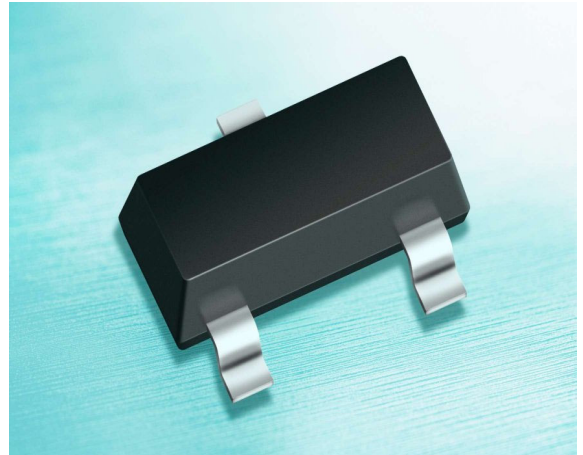


### Silicon TVS diodes

- ESD / transient protection of CAN/LIN bus networks power supply lines according to:  
IEC61000-4-2 (ESD):  $\pm 30\text{kV}$  (air / contact)  
IEC61000-4-4 (EFT): 80 A (5/50 ns)  
IEC61000-4-5 (surge): 5 A (8/20 $\mu\text{s}$ )  
ISO7637-2: Pulse 1 (max. 50 V),  
Pulse 2 (max. 125 V), Pulse 3a, b (max. 800 V)
- Max. working voltage: 24 V
- Low capacitance: 24 pF typ.
- Low clamping voltage: < 41 V
- Extremely low reverse current: < 1 nA typ.
- Pb-free (RoHS compliant) package

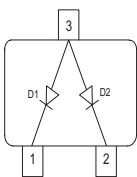


### Applications

- Low and High-Speed CAN
- Fault Tolerant CAN
- Industrial control networks
- 12/24 V DC power supply lines



### ESD24VS2U



Type	Package	Configuration	Marking
ESD24VS2U	SOT23	2 lines, uni-directional*	EUs

\* 1 line, bi-directional between pins 1 and 2, if pin 3 is not connected

**Maximum Ratings** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Value	Unit
ESD contact discharge <sup>1)</sup>	$V_{\text{ESD}}$	30	kV
Peak pulse current ( $t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>	$I_{\text{pp}}$	5	A
Peak pulse power ( $t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>	$P_{\text{pk}}$	230	W
Operating temperature range	$T_{\text{op}}$	-55...150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	-65...150	

**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

**Characteristics**

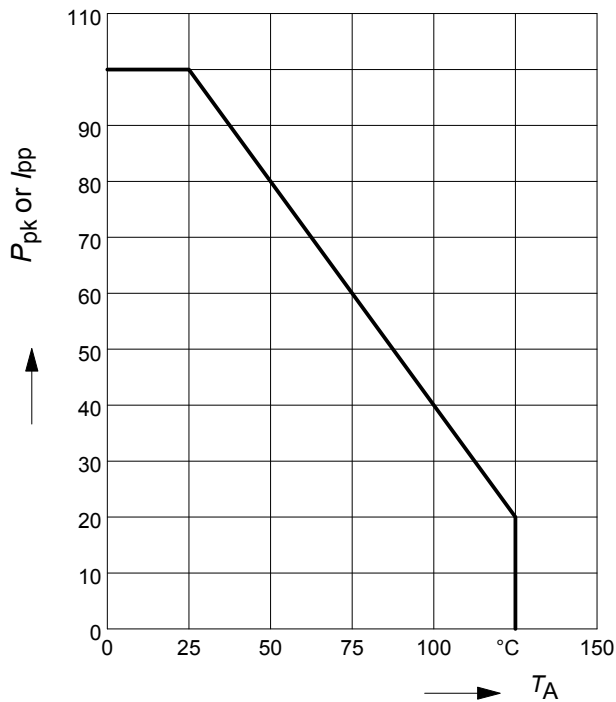
Reverse working voltage	$V_{\text{RWM}}$	-	-	24	V
Breakdown voltage $I_{\text{(BR)}} = 1 \text{ mA}$	$V_{\text{(BR)}}$	26	-	32	
Reverse current $V_R = 24 \text{ V}$	$I_R$	-	<1	10	nA
Clamping voltage $I_{\text{PP}} = 1 \text{ A}, t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup> $I_{\text{PP}} = 5 \text{ A}, t_p = 8 / 20 \mu\text{s}$ ) <sup>2)</sup>	$V_{\text{CL}}$	- -	30 36	34 41	V
Line capacitance <sup>3)</sup> $V_R = 0 \text{ V}, f = 1 \text{ MHz}$ , (pins 1 to 2, pin 3 n.c.) $V_R = 0 \text{ V}, f = 1 \text{ MHz}$ , (pins 1 or 2 to 3)	$C_T$	- -	24 48	28 52	

<sup>1)</sup>  $V_{\text{ESD}}$  according to IEC61000-4-2. Device stressed with 10 positive / negative ESD pulses.

<sup>2)</sup>  $I_{\text{pp}}$  according to IEC61000-4-5. Non-repetitive current pulse.

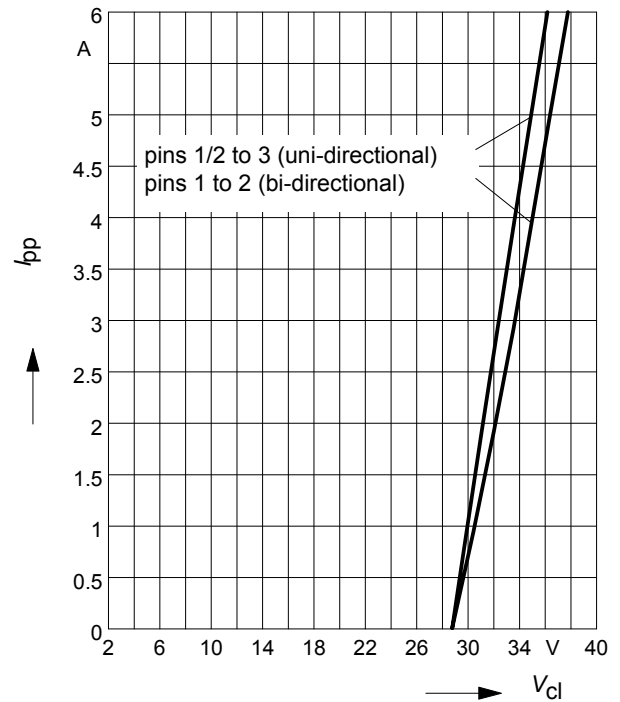
<sup>3)</sup> Total capacitance line to ground (per line)

**Power derating curve**  $P_{pk} = f(T_A)$



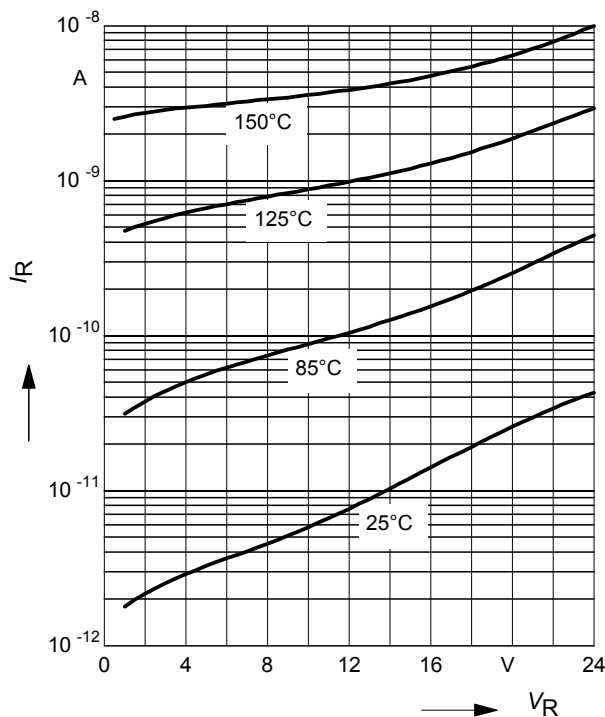
**Clamping voltage**,  $V_{cl} = f(I_{pp})$

$t_p = 8 / 20 \mu\text{s}$



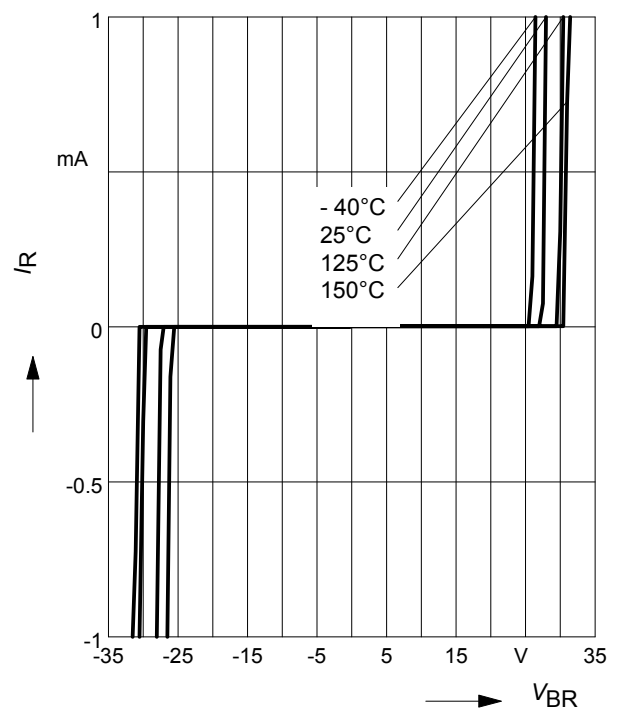
**Reverse current**  $I_R = f(V_R)$

$T_A = \text{Parameter, pins 1 / 2 to 3}$   
( uni-directional )



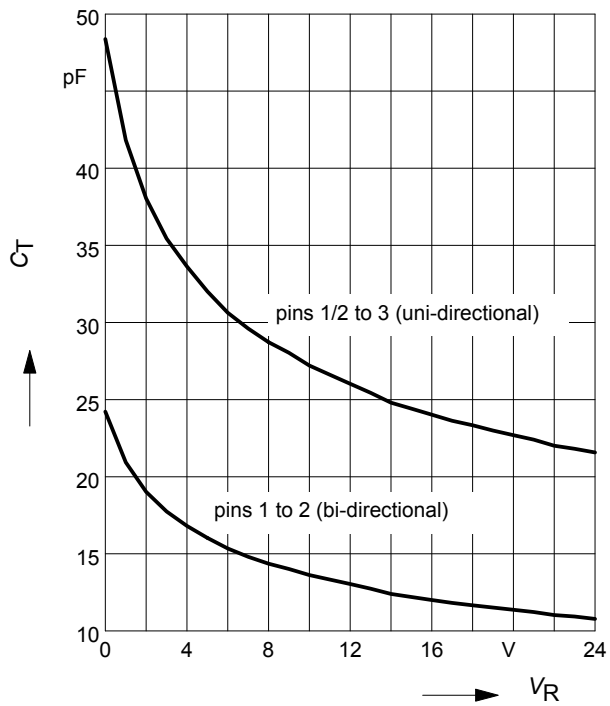
**Breakdown voltage**  $V_{BR} = f(I_R)$

$T_A = \text{Parameter, pins 1 to 2}$   
( bi-directional )

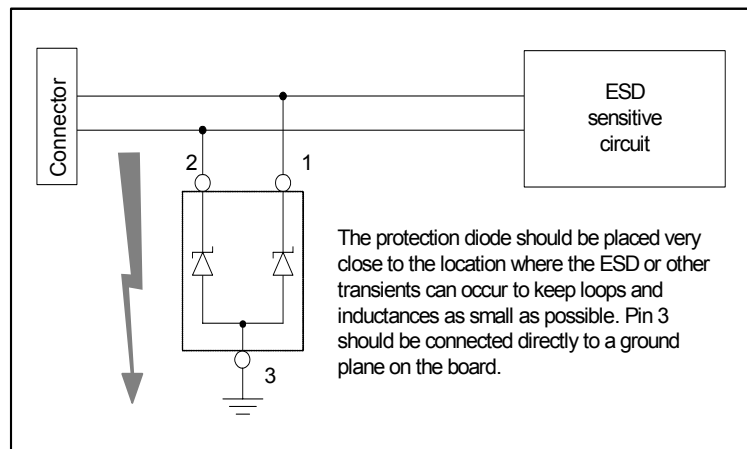


Line capacitance  $C_T = f(V_R)$

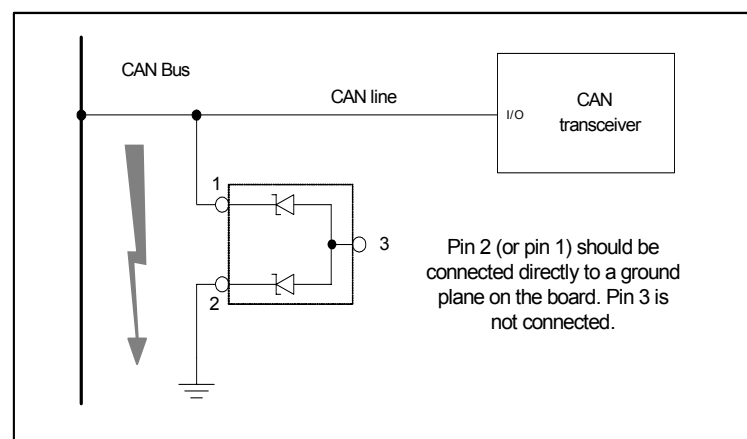
$f = 1\text{MHz}$



**Application example ESD24VS2U ( uni-directional )**  
 12V / 24V DC power supply line protection

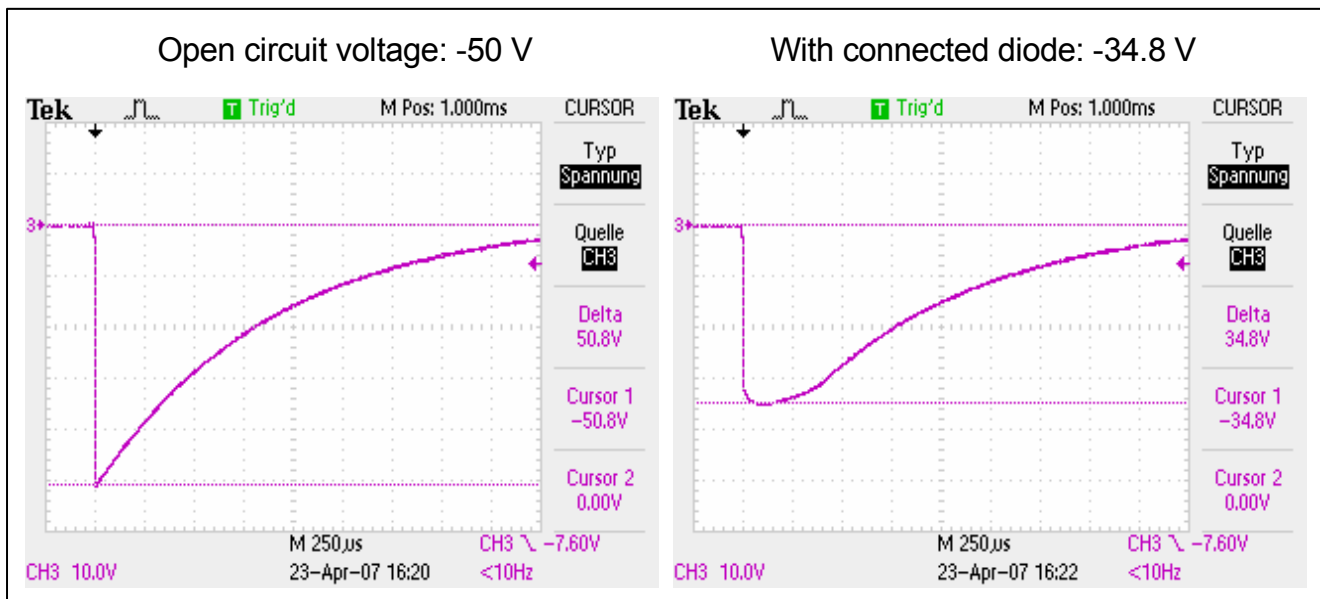


**Application example ESD24VS2U ( bi-directional )**  
 Single Wire CAN and LIN bus protection



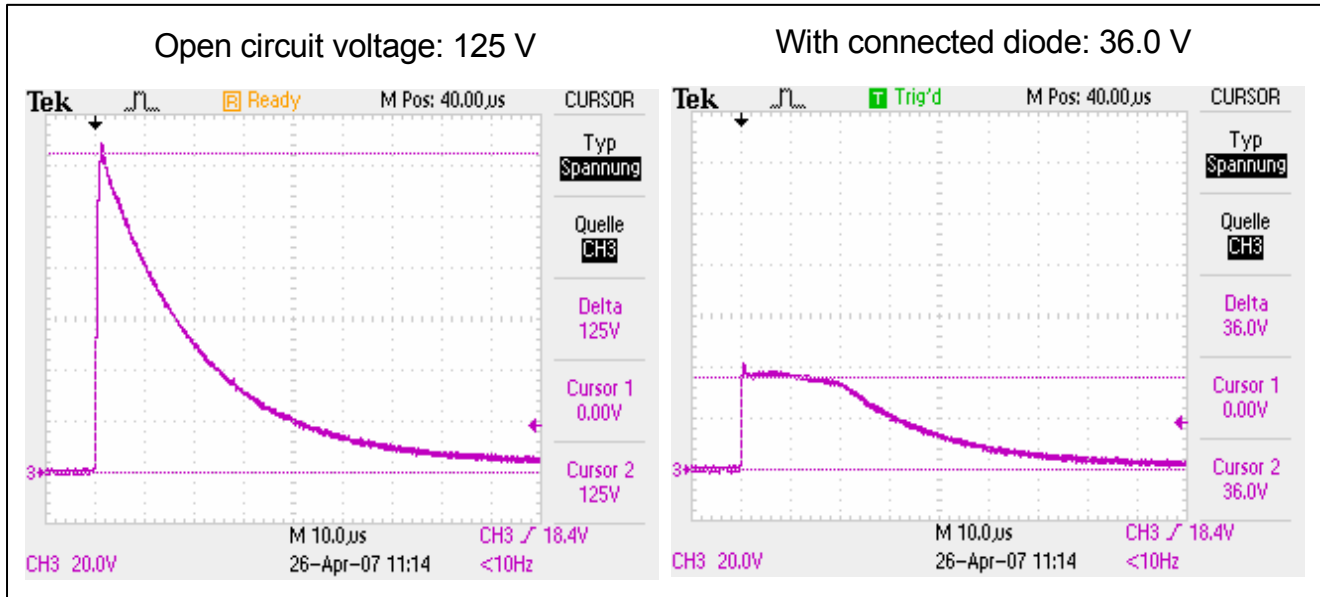
# Clamping voltage according to ISO 7637-2: Pulse 1

$R_i = 10\ \Omega$ ,  $t_d = 2\ \text{ms}$ , 5000 pulses



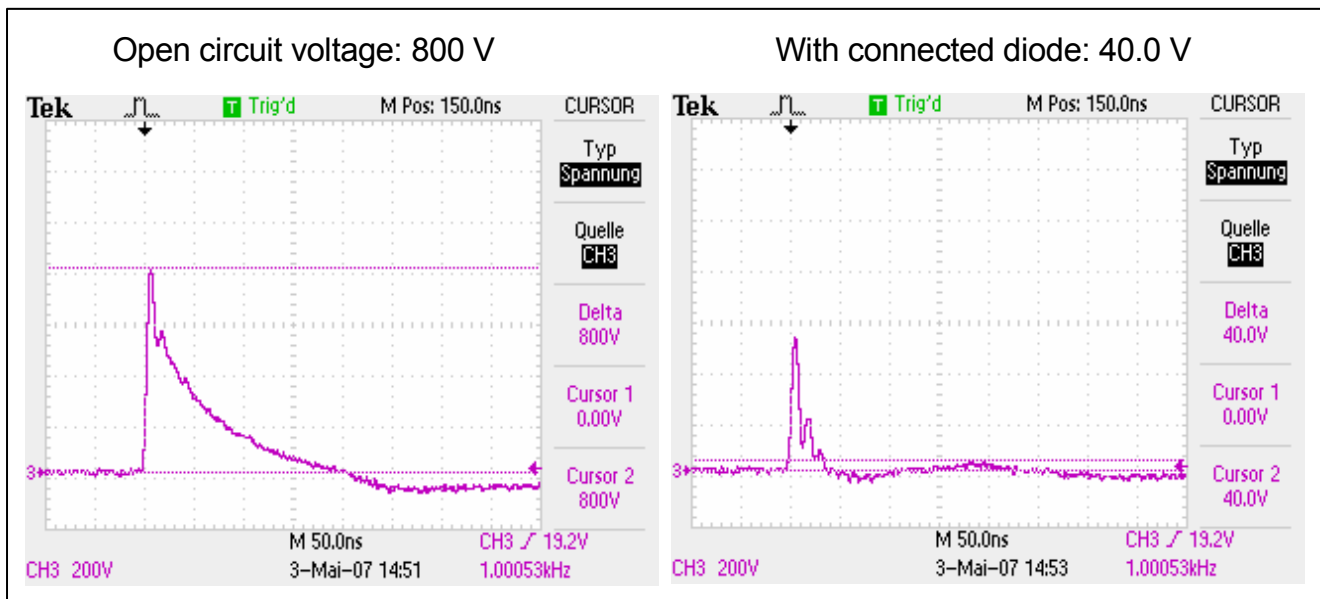
# Clamping voltage according to ISO 7637-2: Pulse 2a

$R_i = 10\ \Omega$ ,  $t_d = 2\ \mu s$ , 4000 pulses, 60 min



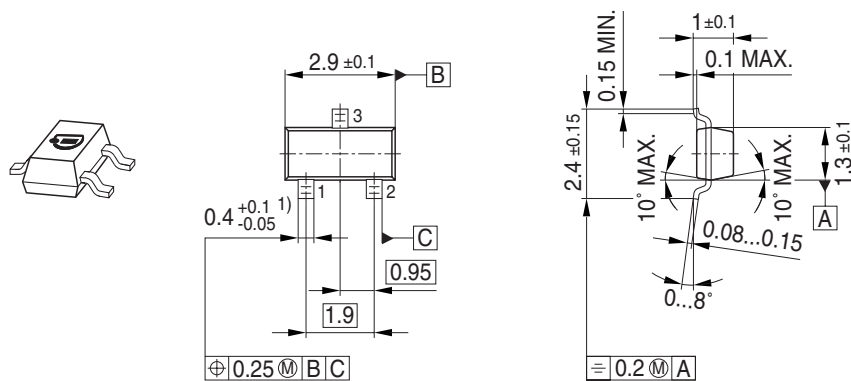
### Clamping voltage according to ISO 7637-2: Pulse 3

$R_i = 50 \text{ Ohm}$ ,  $t_d = 100 \text{ ns}$ , 10 min



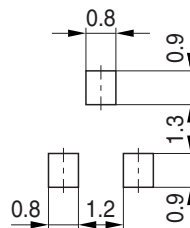


## Package Outline

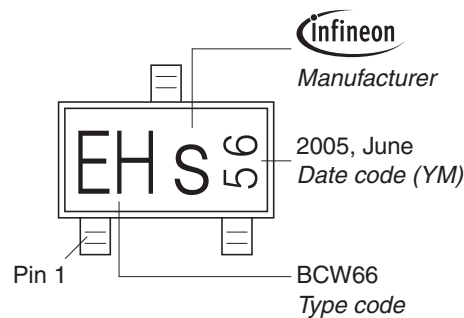


1) Lead width can be 0.6 max. in dambar area

## Foot Print

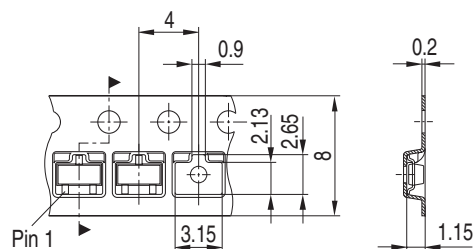


## Marking Layout (Example)



## Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel  
Reel ø330 mm = 10.000 Pieces/Reel



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