



ORIENT

Photo MOS Product

Data Sheet

Part Number: OR-8XXA

Customer: _____

Date: _____

SHENZHEN ORIENT COMPONENTS CO., LTD

Block A 3rd Floor No.4 Building, Tian'an Cyber Park, Huangge Rd, LongGang Dist, Shenzhen, GD

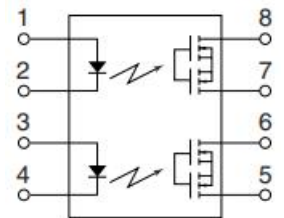
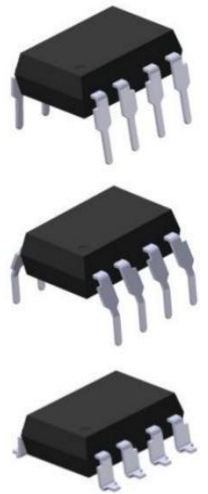
TEL: 0755-29681816

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www.orient-opto.com

1. Features

- (1) Compact 8-pin DIP size
- (2) Applicable for 2 Form A use as well as two independent 1Form A use
- (3) Controls low-level analog signals
- (4) High sensitivity and high speed response
- (5) Low-level off state leakage current of max. 1uA
- (6) Wide operating temperature range of -40°C to 85°C
- (7) High isolation voltage between input and output (Viso = 5000 Vrms)
- (8) Safety approval
 - UL approved(No.E323844)
 - VDE approved(No.40029733)
 - CQC approved (No.CQC19001231254)
- (9) In compliance with RoHS, REACH standards
- (10) MSL Level 1



2, 4 LED Cathode
8, 7, 6, 5 MOSFET

2. Description

The OR-806A, OR-825A, OR-840A and OR-860A are solid state relays containing an AlGaAs infrared LEDs on the light emitting side (input side) optically coupled to a high voltage output detector circuit. The detector consists of a photovoltaic diode array and MOSFETs on the output side. The dual channel configuration is equivalent to 1 form A EMR. They are packaged in 8 pin DIP and available in surface mount SMD option.

3. Application Range

- High-speed inspection machines
- Telephones equipment
- Computer

4. Absolute Maximum Ratings (Ta=25°C)*1

| Parameter | | Symbol | Rated Value | | | | Unit |
|-------------------------|-------------------------------|--------------------|-------------|---------|---------|---------|------------------|
| | | | OR-806A | OR-825A | OR-840A | OR-860A | |
| Input | Average Forward Input Current | I _F | 50 | | | | mA |
| | Reverse Input Voltage | V _R | 5 | | | | V |
| | Peak Forward Current*1 | I _{FP} | 1 | | | | A |
| | Power Dissipation | P _{IN} | 75 | | | | mW |
| Output | Break Down Voltage*2 | V _L | 60 | 250 | 400 | 600 | V |
| | Continuous Load Current*2 | I _L | 550 | 150 | 120 | 50 | mA |
| | Pulse Load Current*3 | I _{LPeak} | 1.2 | 0.5 | 0.3 | 0.15 | A |
| | Power Dissipation | P _{out} | 800 | | | | mW |
| Total Power Dissipation | | P _T | 850 | | | | mW |
| Isolation Voltage*4 | | V _{iso} | 5000 | | | | V _{rms} |
| Operating Temperature | | T _{OPR} | -40 ~ + 85 | | | | °C |
| Storage Temperature | | T _{STG} | -40 ~ + 125 | | | | |
| Soldering Temperature*5 | | T _{SOL} | 260 | | | | |

Notes:

*1. f=100Hz, Duty Cycle = 0.1%

*2. Indicate the peak AC and DC values

 *3. A connection: 100ms (1 shot), V_L = DC or Peak AC

*4. AC for 1 minute, R.H. = 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

*5. For 10 seconds Opto-electronic Characteristics

5. Electro-Optical Characteristics (Ta=25°C unless specified otherwise)

| Parameter | | Symbol | Min. | Typ. | Max. | Unit | Condition | |
|--------------------------|---------------------------|---------------------|--------------------|--------------------|------|------|---|--|
| Input | Forward Voltage | V _F | --- | 1.18 | 1.5 | V | I _F = 10mA | |
| | Reverse Current | I _R | --- | --- | 1 | μA | V _R = 5V | |
| Output | Off State leakage Current | I _{leak} | --- | --- | 1 | μA | I _F = 0mA, V _L = Max. | |
| | On Resistance | R _{d(ON)} | OR-806A | --- | 0.7 | 2.5 | Ω | I _F = 10mA, I _L = Max, t = 1s |
| | | | OR-825A | --- | 6.5 | 15 | | |
| | | | OR-840A | --- | 20 | 30 | | |
| | | | OR-860A | --- | 40 | 70 | | |
| | Output Capacitance | C(out) | OR-806A | --- | 85 | --- | pF | V _L = 0V, f = 1MHz |
| | | | OR-825A | --- | 60 | --- | | |
| | | | OR-840A | --- | 45 | --- | | |
| OR-860A | | | --- | 30 | --- | | | |
| Transfer Characteristics | LED turn on Current | I _{F(on)} | OR-806A | --- | 1 | 3 | mA | I _L = Max. |
| | | | OR-825A | --- | 1.1 | 3 | | |
| | | | OR-840A | --- | 1.25 | 3 | | |
| | | | OR-860A | --- | 0.9 | 3 | | |
| | LED turn off Current | I _{F(off)} | OR-806A | 0.4 | 0.9 | --- | mA | I _L = Max. |
| | | | OR-825A | 0.4 | 1.0 | --- | | |
| | | | OR-840A | 0.4 | 1.15 | --- | | |
| | | | OR-860A | 0.4 | 0.8 | --- | | |
| | Turn On Time | T _{on} | OR-806A | --- | 0.25 | 1 | ms | I _F = 10mA, I _L = Max, R _L = 200Ω |
| | | | OR-825A | --- | 0.25 | 1 | | |
| | | | OR-840A | --- | 0.25 | 1 | | |
| | | | OR-860A | --- | 0.25 | 1 | | |
| | Turn Off Time | T _{off} | OR-806A | --- | 0.05 | 0.5 | ms | I _F = 10mA, I _L = Max, R _L = 200Ω |
| | | | OR-825A | --- | 0.05 | 0.5 | | |
| | | | OR-840A | --- | 0.05 | 0.5 | | |
| | | | OR-860A | --- | 0.05 | 0.5 | | |
| Isolation Resistance | | R _{I-O} | 5×10 ¹⁰ | 1×10 ¹² | --- | Ω | V _{I-O} = 500V DC | |
| Isolation Capacitance | | C _{I-O} | --- | 1.5 | --- | pF | V = 0V, f = 1MHz | |

6. Order Information

Part Number

OR-8XXAU-Y-Z

Note

8XXA = Part Number. (806A ,825A ,840A or 860A)

U = Lead form option (S, M or none)

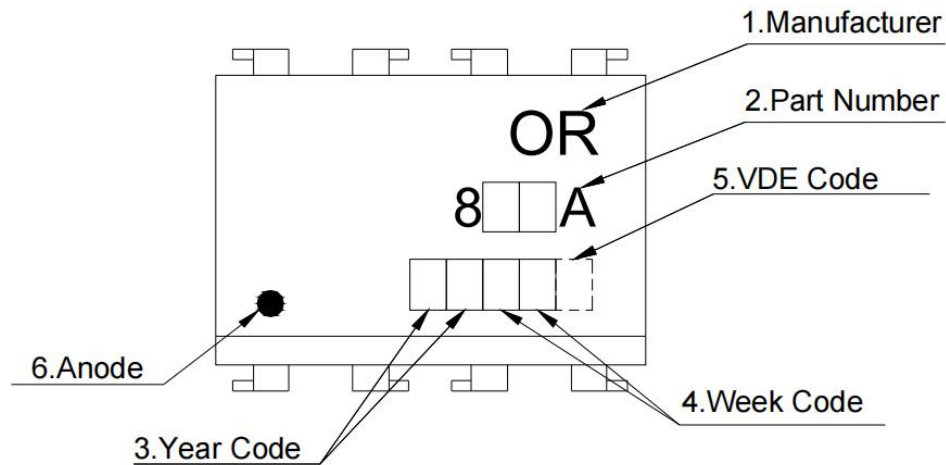
Y = Tape and reel option (TA,TA1 or none).

Z = 'V' code for VDE safety (This options is not necessary).

* VDE Code can be selected.

| Option | Description | Packing quantity |
|--------|--|---------------------|
| None | Standard SMD Option | 45 units per tube |
| M | Wide lead bend (0.4 inch spacing) | 45 units per tube |
| TA | Surface mount lead form (low profile) + TA tape & reel option | 1000 units per reel |
| TA1 | Surface mount lead form (low profile) + TA1 tape & reel option | 1000 units per reel |

7. Naming Rule

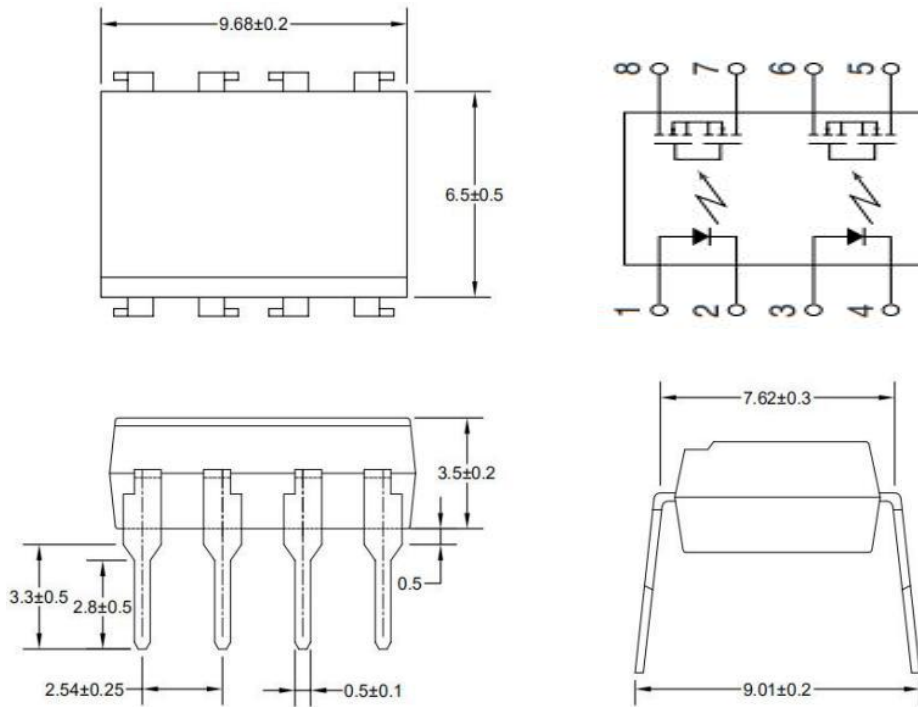


NOTE:

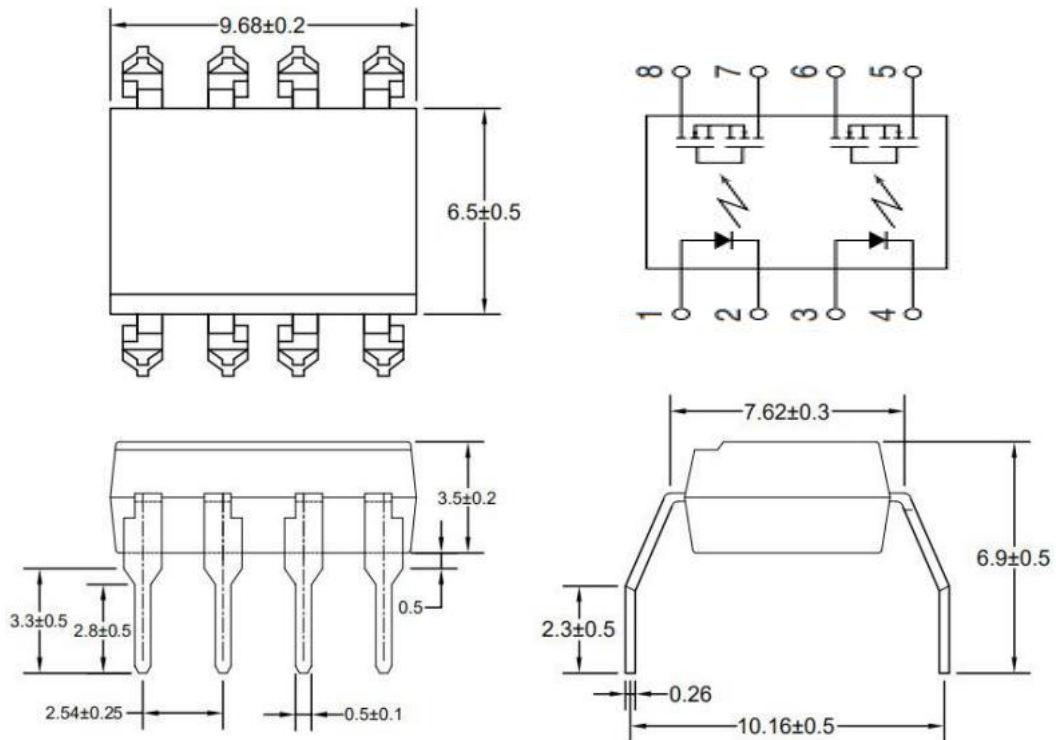
1. Manufacturer : ORIENT.
2. Part Number : 806A, 825A, 840A or 860A.
3. Year Code : '21' means '2021' and so on.
4. Week Code : 01 represents the first week, 02 represents the second week, and so on.
5. VDE Code . (Optional)
6. Anode.

8. Outer Dimension

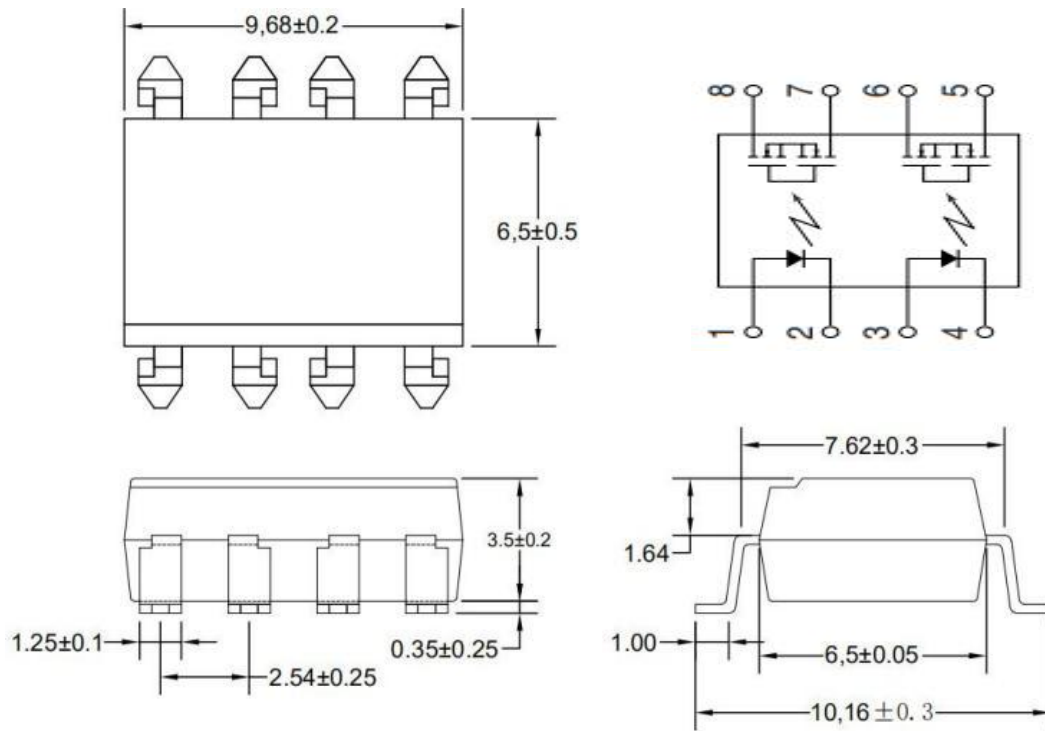
(1) OR-8XXA



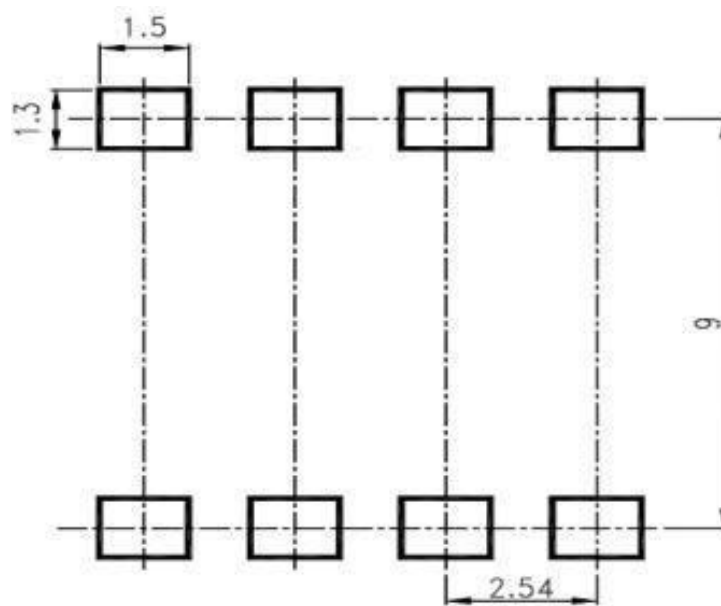
(2) OR-8XXAM



(3) OR-8XXAS



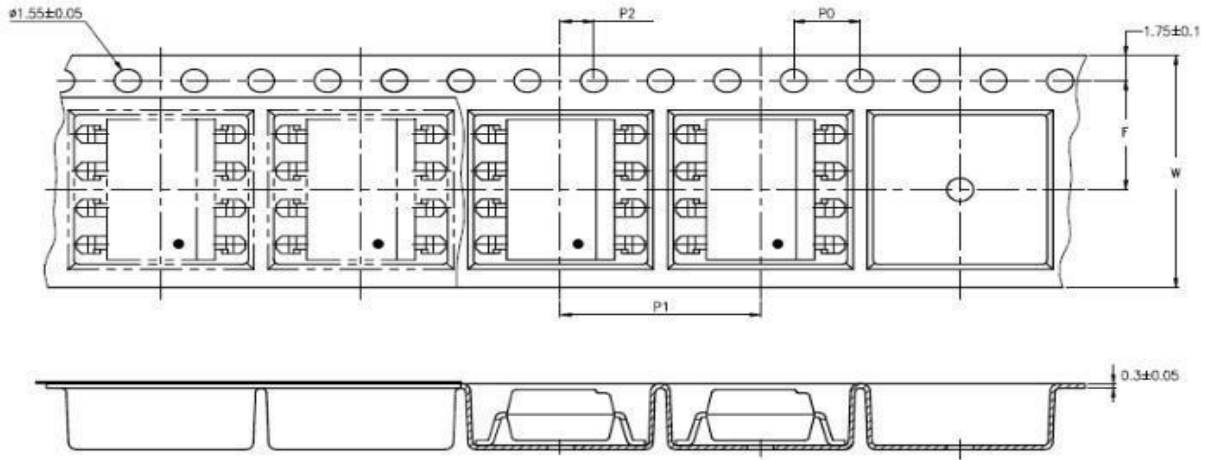
9. Recommended Foot Print Patterns (Mount Pad)



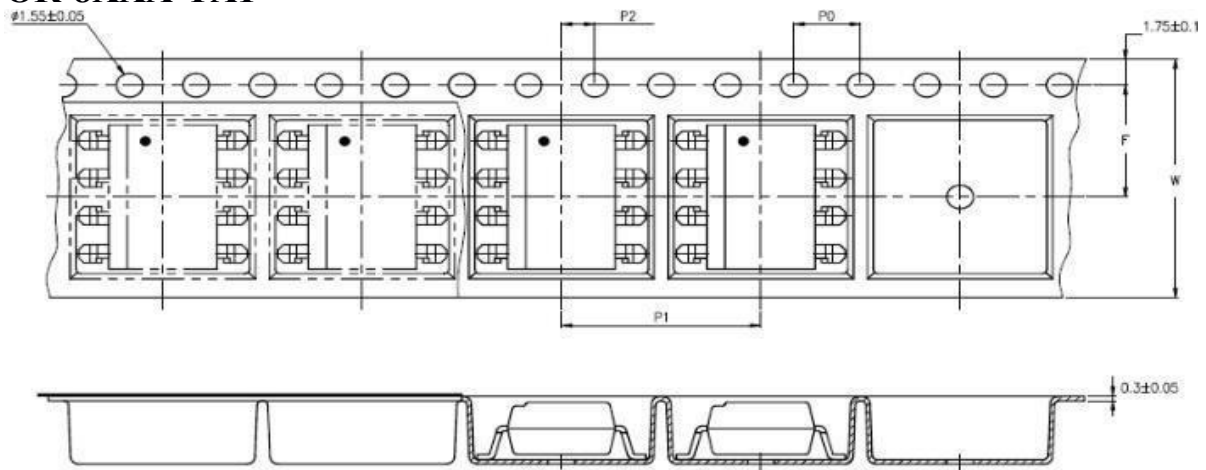
(unit: mm)

10. Taping Dimensions

(1) OR-8XXA-TA



(2) OR-8XXA-TA1



| type | symbol | Size: mm (inches) |
|-----------|--------|-------------------|
| bandwidth | W | 16±0.3 (0.63) |
| pitch | P0 | 4±0.1 (0.15) |
| | F | 7.5±0.1 (0.295) |
| interval | P2 | 2±0.1 (0.079) |
| | P1 | 12±0.1 (0.472) |

| Encapsulation type | TA/TA1 |
|--------------------|--------|
| Amount (pcs) | 1000 |

11. Package Dimension

(1) package dimension

DIP/M type

| Packing Information | |
|-----------------------------|---------------|
| Packing type | Tube |
| Qty per Tube | 45pcs |
| Small box (Inner) Dimension | 525*128*60mm |
| Large box (Outer) Dimension | 545*290*335mm |
| The Amount per Inner Box | 2,250pcs |
| The Amount per Outer Box | 22,500pcs |

SOP type

| Packing Information | |
|-----------------------------|----------------|
| Packing type | Reel type |
| Tape Width | 16mm |
| Qty per Reel | 1,000pcs |
| Small box (inner) Dimension | 345*345*58.5mm |
| Large box (Outer) Dimension | 620x360x360mm |
| Max qty per small box | 2,000pcs |
| Max qty per large box | 20,000pcs |

(2)Packing Label Sample



The label features the ORIENT logo and company name at the top left. It includes several certification logos: VDE, UL, and RoHS REACH. The label contains the following text and barcodes:

- Material Code : 120PCXXXXXX
- P/N : OR-XXXXXX
- Lot No. : XXXXXX-XXXX-TX-X
- D/C : XXXX
- Qty : XXXX PCS

Two boxes are provided for labeling: 内箱码 (Inner Box Code) and 外箱码 (Outer Box Code). At the bottom, it displays a long alphanumeric string: "XXXXXXXXXXXXXXXX" (一体机序列码) and "Made in China".

Note:

1. Material Code :Product ID.
2. P/N :Contents with "Order Information" in the specification.
3. Lot No. :Product data.
4. D/C :Product weeks.
5. Quantity :Packaging quantity.

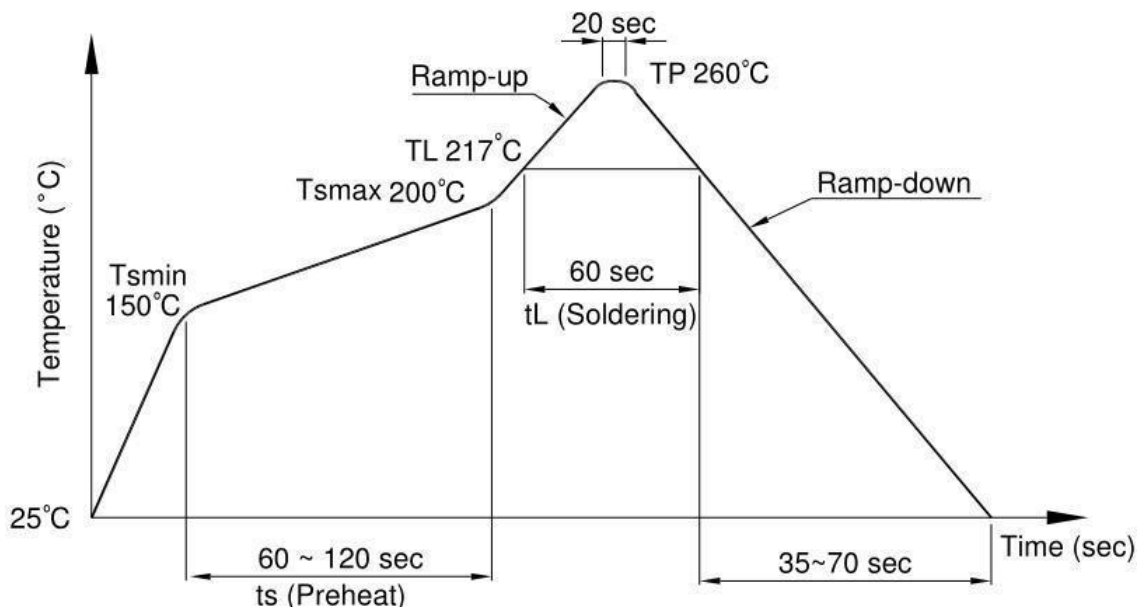
12. Temperature Profile Of Soldering

1. IR Reflow soldering (JEDEC-STD-020C compliant)

One time soldering reflow is recommended within the condition of temperature and time profile shown below.

Do not solder more than three times.

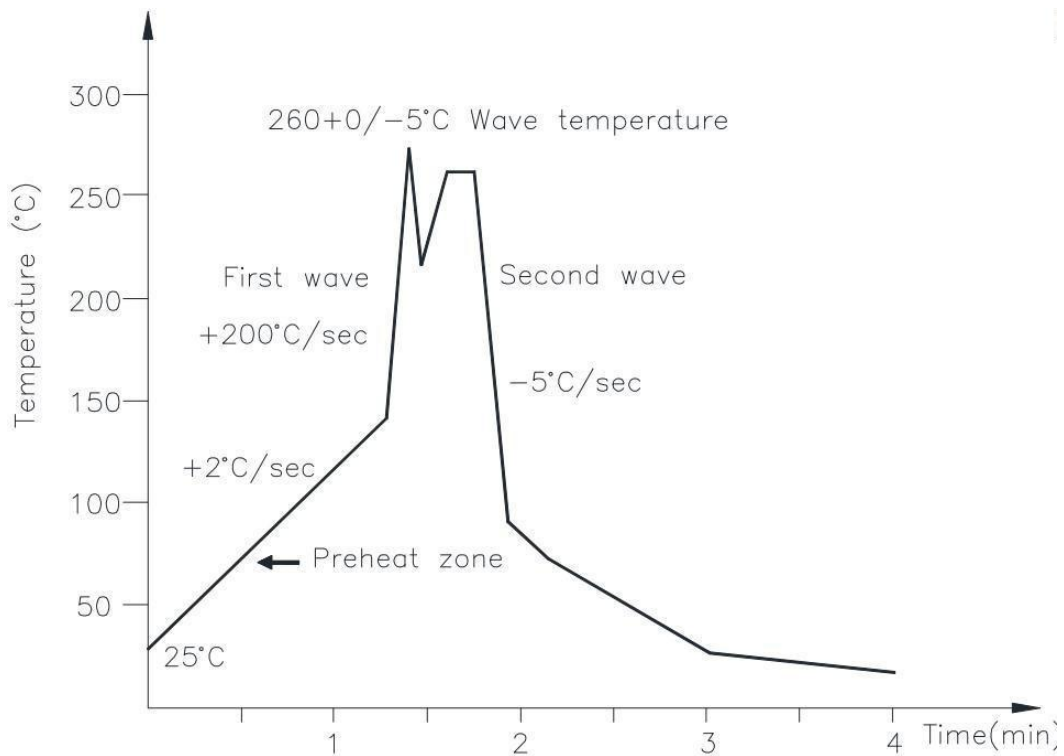
| Profile item | Conditions |
|--------------------------------------|----------------|
| Preheat | |
| - Temperature Min (T Smin) | 150°C |
| - Temperature Max (T Smax) | 200°C |
| - Time (min to max) (ts) | 90±30 sec |
| Soldering zone | |
| - Temperature (TL) | 217°C |
| - Time (t L) | 60 sec |
| Peak Temperature | 260°C |
| Peak Temperature time | 20 sec |
| Ramp-up rate | 3°C / sec max. |
| Ramp-down rate from peak temperature | 3~6°C / sec |
| Reflow times | ≤3 |



13. Wave soldering (JEDEC22A111 compliant)

One time soldering is recommended within the condition of temperature.

| | |
|---------------------|--------------|
| Temperature | 260+0/-5°C |
| Time | 10 sec |
| Preheat temperature | 5 to 140°C |
| Preheat time | 30 to 80 sec |



2. Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

| | |
|-------------|------------|
| Temperature | 380+0/-5°C |
| Time | 3 sec max |

14. Typical Electro-Optical Characteristics Curves

Figure 1-1. Load current vs Ambient temperature

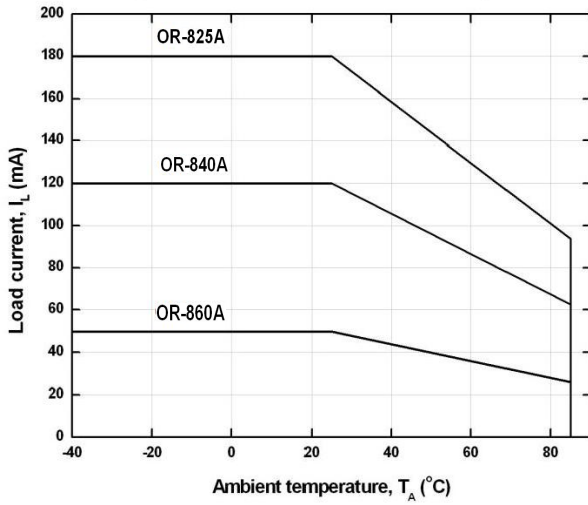


Figure 1-2. Load current vs Ambient temperature

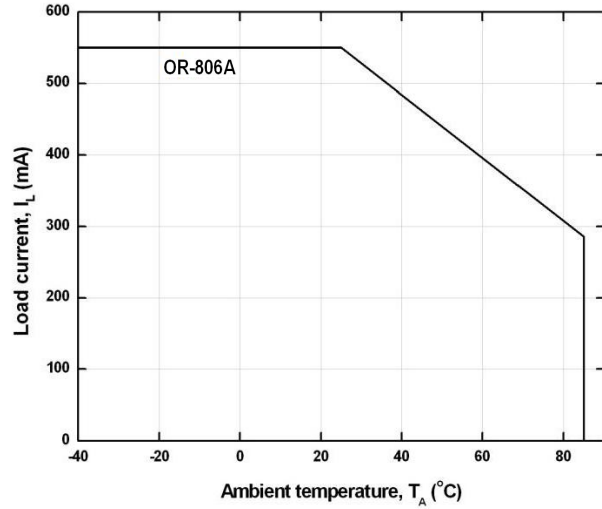


Figure 2-1. On Resistance vs Ambient Temperature

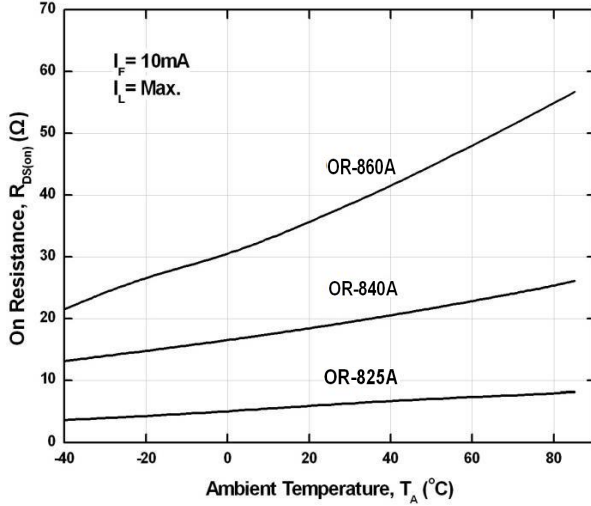


Figure 2-2. On Resistance vs Ambient Temperature

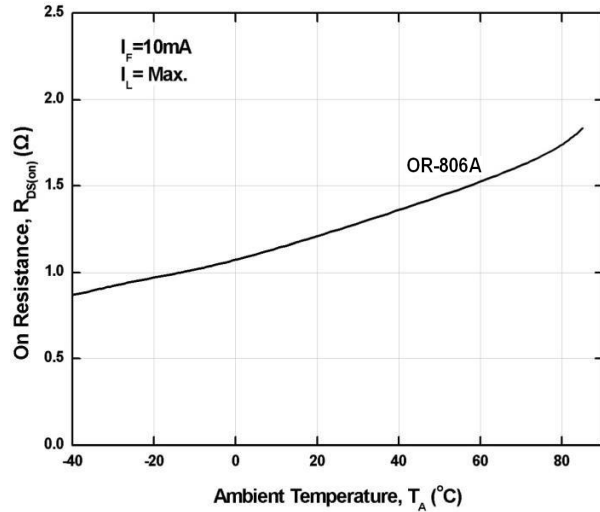


Figure 3. Switching Time vs Ambient Temperature

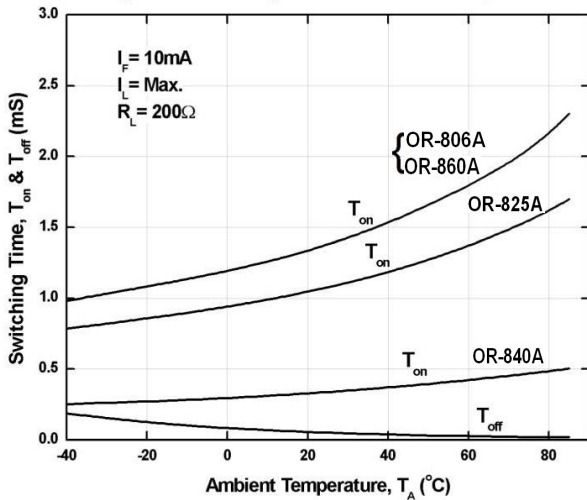


Figure 4-1. Turn On Time vs LED Forward Current

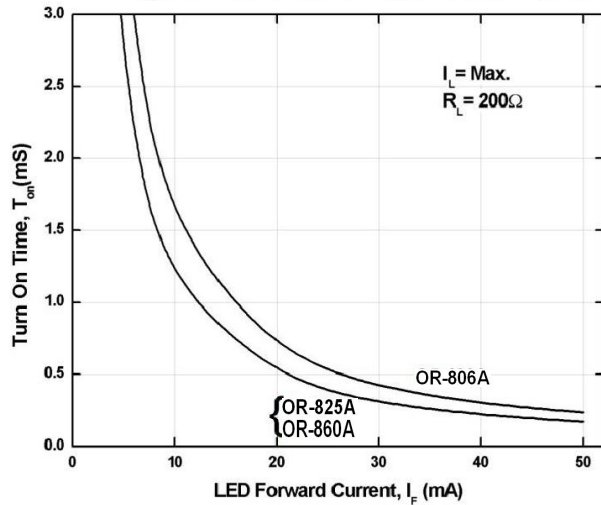


Figure 4-2. Turn On Time vs LED Forward Current

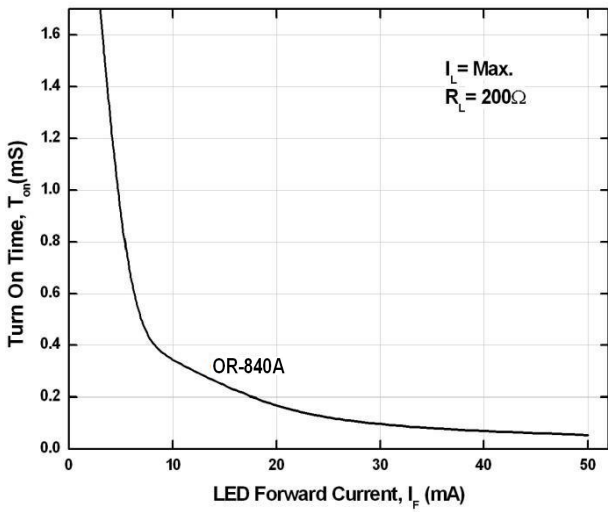


Figure 5. Turn Off Time vs LED Forward Current

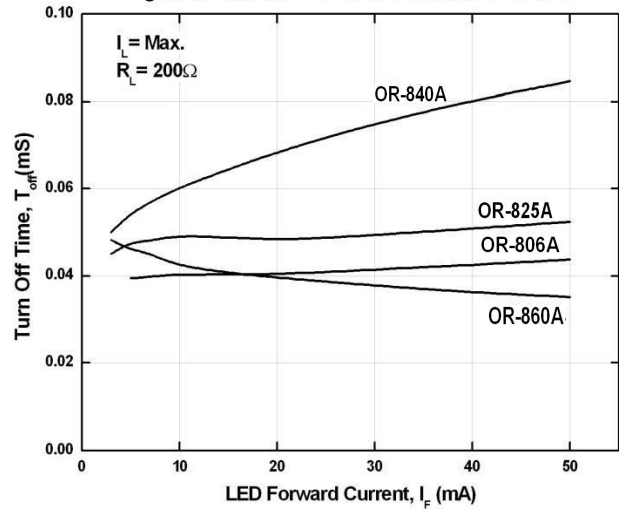


Figure 6. Normalized LED Operate on Current vs Ambient Temperature

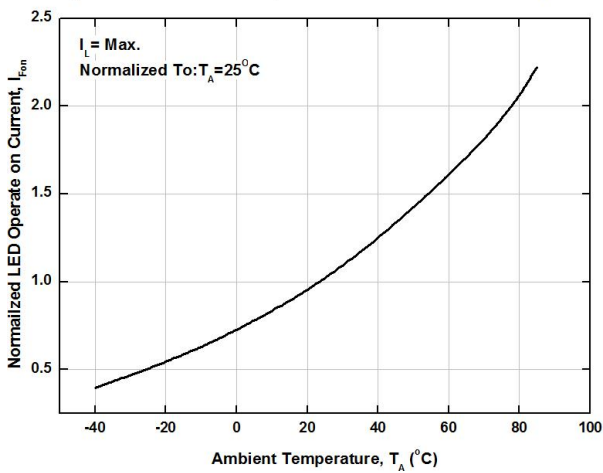


Figure 7. Normalized LED Turn off Current vs Ambient Temperature

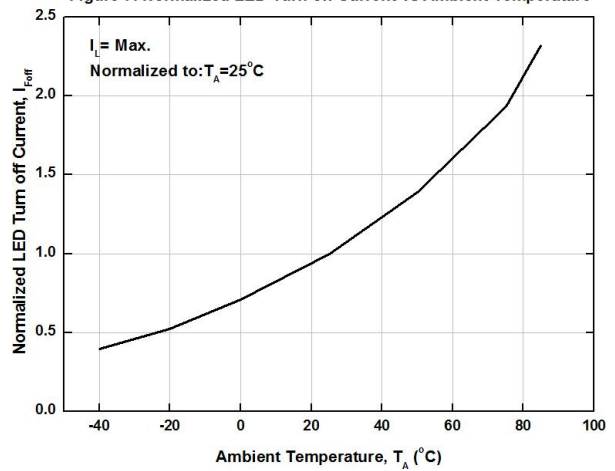


Figure 8. LED Dropout Voltage vs Ambient Temperature

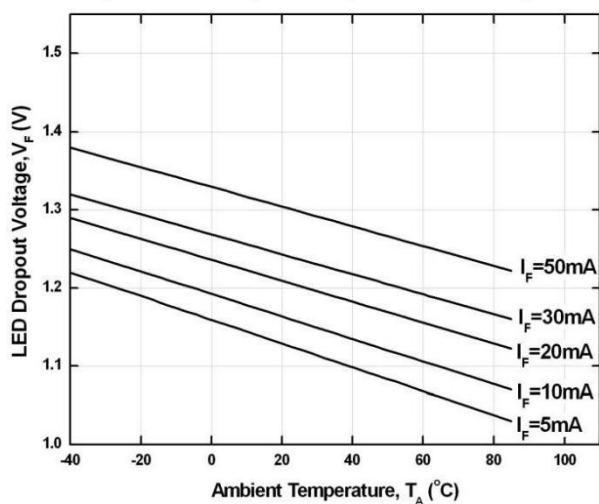


Figure 9-1. Load Voltage vs Load Current

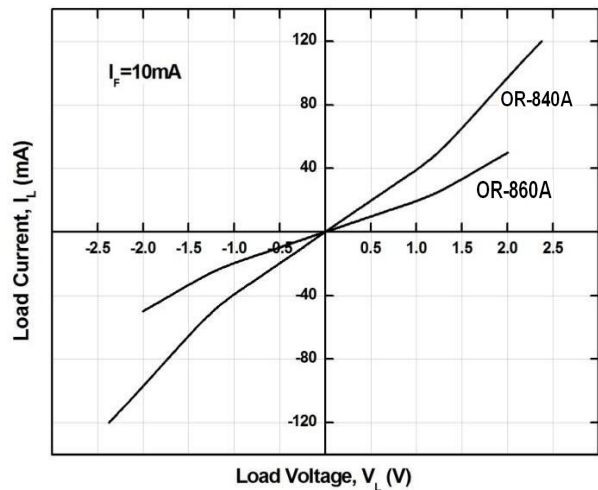


Figure 9-2. Load Voltage vs Load Current

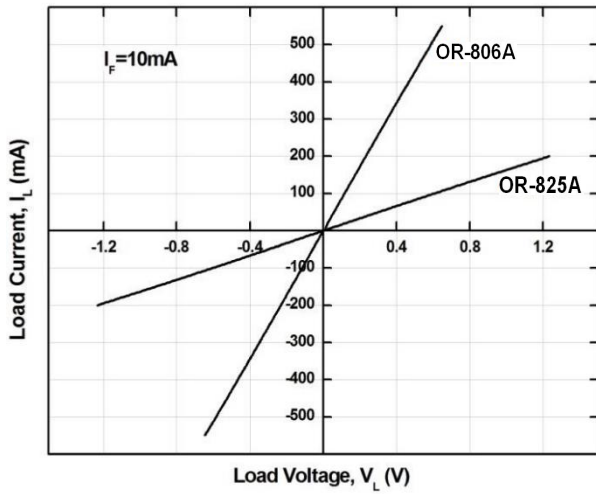


Figure 10. Off State Leakage Current vs Load Voltage

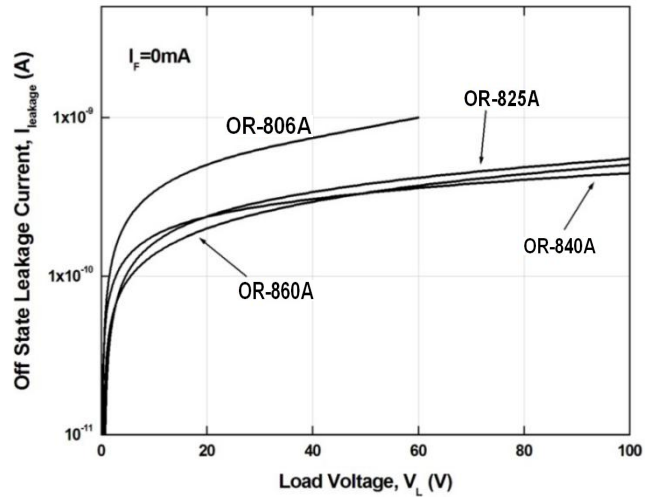
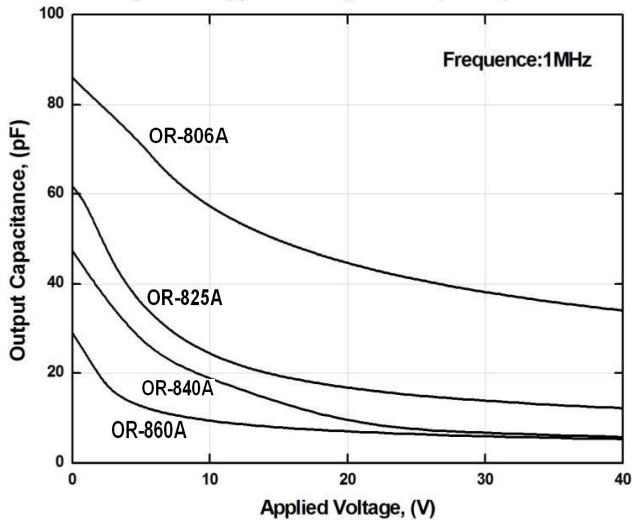


Figure 11. Applied Voltage VS Output Capacitance



Turn on/Turn off Time

