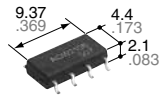
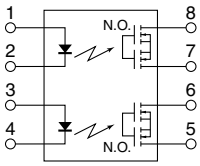
**Miniature SOP8-pin type featuring low C×R High load voltage of 250V**

PhotoMOS®
# RF SOP 2 Form A C×R
(AQW223R2S)




mm inch




**RoHS compliant**

## FEATURES

**1. With high load voltage of 250V, low output capacitance and low on-resistance.**
Output capacitance (Cout): 33 pF (typ.)
On-resistance (Ron): 11Ω (typ.)
**2. 2-channel (Form A) in miniature SOP8-pin package**
(W) 4.4 × (L) 9.37 × (H) 2.1 mm
(W) .173× (L) .369 × (H) .083 inch
**3. Low-level off-state leakage current of typ. 0.03 nA**
**4. Controls low-level analog signals**

## TYPICAL APPLICATIONS

**1. Measuring and testing equipment**
IC tester, Liquid crystal driver tester, Semiconductor performance tester, Bear board tester, In-circuit tester, Function tester, etc.
**2. Telecommunication and broadcasting equipment**
**3. Medical equipment**
**4. Multi-point recorder**
Warping, Thermo couple

## 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 1/2/3/4-pin side | Picked from the 5/6/7/8-pin side | | |
| AC/DC dual use | 250V | 0.14A | SOP8-pin | AQW223R2S | AQW223R2SX | AQW223R2SZ | 1 tube contains: 50 pcs. 1 batch contains: 1,000 pcs. | 1,000 pcs. |

* Indicate the peak AC and DC values.
Note: The packing style indicator "X" or "Z" is not marked on the device.

## RATING

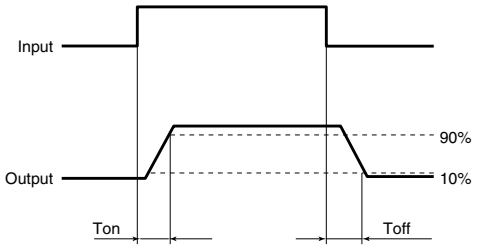
1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

| Item | | Symbol | AQW223R2S | 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) | $V_L$ | 250 V | |
| | Continuous load current | $I_L$ | 0.14 A (0.17 A) | Peak AC, DC ( ): in case of using only 1a (1 channel) |
| | Peak load current | $I_{peak}$ | 0.42 A | 100 ms (1 shot), $V_L$ = DC |
| | Power dissipation | $P_{out}$ | 600 mW | |
| Total power dissipation | | $P_T$ | 650 mW | |
| I/O isolation voltage | | $V_{iso}$ | 1,500 V AC | |
| Temperature limits | Operating | $T_{opr}$ | –40°C to +85°C –40°F to +185°F | Non-condensing at low temperatures |
| | Storage | $T_{stg}$ | –40°C to +100°C –40°F to +212°F | |

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

| Item | | | Symbol | AQW223R2S | Condition |
|---|---|---|---|---|---|
| Input | LED operate current | Typical | $I_{Fon}$ | 0.5mA | $I_L$=Max. |
| | | Maximum | | 3.0mA | |
| | LED turn off current | Minimum | $I_{Foff}$ | 0.1mA | $I_L$=Max. |
| | | Typical | | 0.45mA | |
| | LED dropout voltage | Typical | $V_F$ | 1.32V (1.14V at $I_F$=5mA) | $I_F$=50mA |
| | | Maximum | | 1.5V | |
| Output | On resistance | Typical | $R_{on}$ | 11Ω | $I_F$=5mA<br>$I_L$=Max. |
| | | Maximum | | 15Ω | |
| | Output capacitance | Typical | $C_{out}$ | 33pF | $I_F$=0mA<br>f=1 MHz<br>$V_B$=0V |
| | | Maximum | | 40pF | |
| | Off state leakage current | Typical | $I_{Leak}$ | 0.03nA | $I_F$=0mA<br>$V_L$=Max. |
| | | Maximum | | 10nA (1nA or less)* | |
| Transfer characteristics | Turn on time** | Typical | $T_{on}$ | 0.15ms | $I_F$=5mA<br>$I_L$=Max. |
| | | Maximum | | 0.5ms | |
| | Turn off time** | Typical | $T_{off}$ | 0.05ms | $I_F$=5mA or 10mA<br>$I_L$=Max. |
| | | Maximum | | 0.2ms | |
| | I/O capacitance | Typical | $C_{iso}$ | 0.8pF | f=1MHz<br>$V_B$=0V |
| | | Maximum | | 1.5pF | |
| | Initial I/O isolation resistance | Minimum | $R_{iso}$ | 1,000MΩ | 500V DC |

*Available as custom orders (1 nA or less)
**Turn on/Turn off time




## RECOMMENDED OPERATING CONDITIONS

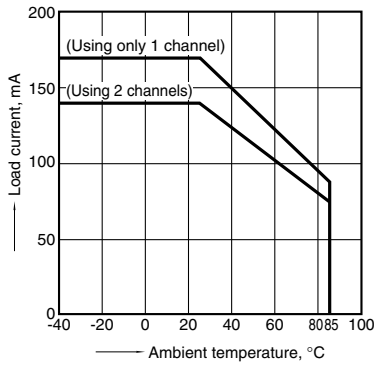
Please obey the following conditions to ensure proper device operation and resetting.

| Item | Symbol | Recommended value | Unit |
|---|---|---|---|
| Input LED current | $I_F$ | 5 | mA |

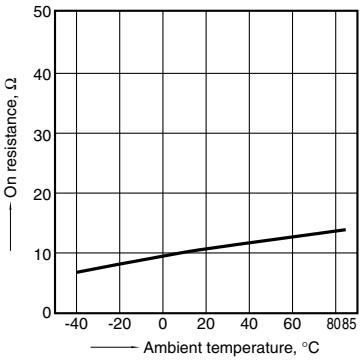
■ **These products are not designed for automotive use.**
**If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.**

## REFERENCE DATA

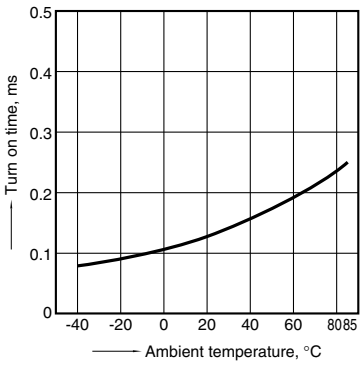
1. Load current vs. ambient temperature characteristics
Allowable ambient temperature: –40°C to +85°C
–40°F to +185°F



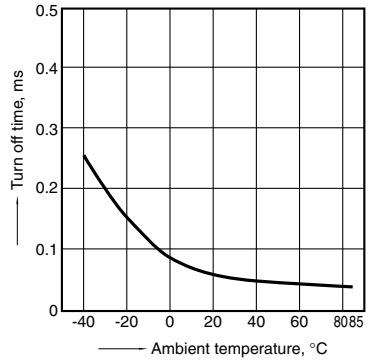

2. On resistance vs. ambient temperature characteristics
Measured portion: between terminals 5 and 6, 7 and 8:
LED current: 5 mA;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



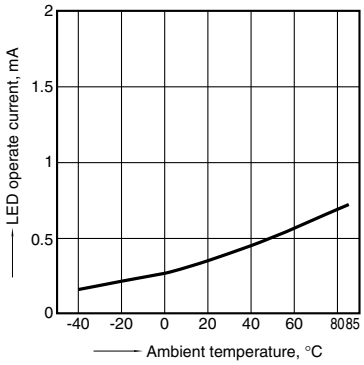

3. Turn on time vs. ambient temperature characteristics
LED current: 5 mA;
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



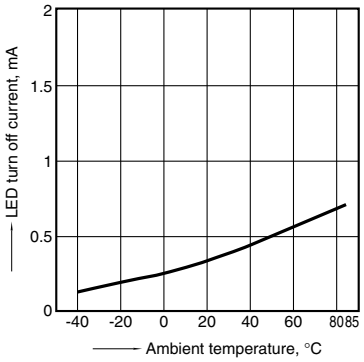
4. Turn off time vs. ambient temperature characteristics
LED current: 5 mA; Load voltage: Max. (DC);
Continuous load current: Max. (DC)



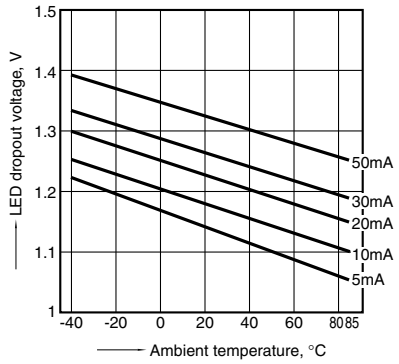

5. LED operate current vs. ambient temperature characteristics
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



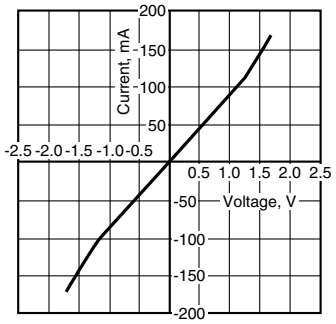

6. LED turn off current vs. ambient temperature characteristics
Load voltage: Max. (DC);
Continuous load current: Max. (DC)



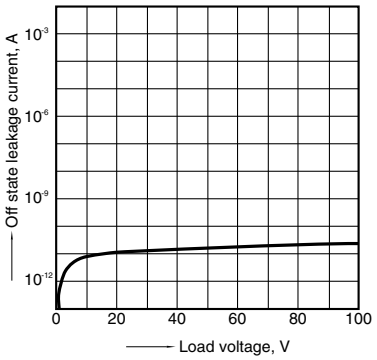

7. LED dropout voltage vs. ambient temperature characteristics
LED current: 5 to 50 mA



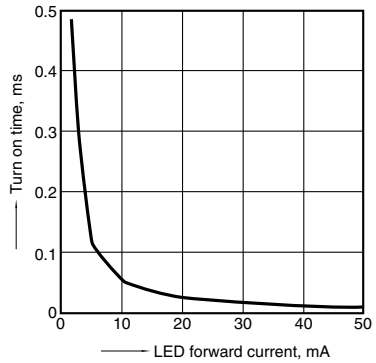

8. Current vs. voltage characteristics of output at MOS portion
Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F



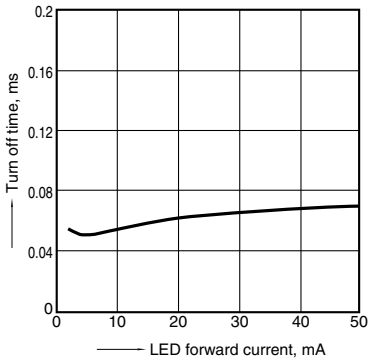

9. Off state leakage current vs. load voltage characteristics
Measured portion: between terminals 5 and 6, 7 and 8;
Ambient temperature: 25°C 77°F




10. Turn on time vs. LED forward current characteristics
Measured portion: between terminals 5 and 6, 7 and 8;
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 5 and 6, 7 and 8;
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 5 and 6, 7 and 8;
Frequency: 1 MHz, 30 mVrms;
Ambient temperature: 25°C 77°F