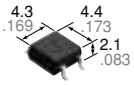
UL pending C-UL pending

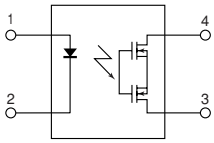
Lower output capacitance (C type) and on resistance (R type). (C × R10)
High speed switching.
(C type: Turn on time: 0.03ms, Turn off time: 0.03ms).



<R type>

<C type>

mm inch



FEATURES

1. Two option package available.
R type offers greatly reduced on-resistance.
C type offers lower output capacitance.

	AQY221R2S (R type)	AQY221N2S (C type)
Output capacitance: C	13pF	1pF
On resistance: R	0.8Ω	9.5Ω

2. High speed switching
Turn on time: 30μs (AQY221N2S)
Turn off time: 30μs (AQY221N2S)

3. Super miniature design
SOP 4-pin type.

4. Low-level off state leakage current of 10pA
The SSR has an off state leakage current of several milliamperes, where as this PhotoMOS relay has typ. 10pA (typical) even with the rated load voltage (AQY221N2S)

TYPICAL APPLICATIONS

Measuring and testing equipment
1. Testing equipment for semiconductor performance
IC tester, Liquid crystal driver tester, semiconductor performance tester
2. Board tester
Bare board tester, In-circuit tester, function tester
3. Medical equipment
Ultrasonic wave diagnostic machine
4. Multi-point recorder
Warping, thermo couple

TYPES

Circuit arrangement	Type	Output rating*		Tape and reel packing style		Packing quantity
		Load voltage	Load current	Picked from the 1/2-pin side	Picked from the 3/4-pin side	
1 Form A	R type	40 V	250 mA	AQY221R2SX	AQY221R2SZ	Tape and reel: 1,000 pcs.
	C type	40 V	120 mA	AQY221N2SX	AQY221N2SZ	

* Indicate the peak AC and DC values.

Notes:
(1) Tape package is the standard packing style. Also available in tube.
(Part No. suffix "X" or "Z" is not needed when ordering; Tube: 100 pcs.; Case: 2,000 pcs.)
(2) For space reasons, the initial letters of the product number "AQY and S", the package type indicator "X" and "Z" are omitted from the seal.

RATING

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

Item		Symbol	AQY221R2S (R type)	AQY221N2S (C type)	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		
	Continuous load current	I_L	0.25A	0.12A	Peak AC,DC
	Peak load current	I_{peak}	0.75A	0.30A	100 ms (1 shot), V_L= DC
	Power dissipation	P_{out}	300mW		
Total power dissipation		P_T	350mW		
I/O isolation voltage		V_{iso}	500V AC	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		

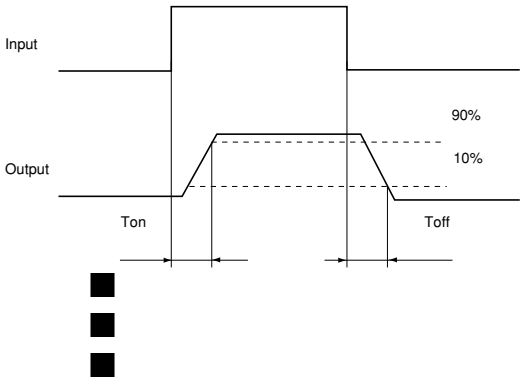
RF PhotoMOS (AQY221❍2S)

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

Item				Symbol	AQY221R2S (R type)	AQY221N2S (C type)	Condition
Input	LED operate current		Typical	I_{Fon}	0.5 mA	0.9 mA	I_L = 250 mA (R type) I_L = 80 mA (C type)
			Maximum		3.0 mA		
	LED turn off current		Minimum	I_{Foff}	0.1 mA	0.2 mA	I_L = 250 mA (R type) I_L = 80 mA (C type)
			Typical		0.4 mA	0.85 mA	
	LED dropout voltage		Typical	V_F	1.25 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	I_F = 5 mA
			Maximum		1.25Ω	12.5Ω	I_L = 250 mA (R type), I_L = 80 mA (C type) Within 1 s on time
	Output capacitance		Typical	C_{out}	13 pF	1.0 pF	I_F = 0 mA
			Maximum		18 pF	1.5 pF	V_B = 0 V f = 1 MHz
	Off state leakage current		Typical	I_{Leak}	0.03 nA	0.01 nA	I_F = 0 mA
			Maximum		10 nA		V_L = Max.
			Typical		0.1 ms	0.03 ms	I_F = 5 mA
Transfer characteristics	Switching speed	Turn on time*	Typical	T_{on}	0.06 ms	0.03 ms	V_L = 10V R_L = 40Ω (R type), 125Ω (C type) I_F = 5 mA
			Maximum		0.5ms		
		Turn off time*	Typical	T_{off}	0.06 ms	0.03 ms	V_L = 10V R_L = 40Ω (R type), 125Ω (C type) I_F = 5 mA
			Maximum		0.2 ms		
	I/O capacitance		Typical	C_{iso}	0.8 pF		f = 1 MHz
			Maximum		1.5 pF		V_B = 0 V
	Initial I/O isolation resistance		Minimum	R_{iso}	1,000MΩ		500 V DC

Note: Recommendable LED forward current I_F = 5 mA.

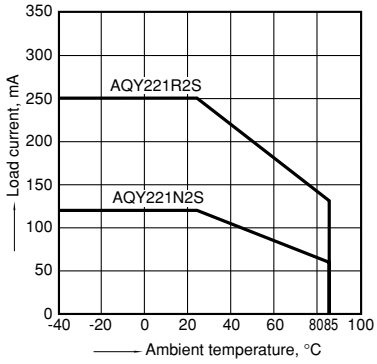
*Turn on/Turn off time



REFERENCE DATA

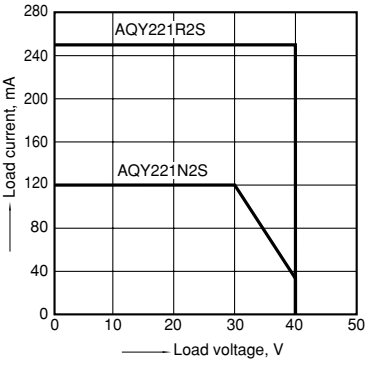
1. Load current vs. ambient temperature characteristics

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



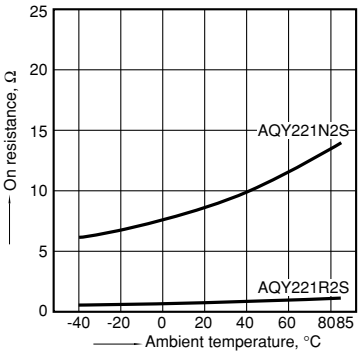
2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



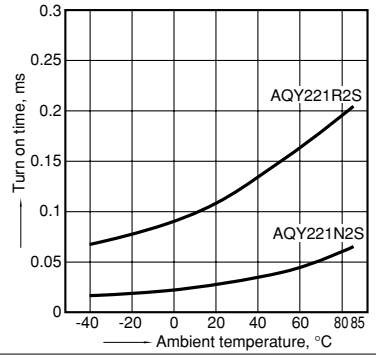
3. On resistance vs. ambient temperature characteristics

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



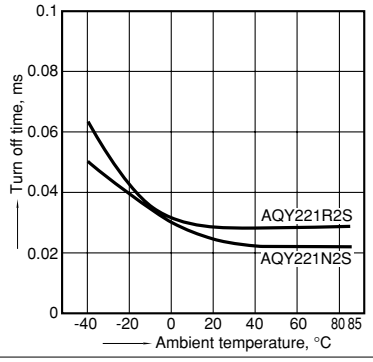
4. Turn on time vs. ambient temperature characteristics

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];



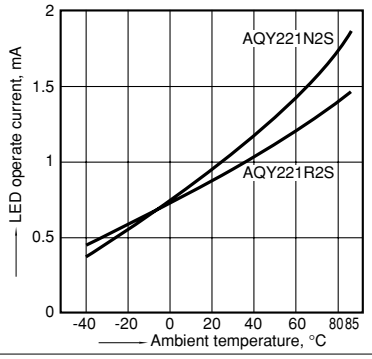
5. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10V (DC);
Continuous load current: 250mA (DC) [R type], 80mA (DC) [C type];



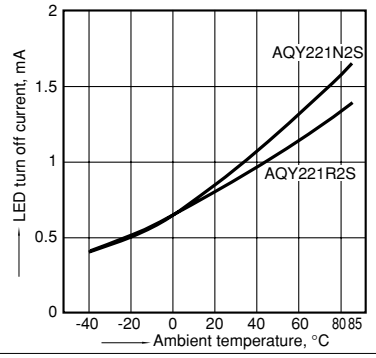
6. LED operate current vs. ambient temperature characteristics

Load voltage: Max. (DC);
Continuous load current: 250mA (DC) [R type], 80mA (DC) [C type];



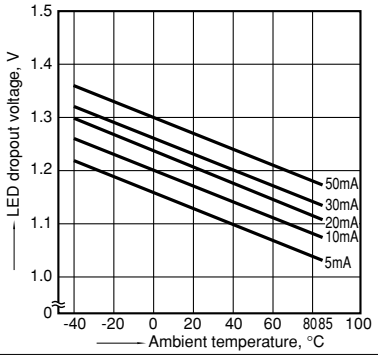
7. LED turn off current vs. ambient temperature characteristics

Load voltage: Max. (DC);
Continuous load current: 250mA (DC) [R type], 80mA (DC) [C type];



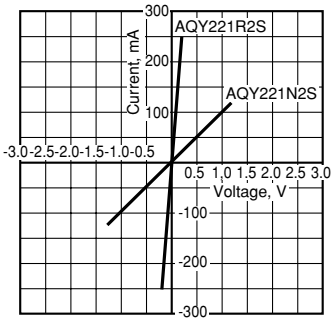
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



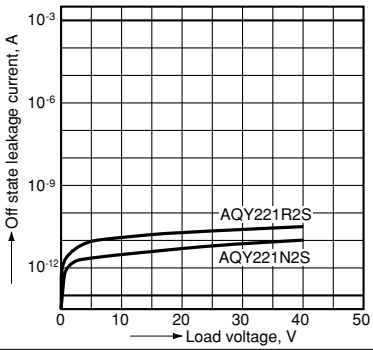
9. Current vs. voltage characteristics of output at MOS portion

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



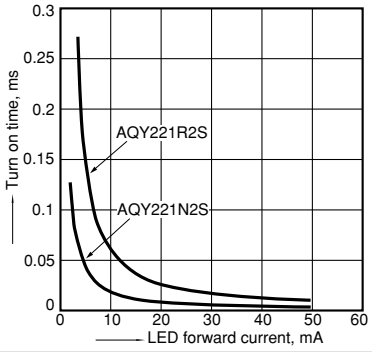
10. Off state leakage current vs. load voltage characteristics

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



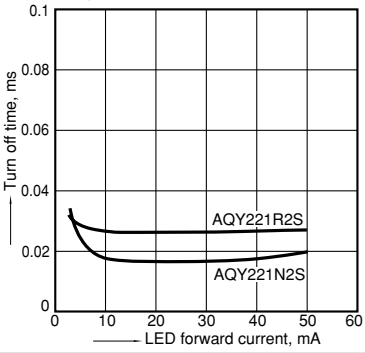
11. Turn on time vs. LED forward current characteristics

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



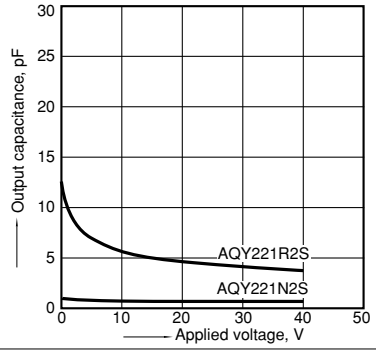
12. Turn off time vs. LED forward current characteristics

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



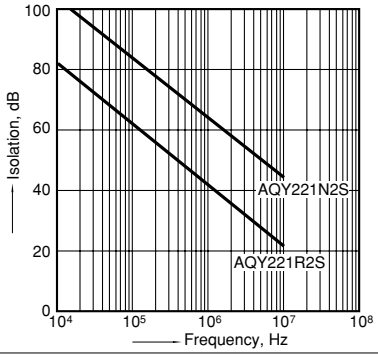
13. Output capacitance vs. applied voltage characteristics

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



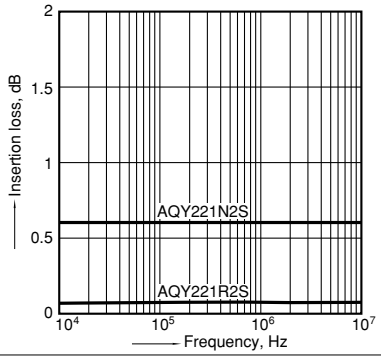
14. Isolation vs. frequency characteristics (50Ω impedance)

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

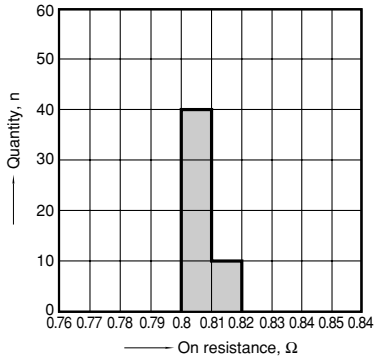


15. Insertion loss vs. frequency characteristics (50Ω impedance)

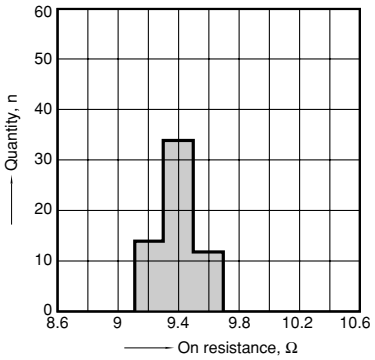
Measured portion: between terminals 3 and 4
Ambient temperature: 25°C 77°F



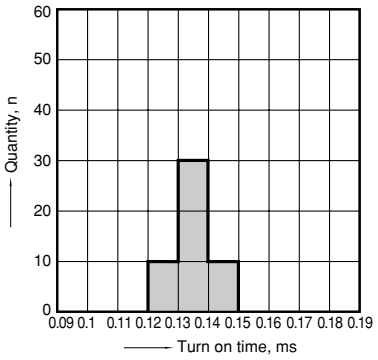
16-(1). On resistance distribution (R type)
Measured portion: between terminals 3 and 4
Continuous load current: 250mA (DC)
Ambient temperature: 25°C 77°F



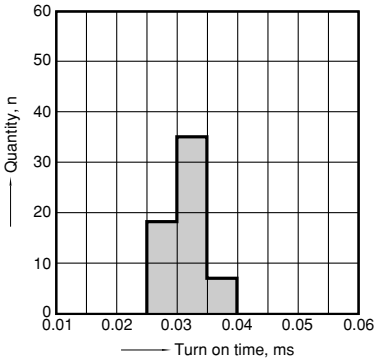
16-(2). On resistance distribution (C type)
Measured portion: between terminals 3 and 4
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



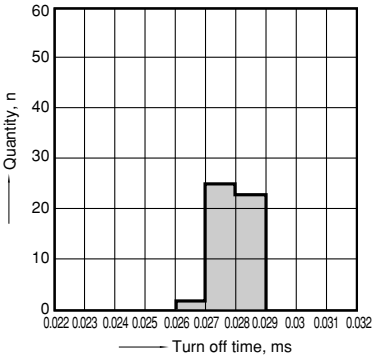
17-(1). Turn on time distribution (R type)
Load voltage: 10V (DC)
Continuous load current: 250mA (DC)
Ambient temperature: 25°C 77°F



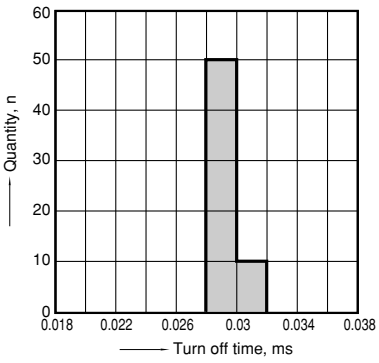
17-(2). Turn on time distribution (C type)
Load voltage: 10V (DC)
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



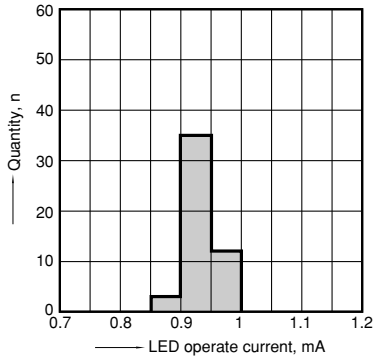
18-(1). Turn off time distribution (R type)
Load voltage: 10V (DC)
Continuous load current: 250mA (DC)
Ambient temperature: 25°C 77°F



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



19-(1). LED operate current distribution (R type)
Load voltage: 10V (DC)
Continuous load current: 250mA (DC)
Ambient temperature: 25°C 77°F



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