FUJITSU SEMICONDUCTOR
DATA SHEET

DS05-20830-1E

FLASH MEMORY

CMOS

SON PACKAGES

MBM29F017/MBM29LV002/MBM29LV004/MBM29LV400/ MBM29LV080/MBM29LV008/MBM29LV800

■ GENERAL DESCRIPTION

SON (Small Outline Non-lead) packages are chip size packages developed by Fujitsu. Not only can SON packages be mounted by the surface mounting technology of TSOP (Thin Small Outline Package), but they are also smaller and thinner than TSOP.

Flash memory is non-volatile semiconductor can hold data even if the power supply is removed OFF, and is used widely for data storage shownby memory card and modules, and other handy application such as portable phone. We have prepared chip size package in response to the trend towards downsized products in these fields.

This Data Sheet introduces the SON package product lineup, and lists only pin assignment, packege dimensions, and pin capacitance. All specifications excepts for pin capacitance are the same specification as SOP and TSOP Packages mounted Fujitsu Flash Memory. For more detail, please refer to the data sheets on Fujitsu flash memory, listed below.

■ FLASH MEMORY SON PACKAGES

Part No.	Supply Voltage	Density	Organization	Access Time (ns)	Sector Erase Size	Number of Pin
MBM29F017*1	4.5 V to 5.5 V*2	16 M	×8	90/120	64 KB	40
MBM29LV002T/B	2.7 V to 3.6 V*3	2 M	×8	100/120	Boot type*4	40
MBM29LV004T/B						40/46
MBM29LV400T/B		4 M	×8/16			46
MBM29LV080*1		8 M	×8		64 KB	
MBM29LV008T/B			×8		Boot type*4	
MBM29LV800T/B			×8/16			

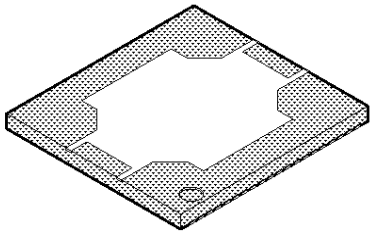
*1: Address Don't Care products during programming (for filing)
*2: 4.75 V to 5.25 V at 90 ns
4.5 V to 5.5 V at 120 ns
*3: 3.0 V to 3.6 V at 100 ns
2.7 V to 3.6 V at 120 ns
*4: 16 KB, 8 KB × 2, 32 KB, others 64 KB

WARNING: Permanent device damage may occur if the above **Absolute Maximum Ratings** are exceeded. Functional operation should be restricted to the conditions as detailed in the operational sections of this data sheet. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

This device contains circuitry to protect the inputs against damage due to high static voltages or electric fields. However, it is advised that normal precautions be taken to avoid application of any voltage higher than maximum rated voltages to this high-impedance circuit.

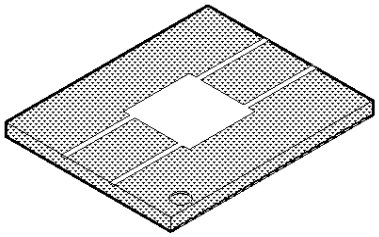
■ PACKAGE

40-pin Plastic SON



(LCC-40P-M02)

46-pin Plastic SON



(LCC-46P-M02)

■ FEATURES

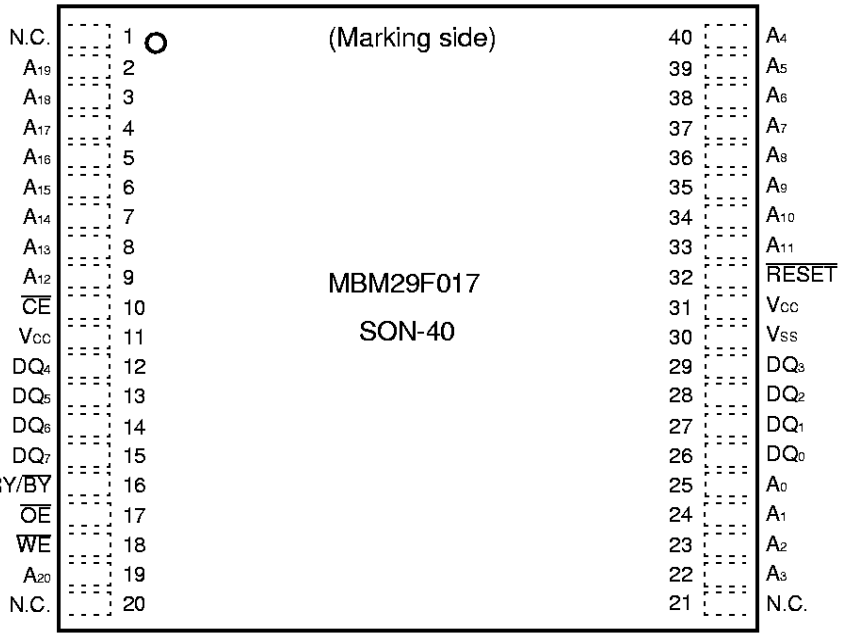
- Mounted on chip size package
  SON-40 Package dimensions: 10.00 × 10.75 × 0.75 mm (lead pitch: 0.5 mm)
  SON-46 Package dimensions: 10.00 × 12.00 × 0.75 mm (lead pitch: 0.5 mm)
- Single 3 V flash memory (2 M, 4 M, 8 M)
- Single 5 V flash memory (16 M)
- Automatic program™ algorithm (Embedded™ Algorithm)
- Built-in erase suspend/resume
- $\overline{\text{Data}}$ polling, and toggle bit feture for detection of program or erase cycle completion
- Ready-Busy output (Hardware Method for detector of program or erase cycle completion)
- Easy memory expansion by output enable pin
- Hardware reset and standby functions by $\overline{\text{RESET}}$ pin
- Compatible with JEDEC-standard commands
- Minimum 100,000 write/erase cycles
- Sector erase architecture (any combination of sectors can be concurrently erased.)
- Sector protection
- Temporary sector unprotection
- Boot code sector architecture (boot type only)
- Automatic Sleep Mode (3 V packages only)
- Address Don't Care during programming (MBM29F017, MBM29LV080 only)

Embedded™ Algorithm is a trademark of Advanced Micro Device, Inc.

■ CONNECTION DIAGRAMS

1. MBM29F017 (SON-40)

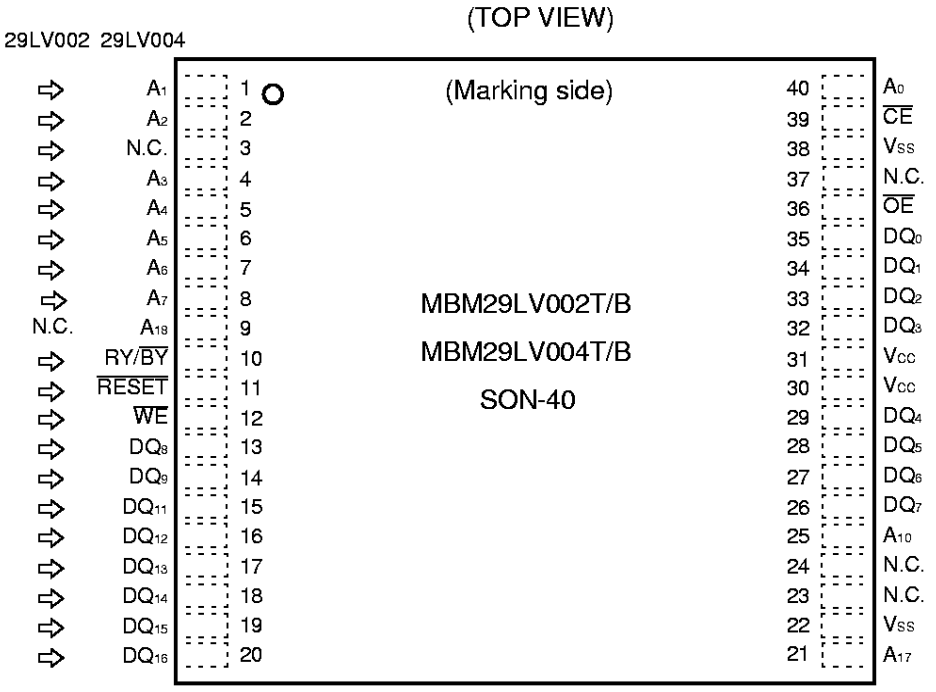
(TOP VIEW)



LCC-40P-M02

Pin Symbol	Pin Name	Pin Symbol	Pin Name
A_0 to A_{20}	Address Inputs	RY/$\overline{BY}$	Reset/Busy Output
DQ_0 to DQ_7	Data I/O	V_{SS}	Device Ground
$\overline{CE}$	Chip Enable	V_{CC}	Power Supply ($5\ V \pm 10\%\ V$ or $5\ V \pm 5\%\ V$)
$\overline{OE}$	Output Enable		
$\overline{WE}$	Write Enable	N.C.	No Connection
$\overline{RESET}$	Hardware Reset Pin/ Temporary Sector Unprotection	—	—

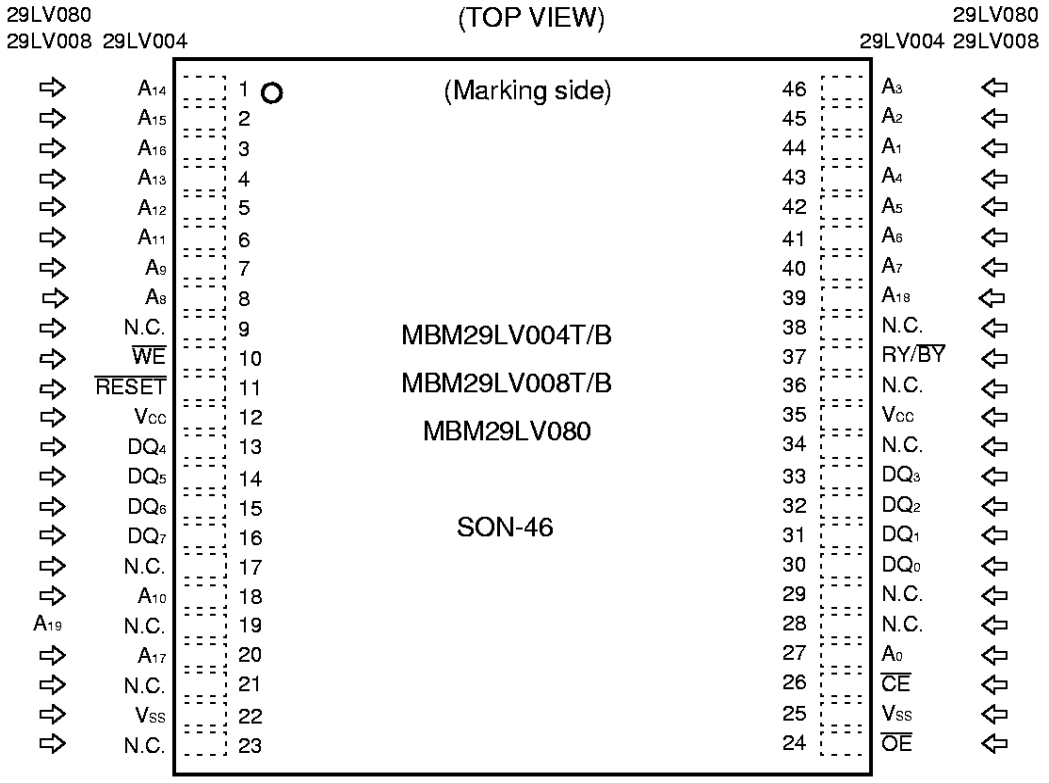
2. MBM29LV002T/B, MBM29LV004T/B (SON-40)



LCC-40P-M02

Pin Symbol	Pin Name	Pin Symbol	Pin Name
A_0 to A_{18}	Address Inputs	RY/$\overline{BY}$	Reset/Busy Output
DQ_0 to DQ_7	Data I/O	V_{SS}	Device Ground
$\overline{CE}$	Chip Enable	V_{CC}	Power Supply ($\begin{pmatrix}2.7\ V \pm 3.6\ V\ or\\ 3.0\ V \pm 3.6\ V\end{pmatrix}$)
$\overline{OE}$	Output Enable		
$\overline{WE}$	Write Enable	N.C.	No Connection
$\overline{RESET}$	Hardware Reset Pin/ Temporary Sector Unprotection	—	—

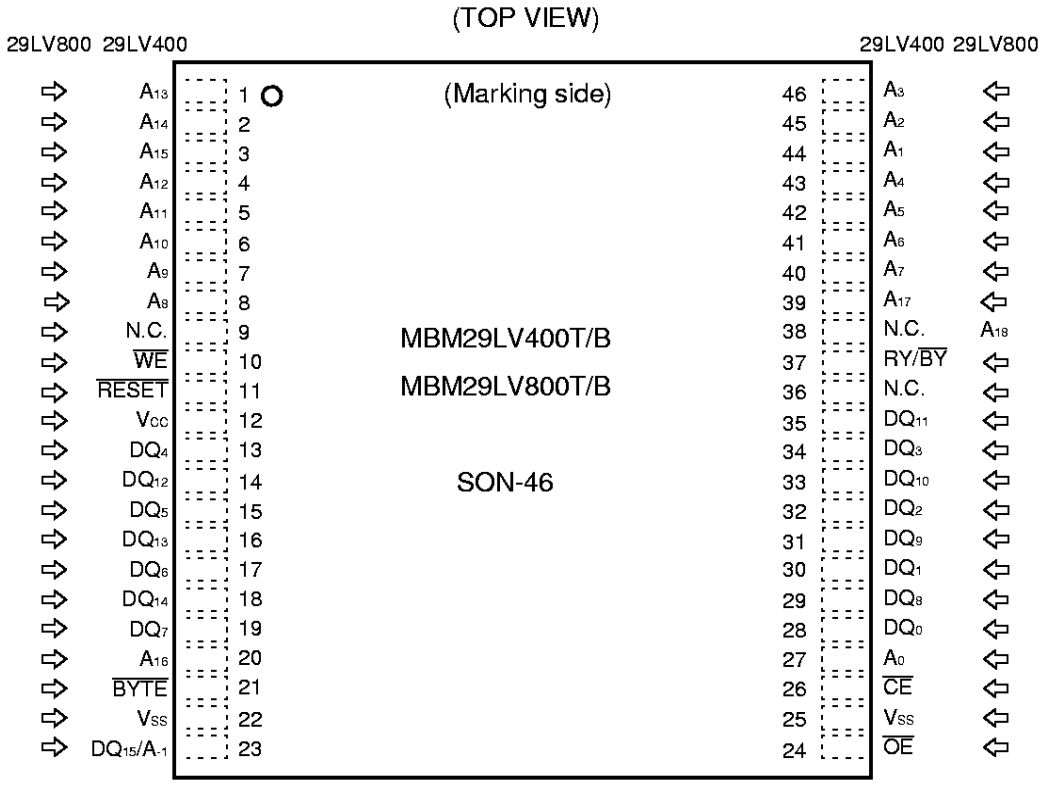
3. MBM29LV004T/B, LV008T/B, LV080 (SON-46)



LCC-46P-M02

Pin Symbol	Pin Name	Pin Symbol	Pin Name
A_0 to A_{19}	Address Inputs	RY/$\overline{BY}$	Reset/Busy Output
DQ_0 to DQ_7	Data I/O	V_{SS}	Device Ground
$\overline{CE}$	Chip Enable	V_{CC}	Power Supply (2.7 V ± 3.6 V or 3.0 V ± 3.6 V)
$\overline{OE}$	Output Enable		
$\overline{WE}$	Write Enable	N.C.	No Connection
$\overline{RESET}$	Hardware Reset Pin/ Temporary Sector Unprotection	—	—

4. MBM29LV400T/B, LV800T/B (SON-46)



LCC-46P-M02

Pin Symbol	Pin Name	Pin Symbol	Pin Name
A_{-1} A_0 to A_{18}	Address Inputs	RY/$\overline{BY}$	Reset/Busy Output
DQ_0 to DQ_{15}	Data I/O	$\overline{BYTE}$	8-bit/16-bit Selection
$\overline{CE}$	Chip Enable	V_{SS}	Device Ground
$\overline{OE}$	Output Enable	V_{CC}	Power Supply (2.7 V ± 3.6 V or 3.0 V ± 3.6 V)
$\overline{WE}$	Write Enable		
$\overline{RESET}$	Hardware Reset Pin/ Temporary Sector Unprotection	N.C.	No Connection

■ I/O TERMINAL CAPACITANCE

Parameter Description	Parameter Symbol	Test Setup	Ratings			Unit
			Min.	Typ.	Max.	
Input Terminal Capacitance	C_{IN}	V_{IN} = 0	—	T.B.D.	T.B.D.	pF
Output Terminal Capacitance	C_{OUT}	V_{OUT} = 0	—	T.B.D.	T.B.D.	pF
Control Terminal Capacitance	C_{IN2}	V_{IN} = 0	—	T.B.D.	T.B.D.	pF

■ HANDLING PRECAUTIONS

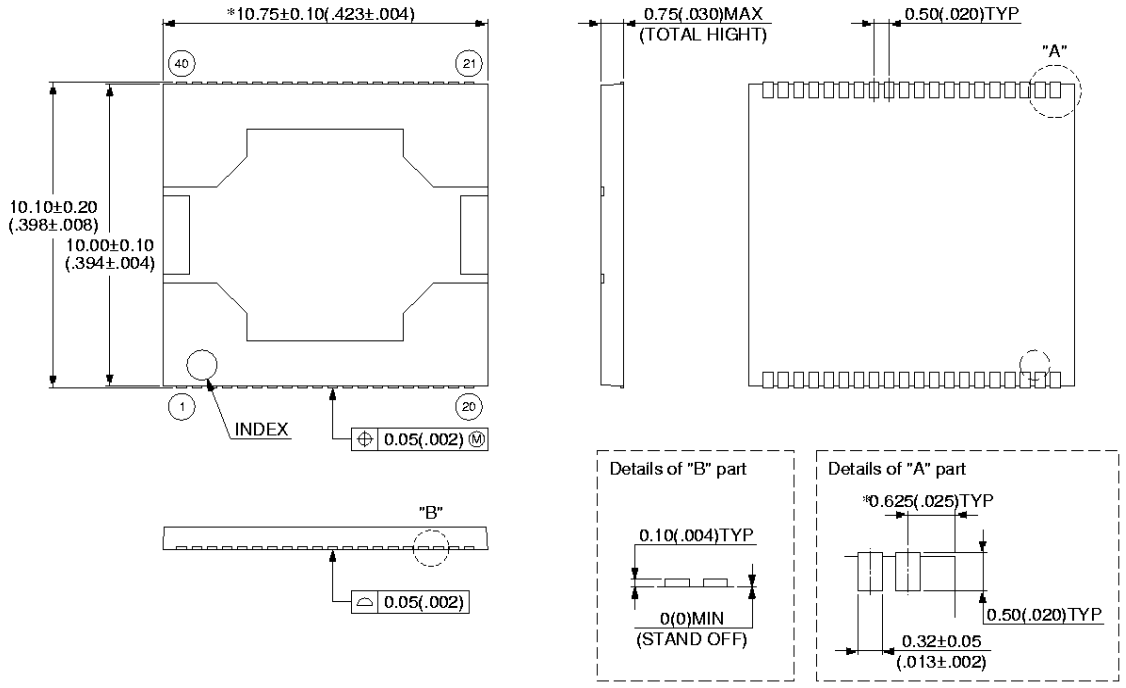
Metal parts on the marking side are electrically connected to the chip inside the package. For this reason, prevent electrical contact with these parts during assembly or execution. In the worst case, overcurrent will may sometimes flow to the chip and damage elements or the system. If this happens, the package may generate heat and burn.

■ ORDER CATALOG NUMBER

Part No.	Package	Access Time (ns)	Remarks
MBM29F017-90PNS MBM29F017-12PNS	Plastic, SON 40-pin (LCC-40P-M02)	90 120	Address Don't Care
MBM29LV002T-10PNS MBM29LV002T-12PNS	Plastic, SON 40-pin (LCC-40P-M02)	100 120	Top Sector
MBM29LV002B-10PNS MBM29LV002B-12PNS	Plastic, SON 40-pin (LCC-40P-M02)	100 120	Bottom Sector
MBM29LV004T-10PNS MBM29LV004T-12PNS	Plastic, SON 40-pin (LCC-40P-M02)	100 120	Top Sector
MBM29LV004B-10PNS MBM29LV004B-12PNS	Plastic, SON 40-pin (LCC-40P-M02)	100 120	Bottom Sector
MBM29LV004T-10PN MBM29LV004T-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Top Sector
MBM29LV004B-10PN MBM29LV004B-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Bottom Sector
MBM29LV400T-10PN MBM29LV400T-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Top Sector
MBM29LV400B-10PN MBM29LV400B-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Bottom Sector
MBM29LV080-10PN MBM29LV080-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Address Don't Care
MBM29LV008T-10PN MBM29LV008T-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Top Sector
MBM29LV008B-10PN MBM29LV008B-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Bottom Sector
MBM29LV800T-10PN MBM29LV800T-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Top Sector
MBM29LV800B-10PN MBM29LV800B-12PN	Plastic, SON 46-pin (LCC-46P-M02)	100 120	Bottom Sector

■ PACKAGE DIMENSIONS

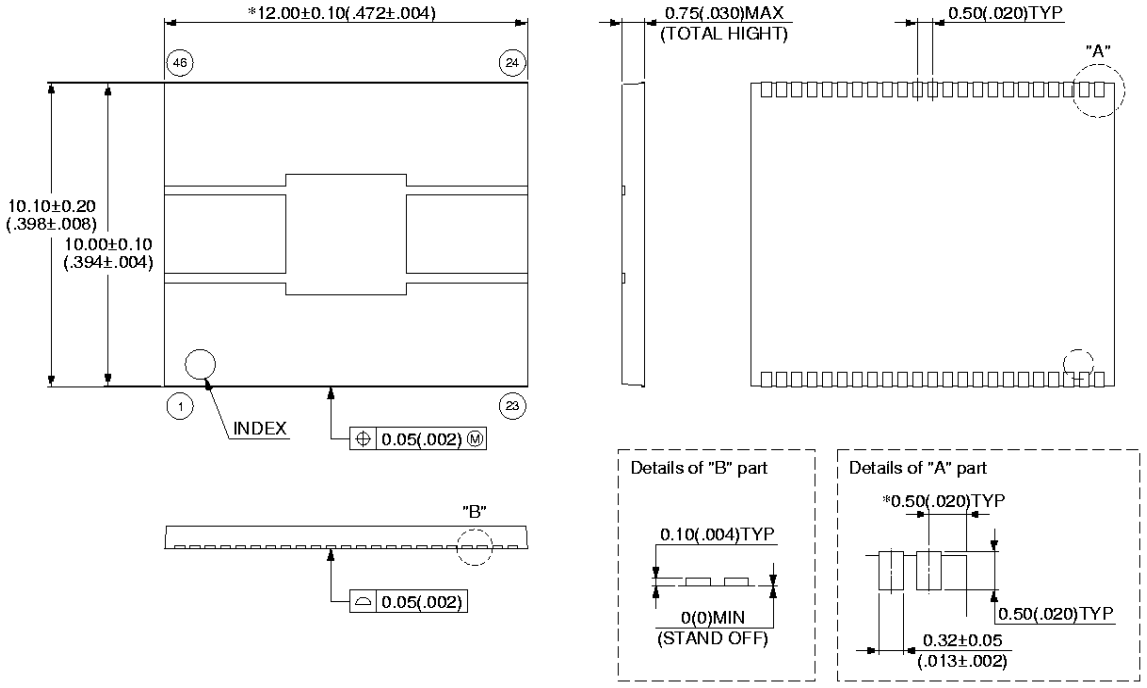
40-LEAD SMALL OUTLINE NON-LEADED
(CASE No. : LCC-40P-M02)



*Resin protrusion. (Each side:.006(0.15)MAX.)

Dimensions in mm (inches)

46-LEAD SMALL OUTLINE NON-LEADED
(CASE No. : LCC-46P-M02)



*Resin protrusion. (Each side:.006(0.15)MAX.)

Dimensions in mm (inches)

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