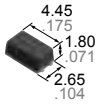
UL pending C-UL pending

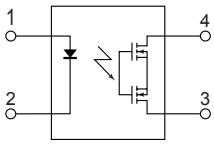
Panasonic
ideas for life

Ultra minimum package size, SSOP (1 Form A) 4-pin type. Lower output capacitance (C type) and on resistance (R type). (C × R10)

RF PhotoMOS (AQY221○2V)



mm inch



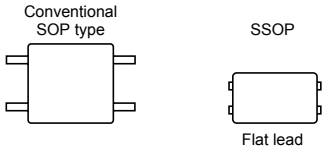
FEATURES

1. Reduced package size
Lower surface has been reduced 60% and mounting space 40% compared to conventional 4-pin SOP type.

2. Two types are available: A type with greatly reduced ON resistance, and a type with even lower output capacitance between terminals.

	AQY221R2V (R Type)	AQY221N2V (C Type)
Output capacitance (C)	12.5pF	1.0pF
ON resistance (R)	0.75Ω	9.5Ω

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



4. High speed switching (Part No.: AQY221N2V)
Turn on time: 0.02ms
Turn off time: 0.02ms

TYPICAL APPLICATIONS

Measuring and testing equipment
1. Test equipment
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
Strainmeter, thermo couple

TYPES

Type		Output rating*		Part No. (Tape and reel packing style)		Packing quantity
		Load voltage	Load current	Picked from the 1/4-pin side	Picked from the 2/3-pin side	
AC/DC type	Low on resistance (R Type)	40 V	250 mA	AQY221R2VY	AQY221R2VW	Tape and reel: 3,500 pcs.
	Low capacitance (C Type)	40 V	120 mA	AQY221N2VY	AQY221N2VW	

* Indicate the peak AC and DC values.

Notes: (1) Tape package is the standard packing style.
(2) For space reasons, the initial letters of the product number "AQY", the package type indicator "Y" and "W" are omitted from the seal. (Ex. the label for product number AQY221N2V is 221N2)

RATING

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

Item		Symbol	AQY221R2V	AQY221N2V	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 (peak AC)	I_L	0.25A	0.12A	Peak AC, DC
	Peak load current	I_{peak}	0.75A	0.3A	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		

RF PhotoMOS (AQY221❍2V)

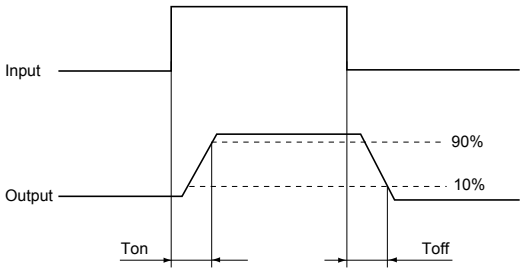
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item				Symbol	AQY221R2V	AQY221N2V	Condition*2
Input	LED operate current		Typical	I_{Fon}	0.9 mA	1.0 mA	C type (I_L = 80 mA) R type (I_L = 250 mA)
			Maximum		3.0 mA		
	LED turn off current		Minimum	I_{Foff}	0.1 mA	0.2 mA	C type (I_L = 80 mA) R type (I_L = 250 mA)
			Typical		0.8 mA	0.9 mA	
	LED dropout voltage		Typical	V_F	1.35 V (1.14 V at I_F = 5 mA)		C type (I_F = 50 mA) R type (I_F = 50 mA)
			Maximum		1.5 V		
Output	On resistance		Typical	R_{on}	0.75Ω	9.5Ω	C type (I_F = 5 mA, I_L = 80 mA Within 1 s on time) R type (I_F = 5 mA, I_L = 250 mA Within 1 s on time)
			Maximum		1.25Ω	12.5Ω	
	Output capacitance		Typical	C_{out}	12.5 pF	1.0 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}	0.02 nA	0.01 nA	C type (I_F = 0 mA, V_L = Max.) R type (I_F = 0 mA, V_L = Max.)
			Maximum		10 nA		
Transfer characteristics	Switching speed	Turn on time*1	Typical	T_{on}	0.10 ms	0.02 ms	C type (I_F = 5 mA, V_L = 10 V R_L = 125Ω) R type (I_F = 5 mA, V_L = 10 V R_L = 40Ω)
			Maximum		0.5ms		
		Turn off time*1	Typical	T_{off}	0.08 ms	0.02 ms	C type (I_F = 5 mA, V_L = 10 V R_L = 125Ω) R type (I_F = 5 mA, V_L = 10 V R_L = 40Ω)
			Maximum		0.2 ms		
	I/O capacitance		Typical	C_{iso}	0.8 pF		C type (f = 1 MHz, V_B = 0 V) R type (f = 1 MHz, V_B = 0 V)
			Maximum		1.5 pF		
	Initial I/O isolation resistance		Minimum	R_{iso}	1,000MΩ		500V DC

Notes:

2. Variation possible through combinations of output capacitance and ON resistance.

*1 Turn on/Turn off time

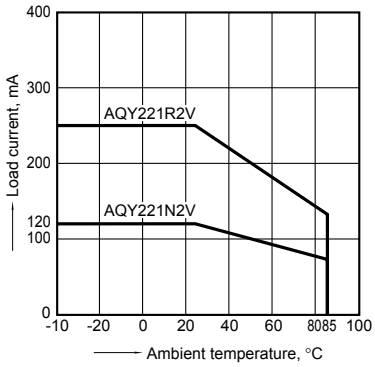


*2 Low on resistance (R type)
Low capacitance (C type)

REFERENCE DATA

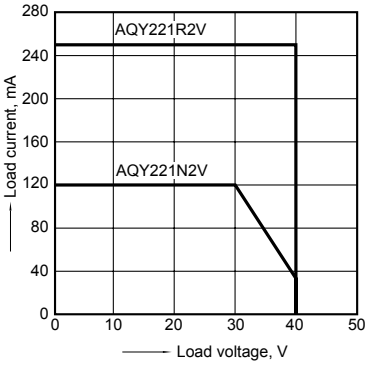
1. Load current vs. ambient temperature characteristics

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



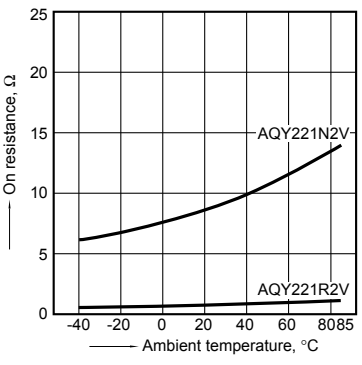
2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



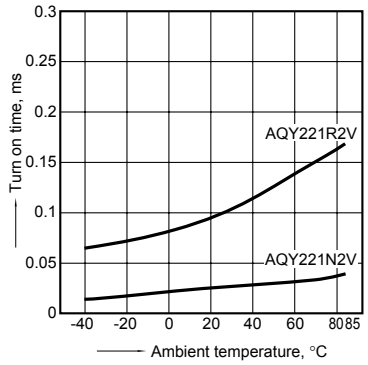
3. On resistance vs. ambient temperature characteristics

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



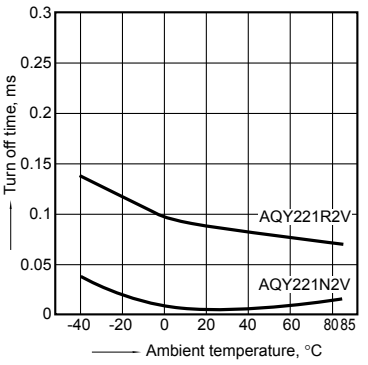
4. Turn on time vs. ambient temperature characteristics

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



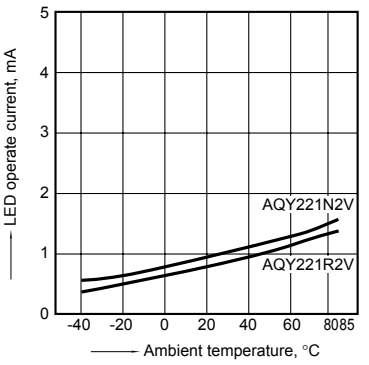
5. Turn off time vs. ambient temperature characteristics

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



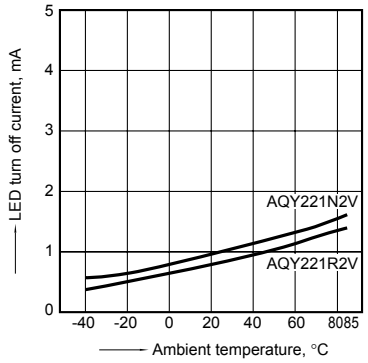
6. LED operate current vs. ambient temperature characteristics

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



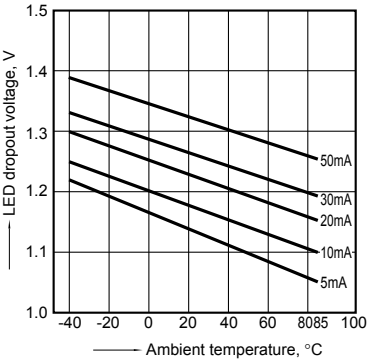
7. LED turn off current vs. ambient temperature characteristics

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



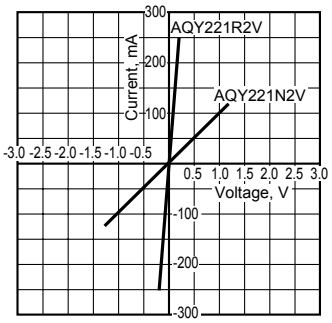
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



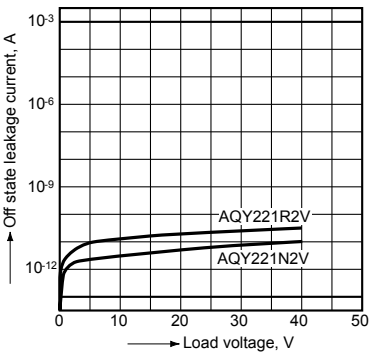
9. Current vs. voltage characteristics of output at MOS portion

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



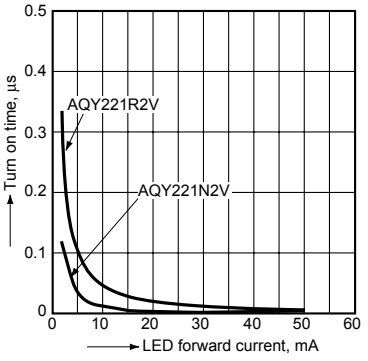
10. Off state leakage current vs. load voltage characteristics

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



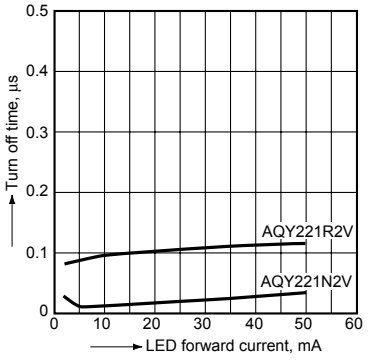
11. Turn on time vs. LED forward current characteristics

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



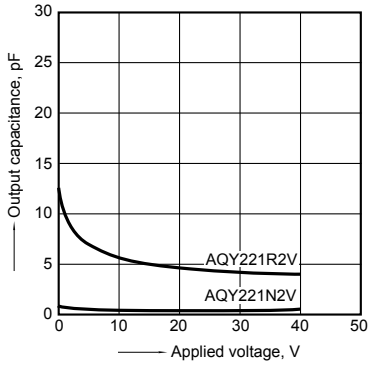
12. Turn off time vs. LED forward current characteristics

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

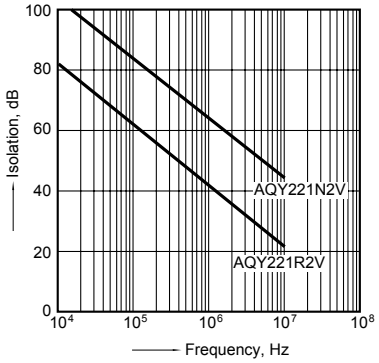


RF PhotoMOS (AQY221❍2V)

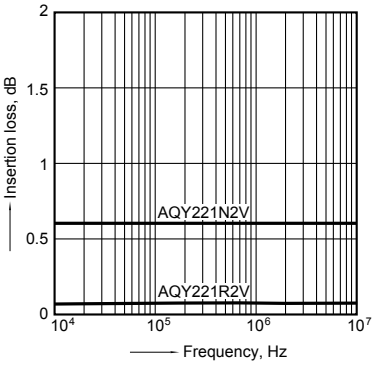
13. Output capacitance vs. applied voltage characteristics
Measured portion: between terminals 3 and 4
Frequency: 1 MHz, 30m Vrms;
Ambient temperature: 25°C 77°F



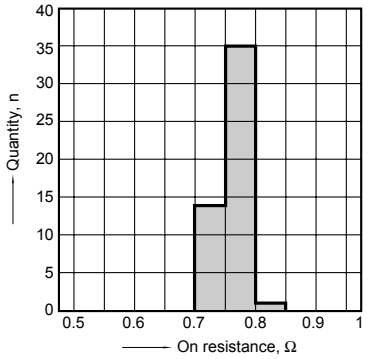
14. Isolation vs. frequency characteristics (50Ω impedance)
Measured portion: between terminals 3 and 4
Ambient temperature: 25°C 77°F



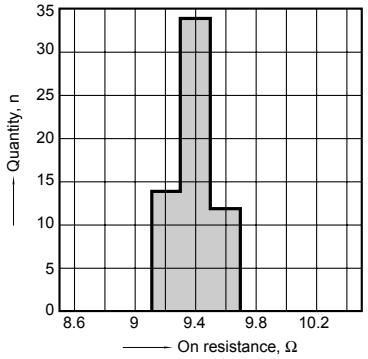
15. Insertion loss vs. frequency characteristics (50Ω impedance)
Measured portion: between terminals 3 and 4
Ambient temperature: 25°C 77°F



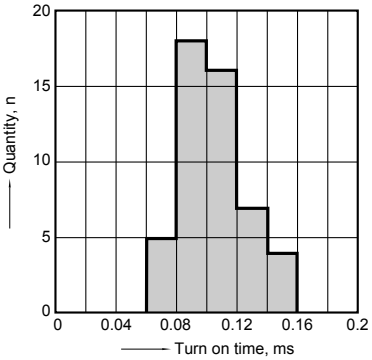
16-(1). On resistance distribution (R type)
Measured portion: between terminals 3 and 4
Continuous load current: 250mA (DC)
Ambient temperature: 25°C 77°F



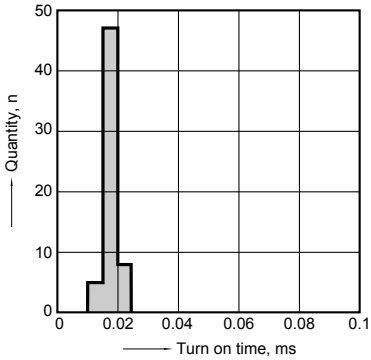
16-(2). On resistance distribution (C type)
Measured portion: between terminals 3 and 4
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



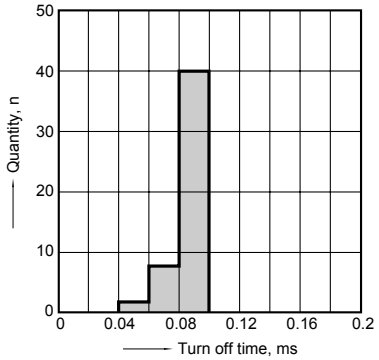
17-(1). Turn on time distribution (R type)
Load voltage: 10V (DC)
Continuous load current: 250mA (DC)
Ambient temperature: 25°C 77°F



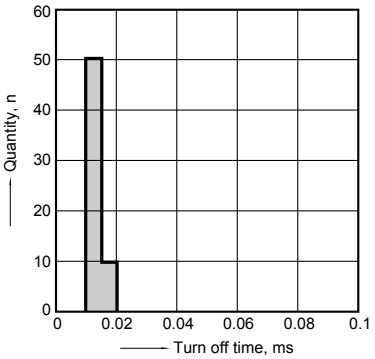
17-(2). Turn on time distribution (C type)
Load voltage: 10V (DC)
Continuous load current: 80mA (DC)
Ambient temperature: 25°C 77°F



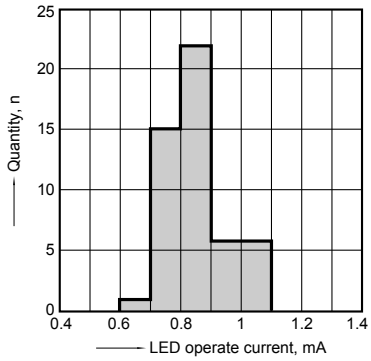
18-(1). Turn off time distribution (R type)
Load voltage: 10V (DC)
Continuous load current: 250mA (DC)
Ambient temperature: 25°C 77°F



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