

FOD8173, FOD8173

3.3 / 5 V, 20 Mbit/sec, 55 ns Propagation Delay, 20 ns Pulse Width Distortion, 1,140 V Peak Working Insulation Voltage, OP 6-R

Description

The FOD8173 series packaged in a stretched body 6-pin small outline plastic package, consists of an aluminum gallium arsenide (AlGaAs) light emitting diode and a CMOS detector IC comprises an integrated photodiode, a high speed transimpedance amplifier and a voltage comparator with a totem-pole output driver. The electrical and switching characteristics are guaranteed over the extended industrial temperature range of -40°C to 100°C and a V_{DD} range of 3 V to 5.5 V.

Features

- FOD8173T – 8 mm Creepage and Clearance Distance, and 0.4 mm insulation distance to achieve reliable and high voltage insulation
- High Noise Immunity characterized by common mode transient immunity (CMTI)
- 20 kV/ μs Minimum CMTI
- 3.3 V and 5 V CMOS Compatibility
- Specifications Guaranteed Over 3 V to 5.5 V supply voltage and -40 to 100°C extended industrial temperature range
- High Speed
 - ♦ 20 Mbit/sec Data Rate (NRZ)
 - ♦ 55 ns max. Propagation Delay
 - ♦ 20 ns max. Pulse Width Distortion
- Safety and regulatory pending approvals
 - ♦ UL1577, 5,000 VAC_{RMS} for 1 min.
 - ♦ DIN-EN/IEC60747-5-5, 1,140 V peak working insulation voltage for FOD8173T

Typical Applications

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Table 3. ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Units
T_{STG}	Storage Temperature	-40 to +125	$^\circ\text{C}$
T_{OPR}	Operating Temperature	-40 to +100	$^\circ\text{C}$
T_J	Junction Temperature	-40 to +125	$^\circ\text{C}$
T_{SOL}	Lead Solder Temperature (Refer to Reflow Temperature Profile)	260 for 10sec	$^\circ\text{C}$
Input Characteristics			
I_F	Average Forward Input Current	20	mA
V_R	Reverse Input Voltage	5.0	V
P_{DI}	Input Power Dissipation (Note 1)	40	mW
Output Characteristics			
V_{DD}			

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Table 6. ELECTRICAL CHARACTERISTICS

(Apply over all recommended conditions, $T_A = -40^{\circ}\text{C}$ to $+100^{\circ}\text{C}$, $3.0\text{V} \leq V_{DD} \leq 5.5\text{V}$, unless otherwise specified.
Typical value is measured at $T_A = 25^{\circ}\text{C}$ and $V_{DD} = 3.3\text{V}$.)

Units

V

W

mA

TYPICAL CHARACTERISTICS

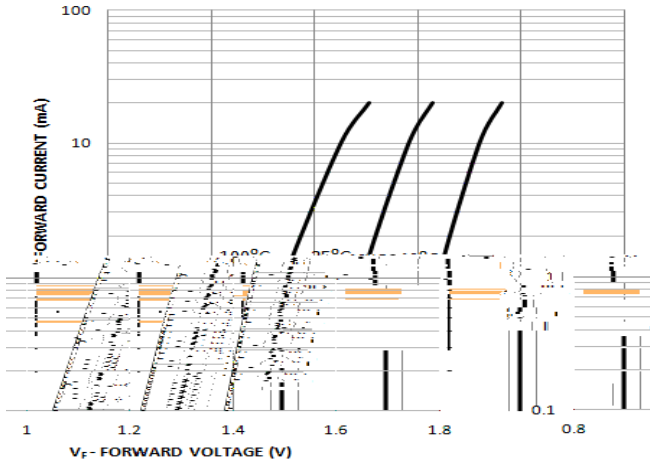


Figure 1. Input Forward Current vs. Forward Voltage

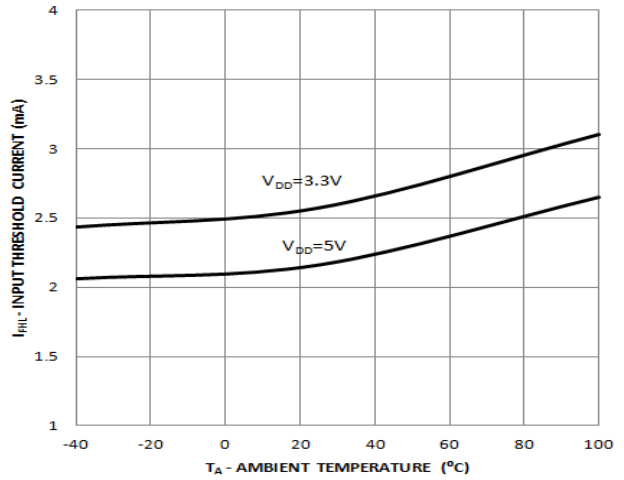


Figure 2. Input Threshold Current vs. Ambient Temperature

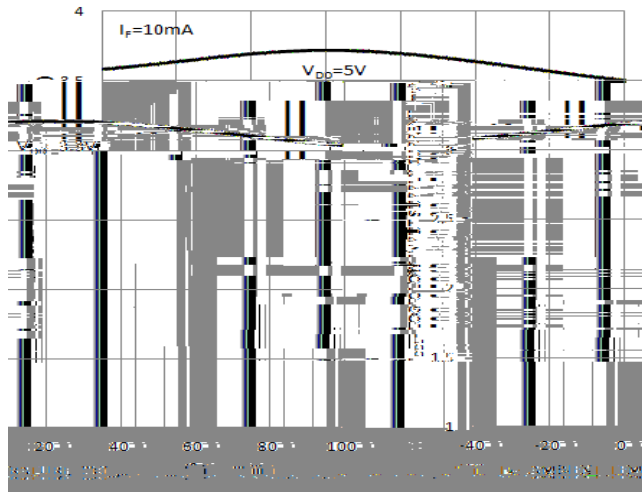


Figure 3. Logic Low Input Supply Current vs. Ambient Temperature

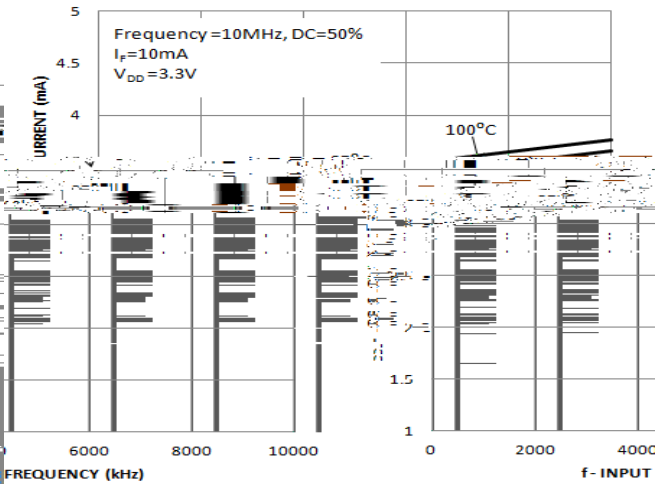


Figure 4. Logic Low Input Supply Current vs. Input Frequency ($V_{DD} = 3.3 V$)

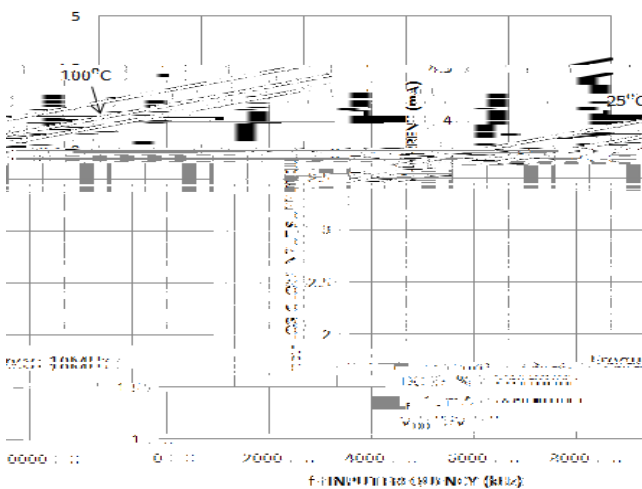


Figure 5. Logic Low Input Supply Current vs. Input Frequency ($V_{DD} = 5 V$)

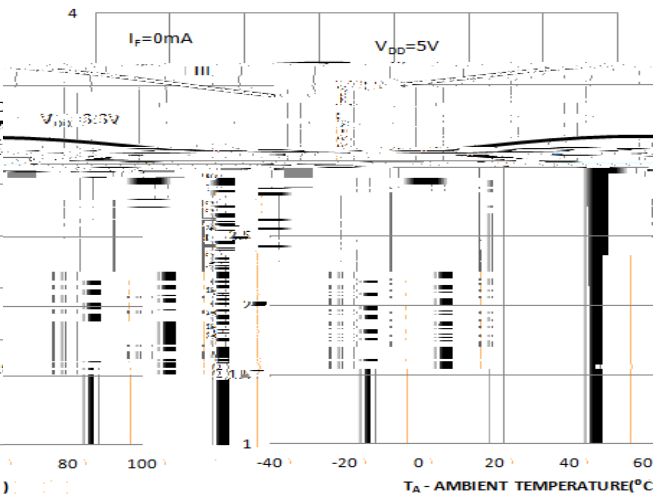


Figure 6. Logic High Input Supply Current vs. Ambient Temperature

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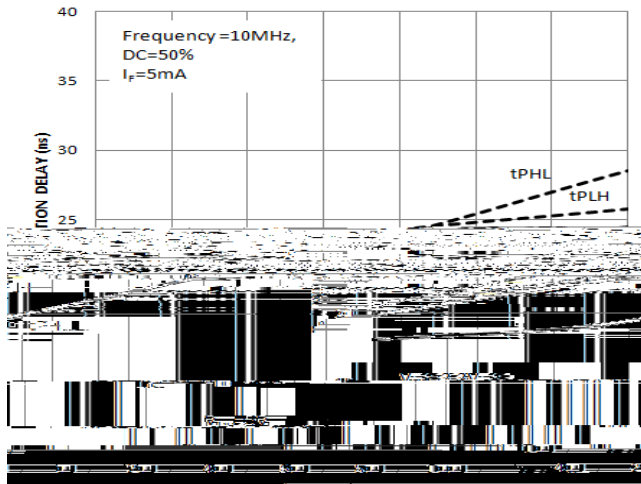


Figure 7. Propagation Delay vs. Ambient Temperature

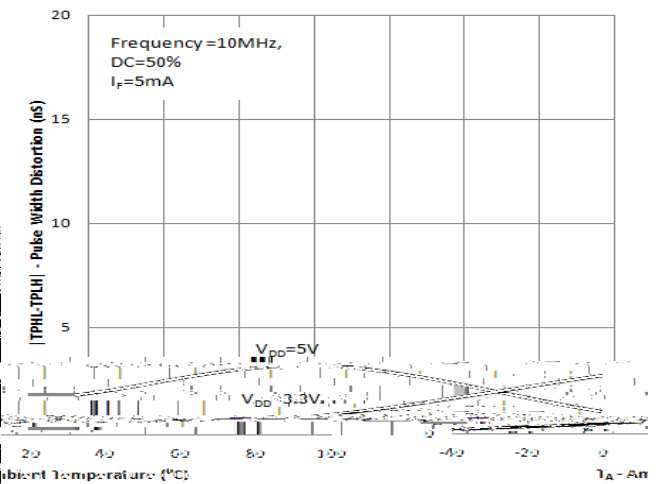


Figure 8. Pulse Width Distortion vs. Ambient Temperature

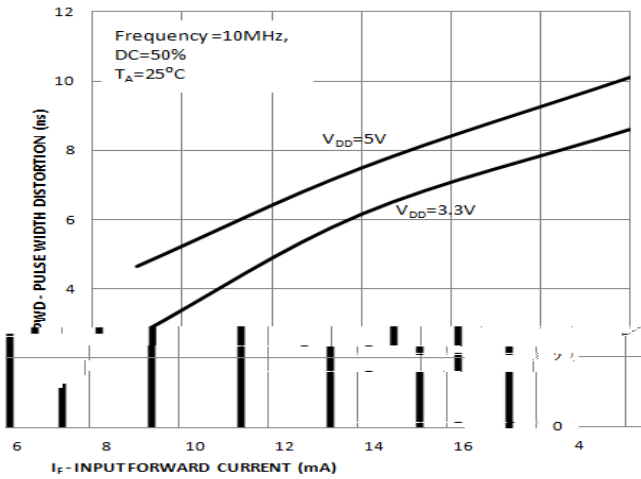


Figure 9. Pulse Width Distortion vs. Input Forward Current

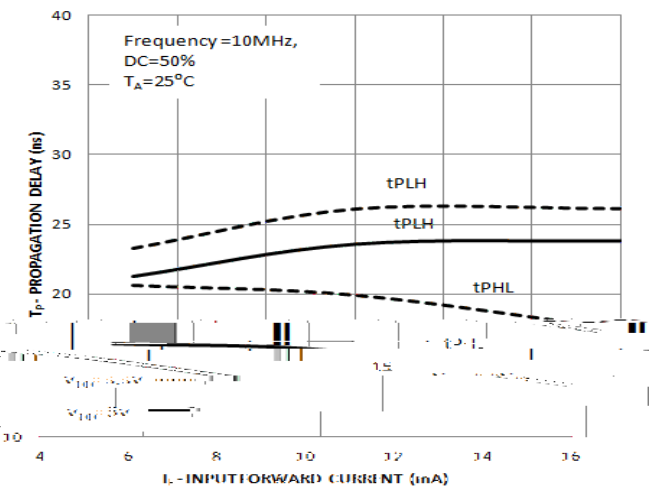


Figure 10. Propagation Delay vs. Input Forward Current

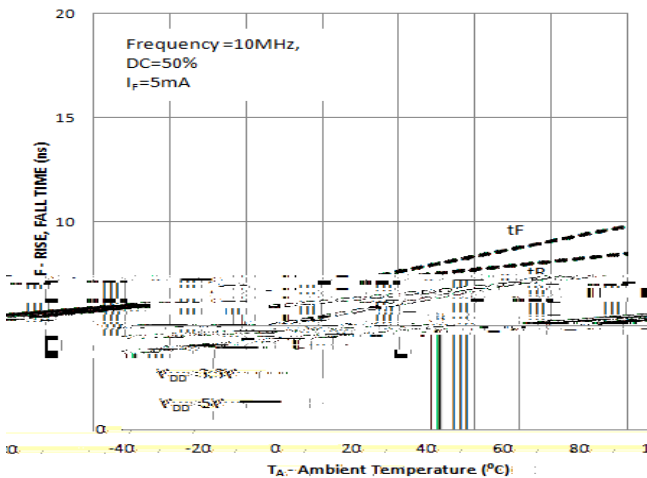


Figure 11. Rise, Fall Time vs. Ambient Temperature

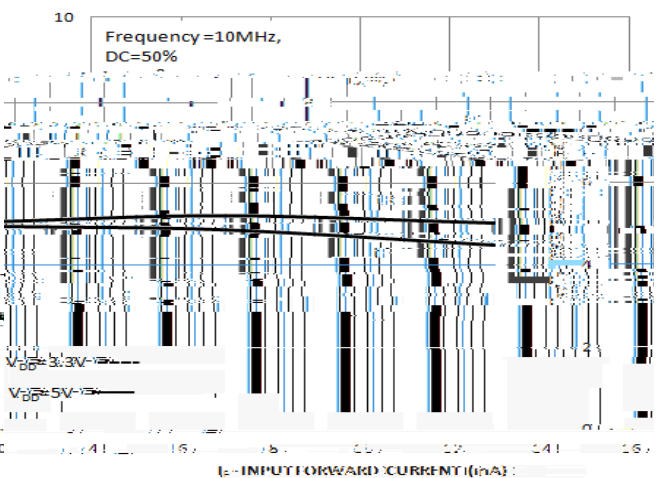


Figure 12. Rise, Fall Time vs. Input Forward Current

SCHEMATICS

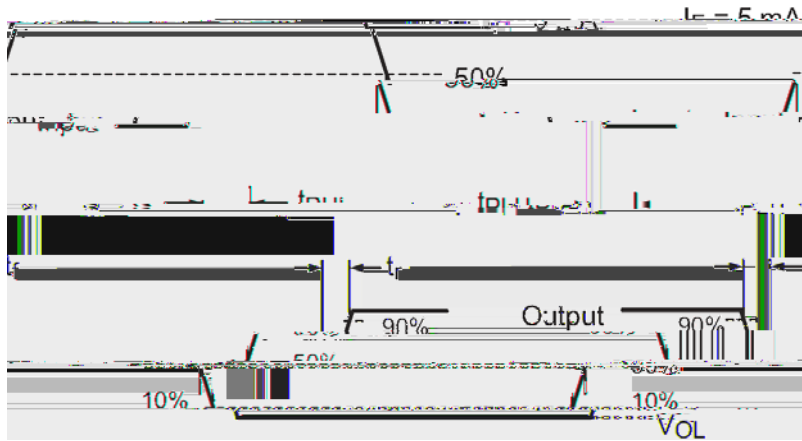
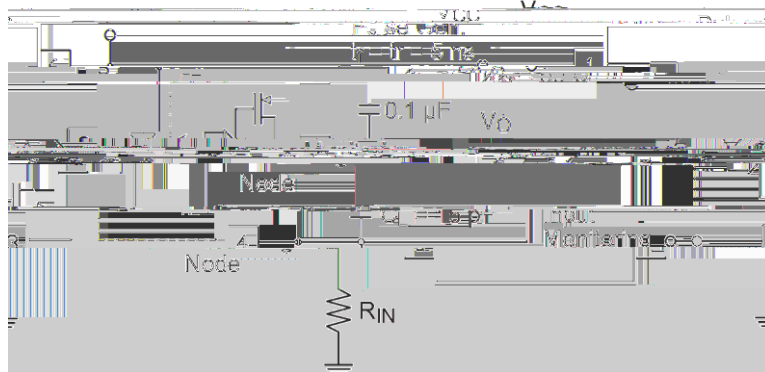


Figure 13. Test Circuit for Propagation Delay Time, Rise Time and Fall Time

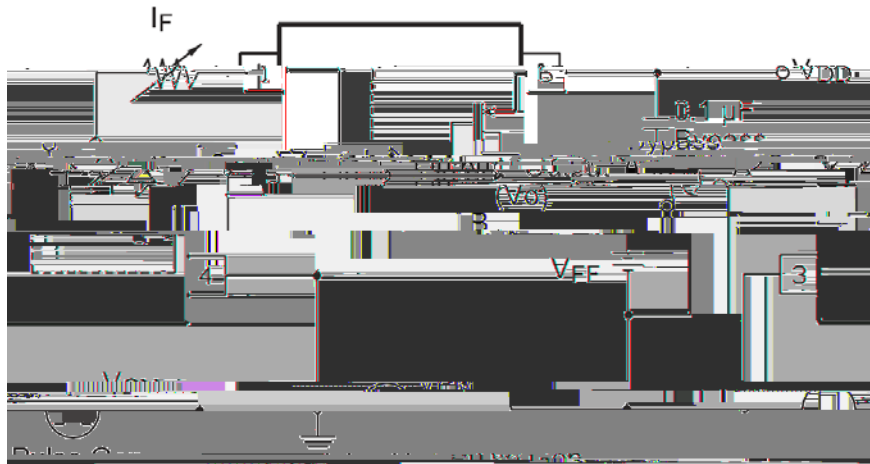


Figure 14. Test Circuit for Instantaneous Common Mode Rejection Voltage

REFLOW PROFILE

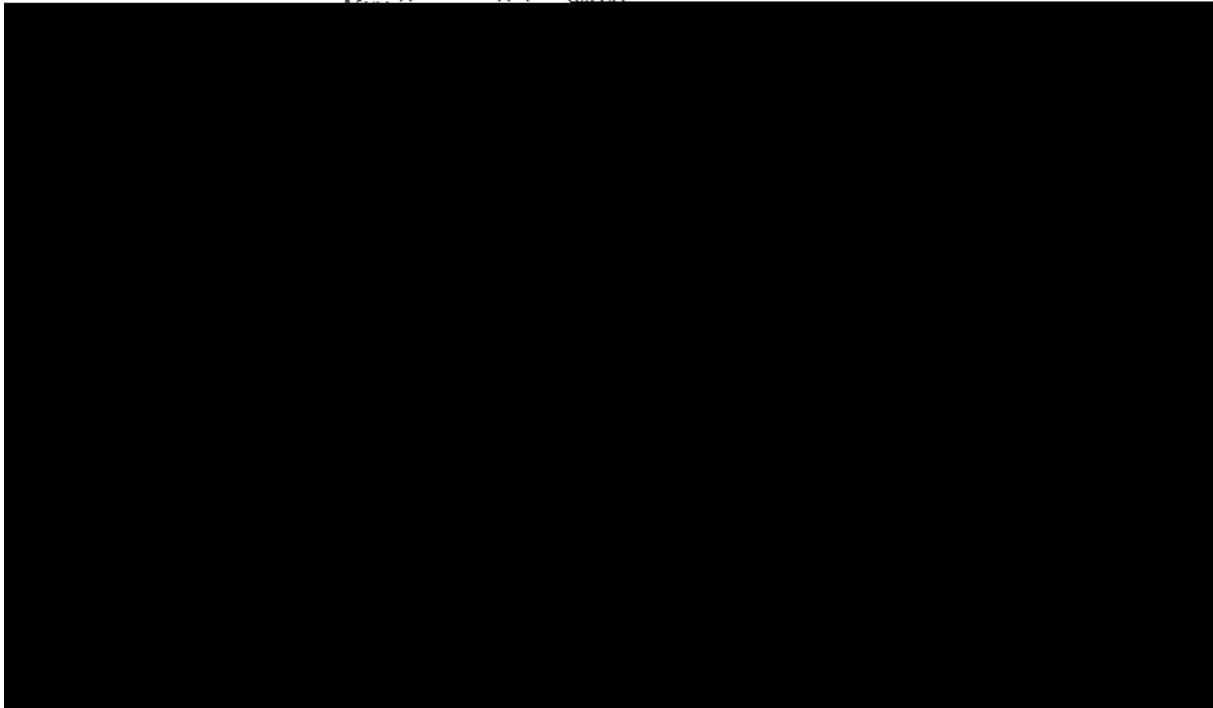


Figure 15. Reflow Profile

Table 8. REFLOW PROFILE

Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{min})	150°C
Temperature Max. (T _{max})	200°C
Time (t _S) from (T _{min} to T _{max})	60 – 120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max
Liquidous Temperature (TL)	217°C
Time (t _L) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260°C + 0°C / -5°C
Time (t _P) within 5°C of 260°C	30 seconds
Ramp-down Rate (TP to TL)	6°C / second max.
Time 25°C to Peak Temperature	8 minutes max.

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Table 9. ORDERING INFORMATION

Part Number	Package	Packing Method
FOD8173	Stretched Body SOP 6-Pin	Tube (100 units per tube)
FOD8173R2	Stretched Body SOP 6-Pin	Tape and Reel (1,000 units per reel)
FOD8173V	Stretched Body SOP 6-Pin, DIN EN/IEC60747-5-5 Option (pending)	Tube (100 units per tube)
FOD8173R2V	Stretched Body SOP 6-Pin, DIN EN/ IEC60747-5-5 Option (pending)	Tape and Reel (1,000 units per reel)
FOD8173T	Stretched Body SOP 6-Pin, Wide Lead	Tube (100 units per tube)
FOD8173TR2	Stretched Body SOP 6-Pin, Wide Lead	Tape and Reel (1,000 units per reel)
FOD8173TV	Stretched Body SOP 6-Pin, Wide Lead, DIN EN/IEC60747-5-5 Option (pending)	Tube (100 units per tube)
FOD8173TR2V	Stretched Body SOP 6-Pin, Wide Lead, DIN EN/ IEC60747-5-5 Option (pending)	Tape and Reel (1,000 units per reel)

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NOTES: UNLESS OTHERWISE SPECIFIED

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