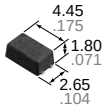
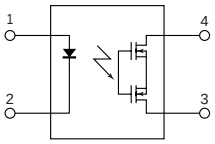
Panasonic
ideas for life

Super miniature SSOP
Lower output capacitance and on resistance (C×R5)
Load voltage 25V

PhotoMOS Relays
RF SSOP 1 Form A C×R5
(AQY221N3V)



mm inch



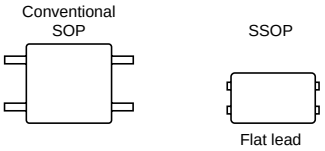
Compliance with RoHS Directive

FEATURES

1. Reduced package size
Lower surface has been reduced 60% and mounting space 40% compared to conventional SOP4-pin type.

2. Lower output capacitance and on-resistance
Output capacitance (Cout): 1.0pF (typ.)
ON resistance (Ron): 5.5Ω (typ.)

3. Mounting space has been reduced and output signals have been improved by using new flat lead terminals.



4. High speed switching
Turn on time: 0.02ms (typ.)
Turn off time: 0.02ms (typ.)

TYPICAL APPLICATIONS

1. Measuring and testing equipment
IC tester, Liquid crystal driver tester, Semiconductor performance tester, Board tester, etc.

2. Medical equipment
Ultrasonic wave diagnostic machine

3. Multi-point recorder
Warping, Thermo couple, etc.

4. Telecommunication and broadcasting equipment

TYPES

	Output rating*1		Package	Tape and reel packing style		Packing quantity in tape and reel*2
	Load voltage	Load current		Picked from the 1/4-pin side	Picked from the 2/3-pin side	
AC/DC dual use	25 V	150 mA	SSOP	AQY221N3VY	AQY221N3VW	3,500 pcs.

Notes: *1 Indicate the peak AC and DC values.
*2 Tape and reel is the standard packing style for SSOP.
For space reasons, only "N3V" is marked on the product as the part number. The three initial letters of the part number "AQY", and the package (SSOP) indicator "V" and the packing style indicator "Y" or "W" are not marked on the relay.

RATING

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

Item		Symbol	AQY221N3V	Remarks
Input	LED forward current	I_F	50mA	
	LED reverse voltage	V_R	5V	
	Peak forward current	I_{FP}	1A	f=100 Hz, Duty factor=0.1%
	Power dissipation	P_{in}	75mW	
Output	Load voltage (peak AC)	V_L	25V	
	Continuous load current	I_L	0.15A	Peak AC, DC
	Peak load current	I_{peak}	0.4A	100 ms (1 shot), V_L= DC
	Power dissipation	P_{out}	250mW	
Total power dissipation		P_T	300mW	
I/O isolation voltage		V_{iso}	1,500V 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	

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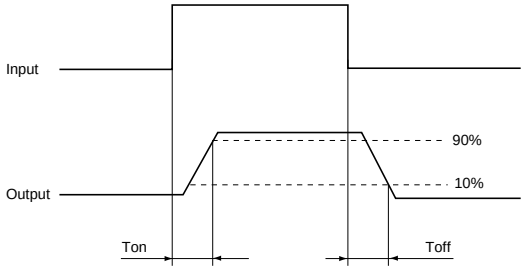
RF SSOP 1 Form A C×R5 (AQY221N3V)

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

Item			Symbol	AQY221N3V	Condition
Input	LED operate current	Typical	I_{Fon}	1.0 mA	I_L = 80 mA
		Maximum		3.0 mA	
	LED turn off current	Minimum	I_{Foff}	0.2 mA	I_L = 80 mA
		Typical		0.9 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}	5.5Ω	I_F = 5 mA, I_L = 80 mA Within 1 s on time
		Maximum		7.5Ω	
	Output capacitance	Typical	C_{out}	1.0 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}	0.02 ms	I_F = 5 mA, V_L = 10 V R_L = 125Ω
		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}	1,000MΩ	500V DC

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

*Turn on/Turn off time



RECOMMENDED OPERATING CONDITIONS

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

Item	Symbol	Recommended value	Unit
Input LED current	I_F	5	mA

■ For Dimensions

■ For Schematic and Wiring Diagrams

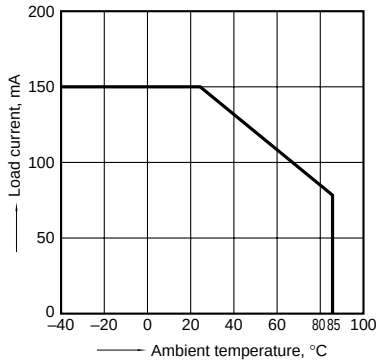
■ For Cautions for Use

■ These products are not designed for automotive use.
If you are considering to use these products for automotive applications, please contact your local Panasonic Electric Works technical representative.
For more information

REFERENCE DATA

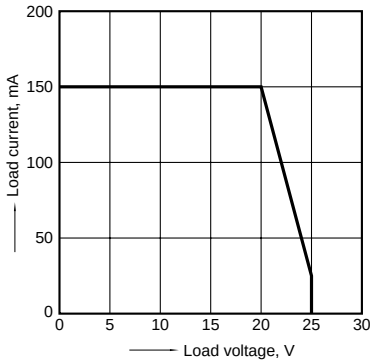
1. Load current vs. ambient temperature characteristics

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



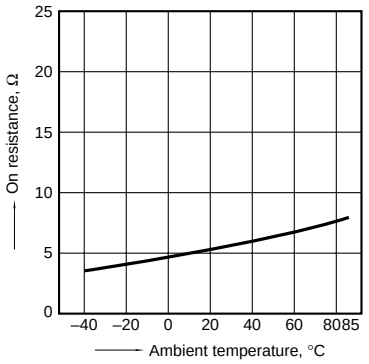
2. Load current vs. Load voltage characteristics

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);
Load current: 80mA (DC)



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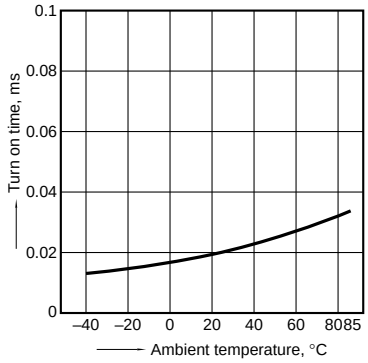
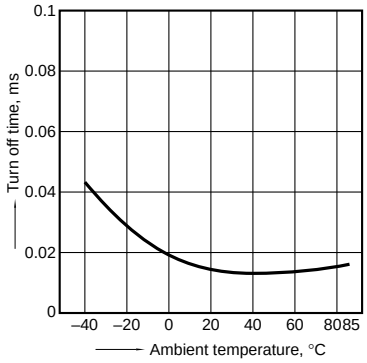
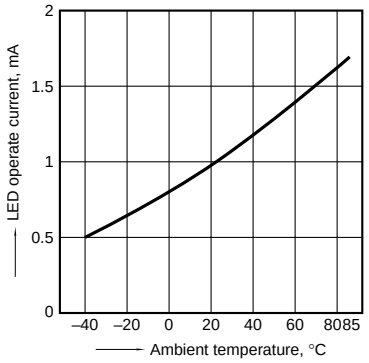
4. Turn on time vs. ambient temperature characteristics
Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



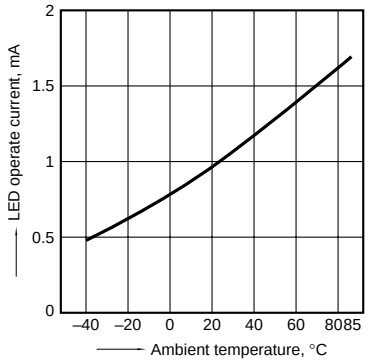
5. Turn off time vs. ambient temperature characteristics
Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



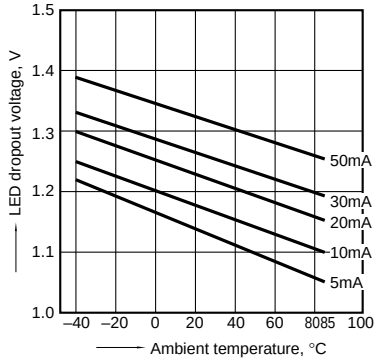
6. LED operate current vs. ambient temperature characteristics
Measured portion: between terminals 3 and 4
Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



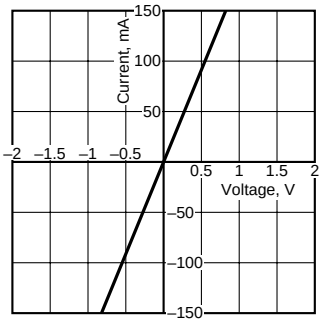
7. LED turn off current vs. ambient temperature characteristics
Measured portion: between terminals 3 and 4
Load voltage: 10V (DC);
Continuous load current: 80mA (DC)



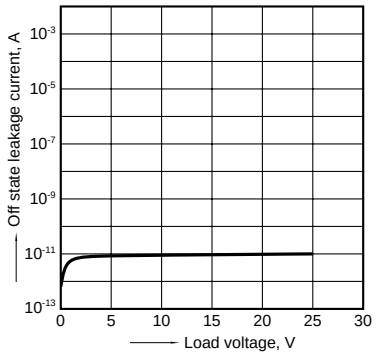
8. LED dropout voltage vs. ambient temperature characteristics
LED current: 5 to 50 mA



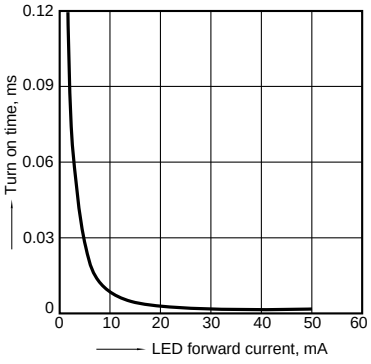
9. Current vs. voltage characteristics of output at MOS portion
Measured portion: between terminals 3 and 4
Ambient temperature: 25°C 77°F



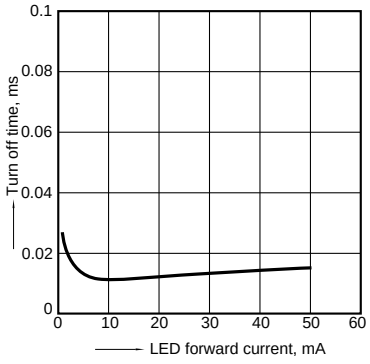
10. Off state leakage current vs. load voltage characteristics
Measured portion: between terminals 3 and 4
Ambient temperature: 25°C 77°F



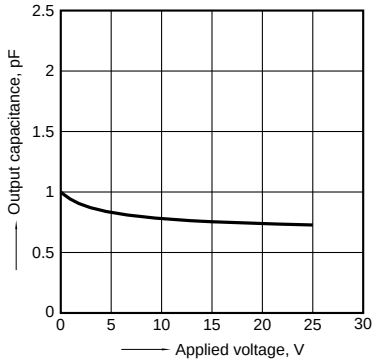
11. Turn on time vs. LED forward current characteristics
Measured portion: between terminals 3 and 4
Load voltage: 10V (DC); Continuous load current: 80mA (DC); Ambient temperature: 25°C 77°F



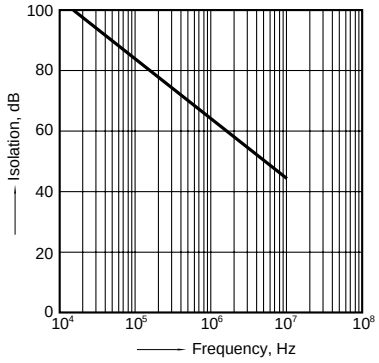
12. Turn off time vs. LED forward current characteristics
Measured portion: between terminals 3 and 4
Load voltage: 10V (DC); Continuous load current: 80mA (DC); Ambient temperature: 25°C 77°F



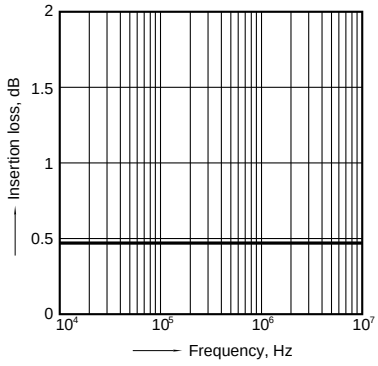
13. Output capacitance vs. applied voltage characteristics
Measured portion: between terminals 3 and 4
Frequency: 1 MHz, 30m Vrms; Ambient temperature: 25°C 77°F



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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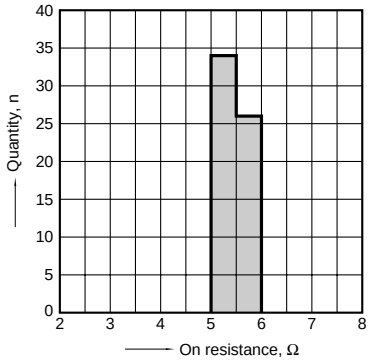
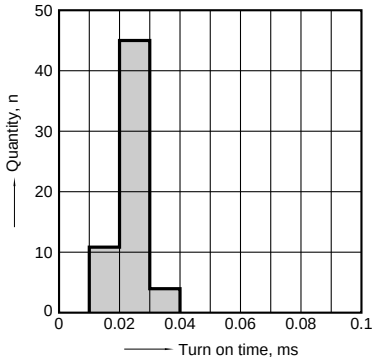
RF SSOP 1 Form A C×R5 (AQY221N3V)

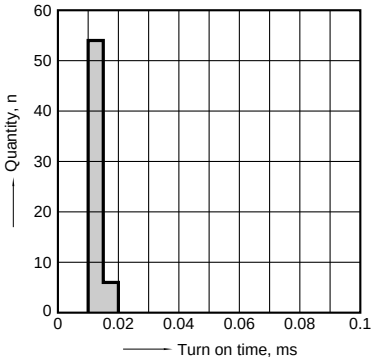
16. On resistance distribution
Measured portion: between terminals 3 and 4
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



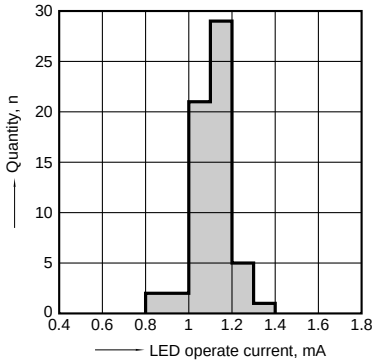
17. Turn on time distribution
Load voltage: 10V (DC)
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



18. Turn off time distribution
Load voltage: 10V (DC)
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



19. LED operate current distribution
Load voltage: 10V (DC)
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



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