

# ASSR-V621 and ASSR-V622

## Dual Channel Photovoltaic MOSFET Driver

(6.5V/15 $\mu$ A)



## Data Sheet



### Description

The ASSR-V62X Series is specially designed to drive high power MOSFETs. It consists of an AlGaAs infrared light-emitting diode (LED) input stage optically coupled to an output detector circuit. The detector consists of a high-speed photovoltaic diode array and driver circuitry to switch on/off two discrete high voltage MOSFETs externally. The relay driver turns on (contact closes) with a minimum input current of 3mA through the input LED. The relay driver turns off (contact opens) with an input voltage of 0.8V or less.

The dual channel configurations, ASSR-V621 and ASSR-V622, allow 2 independent MOSFETs to be driven. It has the versatility to double the photovoltaic voltage by connecting the 2 channels in series or to double the short circuit current by connecting the 2 channels in parallel. They are available in 8-pin DIP and Gull Wing Surface Mount packages.

### Features

- Dual Channel Photovoltaic MOSFET Driver
- Open Circuit Voltage: 7V Typical
- Short Circuit Current: 20 $\mu$ A Typical
- Low Input Current: CMOS Compatibility
- Fast Switching Speed:  
0.3ms (Ton), 0.03ms (Toff) Typical
- High Input-to-Output Insulation Voltage (Safety and Regulatory Pending Approvals)
  - 3750 Vrms for 1 min per UL1577
  - CSA Component Acceptance

### Applications

- Solid State Relay Module
- Voltage Supply for electronic circuits

**CAUTION:** It is advised that normal static precautions be taken in handling and assembly of this component to prevent damage and/or degradation which may be induced by ESD.

## Ordering Information

ASSR-xxxx is UL Recognized with 3750 Vrms for 1 minute per UL1577 and is approved under CSA Component Acceptance Notice #5.

| Part number | Option         | Package       | Surface Mount | Gull Wing | Tape & Reel | Quantity            |
|-------------|----------------|---------------|---------------|-----------|-------------|---------------------|
|             | RoHS Compliant |               |               |           |             |                     |
| ASSR-V621   | -002E          | 300 mil DIP-8 | X             | X         | X           | 50 units per tube   |
|             | -302E          |               |               |           |             | 50 units per tube   |
|             | -502E          |               |               |           |             | 1000 units per reel |
| ASSR-V622   | -002E          | 300 mil DIP-8 | X             | X         | X           | 50 units per tube   |
|             | -302E          |               |               |           |             | 50 units per tube   |
|             | -502E          |               |               |           |             | 1000 units per reel |

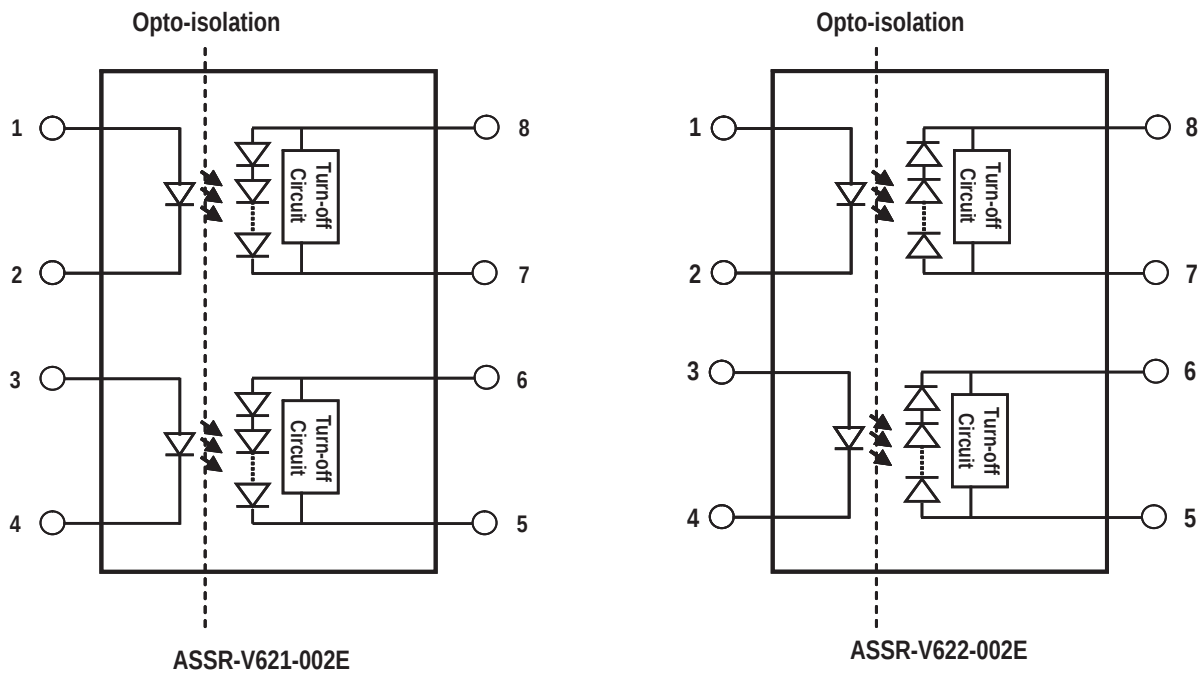
To order, choose a part number from the part number column and combine with the desired option from the option column to form an order entry.

Example:

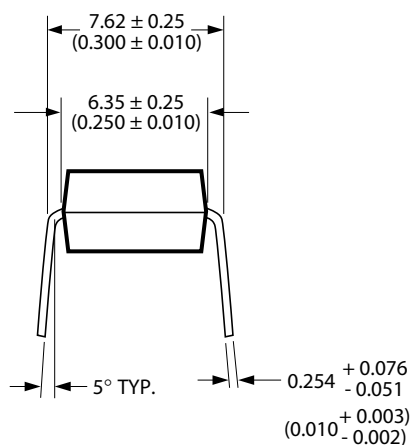
ASSR-V621-002E to order product of 300mil DIP-8 package in tube packaging and RoHS Compliant.

Option datasheets are available. Contact your Avago sales representative or authorized distributor for information.

## Schematic

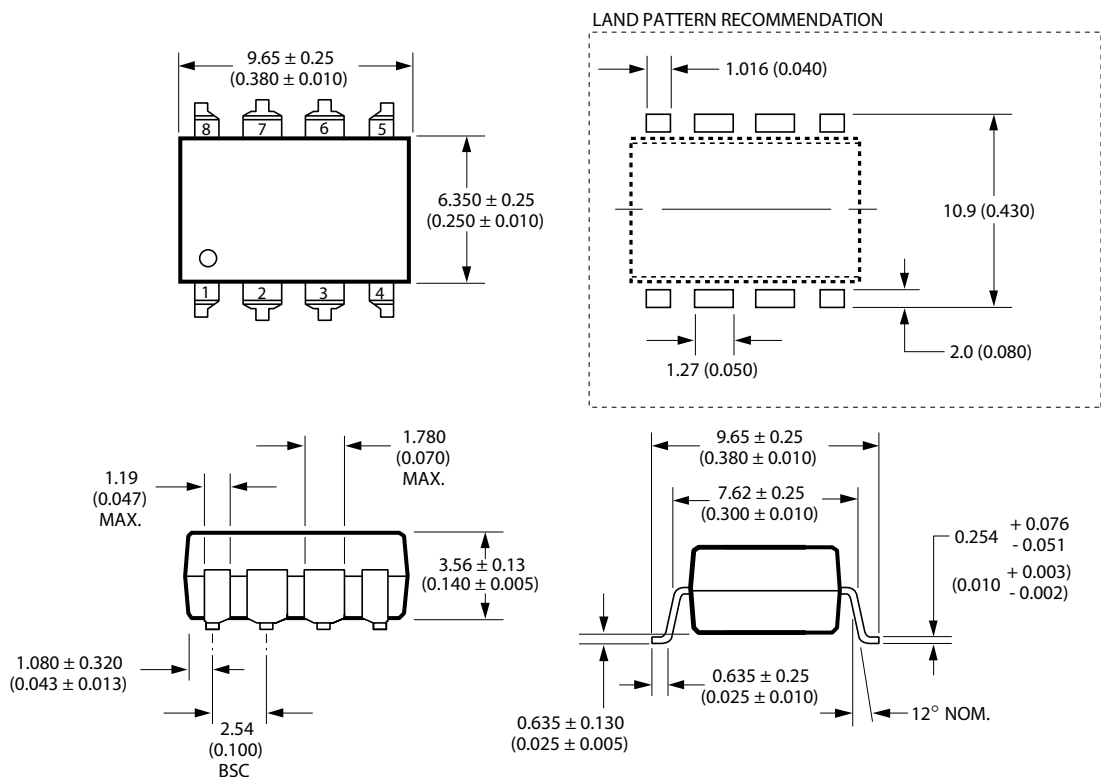


### 8-Pin DIP Package



DIMENSIONS IN MILLIMETERS AND (INCHES).  
OPTION NUMBERS 300 AND 500 NOT MARKED.

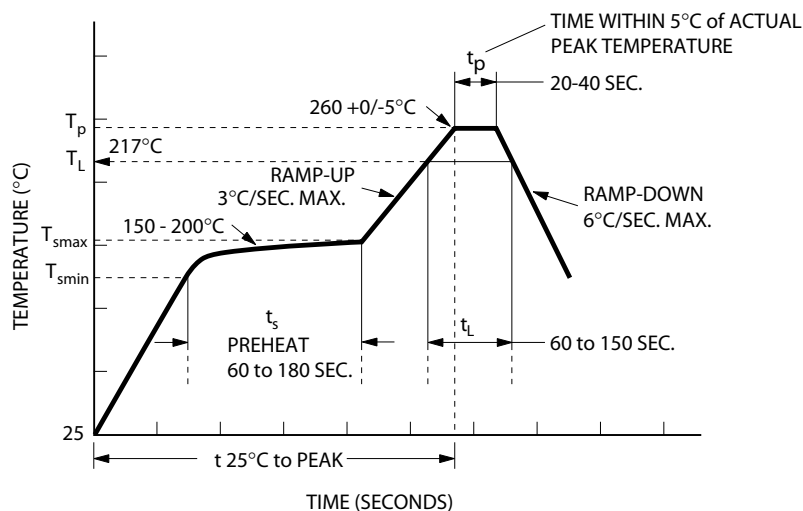
### 8-Pin DIP Package with Gull Wing Surface Mount Option 300



DIMENSIONS IN MILLIMETERS (INCHES).  
LEAD COPLANARITY = 0.10 mm (0.004 INCHES).

NOTE: FLOATING LEAD PROTRUSION IS 0.25 mm (10 mils) MAX.

## Lead Free IR Profile



NOTES:  
THE TIME FROM 25°C to PEAK TEMPERATURE = 8 MINUTES MAX.  
 $T_{smax} = 200^\circ\text{C}$ ,  $T_{smin} = 150^\circ\text{C}$

Use of non-chlorine-activated fluxes is highly recommended.

Note: Non-Halide flux should be used.

## Regulatory Information

The ASSR-V621-002E and ASSR-V622-002E are approved by the following organizations:

### UL

Approved under UL 1577, component recognition program up to  $V_{ISO} = 3750 V_{RMS}$

### CSA

Approved under CSA Component Acceptance Notice #5.

## Insulation and Safety Related Specifications

| Parameter                                         | Symbol | ASSR-V621-002E<br>ASSR-V622-002E | Units | Conditions                                                                                                                         |
|---------------------------------------------------|--------|----------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------|
| Minimum External Air Gap (Clearance)              | L(101) | 7.1                              | mm    | Measured from input terminals to output terminals, shortest distance through air.                                                  |
| Minimum External Tracking (Creepage)              | L(102) | 7.4                              | mm    | Measured from input terminals to output terminals, shortest distance path along body.                                              |
| Minimum Internal Plastic Gap (Internal Clearance) |        | 0.08                             | mm    | Through insulation distance conductor to conductor, usually the straight line distance thickness between the emitter and detector. |
| Tracking Resistance (Comparative Tracking Index)  | CTI    | 175                              | V     | DIN IEC 112/VDE 0303 Part 1                                                                                                        |
| Isolation Group (DIN VDE0109)                     |        | IIIa                             |       | Material Group (DIN VDE 0109)                                                                                                      |

## Absolute Maximum Ratings

| Parameter                         | Symbol                   | Min.           | Max. | Units | Note |
|-----------------------------------|--------------------------|----------------|------|-------|------|
| Storage Temperature               | T <sub>S</sub>           | -55            | 125  | °C    |      |
| Operating Temperature             | T <sub>A</sub>           | -40            | 85   | °C    |      |
| Lead Soldering Cycle              | Temperature              |                | 260  | °C    |      |
|                                   | Time                     |                | 10   | s     |      |
| Input Current                     | Average                  | I <sub>F</sub> | 30   | mA    |      |
|                                   | Surge                    |                | 300  |       |      |
|                                   | Transient                |                | 1000 |       |      |
| Reversed Input Voltage            | V <sub>R</sub>           |                | 5    | V     |      |
| Input Power Dissipation           | P <sub>IN</sub>          |                | 100  | mW    |      |
| Solder Reflow Temperature Profile | See Lead Free IR Profile |                |      |       |      |

## Recommended Operating Conditions

| Parameter             | Symbol              | Min. | Max. | Units | Note |
|-----------------------|---------------------|------|------|-------|------|
| Input Current (ON)    | I <sub>F(ON)</sub>  | 3    | 30   | mA    |      |
| Input Voltage (OFF)   | V <sub>F(OFF)</sub> | 0    | 0.8  | V     |      |
| Operating Temperature | T <sub>A</sub>      | -40  | +85  | °C    |      |

## Package Characteristics

Unless otherwise specified, operating temperature T<sub>A</sub> = 25°C.

| Parameter                                | Symbol           | Min. | Typ.             | Max. | Units            | Conditions                          | Fig. | Note |
|------------------------------------------|------------------|------|------------------|------|------------------|-------------------------------------|------|------|
| Input-Output Momentary Withstand Voltage | V <sub>ISO</sub> | 3750 |                  |      | V <sub>rms</sub> | RH ≤ 50%, t = 1 min                 |      | 1    |
| Input-Output Resistance                  | R <sub>I-O</sub> |      | 10 <sup>12</sup> |      | Ω                | V <sub>I-O</sub> = 500 Vdc          |      |      |
| Input-Output Capacitance                 | C <sub>I-O</sub> |      | 0.6              |      | pF               | f = 1 MHz; V <sub>I-O</sub> = 0 Vdc |      |      |

## Electrical Specifications (DC)

For operating T<sub>A</sub> = +25°C

| Parameter                       | Symbol          | Min. | Typ. | Max. | Units | Conditions                                  | Fig. | Note |
|---------------------------------|-----------------|------|------|------|-------|---------------------------------------------|------|------|
| Open Circuit Voltage            | V <sub>OC</sub> | 6.5  | 7    |      | V     | I <sub>F</sub> = 10mA, I <sub>O</sub> = 0mA |      |      |
| Short Circuit Current           | I <sub>SC</sub> | 15   | 20   |      | μA    | I <sub>F</sub> = 10mA, V <sub>O</sub> = 0V  |      |      |
| Input Reverse Breakdown Voltage | V <sub>R</sub>  | 5    |      |      | V     | I <sub>R</sub> = 10μA                       |      |      |
| Input Forward Voltage           | V <sub>F</sub>  | 1.1  | 1.3  | 1.7  | V     | I <sub>F</sub> = 10mA                       |      |      |

## Switching Specifications (AC)

For operating T<sub>A</sub> = +25°C

| Parameter     | Symbol           | Min. | Typ. | Max. | Units | Conditions                                  | Fig. | Note |
|---------------|------------------|------|------|------|-------|---------------------------------------------|------|------|
| Turn On Time  | T <sub>ON</sub>  |      | 0.28 |      | ms    | I <sub>F</sub> = 10mA, C <sub>L</sub> = 1nF |      |      |
| Turn Off Time | T <sub>OFF</sub> |      | 0.03 |      | ms    | I <sub>F</sub> = 10mA, C <sub>L</sub> = 1nF |      |      |

Note:

1. Device is considered as a two terminal device; pin 1, 2, 3, 4 shorted and pin 5, 6, 7, 8 shorted.

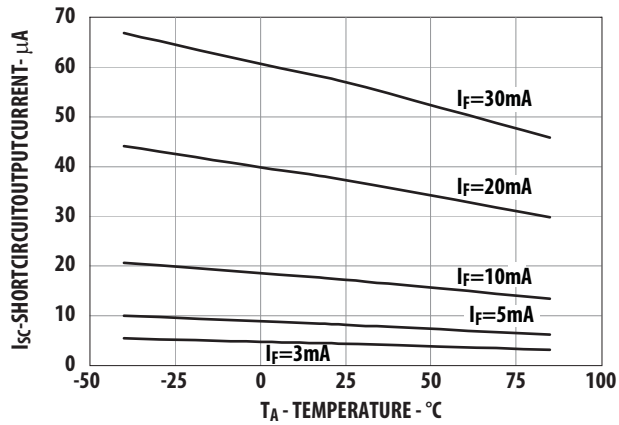


Figure 1. Short Circuit Output Current vs

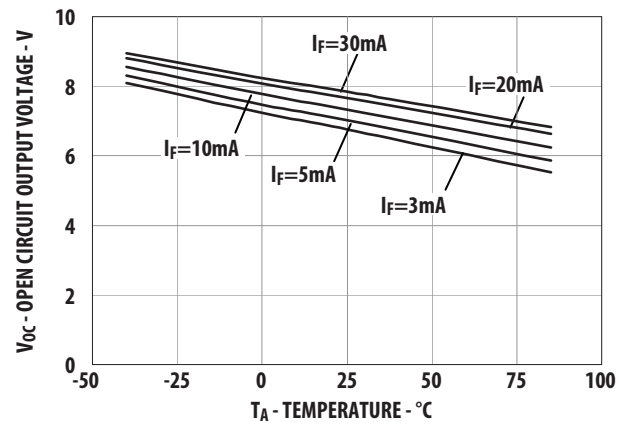


Figure 2. V<sub>OC</sub> vs Temperature

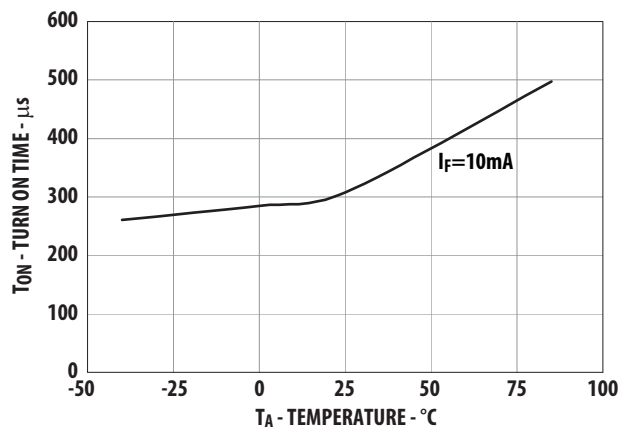


Figure 3. T<sub>ON</sub> vs Temperature

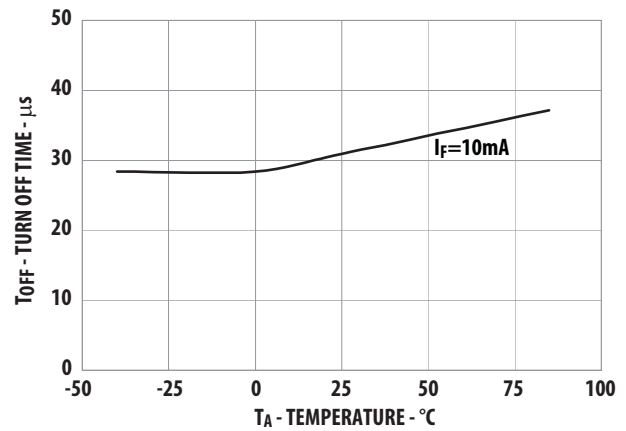


Figure 4. T<sub>OFF</sub> vs Temperature

For product information and a complete list of distributors, please go to our web site: [www.avagotech.com](http://www.avagotech.com)

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