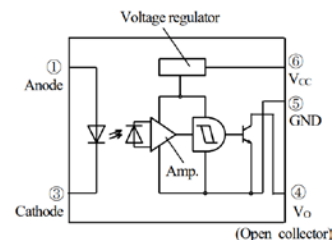


### ● Description

The KPC400 series consist of an LED. It is a super high-speed digital output type photo coupler packaged in a 5pin mini-flat package.

### ● Schematic



- |            |        |
|------------|--------|
| 1. Anode   | 4. Vo  |
| 3. Cathode | 5. GND |
|            | 6. Vcc |

### ● Features

1. " Low " output during light emission
2. Isolation voltage between input and output ( Viso: 3750V rms )
3. TTL and LSTTL compatible output
4. Safety Approvals:  
CQC GB4943.1-2022

### ● Applications

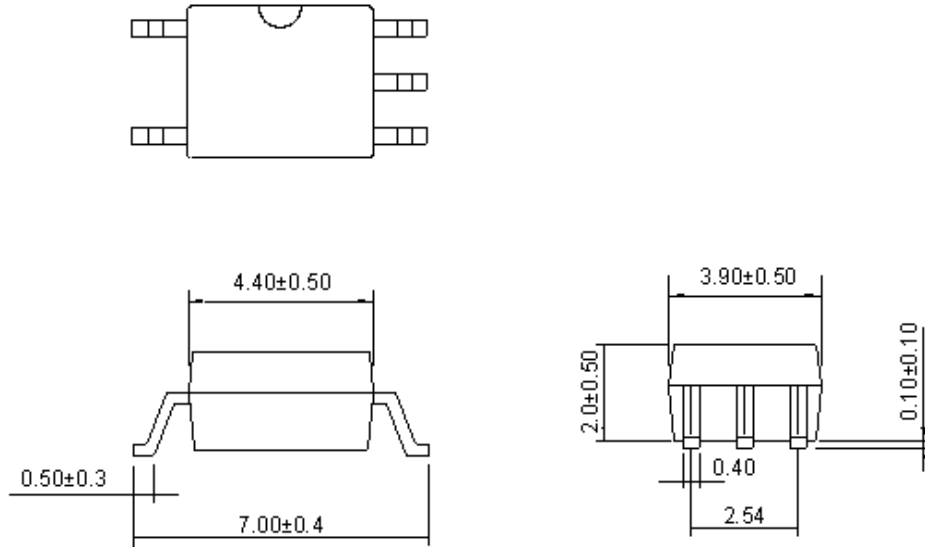
1. Hybrid substrate which requires high density mounting
2. Personal computers, office computers and peripheral equipment
3. Electronic musical instruments

### ● Truth Table

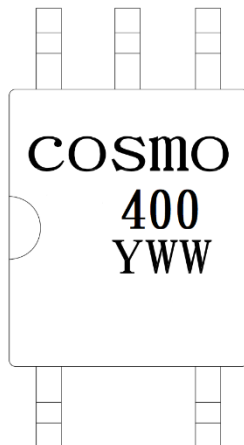
| Input | Output |
|-------|--------|
| H     | L      |
| L     | H      |

● Outside Dimension

Unit : mm



● Device Marking



Notes:

cosmo  
400  
YWW      Y: Year code / WW: Week code

### ● Absolute Maximum Ratings

(Ta = 25°C)

| Parameter                        |                              | Symbol                | Rating      | Unit |
|----------------------------------|------------------------------|-----------------------|-------------|------|
| Input                            | Forward current <sup>1</sup> | I <sub>F</sub>        | 50          | mA   |
|                                  | Reverse voltage              | V <sub>R</sub>        | 6           | V    |
|                                  | Power dissipation            | P                     | 70          | mW   |
| Output                           | Supply voltage               | V <sub>CC</sub>       | 16          | V    |
|                                  | High level output voltage    | V <sub>OH</sub>       | 16          | V    |
|                                  | Low level output current     | I <sub>OL</sub>       | 50          | mA   |
|                                  | Collector power dissipation  | P <sub>O</sub>        | 130         | mW   |
| Total power dissipation          |                              | P <sub>tot</sub>      | 150         | mW   |
| Isolation voltage <sup>2</sup>   |                              | V <sub>iso(rms)</sub> | 3750        | V    |
| Operating temperature            |                              | T <sub>opr</sub>      | -40 to +110 | °C   |
| Storage temperature              |                              | T <sub>stg</sub>      | -55 to +125 | °C   |
| Soldering temperature 10 seconds |                              | T <sub>sol</sub>      | 260         | °C   |

Note

1 Ta=25°C

2 This device is considered as a two-terminal device: Pins 1 and 3 are shorted together, and pins 4, 5 and 6 are shorted together

### ● Recommended Operating Conditions

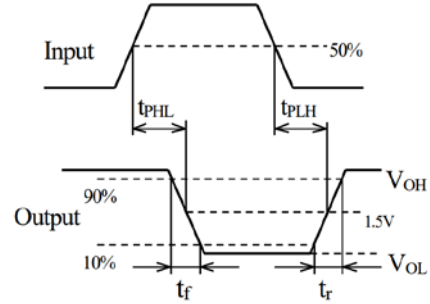
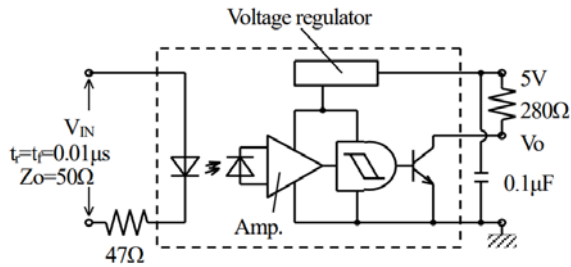
| Parameter                      | Symbol          | Min | Max | Unit |
|--------------------------------|-----------------|-----|-----|------|
| Operating supply voltage range | V <sub>CC</sub> | 3   | 15  | V    |

### ● Electro-optical Characteristics

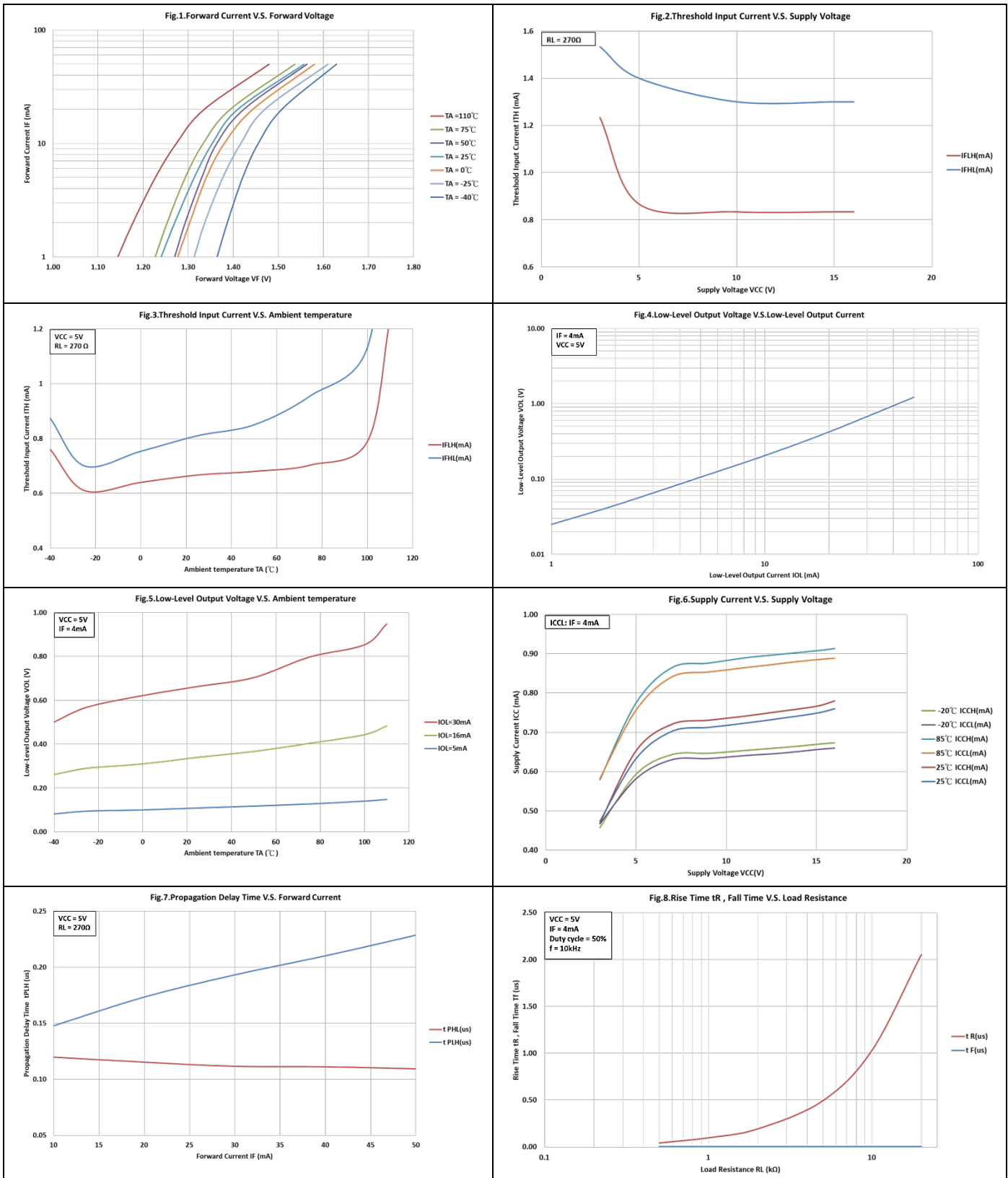
Ta = 0 to 70°C unless otherwise specified

| Parameter                                   | Symbol                              | Conditions   | Min.               | Typ.             | Max. | Unit |
|---|-------------------------------------|--|--------------------|------------------|------|------|
| Input forward voltage                       | V <sub>F</sub>                      | I <sub>F</sub> =4mA  | -                  | 1.1              | 1.4  | V    |
|   |                                     | I <sub>F</sub> =0.3mA  | 0.7                | 1.0              | -    | V    |
| Reverse current                             | I <sub>R</sub>                      | V <sub>R</sub> =3V   | -                  | -                | 10   | μA   |
| Terminal capacitance                        | C <sub>t</sub>                      | V <sub>F</sub> =0, f=1KHz  | -                  | 30               | 250  | pF   |
| High level output current                   | I <sub>OH</sub>                     | I <sub>F</sub> =0, V <sub>CC</sub> =V <sub>O</sub> =15V                              | -                  | -                | 100  | uA   |
| Low level output voltage                    | V <sub>OL</sub>                     | I <sub>OL</sub> =16mA, V <sub>CC</sub> =5V, I <sub>F</sub> =4mA                      | -                  | 0.2              | 0.4  | V    |
| Threshold input current(Output H→L)         | I <sub>FHL</sub>                    | V <sub>CC</sub> =5V, R <sub>L</sub> =280Ω, T <sub>A</sub> =25°C                      | -                  | 1.1              | 2.0  | mA   |
|   |                                     | V <sub>CC</sub> =5V, R <sub>L</sub> =280Ω  | -                  | -                | 4.0  | mA   |
| Threshold input current(Output L→H)         | I <sub>FLH</sub>                    | V <sub>CC</sub> =5V, R <sub>L</sub> =280Ω, T <sub>A</sub> =25°C                      | 0.4                | 0.8              | -    | mA   |
|   |                                     | V <sub>CC</sub> =5V, R <sub>L</sub> =280Ω  | 0.3                | -                | -    | mA   |
| Hysteresis                                  | I <sub>FLH</sub> / I <sub>FHL</sub> | V <sub>CC</sub> =5V, R <sub>L</sub> =280Ω  | 0.5                | 0.7              | 0.9  |      |
| High level supply current                   | I <sub>CCH</sub>                    | I <sub>F</sub> =0, V <sub>CC</sub> =5V   | -                  | 1.0              | 5    | mA   |
| Low level supply current                    | I <sub>CCL</sub>                    | I <sub>F</sub> =4mA, V <sub>CC</sub> =5V   | -                  | 2.5              | 5    | mA   |
| Isolation resistance (input-output)         | R <sub>I-O</sub>                    | V <sub>I-O</sub> =500V,  | 5×10 <sup>10</sup> | 10 <sup>11</sup> | -    | Ω    |
| Propagation delay time to high Output level | t <sub>PLH</sub>                    | T <sub>A</sub> =25°C, V <sub>CC</sub> =5V, I <sub>F</sub> =4mA, R <sub>L</sub> =280Ω | -                  | 1                | 3    | us   |
| Propagation delay time to low Output level  | t <sub>PHL</sub>                    |  | -                  | 2                | 6    | us   |
| Output rise time                            | tr                                  |  | -                  | 0.1              | 0.5  | us   |
| Output fall time                            | tf                                  |  | -                  | 0.05             | 0.5  | us   |

- Test Circuit for Propagation Delay time



### ● Characteristics Curves

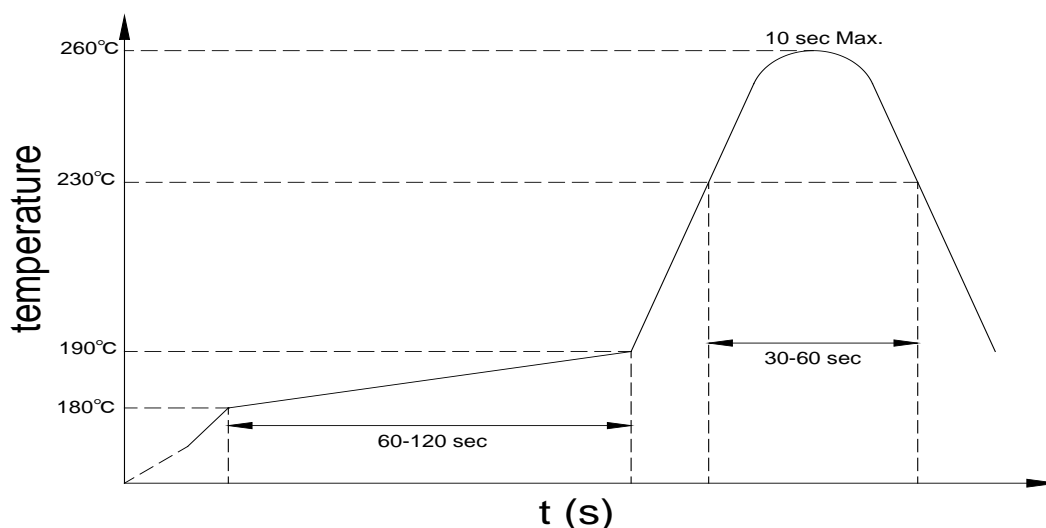


● **Recommended Soldering Conditions**

(a) **Infrared reflow soldering :**

- Peak reflow soldering : 260°C or below (package surface temperature)
- Time of peak reflow temperature : 10 sec
- Time of temperature higher than 230°C : 30-60 sec
- Time to preheat temperature from 180~190°C : 60-120 sec
- Time(s) of reflow : Two
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

**Recommended Temperature Profile of Infrared Reflow**



(b) **Wave soldering :**

- Temperature : 260°C or below (molten solder temperature)
- Time : 10 seconds or less
- Preheating conditions : 120°C or below (package surface temperature)
- Time(s) of reflow : One
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(c) **Cautions :**

- Fluxes : Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

- **Numbering System**

## KPC400 (Y)

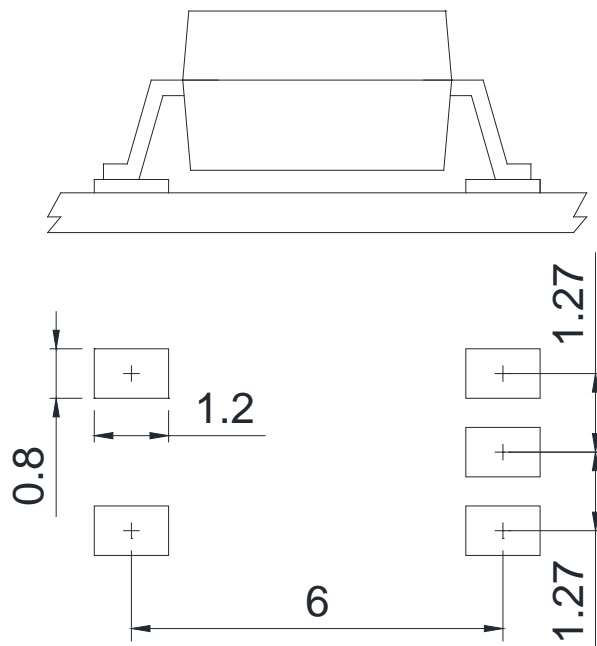
**Notes:**

KPC400 = Part No.

Y = Tape and reel option (TLD · TRU)

| Option | Description  | Packing quantity    |
|--------|--|---------------------|
| (TLD)  | surface mount type package + TL tape & reel option | 3000 units per reel |
| (TRU)  | surface mount type package + TR tape & reel option | 3000 units per reel |

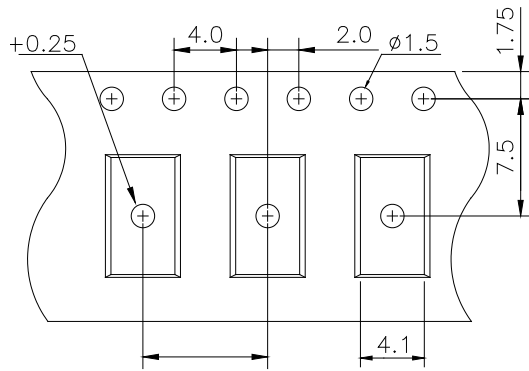
- **Recommended Pad Layout for Surface Mount Lead Form**



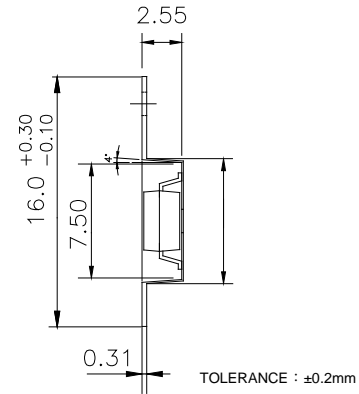
Unit :mm

● 8-pin SMD Carrier Tape & Reel

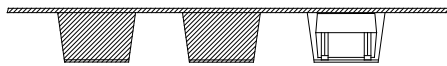
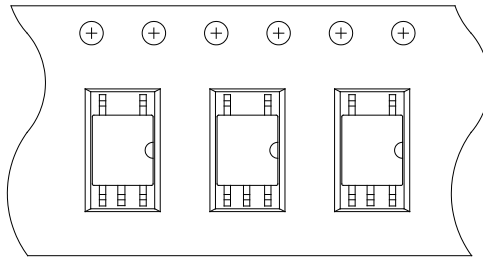
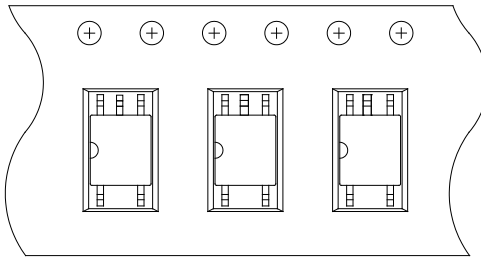
Unit: mm



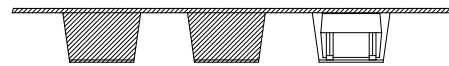
TLD



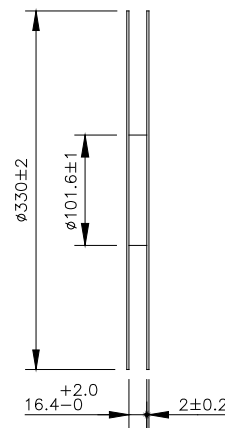
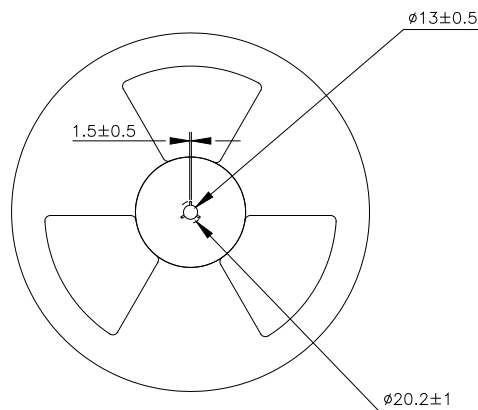
TRU



Direction of feed from reel



Direction of feed from reel





- **Application Notice**

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