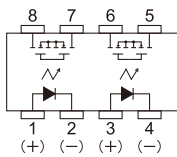
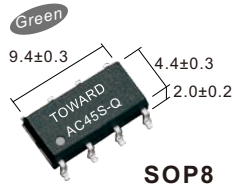


# AC45S-Q

60V • 2 Form A

AEC-Q101  
Certification



RoHS compliant

## Features

- Contact Form 2a
- Load Voltage 60 V Max.
- Operation LED Current 3mA Max.
- Load Current 200mA Max.
- On-Resistance 2Ω Typ.
- Output Capacitance 20 pF Typ.

## Application:

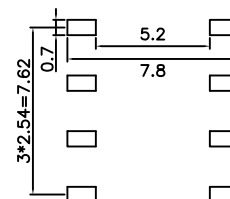
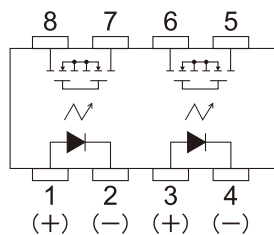
- Automobile BMS Controller
- Energy Storage System Big-
- data storage

## Part Identification

| SOP Type |                                  | Quantity  |
|----------|----------------------------------|-----------|
| Stick    | Tape & Reel                      | Stick 50  |
|          | Feed direction : Pin No. 5,6,7,8 | Tape 1000 |
| AC45S-Q  | AC45S-Q-R1                       |           |

## Terminal Identification 電路結構圖

### Terminal Identification



1,3: Anode (LED)  
2,4: Cathode (LED)  
5,6,7,8: Drain (MOS FET)

\* Recommended Soldering Pattern  
For Reflow Soldering

## Absolute Maximum Ratings 絕對最大定格 (Ambient Temperature 周圍溫度 :25°C)

| Item                            |  | Symbol            | Value                 |
|---------------------------------|--|-------------------|-----------------------|
| Input<br>輸入                     | Continuous LED Current 連續的LED電流              | I <sub>F</sub>    | 50mA                  |
|                                 | Peak LED Current LED的峰值電流 (f=100 Hz duty=1%) | I <sub>FP</sub>   | 500mA                 |
|                                 | LED Reverse Voltage 逆向的LED電壓                 | V <sub>R</sub>    | 5V                    |
|                                 | Input Power Dissipation 容許損失                 | P <sub>In</sub>   | 75mW                  |
| Output<br>輸出                    | Load Voltage 負荷電壓                            | V <sub>L</sub>    | 60V(AC peak or DC)    |
|                                 | Load Current 負荷電流                            | I <sub>L</sub>    | 200mA(1ch) 160mA(2ch) |
|                                 | Peak Load Current 峰值負荷電流(1 ms,1 shot)        | I <sub>Peak</sub> | 600mA                 |
|                                 | Output Power Dissipation 電流損耗                | P <sub>Out</sub>  | 300mW(1ch) 450mW(2ch) |
| Total Power Dissipation 全損耗     |  | P <sub>T</sub>    | 350mW(1ch) 500mW(2ch) |
| I/O Breakdown Voltage 入/出力間絕緣電壓 |  | V <sub>I/O</sub>  | 1500Vrms Min.         |
| Operating Temperature 使用時周圍溫度 * |  | T <sub>Opr</sub>  | -40°C ~ +105°C        |
| Storage Temperature 周圍保存溫度 *    |  | T <sub>Stg</sub>  | -40°C ~ +125°C        |

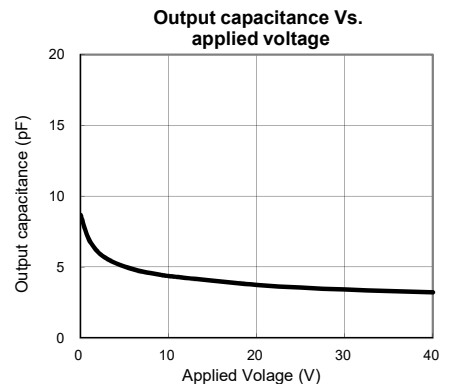
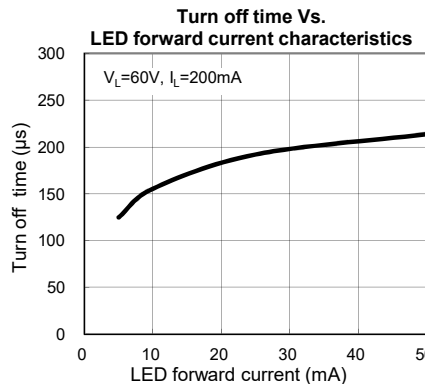
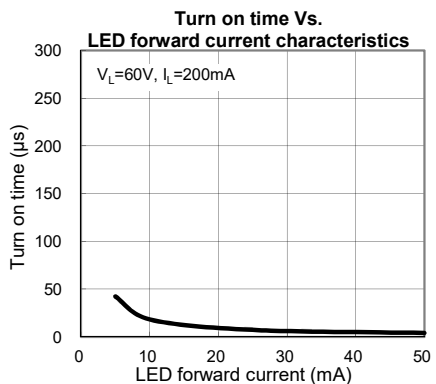
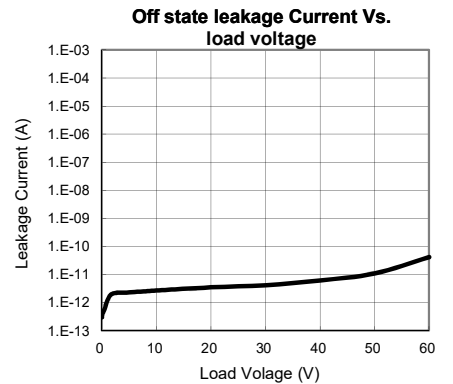
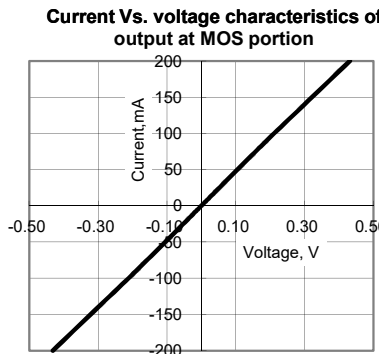
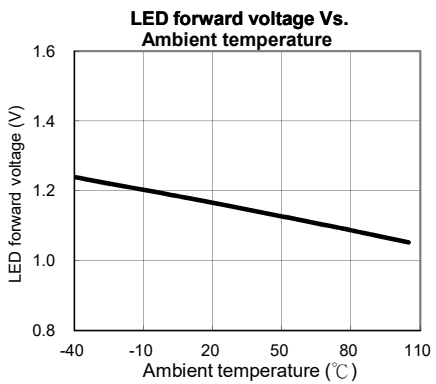
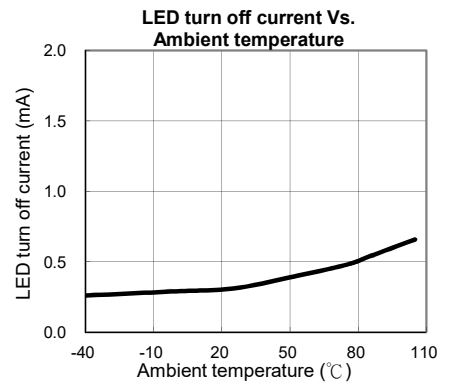
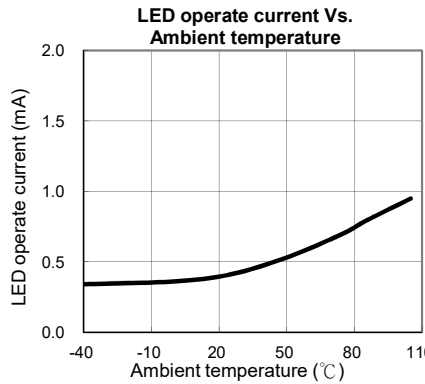
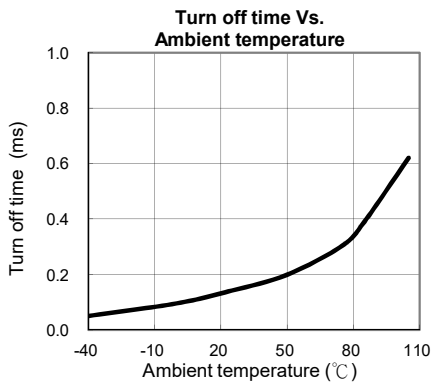
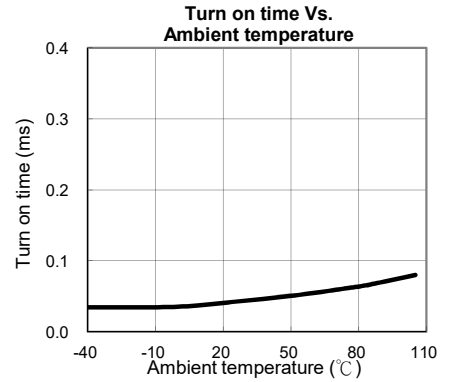
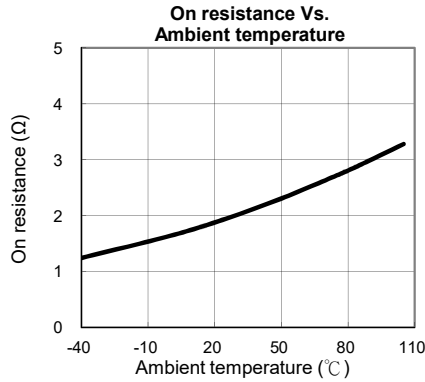
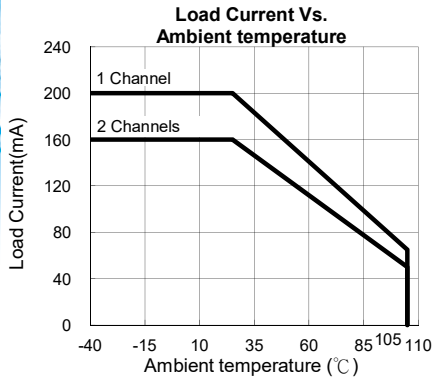
\* The temperature is based on AEC-Q101 certification.

## Recommended Operating Condition 建議使用條件 (Ambient Temperature 周圍溫度: 25°C)

| Item                             | Symbol         | Number of used channels | MIN. | TYP. | MAX. | units |
|----------------------------------|----------------|-------------------------|------|------|------|-------|
| Continuous LED Current 連續的 LED電流 | I <sub>F</sub> |                         | 5    | 10   | 15   | m A   |
| Load Voltage 負荷電壓                | V <sub>L</sub> |                         | ---  | ---  | 30   | V     |
| Load Current 負荷電流                | I <sub>L</sub> | 1 ch                    | ---  | ---  | 100  | m A   |
|                                  |                | 2 ch                    | ---  | ---  | 80   |       |

## Electrical Specifications LED順向電壓(Ambient Temperature 周圍溫度 :25°C)

| Item               |                                      | Symbol             | MIN.            | TYP. | MAX. | Units | Conditions  |
|--------------------|--------------------------------------|--------------------|-----------------|------|------|-------|---|
| Input<br>輸入        | LED Forward Voltage LED順向電壓          | V <sub>F</sub>     | 0.9             | 1.17 | 1.3  | V     | I <sub>F</sub> =10mA  |
|                    | Operation LED Current LED的動作電流       | I <sub>F On</sub>  |                 | 0.5  | 3    | mA    |   |
|                    | Recovery LED Voltage LED的恢復電壓        | V <sub>F Off</sub> | 0.5             | 1    |      | V     |   |
| Output<br>輸出       | On-Resistance 導通電阻<br>Drain to Drain | R <sub>On</sub>    |                 | 2    | 5    | Ω     | I <sub>F</sub> =5mA, I <sub>L</sub> = Rated Current<br>Time to flow is within 1sec. |
|                    | Off-State Leakage Current 開路狀態時的電流   | I <sub>Leak</sub>  |                 |      | 1    | uA    | V <sub>L</sub> =60V   |
|                    | Output Capacitance 輸出端容量             | C <sub>Out</sub>   |                 | 20   |      | pF    | V <sub>L</sub> =0V, f=1MHz  |
| Transmission<br>傳達 | Turn-On Time 動作時間                    | T <sub>On</sub>    |                 | 0.05 | 0.5  | ms    | I <sub>F</sub> =5mA<br>I <sub>L</sub> =Rated Current                                |
|                    | Turn-Off Time 復位時間                   | T <sub>Off</sub>   |                 | 0.13 | 0.5  | ms    |   |
| Coupled<br>結合      | I/O Insulation Resistance 輸入/出間的絕緣阻抗 | R <sub>I/O</sub>   | 10 <sup>9</sup> |      |      | Ω     |   |
|                    | I/O Capacitance 輸入/力端的靜電容量           | C <sub>I/O</sub>   |                 | 1.3  |      | pF    | f=1MHz  |



## AEC-Q101 Test Report

| Station | Test Item                             |                    | Test Condition  | Sample Size                  | Result |
|---------|---------------------------------------|--------------------|---|------------------------------|--------|
| 1       | External Visual                       | EV                 | Reference JESD22 B-101  | 616 ea                       | PASS   |
| 2       | High Temperature Reverse Bias         | HTRB               | 125C, total :1000H, Readout: 1000hr   | 77ea*3 lot<br>(Total 231 ea) | PASS   |
| 3       | High Temperature Gate Bias            | HTGB               | 125C, total :1000H, Readout: 1000hr   | 77ea*3 lot<br>(Total 231 ea) | PASS   |
|         |                                       |                    |   |                              | PASS   |
| 4       | PC                                    | Bake               | MSL_3 : 125°C, 24hrs  | 616 ea                       | PASS   |
|         |                                       | Soak               | MSL_3 : 60°C , 60%RH, 192hrs  |                              | PASS   |
|         |                                       | Reflow             | MSL_3 : 260°C , 3 times   |                              | PASS   |
| 5       | Temperature Cycling                   | TC                 | -55~125C/15min 30min/cyc 1000 cycles<br>Reference JESD22 A-104, Readout: 500cyc   | 77ea*3 lot<br>(Total 231 ea) | PASS   |
| 6       | TC Delamination Test                  | TCDT               | After TCT 100% C-SAM  | 77ea*3 lot<br>(Total 231 ea) | PASS   |
| 7       | Autoclave                             | AC                 | 96 hours, TA = 121°C, RH = 100%, 15psig.  | 77ea*3 lot<br>(Total 231 ea) | PASS   |
| 8       | High Humidity High Temp. Reverse Bias | H <sup>3</sup> TRB | 1000 hours at TA = 85°C/85% RH with part reverse biased at 80% of rated breakdown voltage up to a maximum of 100V or limit of chamber.<br>Readout: 1000hr | 77ea*3 lot<br>(Total 231 ea) | PASS   |
| 9       | Power and Temperature Cycle           | PTC                | Reference JESD22 A-105<br>TCT : -40~125/10min, 750cyc ; 5min on/5min off<br>6000cys   | 77ea*3 lot<br>(Total 231 ea) | PASS   |
| 10      | D.P.A.                                | DPA                | Random sample of parts that have successfully completed H3TRB or HAST, and TC.  | 2ea*2 lots                   | PASS   |
| 11      | ESD                                   | HBM                | >2000V level per pins<br>*Reference AEC Q101-001  | 30ea *1 lot                  | PASS   |
|         | ESD                                   | CDM                | *Reference AEC Q101-005   | 30ea *1 lo                   | PASS   |
| 12      | Resistance to Solder Heat             | RSH                | 270°C± 5°C +2/-0 seconds<br>**Reference JESD22 B-106  | 30ea *1 lot                  | PASS   |
| 13      | Die shear                             | DS                 | MIL-750-2017  | 5ea*1 lot                    | PASS   |