RATING

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

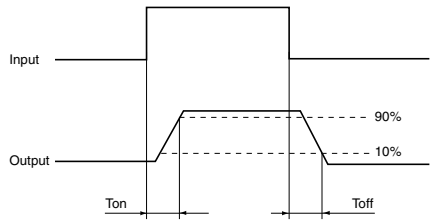
Item		Symbol	C×R10 R type		C×R10 C type	C×R5 type	Remarks
			AQY221R6T	AQY221R2T	AQY221N2T	AQY221N3T	
Input side	LED forward current	I_F	50 mA				
	LED reverse voltage	V_R	5 V				
	Peak forward current	I_{FP}	1 A				f = 100 Hz, Duty factor = 0.1%
	Power dissipation	P_{in}	75 mW				
Output side	Load voltage (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 AC, DC
	Peak load current	I_{peak}	1.5 A	0.75 A	–	–	100 ms (1shot), V_L = DC
	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_{stg}	–40°C to +100°C –40°F to +212°F				

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

Item			Symbol	C×R10 R type		C×R10 C type	C×R5 type	Condition
				AQY221R6T	AQY221R2T	AQY221N2T	AQY221N3T	
Input	LED operate current	Typical	I_{Fon}	0.5 mA		0.7 mA		AQY221R6T: I_L = 100 mA AQY221R2T: I_L = 250 mA AQY221N2T: I_L = 80 mA AQY221N3T: I_L = 80 mA
		Maximum		3 mA				
	LED turn off current	Minimum	I_{Foff}	0.1 mA		0.2 mA		
		Typical		0.4 mA		0.6 mA		
	LED dropout voltage	Typical	V_F	1.14 V (1.35 V at I_F = 50 mA)				I_F = 5 mA
		Maximum		1.5 V				
Output	On resistance	Typical	R_{on}	0.18 Ω	0.8 Ω	9.5 Ω	5.5 Ω	AQY221R6T: I_F = 5 mA, I_L = 800 mA AQY221R2T: I_F = 5 mA, I_L = 250 mA AQY221N2T: I_F = 5 mA, I_L = 80 mA AQY221N3T: I_F = 5 mA, I_L = 80 mA Within 1 s on time
		Maximum		0.35 Ω	1.25 Ω	12.5 Ω	7.5 Ω	
	Output capacitance	Typical	C_{out}	37.5 pF	14 pF	1.1 pF		I_F = 0 mA, f = 1 MHz, V_B = 0 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 mA, V_L = Max.
		Maximum		10 nA (1 nA or less)*				
Transfer characteristics	Turn on time**	Typical	T_{on}	0.1 ms		0.01 ms		AQY221R6T: I_F = 5 mA, V_L = 10 V, R_L = 100 Ω AQY221R2T: I_F = 5 mA, V_L = 10 V, R_L = 40 Ω AQY221N2T: I_F = 5 mA, V_L = 10 V, R_L = 125 Ω AQY221N3T: I_F = 5 mA, V_L = 10 V, R_L = 125 Ω
		Maximum		0.5 ms		0.2 ms		
	Turn off time**	Typical	T_{off}	0.06 ms		0.03 ms		
		Maximum		0.2 ms				
	I/O capacitance	Typical	C_{iso}	0.4 pF				f = 1 MHz, V_B = 0 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.

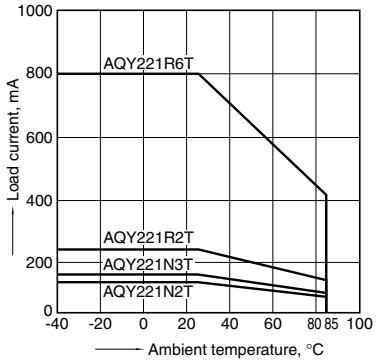
Item	Symbol	Recommended value	Unit
Input LED current	I_F	5	mA

■ **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

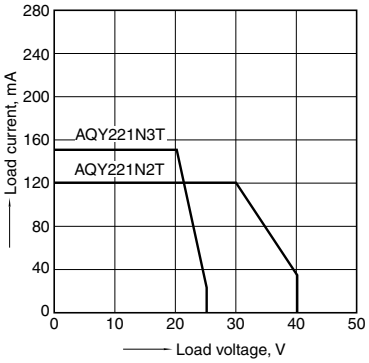
1. Load current vs. ambient temperature characteristics

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



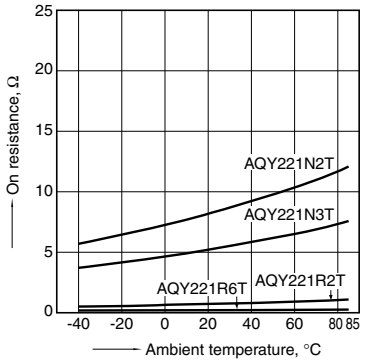
2. Load current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F



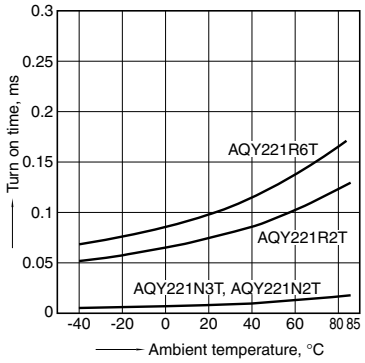
3. On resistance vs. ambient temperature characteristics

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



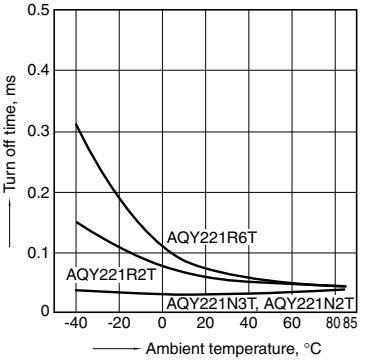
4. Turn on time vs. ambient temperature characteristics

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



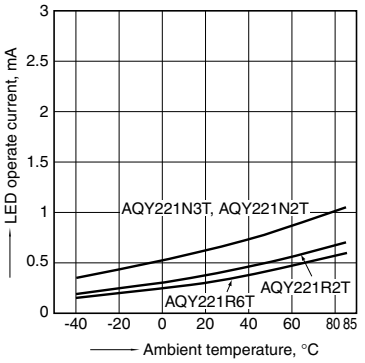
5. Turn off time vs. ambient temperature characteristics

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



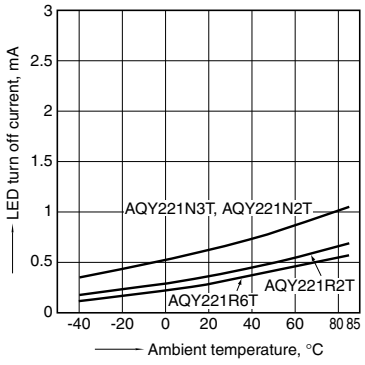
6. LED operate current vs. ambient temperature characteristics

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



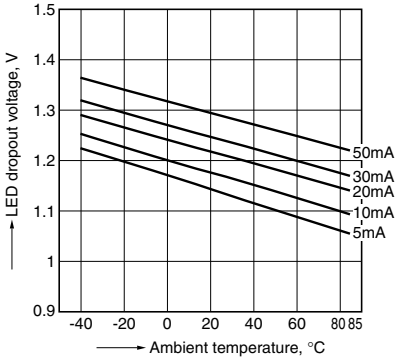
7. LED turn off current vs. ambient temperature characteristics

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



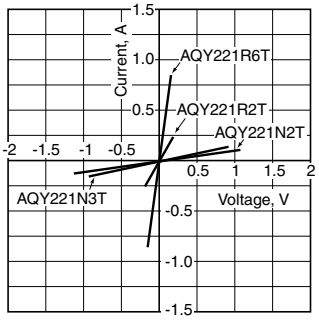
8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



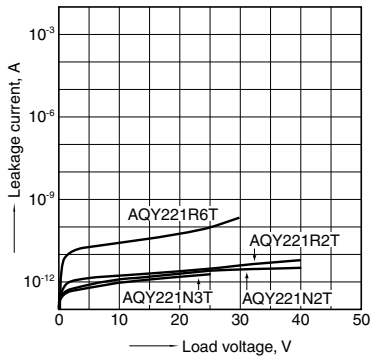
9. Current vs. voltage characteristics of output at MOS portion

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



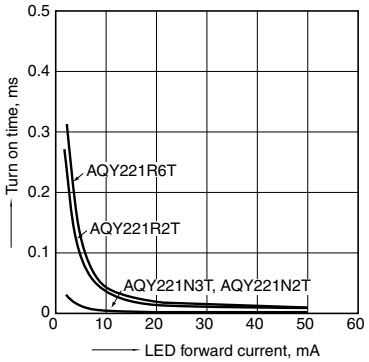
10. Off state leakage current vs. load voltage characteristics

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



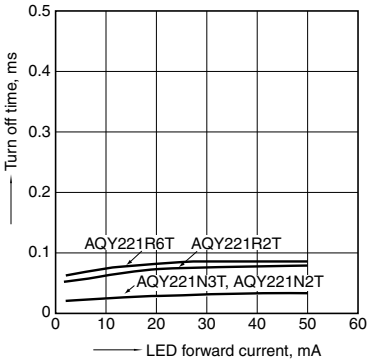
11. Turn on time vs. LED forward current characteristics

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



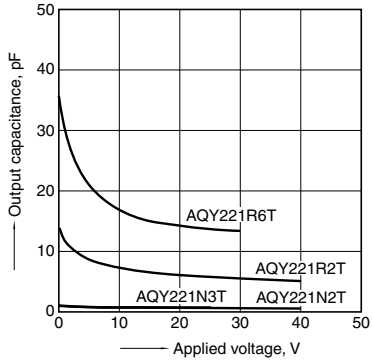
12. Turn off time vs. LED forward current characteristics

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



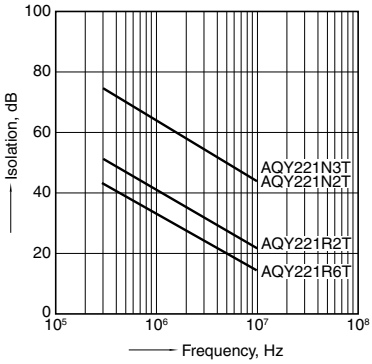
13. Output capacitance vs. applied voltage characteristics

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



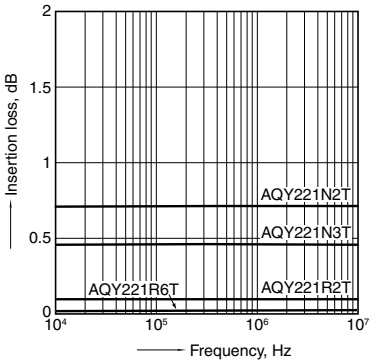
14. Isolation vs. frequency characteristics (50Ω impedance)

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



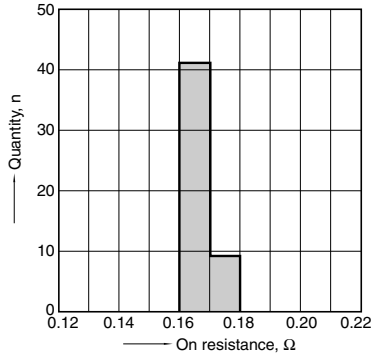
15. Insertion loss vs. frequency characteristics (50Ω impedance)

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



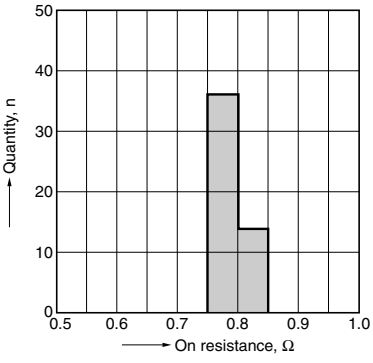
16.-(1) On resistance distribution

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



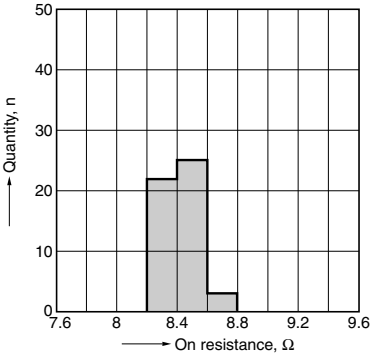
16.-(2) On resistance distribution

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

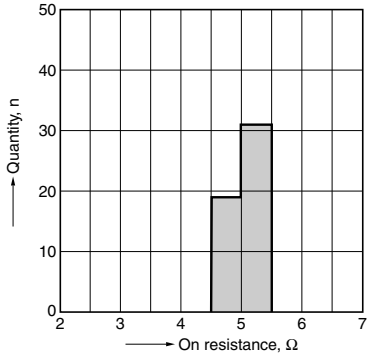


16.-(3) On resistance distribution

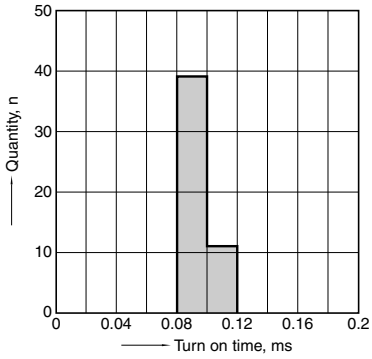
Sample: AQY221N2T
Measured portion: between terminals 3 and 4
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



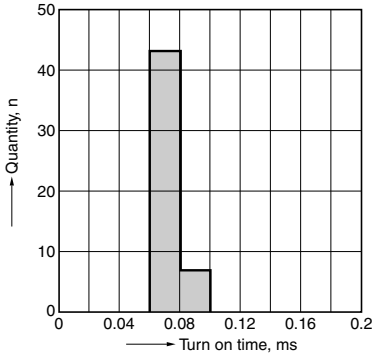
16.-(4) On resistance distribution
Sample: AQY221N3T
Measured portion: between terminals 3 and 4
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



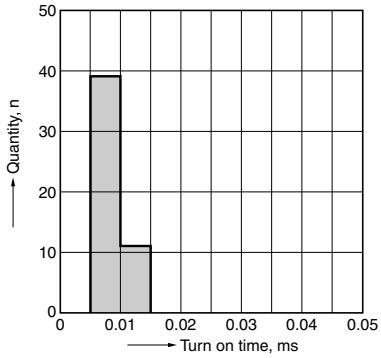
17.-(1) Turn on time distribution
Sample: AQY221R6T
Load voltage: 10V (DC)
Continuous load current: 100 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



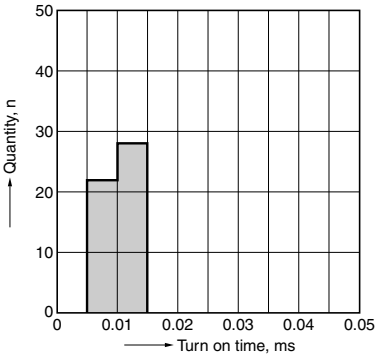
17.-(2) Turn on time distribution
Sample: AQY221R2T
Load voltage: 10V (DC)
Continuous load current: 250 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



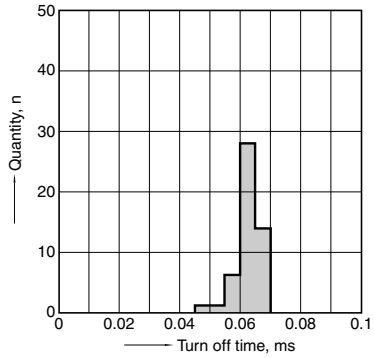
17.-(3) Turn on time distribution
Sample: AQY221N2T
Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



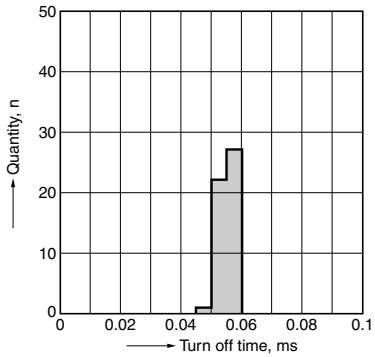
17.-(4) Turn on time distribution
Sample: AQY221N3T
Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



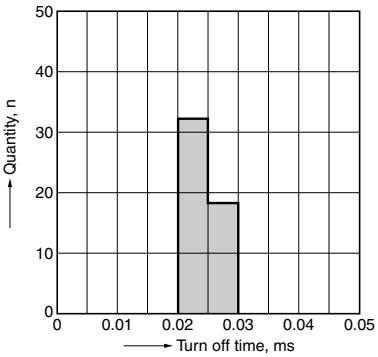
18.-(1) Turn off time distribution
Sample: AQY221R6T
Load voltage: 10V (DC)
Continuous load current: 100 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



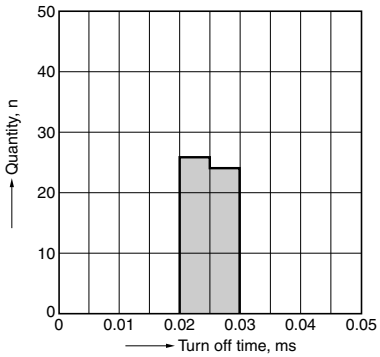
18.-(2) Turn off time distribution
Sample: AQY221R2T
Load voltage: 10V (DC)
Continuous load current: 250 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



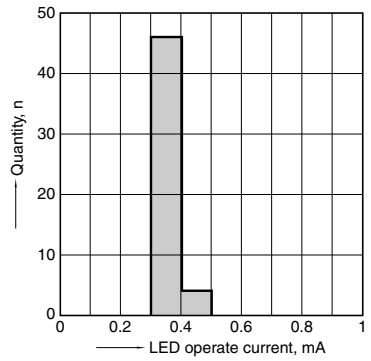
18.-(3) Turn off time distribution
Sample: AQY221N2T
Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



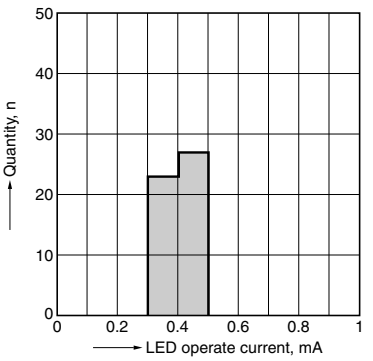
18.-(4) Turn off time distribution
Sample: AQY221N3T
Load voltage: 10V (DC)
Continuous load current: 80 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



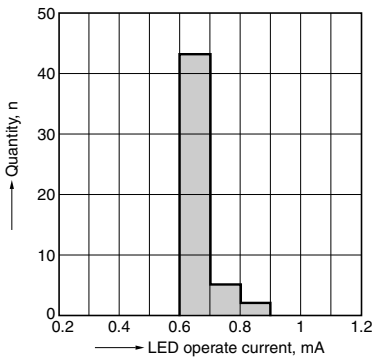
19.-(1) LED operate current distribution
Sample: AQY221R6T
Load voltage: 10V (DC)
Continuous load current: 100 mA (DC), n: 50pcs.
Ambient temperature: 25°C 77°F



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