

## 1. DESCRIPTION

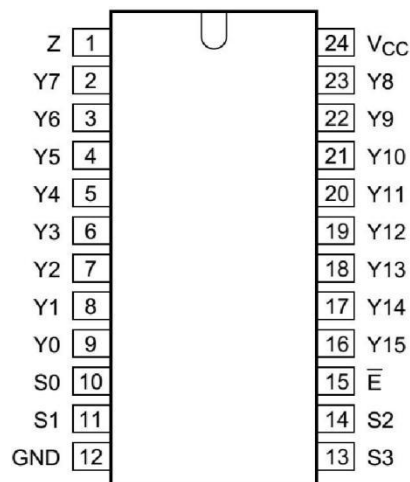
XL4067 and XL4067-SS are digitally controlled analog switching multiplexer/resolver with low on-resistance, very low cut-off leakage current, and internal address decoding features. The on-resistance remains relatively stable throughout the input signal range, and the circuit can be used for digital or analog applications.

XL4067 and XL4067-SS are 16-channel multiplexer/resolver with a suppressor and four binary input control terminals A~D. Any switch in the 16 channels can be selected through the corresponding switch selection.

## 2. FEATURES

- Low turn-off leakage current
- Channel resistance matching
- Low static power consumption Low-current Standby mode
- Crosstalk between low channels
- Wide operating voltage range: 2~10V
- Low noise
- Package option: XL4067 (SOP24), XL4067-SS (SSOP24)

## 3. PIN CONFIGURATIONS



#### 4. LIMIT PARAMETERS

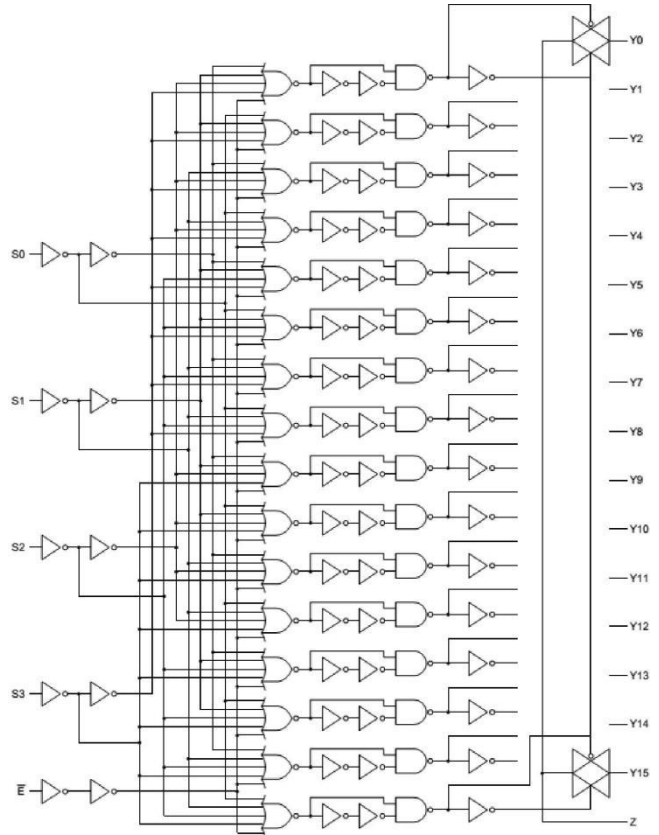
| Symbol                             | Parameter                                       | Typ                        | Unit |
|------------------------------------|---|----------------------------|------|
| V <sub>DD</sub>                    | DC voltage range                                | -0.5 ~ +11V                | V    |
| V <sub>IN</sub> , V <sub>OUT</sub> | Input or output voltage range (DC or transient) | -0.5 ~ V <sub>+</sub> +0.5 | V    |
| I <sub>IN</sub>                    | Input current (DC or transient)                 | ±20                        | mA   |
| I <sub>SW</sub>                    | Switching current                               | ±25                        | mA   |
| P <sub>D</sub>                     | Power dissipation                               | 500                        | mW   |
| T <sub>A</sub>                     | Ambient temperature range                       | 0 to +70                   | °C   |
| T <sub>STG</sub>                   | Storage temperature range                       | -65 to +150                | °C   |

#### 5. RECOMMENDED OPERATING CONDITIONS

| Symbol          | Parameter                           | Typ                   | Unit |
|-----------------|-------------------------------------|-----------------------|------|
| V <sub>DD</sub> | DC voltage range                    | 2 ~ +10V              | V    |
| V <sub>IN</sub> | Input voltage                       | Gnd ~ V <sub>DD</sub> | V    |
| V <sub>SW</sub> | Switching voltage                   | Gnd ~ V <sub>DD</sub> | V    |
| T <sub>A</sub>  | Operating ambient temperature range | 0 to +70              | °C   |

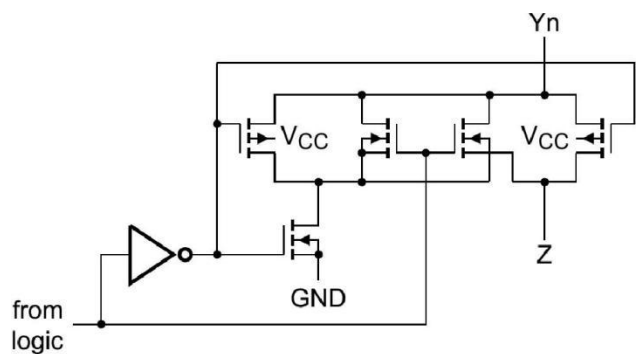
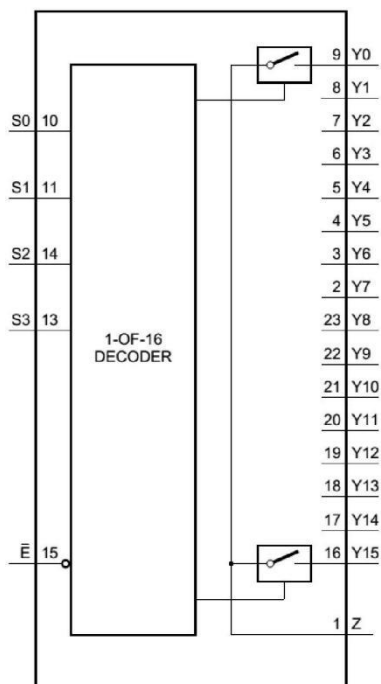
| Truth table   |    |    |    |   |                |
|---------------|----|----|----|---|----------------|
| Control input |    |    |    |   | Select passage |
| S0            | S1 | S2 | S3 | E |                |
| X             | X  | X  | X  | H | -              |
| L             | L  | L  | L  | L | Y0             |
| H             | L  | L  | L  | L | Y1             |
| L             | H  | L  | L  | L | Y2             |
| H             | H  | L  | L  | L | Y3             |
| L             | L  | H  | L  | L | Y4             |
| H             | L  | H  | L  | L | Y5             |
| L             | H  | H  | L  | L | Y6             |
| H             | H  | H  | L  | L | Y7             |
| L             | L  | L  | H  | L | Y8             |
| H             | L  | L  | H  | L | Y9             |
| L             | H  | L  | H  | L | Y10            |
| H             | H  | L  | H  | L | Y11            |
| L             | L  | H  | H  | L | Y12            |
| H             | L  | H  | H  | L | Y13            |
| L             | H  | H  | H  | L | Y14            |
| H             | H  | H  | H  | L | Y15            |

Internal logic circuit



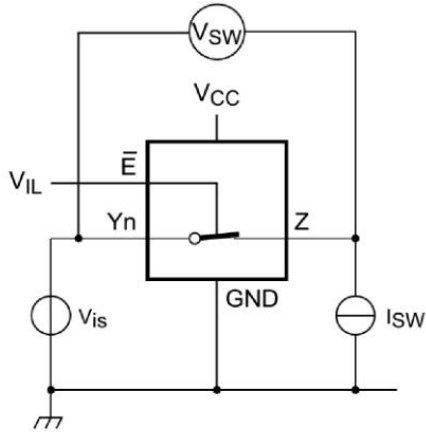
Schematic diagram (single path)

Functional block diagram:



### Electrical characteristics: static parameter

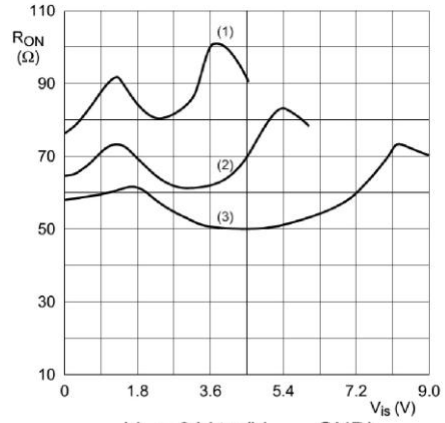
| Symbol                 | Parameter                         | Conditions                                    | Min  | Typ | Max  | Unit |
|------------------------|-----------------------------------|---|------|-----|------|------|
| R <sub>on (Peak)</sub> | Resistance in the on state (Peak) | Vis = Vcc to Gnd                              | -    | -   | -    | -    |
|                        |                                   | Vcc=4.5V; Isw=1000uA                          | -    | 110 | 180  | Ω    |
|                        |                                   | Vcc=6.0V; Isw=1000uA                          | -    | 95  | 160  | Ω    |
|                        |                                   | Vcc=9.0V; Isw=1000uA                          | -    | 75  | 130  | Ω    |
| R <sub>on (Rail)</sub> | Resistance in the on state (Rail) | Vis = Gnd to Vcc                              | -    | -   | -    | -    |
|                        |                                   | Vcc=4.5V; Isw=1000uA                          | -    | 90  | 160  | Ω    |
|                        |                                   | Vcc=6.0V; Isw=1000uA                          | -    | 80  | 140  | Ω    |
| V <sub>IH</sub>        | High level input voltage          | Vcc=2.0V                                      | 1.5  | 1.2 | -    | V    |
|                        |                                   | Vcc=4.5V                                      | 3.15 | 2.4 | -    | V    |
|                        |                                   | Vcc=6.0V                                      | 4.2  | 3.2 | -    | V    |
|                        |                                   | Vcc=9.0V                                      | 6.3  | 4.7 | -    | V    |
| V <sub>IL</sub>        | Low-level input voltage           | Vcc=2.0V                                      | -    | 0.8 | 0.5  | V    |
|                        |                                   | Vcc=4.5V                                      | -    | 2.1 | 1.35 | V    |
|                        |                                   | Vcc=6.0V                                      | -    | 3.2 | 1.80 | V    |
|                        |                                   | Vcc=9.0V                                      | -    | 4.3 | 2.70 | V    |
| I <sub>i</sub>         | Input leakage current             | Vi = Vcc or GND                               | -    | -   | -    | -    |
|                        |                                   | Vcc=6.0V                                      | -    | -   | ±0.1 | μA   |
|                        |                                   | Vcc=10.0V                                     | -    | -   | ±0.2 | μA   |
| I <sub>S(OFF)</sub>    | Off leakage current               | Vcc=10.0V; Vi = Vih or Vil<br> Vsw  = Vcc-GND | -    | -   | -    | -    |
|                        |                                   | Per channel                                   | -    | -   | ±0.1 | μA   |
|                        |                                   | All channels                                  | -    | -   | ±0.8 | μA   |
| I <sub>S(ON)</sub>     | Open leakage current              | Vcc=10.0V; Vi = Vih or Vil<br> Vsw  = Vcc-GND | -    | -   | ±0.8 | μA   |
| I <sub>CC</sub>        | Supply current                    | Vi = Vcc or Gnd; Vis = GND or Vcc             | -    | -   | -    | -    |
|                        |                                   | Vos = Vcc or Gnd                              | -    | -   | -    | -    |
|                        |                                   | Vcc=6.0V                                      | -    | -   | 8.0  | μA   |
|                        |                                   | Vcc=10.0V                                     | -    | -   | 16.0 | μA   |



$V_{is} = 0\text{ V to } (V_{CC} - \text{GND})$

$$R_{ON} = \frac{V_{SW}}{I_{SW}}$$

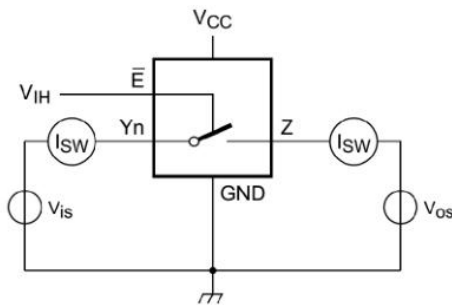
Ron test circuit



$V_{is} = 0\text{ V to } (V_{CC} - \text{GND})$

- (1)  $V_{CC} = 4.5\text{ V}$
- (2)  $V_{CC} = 6.0\text{ V}$
- (3)  $V_{CC} = 9.0\text{ V}$

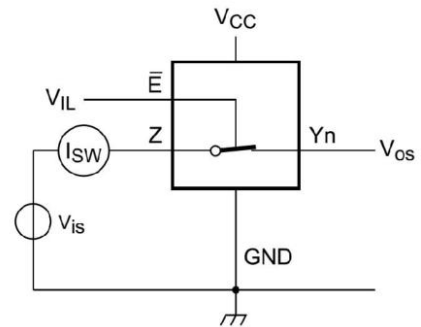
Relationship between Ron and Vis



$V_{is} = V_{CC}$  and  $V_{os} = \text{GND}$

$V_{is} = \text{GND}$  and  $V_{os} = V_{CC}$

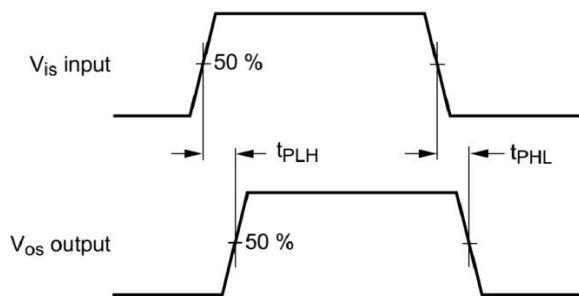
Off leakage current test circuit



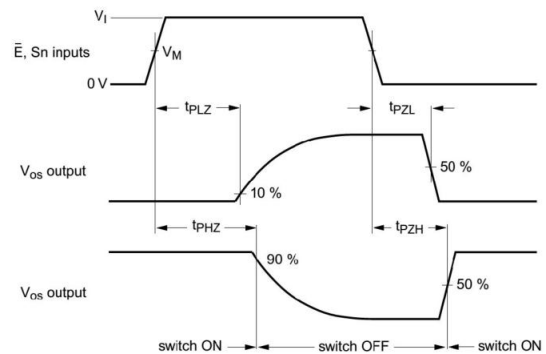
$V_{is} = V_{CC}$  and  $V_{os} = \text{open}$

$V_{is} = \text{GND}$  and  $V_{os} = \text{open}$

Open leakage current test circuit



Delay from input Vis to output Vos



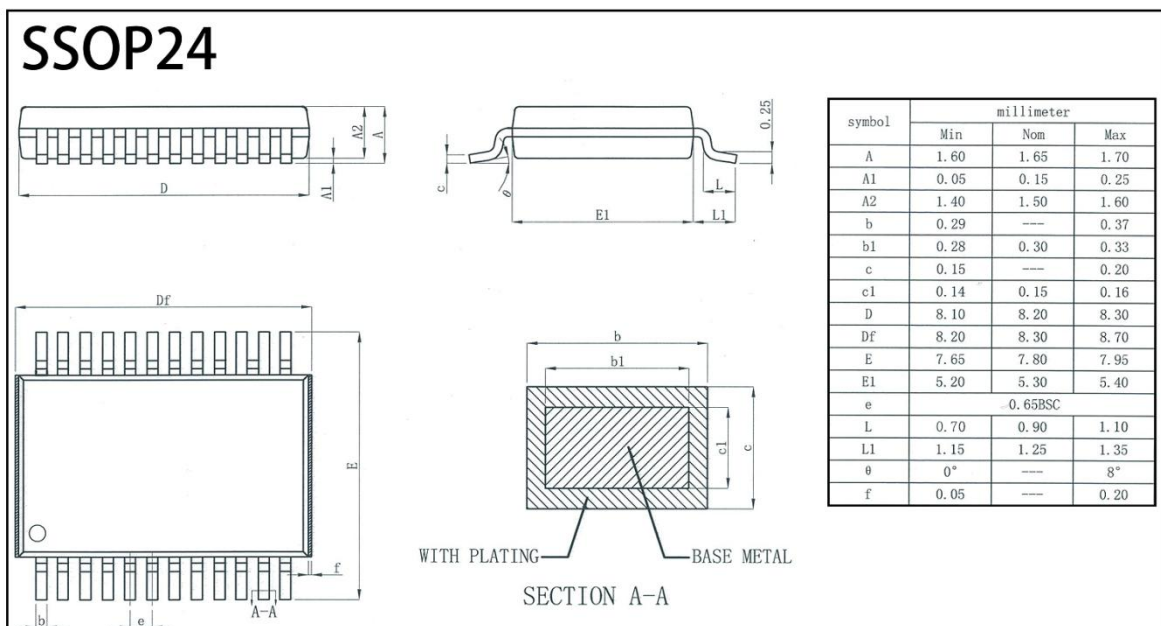
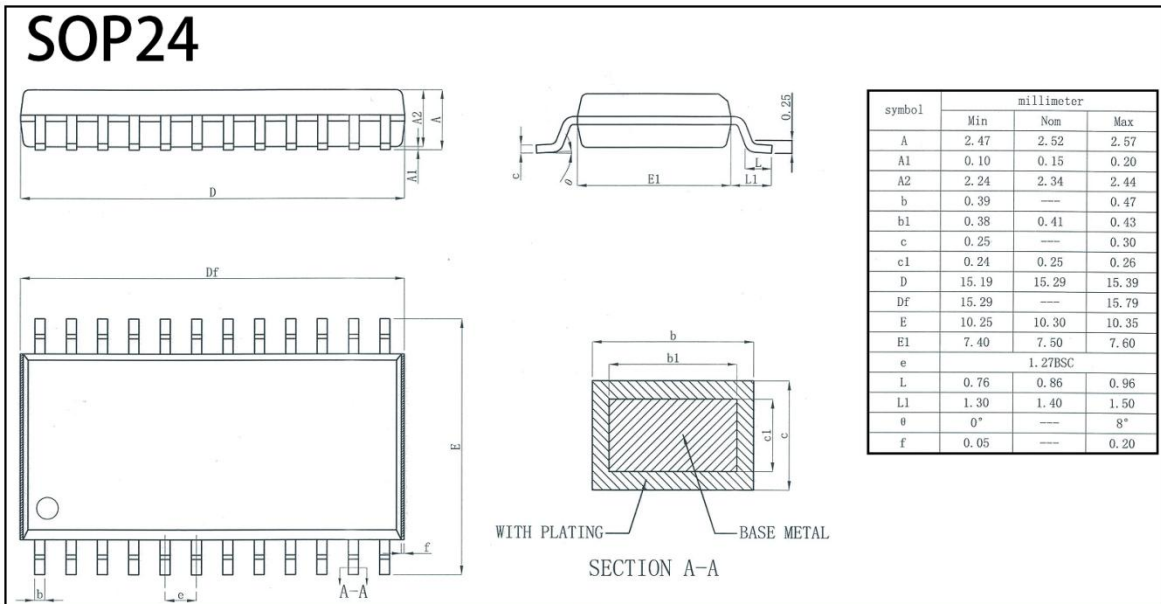
On or off time

## 6. ORDERING INFORMATION

Ordering Information

| Part Number | Device Marking | Package Type | Body size (mm) | Temperature (°C) | MSL  | Transport Media | Package Quantity |
|-------------|----------------|--------------|----------------|------------------|------|-----------------|------------------|
| XL4067      | XL4067         | SOP24        | 15.29 * 7.50   | - 40 to 85       | MSL3 | T&R             | 2000             |
| XL4067-SS   | XL4067-SS      | SSOP24       | 8.20 * 5.30    | - 40 to 85       | MSL3 | Tube 50         | 2500             |

## 7. DIMENSIONAL DRAWINGS



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