MX3N10G

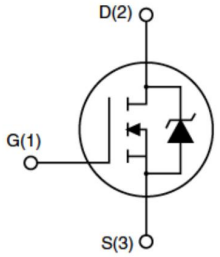
N-Channel Enhancement Mode Power MOSFET

Deneral Features

V_{DS} =100V，I_D = 2.2A

V_{GS}= 4.5V $R_{DS(ON)}$(Typ.)=260mΩ

V_{GS}=10 V $R_{DS(ON)}$(Typ.)=250mΩ



Schematic diagram

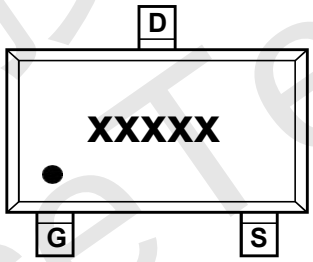
1.High power and current handing capability
2.Lead free product is acquired
3.Surface mount package

Application

1.Uninterruptible Power Supply(UPS)

2.Hard Switched and High Frequency Circuits

3.Power Switching application

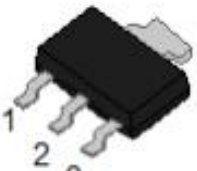


Marking and pin assignment

Package

SOT-23


SOT89-3



SOT-223

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Symbol	Parameter		Max.			Units
			SOT-23	SOT89-3	SOT-223	
V_{DSS}	Drain-Source Voltage		100			V
V_{GSS}	Gate-Source Voltage		±20			V
I_D	Continuous Drain Current	T_C = 25℃	2.2			A
		T_C = 100℃	1.5			A
I_{DM}	Pulsed Drain Current note1		12			A
P_D	Power Dissipation	T_A = 25℃	2.5	3.9	5	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		50	32	25	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150			℃

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MX3N10G

Electrical Characteristics (TA=25℃ unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} =100V, V_{GS} = 0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} =0V,V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}= V_{GS}, I_D=250μA	1.0	1.8	3.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note2	V_{GS} =10V, I_D =2A	-	250	280	mΩ
		V_{GS} =4.5V, I_D =1A	-	260	310	
g_{FS}	Forward Transconductance	V_{DS} =10V, I_D =3A	-	1.1	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =50V, V_{GS} = 0V, f = 1.0MHz	-	330	-	pF
C_{oss}	Output Capacitance		-	88	-	pF
C_{rss}	Reverse Transfer Capacitance		-	15	-	pF
Q_g	Total Gate Charge	V_{DS} =50V, I_D =1A, V_{GS} =10V	-	5.2	-	nC
Q_{gs}	Gate-Source Charge		-	1.0	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	1.4	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V,R_L=39Ω, R_G=1Ω, V_{GS} =10V	-	14	-	ns
t_r	Turn-on Rise Time		-	54	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	18	-	ns
t_f	Turn-off Fall Time		-	11	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=1A	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

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Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

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Typical Performance Characteristics

Figure1: Output Characteristics

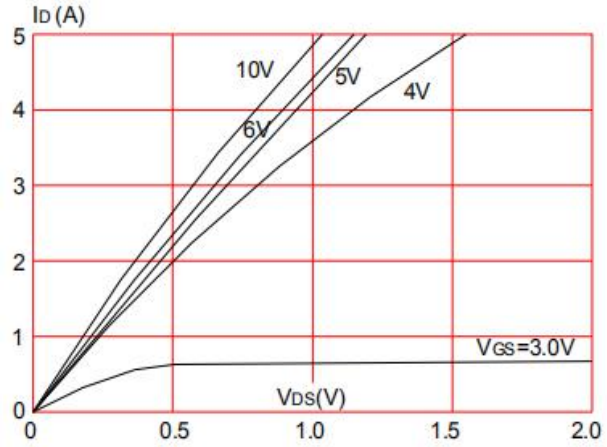

Figure 2: Typical Transfer Characteristics

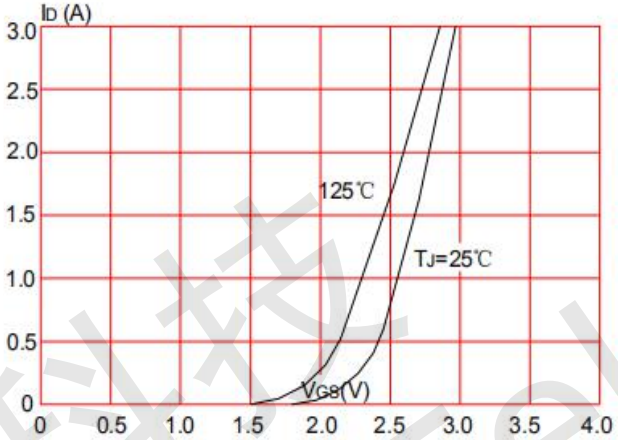

Figure 3: On-resistance vs. Drain Current

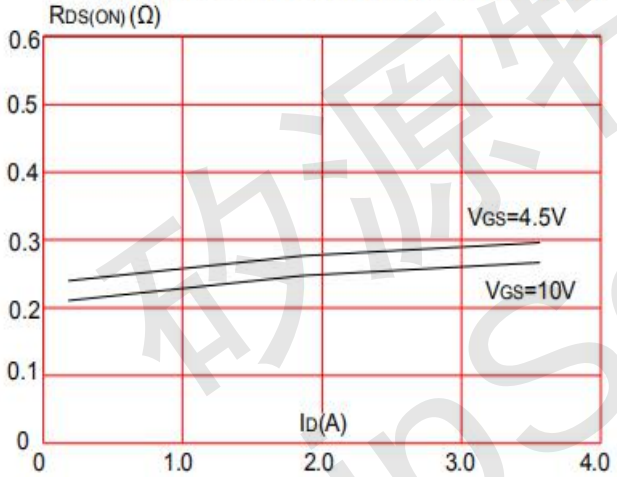

Figure 4: Body Diode Characteristics

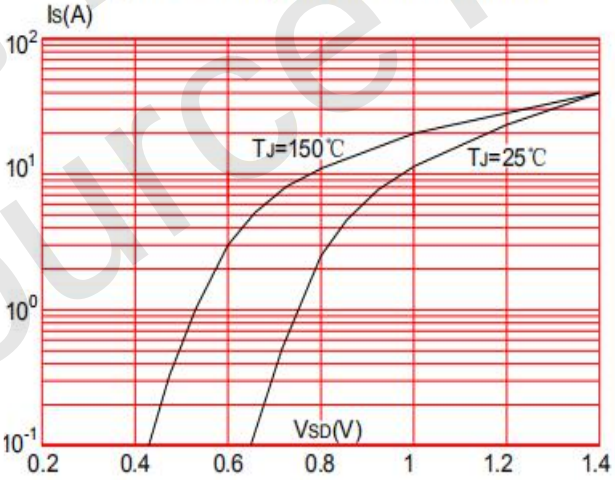

Figure 5: Gate Charge Characteristics

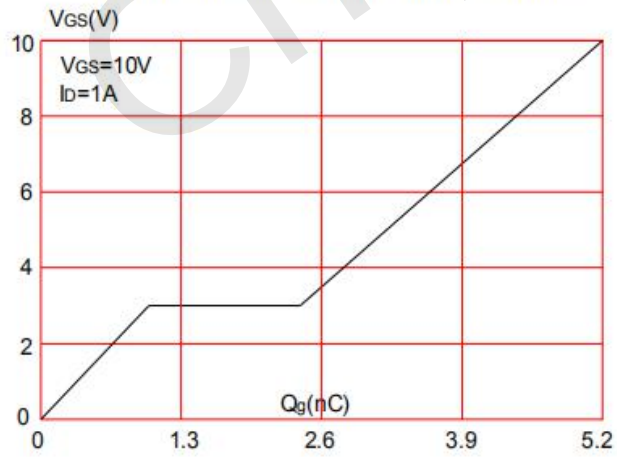

Figure 6: Capacitance Characteristics

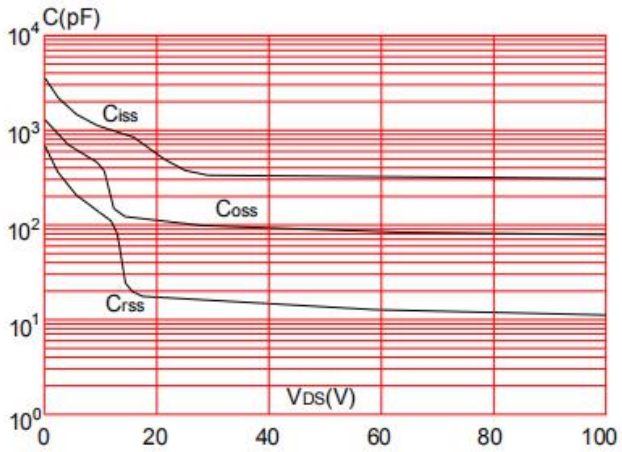

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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

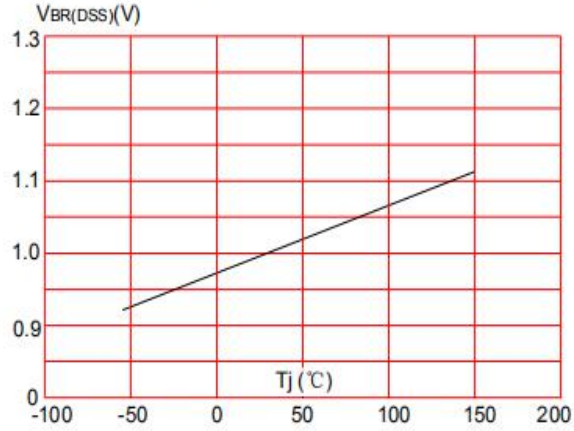

Figure 8: Normalized on Resistance vs. Junction Temperature

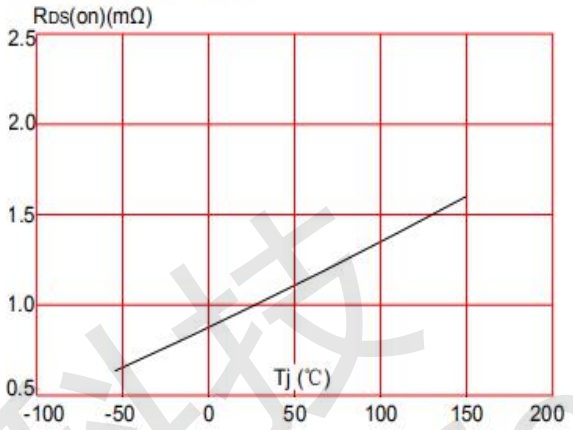

Figure 9: Maximum Safe Operating Area

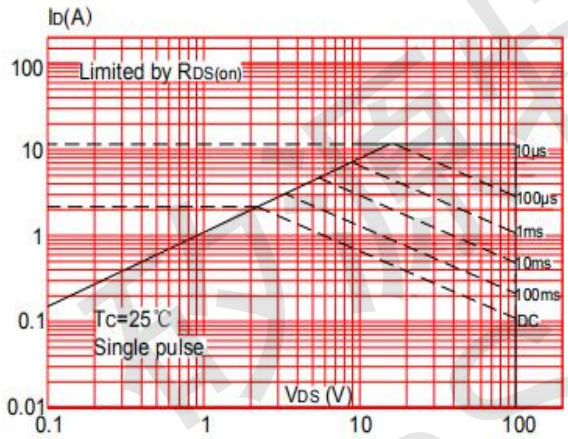

Figure 10: Maximum Continuous Drain Current vs. Case Temperature

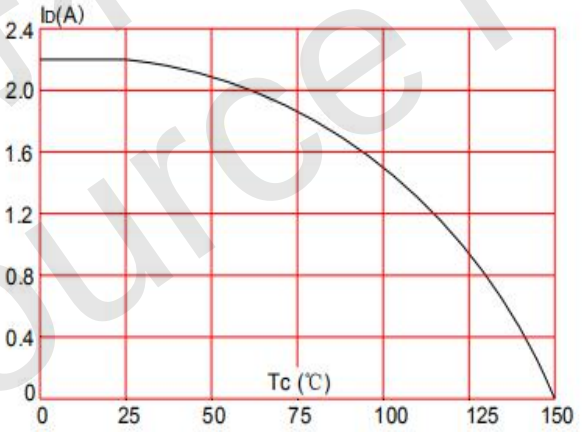

Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT-23)

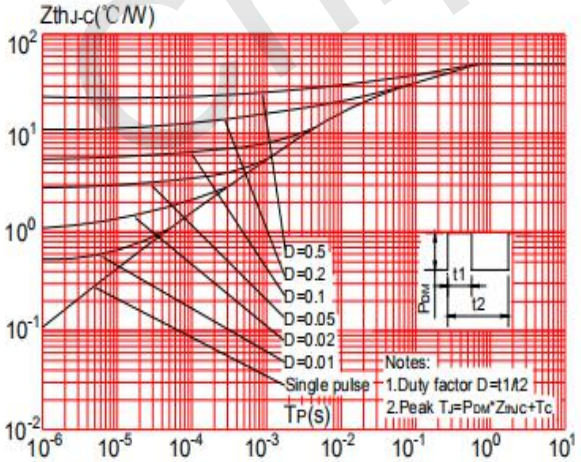

Figure.12: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT89-3)

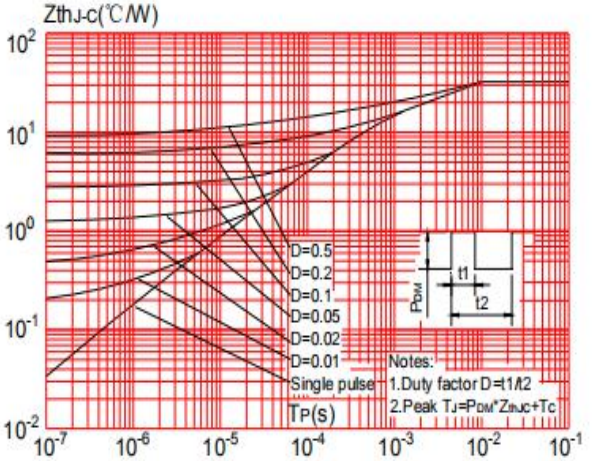

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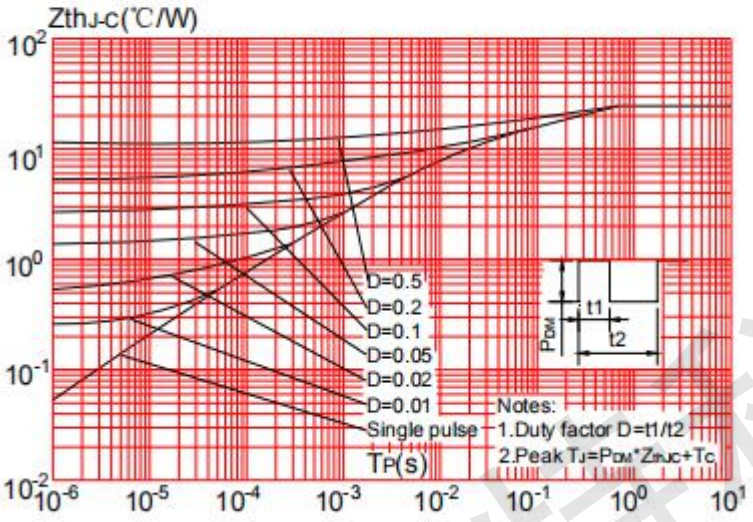
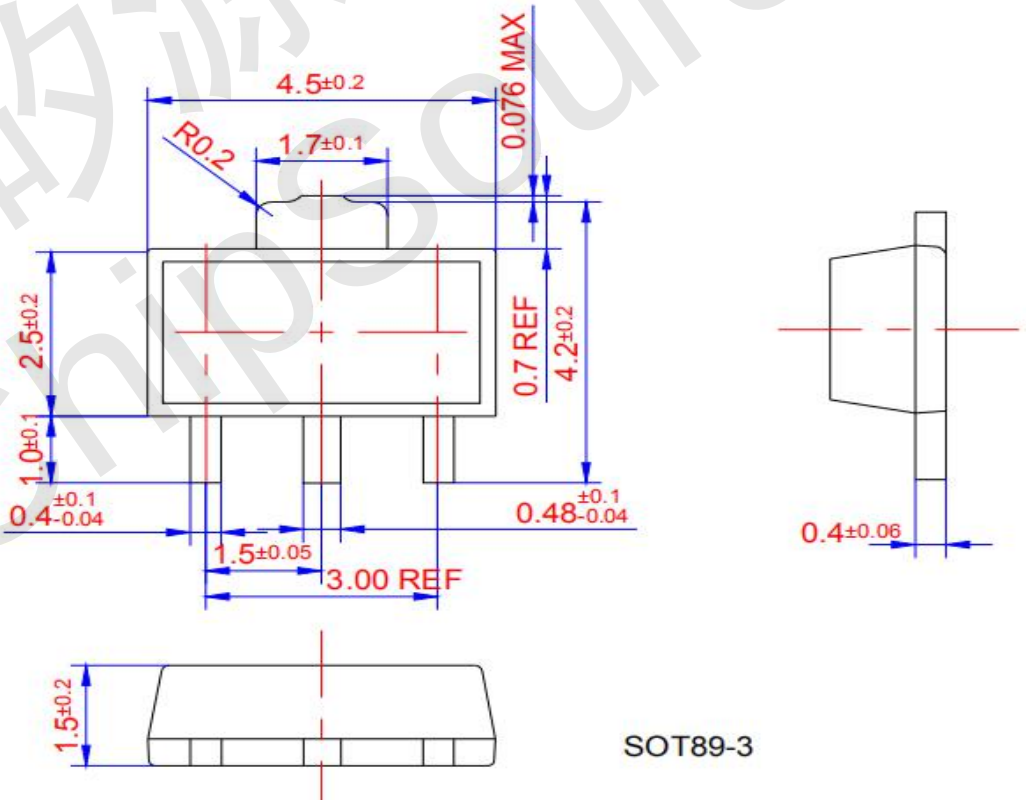
Figure.13: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT-223)



Package Mechanical Data



SOT89-3

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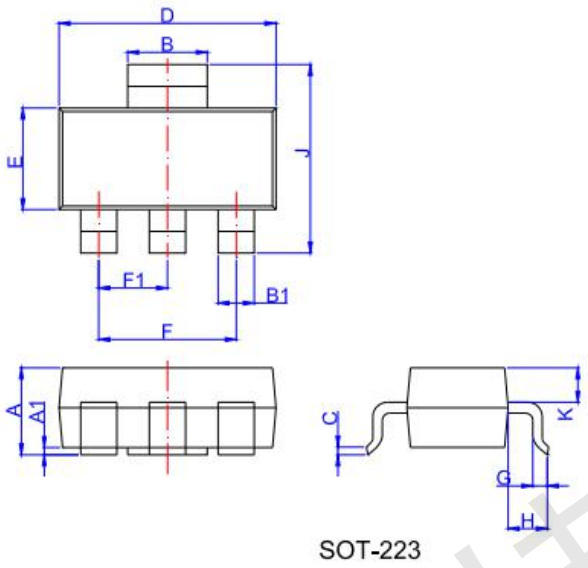
MX3N10G

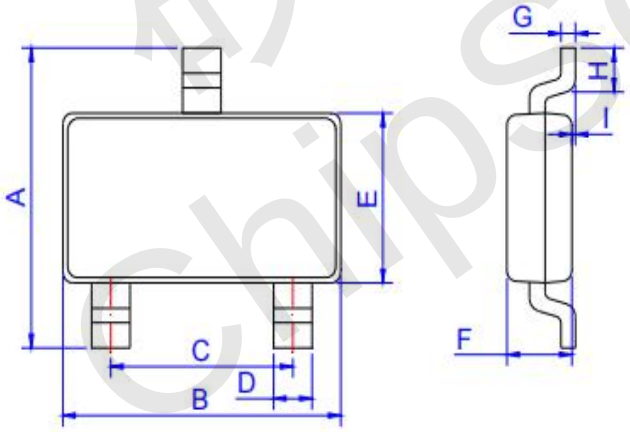


SOT-223

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.5	1.6	1.8	0.059	0.063	0.071
A1	0.01	0.06	0.10	0.001	0.002	0.004
B	2.9	3.0	3.1	0.114	0.118	0.122
B1	0.6	0.7	0.8	0.024	0.028	0.031
C	0.22	0.26	0.32	0.009	0.010	0.013
D	6.3	6.5	6.7	0.248	0.256	0.264
E	3.3	3.5	3.7	0.130	0.138	0.146
F		4.6			0.181	
F1		2.3			0.091	
G	0.7	0.9	1.1	0.028	0.035	0.043
H	1.5	1.75	2.0	0.059	0.069	0.079
J	6.7	7.0	7.3	0.264	0.276	0.287
K	0.8	0.9	1.0	0.031	0.035	0.039

Reel Specification-SOT-223

SOT-23-3L Package Information



SOT-23

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.30	2.40	2.50	0.091	0.095	0.098
B	2.80	2.90	3.00	0.110	0.114	0.118
C	1.90 REF			0.075 REF		
D	0.35	0.40	0.45	0.014	0.016	0.018
E	1.20	1.30	1.40	0.047	0.051	0.055
F	0.90	1.00	1.10	0.035	0.039	0.043
G		0.10	0.15		0.004	0.006
H	0.20			0.008		
I	0		0.10	0		0.004

Notes

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

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