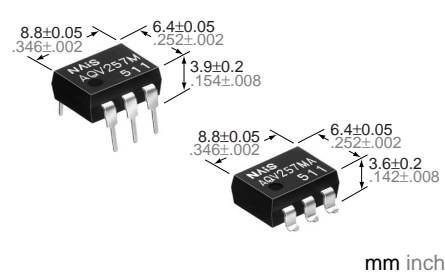


NAIS

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

PhotoMOS
RELAYS



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	f = 100 Hz, Duty factor = 0.1%	
	LED reverse voltage	V _R		3 V		
	Peak forward current	I _{FP}		1 A		
	Power dissipation	P _{in}		75 mW		
Output	Load voltage (peak AC)	V _L		200 V	A connection: Peak AC, DC B, C connection: DC	
	Continuous load current	I _L		A		0.25 A
				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		

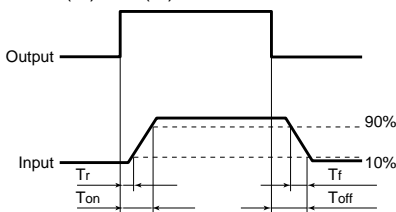
AQV257M

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**	I _F = 50 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.**1.25 V at I_F = 50 mA

For type of connection, see Page 444.

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

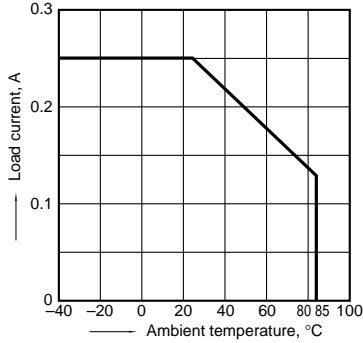
- For Dimensions, see Page 440.
- For Schematic and Wiring Diagrams, see Page 444.
- For Cautions for Use, see Page 449.

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

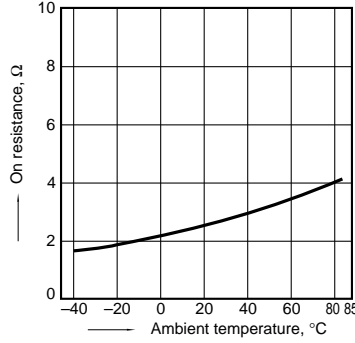
Allowable ambient temperature: -40°C to $+85^{\circ}\text{C}$
 -40°F to $+185^{\circ}\text{F}$;

Type of connection: A



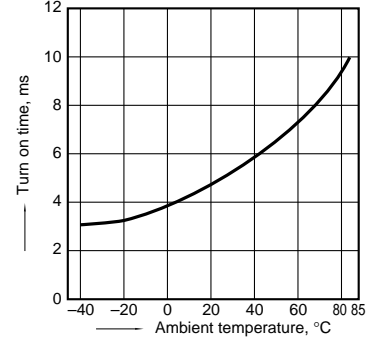
2. On resistance vs. ambient temperature characteristics

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



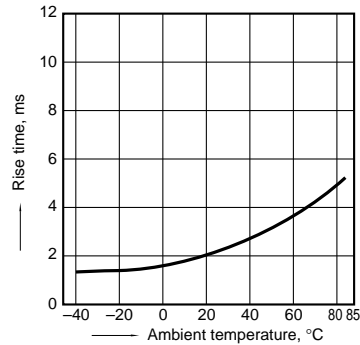
3. Turn on time vs. ambient temperature characteristics

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



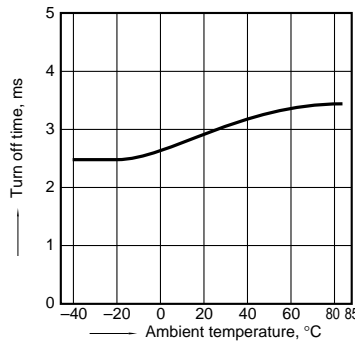
4. Rise time vs. ambient temperature characteristics

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



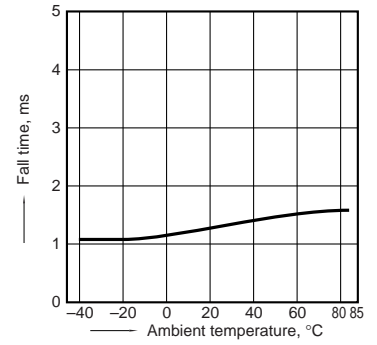
5. Turn off time vs. ambient temperature characteristics

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



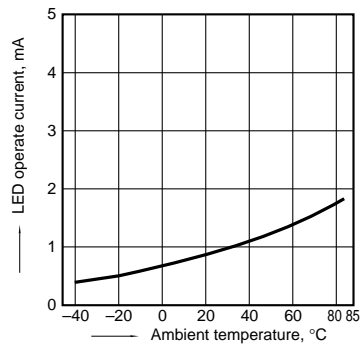
6. Fall time vs. ambient temperature characteristics

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



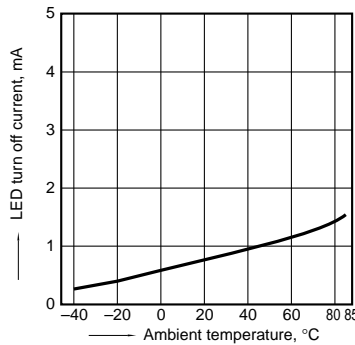
7. LED operate current vs. ambient temperature characteristics

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



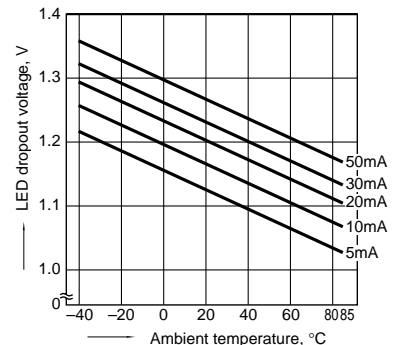
8. LED turn off current vs. ambient temperature characteristics

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



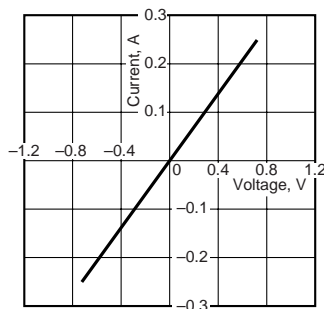
9. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



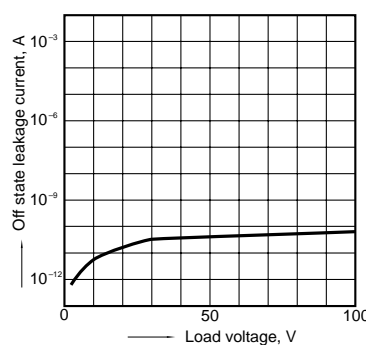
10. Voltage vs. current characteristics of output at MOS portion

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



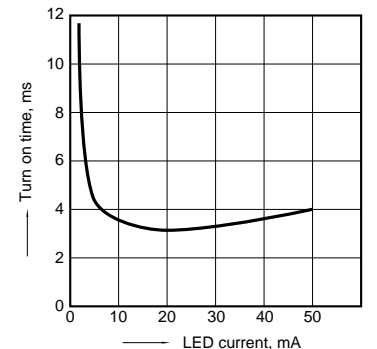
11. Off state leakage current

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



12. LED forward current vs. turn off time characteristics

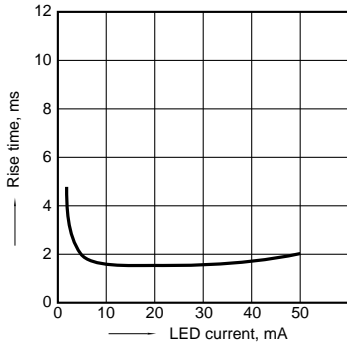
Sample: AQV257M; Measured portion: between terminals 4 and 6; Load voltage: 200 V (DC); Continuous load current: 250 mA (DC); Ambient temperature: 25°C 77°F



AQV257M

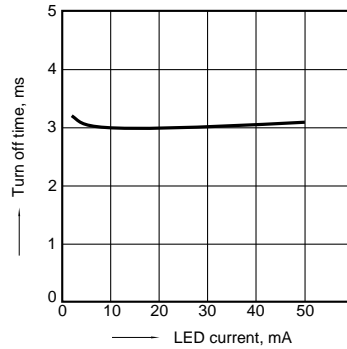
13. LED current vs. rise time characteristics

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



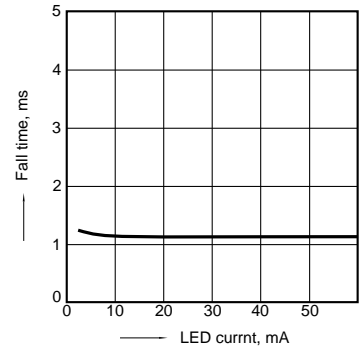
14. LED forward current vs. turn off time characteristics

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

