



SPN3414

N-Channel Enhancement Mode MOSFET

DESCRIPTION

The SPN3414 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits where high-side switching , and low in-line power loss are needed in a very small outline surface mount package.

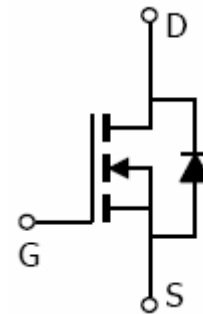
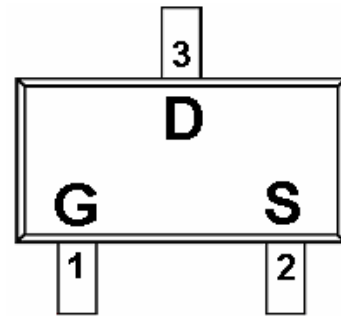
FEATURES

- ◆ 20V/4.0A, $R_{DS(ON)}=55m\Omega@V_{GS}=4.5V$
- ◆ 20V/3.4A, $R_{DS(ON)}=70m\Omega@V_{GS}=2.5V$
- ◆ 20V/2.8A, $R_{DS(ON)}=90m\Omega@V_{GS}=1.8V$
- ◆ Super high density cell design for extremely low $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOT-23-3L package design

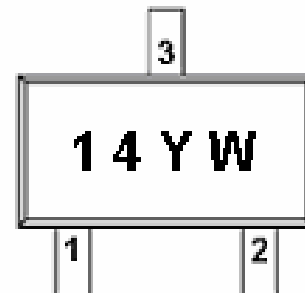
APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

PIN CONFIGURATION(SOT-23-3L)



PART MARKING



Y : Year Code
W : Week Code



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PIN DESCRIPTION

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1 | G | Gate |
| 2 | S | Source |
| 3 | D | Drain |

ORDERING INFORMATION

| Part Number | Package | Part Marking |
|--------------|-----------|--------------|
| SPN3414S23RG | SOT-23-3L | 14YW |

※ Week Code : A ~ Z (1 ~ 26) ; a ~ z (27 ~ 52)

※ SPN3414S23RG : Tape Reel ; Pb – Free

ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

| Parameter | Symbol | Typical | Unit | |
|---|------------------|---------|------|---|
| Drain-Source Voltage | V _{DSS} | 20 | V | |
| Gate –Source Voltage | V _{GSS} | ±12 | V | |
| Continuous Drain Current(T _J =150°C) | I _D | TA=25°C | 4.0 | A |
| | | TA=70°C | 3.4 | |
| Pulsed Drain Current | I _{DM} | 10 | A | |
| Continuous Source Current(Diode Conduction) | I _S | 1.6 | A | |
| Power Dissipation | P _D | TA=25°C | 1.25 | W |
| | | TA=70°C | 0.8 | |
| Operating Junction Temperature | T _J | -55/150 | °C | |
| Storage Temperature Range | T _{STG} | -55/150 | °C | |
| Thermal Resistance-Junction to Ambient | R _{θJA} | 105 | °C/W | |



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ELECTRICAL CHARACTERISTICS

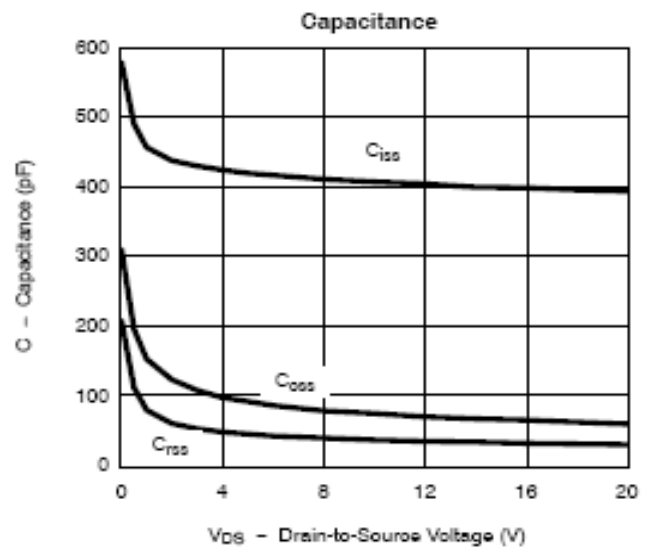
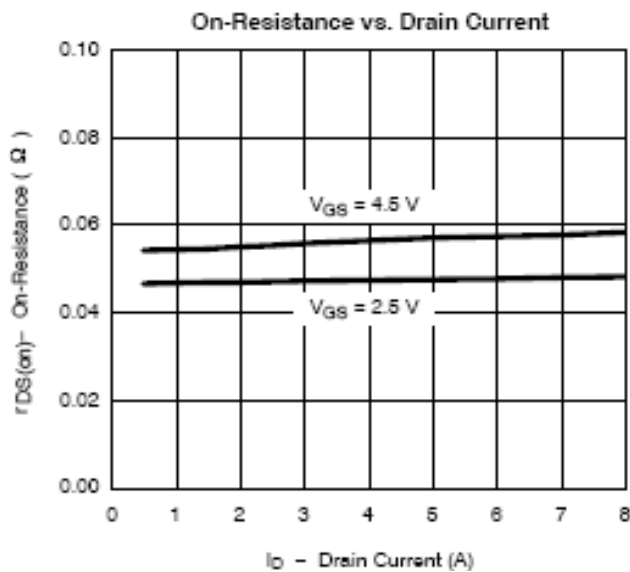
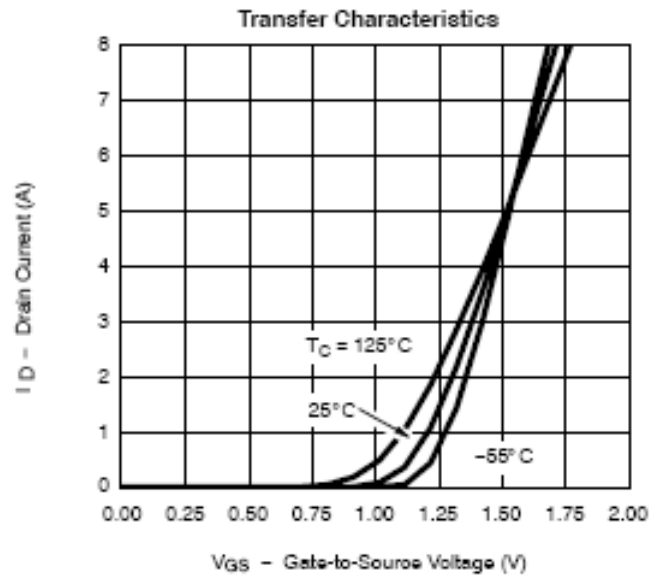
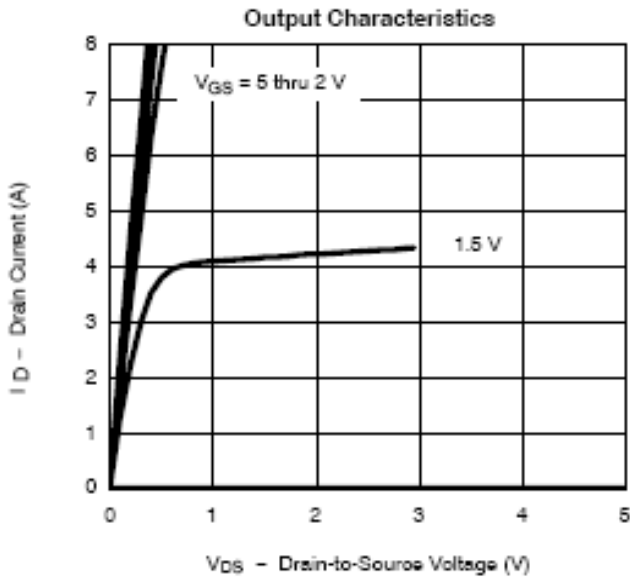
(T_A=25°C Unless otherwise noted)

| Parameter | Symbol | Conditions | Min. | Typ | Max. | Unit |
|---------------------------------|----------------------|---|------|-------|-------|------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} =0V, I _D =250μA | 20 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 0.4 | | 1.0 | |
| Gate Leakage Current | I _{GSS} | V _{DS} =0V, V _{GS} =±12V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =20V, V _{GS} =0V | | | 1 | μA |
| | | V _{DS} =20V, V _{GS} =0V T _J =55°C | | | 5 | |
| On-State Drain Current | I _{D(on)} | V _{DS} ≤ 5V, V _{GS} =4.5V | 6 | | | A |
| Drain-Source On-Resistance | R _{DSS(on)} | V _{GS} =4.5V, I _D =4.0A | | 0.040 | 0.055 | Ω |
| | | V _{GS} =2.5V, I _D =3.4A | | 0.055 | 0.070 | |
| | | V _{GS} =1.8V, I _D =2.8A | | 0.075 | 0.090 | |
| Forward Transconductance | g _{fs} | V _{DS} =5V, I _D =-3.6A | | 10 | | S |
| Diode Forward Voltage | V _{SD} | I _S =1.6A, V _{GS} =0V | | 0.8 | 1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q _g | V _{DS} =6V, V _{GS} =4.5V I _D =2.8A | | 4.8 | 8 | nC |
| Gate-Source Charge | Q _{gs} | | | 1.0 | | |
| Gate-Drain Charge | Q _{gd} | | | 1.0 | | |
| Input Capacitance | C _{iss} | V _{DS} =6V, V _{GS} =0V f=1MHz | | 485 | | pF |
| Output Capacitance | C _{oss} | | | 85 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 40 | | |
| Turn-On Time | t _{d(on)} | V _{DD} =6V, R _L =6Ω I _D =1.0A, V _{GEN} =4.5V R _G =6Ω | | 8 | 14 | ns |
| | t _r | | | 12 | 18 | |
| Turn-Off Time | t _{d(off)} | | | 30 | 35 | |
| | t _f | | | 12 | 16 | |



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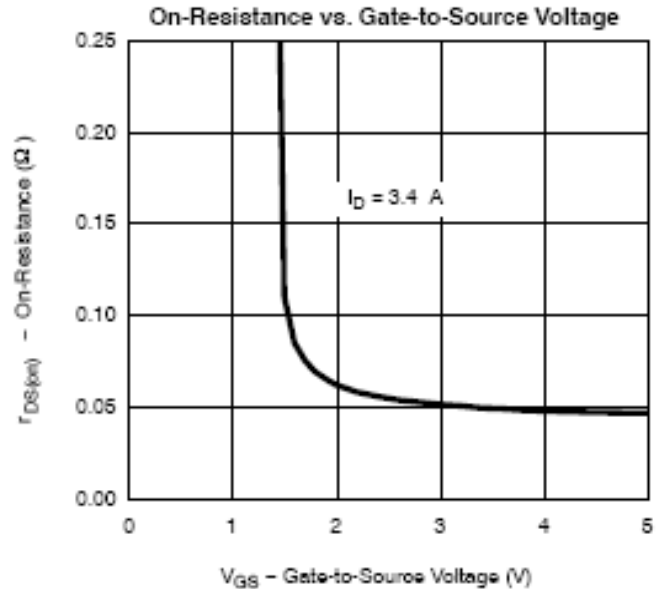
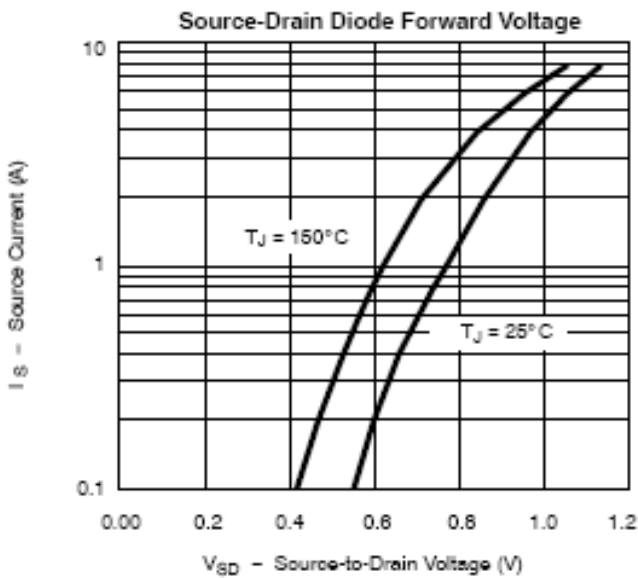
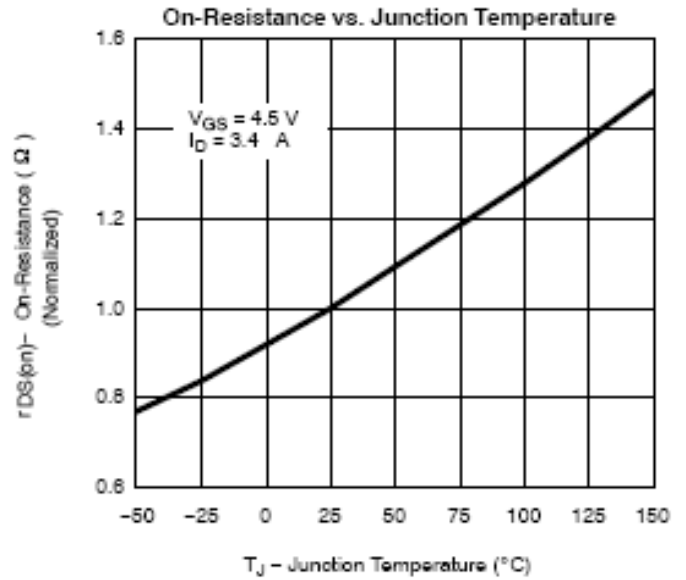
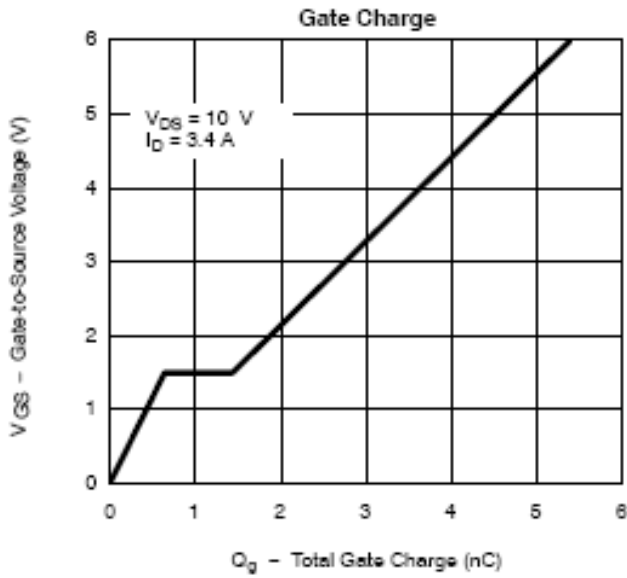
TYPICAL CHARACTERISTICS





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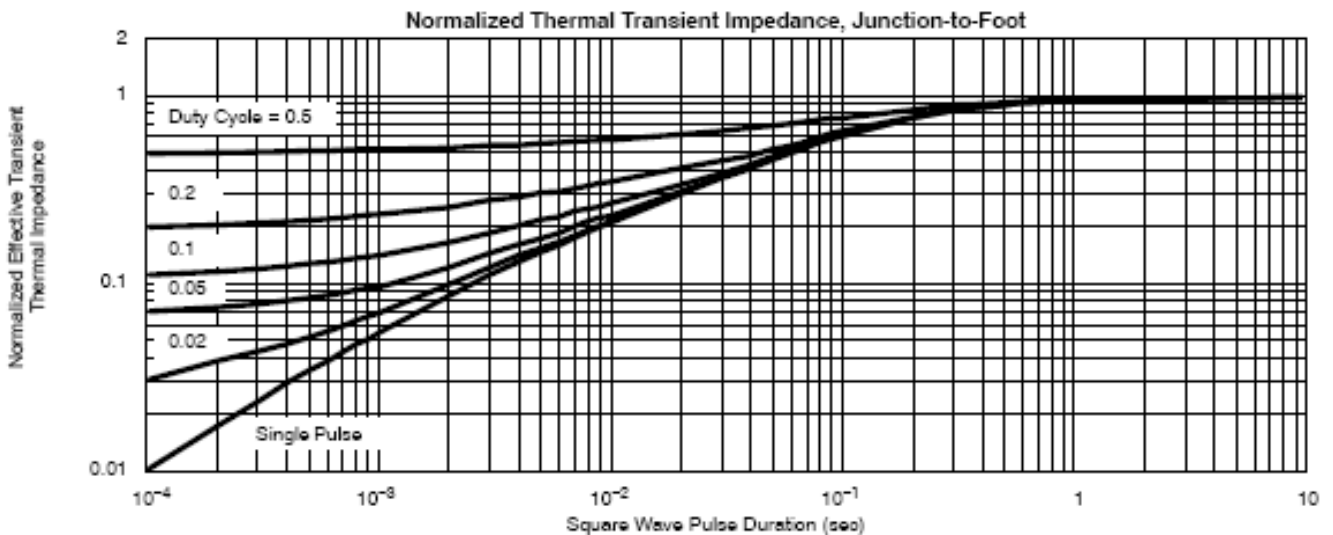
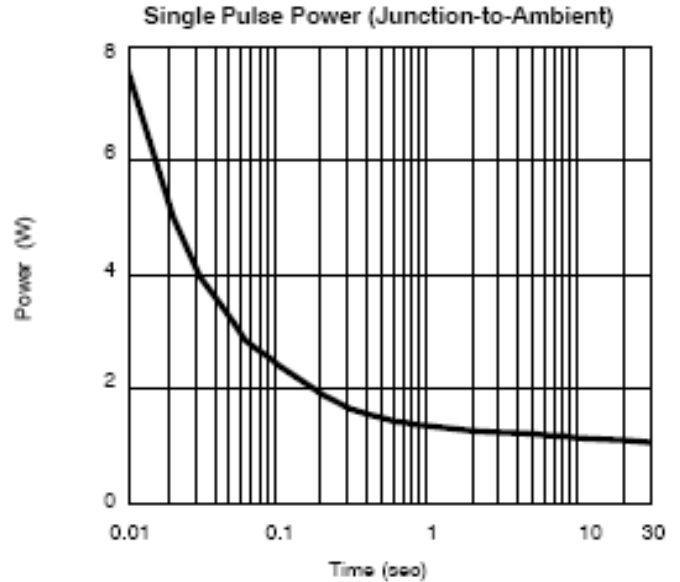
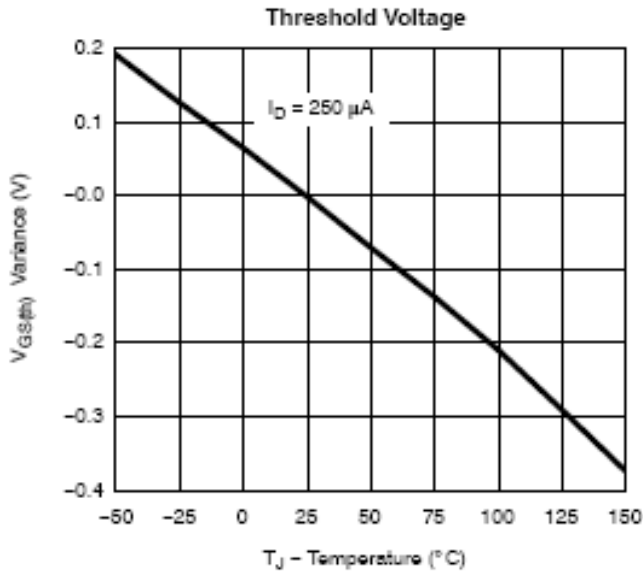
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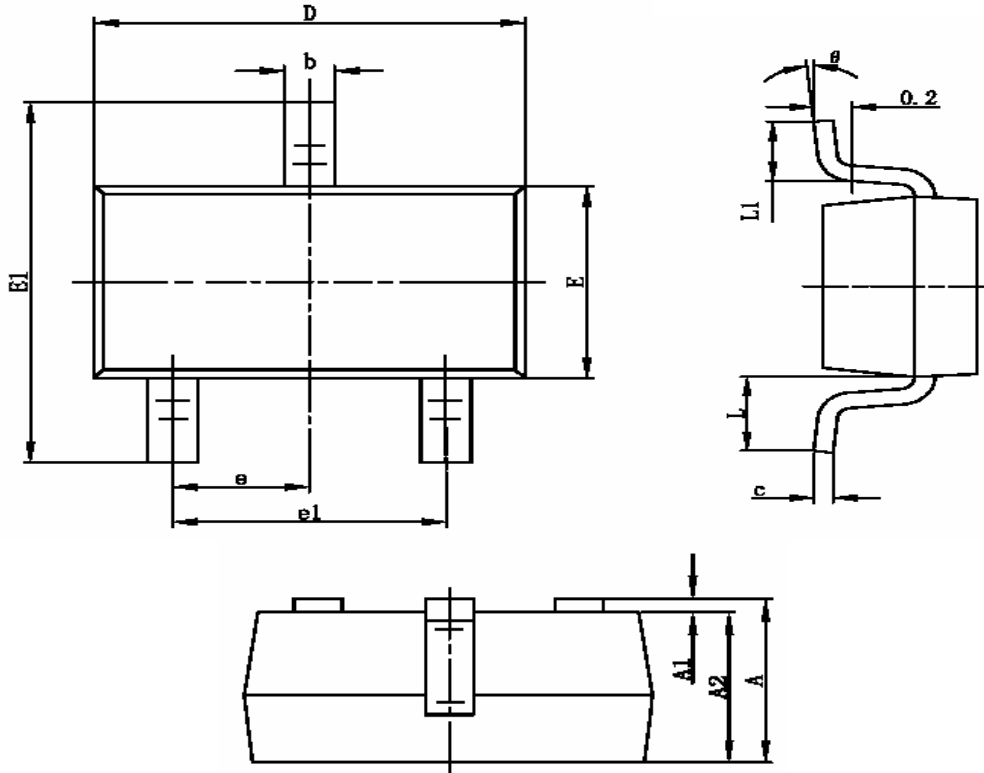




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SOT-23-3L PACKAGE OUTLINE



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.400 | 0.012 | 0.016 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950TYP | | 0.037TYP | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.700REF | | 0.028REF | |
| L1 | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |



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