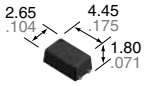
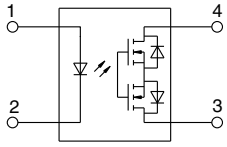
**C×R3 type, SSOP package, 20 V load voltage**

# PhotoMOS® RF SSOP 1 Form A C×R3 (AQY22○○○V)




mm inch




**RoHS compliant**

## FEATURES

**1. Miniature SSOP package**
(Compared to SOP 4-pin models, volume ratio can be reduced by approximately 53%.)
**2. Load voltage: 20 V**
**3. Low C×R (C×R3)**
Output capacitance: Typ. 1.1 pF, On resistance: Typ. 2.8Ω

## TYPICAL APPLICATIONS

**1. Measuring and testing equipment**
IC tester, Probe card, Board tester and other testing equipment
**2. Telecommunication equipment**

*Does not support automotive applications.

## TYPES

| Type | Output rating*1 | | Part No. (Tape and reel packing style)*2 | | Packing quantity in the tape and reel |
|---|---|---|---|---|---|
| | Load voltage | Load current | Picked from the 1 and 4-pin side | Picked from the 2 and 3-pin side | |
| AC/DC dual use | 20 V | 180 mA | AQY221N5VY | AQY221N5VW | 3,500 pcs. |

Notes: *1. Indicate the peak AC and DC values.
*2. Only tape and reel package is available. Packing quantity of 1,000 pieces is possible. Please consult us.
For space reasons, the three initial letters of the part number "AQY", the package (SSOP) indication "V", and the packaging style "Y" or "W" are not marked on the device.

## RATING

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

| Item | | Symbol | AQY221N5V | Remarks |
|---|---|---|---|---|
| Input side | 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 side | Load voltage (peak AC) | $V_L$ | 20 V | |
| | Continuous load current | $I_L$ | 0.18 A | Peak AC, DC |
| | Peak load current | $I_{peak}$ | 0.3 A | 100 ms (1shot), $V_L$ = DC |
| | Power dissipation | $P_{out}$ | 250 mW | |
| Total power dissipation | | $P_T$ | 300 mW | |
| I/O isolation voltage | | $V_{iso}$ | 1,500 Vrms | |
| Ambient temperature | Operating | $T_{opr}$ | –40 to +85°C –40 to +185°F | (Non-icing at low temperatures) |
| | Storage | $T_{stg}$ | –40 to +100°C –40 to +212°F | |

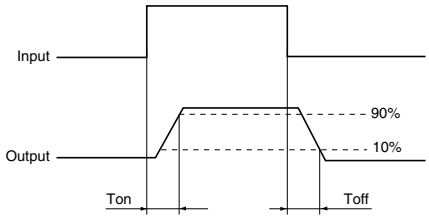
**2. Electrical characteristics** (Ambient temperature: 25°C 77°F)

| Item | | | Symbol | AQY221N5V | Condition |
|---|---|---|---|---|---|
| Input | LED operate current | Typical | $I_{Fon}$ | 0.8 mA | $I_L$ = 80 mA |
| | | Maximum | | 3 mA | |
| | LED turn off current | Minimum | $I_{Foff}$ | 0.2 mA | |
| | | Typical | | 0.7 mA | |
| | LED dropout voltage | Typical | $V_F$ | 1.35 V (1.14 V at $I_F$ = 5 mA) | $I_F$ = 50 mA |
| | | Maximum | | 1.5 V | |
| Output | On resistance | Typical | $R_{on}$ | 2.8Ω | $I_F$ = 5 mA, $I_L$ = 80 mA Within 1 s |
| | | Maximum | | 4.5Ω | |
| | Output capacitance | Typical | $C_{out}$ | 1.1 pF | $I_F$ = 0 mA, $V_B$ = 0 V, f = 1 MHz |
| | | Maximum | | 1.5 pF | |
| | Off state leakage current | Typical | $I_{Leak}$ | 0.01 nA | $I_F$ = 0 mA, $V_L$ = Max. |
| | | Maximum | | *10 nA | |
| Transfer characteristics | Turn on time** | Typical | $T_{on}$ | 0.02 ms | $I_F$ = 5 mA, $V_L$ = 10 V, $R_L$ = 125Ω |
| | | Maximum | | 0.2 ms | |
| | Turn off time** | Typical | $T_{off}$ | 0.01 ms | |
| | | Maximum | | 0.2 ms | |
| | I/O capacitance | Typical | $C_{iso}$ | 0.8 pF | f = 1 MHz, $V_B$ = 0 V |
| | | Maximum | | 1.5 pF | |
| | Initial I/O isolation resistance | Minimum | $R_{iso}$ | 1,000 MΩ | 500 V DC |

Note: Variation possible through combinations of output capacitance and on resistance. For more information, please contact our sales office in your area.

*Available as custom orders (1 nA or less)

**Turn on/Turn off time




**3. Recommended operating conditions** (Ambient temperature: 25°C 77°F)

Please use under recommended operating conditions to obtain expected characteristics.

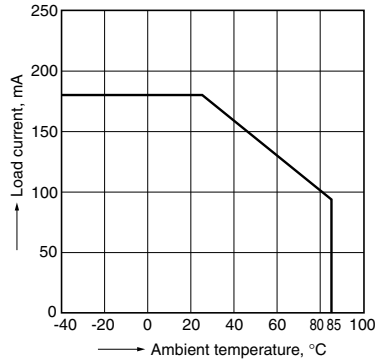
| Item | | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|---|
| LED current | | $I_F$ | 5 | 30 | mA |
| AQY221N5V | Load voltage (Peak AC) | $V_L$ | — | 10 | V |
| | Continuous load current | $I_L$ | — | 0.18 | A |

■ **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

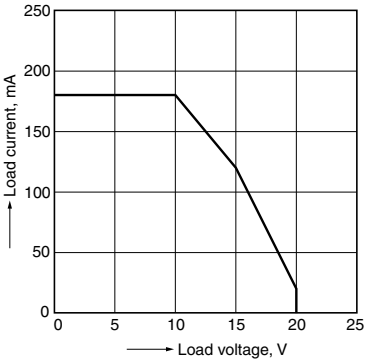
1. Load current vs. ambient temperature characteristics

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



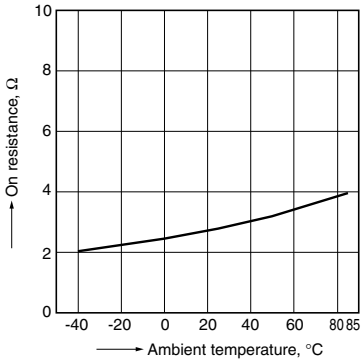

2. Load current vs. load voltage characteristics

Ambient temperature: 25°C 77°F



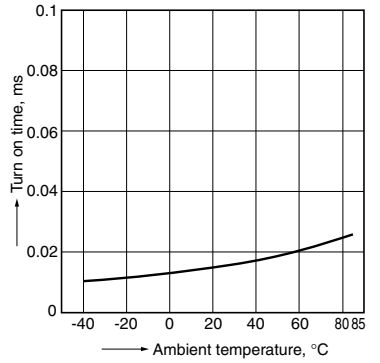

3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC)
Continuous load current: 80mA (DC)



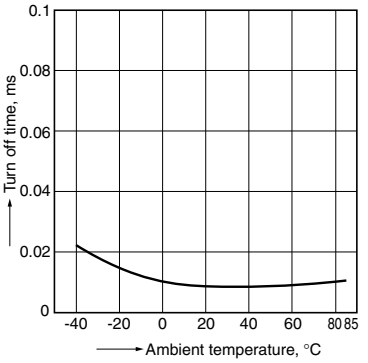

4. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



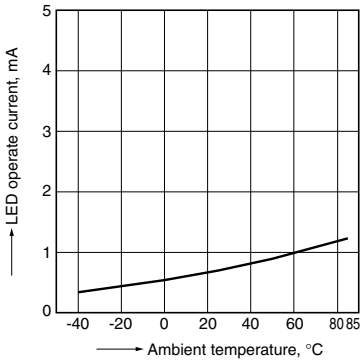

5. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



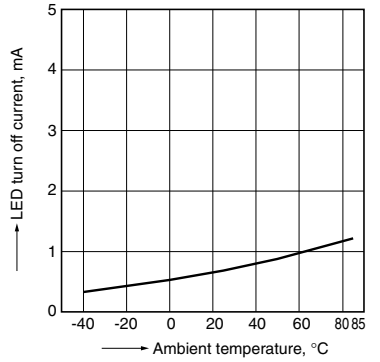

6. LED operate current vs. ambient temperature characteristics

Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



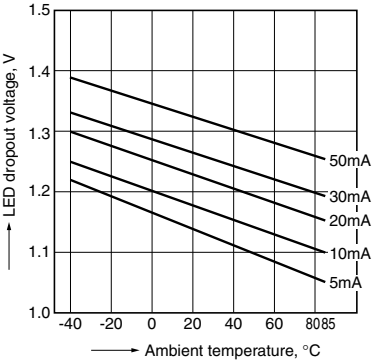

7. LED turn off current vs. ambient temperature characteristics

Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



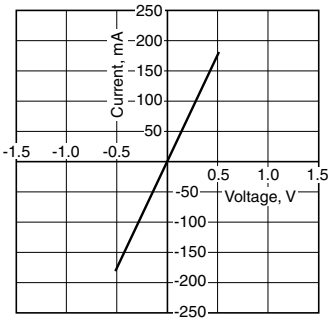

8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



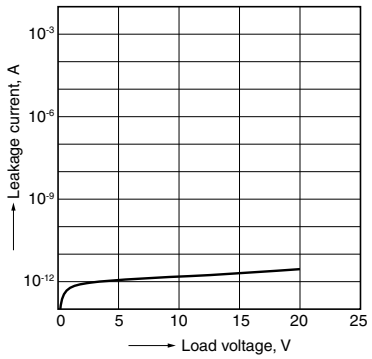

9. Current vs. voltage characteristics of output at MOS portion

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



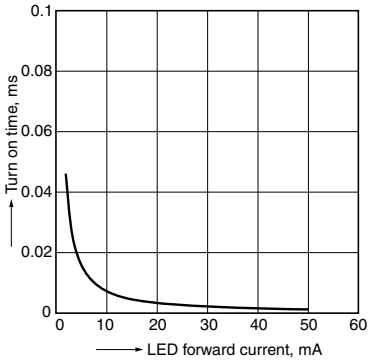
10. Off state leakage current vs. load voltage characteristics

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



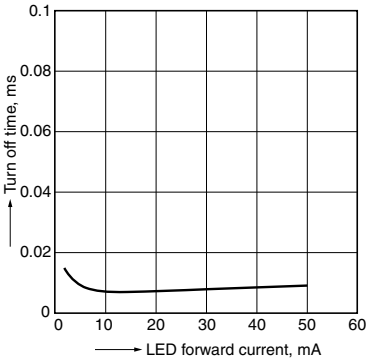

11. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;
Load voltage: 10V (DC); Continuous load current: 80mA (DC); Ambient temperature: 25°C 77°F



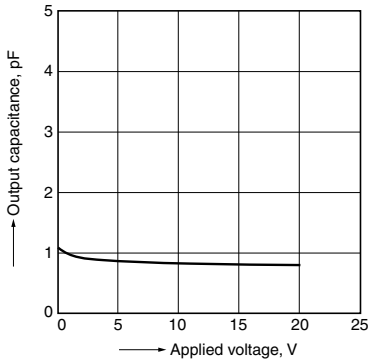

12. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;
Load voltage: 10V (DC); Continuous load current: 80mA (DC); Ambient temperature: 25°C 77°F



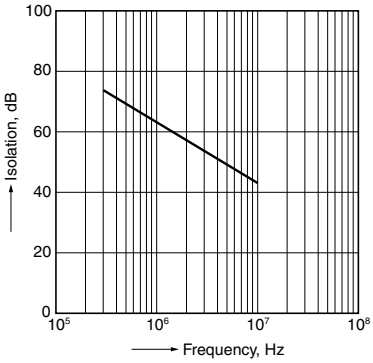

13. Output capacitance vs. applied voltage characteristics

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



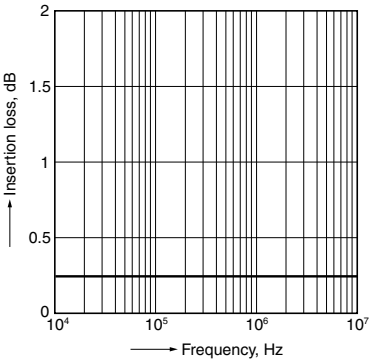

14. Isolation vs. frequency characteristics (50Ω impedance)

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




15. Insertion loss vs. frequency characteristics (50Ω impedance)

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



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