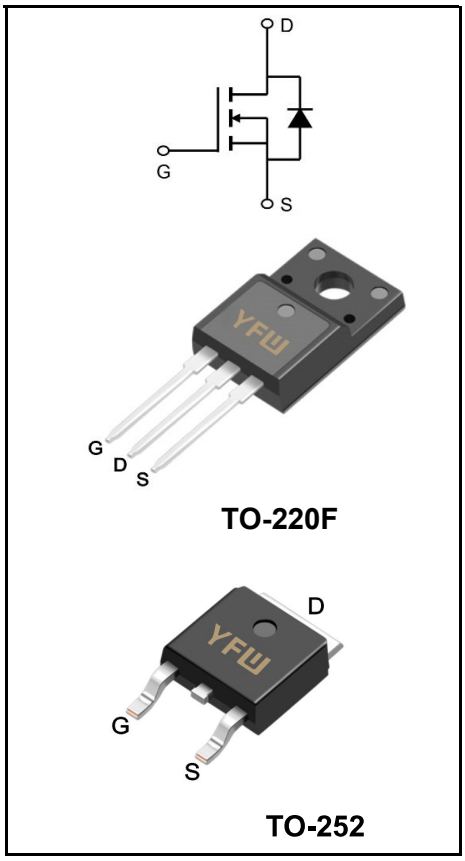
650V N-channel Super Junction MOSFET

MAIN CHARACTERISTICS

I_D	7A
V_{DS}	650V
R_{DSON}-typ(@V_{GS}=10V)	＜600mΩ(Typ:520mΩ)



FEATURES

- Low gate charge
- Very low switching and conduction loss
- Extremely high commutation ruggedness

APPLICATIONS

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS）
- Power Factor Correction(PFC)

MECHANICAL DATA

- Case:TO-220F/AF TO-252/AD
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275℃ maximum,10s per JESD 22-B106

Maximum Ratings at Tc=25°C unless otherwise specified

Parameter	Symbol	Value		Unit
		TO-220F	TO-252	
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	±30		V
Continue Drain Current	I_D	7		A
Pulsed Drain Current (Note1)	I_{DM}	24		A
Power Dissipation	P_D	64		W
Single Pulse Avalanche Energy (Note1)	E_{AS}	129		mJ
Operating Temperature Range	T_J	-50 to +150		°C
Storage Temperature Range	T_{STG}	-50 to +150		°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.8	1.97	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62		°C/W

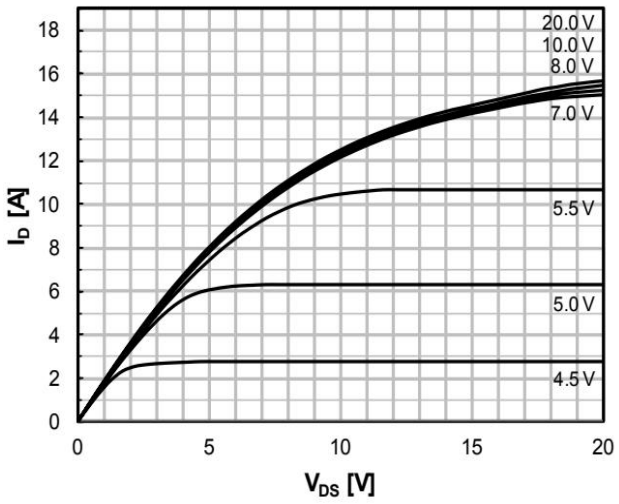
Note1:Pulse test: 300 μs pulse width, 2 % duty cycle

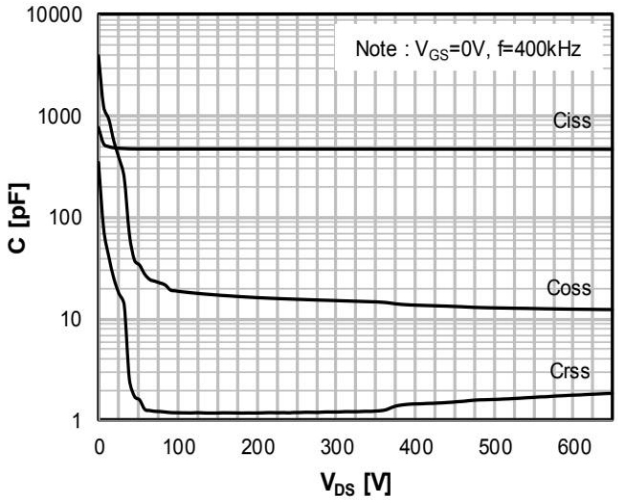
Maximum Ratings at Tc=25°C unless otherwise specified

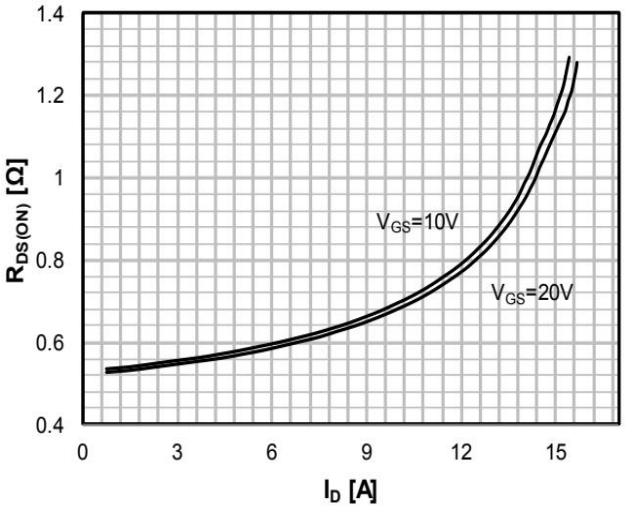
Parameter	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{GS} = 0 V,I_D = 250 μA	BV_{DSS}	650	-	-	V
Drain-Source Leakage Current	V_{DS} =650 V, V_{GS} = 0 V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS} = ± 30 V, V_{DS} = 0 V	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	V_{DS} = V_{GS} , I_D = 250 μA	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance	V_{GS}=10V, I_D=3.5A	$R_{DS(ON)}$	-	520	600	mΩ
Forward Transconductance	V_{DS} = 5 V, I_D = 2 A	gfs	-	-	8	S
Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	C_{iss}	-	715	-	pF
Output Capacitance		C_{oss}	-	35	-	
Reverse Transfer Capacitance		C_{rss}	-	1.7	-	
Turn-on Delay Time(Note2)	V_{DD} = 325V I_D = 7A V_{GS} =10V RG =25Ω	$t_{d(on)}$	-	17	-	ns
Rise Time(Note2)		T_r	-	26	-	
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	53	-	
Fall Time(Note2)		t_f	-	38	-	
Total Gate Charge(Note2)	V_{DS} = 520V, V_{GS} = 10V, I_D = 7A	Q_g	-	13	-	nC
Gate to Source Charge(Note2)		Q_{gs}	-	2.1	-	
Gate to Drain Charge(Note2)		Q_{gd}	-	6.9	-	
Maximun Body-Diode Continuous Current		I_S	-	-	7	A
Maximun Body-Diode Pulsed Current(Note2)		I_{SM}	-	-	24	A
Drain-Source Diode Forward Voltage	V_{GS}=0V , I_S=3.5A , TJ=25℃	V_{SD}	-	-	1.4	V
Body Diode Reverse Recovery Time	V_R=30V,I_F=1A, dI/dt=100A/μs	t_{rr}	-	151	-	ns
Body Diode Reverse Recovery Charge		Q_{rr}	-	565	-	nC

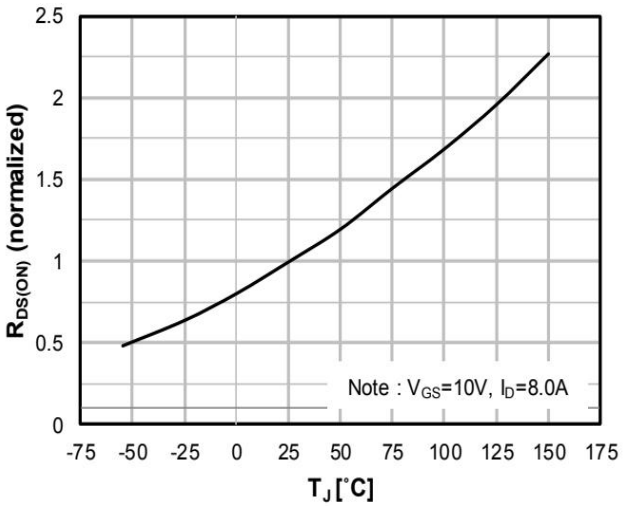
Note2:Pulse test: 300 μs pulse width, 2 % duty cycle

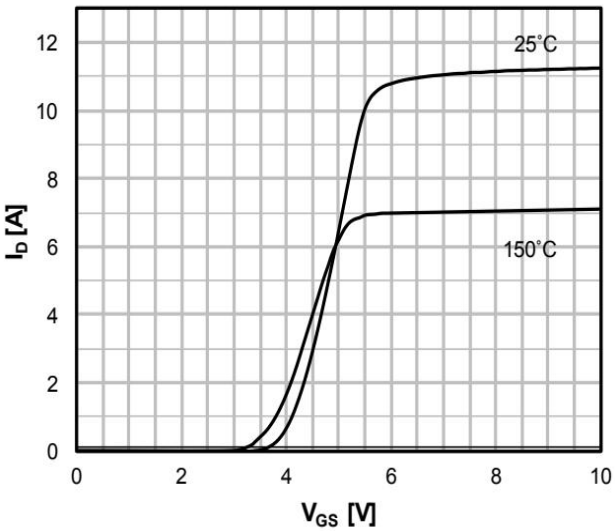
Ratings and Characteristic Curves

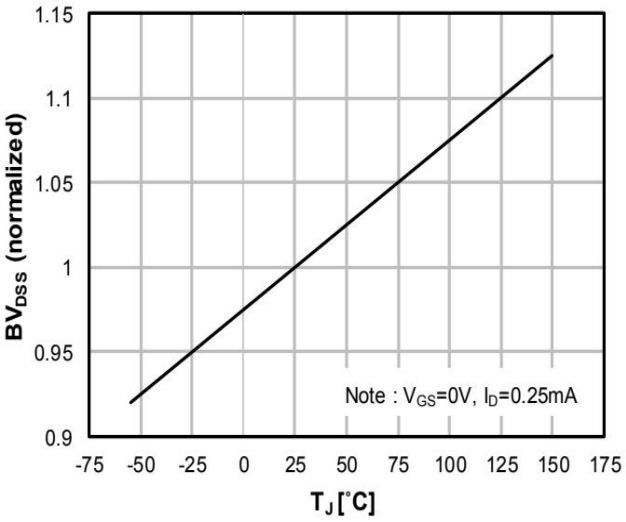




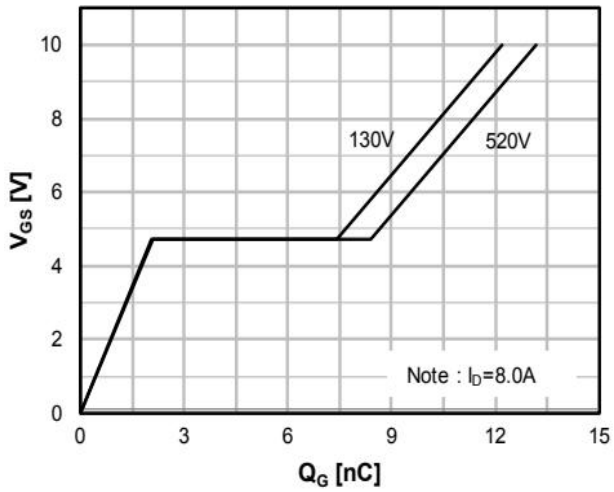


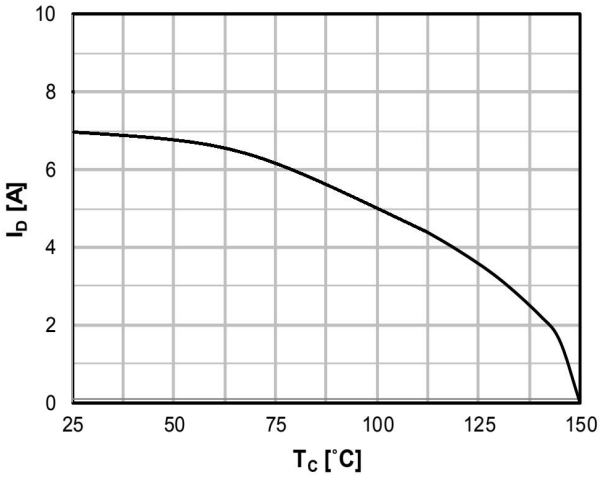


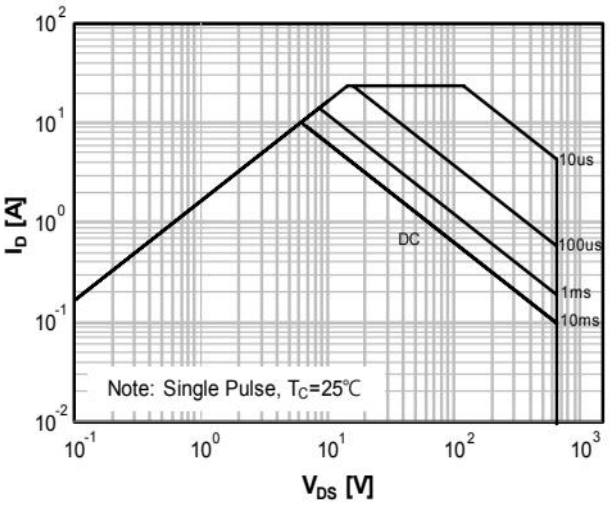


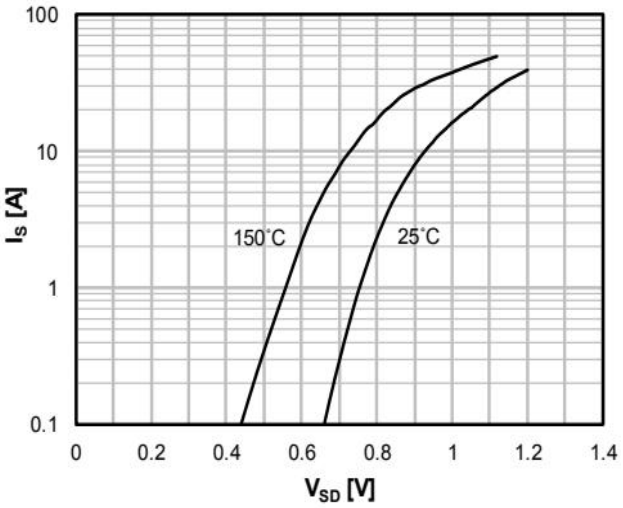


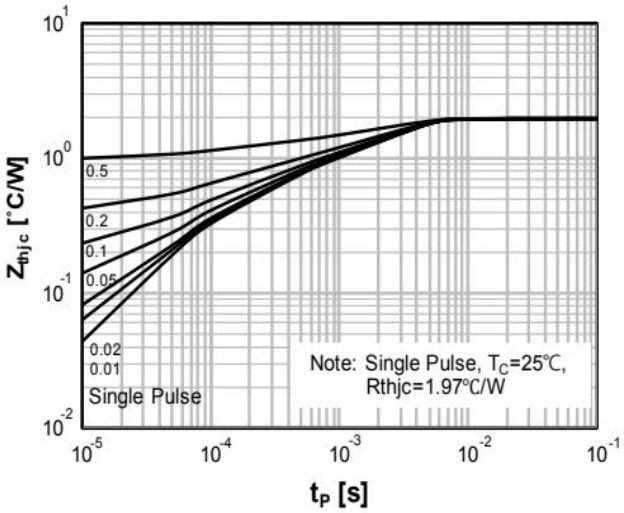
Ratings and Characteristic Curves



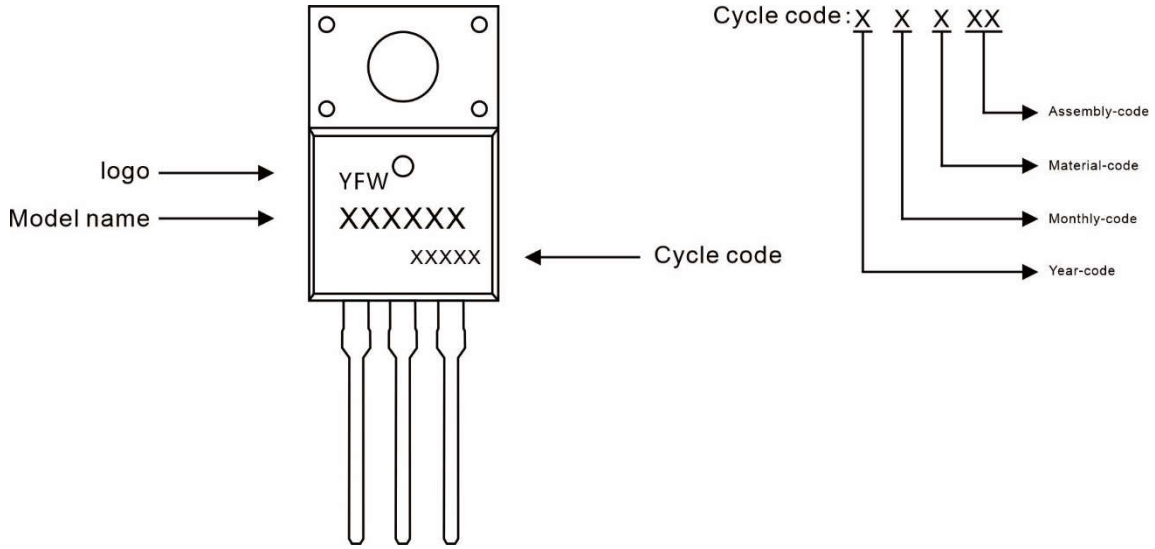








Marking Diagram

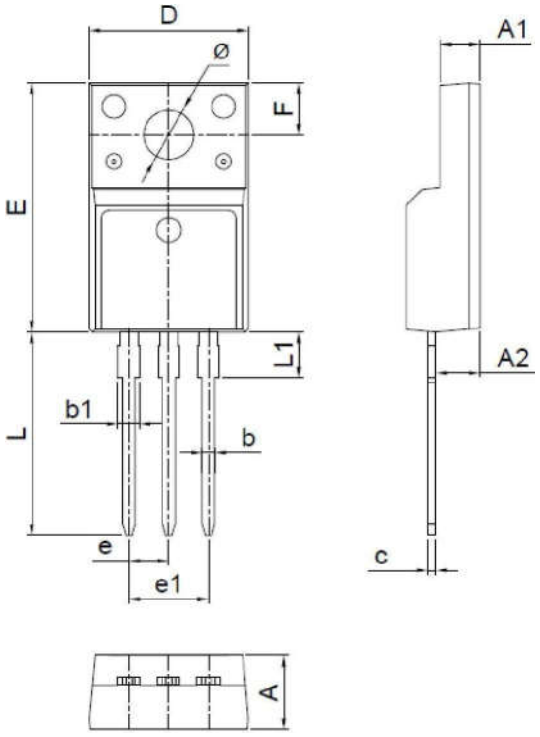


Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW65R600AF	TO-220F	0.06oz(1.74g)	50pcs/tube	1000PCS/Box 5000PCS/Carton

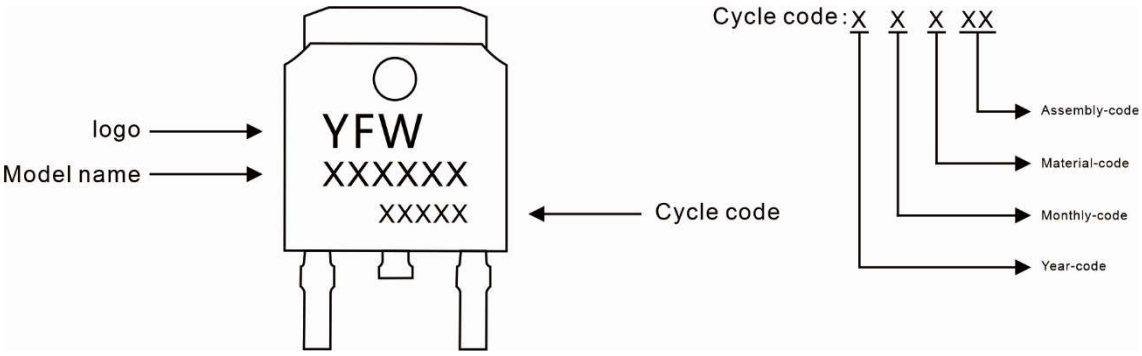
Package Dimensions

TO-220F



Symbol	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.66	2.86	0.105	0.113
b	0.75	0.85	0.030	0.033
b1	1.24	1.44	0.049	0.057
c	0.40	0.60	0.016	0.024
D	10.00	10.32	0.394	0.406
E	15.75	16.05	0.620	0.632
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
F	3.10	3.5	0.122	0.138
L	13.50	13.90	0.531	0.547
L1	2.90	3.30	0.114	0.130
Φ	3.10	3.30	0.122	0.130

Marking Diagram

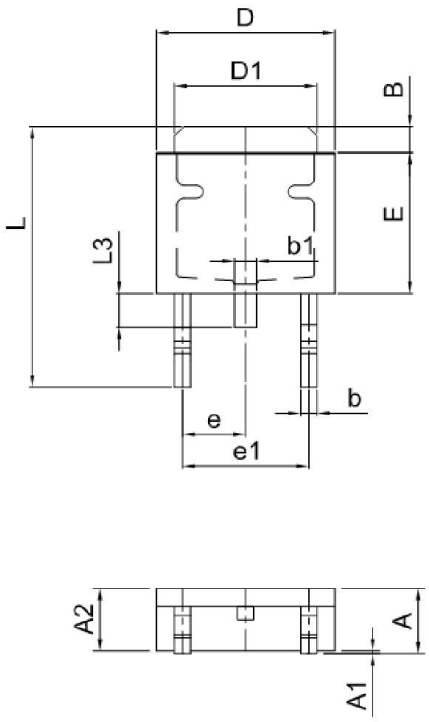


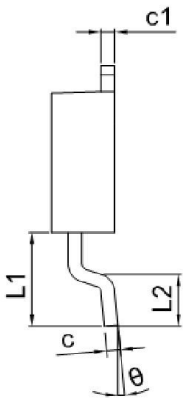
Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
YFW65R600AD	TO-252	0.011oz(0.32g)	2500pcs/reel	5000pcs/box 25000pcs/Carton

Package Dimensions

TO-252





Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.50	0.087	0.098
A1	0.00	0.12	0.000	0.005
A2	2.20	2.40	0.087	0.094
B	1.20	1.60	0.047	0.063
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.35	6.65	0.250	0.262
D1	5.20	5.40	0.205	0.213
E	5.40	5.70	0.213	0.224
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	10.00	11.00	0.393	0.433
L1	2.70	3.10	0.106	0.122
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

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