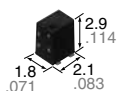
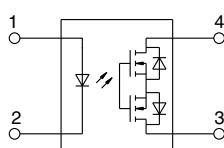


**C×R type VSSOP package**  
**60 V and 100 V load voltage**

**PhotoMOS<sup>®</sup>**  
**RF VSSOP 1 Form A C×R**  
**(AQY22○○○T)**



mm inch



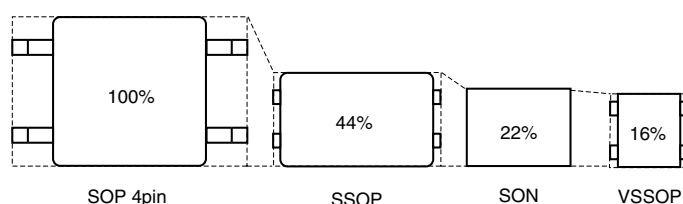
**RoHS compliant**

### FEATURES

#### 1. Miniature VSSOP package

4.6 mm<sup>2</sup> mounting area achieved. Approx. 29% less than previous product (SON type).

Contributes to the miniaturization of instruments and higher density mounting.



#### 2. Load voltage: 60 V and 100 V

#### 3. Low C×R

Low on resistance and low output capacitance available

• 60 V load voltage: AQY222R2T

Output capacitance: Typ. 27 pF, On resistance: Typ. 0.8Ω

• 100 V load voltage: AQY225R3T

Output capacitance: Typ. 5.8 pF, On resistance: Typ. 8.8Ω

### 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 | 60 V            | 400 mA       | AQY222R2TY                               | AQY222R2TW                       | 1,000 pcs.                            |
|                | 100 V           | 120 mA       | AQY225R3TY                               | AQY225R3TW                       |                                       |

Notes: \*1. Indicate the peak AC and DC values.

\*2. Only tape and reel package is available.

For space reasons, only "2R2" or "5R3" is marked on the product as the part number.

## RATING

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

| Item                    |                         | Symbol     | AQY222R2T                   | AQY225R3T | Remarks                                   |
|-------------------------|-------------------------|------------|-----------------------------|-----------|---|
| Input side              | LED forward current     | $I_F$      | 50 mA                       |           |   |
|                         | LED reverse voltage     | $V_R$      | 5 V                         |           |   |
|                         | Peak forward current    | $I_{FP}$   | 1 A                         |           | $f = 100 \text{ Hz}$ , Duty factor = 0.1% |
|                         | Power dissipation       | $P_{in}$   | 75 mW                       |           |   |
| Output side             | Load voltage (peak AC)  | $V_L$      | 60 V                        | 100 V     |   |
|                         | Continuous load current | $I_L$      | 0.4 A                       | 0.12 A    | Peak AC, DC                               |
|                         | Peak load current       | $I_{peak}$ | 1.2 A                       | 0.3 A     | 100 ms (1shot), $V_L = \text{DC}$         |
|                         | 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 |           |   |

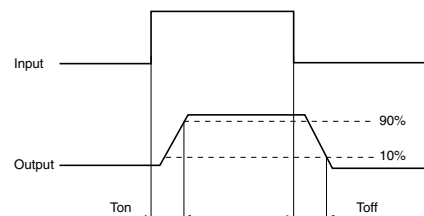
### 2. Electrical characteristics (Ambient temperature: 25°C 77°F)

| Item                      |                      |            | Symbol                                    | AQY222R2T     | AQY225R3T                                  | Condition  |
|---------------------------|----------------------|------------|---|---------------|--|--|
| Input                     | LED operate current  | Typical    | $I_{Fon}$                                 | 0.4 mA        |  | AQY222R2T: $I_L = 400 \text{ mA}$<br>AQY225R3T: $I_L = 80 \text{ mA}$  |
|                           |                      | Maximum    |   | 3 mA          |  |  |
|                           | LED turn off current | Minimum    | $I_{Foff}$                                | 0.1 mA        |  |  |
|                           |                      | Typical    |   | 0.35 mA       |  |  |
| LED dropout voltage       | Typical              | $V_F$      | 1.14 V (1.35 V at $I_F = 50 \text{ mA}$ ) |               | $I_F = 5 \text{ mA}$                       |  |
|                           | Maximum              |            | 1.5 V                                     |               |  |  |
| Output                    | On resistance        | Typical    | $R_{on}$                                  | 0.8 $\Omega$  | 8.8 $\Omega$                               | AQY222R2T: $I_F = 5 \text{ mA}$ , $I_L = 400 \text{ mA}$<br>AQY225R3T: $I_F = 5 \text{ mA}$ , $I_L = 80 \text{ mA}$<br>Within 1 s                          |
|                           |                      | Maximum    |   | 1.25 $\Omega$ | 14 $\Omega$                                |  |
|                           | Output capacitance   | Typical    | $C_{out}$                                 | 27 pF         | 5.8 pF                                     | $I_F = 0 \text{ mA}$ , $V_B = 0 \text{ V}$ , $f = 1 \text{ MHz}$   |
|                           |                      | Maximum    |   | 40 pF         | 8 pF                                       |  |
| Off state leakage current | Typical              | $I_{Leak}$ | —   |               | $I_F = 0 \text{ mA}$ , $V_L = \text{Max.}$ |  |
|                           | Maximum              |            | *10 nA                                    |               |  |  |
| Transfer characteristics  | Turn on time**       | Typical    | $T_{on}$                                  | 0.12 ms       | 0.04 ms                                    | AQY222R2T: $I_F = 5 \text{ mA}$ , $V_L = 10 \text{ V}$ , $R_L = 100 \Omega$<br>AQY225R3T: $I_F = 5 \text{ mA}$ , $V_L = 10 \text{ V}$ , $R_L = 125 \Omega$ |
|                           |                      | Maximum    |   | 0.5 ms        |  |  |
|                           | Turn off time**      | Typical    | $T_{off}$                                 | 0.08 ms       | 0.05 ms                                    |  |
|                           |                      | Maximum    |   | 0.2 ms        |  |  |
| I/O capacitance           | Typical              | $C_{iso}$  | 0.4 pF                                    |               | $f = 1 \text{ MHz}$ , $V_B = 0 \text{ V}$  |  |
|                           | 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   |
| AQY222R2T   | Load voltage (Peak AC)  | $V_L$  | —    | 30   | V    |
|             | Continuous load current | $I_L$  | —    | 0.4  | A    |
| AQY225R3T   | Load voltage (Peak AC)  | $V_L$  | —    | 50   | V    |
|             | Continuous load current | $I_L$  | —    | 0.12 | A    |

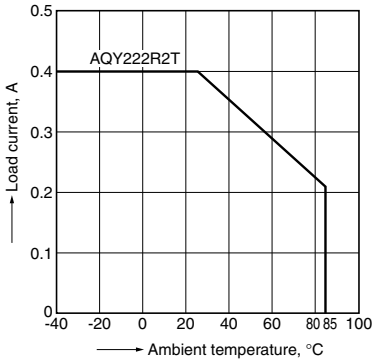
■ These products are not designed for automotive use.

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

**REFERENCE DATA**

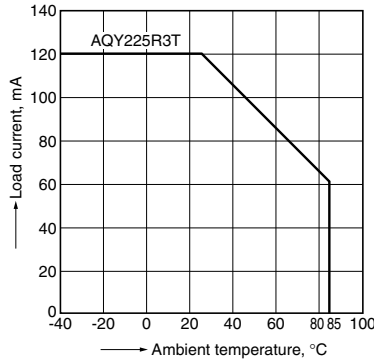
1.-(1) Load current vs. ambient temperature characteristics

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



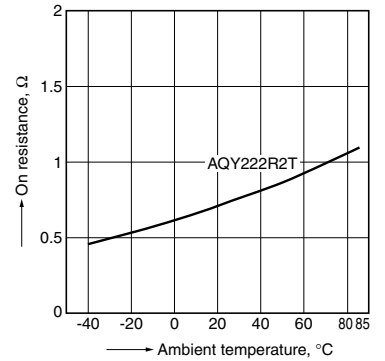
1.-(2) Load current vs. ambient temperature characteristics

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



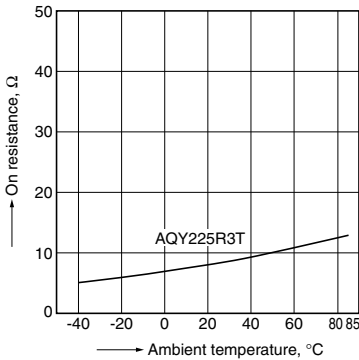
2.-(1) On resistance vs. ambient temperature characteristics

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



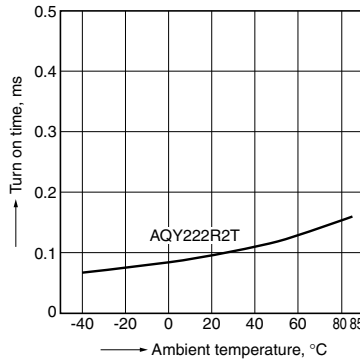
2.-(2) On resistance vs. ambient temperature characteristics

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



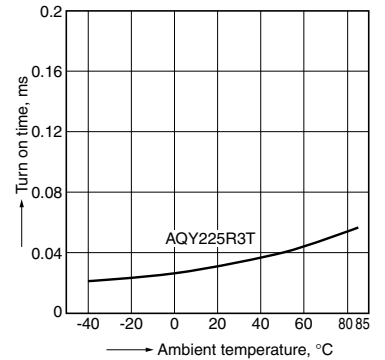
3.-(1) Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10V (DC);  
Continuous load current: 100mA (DC)



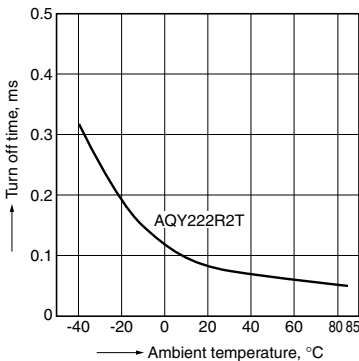
3.-(2) Turn on time vs. ambient temperature characteristics

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



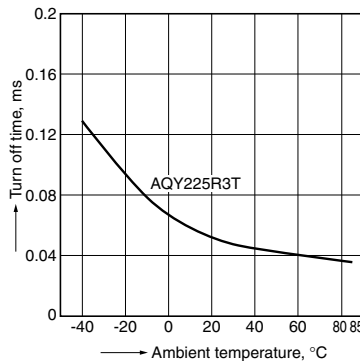
4.-(1) Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10V (DC);  
Continuous load current: 100mA (DC)



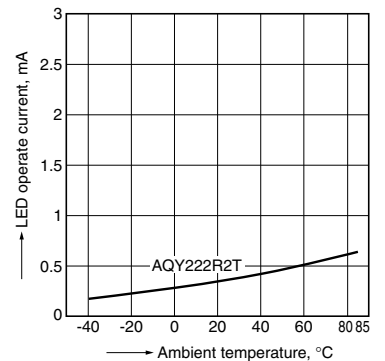
4.-(2) Turn off time vs. ambient temperature characteristics

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



5.-(1) LED operate current vs. ambient temperature characteristics

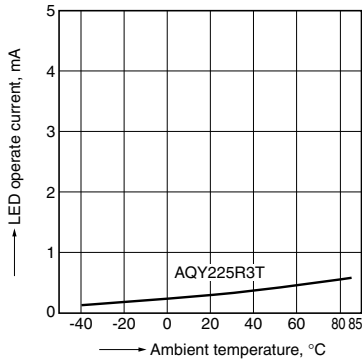
Load voltage: 10V (DC);  
Continuous load current: 400mA (DC)



# RF VSSOP 1 Form A CxR (AQY22000T)

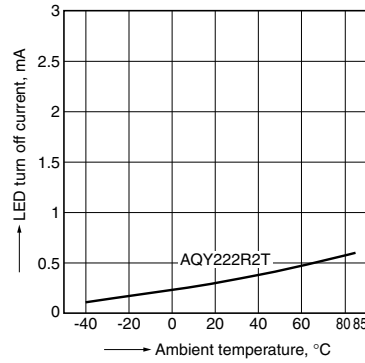
5.-(2) LED operate current vs. ambient temperature characteristics

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



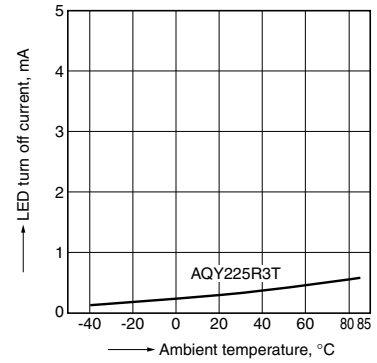
6.-(1) LED turn off current vs. ambient temperature characteristics

Load voltage: 10V (DC);  
Continuous load current: 400mA (DC)



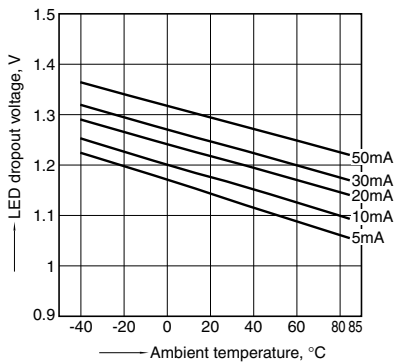
6.-(2) LED turn off current vs. ambient temperature characteristics

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



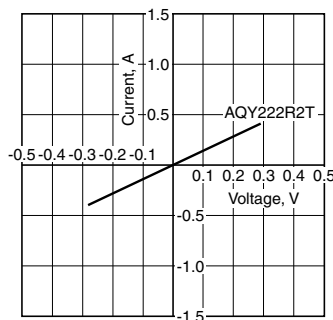
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



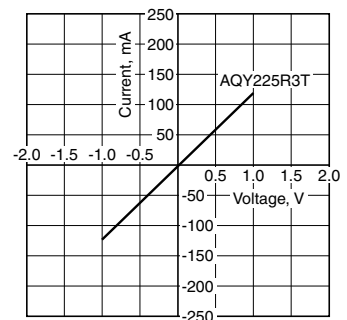
8.-(1) Current vs. voltage characteristics of output at MOS portion

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



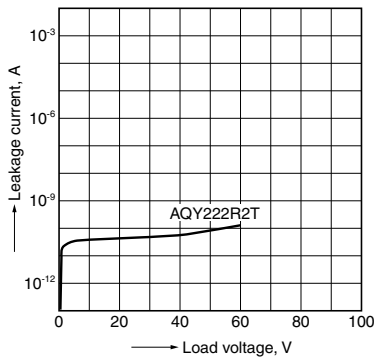
8.-(2) Current vs. voltage characteristics of output at MOS portion

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



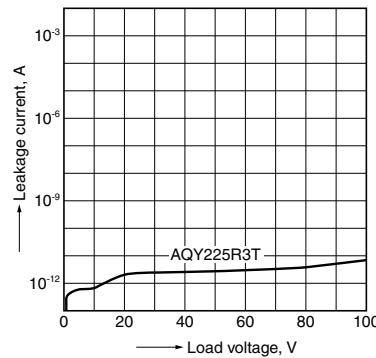
9.-(1) Off state leakage current vs. load voltage characteristics

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



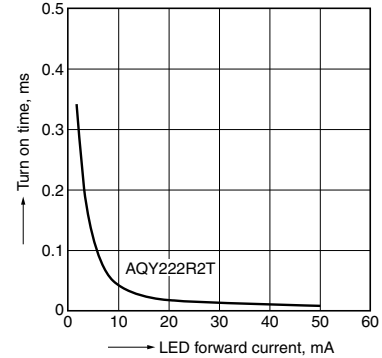
9.-(2) Off state leakage current vs. load voltage characteristics

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



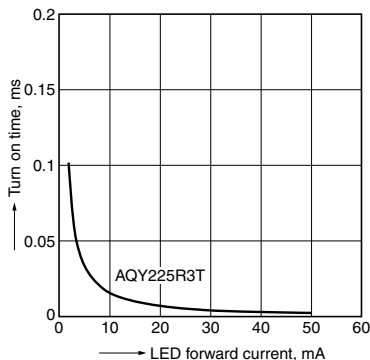
10.-(1) Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;  
Load voltage: 10V (DC); Continuous load current: 100mA (DC); Ambient temperature: 25°C 77°F



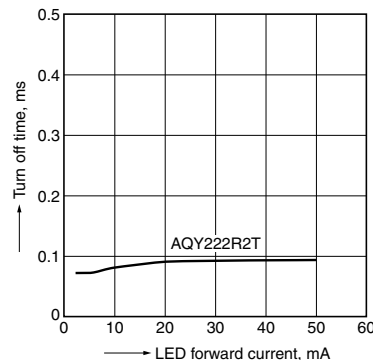
10.-(2) Turn on time vs. LED forward current characteristics

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



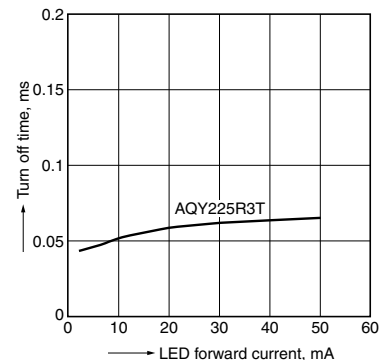
11.-(1) Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4;  
Load voltage: 10V (DC); Continuous load current: 100mA (DC); Ambient temperature: 25°C 77°F



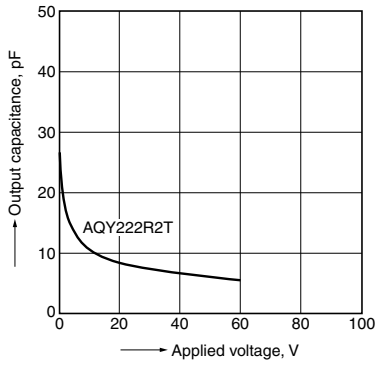
11.-(2) Turn off time vs. LED forward current characteristics

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



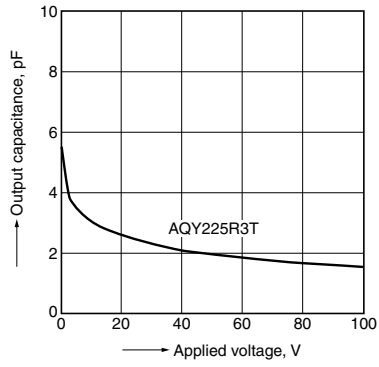
12.-(1) Output capacitance vs. applied voltage characteristics

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



12.-(2) Output capacitance vs. applied voltage characteristics

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



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