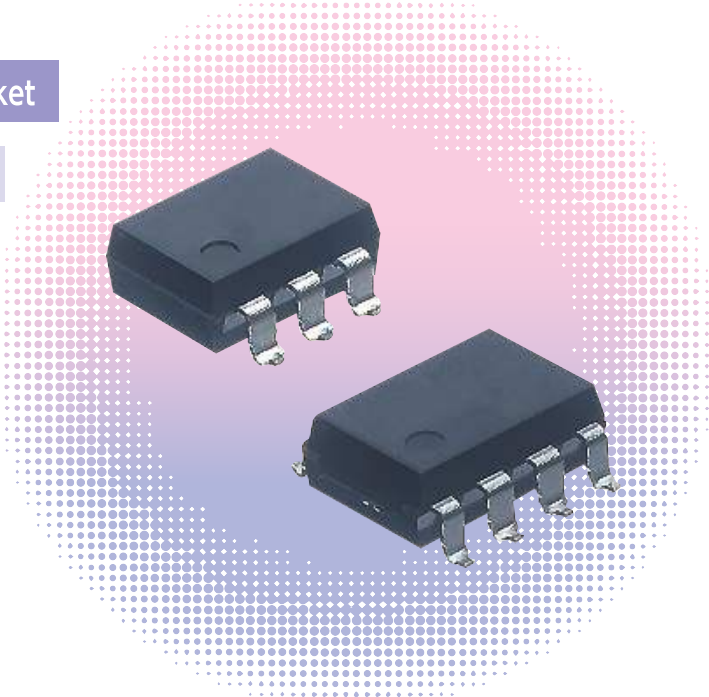
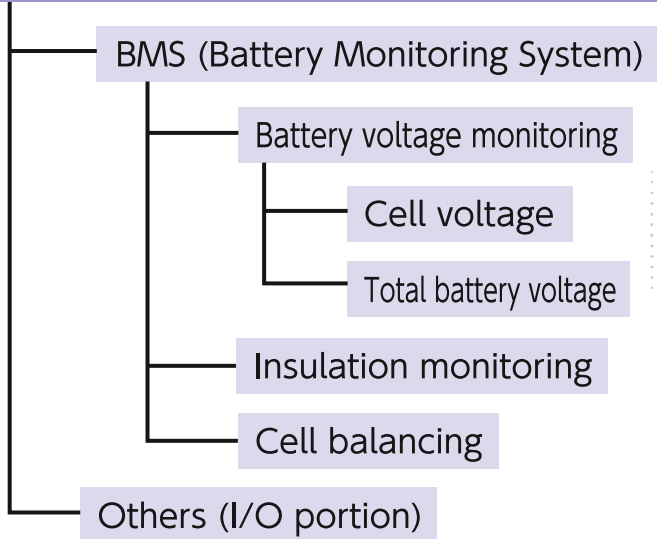


PhotoMOS®

■ Applications

- PhotoMOS® are mainly for high voltage battery monitoring in automotive applications.
- Starting from the early 2000s with HEV, we have achieved a great global track record with PHEV, EV and FCV selling over 100 million pieces.

Main PhotoMOS® applications in automotive market



■ RATING Typical products for automotive applications

■ Types and absolute maximum ratings (Ambient temperature: 25°C)

| Part number | Type | Package | Contact configuration | Load voltage (V _L)*1 | Continuous load current (I _L)*1 | Ambient temperature | |
|--------------|------|----------------|-----------------------|----------------------------------|---------------------------------------------|-------------------------------|-----------------------------|
| | | | | | | Operating (T _{opr}) | Storage (T _{stg}) |
| AQW216HAX*** | GU | DIP8-pin (SMD) | 2 Form A | 600 V | 40 mA (50 mA)*2 | -40 to +85°C* | -40 to +100°C* |
| AQV219HAX*** | GU | DIP6-pin (SMD) | 1 Form A | 900 V | 15 mA | | |
| AQV258HAX*** | HE | DIP6-pin (SMD) | 1 Form A | 1,500 V | 20 mA | | |

*1. Indicate the peak AC and DC values.

*2. In case of using only 1 channel

***Please inquire regarding support for temperatures between -40 and 105°C.**

■ Recommended conditions of use (Ambient temperature: 25°C)

| Part number | Load voltage (V _L) | Continuous load current (I _L) | LED forward current (I _F) |
|--------------|--------------------------------|-------------------------------------------|---------------------------------------|
| AQW216HAX*** | Max. 240 V | Max. 20 mA | 10 mA |
| AQV219HAX*** | Max. 360 V | Max. 7.5 mA | 10 mA |
| AQV258HAX*** | Max. 600 V | Max. 10 mA | 10 mA |

Electric characteristics (Ambient temperature: 25°C)

| Item | | | Symbol | Part number | | | Test conditions | |
|--------------------------|---------------------------|------|------------|-----------------|-----------------|------------------|----------------------------------------------|-----------------------|
| | | | | AQW216HAX*** | AQV219HAX*** | AQV258HAX*** | | |
| Input | LED operate current | Typ. | I_{Fon} | 1 mA | 0.85 mA | 0.8 mA | $I_L = \text{Max.}$ | |
| | | Max. | | 3 mA | 3 mA | 3 mA | | |
| | LED turn off current | Min. | I_{Foff} | 0.2 mA | 0.2 mA | 0.2 mA | | |
| | | Typ. | | 0.8 mA | 0.8 mA | 0.7 mA | | |
| | LED dropout voltage | Typ. | V_F | 1.25 V | 1.35 V | 1.35 V | | $I_F = 50 \text{ mA}$ |
| | | Max. | | 1.5 V | 1.5 V | 1.5 V | | |
| Output | On resistance | Typ. | R_{on} | 70 Ω | 310 Ω | 305 Ω | $I_F = 10 \text{ mA}$ $I_L = \text{Max.}$ | |
| | | Max. | | 150 Ω | 500 Ω | 500 Ω | | |
| | Off state leakage current | Max. | I_{Leak} | 1 μA | 1 μA | 10 μA | $I_F = 0 \text{ mA}, V_L = \text{Max.}$ | |
| Transfer characteristics | Turn on time | Typ. | T_{on} | 0.2 ms | 0.06 ms | 0.14 ms | $I_F = 10 \text{ mA}$ $I_L = \text{Max.}$ | |
| | | Max. | | 0.5 ms | 0.5 ms | 1 ms | | |
| | Turn off time | Typ. | T_{off} | 0.04 ms | 0.03 ms | 0.1 ms | | |
| | | Max. | | 0.5 ms | 0.5 ms | 0.5 ms | | |

Before selecting PhotoMOS® for automotive applications

Some changes in specification parameters are needed when PhotoMOS® are used in certain automotive applications. Automotive grade PhotoMOS® are generally used in automotive environment since stricter enhanced quality controls are needed.

The user is cautioned and asked to inquire with a Panasonic Corporation sales representative before designing the products in such environments.

About specification reviews

Automotive applications require specification reviews.

This is important and necessary in order to prevent performance, quality and reliability problems.

The following parameters should be reviewed with a Panasonic Corporation sales representative:

- Targeted application
- Targeted levels of quality and reliability
- Circuits description of load level, driving methods, etc.
- Service conditions
- Influence at failure and failsafe concepts, etc.

About derating design

Derating is essential in any reliable design and a significant factor in consideration of product life.

Sufficient derating is needed absolute maximum rating when designing a system.

It is recommended using a derated voltage of 40% (or less) of absolute maximum load voltage rating, and 50% (or less) of absolute maximum load current ratings.

Devices should be examined using a measurement equipment. Derated voltages must be considered according to operating and environmental conditions the device will be subjected to. In case of automotive applications, more allowance should be given to maximum ratings and installation of safety measures (i.e. use of double circuits.)

Misuse of the products listed in this document shall be made at the users' own risk.

All automotive products are handled as special orders. Please inquire with a Panasonic Corporation sales representative for confirmation of usage conditions, etc.

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*Recognized in Japan, the United States, all member states of European Union and other countries.

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