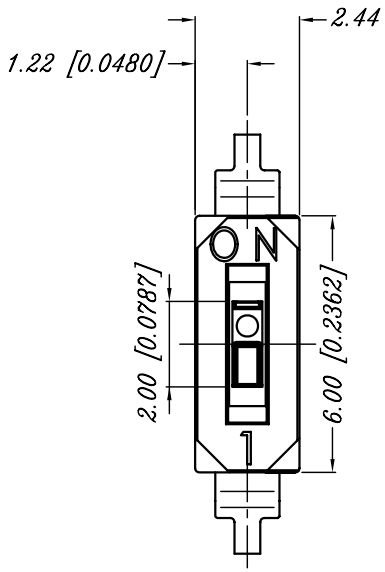
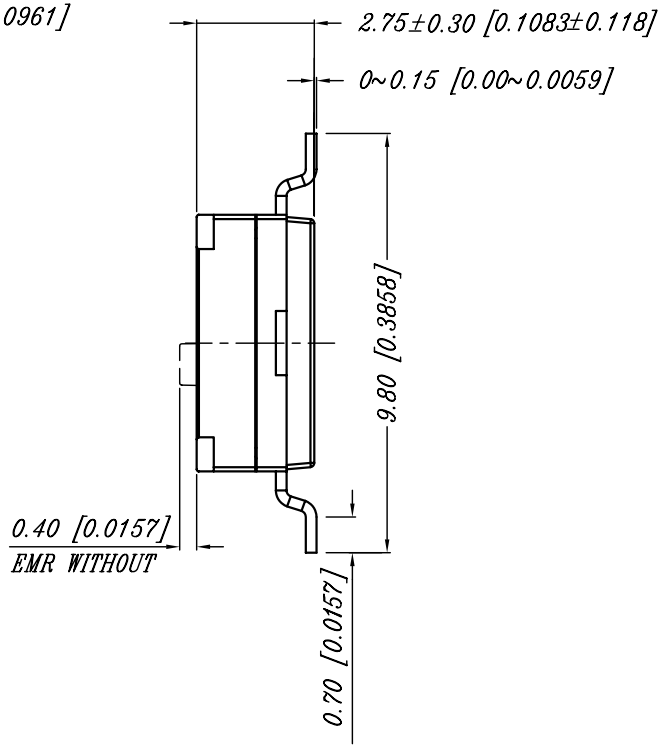
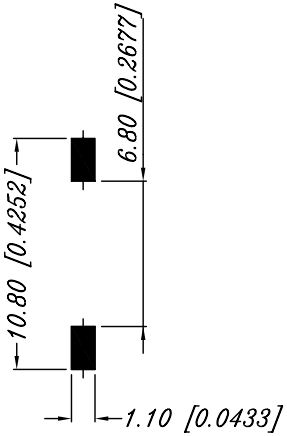
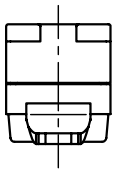




CIRCUIT DIAGRAM



P.C.B. LAYOUT

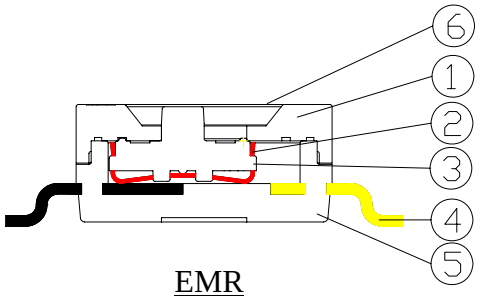


NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS, BRACKETED DIMENSIONS ARE IN INCHES.
2. GENERAL TOLERANCES MAX. ±0.20mm.

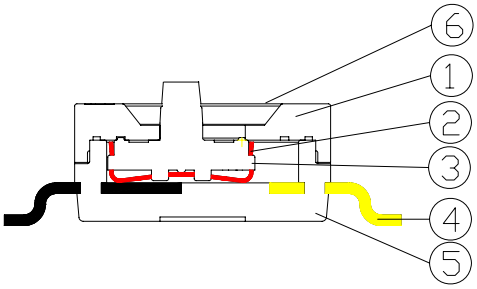
ZONE	REV.	DESCRIPTION	DATE	APPD.
4				
3				
2				
1	A	DWG.REL	2009.05.06	

APPD:	Q'TY:	圓達實業股份有限公司 DIPTRONICS MANUFCTURING INC.	PART NAME: END-STACKABLE TYPE
CHKD:	SCALE: 10:1		
DR: 2009.05.06 蘇文道	REV: A UNITS: MM	PART NO: EM□-01-V	MAT'L:
DESIGN: 黃昌茂			FINISH: DWG NO: EM□-01-V

ITEM	DESC.	Q'TY	MATERIALS	TREATMENT	REMARK
1.	COVER	1	HIGH – TEMP. THERMOPLASTIC PA-9T UL 94V-0	MOLDED BLACK	-
2.	CONTACT	*	COPPER	GOLD PLATED AT CONTACT AREA	-
3.	ACTUATOR	*	THERRMOPLASTIC LCP UL 94V-0	MOLDED WHITE	-
4.	TERMINAL	1	BRASS	GOLD PLATED	-
5.	BASE	1	HIGH – TEMP. THERMOPLASTIC PA9T UL 94V-0	MOLDED BLACK	-
6.	TAPE	1	KAPTON	-	-



EMR



EM

REMARK : E □ □- □ □ - □ - □ - □

PACKAGE STYLE
□ =TUBE
T/R=TAPE & REEL

V= Lead Free

SEAL:
□=REGULAR
T =TOP TAPE SEALED

NUMBER OF POSITIONS:
01.02.03.04.05.06.07.08.09.10.12 POSITIONS
(01POS WITHOUT EJ TYPE)

ACTUATOR TYPE:
□=RAISED ACTUATOR
R =RECESSED ACTUATOR

TERMINAL TYPE
S =THUOUGH HOLE TYPE 8.50mm
M = S.M.T.
I =THUOUGH HOLE TYPE 7.62mm
J=S.M.T

END-STACKABLE TYPE

B	新增 EJ 規格	
A	DWG.REL	邱明義
REV	ECO. NO	APPD

TITLE: END STACKABLE TYPE DIP SWITCHES	APPD. :	
	CHKD. :	
PRROD.NO:E□□-□□□-V-□	PR. : 陳碧霞'08.10.24	
FILE NO: E-V-CD15	REV : B	SHEET : 1 of 1

1.**Style:**

This specification describes "DUAL IN-LINE PACKAGE SWITCHES" mainly used as signal switch of electric devices with the general requirements of mechanical and electrical characteristics.

1.1 Operating Temperature Range : -20℃ ~ +85℃

1.2 Storage Temperature Range : -40℃ ~ +85℃

1.3 The shelf life of product is within 6 months.

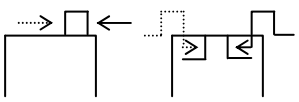
2. **Current Range :**

2.1 Non-Switching : 100mA, 50V DC

2.2 Switching : 25mA , 24V DC

3. **Type of Actuation:** Actuated by sliding

4. **Test Sequence :**

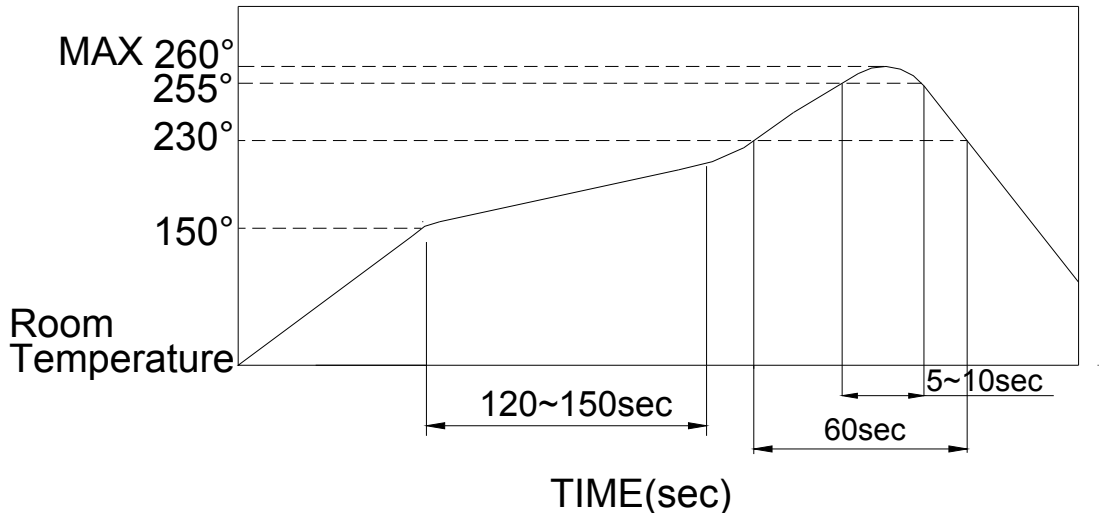
	ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
ELECTRIC PERFORMANCE	1	Visual Examination	By visual examination check without any out pressure & testing.	There shall be no defects that affect the serviceability of the product.
	2	Contact Resistance	1)To be measured between the two terminals associated with each switch pole. 2)Measurements shall be made with a 1kHz shall current contact resistance meter.	100mΩ max. (initial)
	3	Insulation Resistance	500V DC, 1 minute ± 5 sec.	100MΩ min.
	4	Dielectric withstand-ing Voltage	500V AC (50Hz or 60 Hz) shall be applied between all the adjacent terminals and between the terminal and the frame for 1 minute.	There shall be no breakdown or flashover.
	5	Capacitance	1 MHz ± 10 kHz	5 pF max.
MECHANICAL PERFORMANCE	6	Operation Force	Applied in the direction of operation. ON→OFF OFF→ON 	1000gf max （9.8N max）

<table>
<tr><td rowspan="6">MECHANICAL PERFORMANCE</td><td>7</td><td>Stop Strength</td><td colspan="3">A static load of 1 kgf is applied in the operating direction and pulling direction operated for a period of 15 seconds.</td><td>There shall be no sign of damage mechanically.</td></tr>
<tr><td rowspan="4">8</td><td rowspan="4">Soldering Heat Resistance</td><td colspan="3">1)Soldering Temperature :
<table>
<tr><td>PROD SERIES</td><td>TEMP</td><td>TIME</td></tr>
<tr><td>THROUGH HOLE TYPE E□(R)</td><td>260℃±5℃</td><td>5±1 sec.</td></tr>
<tr><td rowspan="2">SMT TYPE EM(R)</td><td>255~260℃</td><td>5~10sec</td></tr>
<tr><td colspan="2">SEE PAGE 4/4</td></tr>
</table></td><td rowspan="3">1)Contact Resistance : 200mΩMax
2)As shown in item 3~6</td></tr>
<tr><td colspan="3">2)Duration of Solder Immersion:
5±1 sec.
3)Frequency of Soldering Process:
2 times max.
(PCB is 1.6mm in thickness.)</td></tr>
<tr><td>9</td><td>Vibration</td><td colspan="3">Shall be vibrated in accordance with Method 201A of MIL-STD-202F
1)Frequency: 10-55-10 Hz 1 min/cycle.
2)Direction: 3 vertical directions including the direction of operation.
3)Test Time: 2 hours each direction.</td><td>As shown in item 2~6</td></tr>
<tr><td>10</td><td>Shock</td><td colspan="3">Shall be shocked in accordance with Method 213B condition A of MIL-STD-202F
1)Acceleration: 50G.
2)Action Time : 11 ± 1 m sec.
3)Testing Direction: 6 sides.
4)Test cycle: 3 times in each direction</td><td>As shown in item 2~6</td></tr>
<tr><td>11</td><td>Solderability</td><td colspan="3">①E□(R) Soldering Temperature:245±3℃
Lead-Free solder：M705E JIS Z 3282 Class A
(Tin 96.5%，Silver 3%，Copper 0.5%)
②EM(R) SEE PAGE 4/4
③Flux: 5-10 seconds.
④Duration of solder Immersion:
5±1 sec.</td><td>No anti-soldering and the coverage of dipping into solder must more than 75% was requested.</td></tr>
</table>

DURABILITY	**12**	Operation Life	Measurements shall be made following the test set forth below: 1)25 mA, 24V DC resistive load 2)Rate of Operation: 15~20 cycles/ minute 3)Cycle of Operation: 2000 cycles.	1)As show in item 3,4 2)Contact Resistance: 500mΩ max. (final-after test)
WEATHER-PROOF	**13**	Resistance Low Temperature	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made : 1)Temperature : -40℃±3℃ 2)Time: 96 hours	As shown in item 2~6
	14	Resistance High Temperature	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made : 1)Temperature : 85℃±2℃ 2)Time: 96 hours	1)As shown in item 3~6 2)Contact Resistance: 100mΩ max.
	15	Resistance Humidity	Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before measurements are made : 1)Temperature : 40℃±2℃ 2)Relative Humidity :90~95% 3)Time: 96 hours	1)As shown in item 4,6 2)Contact Resistance: 100mΩ max. 3)Insulation Resistance: 10MΩ min.

5. SOLDERING CONDITIONS:

■ Condition for Soldering –EM(R) Series



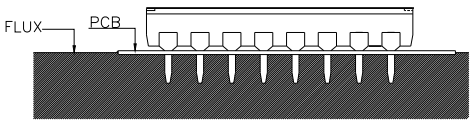
■ The condition mentioned above is the temperature on the Cu foil of the P.C.B surface. There are cases where board's temperature greatly differs from switch's surface temperature depending on board's material, size, thickness, etc. Care, therefore, should be used not to allow switch's surface temperature to exceed 260℃.

■ Manual Soldering

Soldering Temperature	Max.350℃
Continuous Soldering Time	Max. 5 seconds

■ Precautions in Handling

1. Care should be exercised so that flux from the upper part of the printed circuit board does not adhere to the switch.
2. Don't clean the switch body except with top tape sealed type, which can only spray of cleaning method from top of s/w.
3. Please make sure that there is no flux rose over the surface of the PCB



■ Notes on storage conditions:

Do not store in the following environment or it may affect product's function and solderbility:

1. temperature of -10 (max) ~ +40 (min) ℃ & humidity at 85% (min)
2. environment with corrosive gas
3. storage over 6 months
4. place of direct sunlight

Store with proper packaging conditions and to avoid loading heavy force

We suggest to use the products within 3 months or at least 6 months.

After opening the package, the rest products must be stored in the appropriate moisture-proof & airtight environment