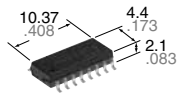
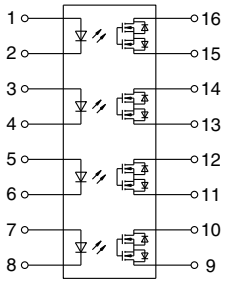
Space-saving low C×R type 4 channels in a SOP16-pin package

PhotoMOS® RF SOP 4 Form A C×R10 (AQS221○2S)



mm inch



RoHS compliant

FEATURES

1. 4-channel (4 Form A) in a small SOP16-pin package
The device comes in a miniature SOP measuring (W)10.37 × (L)4.4 × (H)2.1mm (W).408×(L).173×(H).083inch
This contributes to space-saving of PC board.

2. Both low on-resistance (R type) and low capacitance (C type) available at excellent characteristics of C×R10
- R type: On resistance Typ. 0.8Ω
  Output capacitance Typ. 13pF
- C type: On resistance Typ. 9.5Ω
  Output capacitance Typ. 1.0pF

3. High-speed switching of 0.03ms (C type, typical turn on time)

4. Applicable for 4 Form A use, as well as 4 independent 1 Form A

TYPICAL APPLICATIONS

1. Measuring and testing equipment
IC tester, Liquid crystal driver tester, Semiconductor performance tester, Bare board tester, In-circuit tester, Function tester, etc.

2. Telecommunication and broadcasting equipment

3. Medical equipment
Ultrasonic wave diagnostic machine

4. Multi-point recorder
Data logger, Warping and Thermocouple, etc.

TYPES

	Type	Output rating*1		Package	Part No.*2			Packing quantity	
		Load voltage	Load current		Tube packing style	Tape and reel packing style		Tube	Tape and reel
						Picked from the 1/2/3/4/5/6/7/8-pin side	Picked from the 9/10/11/12/13/14/15/16-pin side		
AC/DC dual use	Low on-resistance (R type)	40V	0.16A	SOP16-pin	AQS221R2S	AQS221R2SX	AQS221R2SZ	1 tube contains: 50 pcs. 1 batch contains: 1,000 pcs.	1,000 pcs.
	Low capacitance (C type)	40V	0.06A		AQS221N2S	AQS221N2SX	AQS221N2SZ		

Notes: *1 Indicate the peak AC and DC values.
*2 The packing style indicator "X" or "Z" is not marked on the device.

RATING

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

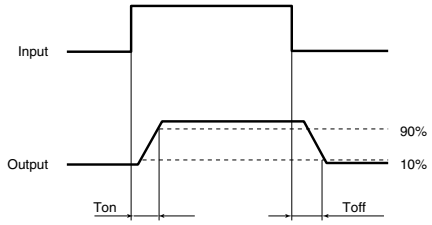
Item		Symbol	AQS221R2S (R type)	AQS221N2S (C type)	Remarks
Input	LED forward current	I_F	50 mA		
	LED reverse voltage	V_R	5 V		
	Peak forward current	I_{FP}	1 A		f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW		
Output	Load voltage (peak AC)	V_L	40 V		
	Continuous load current	I_L	0.16 A	0.06 A	Peak AC, DC
	Peak load current	I_{peak}	0.2 A	0.12 A	100 ms (1 shot), V_L= DC
	Power dissipation	P_{out}	600 mW		
Total power dissipation		P_T	650 mW		
I/O isolation voltage		V_{iso}	500 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	AQS221R2S (R type)	AQS221N2S (C type)	Condition
Input	LED operate current	Typical	I_{Fon}	0.5 mA	0.9 mA	I_L = Max.
		Maximum		3.0 mA		
	LED turn off current	Minimum	I_{Foff}	0.1 mA		I_L = Max.
		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 I_L = Max. Within 1 s
		Maximum		1.25Ω	12.5Ω	
	Output capacitance	Typical	C_{out}	13.0 pF	1.0 pF	I_F = 0 mA V_B = 0 V f = 1 MHz
		Maximum		18.0 pF	1.5 pF	
	Off state leakage current	Typical	I_{Leak}	0.03 nA	0.01 nA	I_F = 0 mA V_L = Max.
		Maximum		*10 nA		
Transfer characteristics	Turn on time**	Typical	T_{on}	0.15 ms	0.03 ms	I_F = 5 mA V_L = 10V R_L = 62.5Ω (R type), R_L = 500Ω (C type)
		Maximum		0.5 ms	0.2 ms	
	Turn off time**	Typical	T_{off}	0.06 ms	0.03 ms	I_F = 5 mA V_L = 10V R_L = 62.5Ω (R type), R_L = 500Ω (C type)
		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}	1,000 MΩ		500 V DC

*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.

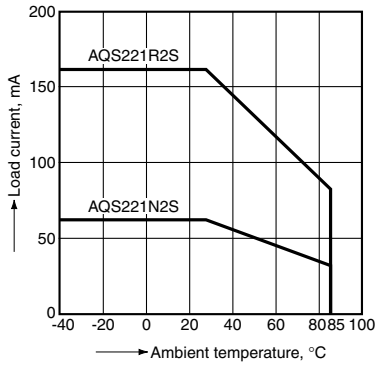
Item		Symbol	Min.	Max.	Unit
LED current		I_F	5	30	mA
AQS221R2S	Load voltage (Peak AC)	V_L	—	15	V
	Continuous load current	I_L	—	0.16	A
AQS221N2S	Load voltage (Peak AC)	V_L	—	15	V
	Continuous load current	I_L	—	0.06	A

■ **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

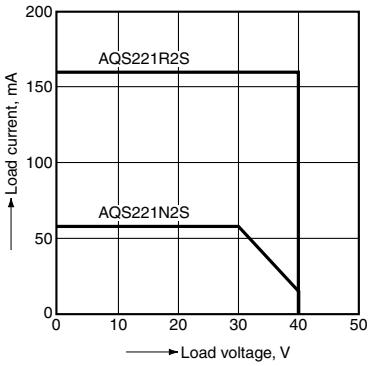
1. Load current vs. ambient temperature characteristics

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



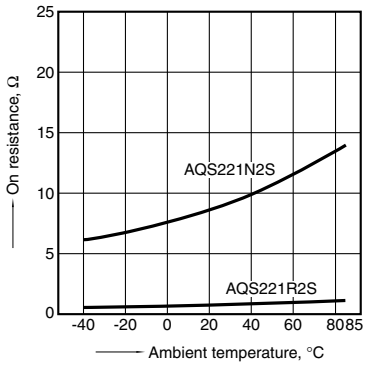
2. Load current vs. load voltage characteristics

Ambient temperature: 25°C 47°F



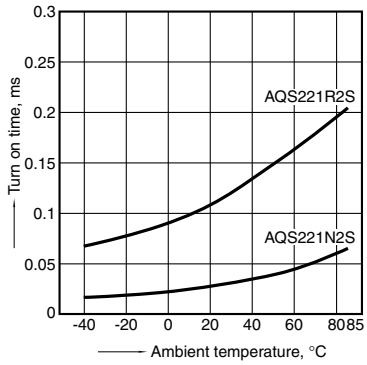
3. On resistance vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10 V (DC);
Continuous load current: 160 mA (DC) R type
60 mA (DC) C type



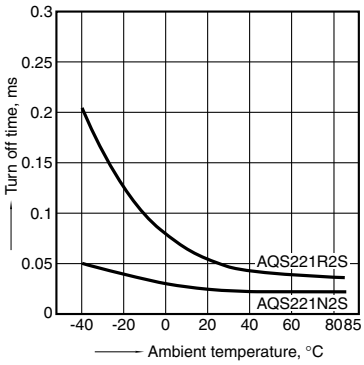
4. Turn on time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10 V (DC);
Continuous load current: 160 mA (DC) R type
20 mA (DC) C type



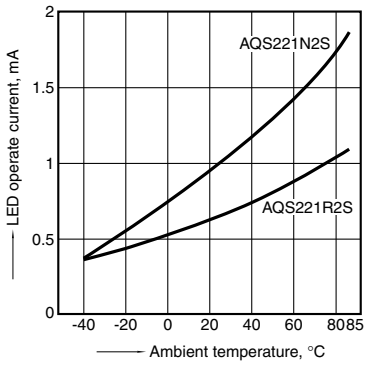
5. Turn off time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: 10 V (DC);
Continuous load current: 160 mA (DC) R type
20 mA (DC) C type



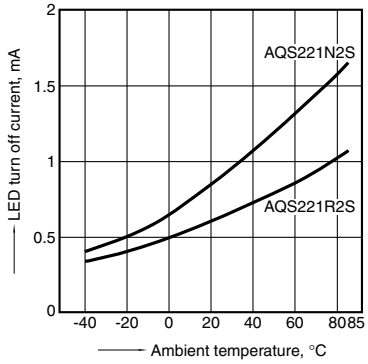
6. LED operate current vs. ambient temperature characteristics

Load voltage: 10 V (DC);
Continuous load current: 160 mA (DC) R type
60 mA (DC) C type



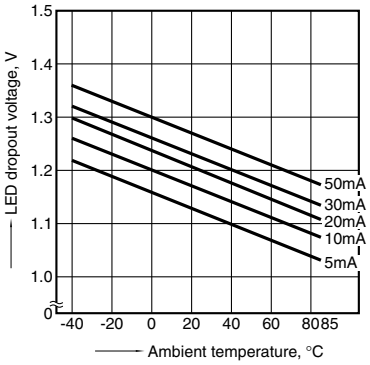
7. LED turn off current vs. ambient temperature characteristics

Load voltage: 10 V (DC);
Continuous load current: 160 mA (DC) R type
60 mA (DC) C type



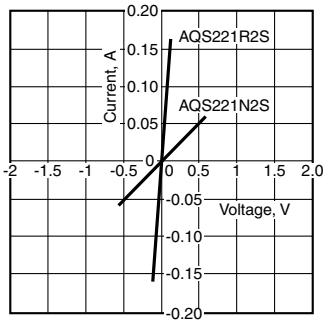
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



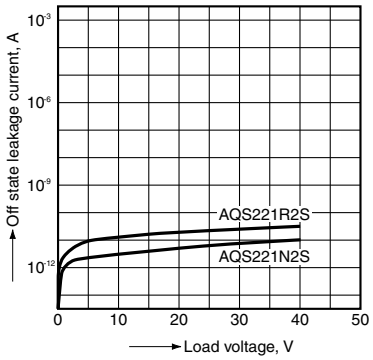
9. Current vs. voltage characteristics of output at MOS portion

Ambient temperature: 25°C 77°F



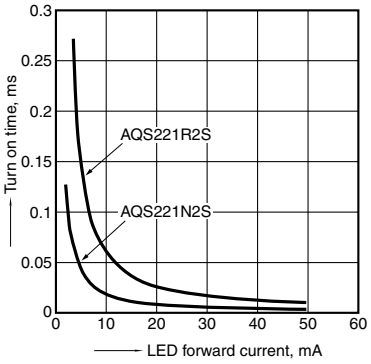
10. Off state leakage current vs. load voltage characteristics

Ambient temperature: 25°C 77°F



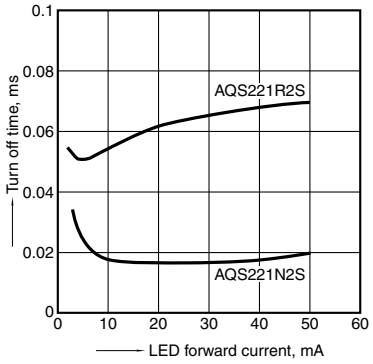
11. Turn on time vs. LED forward current characteristics

Load voltage: 10 V (DC);
Continuous load current: 160 mA (DC) R type
20 mA (DC) C type
Ambient temperature: 25°C 77°F



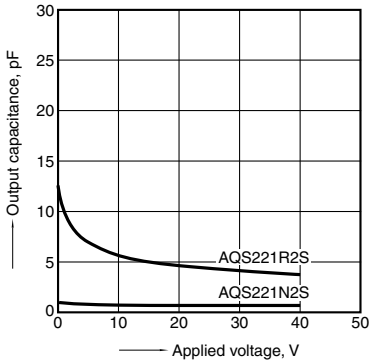
12. Turn off time vs. LED forward current characteristics

Load voltage: 10 V (DC);
Continuous load current: 160 mA (DC) R type
20 mA (DC) C type
Ambient temperature: 25°C 77°F



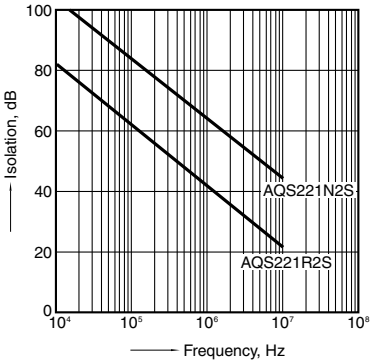
13. Output capacitance vs. applied voltage characteristics

Frequency: 1 MHz, 30mVrms;
Ambient temperature: 25°C 77°F



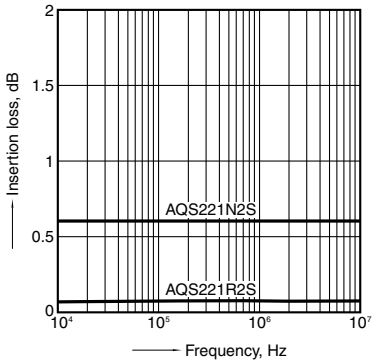
14. Isolation vs. frequency characteristics (50Ω impedance)

Ambient temperature: 25°C 77°F



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

Ambient temperature: 25°C 77°F



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