



ORIENT

Photo coupler

Product Data Sheet

Part Number: OR-AQV258HP5

Customer: _____

Date: _____

SHENZHEN ORIENT COMPONENTS CO., LTD

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

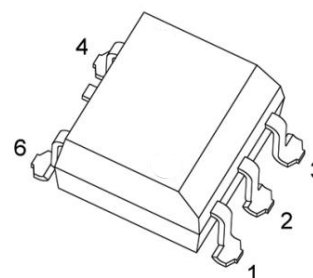
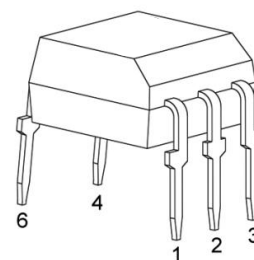
TEL: 0755-29681816

FAX: 0755-29681200

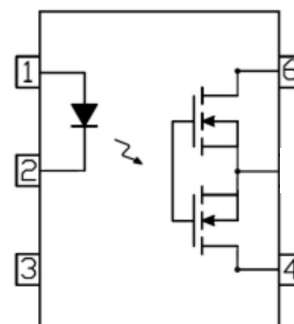
www.orient-opto.com

1. Features

- (1) Battery Control in Automotive Equipment
- (2) Fuel Battery Control in Automotive Equipment
- (3) Application for Electrical Vehicle
- (4) Normally open signal pole signal throw relay
- (5) 1 Form A
- (6) SiC MOSFET Output
- (7) Low operating current
- (8) 1,500V load voltage
- (9) Low on resistance
- (10) Wide operating temperature range of -40°C to 125°C
- (11) High I/O isolation voltage of 5,000 V available
- (12) Safety approval
 - UL approved(No.E323844)
 - VDE approved(No.40029733)
 - CQC approved (No.CQC19001231480)
- (13) In compliance with RoHS, REACH standards
- (14) MSL Level 1



Schematic



Pin Configuration

- 1, LED Anode
- 2, LED Cathode
- 4, 6, MOSFET Drain

2. Description

The OR-AQV258HP5 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 MOSFET on the output side. They can enable AC/DC output connections. The single channel configuration is equivalent to 1 form A EMR. They are packaged in 6 pin DIP and available in surface mount SMD option.

3. Application Range

- Measuring instruments
- Data communication equipment
- Telephone equipment
- Automatic meter reading device
- Security

4. Absolute Maximum Ratings (Ta=25°C, unless otherwise specified)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I _F	50	mA
	Reverse Voltage	V _R	10	V
	Peak Forward Current* ¹	I _{FP}	1	A
	Power Dissipation	P _{in}	75	mW
Output	Load voltage (peak AC)	V _L	1500	V
	Continuous Load Current	I _L	60	mA
	Pulse Load Current* ²	I _{Peak}	80	mA
	Power Dissipation	P _{out}	360	mW
Total Power Dissipation		P _T	410	mW
Isolation Voltage* ³		V _{iso}	5000	V _{rms}
Storage Temperature		T _{STG}	-40 to 125	°C
Operating Temperature		T _{OPR}	-40 to 125	°C
Soldering Temperature* ⁴		T _{SOL}	260	°C

Notes:

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

*2. A connection: 100ms (1 shot), V_I = DC

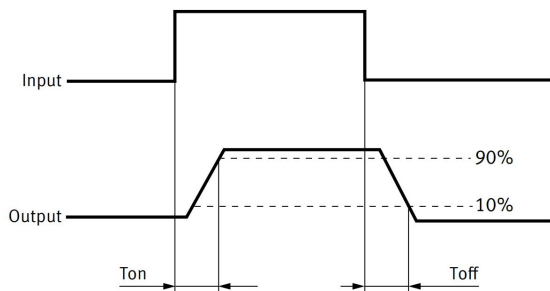
*3. AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1,2, 3 are shorted together, and pins 4, 6 are shorted together.

*4. For 10 seconds

5. Electrical Optical Characteristics at Ta=25°C

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Input	Forward Voltage	VF	---	1.15	1.5	V	IF = 10mA
	Reverse Current	IR	---	---	10	μA	VR = 10V
Output	Off State leakage Current	Ileak	---	---	10	μA	IF = 0mA, VL = Max.
	On Resistance	Rd(ON)	---	50	100	Ω	IF = 5mA, IL = Max, t = 1s
	Output Capacitance	C(out)	---	85	---	pF	VL = 0V, f = 1MHz
Transfer Characteristics	LED turn on Current	IF(on)	---	1.8	3	mA	IL = Max.
	LED turn off Current	IF(off)	0.4	1.7	---	mA	IL = Max.
	Turn On Time*	Ton	---	1.2	2	ms	IF = 5mA, IL = Max,
	Turn Off Time*	Toff	---	0.06	0.2		
	Isolation Resistance	RI-O	5×10 ¹⁰	1×10 ¹²	---	Ω	V I-O = 500V DC
	Isolation Capacitance	CI-O	---	1.5	---	pF	V = 0V, f = 1MHz

*Turn on/Turn off time



6. Order Information

Part Number

OR-AQV258HP5U-Y-Z

Note

AQV258HP5 = Part Number

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

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

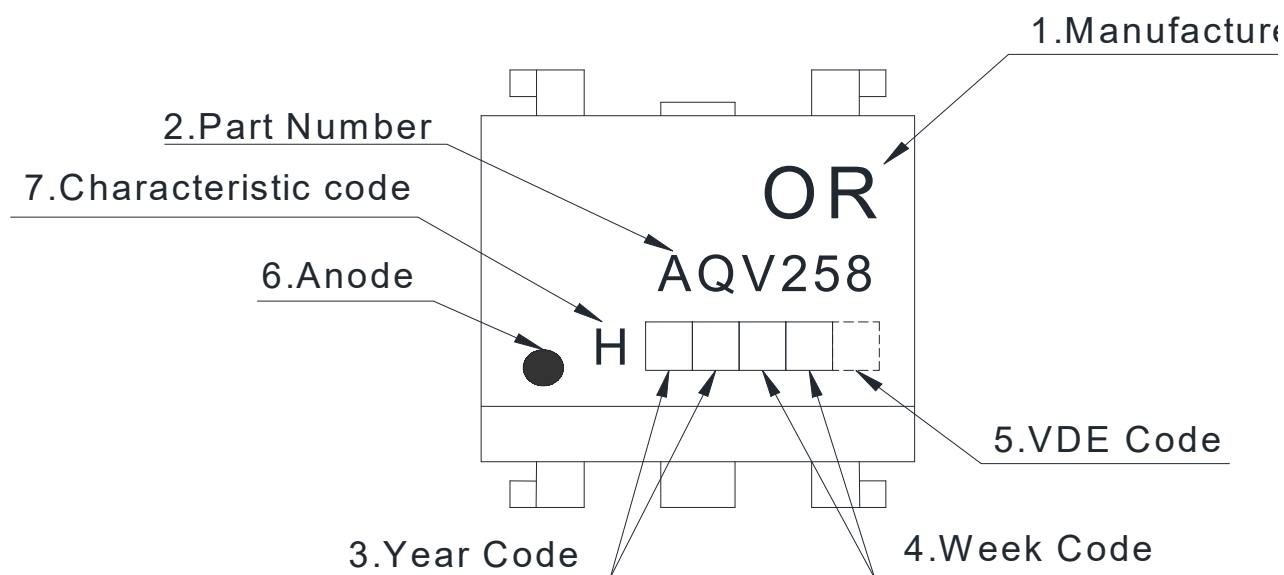
Z = 'V' code for VDE safety (This options is not necessary).

(BYD) = Customer Code.

* VDE Code can be selected.

Option	Description	Packing quantity
None	Standard DIP-5	66 units per tube
M	Wide lead bend (0.4 inch spacing)	66 units per tube
S(TA)	Surface mount lead form (low profile) + TA tape & reel option	1000 units per reel
S(TA1)	Surface mount lead form (low profile) + TA1 tape & reel option	1000 units per reel

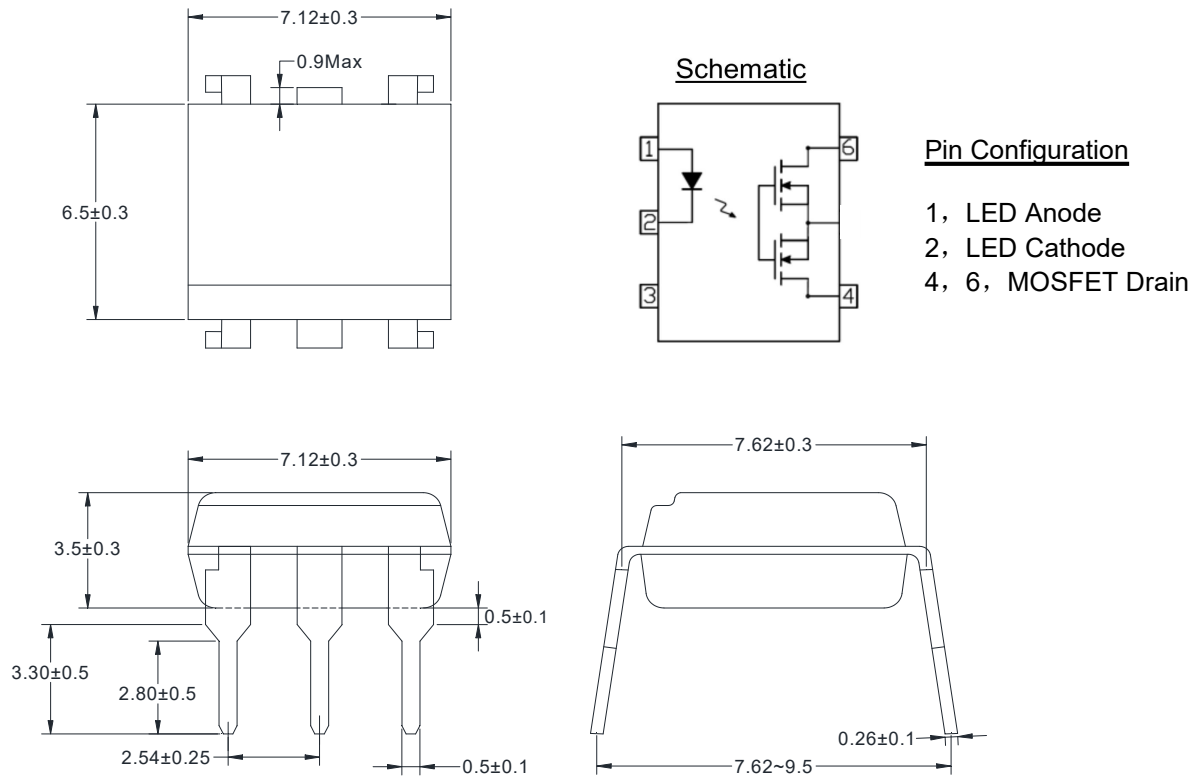
7. Naming Rule



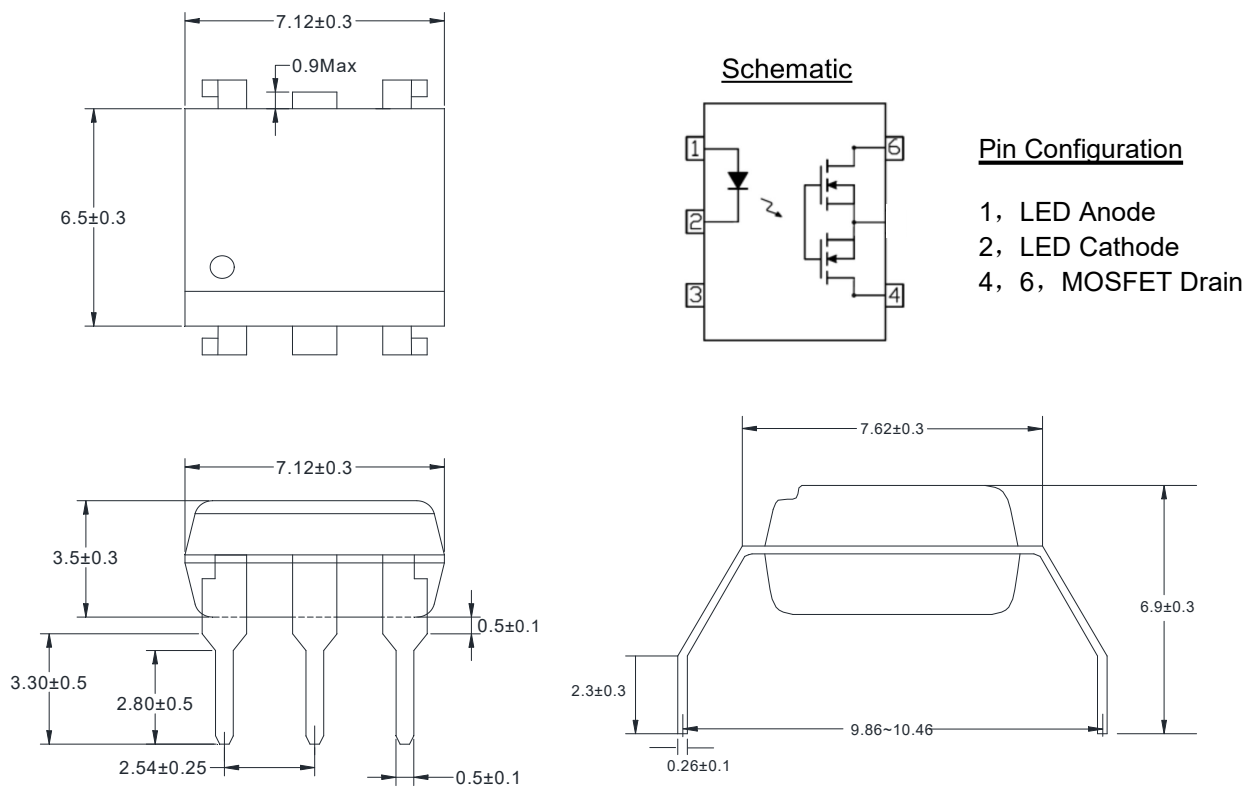
1. Manufacturer : ORIENT.
2. Part Number : AQV258H
3. Year Code : '22' means '2022' and so on.
4. Week Code : 01 means the first week, 02 means the second week and so on.
5. VDE Code : (Optional)
6. Anode.
7. Characteristic code: H

8. Package Dimension

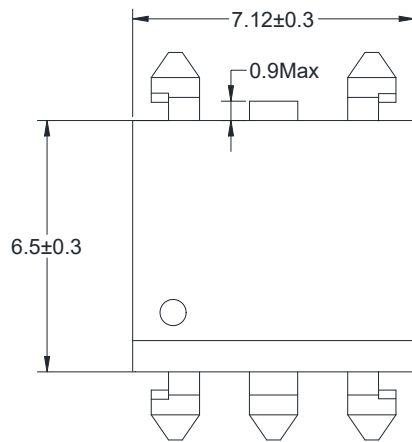
(1).OR-AQV258HP5



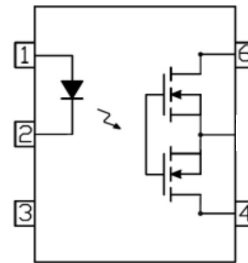
(2).OR-AQV258HP5M



(3).OR-AQV258HP5S

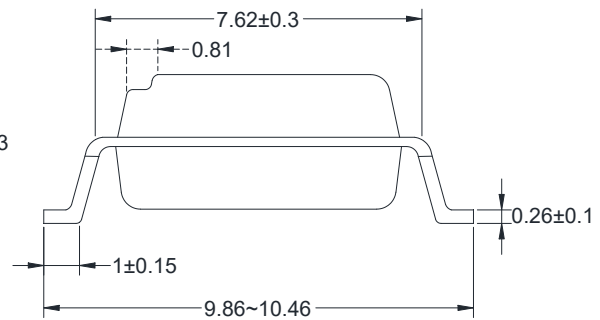
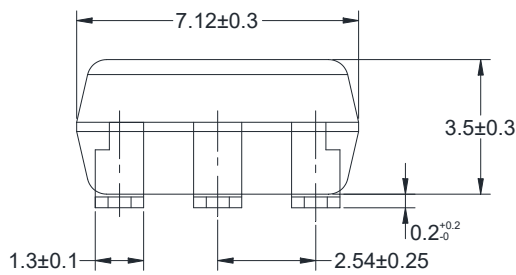


Schematic

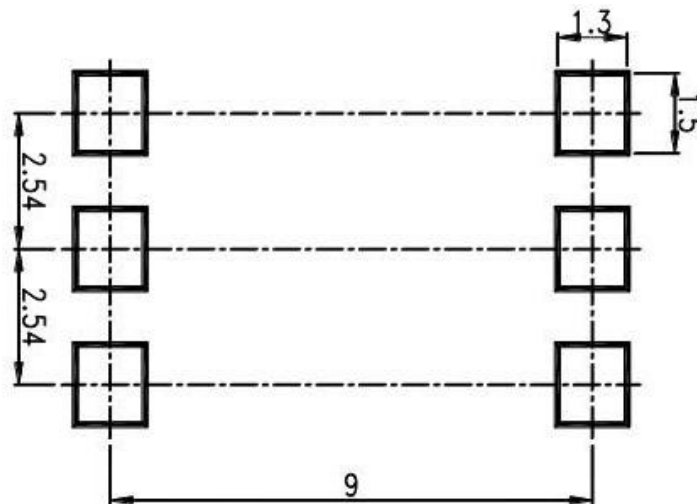


Pin Configuration

- 1, LED Anode
- 2, LED Cathode
- 4, 6, MOSFET Drain



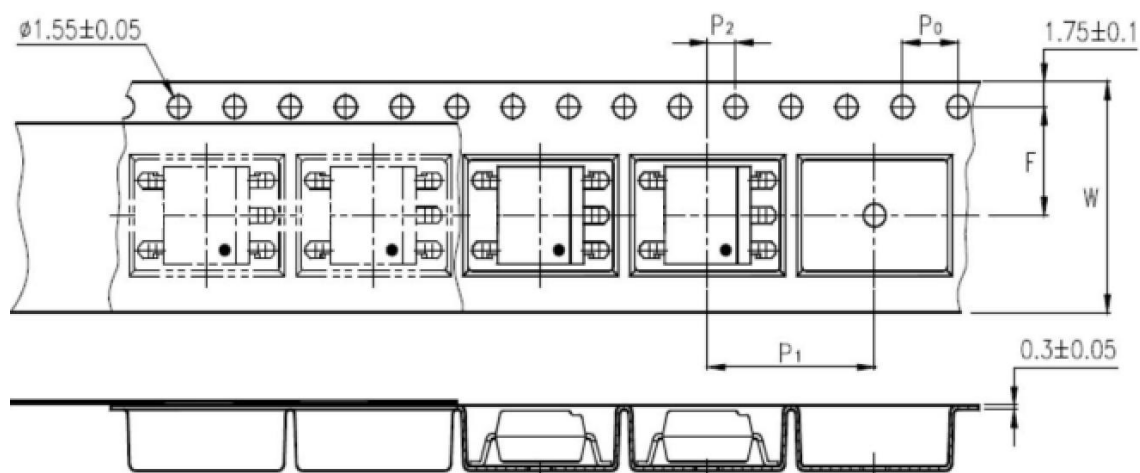
9. Recommended pad layout for surface mount leadform



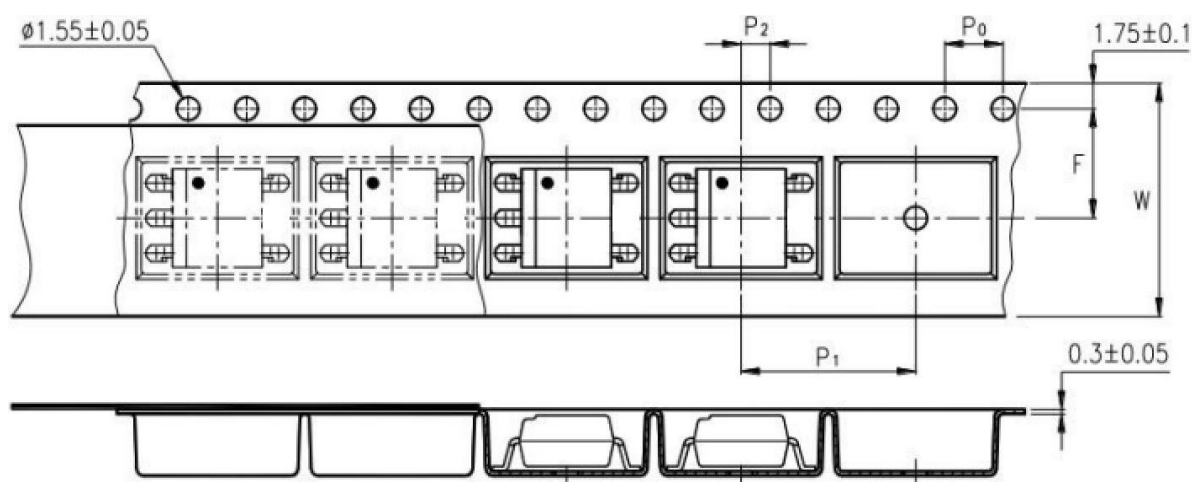
Unit: mm

10. Taping Dimensions

(1).OR-AQV258HP5S-TA



(2).OR-AQV258HP5S-TA1



Description	Symbol	Dimension in mm (inch)
Tape wide	W	16±0.3 (0.63)
Pitch of sprocket holes	P ₀	4±0.1 (0.15)
Distance of compartment	F	7.5±0.1 (0.295)
	P ₂	2±0.1 (0.079)
Distance of compartment to compartment	P ₁	12±0.1 (0.472)

Package Type	TA/TA1
Quantities(pcs)	1000

11. Package Dimension

(1) package dimension

DIP/M type

Packing Information	
Packing type	Tube
Qty per Tube	66pcs
Small box (Inner) Dimension	525*128*60mm
Large box (Outer) Dimension	545*290*335mm
The Amount per Inner Box	3,300pcs
The Amount per Outer Box	33,000pcs

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






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

内箱码

外箱码

“XXXXXXXXXXXXXXXX” (一体机序列码)
Made in China

Note:

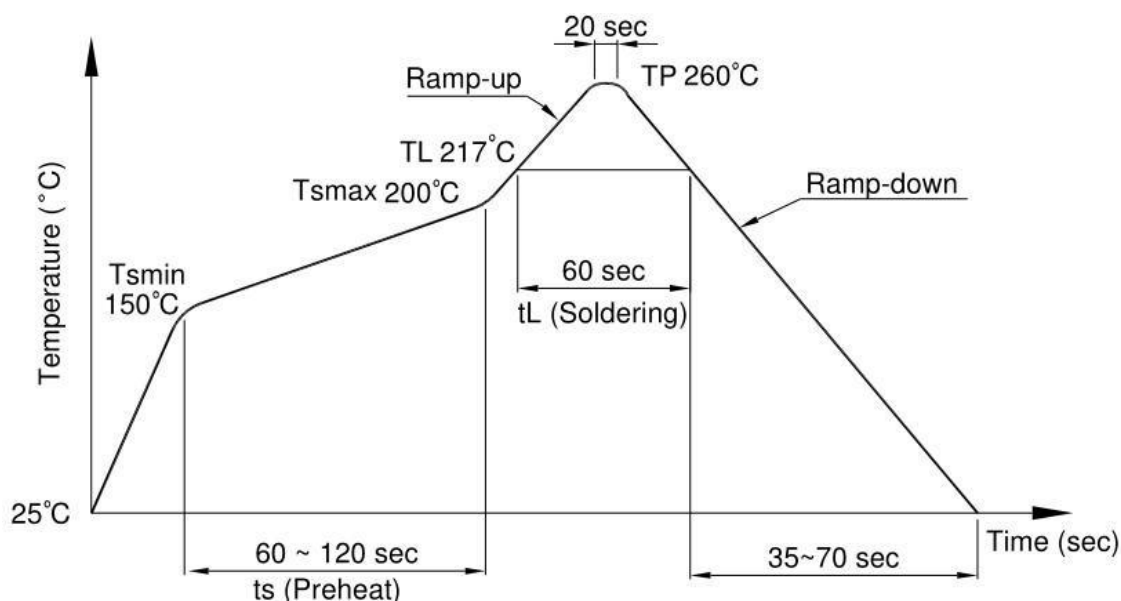
1. Material Code :Product ID.
2. P/N :Contents with "Order Information" in the specification.
3. Lot No. :Product data.
4. D/C :Product weeks.
5. Quantity :Packaging quantity.

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.

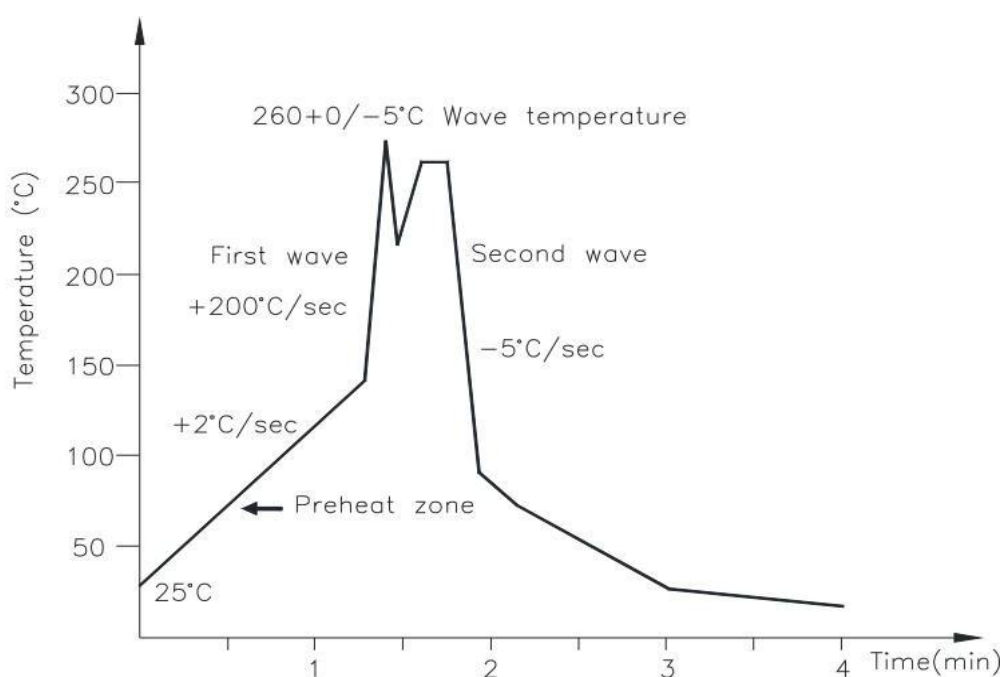
Profile item	Conditions
Preheat	
- Temperature Min (T Smin)	150°C
- Temperature Max (T Smax)	200°C
- Time (min to max) (ts)	90±30 sec
Soldering zone	
- Temperature (TL)	217°C
- Time (t L)	60 sec
Peak Temperature	260°C
Peak Temperature time	20 sec
Ramp-up rate	3°C / sec max.
Ramp-down rate from peak temperature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



(3).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



(3).Hand soldering by soldering iron

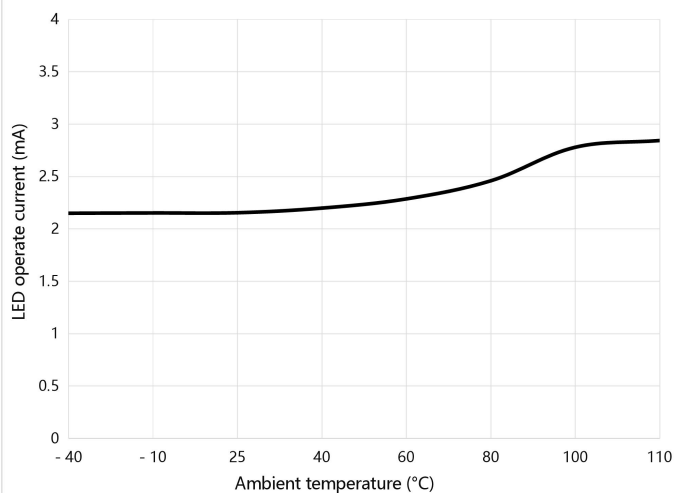
Allow single lead soldering in every single process. One time soldering is recommended.

Temperature	380+0/-5°C
Time	3 sec max

13. Typical Electro-Optical Characteristics Curves

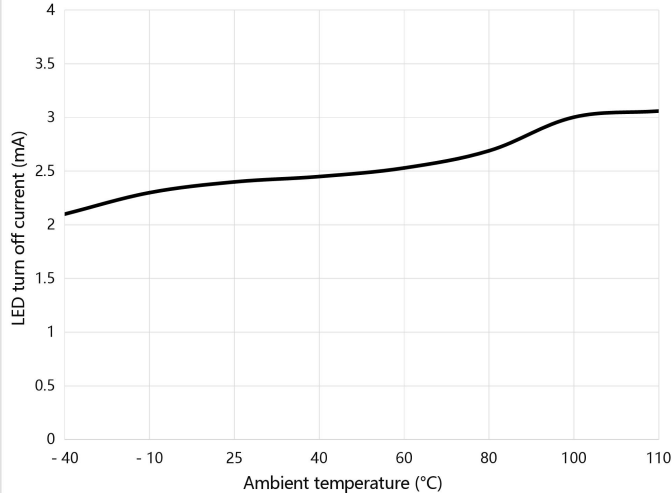
1. LED operate current vs. Ambient Temperature

(Test Condition: IL = 20 mA)



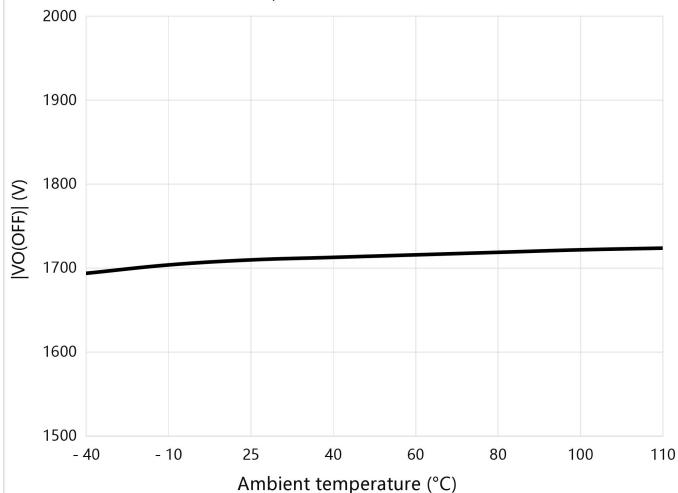
2. LED turn off current vs. Ambient Temperature

(Test Condition: IL = 20 mA)



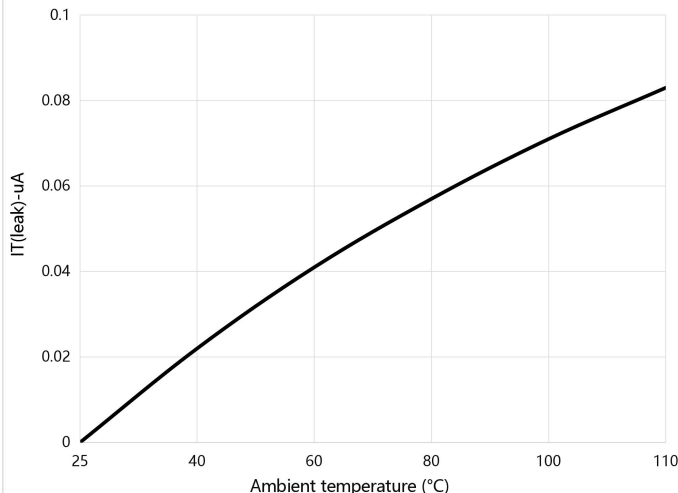
3. |VO(OFF)| vs. Ambient Temperature

(Test Condition: IO = 250 μA)



4. IT(Leak) vs. Ambient Temperature

(Test Condition: VL = 1000V)

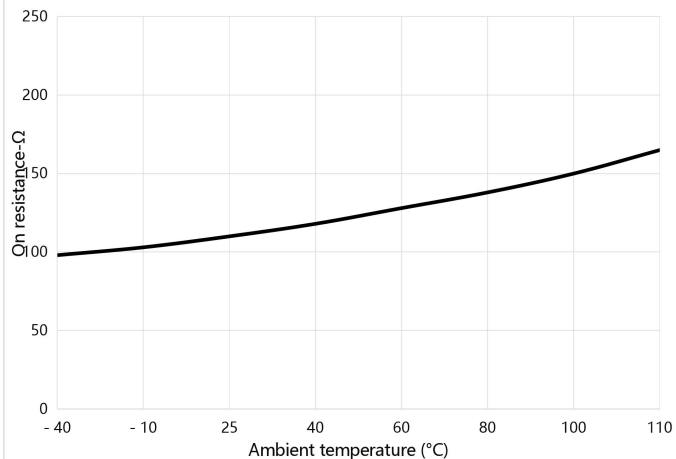


5. On resistance vs. Ambient Temperature

Allowable ambient temperature: -40 to +110°C

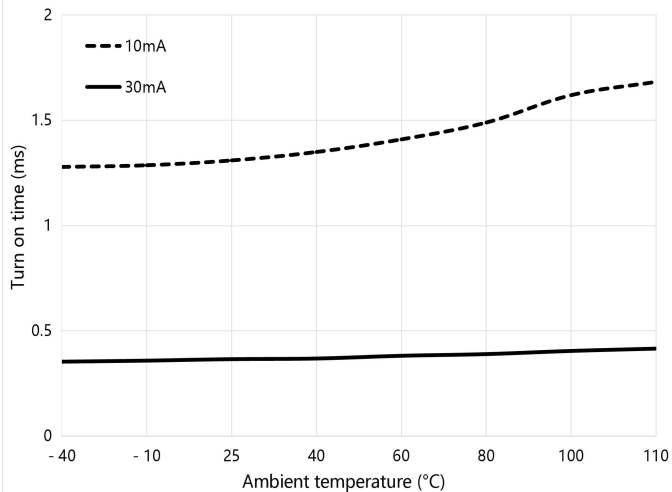
Type of connection: A

Continuous load current: 30 mA (DC)



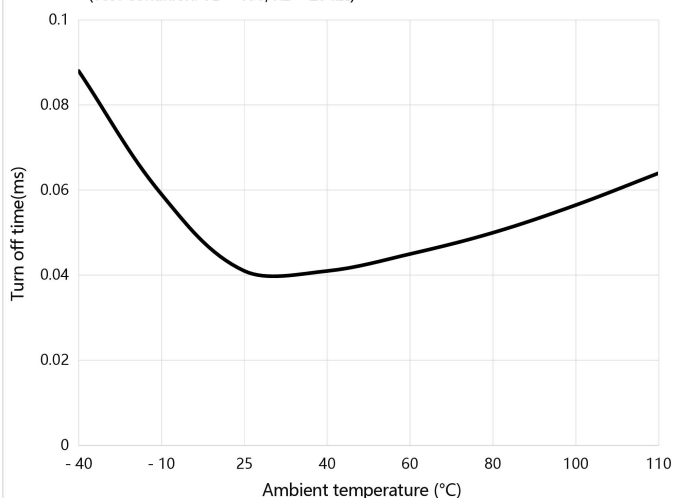
6. Turn on time vs. Ambient Temperature

(Test Condition: VL= 40V, RL = 20 kΩ)



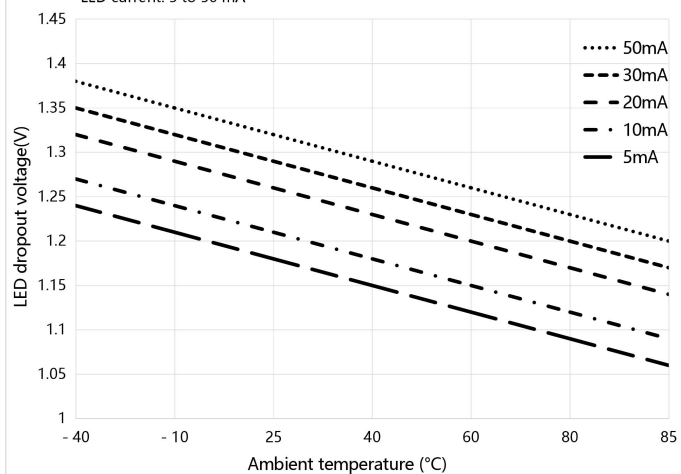
7. Turn off time vs. Ambient Temperature

(Test Condition: VL = 40V, RL = 20 k Ω)

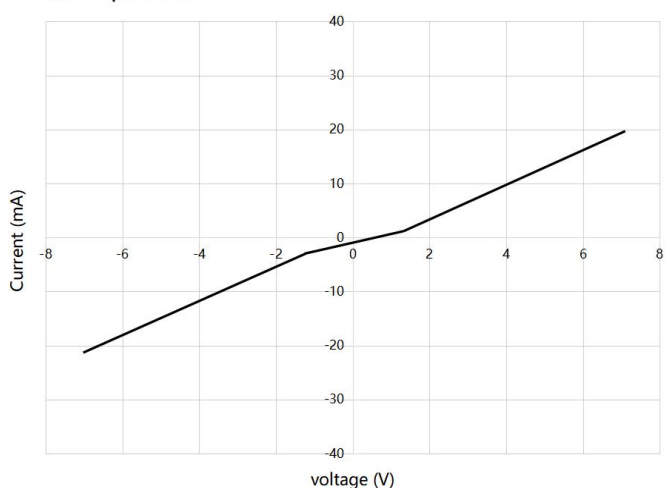


8. LED dropout voltage vs. ambient temperature characteristics

LED current: 5 to 50 mA

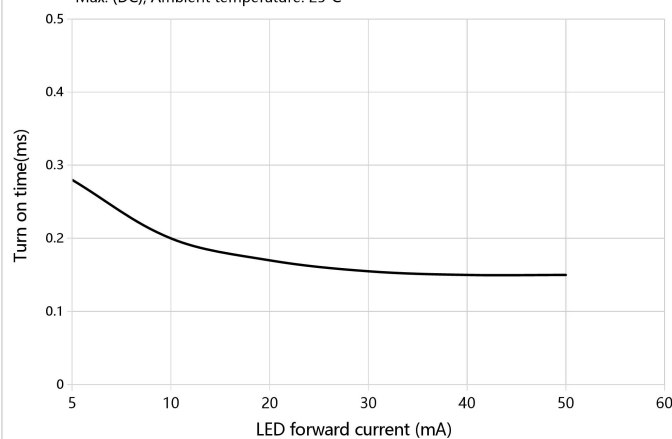


9. Current vs. voltage characteristics of output at MOS portion



10. Turn 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



11. Turn 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

