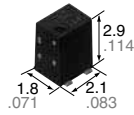
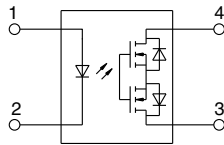


| | |
|---|---|
| 4.6 mm² mounting area C×R10: 30 V/40 V load voltage C×R5: 25 V load voltage | PhotoMOS[®] RFVSSOP 1 Form A C×R10/C×R5 (AQY22○○○T) |
|---|---|



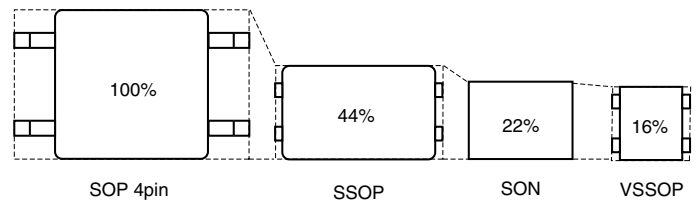
mm inch



RoHS compliant

FEATURES

1. VSSOP type with further reduction in mounting area
 4.6 mm² mounting area achieved. Approx. 29% less than previous product (SON type).
 Contributes to the miniaturization of instruments and higher density mounting.



2. Low on resistance and low output capacitance available

- **C×R10**
 - <R type>
 Output capacitance: Typ. 37.5 pF, On resistance: Typ. 0.18Ω
 - <C type>
 Output capacitance: Typ. 1.1 pF, On resistance: Typ. 9.5Ω
- **C×R5**
 Output capacitance: Typ. 1.1 pF, On resistance: Typ. 5.5Ω

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 | C×R10 | Low on resistance (R type) | 30 V | 800 mA | AQY221R6TY | AQY221R6TW | 1,000 pcs. |
| | | | 40 V | 250 mA | AQY221R2TY | AQY221R2TW | |
| | Low output capacitance (C type) | | 40 V | 120 mA | AQY221N2TY | AQY221N2TW | |
| | C×R5 | | 25 V | 150 mA | AQY221N3TY | AQY221N3TW | |

Notes: *1 Indicate the peak AC and DC values.
 *2 Only tape and reel package is available.
 For space reasons, only "1R6", "1R2", "1N2" or "1N3" is marked on the product as the part number.

RATING

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

| Item | Symbol | C×R10 R type | | C×R10 C type | C×R5 type | Remarks | |
|-------------------------|-------------------------|-------------------|-----------------------------|--------------|-----------|---------------------------------|-------------------------------------|
| | | AQY221R6T | AQY221R2T | AQY221N2T | AQY221N3T | | |
| 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 | 30 V | 40 V | 40 V | 25 V | |
| | Continuous load current | I _L | 0.8 A | 0.25 A | 0.12 A | 0.15 A | Peak AC, DC |
| | Peak load current | I _{peak} | 1.5 A | 0.75 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} | 200 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 | | | | |

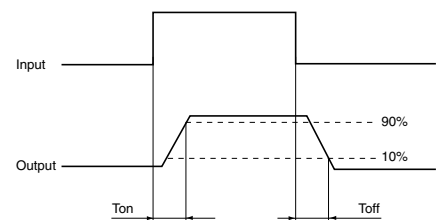
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

| Item | Symbol | C×R10 R type | | C×R10 C type | C×R5 type | Condition | |
|---------------------------|----------------------|---|-----------|--------------|-----------|---|--|
| | | AQY221R6T | AQY221R2T | AQY221N2T | AQY221N3T | | |
| Input | LED operate current | Typical | 0.5 mA | | 0.7 mA | AQY221R6T: I _L = 100 mA AQY221R2T: I _L = 250 mA AQY221N2T: I _L = 80 mA AQY221N3T: I _L = 80 mA | |
| | | Maximum | 3.0 mA | | | | |
| | LED turn off current | Minimum | 0.1 mA | | 0.2 mA | | |
| | | Typical | 0.4 mA | | 0.6 mA | | |
| LED dropout voltage | Typical | 1.14 V (1.35 V at I _F = 50 mA) | | | | I _F = 5 mA | |
| | Maximum | 1.5 V | | | | | |
| Output | On resistance | Typical | 0.18 Ω | 0.8 Ω | 9.5 Ω | 5.5 Ω | AQY221R6T: I _F = 5 mA, I _L = 800 mA AQY221R2T: I _F = 5 mA, I _L = 250 mA AQY221N2T: I _F = 5 mA, I _L = 80 mA AQY221N3T: I _F = 5 mA, I _L = 80 mA Within 1 s |
| | | Maximum | 0.35 Ω | 1.25 Ω | 12.5 Ω | 7.5 Ω | |
| | Output capacitance | Typical | 37.5 pF | 14 pF | 1.1 pF | | |
| | | Maximum | 100 pF | 18 pF | 1.5 pF | | |
| Off state leakage current | Typical | — | 0.02 nA | 0.01 nA | | I _F = 0 mA, V _L = Max. | |
| | Maximum | *10 nA | | | | | |
| Transfer characteristics | Turn on time** | Typical | 0.1 ms | | 0.01 ms | AQY221R6T: I _F = 5 mA, V _L = 10 V, R _L = 100 Ω AQY221R2T: I _F = 5 mA, V _L = 10 V, R _L = 40 Ω AQY221N2T: I _F = 5 mA, V _L = 10 V, R _L = 125 Ω AQY221N3T: I _F = 5 mA, V _L = 10 V, R _L = 125 Ω | |
| | | Maximum | 0.5 ms | | 0.2 ms | | |
| | Turn off time** | Typical | 0.06 ms | | 0.03 ms | | |
| | | Maximum | 0.2 ms | | | | |
| I/O capacitance | Typical | 0.4 pF | | | | f = 1 MHz, V _B = 0 V | |
| | Maximum | 1.5 pF | | | | | |

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 |
| AQY221R6T | Load voltage (Peak AC) | — | 15 | V |
| | Continuous load current | — | 0.8 | A |
| AQY221R2T | Load voltage (Peak AC) | — | 15 | V |
| | Continuous load current | — | 0.25 | A |
| AQY221N2T | Load voltage (Peak AC) | — | 15 | V |
| | Continuous load current | — | 0.12 | A |
| AQY221N3T | Load voltage (Peak AC) | — | 15 | V |
| | Continuous load current | — | 0.15 | A |

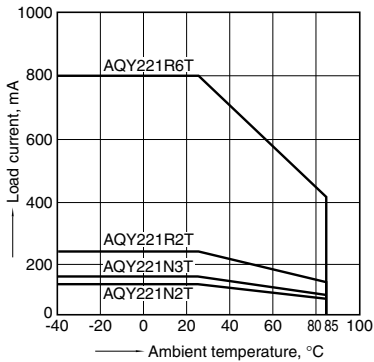
■ These products are not designed for automotive use.

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

REFERENCE DATA

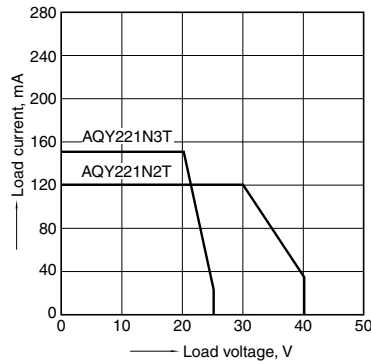
1. Load current vs. ambient temperature characteristics

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



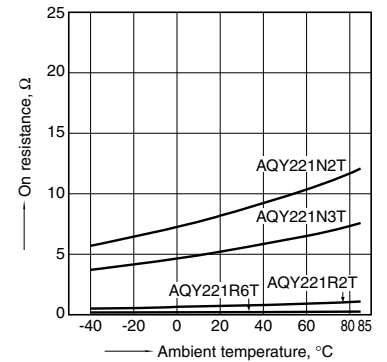
2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



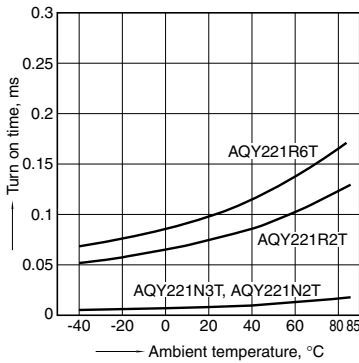
3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC)
Continuous load current: 800mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



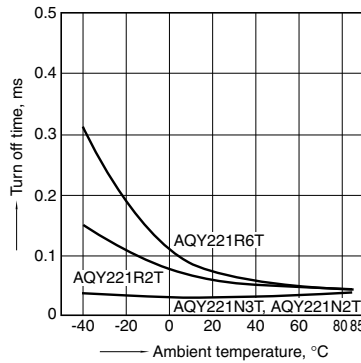
4. Turn on time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



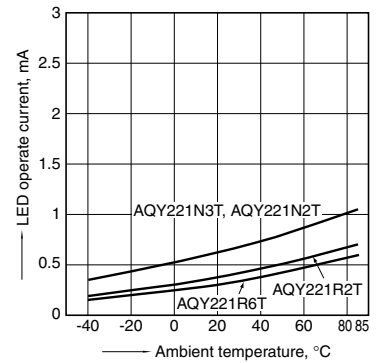
5. Turn off time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



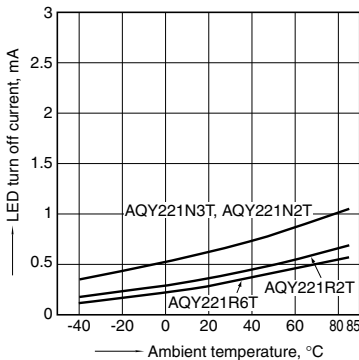
6. LED operate current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



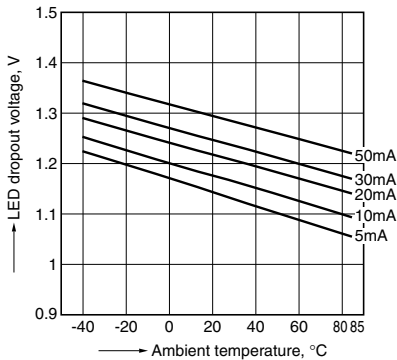
7. LED turn off current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



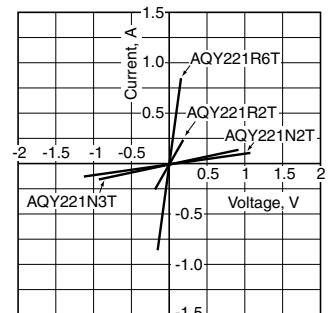
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



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

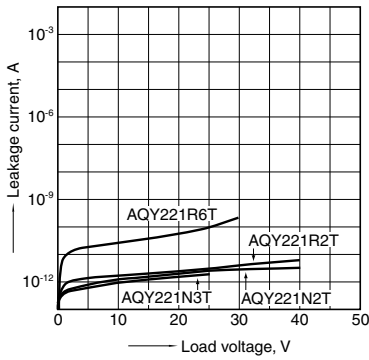
Measured portion: between terminals 3 and 4;
Ambient temperature: 25°C 77°F



RF VSSOP 1 Form A C×R10/C×R5 (AQY22○○○T)

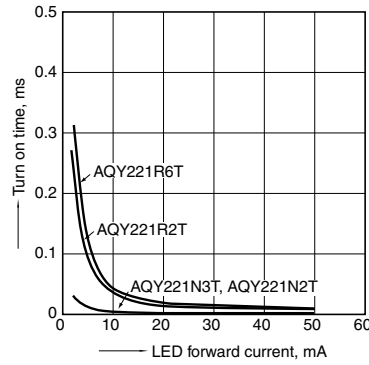
10. Off state leakage current vs. load voltage characteristics

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



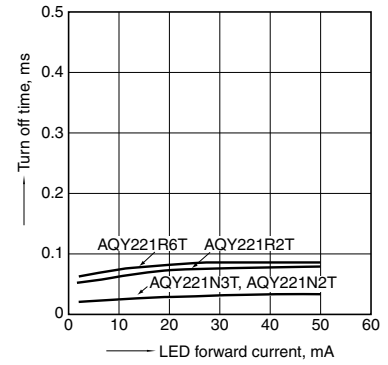
11. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T
Ambient temperature: 25°C 77°F



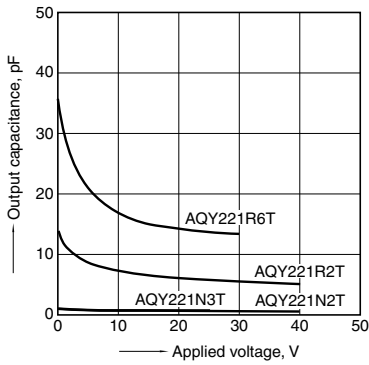
12. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T
Ambient temperature: 25°C 77°F



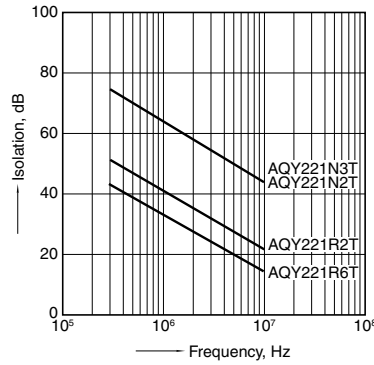
13. Output capacitance vs. applied voltage characteristics

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



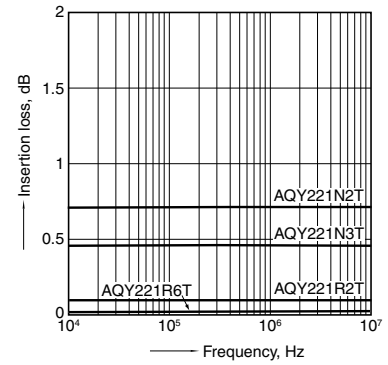
14. Isolation vs. frequency characteristics (50Ω impedance)

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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