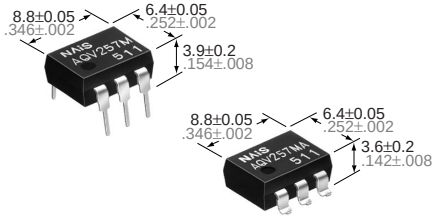
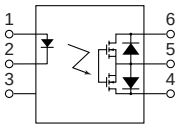
HE (High-function Economy) Type [1-Channel (Form A) Type] —Soft-ON/OFF Operation—

PhotoMOS RELAYS



mm inch



FEATURES

1. Reducing switching-noise
Smooth switching realized by Soft-ON/OFF operation.

2. Reducing inrush current generated in the circuit by Soft-ON operating function

3. Reducing counter electromotive force by Soft-OFF operating function

4. Controls low-level analog signals

TYPICAL APPLICATIONS

- OCU (Official Channel Unit) line switching
- Need to eliminate inrush and counter electromotive force

TYPES

	Output rating*		Part No.				Packing quantity	
			Through hole terminal	Surface-mount terminal				
	Load voltage	Load current	Tube packing style		Tape and reel packing style		Tube	Tape and reel
					Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side		
AC/DC type	200 V	250 mA	AQV257M	AQV257MA	AQV257MAX	AQV257MAZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs

*Indicate the peak AC and DC values.
Note: For space reasons, 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	Type of connection	AQV257M(A)	Remarks
Input	LED forward current	I_F		50 mA	
	LED reverse voltage	V_R		3 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		200 V	
	Continuous load current	I_L	A	0.25 A	A connection: Peak AC, DC B, C connection: DC
			B	0.35 A	
			C	0.5 A	
	Peak load current	I_{peak}		0.75 A	A connection: 100 ms (1 shot), V_L = DC
	Power dissipation	P_{out}		360 mW	
Total power dissipation		P_T		410 mW	
I/O isolation voltage		V_{iso}		1,500 V 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	

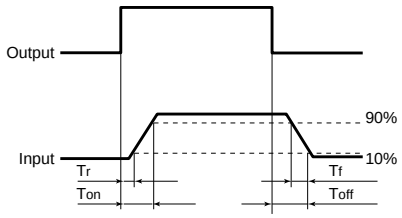
2. Electrical characteristics (Ambient temperature: 25°C 77°F)

Item				Symbol	Type of connection	AQV257M(A)	Condition
Input	LED operate current		Typical	I_{Fon}	—	0.6 mA	I_L = Max.
			Maximum			2.0 mA	
	LED turn off current		Minimum	I_{Foff}	—	0.2 mA	I_L = Max.
			Typical			0.5 mA	
	LED dropout voltage		Typical	V_F	—	1.14 V (1.25 V at I_F = 50 mA)	I_F = 5 mA
			Maximum			1.5 V	
Output	On resistance		Typical	R_{on}	A	2.6 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
			Maximum			4 Ω	
			Typical	R_{on}	B	1.4 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
			Maximum			2 Ω	
			Typical	R_{on}	C	0.7 Ω	I_F = 5 mA I_L = Max. Within 1 s on time
			Maximum			1 Ω	
	Off state leakage current		Maximum	I_{Leak}	—	1 μA	I_F = 0 V_L= Max.
Transfer characteristics	Switching speed	Turn on time*	Typical	T_{on}	—	5.1 ms	I_F = 5 mA I_L = Max. V_L = Max.
			Maximum			15.0 ms	
		Rise time*	Minimum	T_r	—	1.0 ms	I_F = 5 mA I_L = Max. V_L = Max.
			Typical			2.2 ms	
		Turn off time*	Typical	T_{off}	—	3.2 ms	I_F = 5 mA I_L = Max. V_L = Max.
			Maximum			10.0 ms	
		Fall time*	Minimum	T_f	—	0.6 ms	I_F = 5 mA I_L = Max. V_L = Max.
			Typical			1.3 ms	
	I/O capacitance		Typical	C_{iso}	—	0.8 pF	f = 1 MHz V_B = 0
			Maximum			1.5 pF	
	Initial I/O isolation resistance		Minimum	R_{iso}	—	1,000 MΩ	500 V DC

Note: Recommendable LED forward current I_F= 5 mA.

For type of connection, see Page 31.

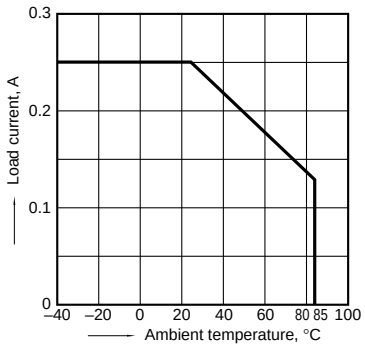
* Turn on (T_{on})/Turn off (T_{off}) time
Rise (T_r)/Fall (T_f) time



REFERENCE DATA

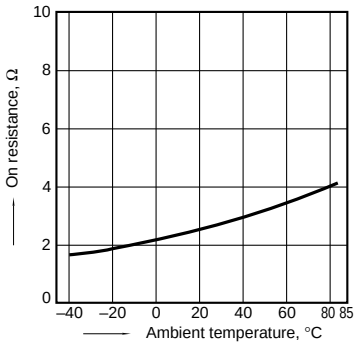
1. Load current vs. ambient temperature characteristics

Allowable ambient temperature: –40°C to +85°C
–40°F to +185°F;
Type of connection: A



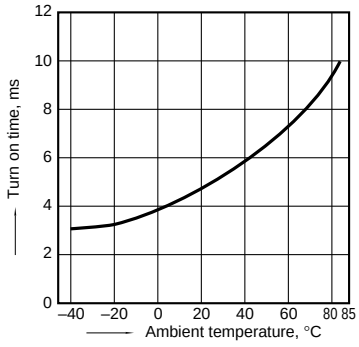
2. On resistance vs. ambient temperature characteristics

Sample: AQV257M; Measured portion: between terminals 4 and 6; LED current: 5 mA;
Continuous load current: 250 mA (DC)



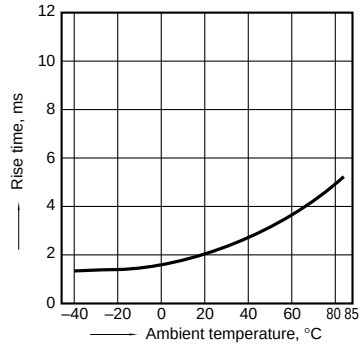
3. Turn on time vs. ambient temperature characteristics

Sample: AQV257M;
LED current: 5 mA; Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC)



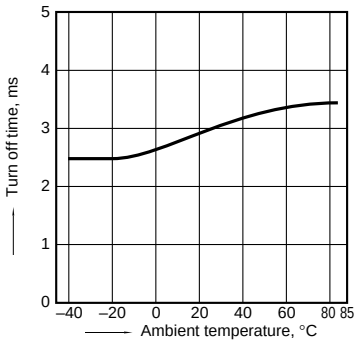
4. Rise time vs. ambient temperature characteristics

Sample: AQV257M;
LED current: 5 mA; Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC)



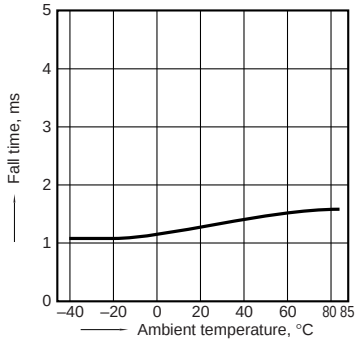
5. Turn off time vs. ambient temperature characteristics

Sample: AQV257M;
LED current: 5 mA; Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC)



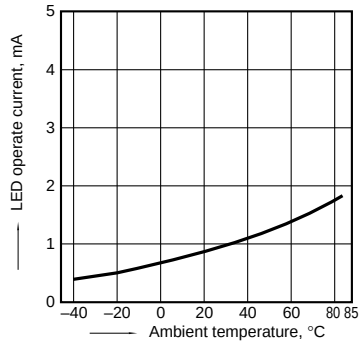
6. Fall time vs. ambient temperature characteristics

Sample: AQV257M;
LED current: 5 mA; Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC)



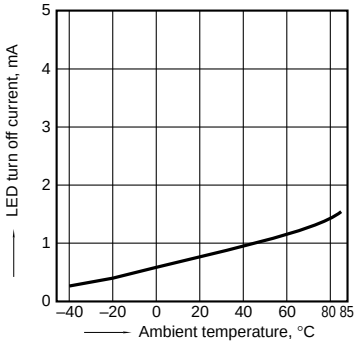
7. LED operate current vs. ambient temperature characteristics

Sample: AQV257M; Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC)



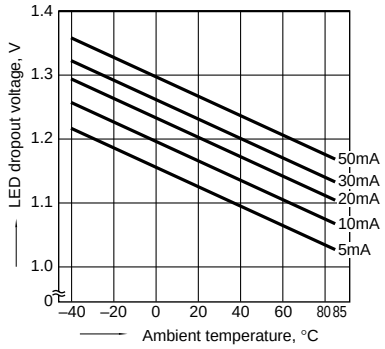
8. LED turn off current vs. ambient temperature characteristics

Sample: AQV257M; Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC)



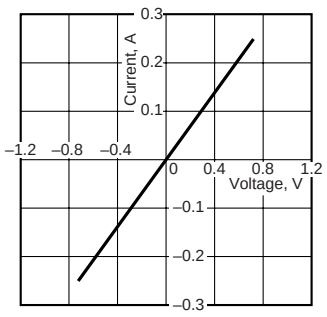
9. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



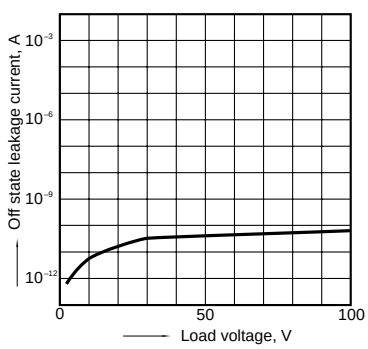
10. Voltage vs. current characteristics of output at MOS portion

Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



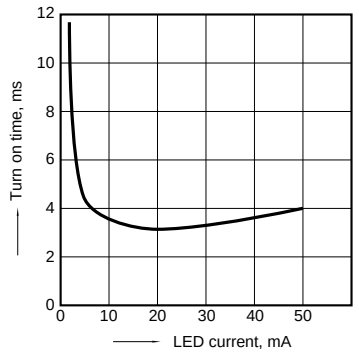
11. Off state leakage current

Sample: AQV257M;
Measured portion: between terminals 4 and 6;
Ambient temperature: 25°C 77°F



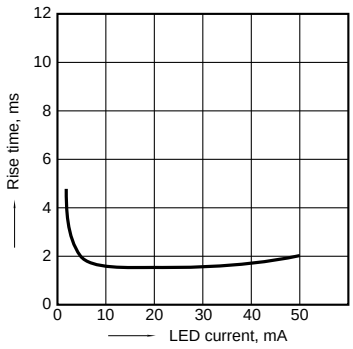
12. LED forward current vs. turn off time characteristics

Sample: AQV257M; Measured portion: between terminals 4 and 6; Load voltage: 200 V (DC); Continuous load current: 250 mA (DC); Ambient temperature: 25°C 77°F



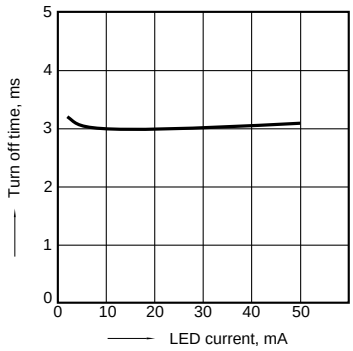
13. LED current vs. rise time characteristics

Sample: AQV257M;
Measured portion: between terminals 4 and 6;
Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC);
Ambient temperature: 25°C 77°F



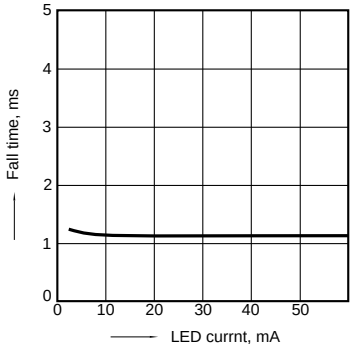
14. LED forward current vs. turn off time characteristics

Sample: AQV257M;
Measured portion: between terminals 4 and 6;
Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC);
Ambient temperature: 25°C 77°F



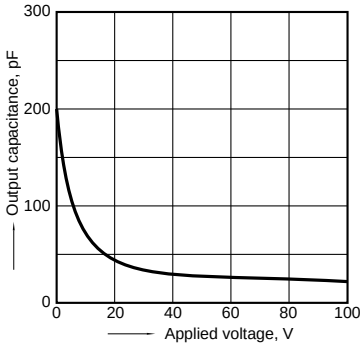
15. LED current vs. fall time characteristics

Sample: AQV257M;
Measured portion: between terminals 4 and 6;
Load voltage: 200 V (DC);
Continuous load current: 250 mA (DC);
Ambient temperature: 25°C 77°F



16. Applied voltage vs. output capacitance characteristics

Measured portion: between terminals 4 and 6;
Frequency: 1 MHz; Ambient temperature: 25°C 77°F



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