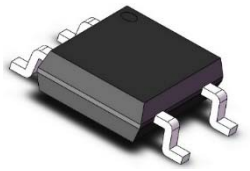
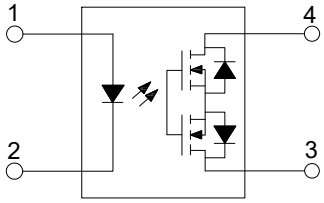
JOCMA1AC-M4 Series

Rev.A.1.0

DESCRIPTION:

The products are 4-pin optical relays. The device combines an AlGaAs infrared emitting diode input stage optically coupled to a high-voltage output detector circuit. The detector consists of a high-speed photovoltaic diode array and driver circuitry. The products are widely used in accumulation, automotive battery management system, automobile battery and power system insulation testing, industrial controls and EMR/reed relay replacement.





MAIN FEATURES:

High isolation 3750 Vrms
Single channel normally on Single-Pole-Single-Throw Relay
Operating temperature range -40°C to 110°C
REACH & RoHS compliance
HBM: H3A; MM: M4; CDM: C3
CQC approved
VDE approved
UL approved

ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current	I_{FP}	1①	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	75	mW
Output	Switching Voltage	V_O	30	V
	Continuous Load Current	I_O	3.5	A
	Power Dissipation	P_C	360	mW
Operating Temperature		T_{opr}	-40~110	℃
Junction Temperature		T_j	125	℃
Storage Temperature		T_{stg}	-55~125	℃
Total Power Dissipation		P_{tot}	450	mW
Isolation Voltage		V_{iso}	3750②	Vrms

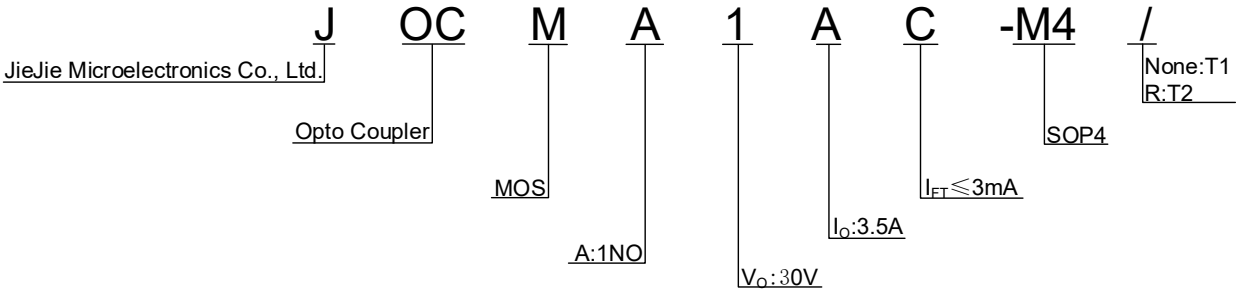
Soldering Temperature	T_{sol}	260	℃

NOTE1: 100μs pulse, 100Hz frequency
NOTE2: AC for 1minute, R.H.=40~60%

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

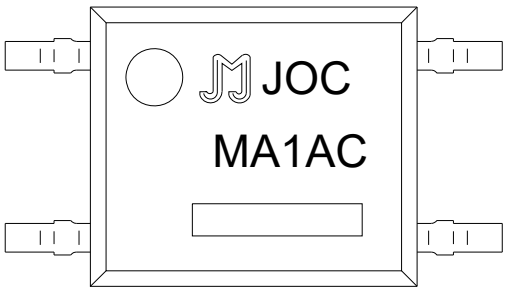
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F=10mA	-	1.35	1.5	V
	Reverse Current	I_R	V_R=6V	-	-	1	μA
	Terminal Capacitance	C_t	V=0,f=1MHz	-	70	-	pF
	LED Trigger Current	I_{FT}	I_O=$I_{O(MAX)}$	-	-	3	mA
	Reset Current	$I_{F(OFF)}$	I_O=$I_{O(MAX)}$	0.1	-	-	mA
Output	Open-circuit leakage current	I_{Leak}	V_O=30V	-	-	1	μA
	ON Resistance	R_{ON}	I_O=$I_{O(MAX)}$, I_F=5mA	-	30	50	mΩ
Transfer Characteristics	Floating Capacitance	C_{IO}	V=0, f=1MHz	-	0.8	-	pF
	Isolation Resistance	R_{ISO}	DC500V 40~60%R.H.	10^9	10^{14}	-	Ω
	Turn On Time	t_{on}	I_O=3.5A, I_F=5mA	-	1	2	ms
	Turn Off Time	t_{off}	I_O=3.5A, I_F=5mA	-	0.2	1	ms

ORDERING INFORMATION



Packing Quantity			
Option	**Quantity**	**Quantity – Inner box**	**Quantity –Outer box**
SOP4	3000 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box =30k Units

MARKING



Characteristics Curves

FIG.1: Forward Current vs. Forward Voltage

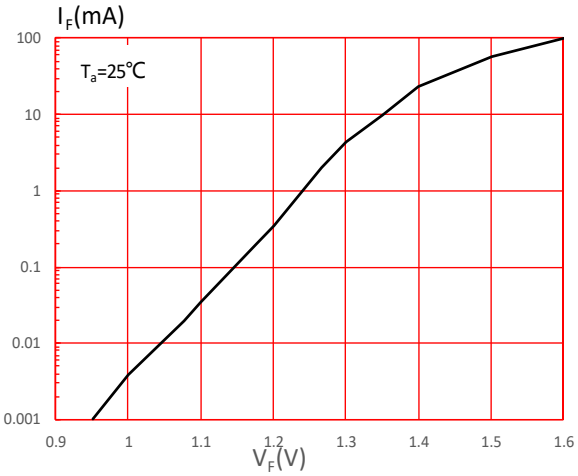


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

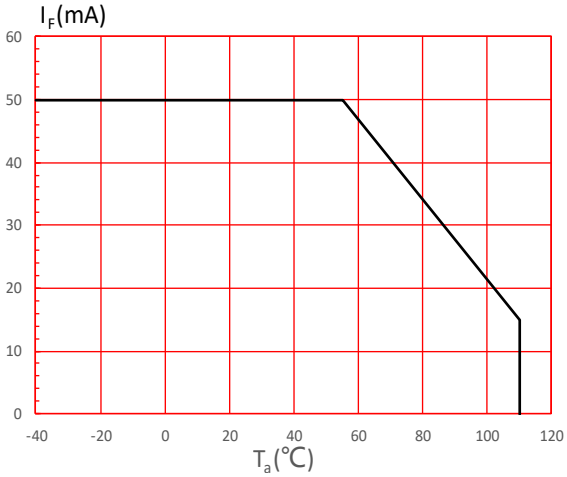


FIG.3: LED Operate Current vs. Ambient Temperature

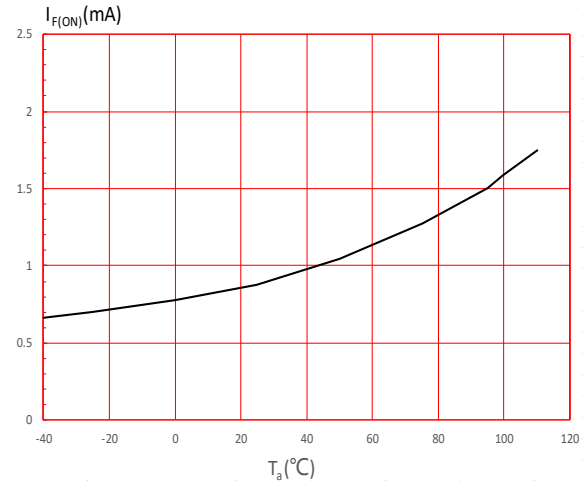


FIG.4: On Resistance vs. Ambient Temperature

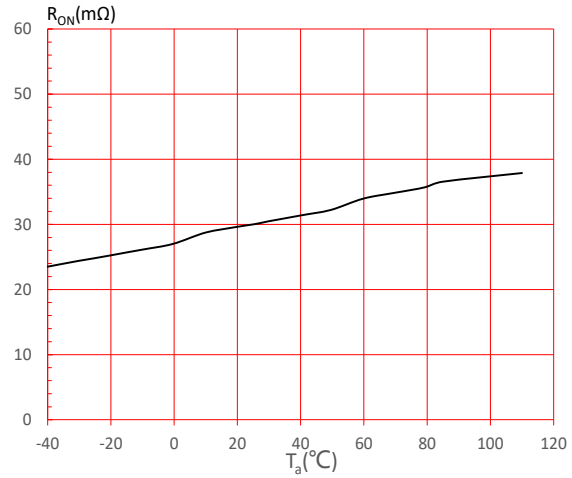


FIG.5: Turn On Time vs. Ambient Temperature

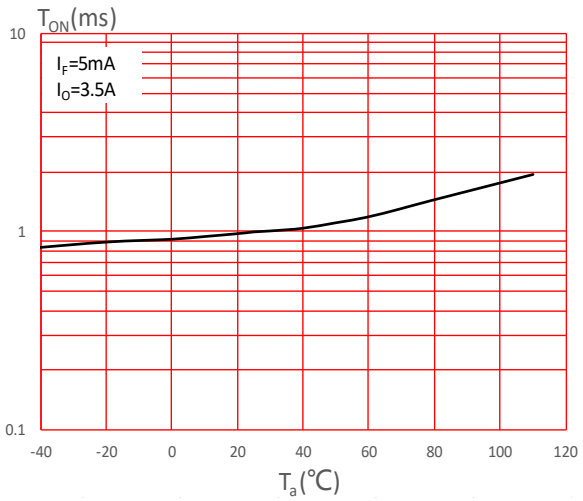


FIG.6: Turn Off Time vs. Ambient Temperature

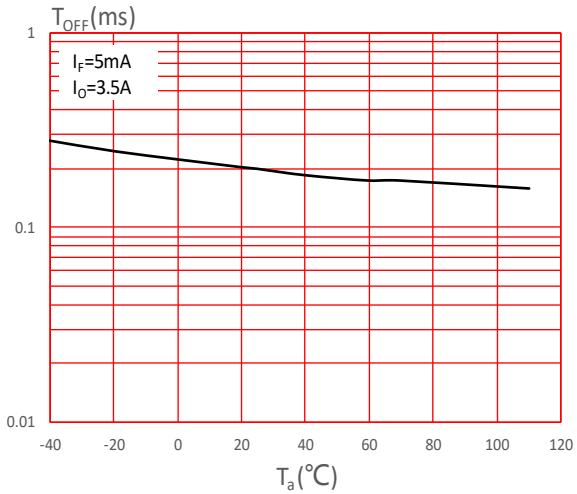


FIG.7: Output Current vs. Output Voltage

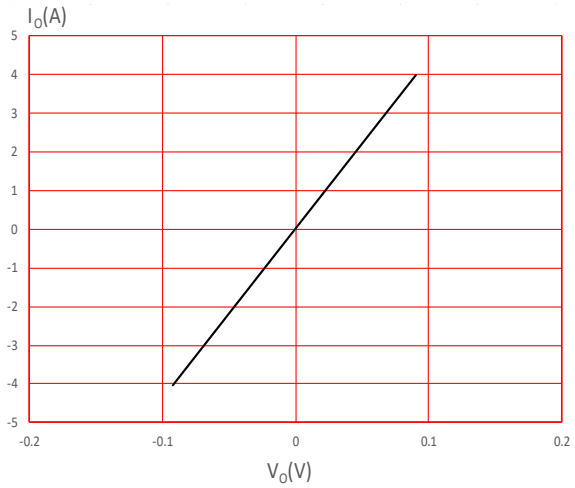
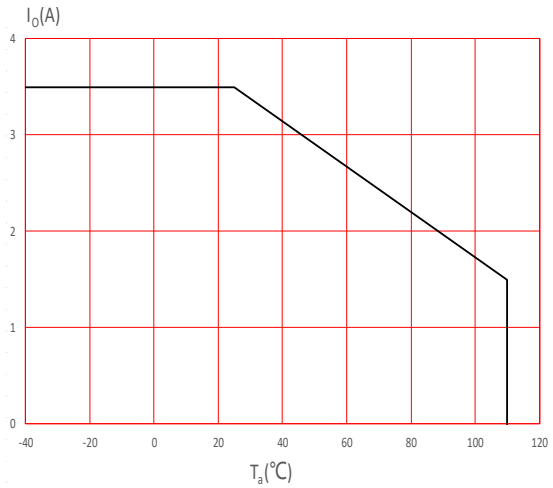
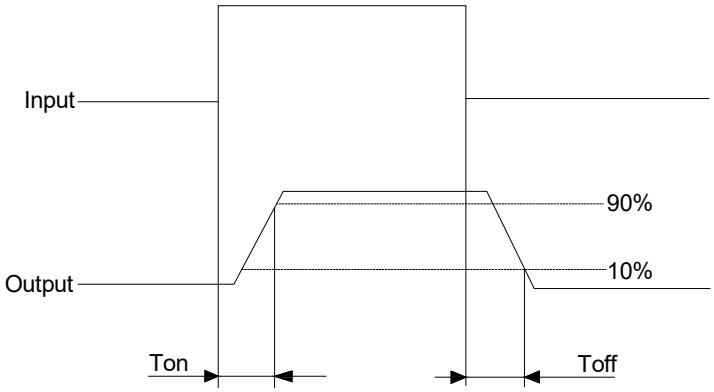


FIG.8: Output Current vs. Ambient Temperature

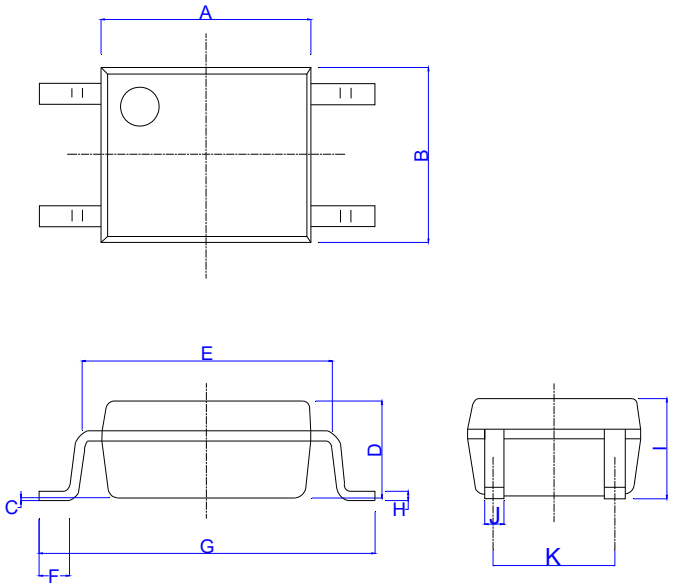


TEST CIRCUITS

FIG.9: The test method of Ton and Toff

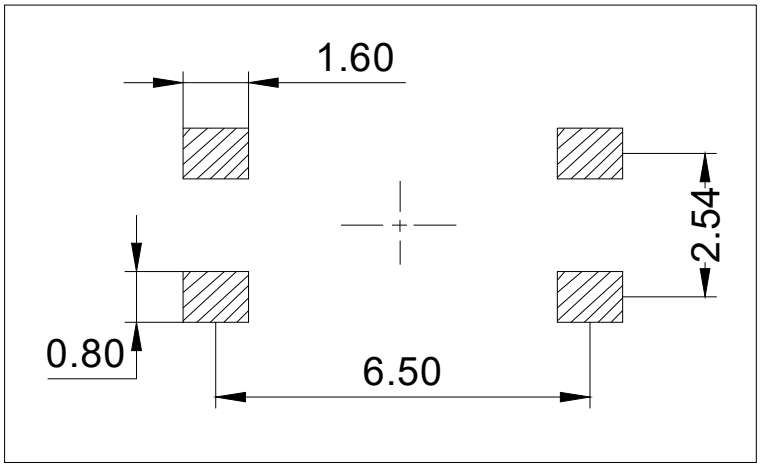


Package Dimension (Unit: mm)



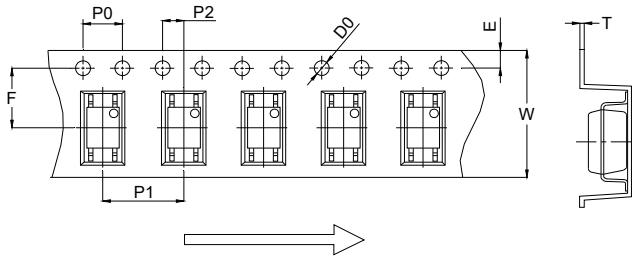
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.80	0.173		0.189
B	3.60		4.20	0.142		0.165
C	0.00		0.20	0.000		0.008
D	1.90		2.30	0.075		0.091
E	5.00		5.60	0.197		0.220
F	0.34		0.94	0.013		0.037
G	6.70		7.30	0.264		0.287
H	0.10		0.30	0.004		0.012
I	2.00		2.40	0.079		0.094
J	0.25		0.55	0.010		0.022
K	2.29		2.79	0.090		0.110

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



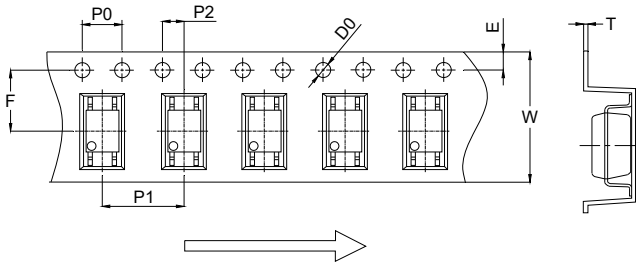
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option None



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	4.40	4.50	4.60	0.173	0.177	0.181
T	0.25	0.30	0.35	0.010	0.012	0.014
W	11.90	12.00	12.30	0.469	0.472	0.484

Option R



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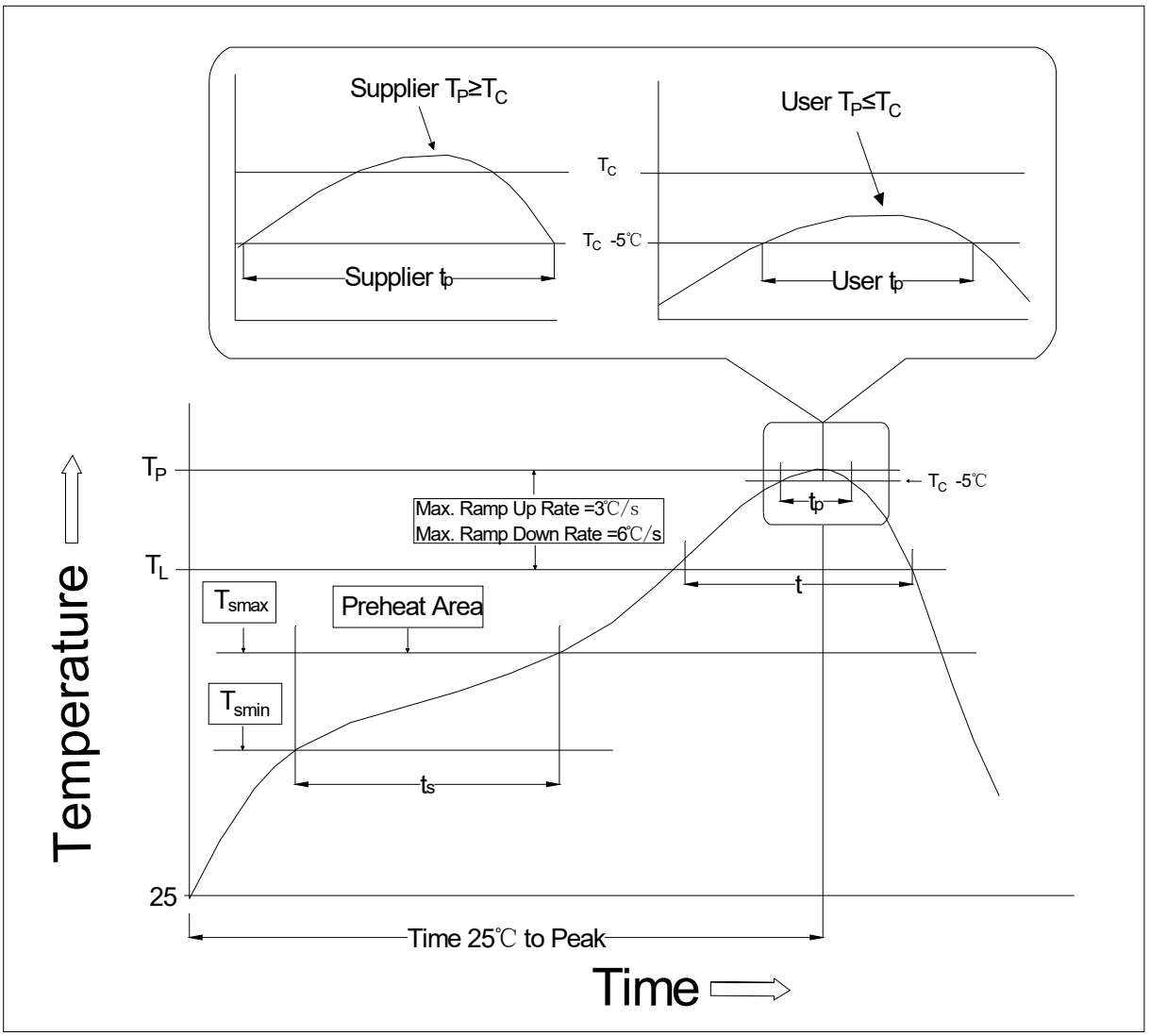
REFLOW INFORMATION



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100℃	150℃
Temperature Max. (Tsmax)	150℃	200℃
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3℃/second max.	3℃/second max.
Liquidus Temperature (TL)	183℃	217℃
Time (tL) Maintained Above (TL)	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235℃+0℃/-5℃	260℃+0℃/-5℃
Time (tP) within 5℃ of 260℃	10 seconds	10 seconds
Ramp-down Rate (TP to TL)	3-6℃/second	3-6℃/second
Time 25℃ to Peak Temperature	6 minutes max.	8 minutes max.

Note:

1. Reflow soldering is recommended at the temperatures and times shown, no more than three times.

2. Avoid direct contact between the epoxy body and any tools or surfaces exceeding its maximum storage temperature.

3. Application of pressure on the epoxy body is prohibited at elevated temperatures. In specific scenarios, any applied force must not exceed 2.5N.

4. Ensure the component has cooled to ambient temperature before proceeding with any subsequent manufacturing steps.

5. The component has a shelf life of one year when stored under standard conditions.

6. Recommend storage Temp.: 0~40°C;

Recommend storage humidity: <60%;

MSL level: MSL 1

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