

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

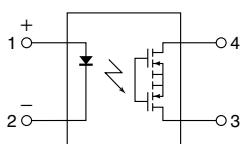
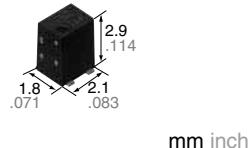
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

**4.6 mm² mounting area
CxR10: 30V and 40 V load
voltage
CxR5: 25 V load voltage**

**PhotoMOS[®]
RFVSSOP 1 Form A CxR10/CxR5
(AQY221OOT)**

New

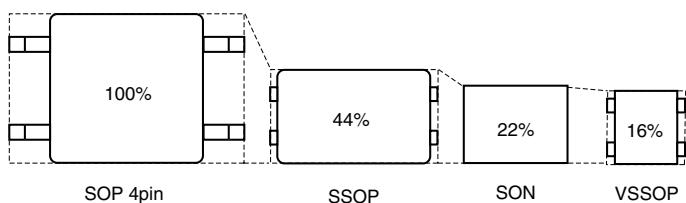


RoHS compliant

FEATURES

1. VSSOP type with further reduction in mounting area

4.6 mm² mounting area achieved. Approx 29% less than previous product (SON type). Contributes to the miniaturization of instruments and higher density mounting.



2. Low on resistance and low output capacitance available

• CxR10

<R type>

Output capacitance: 14 pF (typical), On resistance: 0.8Ω (typical)
Output capacitance: 37.5 pF (typical), On resistance: 0.18Ω (typical)

<C type>

Output capacitance: 1.1 pF (typical), On resistance: 9.5Ω (typical)

• CxR5

Output capacitance: 1.1 pF (typical), On resistance: 5.5Ω (typical)

TYPICAL APPLICATIONS

1. Measuring and testing equipment

IC tester, Probe card, Board tester and other testing equipment

2. Telecommunication equipment

*Does not support automotive applications.

TYPES

Type			Output rating*1		Part No. (Tape and reel packing style)*2		Packing quantity in the 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	CxR10	Low on resistance (R type)	New 30 V	800 mA	AQY221R6TY	AQY221R6TW	1,000 pcs.
			New 40 V	250 mA	AQY221R2TY	AQY221R2TW	
	CxR5	Low output capacitance (C type)	New 40 V	120 mA	AQY221N2TY	AQY221N2TW	
			New 25 V	150 mA	AQY221N3TY	AQY221N3TW	

Notes: *1 Indicate the peak AC and DC values.

*2 Only tape and reel package is available.

For space reasons, only "1R6", "1R2", "1N2" or "1N3" is marked on the product as the part number.

RATING

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

Item	Symbol	CxR10 R type		CxR10 C type	CxR5 type	Remarks
		AQY221R6T	AQY221R2T	AQY221N2T	AQY221N3T	
Input side	LED forward current	I_F		50 mA		
	LED reverse voltage	V_R		5 V		
	Peak forward current	I_{FP}		1 A		$f = 100 \text{ Hz, Duty factor} = 0.1\%$
	Power dissipation	P_{in}		75 mW		
Output side	Load voltage (peak AC)	V_L	30 V	40 V	40 V	25 V
	Continuous load current	I_L	0.8 A	0.25 A	0.12 A	0.15 A
	Peak load current	I_{peak}	1.5 A	0.75 A	—	—
	Power dissipation	P_{out}		250 mW		
Total power dissipation		P_T		300 mW		
I/O isolation voltage		V_{iso}		200 V AC		
Operating temperature		T_{opr}		−40°C to +85°C	−40°F to +185°F	Non-condensing at low temperatures
Storage temperature		T_{sig}		−40°C to +100°C	−40°F to +212°F	

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

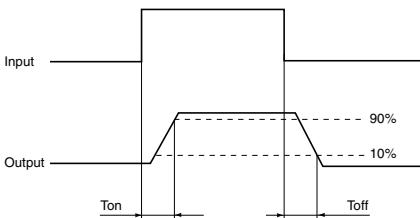
Item	Symbol	CxR10 R type		CxR10 C type	CxR5 type	Condition		
		AQY221R6T	AQY221R2T	AQY221N2T	AQY221N3T			
Input	LED operate current	Typical	I_{Fon}	0.5 mA	0.7 mA	AQY221R6T: $I_L = 100 \text{ mA}$ AQY221R2T: $I_L = 250 \text{ mA}$ AQY221N2T: $I_L = 80 \text{ mA}$ AQY221N3T: $I_L = 80 \text{ mA}$		
		Maximum		3 mA				
	LED turn off current	Minimum	I_{Foff}	0.1 mA	0.2 mA	AQY221R6T: $I_L = 100 \text{ mA}$ AQY221R2T: $I_L = 250 \text{ mA}$ AQY221N2T: $I_L = 80 \text{ mA}$ AQY221N3T: $I_L = 80 \text{ mA}$		
		Typical		0.4 mA	0.6 mA			
Output	LED dropout voltage	Typical	V_F	1.14 V (1.35 V at $I_F = 50 \text{ mA}$)		$I_F = 5 \text{ mA}$		
		Maximum		1.5 V				
	On resistance	Typical	R_{on}	0.18 Ω	0.8 Ω	9.5 Ω	5.5 Ω	AQY221R6T: $I_F = 5 \text{ mA, } I_L = 800 \text{ mA}$ AQY221R2T: $I_F = 5 \text{ mA, } I_L = 250 \text{ mA}$ AQY221N2T: $I_F = 5 \text{ mA, } I_L = 80 \text{ mA}$ AQY221N3T: $I_F = 5 \text{ mA, } I_L = 80 \text{ mA}$ Within 1 s on time
		Maximum		0.35 Ω	1.25 Ω	12.5 Ω	7.5 Ω	
Transfer characteristics	Output capacitance	Typical	C_{out}	37.5 pF	14 pF	1.1 pF	$I_F = 0 \text{ mA, } f = 1 \text{ MHz, } V_B = 0 \text{ V}$	
		Maximum		100 pF	18 pF	1.5 pF		
	Off state leakage current	Typical	I_{Leak}	—	0.02 nA	0.01 nA	$I_F = 0 \text{ mA, } V_L = \text{Max.}$	
		Maximum		10 nA (1 nA or less)*				
	Turn on time**	Typical	T_{on}	0.1 ms		0.01 ms	AQY221R6T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 100 \text{ Ω}$ AQY221R2T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 40 \text{ Ω}$ AQY221N2T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 125 \text{ Ω}$ AQY221N3T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 125 \text{ Ω}$	
		Maximum		0.5 ms		0.2 ms		
	Turn off time**	Typical	T_{off}	0.06 ms		0.03 ms	AQY221R6T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 100 \text{ Ω}$ AQY221R2T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 40 \text{ Ω}$ AQY221N2T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 125 \text{ Ω}$ AQY221N3T: $I_F = 5 \text{ mA, } V_L = 10 \text{ V, } R_L = 125 \text{ Ω}$	
		Maximum		0.2 ms				
	I/O capacitance	Typical	C_{iso}	0.4 pF		$f = 1 \text{ MHz, } V_B = 0 \text{ V}$		
		Maximum		1.5 pF				

Notes: 1. Please refer to the "Schematic and Wiring Diagrams" for connection method.

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

*Available as custom orders (1 nA or less)

**Turn on/Turn off time

**RECOMMENDED OPERATING CONDITIONS**

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

Item	Symbol	Recommended value	Unit
Input LED current	I_F	5	mA

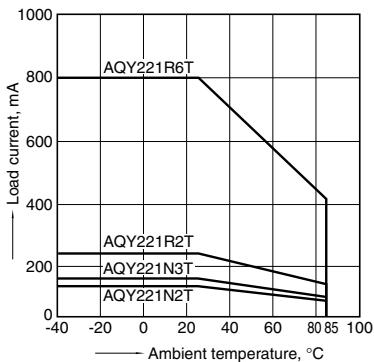
■ These products are not designed for automotive use.

If you are considering to use these products for automotive applications, please contact your local Panasonic Corporation technical representative.

REFERENCE DATA

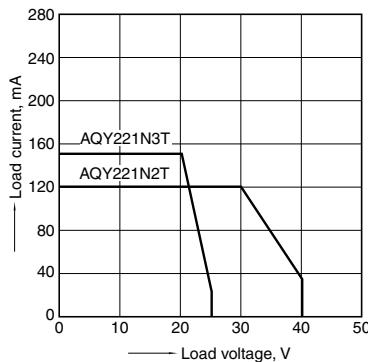
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: -40°C to $+85^{\circ}\text{C}$
 -40°F to $+185^{\circ}\text{F}$



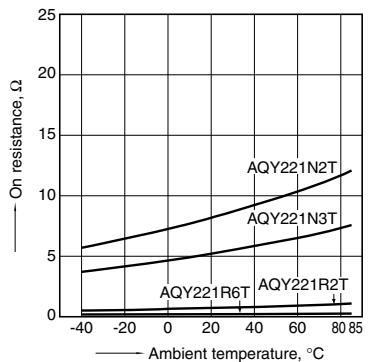
2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



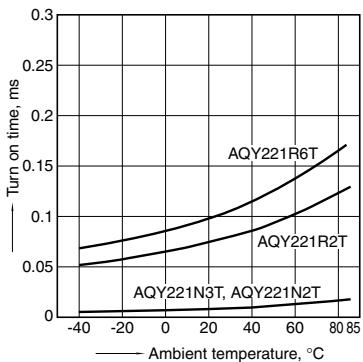
3. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC)
Continuous load current: 800mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



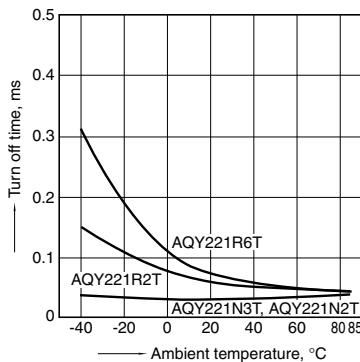
4. Turn on time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



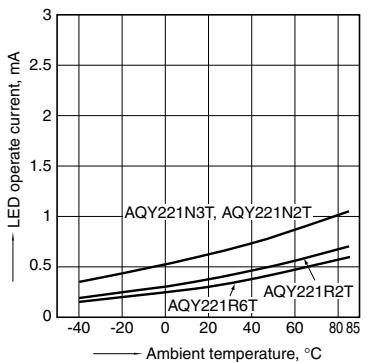
5. Turn off time vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
LED current: 5 mA; Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



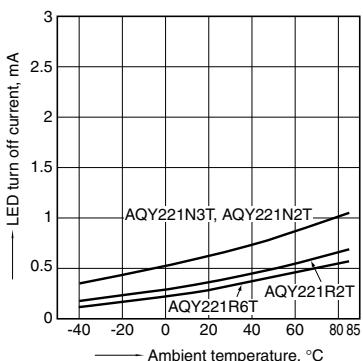
6. LED operate current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



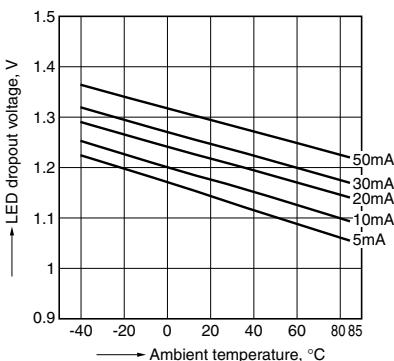
7. LED turn off current vs. ambient temperature characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T,
250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T,
AQY221N3T



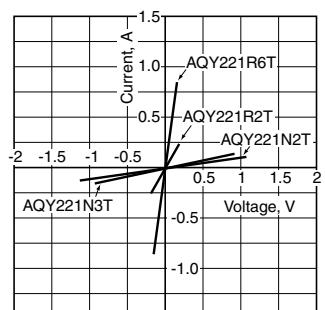
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



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

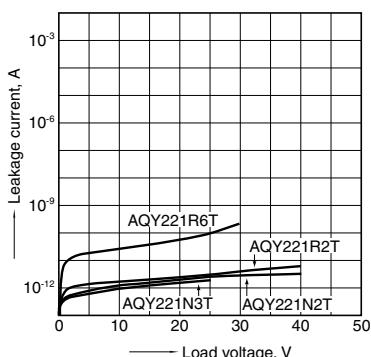
Measured portion: between terminals 3 and 4;
Ambient temperature: 25°C 77°F



RF VSSOP 1 Form A CxR10/CxR5 (AQY221OOT)

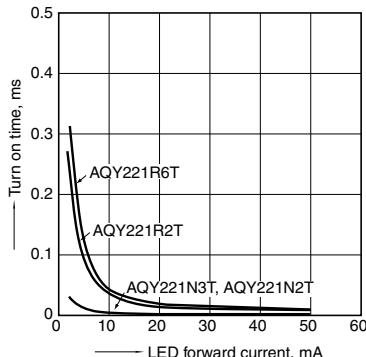
10. Off state leakage current vs. load voltage characteristics

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



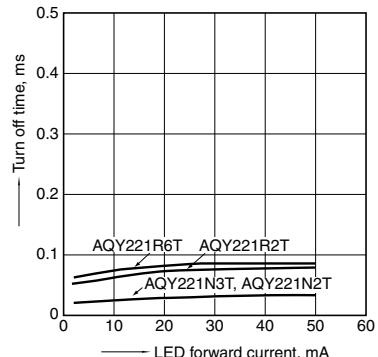
11. Turn on time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T, 250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T, AQY221N3T
Ambient temperature: 25°C 77°F



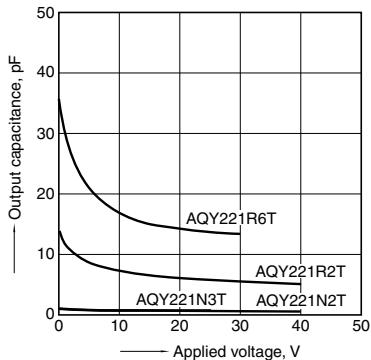
12. Turn off time vs. LED forward current characteristics

Measured portion: between terminals 3 and 4
Load voltage: 10V (DC)
Continuous load current: 100mA (DC) AQY221R6T, 250mA (DC) AQY221R2T, 80mA (DC) AQY221N2T, AQY221N3T
Ambient temperature: 25°C 77°F



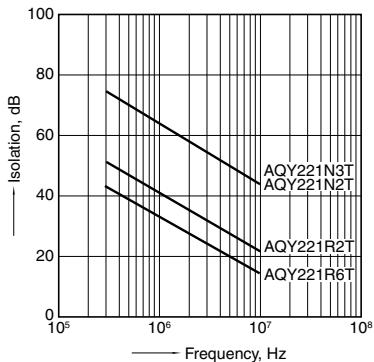
13. Output capacitance vs. applied voltage characteristics

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



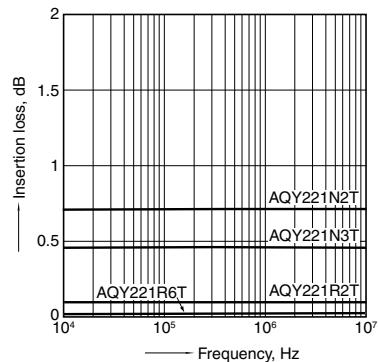
14. Isolation vs. frequency characteristics (50Ω impedance)

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



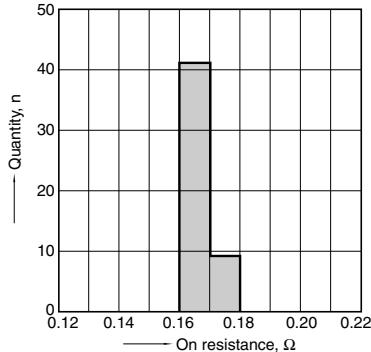
15. Insertion loss vs. frequency characteristics (50Ω impedance)

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



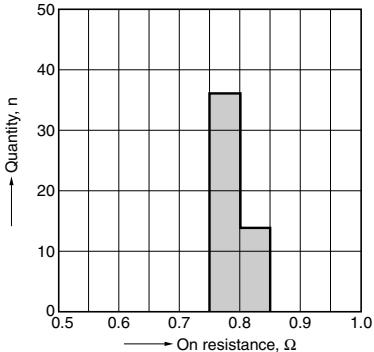
16.-1) On resistance distribution

Sample: AQY221R6T
Measured portion: between terminals 3 and 4
Continuous load current: 800 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



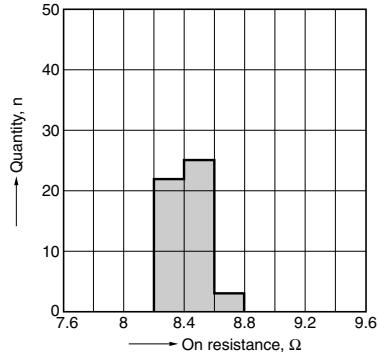
16.-2) On resistance distribution

Sample: AQY221R2T
Measured portion: between terminals 3 and 4
Continuous load current: 250 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



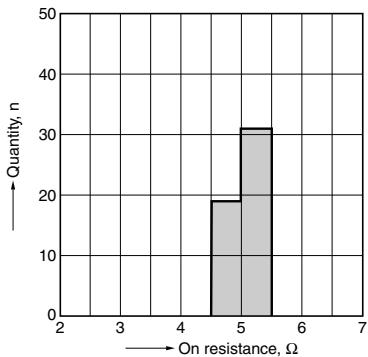
16.-3) On resistance distribution

Sample: AQY221N2T
Measured portion: between terminals 3 and 4
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



16.-(4) On resistance distribution

Sample: AQY221N3T

Measured portion: between terminals 3 and 4
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

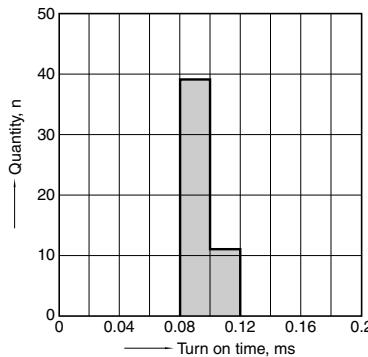
17.-(1) Turn on time distribution

Sample: AQY221R6T

Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

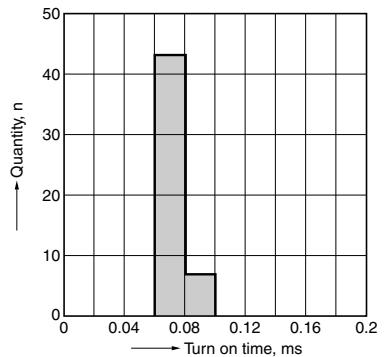
17.-(1) Turn on time distribution

Sample: AQY221R6T

Load voltage: 10V (DC)
Continuous load current: 100 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

17.-(2) Turn on time distribution

Sample: AQY221R2T

Load voltage: 10V (DC)
Continuous load current: 250 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

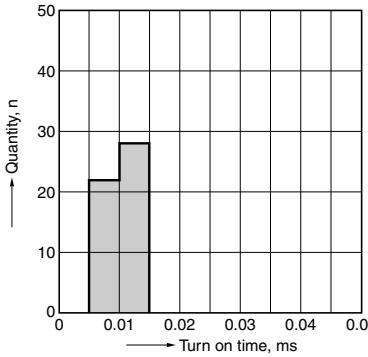
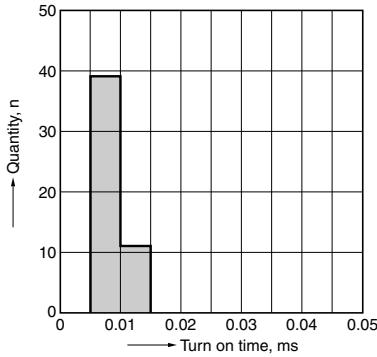
17.-(3) Turn on time distribution

Sample: AQY221N2T

Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

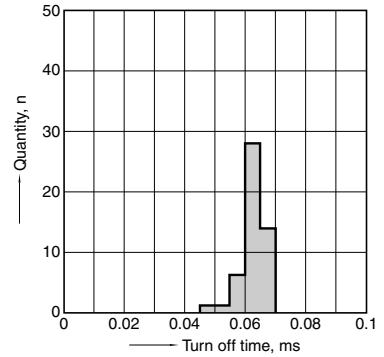
17.-(4) Turn on time distribution

Sample: AQY221N3T

Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

18.-(1) Turn off time distribution

Sample: AQY221R6T

Load voltage: 10V (DC)
Continuous load current: 100 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

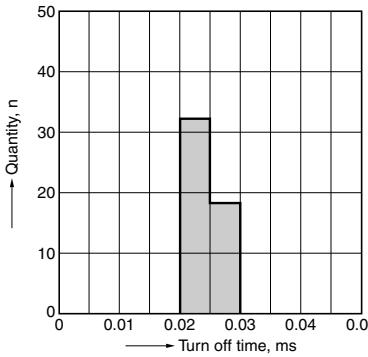
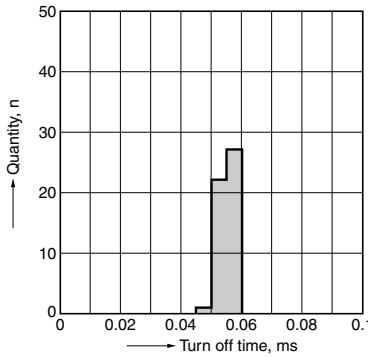
18.-(2) Turn off time distribution

Sample: AQY221R2T

Load voltage: 10V (DC)
Continuous load current: 250 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

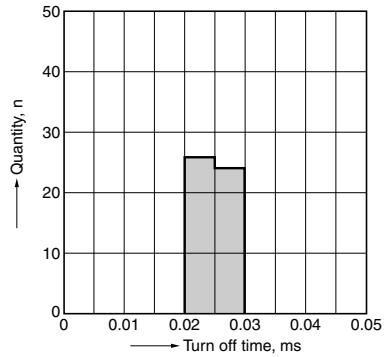
18.-(3) Turn off time distribution

Sample: AQY221N2T

Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

18.-(4) Turn off time distribution

Sample: AQY221N3T

Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

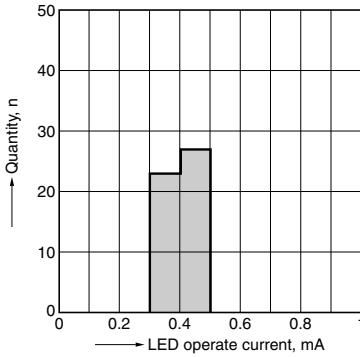
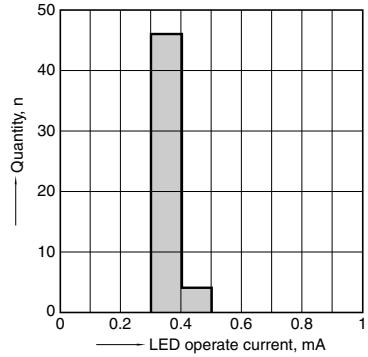
19.-(1) LED operate current distribution

Sample: AQY221R6T

Load voltage: 10V (DC)
Continuous load current: 100 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

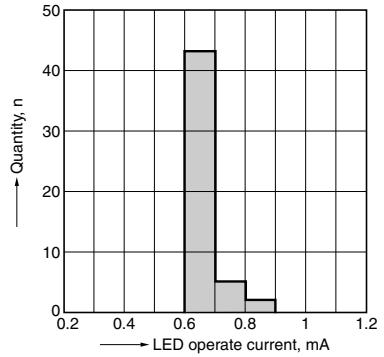
19.-(2) LED operate current distribution

Sample: AQY221R2T

Load voltage: 10V (DC)
Continuous load current: 250 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

19.-(3) LED operate current distribution

Sample: AQY221N2T

Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F

19.-(4) LED operate current distribution

Sample: AQY221N3T

Load voltage: 10V (DC)

Continuous load current: 80 mA (DC), n: 50pcs.

Ambient temperature: 25°C 77°F

