compact package assembly supports N Type female connectors and solder terminal pins for all command control functions. And for highly reliable operation, the model is guaranteed to meet MIL-STD-202 environmental test conditions for shock and random vibration.

### Electrical Specifications

|                    |   |
|--------------------|---|
| Switch Type        | SP4T                                      |
| Actuator Type      | Normally Open                             |
| Switching Sequence | Break Before Make                         |
| Actuator Options   | TTL Logic, Solder Pins, Indicators        |
| TTL Control        | on: 2.4 to 5 Volts<br>off: 0 to 0.8 Volts |

| Description                         | Min | Typ   | Max   | Units  |
|-------------------------------------|-----|-------|-------|--------|
| Frequency Range                     | DC  |       | 12    | GHz    |
| Impedance                           |     | 50    |       | Ohms   |
| Operating Voltage                   | 26  | 28    | 30    | Volts  |
| Actuating Current @ 28 Volts        |     |       | 280   | mA     |
| VSWR                                |     | 1.4:1 | 1.7:1 |        |
| Insertion Loss                      |     | 0.2   | 0.5   | dB     |
| Isolation                           | 60  | 80    |       | dB     |
| Input Power (CW)<br>(CW at 400 MHz) |     |       | 1     | kWatts |
| Switching Time                      |     |       | 20    | ms     |

### Performance by Frequency

| Description         | F1     | F2    | F3     | F4 | F5 | Units |
|---------------------|--------|-------|--------|----|----|-------|
| Frequency Range     | DC - 1 | 1 - 4 | 4 - 12 |    |    | GHz   |
| VSWR, Max           | 1.25:1 | 1.4:1 | 1.7:1  |    |    |       |
| Insertion Loss, Max | 0.3    | 0.4   | 0.5    |    |    | dB    |
| Isolation, Min      | 70     | 60    | 60     |    |    | dB    |
| Power In, Max (CW)  | 600    | 300   | 200    |    |    | Watts |



### Features:

- Single Pole Four Throw Electromechanical Relay Switch
- DC to 12 GHz Frequency Range
- Latching Self Cut-Off Actuator
- TTL Logic Control
- Suppression Diodes
- Indicators
- 2M Lifecycle Rating
- Insertion Loss 0.2 dB typ
- Isolation > 80 dB typ
- VSWR as low as 1.25:1 max
- +28 Volt DC Bias
- Terminal Solder Pins for all Command Control Functions
- N Type Female Connectors
- -25°C to +65°C Operating Temperature
- Up to 600 Watt Average Power Handling
- 50 Ohm Design
- Hot Switching Capability - Consult Factory
- S-Parameter Data available upon request
- Rugged Design meets Mil-STD-202 Test Conditions

### Applications:

- Aerospace & Defense
- Test & Measurement
- Microwave Radio Systems
- Military & Commercial Communication Systems
- Research & Development
- SATCOM
- Wireless Communications
- Enterprise
- IoT

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**Mechanical Specifications**

**Size**

|                |                    |
|----------------|--------------------|
| Length         | 2.65 in [67.31 mm] |
| Width/Diameter | 2.5 in [63.5 mm]   |
| Height         | 2.5 in [63.5 mm]   |
| Finish         | NICKEL             |
| Package Type   | Connectorized      |
| Operating Life | 2,000,000 Cycles   |

**Connectors**

|                   |          |
|-------------------|----------|
| RF Connector Type | N Female |
|-------------------|----------|

**Environmental Specifications**

**Temperature**

|                 |                   |
|-----------------|-------------------|
| Operating Range | -25 to +65 deg C  |
| Storage Range   | -55 to +100 deg C |

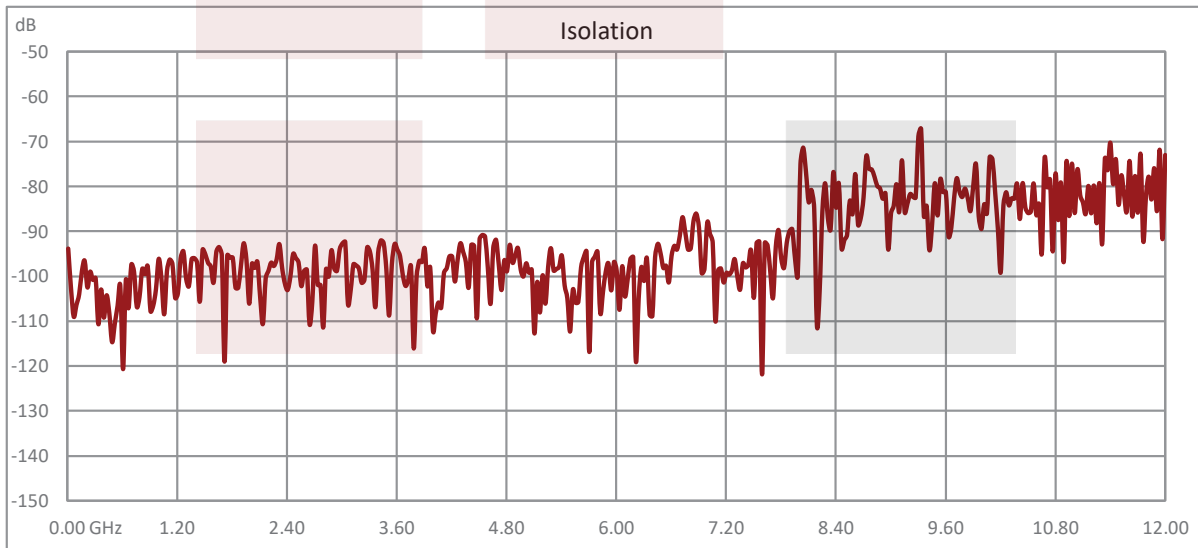
|           |   |
|-----------|---|
| Humidity  | Moisture resistant or immersion sealing available       |
| Shock     | MIL-STD-202 Method 213, Condition D, 500G (non oper)    |
| Vibration | MIL-STD-202 Method 214, Condition D, 10G RMS (non oper) |

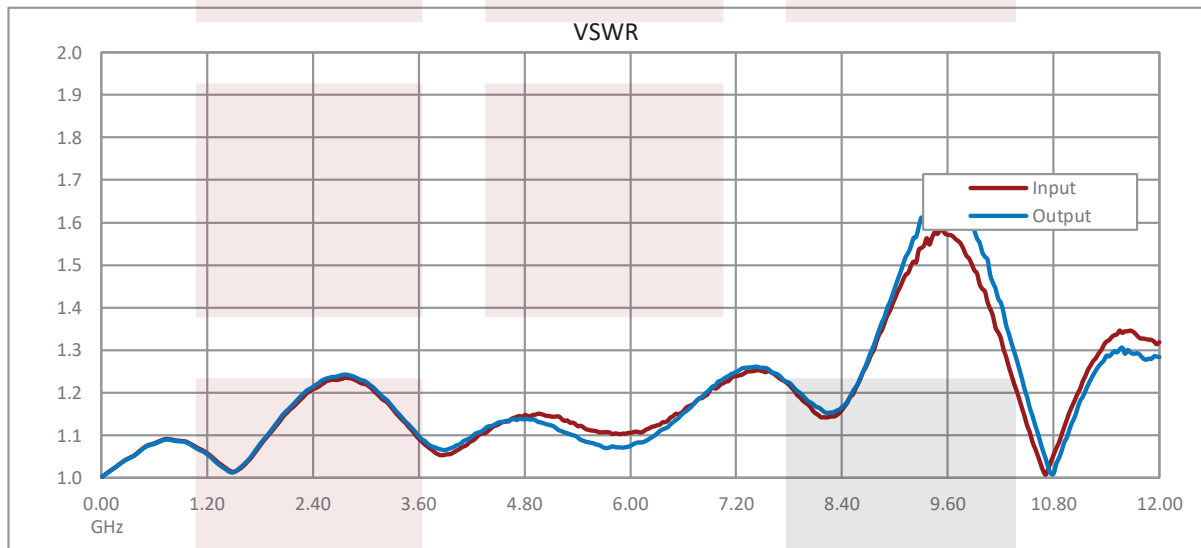
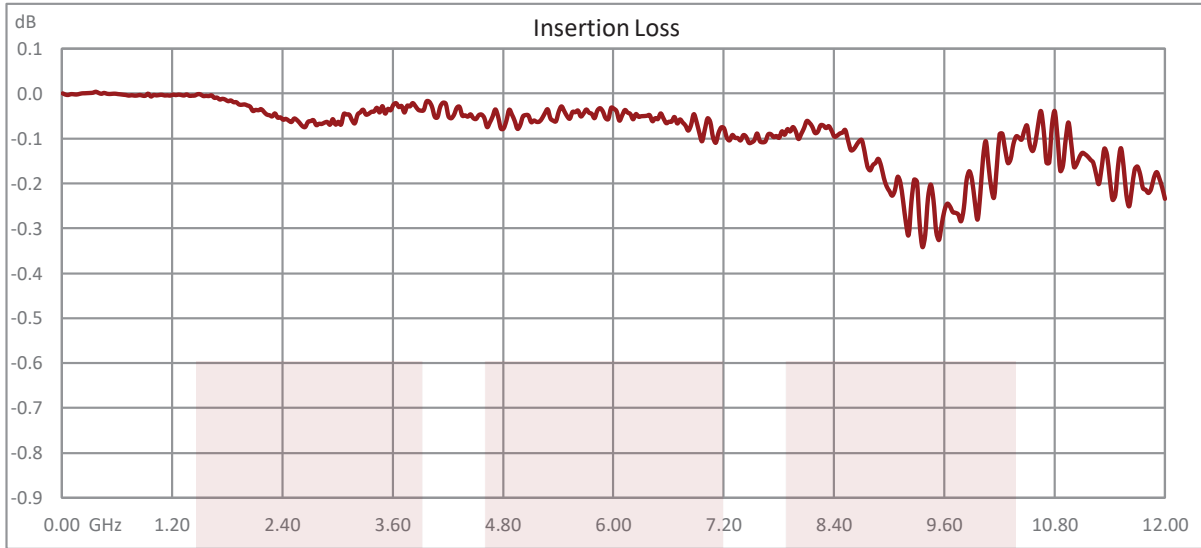
**Compliance Certifications** (see [product page](#) for current document)

**Plotted and Other Data**

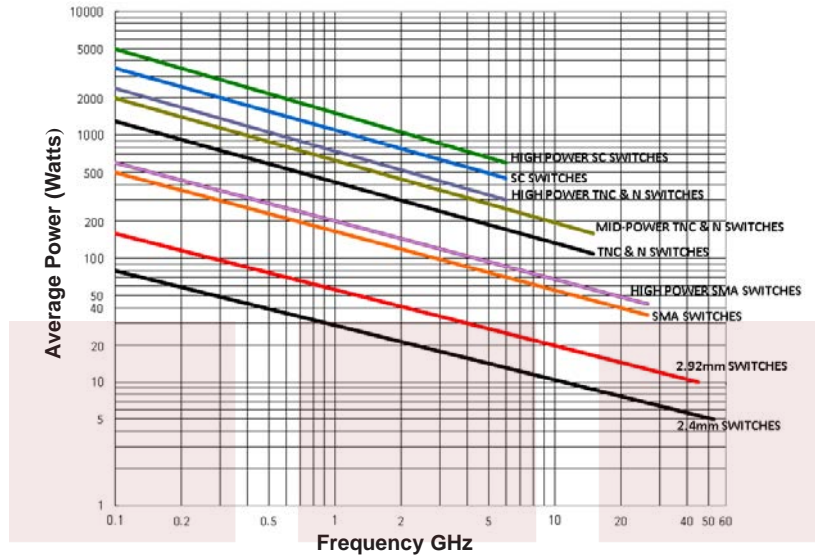
Notes:

**Typical Performance Data**

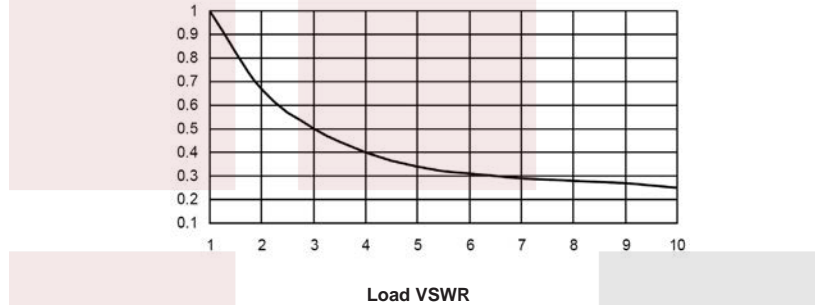




**Power Handling vs. Frequency**



**Power Handling De-rating vs. Load VSWR**



Power Handling Chart and Derating Curves based on the following Test and Environmental Conditions:  
 Ambient temperature: 20 - 25°C  
 Altitude: Sea Level to 1,000 feet  
 Relative Humidity: 50 - 55%  
 Load VSWR: ≤ 1.20:1  
 Operation: Cold Switching

SP4T Electromechanical Relay Normally Open Switch, DC to 12 GHz, up to 600W, 2M Lifecycles, 28V, Indicators, TTL, Suppression Diodes, N from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Lewisville, Texas. Fairview Microwave is RF on-demand.

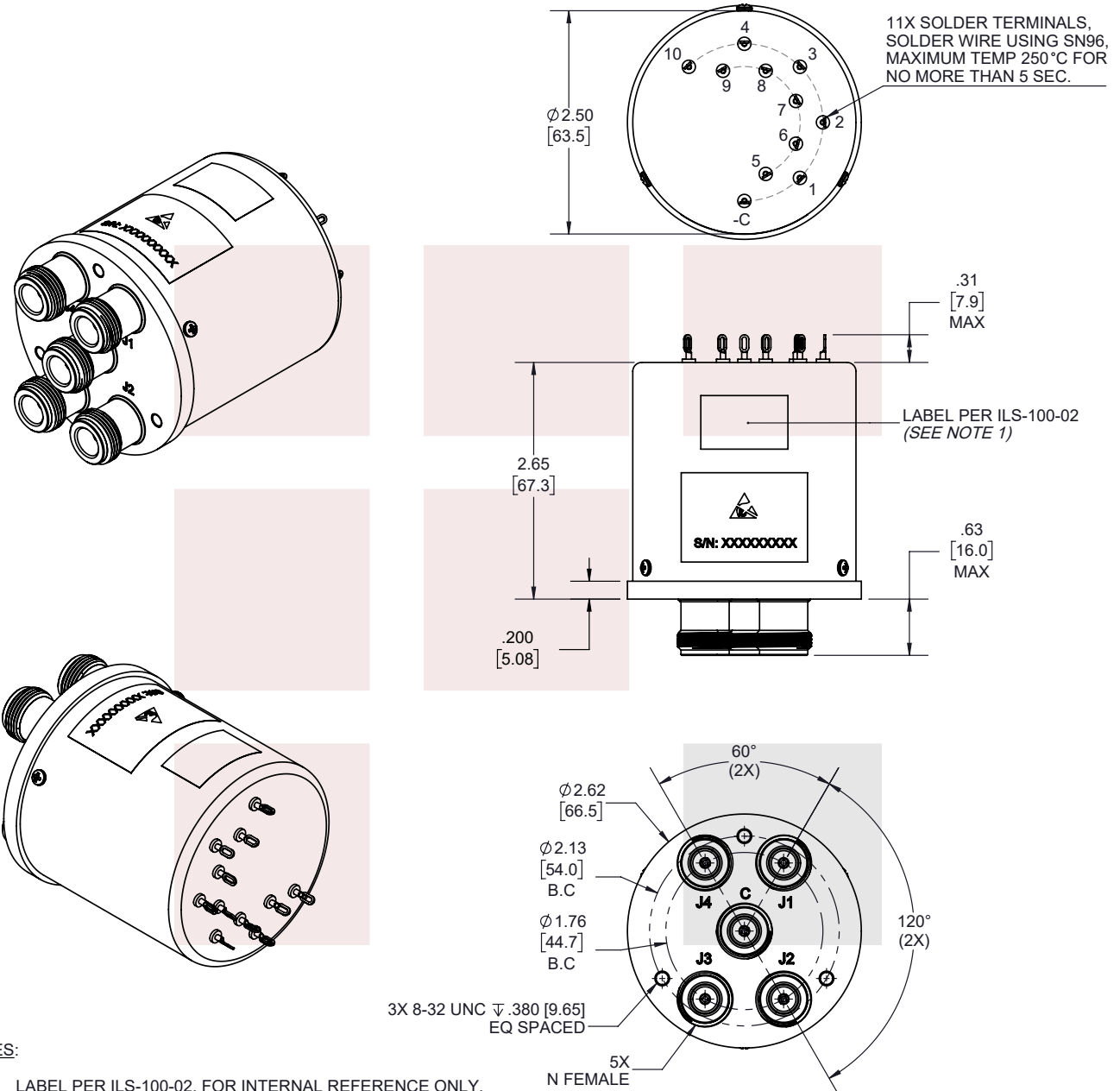
For additional information on this product, please click the following link: [SP4T Electromechanical Relay Normally Open Switch, DC to 12 GHz, up to 600W, 2M Lifecycles, 28V, Indicators, TTL, Suppression Diodes, N FMSW6466](#)

URL: <https://www.fairviewmicrowave.com/sp4t-normally-open-12-ghz-electro-mechanical-relay-switch-1000w-28v-n-fmsw6466-p.aspx>

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| REVISIONS |                 |          |          |
|-----------|-----------------|----------|----------|
| REV.      | DESCRIPTION     | DATE     | APPROVED |
| A         | INITIAL RELEASE | 2/1/2021 | T.GALLA  |



**NOTES:**

1. LABEL PER ILS-100-02. FOR INTERNAL REFERENCE ONLY. LABEL LOCATION FOR REFERENCE ONLY.

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TITLE  
SP4T Electromechanical Relay Normally Open Switch, DC to 12 GHz, up to 600W, 2M Lifecycles, 28V, Indicators, TTL, Suppression Diodes, N

UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES  
DIMENSIONS IN [ ] ARE MILLIMETERS

TOLERANCES: CABLE LENGTH (L) TOLERANCES:

|                    |             |   |
|--------------------|-------------|---|
| .X = ±.2 [5.08]    | FRACTIONS   | L ≤ 12 [305] = +1 [25] / -0                 |
| .XX = ±.02 [.51]   | ± 1/32      | 12 [305] < L ≤ 60 [1524] = +2 [51] / -0     |
| .XXX = ±.005 [.13] | ANGLES ± 1° | 60 [1524] < L ≤ 120 [3048] = +4 [102] / -0  |
|                    |             | 120 [3048] < L ≤ 300 [7620] = +6 [152] / -0 |
|                    |             | 300 [7620] < L = +5%L / -0                  |

THIRD-ANGLE PROJECTION



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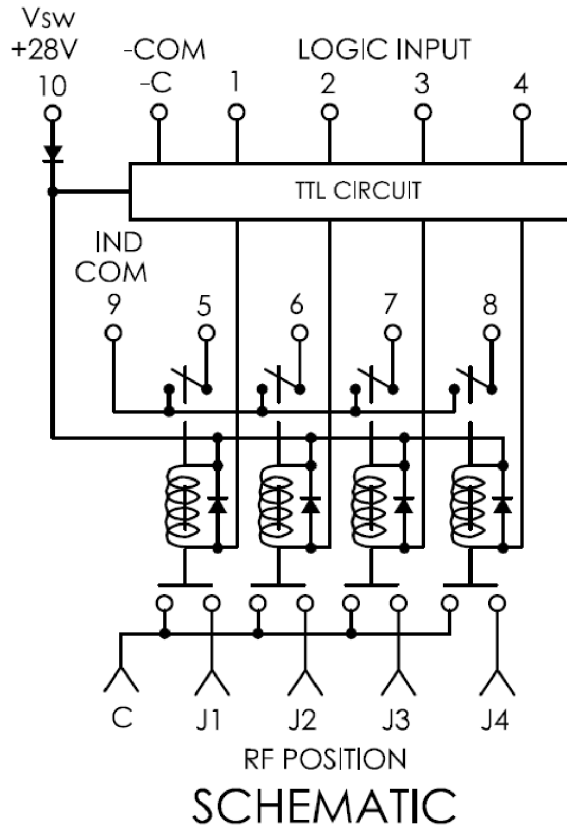
SHEET 1 OF 2

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

SCALE N/A

|           |                    |                    |                      |          |
|-----------|--------------------|--------------------|----------------------|----------|
| SIZE<br>A | CAGE CODE<br>3FKR5 | DRAWN BY<br>K.DANG | ITEM NO.<br>FMSW6466 | REV<br>A |
|-----------|--------------------|--------------------|----------------------|----------|

T-Rev.D



**PIN ASSIGNMENT**

| TERMINALS<br>LOGIC INPUT<br>PINS | RF PATH |     |     |     | INDICATOR |     |     |     |
|----------------------------------|---------|-----|-----|-----|-----------|-----|-----|-----|
|                                  | J1      | J2  | J3  | J4  | 5         | 6   | 7   | 8   |
| 1 ("1")                          | ON      | OFF | OFF | OFF | ON        | OFF | OFF | OFF |
| 2 ("1")                          | OFF     | ON  | OFF | OFF | OFF       | ON  | OFF | OFF |
| 3 ("1")                          | OFF     | OFF | ON  | OFF | OFF       | OFF | ON  | OFF |
| 4 ("1")                          | OFF     | OFF | OFF | ON  | OFF       | OFF | OFF | ON  |

PIN -C. -COM  
PIN 10. V<sub>sw</sub> +28V  
PIN 9. IND COM

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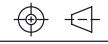
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120 [3048] < L ≤ 300 [7620] = +6 [152] / -0  
300 [7620] < L = +5%L / -0

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SHEET 2 OF 2

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SCALE N/A

|           |                    |                    |                      |          |
|-----------|--------------------|--------------------|----------------------|----------|
| SIZE<br>A | CAGE CODE<br>3FKR5 | DRAWN BY<br>K.DANG | ITEM NO.<br>FMSW6466 | REV<br>A |
|-----------|--------------------|--------------------|----------------------|----------|

T-Rev.D