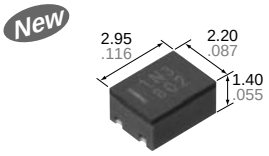
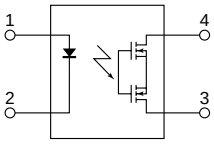
Panasonic
ideas for life

Micro-miniature SON package
Lower output capacitance and on resistance (C×R10)
40V load voltage

PhotoMOS Relays
RF SON 1 Form A C×R10
(AQY221○2M)



mm inch

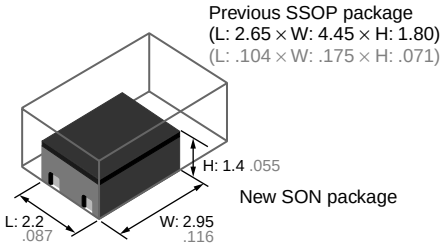


Compliance with RoHS Directive

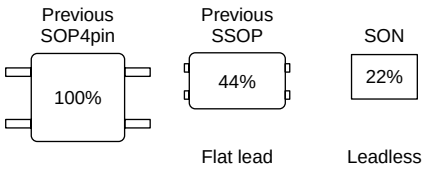
FEATURES

1. Super miniature SON* package contributes to space savings and high density mounting.
The SON type is a new PhotoMOS relay with approximately 43% the volume ratio of existing SSOP type. The super miniature leadless construction reduces the mounting area and enables high density mounting.

***Small Outline No-lead package**
Reduced to approximately 43% volume ratio



Area comparison (including leads)



2. Both low on-resistance (R type) and low capacitance (C type) available at C×R10
- R type: On resistance 0.8Ω (typ.)
  Output capacitance 14pF (typ.)
- C type: On resistance 9.5Ω (typ.)
  Output capacitance 1.1pF (typ.)

TYPICAL APPLICATIONS

1. Measuring equipment
IC tester, Probe cards, board tester and other testing equipment
2. Telecommunication or broadcasting equipment
3. Medical equipment

TYPES

	Type	Output rating*1		Package	Tape and reel packing style*2		Packing quantity in 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	Low on-resistance (R type)	40 V	250 mA	SON	AQY221R2MY	AQY221R2MW	3,500 pcs.
	Low capacitance (C type)	40 V	120 mA		AQY221N2MY	AQY221N2MW	

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

RATING

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

Item		Symbol	AQY221R2M	AQY221N2M	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	40V	40V	
	Continuous load current	I_L	0.25A	0.12A	Peak AC, DC
	Peak load current	I_{peak}	0.75A	–	100ms (1shot), V_L=DC
	Power dissipation	P_{out}	250mW		
Total power dissipation		P_T	300mW		
I/O isolation voltage		V_{iso}	200V AC		
Operating temperature		T_{opr}	–40°C to +85°C –40°F to +185°F		Non-condensing at low temperatures
Storage temperature		T_{stg}	–40°C to +100°C –40°F to +212°F		

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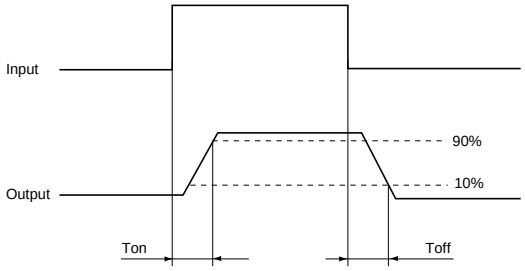
RF SON 1 Form A C×R10 (AQY221❍2M)

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

Item			Symbol	R type	C type	Condition
				AQY221R2M	AQY221N2M	
Input	LED operate current	Typical	I_{Fon}	0.8 mA	1.0 mA	R type: I_L = 250 mA C type: I_L = 80 mA
		Maximum		3.0 mA		
	LED turn off current	Minimum	I_{Foff}	0.2 mA		
		Typical		0.7 mA	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}	0.8Ω	9.5Ω	R type: I_F = 5 mA, I_L = 250 mA C type: I_F = 5 mA, I_L = 80 mA Within 1 s on time
		Maximum		1.25Ω	12.5Ω	
	Output capacitance	Typical	C_{out}	14 pF	1.1 pF	I_F = 0 mA V_B = 0 V f = 1 MHz
		Maximum		18 pF	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}	0.2 ms	0.02 ms	R type: I_F = 5 mA, V_L = 10 V, R_L = 40Ω C type: I_F = 5 mA, V_L = 10 V, R_L = 125Ω
		Maximum		0.5 ms	0.2 ms	
	Turn off time*	Typical	T_{off}	0.04 ms	0.02 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		

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

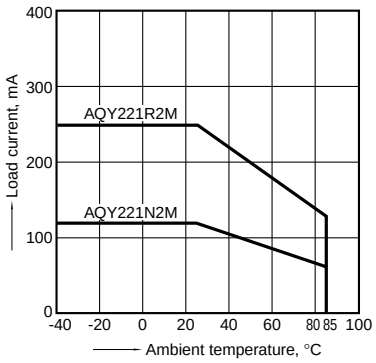
■ For Cautions for Use

■ 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

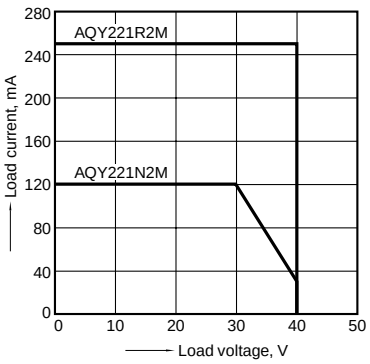
1. Load current vs. ambient temperature characteristics

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



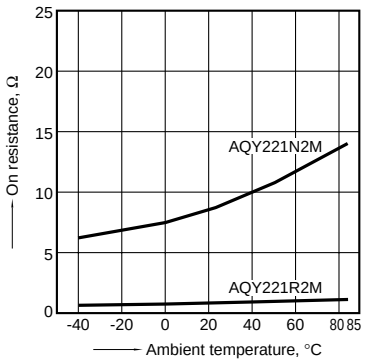
2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



3. On resistance vs. ambient temperature characteristics

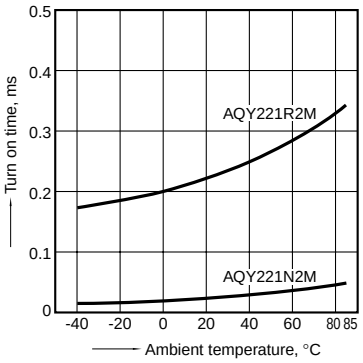
Measured portion: between terminals 3 and 4;
LED current: 5 mA; Load voltage: 10V (DC); Load current: 250mA (DC) R type, 80mA (DC) C type



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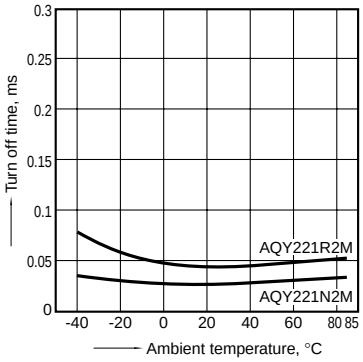
4. Turn on time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4; LED current: 5 mA; Load voltage: 10V (DC); Continuous load current: 250mA (DC) R type, 80mA (DC) C type



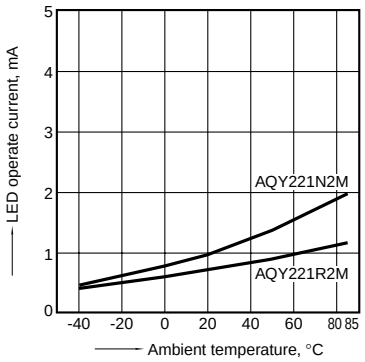
5. Turn off time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4; LED current: 5 mA; Load voltage: 10V (DC); Continuous load current: 250mA (DC) R type, 80mA (DC) C type



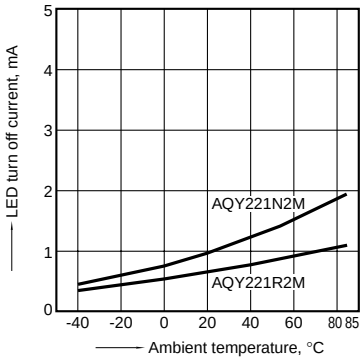
6. LED operate current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4; Load voltage: 10V (DC); Continuous load current: 250mA (DC) R type, 80mA (DC) C type



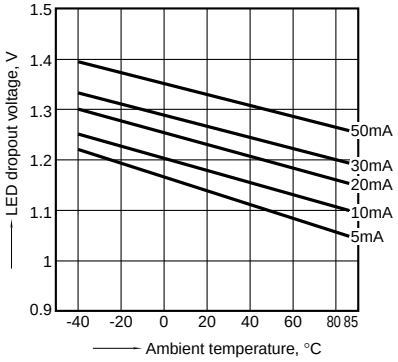
7. LED turn off current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4; Load voltage: 10V (DC); Continuous load current: 250mA (DC) R type, 80mA (DC) C type



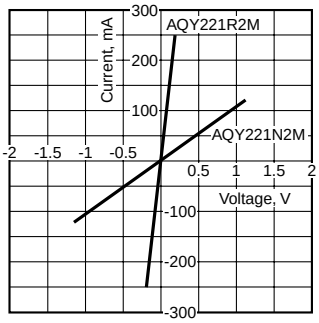
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



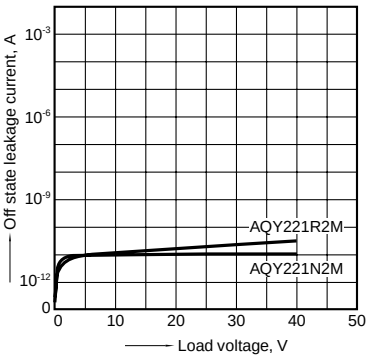
9. Current vs. voltage characteristics of output at MOS portion

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



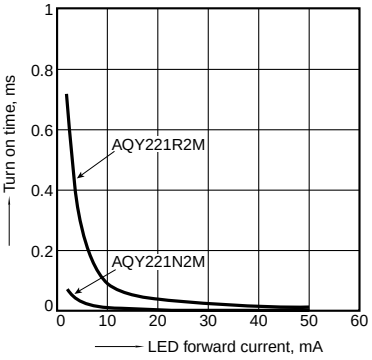
10. Off state leakage current vs. load voltage characteristics

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



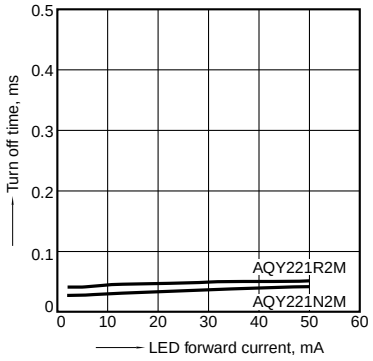
11. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4; Load voltage: 10V (DC); Continuous load current: 250mA (DC) R type, 80mA (DC) C type; Ambient temperature: 25°C 77°F



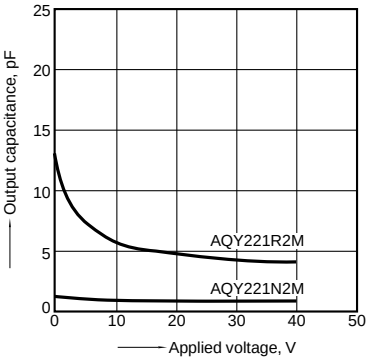
12. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4; Load voltage: 10V (DC); Continuous load current: 250mA (DC) R type, 80mA (DC) C type; Ambient temperature: 25°C 77°F



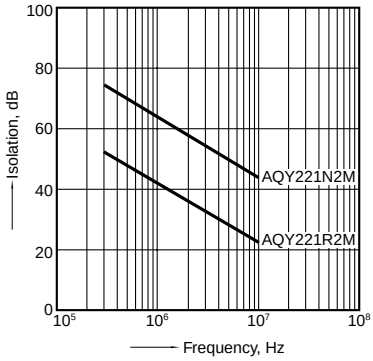
13. Output capacitance vs. applied voltage characteristics

Measured portion: between terminals 3 and 4; Frequency: 1 MHz, 30m Vrms; Ambient temperature: 25°C 77°F



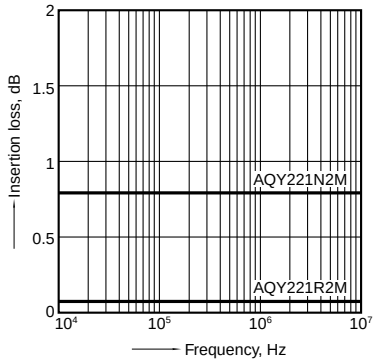
14. Isolation vs. frequency characteristics (50Ω impedance)

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



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

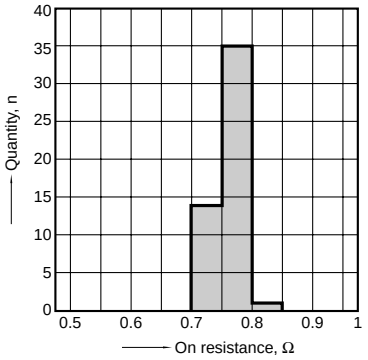
Measured portion: between terminals 3 and 4
Ambient temperature: 25°C 77°F



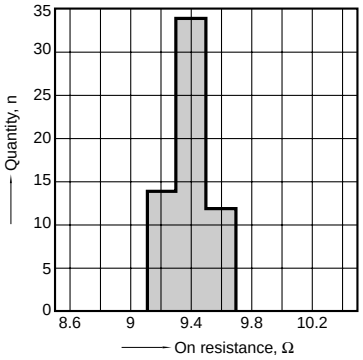
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RF SON 1 Form A C×R10 (AQY221❍2M)

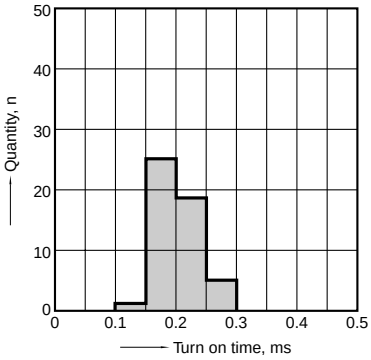
16.-(1) On resistance distribution
Sample: AQY221R2M; Measured portion: between terminals 3 and 4; Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



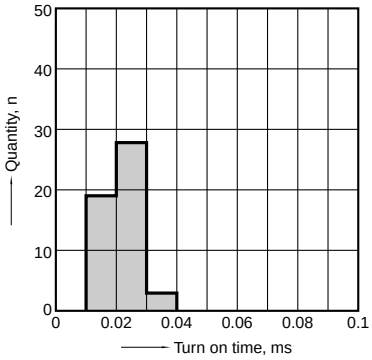
16.-(2) On resistance distribution
Sample: AQY221N2M; Measured portion: between terminals 3 and 4; Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



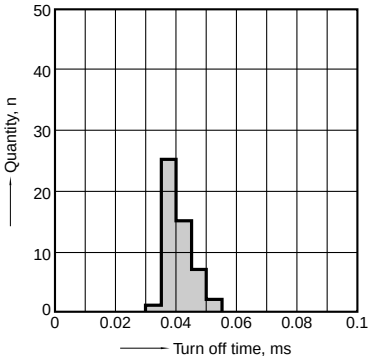
17.-(1) Turn on time distribution
Sample: AQY221R2M; Load voltage: 10V (DC) Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



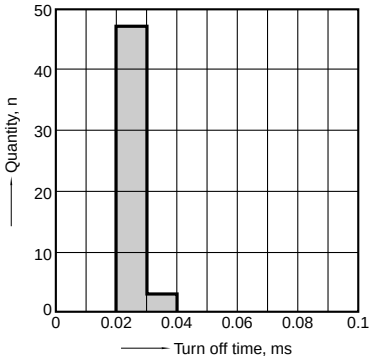
17.-(2) Turn on time distribution
Sample: AQY221N2M; Load voltage: 10V (DC) Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



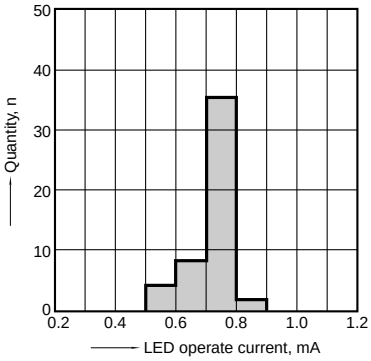
18.-(1) Turn off time distribution
Sample: AQY221R2M; Load voltage: 10V (DC) Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



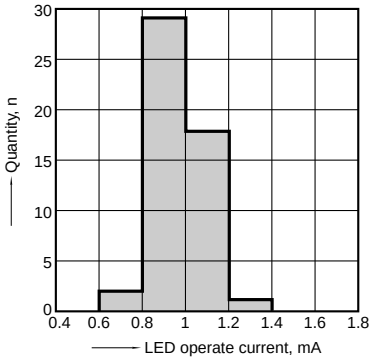
18.-(2) Turn off time distribution
Sample: AQY221N2M; Load voltage: 10V (DC) Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



19.-(1) LED operate current distribution
Sample: AQY221R2M; Load voltage: 10V (DC) Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



19.-(2) LED operate current distribution
Sample: AQY221N2M; Load voltage: 10V (DC) Continuous load current: 250mA (DC) R type, 80mA (DC) C type, n: 50pcs.
Ambient temperature: 25°C 77°F



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