

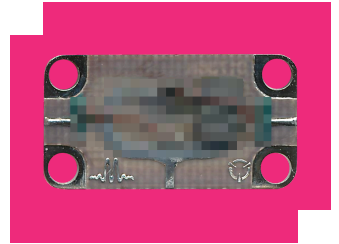
# M2H-0220ME-1

## Triple-Balanced 2 - 20 GHz Mixers

### DEVICE OVERVIEW

#### General Description

M2 triple balanced mixers are hybrid assemblies that have been hand-tuned to feature low conversion loss and high isolations. M2 mixers offer ultrabroadband overlapping frequency coverage on all 3 ports. Many M2 mixers have replaced with MM2 mixers with superior performance, repeatability, and availability. M2 mixers suitable for systems where an MM2 mixer is not available.



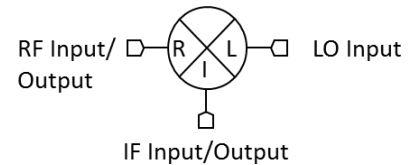
#### Features

- LO/RF 2.0 to 20.0 GHz
- IF 2.0 to 10.0 GHz
- 8.0 dB Typical Conversion Loss
- 27 dB Typical LO to RF Isolation
- Ultra-Broadband RF, LO, and IF

#### Applications

N/A

#### Functional Block Diagram



#### Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification	Recommended Replacement
<a href="#">M2H-0220LE-1</a>	Triple-Balanced 2 - 20 GHz Mixers	E	<a href="#">Consult Factory</a>	End of Life	EAR99	<a href="#">T3-20GLES-1T3-20GLCTG-1MM1-0222LSM-2</a>
<a href="#">M2H-0220ME-2</a>	Triple-Balanced 2 - 20 GHz Mixers	E	Non-RoHS	End of Life	EAR99	<a href="#">T3-20GLES-2T3-20GLCTG-2MM1-0222LS</a>
M2H-0220ME-1	Triple-Balanced 2 - 20 GHz Mixers	E	Non-RoHS	Not Recommended for New Design	EAR99	<a href="#">T3-20GLES-1T3-20GLCTG-1MM1-0222LS</a>
<a href="#">M2H-0220NE-2</a>	Triple-Balanced 2 - 20 GHz Mixers	E	<a href="#">Consult Factory</a>	End of Life	EAR99	<a href="#">T3-20GLES-2T3-20GLCTG-2MM1-0222HSM-2</a>
<a href="#">M2H-0220LE-2</a>	Triple-Balanced 2 - 20 GHz Mixers	E	Non-RoHS	End of Life	EAR99	<a href="#">T3-20GLES-2T3-20GLCTG-2MM1-0222LSM-2</a>

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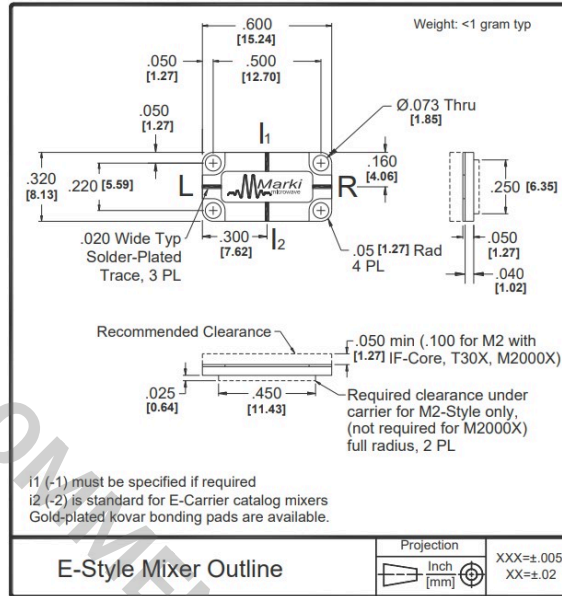
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## Revision History

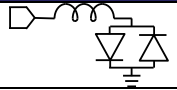
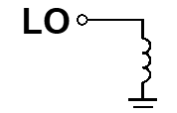
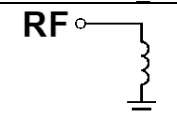
Revision Code	Revision Date	Comment
A	2024-04-23	Revised conversion loss specification and IF frequency range.

**Port Configuration and Functions**

**Port Diagram**



**Port Functions**

Port	Function	Description	Equivalent Circuit for Package
IF	IF	The IF port is DC coupled to the diodes and AC matched to 50 Ohms from 1 to 10 GHz. Blocking capacitor is optional.	
LO	LO	The LO port is DC coupled to ground and AC matched to 50 Ohms from 2 to 20 GHz. Blocking capacitor is optional.	
RF	RF	The RF port is DC coupled to ground and AC matched to 50 Ohms from 2 to 20 GHz. Blocking capacitor is optional.	

## Specifications

### Package Information

Parameter	Details	Rating
Weight	Package name: E	1g
Dimensions	-	15.24 x 8.13 mm

### Recommended Operating Conditions

Parameter	Min	Nominal	Max	Unit
LO Input Power	13	-	16	-

NOT RECOMMENDED FOR NEW DESIGN

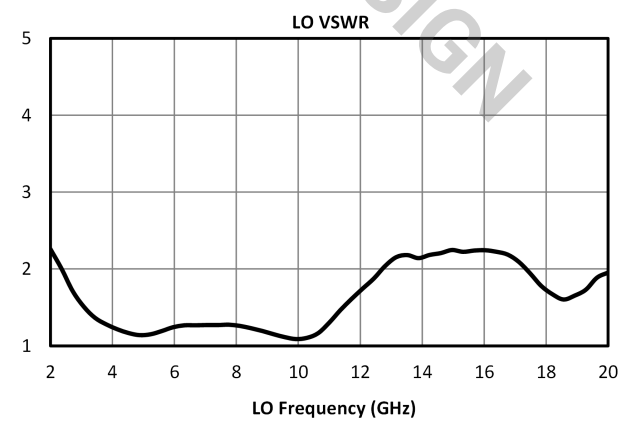
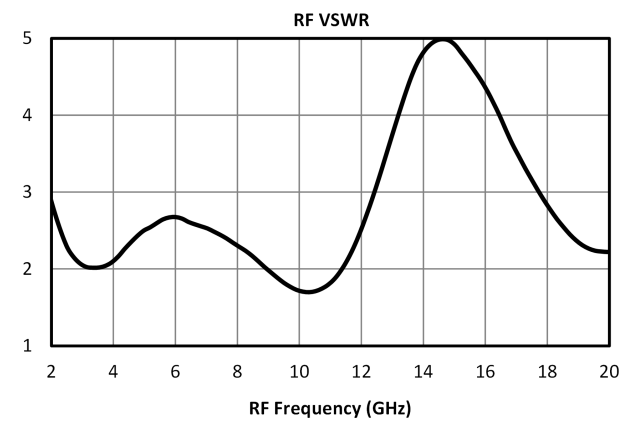
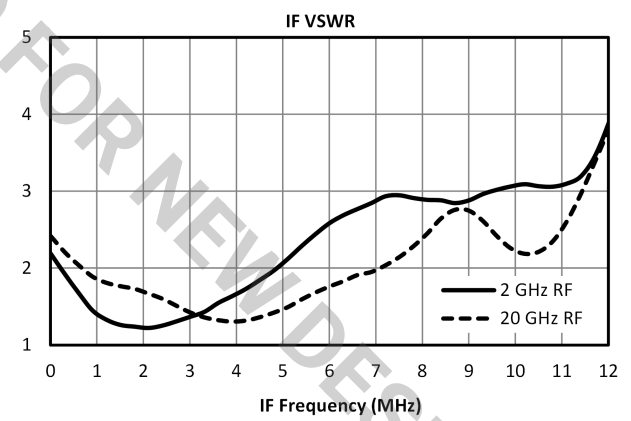
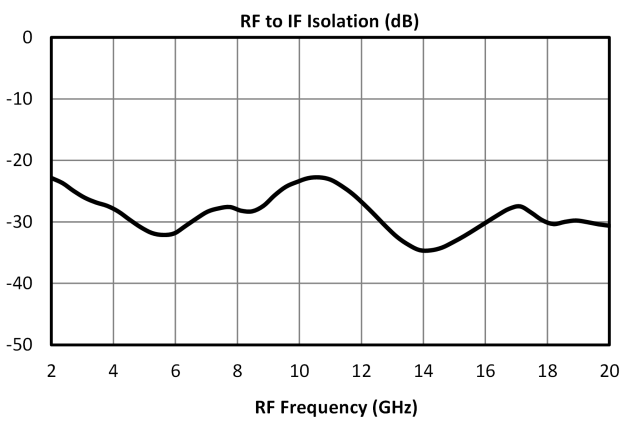
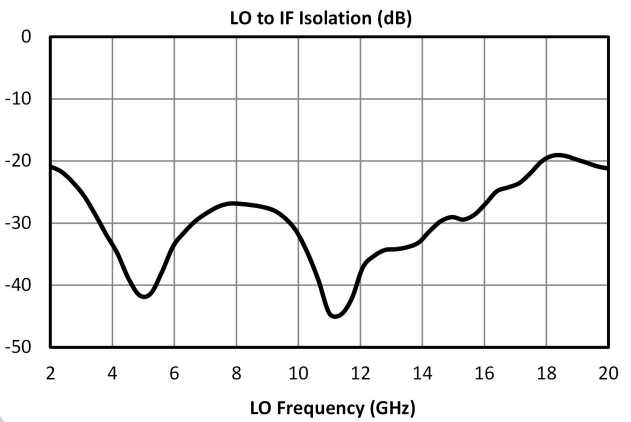
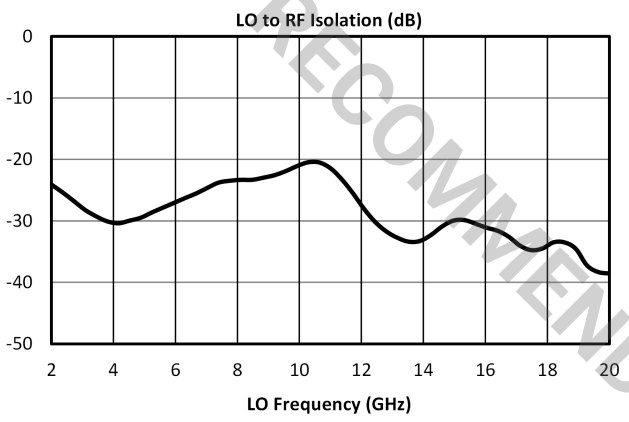
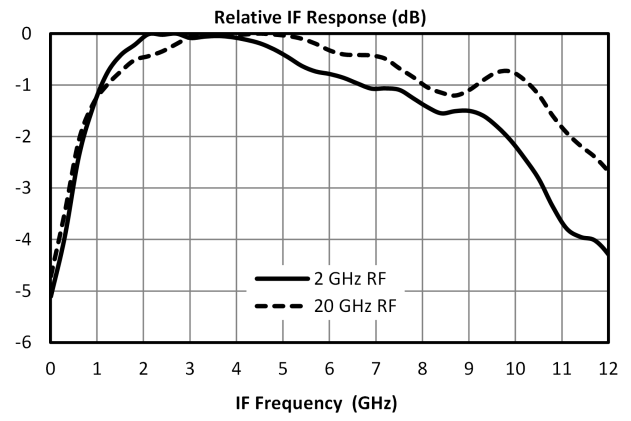
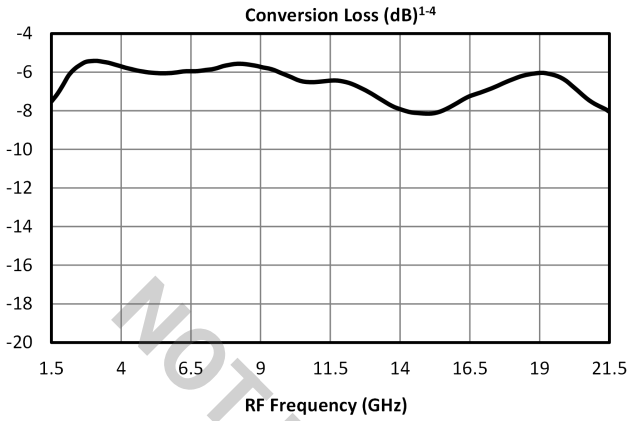
## Electrical Specifications

Specifications guaranteed from -55 to +100°C, measured in a 50-Ohm system.

Parameter	Test Conditions	Min	Typ	Max	Unit
Conversion Loss	LO/RF=2-20 GHz IF=2-10 GHz	-	8	13	dB
Input 1 dB Compression	LO/RF=2-20 GHz LO drive level, M Diode Option=13-16 dBm	-	8	-	dBm
Input IP3	LO/RF=2-20 GHz LO drive level, M Diode Option=13-16 dBm	-	18	-	dBm
Isolation, LO to IF	LO/RF=2-20 GHz	-	27	-	dB
Isolation, LO to RF	LO/RF=2-20 GHz	15	27	-	dB
Isolation, RF to IF	LO/RF=2-20 GHz	-	27	-	dB
IF Frequency Range	-	1	-	10	GHz
RF Frequency Range	-	2	-	20	GHz

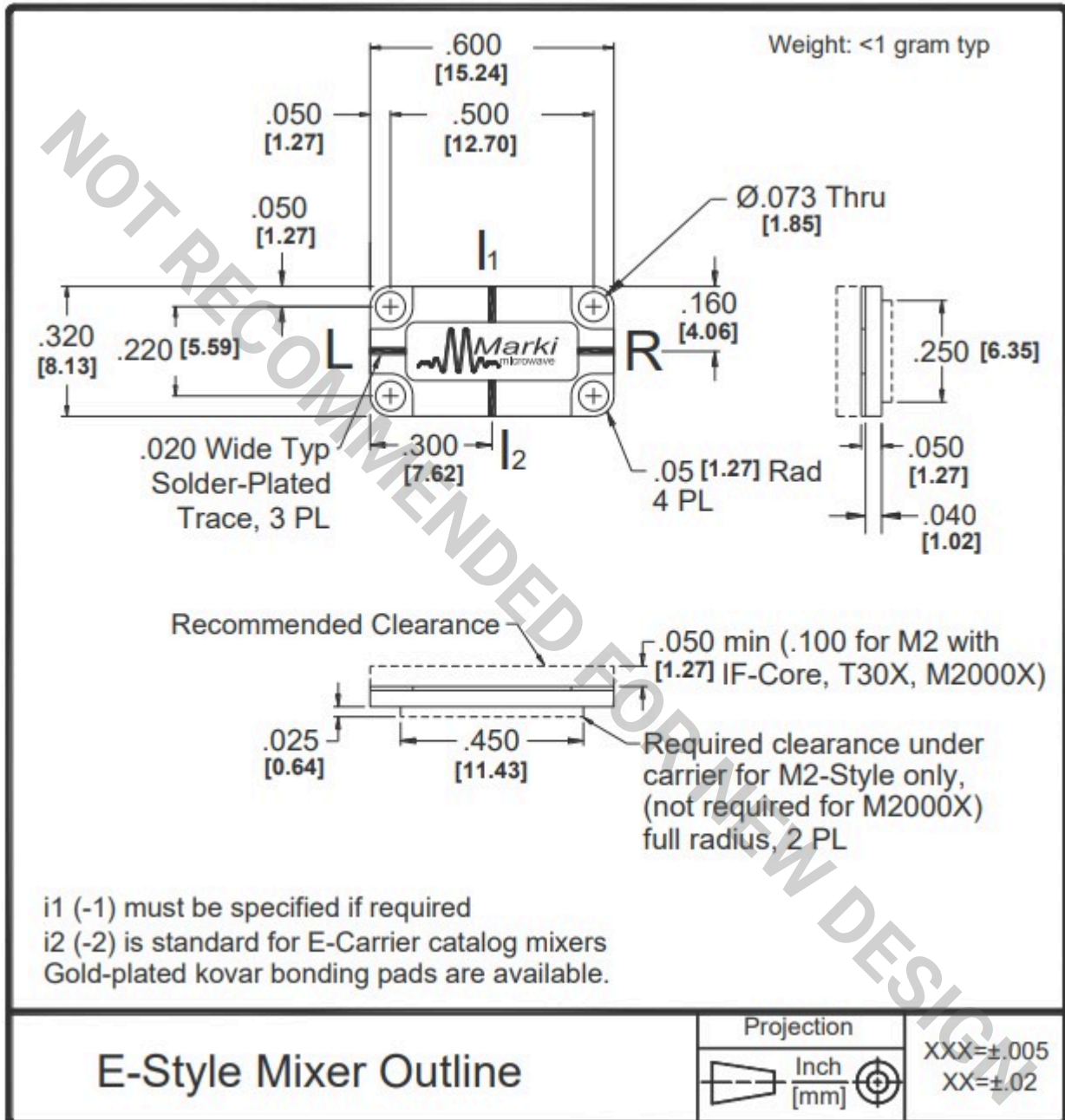
NOT RECOMMENDED FOR NEW DESIGN

Typical Performance Plots

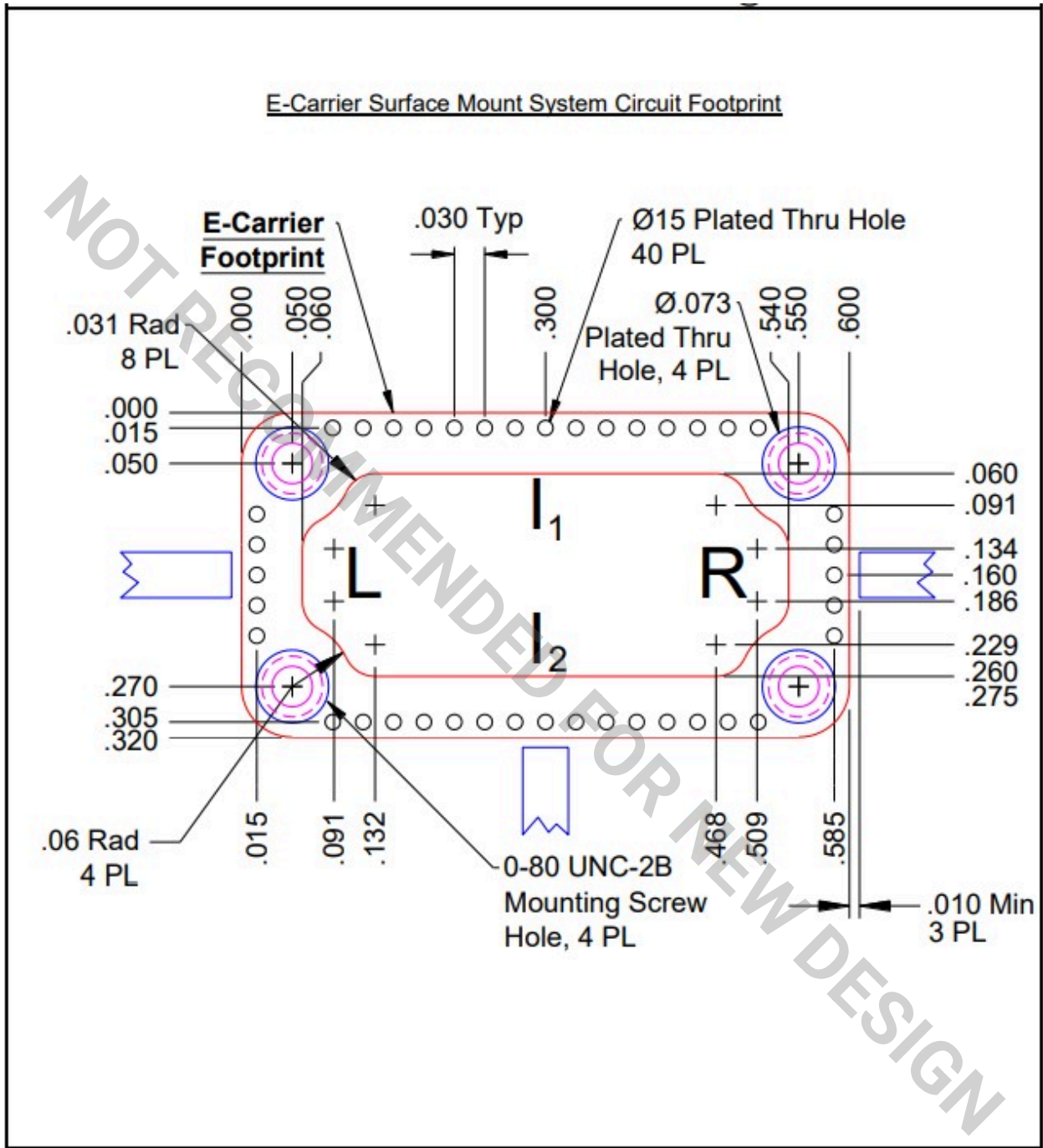


Mechanical Data

Outline Drawing



Footprint Image



## Notes

1. Mixer Conversion Loss Plot IF frequency is 2.0 GHz.
2. Mixer Noise Figure typically measures within +0.5 dB of conversion loss for IF frequencies greater than 5 MHz.
3. Conversion Loss typically degrades less than 0.5 dB for LO drives 2 dB below the lowest and 3 dB above highest nominal LO drive levels.
4. Conversion Loss typically degrades less than 0.5 dB at +100°C and improves less than 0.5 dB at -55°C.
5. Maximum input power is +26 dBm at +25°C, derated linearly to +23 dBm at +100°C.
6. Specifications are subject to change without notice. Contact Marki Microwave for the most recent specifications and data sheets.
7. Standard configuration for A, B, and C outlines are with connectors and bottom spacer.
8. Catalog mixer circuits are continually improved. Configuration control requires custom mixer model numbers and specifications.

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