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With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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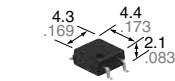
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



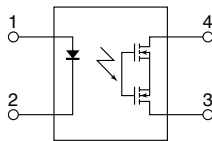


Recommended LED forward current 2 mA, High Sensitivity (Low current-consumption) Miniature SOP4-pin Type

PhotoMOS® HS SOP 1 Form A (AQY230S)



mm inch



RoHS compliant

FEATURES

1. High sensitivity (Low current-consumption)

HS type PhotoMOS need less than half LED forward current of other types. This contributes to energy-saving working of equipment and longer operating life for battery.

Sensitivity comparison between HS type and GU type

In case of load voltage 60V type, SOP4-pin

| | | HS type (AQY232S) | GU type (AQY212S) |
|---------------------------------|---------|-------------------|-------------------|
| LED operate current | Typical | 0.35 mA | 0.9 mA |
| | Maximum | 0.5 mA | 3 mA |
| Recommended LED forward current | | 2 mA | 5 mA |

- 2. Small package (SOP4-pin)
- 3. 60 V, 350 V and 400 V load voltage types available

TYPICAL APPLICATIONS

Ideal for battery-powered devices that need to lengthen operating life. Also recommended for power-economizing of testing equipment that uses many relays.

- 1. Security equipment
 - Crime-preventing system: Surveillance camera, burglar alarm
 - Disaster-preventing system: Fire alarm, heat/smoke sensor
- 2. Measuring instruments
- 3. Meters (watt-hour, gas, etc.)
- 4. Telecommunication equipment
- 5. Industrial equipment

TYPES

| | Output rating* | | Package | Part No. | | | Packing quantity | |
|----------------|----------------|--------------|----------|--------------------|------------------------------|------------------------------|---|---------------|
| | Load voltage | Load current | | Tube packing style | Tape and reel packing style | | Tube | Tape and reel |
| | | | | | Picked from the 1/2-pin side | Picked from the 3/4-pin side | | |
| AC/DC dual use | 60V | 500mA | SOP4-pin | AQY232S | AQY232SX | AQY232SZ | 1 tube contains: 100 pcs. 1 batch contains: 2,000 pcs. | 1,000 pcs. |
| | 350V | 120mA | | AQY230S | AQY230SX | AQY230SZ | | |
| | 400V | 100mA | | AQY234S | AQY234SX | AQY234SZ | | |

Note: For space reasons, the three initial letters of the part number "AQY", the surface mount terminal indicator "S" and the packing style indicator "X" or "Z" are not marked on the device. (Ex. the label for product number AQY232SX is 232.)

* Indicate the peak AC and DC values.

Ratings and packages other than those given above are available by special order. Please contact our sales office in your area.

RATING

1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

| Item | | Symbol | AQY232S | AQY230S | AQY234S | Remarks |
|-------------------------|-------------------------|-------------------|---------------------------------|---------|---------|-------------------------------------|
| Input | LED forward current | I _F | 50 mA | | | |
| | LED reverse voltage | V _R | 5 V | | | |
| | Peak forward current | I _{FP} | 1 A | | | f = 100 Hz, Duty factor = 0.1% |
| | Power dissipation | P _{in} | 75 mW | | | |
| Output | Load voltage (peak AC) | V _L | 60 V | 350 V | 400 V | |
| | Continuous load current | I _L | 0.5 A | 0.12 A | 0.1 A | Peak AC, DC |
| | Peak load current | I _{peak} | 1.5 A | 0.3 A | 0.24 A | 100ms (1 shot), V _L = DC |
| | Power dissipation | P _{out} | 300 mW | | | |
| Total power dissipation | | P _T | 350 mW | | | |
| I/O isolation voltage | | V _{iso} | 1,500 V AC | | | |
| Operating temperature | | T _{opr} | -40°C to +85°C -40°F to +185°F | | | Non-condensing at low temperatures |
| Storage temperature | | T _{stg} | -40°C to +100°C -40°F to +212°F | | | |

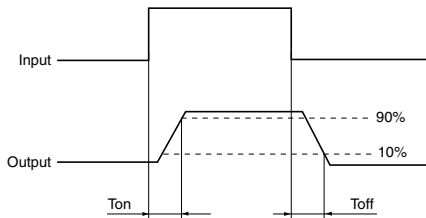
HS SOP 1 Form A (AQY230S)

2. Electrical characteristics (Ambient temperature: 25°C 77°F)

| Item | | | Symbol | AQY232S | AQY230S | AQY234S | Remarks |
|----------------------------------|---------------------------|-----------|---|---------------|-------------|-----------------------|---|
| Input | LED operate current | Typical | I_{Fon} | 0.35 mA | | | $\Delta I_F/\Delta t \geq 100 \mu A/s$ $I_L = \text{Max.}$ |
| | | Maximum | | 0.5 mA | | | |
| | LED turn off current | Minimum | I_{Foff} | 0.1 mA | | | $\Delta I_F/\Delta t \geq 100 \mu A/s$ $I_L = \text{Max.}$ |
| | | Typical | | 0.3 mA | | | |
| LED dropout voltage | Typical | V_F | 1.25 V (1.1 V at $I_F = 2 \text{ mA}$) | | | $I_F = 50 \text{ mA}$ | |
| | Maximum | | 1.5 V | | | | |
| Output | On resistance | Typical | R_{on} | 0.85 Ω | 19 Ω | 27 Ω | $I_F = 2 \text{ mA}$ $I_L = \text{Max.}$ Within 1 s on time |
| | | Maximum | | 2.5 Ω | 25 Ω | 35 Ω | |
| | Off state leakage current | Maximum | I_{Leak} | 1 μA | | | $I_F = 0 \text{ mA}$ $V_L = \text{Max.}$ |
| Transfer characteristics | Turn on time* | Typical | T_{on} | 1.5 ms | 1.2 ms | 0.8 ms | $I_F = 2 \text{ mA}$ $I_L = \text{Max.}$ |
| | | Maximum | | 5 ms | | | |
| | Turn off time* | Typical | T_{off} | 0.15 ms | 0.1 ms | 0.1 ms | $I_F = 2 \text{ mA}$ $I_L = \text{Max.}$ |
| | | Maximum | | 2 ms | | | |
| | I/O capacitance | Typical | C_{iso} | 0.8 pF | | | $f = 1 \text{ MHz}$ $V_B = 0 \text{ V}$ |
| Maximum | | 1.5 pF | | | | | |
| Initial I/O isolation resistance | Minimum | R_{iso} | 1,000 M Ω | | | 500 V DC | |

Note: Please refer to the schematic and wiring diagram for connection method.

*Turn on/Turn off time



RECOMMENDED OPERATING CONDITIONS

Please obey the following conditions to ensure proper device operation (turn on) and resetting (turn off).

| Item | Symbol | Recommended value | Unit |
|-------------------|--------|-------------------|------|
| Input LED current | I_F | 2 | mA |

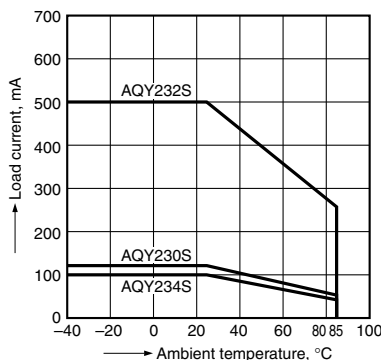
■ These products are not designed for automotive use.

If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

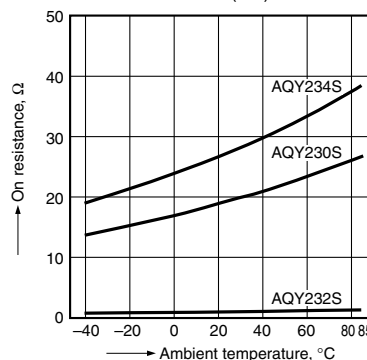
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40°C to +85°C
-40°F to +185°F



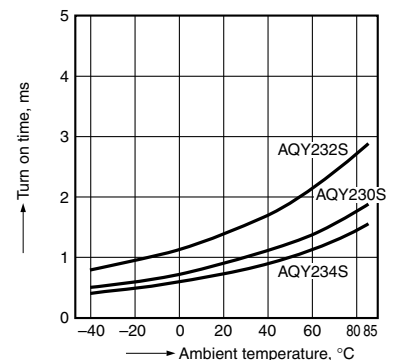
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4;
LED current: 2 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



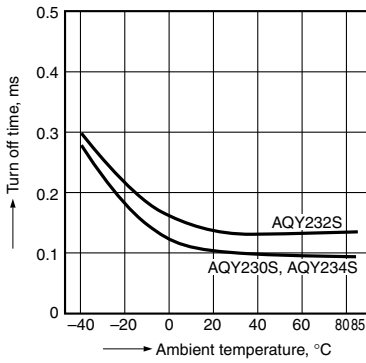
3. Turn on time vs. ambient temperature characteristics

LED current: 2 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



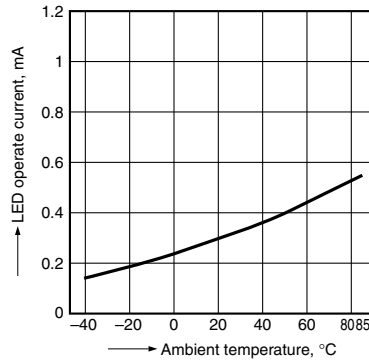
4. Turn off time vs. ambient temperature characteristics

LED current: 2 mA; Load voltage: Max. (DC); Continuous load current: Max. (DC)



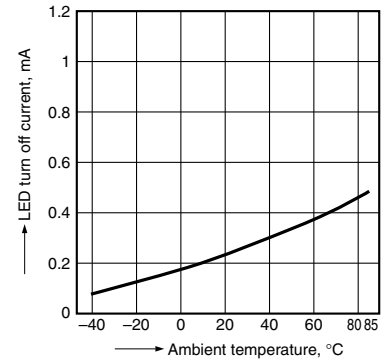
5. LED operate current vs. ambient temperature characteristics

Sample: All types; Load voltage: Max. (DC); Continuous load current: Max. (DC)



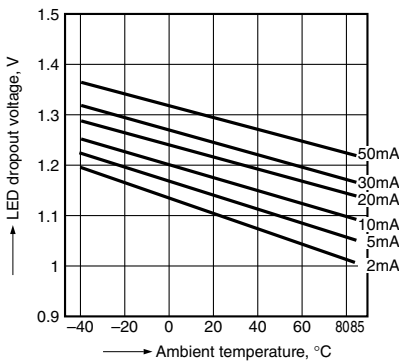
6. LED turn off current vs. ambient temperature characteristics

Sample: All types; Load voltage: Max. (DC); Continuous load current: Max. (DC)



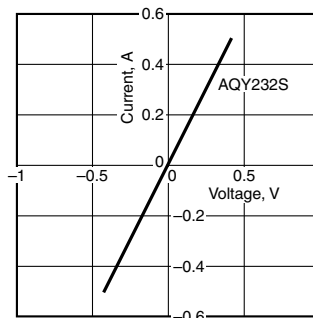
7. LED dropout voltage vs. ambient temperature characteristics

Sample: All types; LED current: 2 to 50 mA



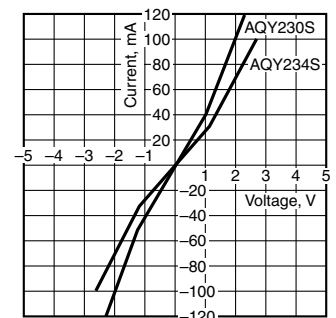
8-(1). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 3 and 4; Ambient temperature: 25°C 77°F



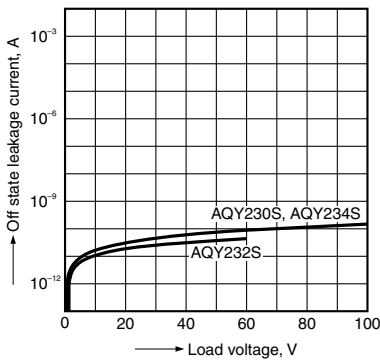
8-(2). Current vs. voltage characteristics of output at MOS portion

Measured portion: between terminals 3 and 4; Ambient temperature: 25°C 77°F



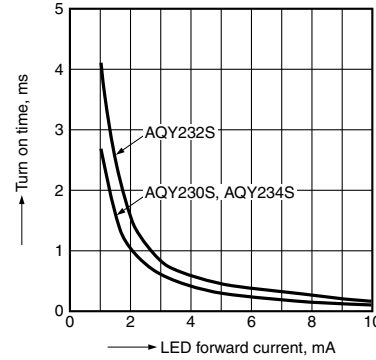
9. Off state leakage current vs. load voltage characteristics

Measured portion: between terminals 3 and 4; Ambient temperature: 25°C 77°F



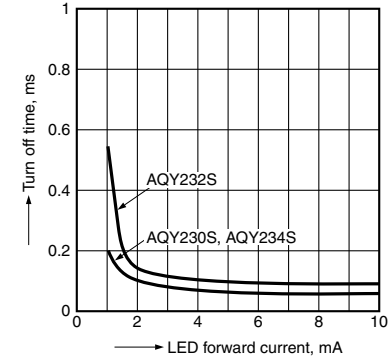
10. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4; Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



11. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4; Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



12. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 3 and 4; Frequency: 1 MHz (30 mVrms); Ambient temperature: 25°C 77°F

