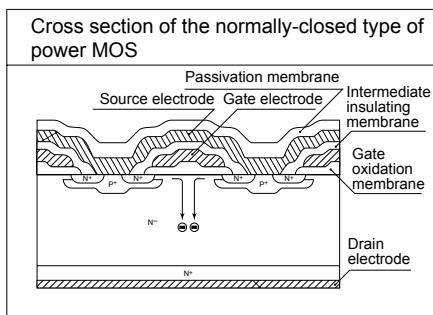
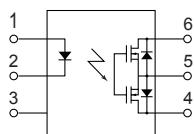
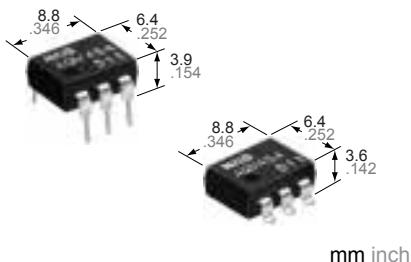


Panasonic
ideas for life

**High sensitivity and low on-resistance.
DIP (1 Form B) 6-pin type.**

**HE PhotoMOS
(AQV45O,
AQV454H)**

FEATURES



2. Controls low-level analog signals
PhotoMOS relays feature extremely low closed-circuit offset voltage to enable control of low-level analog signals without distortion.

3. High sensitivity, low ON resistance
Can control a maximum 0.15 A load current with a 5 mA input current. Low ON resistance of 16 Ω (AQV454). Stable operation because there are no metallic contact parts.

4. Controls various types of load such as relays, motors, lamps and solenoids.

5. Eliminates the need for a power supply to drive the power MOSFET

A power supply used to drive the power MOSFET is unnecessary because of the built-in optoelectronic device. This results in easy circuit design and small PC board area.

6. Low thermal electromotive force (Approx. 1 μV) (Basic insulation)

7. Reinforced insulation 5,000 V type also available.

More than 0.4 mm .016 inch internal insulation distance between inputs and outputs. Conforms to IEC950 (reinforced insulation).

TYPICAL APPLICATIONS

- Security equipment
- High-speed inspection machines
- Measuring instruments
- Telephone equipment
- Sensors

TYPES

Type	I/O isolation	Output rating*		Part No.				Packing quantity	
		Load voltage	Load current	Through hole terminal		Surface-mount terminal			
				Tube packing style		Tape and reel packing style	Picked from the 1/2/3-pin side	Picked from the 4/5/6-pin side	
AC/DC	1,500 V AC	250 V	200 mA	AQV453	AQV453A	AQV453AX	AQV453AZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs.
	400 V	150 mA	AQV454	AQV454A	AQV454AX	AQV454AZ			
			AQV454H	AQV454HA	AQV454HAX	AQV454HAZ			

* Indicate the peak AC and DC values.

Note: For space reasons, the SMD terminal shape indicator "A" and the package type indicator "X" and "Z" are omitted from the seal.

HE PhotoMOS (AQV45O, AQV454H)

RATING

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

Item		Symbol	Type of connection	AQV453(A)	AQV454(A)	AQV454H(A)	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		250 V	400 V				
	Continuous load current	I_L		A	0.2 A	0.15 A	A connection: Peak AC, DC B,C connection: DC		
				B	0.3 A	0.18 A			
				C	0.4 A	0.25 A			
	Peak load current	I_{PEAK}		0.6 A		0.5 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	5,000 V AC				
Temperature limits	Operating	T_{opr}		$-40^\circ C$ to $+85^\circ C$ $-40^\circ F$ to $+185^\circ F$			Non-condensing at low temperatures		
	Storage	T_{stg}		$-40^\circ C$ to $+100^\circ C$ $-40^\circ F$ to $+212^\circ F$					

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

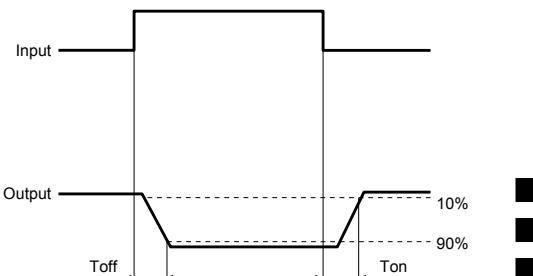
Item			Symbol	Type of connection	AQV453(A)	AQV454(A)	AQV454H(A)	Remarks	
Input	LED operate (OFF) current	Typical	I_{Foff}	—	1 mA	0.9 mA	1.4 mA	$I_L = Max.$	
		Maximum			3 mA				
	LED reverse (ON) current	Minimum		—	0.4 mA				
		Typical			0.9 mA	0.8 mA	1.3 mA		
Output	LED dropout voltage	Typical	V_F	—	1.25 V (1.14 V at $I_F=5$ mA)			$I_F = 50$ mA	
		Maximum			1.5 V				
	On resistance	Typical	R_{on}	A	5.5 Ω	12.4 Ω		$I_F = 0$ mA $I_L = Max.$ Within 1 s on time	
		Maximum			8 Ω	16 Ω			
		Typical	R_{on}	B	2.7 Ω	6.2 Ω			
		Maximum			4 Ω	8 Ω			
	Off state leakage current	Typical	R_{on}	C	1.4 Ω	3.1 Ω		$I_F = 0$ mA $I_L = Max.$ Within 1 s on time	
		Maximum			2 Ω	4 Ω			
Transfer characteristics	Switching speed	Maximum	I_{Leak}	—	1 μA	1 μA	10 μA	$I_F = 5$ mA $V_L = Max.$	
	Operate (OFF) time*	Typical	T_{off}	—	1.52 ms	1.2 ms	1.8 ms	$I_F = 0$ mA → 5 mA $I_L = Max.$	
		Maximum			3 ms	2.0 ms	3.0 ms		
	Reverse (ON) time*	Typical	T_{on}	—	0.4 ms	0.36 ms	0.4 ms	$I_F = 5$ mA → 0 mA $I_L = Max.$	
		Maximum			1 ms				
	I/O capacitance	Typical	C_{iso}	—	1.3 pF		$f = 1$ MHz $V_B = 0$ V		
	Initial I/O isolation resistance	Maximum			3 pF				
	Initial I/O isolation resistance	Minimum	R_{iso}	—	1,000 MΩ		500 V DC		

Note: Recommendable LED forward current.

Standard type: $I_F = 5$ mA

Reinforced type: $I_F = 5$ to 10 mA

*Operate/Reverse time



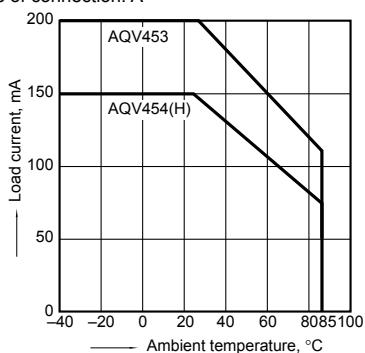
HE PhotOMOS (AQV45○, AQV454H)

REFERENCE DATA

1. Load current vs. ambient temperature characteristics

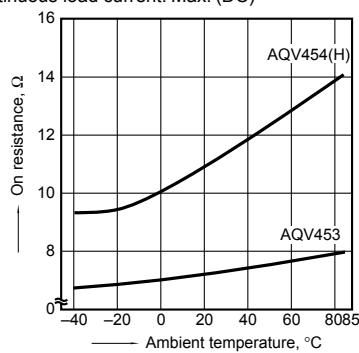
Allowable ambient temperature: -40°C to $+85^{\circ}\text{C}$
 -40°F to $+185^{\circ}\text{F}$

Type of connection: A



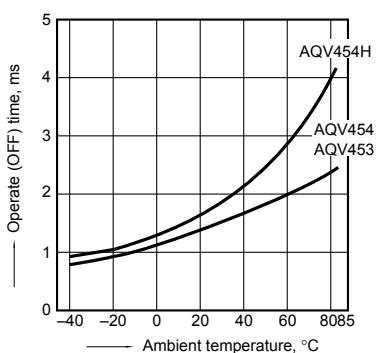
2. On resistance vs. ambient temperature characteristics

Measured portion: between terminals 4 and 6;
 LED current: 0 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



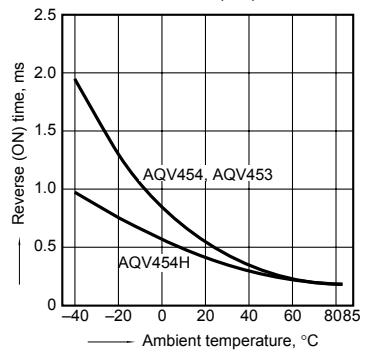
3. Operate (OFF) time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



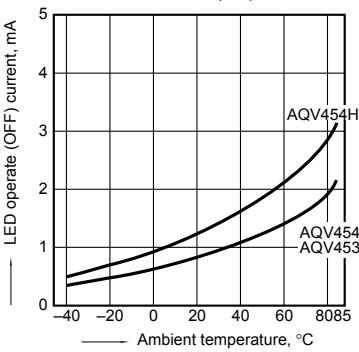
4. Reverse (ON) time vs. ambient temperature characteristics

LED current: 5 mA; Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



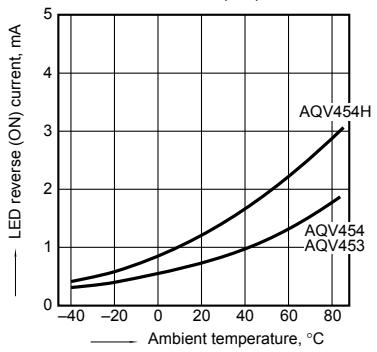
5. LED operate (OFF) current vs. ambient temperature characteristics

Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



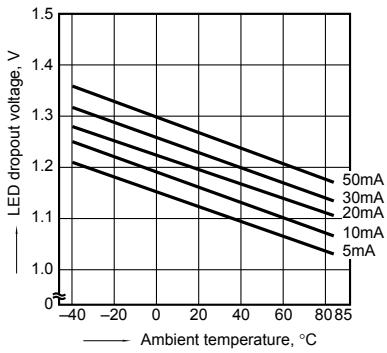
6. LED reverse (ON) current vs. ambient temperature characteristics

Load voltage: Max. (DC);
 Continuous load current: Max. (DC)



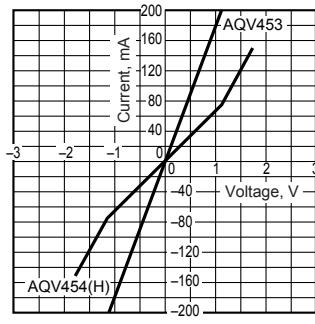
7. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA



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

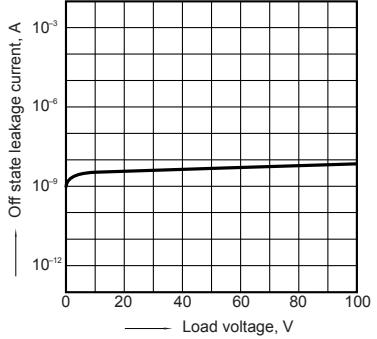
Measured portion: between terminals 4 and 6;
 Ambient temperature: 25°C 77°F



9. Off state leakage current vs. load voltage characteristics

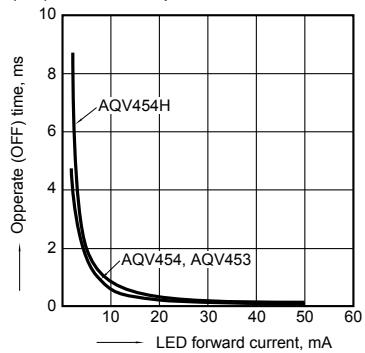
Sample: AQV454;

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



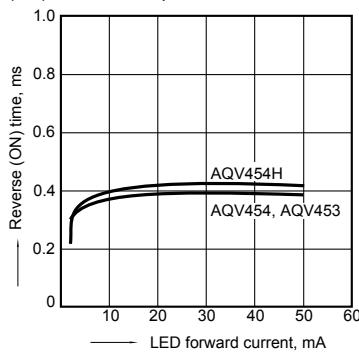
10. Operate (OFF) time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
 Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



11. Reverse (ON) time vs. LED forward current characteristics

Measured portion: between terminals 4 and 6;
 Load voltage: Max. (DC); Continuous load current: Max. (DC); Ambient temperature: 25°C 77°F



12. Output capacitance vs. applied voltage characteristics

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

