

# DATA SHEET

SUNGMUN CODE : E12F7-12M60-20T54-F500

DESCRIPTION : Encoder



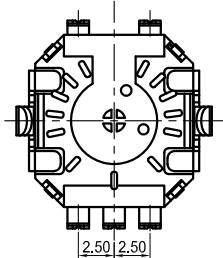
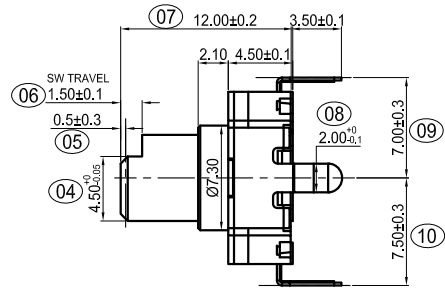
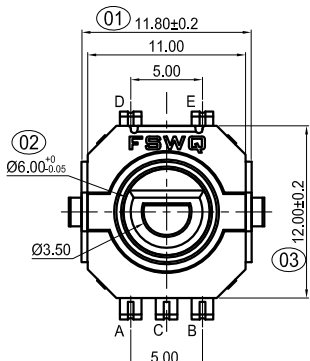
帝凡芯城  
Dicomon.com



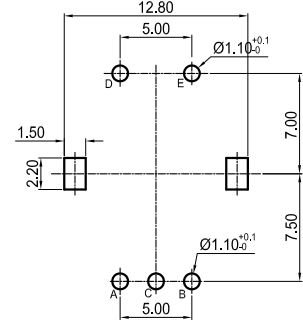
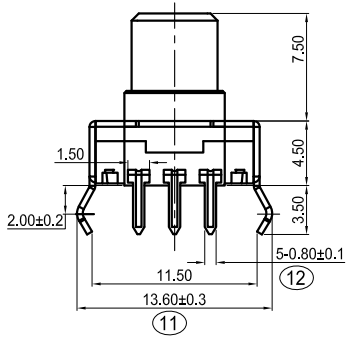
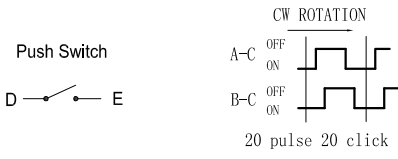
# F-SWITCH ELECTRONICS CO.,LTD.

|             |  |                |                        |                   |                 |
|-------------|--|----------------|------------------------|-------------------|-----------------|
| 名称<br>TITLE | ENCODER  | 料号<br>PART NO. | E12F7-12M60-20T54-F500 | 图号<br>DRAWING NO. | FSE11-WI-DR-006 |
| 规格<br>SPEC  | 立式PCB型, 11.8*12*4.5mm 编码器, 安装高度12.0mm, 轴径6.0mm, 扭力60gf, 开关按力500gf, 20脉冲20定位, 寿命10万次. |                |                        |                   |                 |

| No.     | Items                       | Standard                           | No.         | Items                                  | Standard   |
|---------|-----------------------------|------------------------------------|-------------|--|--|
| 1(1.2)  | Operating Temperature Range | -40°C to +85°C                     | 19(7.1)     | Mechanical Life                        | 50,000 cycles(30 t/min, Torque attenuation <30%) |
| 2(1.3)  | Operating Relative Humidity | ≤85% RH                            | 20(7.2)     | Electronics Life                       | 50,000 cycles(30 t/min, Torque attenuation <30%) |
| 3(3)    | Ratings                     | DC 12V 0.5mA                       | 19(7.3)     | Switch Mechanical Life                 | 50,000 cycles(60 t/min, Torque attenuation <30%) |
| 4(4.1)  | Contact Resistance          | 200mΩ Max(Initial status )         | 20(7.2)     | Switch Electronics Life                | 50,000 cycles(60 t/min, Torque attenuation <30%) |
| 5(4.2)  | Insulation Resistance       | 50MΩ Min.                          | 21(8.1)     | Cold Proof                             | -40±2°C 96h                                      |
| 6(4.3)  | Dielectric Voltage          | AC50V · 60s                        | 22(8.2)     | Hot Proof                              | 85±2°C 96h                                       |
| 7(4.4)  | Output signal format        | C.W. 20pulse/360°,A(A~C),B(B~C)    | 23(8.3)     | Moisture Resistance                    | 40±2°C · 90-95%RH 96h                            |
| (5.2)   |                             | C.C.W. 20pulse/360°,B(B~C),A(A~C)  | 24(8.4)     | Temperature Cycling                    | -40~85°C · change 5 cycles                       |
| 8(4.4)  | Phase-different             | T1,T2,T3,T4 ≥ 4mS                  | 25(8.5)     | Salt Mist                              | 5% NaCl 24h                                      |
| 9(4.5)  | Chattering                  | t1,t3 ≤ 3mS                        | 26(8.6)     | Vulcanization test                     | 3% Na2s 3 minutes                                |
| 10(4.5) | Bounce                      | t2 ≤ 2mS                           | Dimensions: |  |  |
| 11(5.1) | Detent points               | 20 detent points,each angle:20°±3° | 1           | 11.8±0.2mm                             | 12 5-0.8±0.1mm                                   |
| 12(5.3) | Rotational force            | 60±20gf.cm (Initial status )       | 2           | Ø6.0 <sup>+0</sup> <sub>-0.05</sub> mm |  |
| 12(5.3) | Push force                  | 500±150gf (Initial status )        | 3           | 12.0±0.2mm                             |  |
| 12(5.3) | Restoring force             | 80gf (Initial status )             | 4           | 4.5 <sup>+0</sup> <sub>-0.05</sub> mm  |  |
| 13(5.4) | Axial lateral push Strength | 25N, 10S.                          | 5           | 0.5±0.3mm                              |  |
| 14(5.4) | Axial pull Strength         | 50N, 10S.                          | 6           | 3.5±0.1mm                              |  |
| 15(5.5) | Axial Swing Strength        | 3N, 60S. Axial Swing <0.3mm        | 7           | 12.0±0.2mm                             |  |
| 16(5.6) | Terminal Strength           | 3N, 10S.                           | 8           | 2.0±0.1mm                              |  |
| 17(6.2) | Solder Heat Resistance      | Wave Soldering 260°C Max, 5S Min   | 9           | 7.0±0.3mm                              |  |
|         |                             | Manual Soldering 350°C Max, 3s Max | 10          | 7.5±0.3mm                              |  |
| 18(6.1) | Solder Ability              | 260°C Max, 3S Min                  | 11          | 13.6±0.3mm                             |  |



(Tolerance: ±0.1)  
(P.C.B thickness t=1.6~2.0)



### 1. 材质清单 Material list

| 项目 ITEM | 名称 Name            | 材质 MATERIAL                |
|---------|--------------------|----------------------------|
| 1       | 转轴 Shaft           | 工程塑料 (PC)                  |
| 2       | 盖片 Cover           | 铁片 SPCC                    |
| 3       | 定位片 Anchor Plate   | 不锈钢 Stainless Steel Strips |
| 4       | 齿轮 Wheel gear      | 工程塑料 (PA66)                |
| 5       | 接触片 Contact Spring | 磷铜合金 Copper alloy          |
| 6       | 底座 Base            | 工程塑料 (PA66)                |
| 7       | 端子 Terminal        | 磷铜合金 Copper alloy          |
| 8       | 弹片 Spring          | 不锈钢 Stainless Steel Strips |
| 9       | 轴套                 | 工程塑料 (PA66)                |

| VER. | 内容 S.U.B. | 修改 MODIFY | 日期 DATE | 公差 TOLERANCE    | 单位 UNIT   | 张数 SHEET | 图幅 SIZE  | 图类 TYPE  |
|------|-----------|-----------|---------|-----------------|-----------|----------|----------|----------|
| 10   |           |           |         | L<5 ±0.2        | mm        | 1/1      | A4       | 成品图      |
|      |           |           |         | L<10 ±0.3       | 版本 R E V. | 设计 DSGD. | 审核 CHKD. | 核准 APPD. |
|      |           |           |         | L<30 ±0.5       | A2        |          |          |          |
|      |           |           |         | .X° ±2° X.° ±5° | 比例 SCALE  |          |          |          |
|      |           |           |         | 角法 P R O J . 5  | 5:1       |          |          |          |