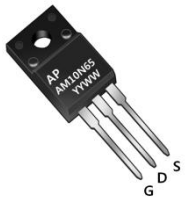
650V 10A Advanced N-Ch Power MOSFET

FEATURES

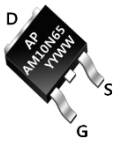
- High Voltage : BV_{DSS}=650V(Min.)
- Low C_{rss} : C_{rss} =16pF(Typ.)
- Low gate charge : Qg=35nC(Typ.)
- Low $R_{DS(on)}$: $R_{DS(on)}$=0.85Ω(Max.)

AM10N65RF

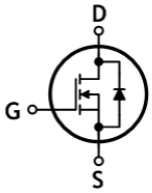


TO-220F

AM10N65RR



TO-252



Marking Information

Row 1 : AP

Row 2 : Product Information

Row 3 : Date Code

- YY : Year Code
- WW : Week Code

Ordering Information

Part No	Package	Packing	Finish	Halogen	Packing Unit
AM10N65RF	TO-220F	Tube	Sn	Free	5,000ea
AM10N65RR	TO-252	Tape & Reel	Sn	Free	2,500ea

Maximum Ratings (Tc=25 °C, unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		650	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC)*	I_D	Tc = 25℃	9	A
		Tc = 100℃	5.5	
Drain current (Pulsed)*	I_{DM}		36	A
Power Dissipation	P_D		40	W
Avalanche current (Single) (Note 2)	I_{AS}		9	A
Single pulsed avalanche energy (Note 2)	E_{AS}		250	mJ
Avalanche current (Repetitive) (Note 1)	I_{AR}		9	A
Repetitive avalanche energy (Note 1)	E_{AR}		11.6	mJ
Junction temperature	T_J		150	℃
Storage temperature range	T_{stg}		-55~150	

***Limited only maximum junction temperature**

Thermal Characteristic

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 3.1	℃/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62.5	

Electrical Characteristics (T_C=25 °C, unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D = 250uA, V_{GS}= 0	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D = 250uA, V_{DS} = V_{GS}	2.0	-	4.0	V
Drain-source cut-off current	I_{DSS}	V_{DS} = 650V, V_{GS} = 0V	-	-	1	uA
Gate leakage current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V	-	-	±100	nA
Drain-source on-resistance (Note 4)	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 4.5A	-	0.72	0.85	Ω
Forward transfer conductance (Note 4)	gfs	V_{DS} = 10V, I_D = 4.5A	-	11	-	S
Input capacitance	Ciss	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	2007	2550	pF
Output capacitance	Coss		-	153	192	
Reverse transfer capacitance	Crss		-	5.68	10	
Turn-on delay time (Note 3,4)	Td(on)	V_{DS} = 300V, I_D = 9A, RG = 25Ω	-	23	-	ns
Rise time (Note 3,4)	Tr		-	69	-	
Turn-off delay time (Note 3,4)	td(off)		-	144	-	
Fall time (Note 3,4)	tf		-	77	-	
Total gate charge (Note 3,4)	Qg	V_{DS} = 520V,V_{GS} = 10V I_D = 9A	-	35	57	nC
Gate-source charge (Note 3,4)	Qgs		-	10	-	
Gate-drain charge (Note 3,4)	Qg		-	9	-	

Source-Drain Diode Ratings and Characteristics (T_C=25 °C, unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	9	A
Source current (Pulsed) (Note 1)	I_{SM}		-	-	36	A
Forward voltage (Note 4)	V_{SD}	V_{GS} = 0V, I_S = 9A	-	-	1.4	V
Reverse recovery time	trr	I_S = 9A, V_{GS} = 0V dIF/dt = 100A/us	-	420	-	ns
Reverse recovery charge	Qrr		-	4.2	-	uC

Note :

1. Repetitive rating : Pulse width limited by maximum junction temperature.
2. L=5.7mH, I_{AS}=9A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃
3. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
4. Essentially independent of operating temperature

Typical Electrical Characteristic

Fig. 1 I_D - V_{DS}

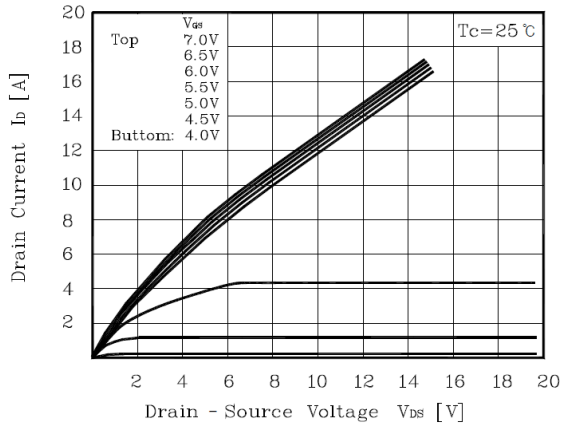


Fig. 2 I_D - V_{GS}

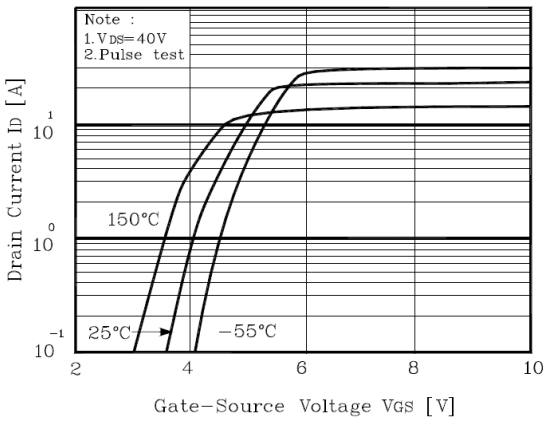


Fig. 3 $R_{DS(on)}$ - I_D

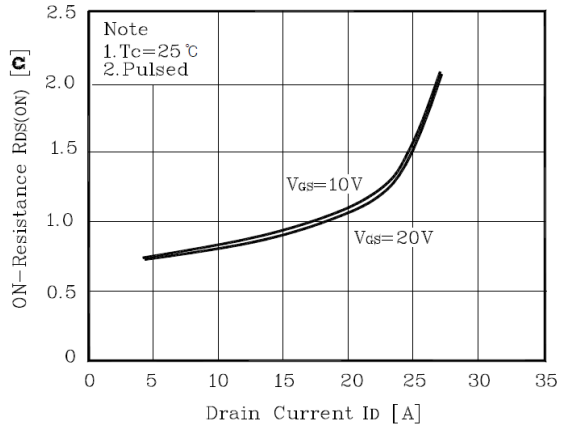
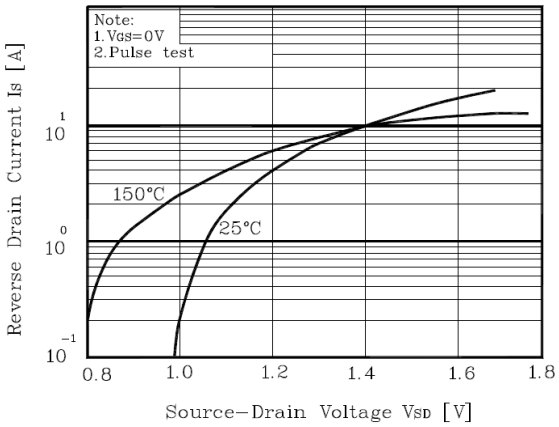


Fig. 4 I_S - V_{SD}



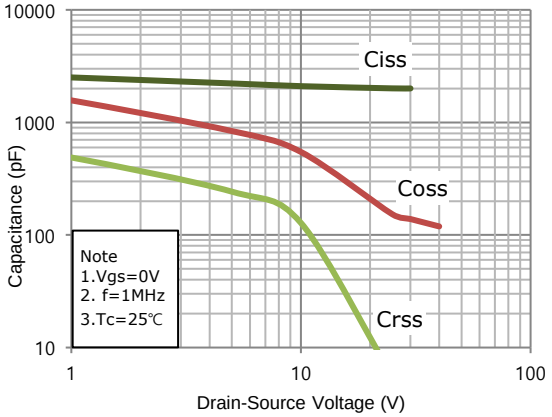
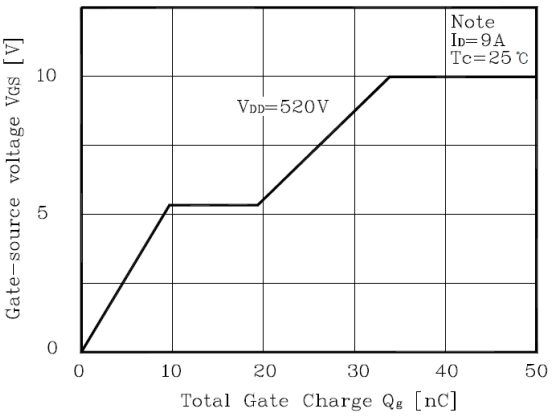


Figure 5 : Capacitance - Vds

Fig.6 V_{GS} - Q_G



Typical Electrical Characteristic

Fig. 7 V_{DSS} - T_J

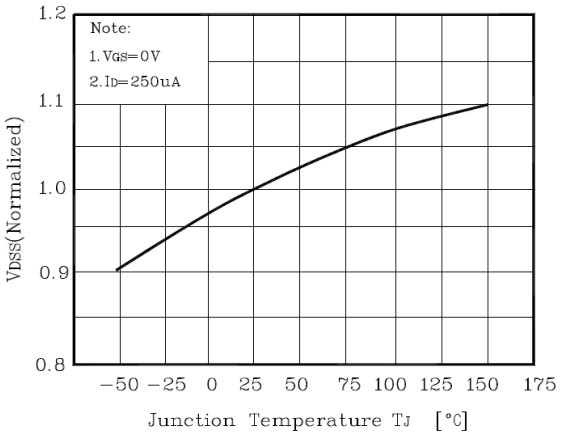


Fig.8 $R_{DS(on)}$ - T_J

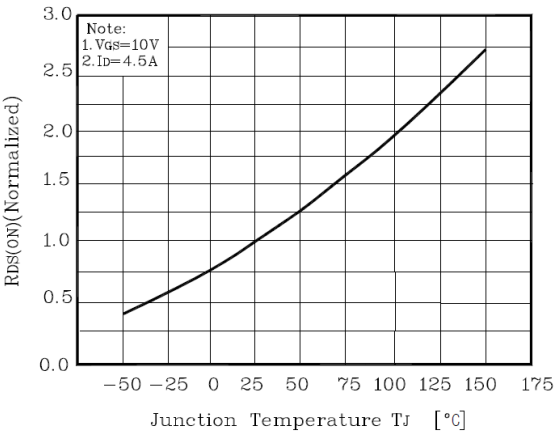


Fig. 9 I_D - T_C

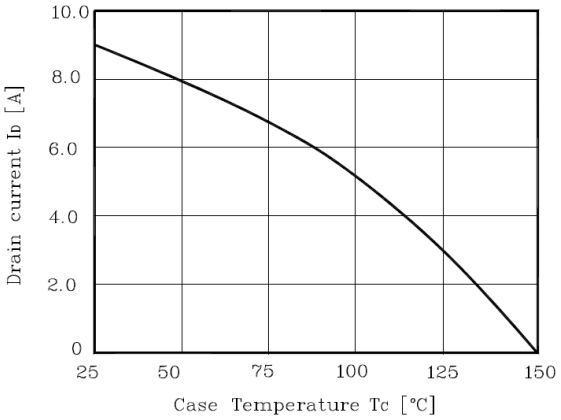


Fig. 10 Safe Operating Area

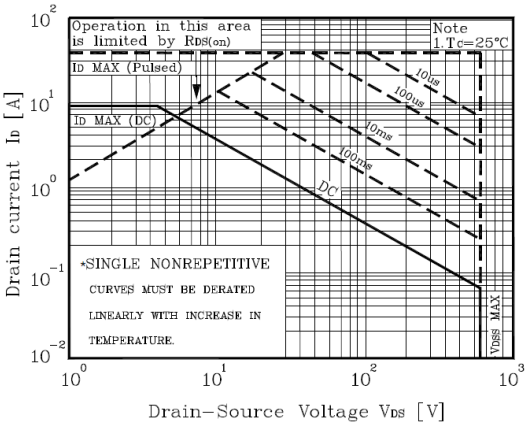


Fig. 11 Gate Charge Test Circuit & Waveform

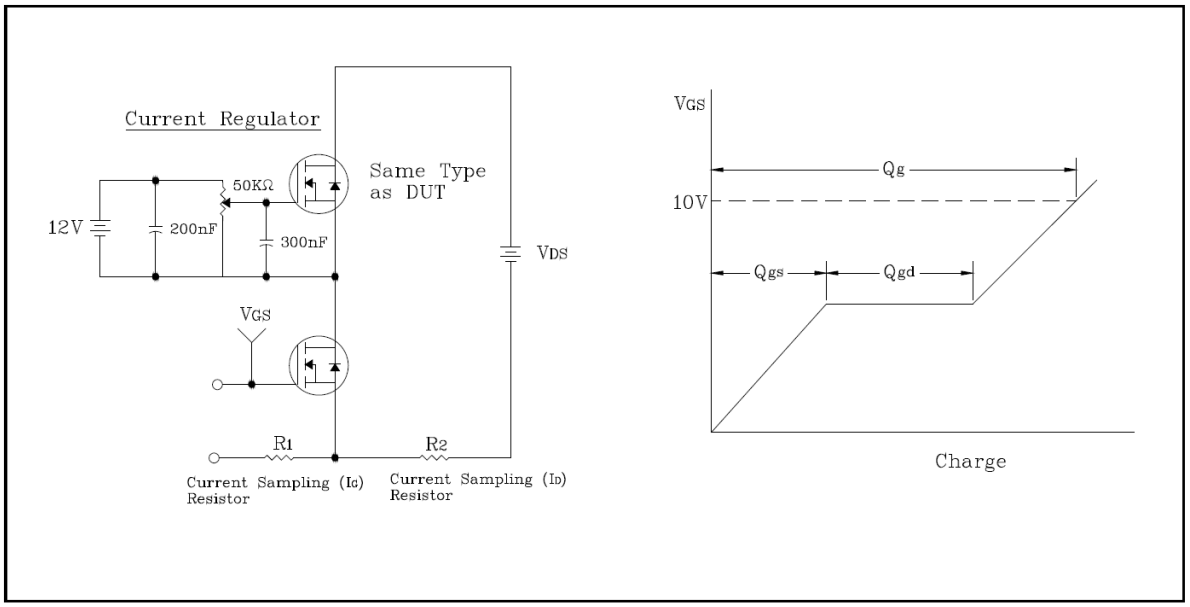


Fig. 12 Resistive Switching Test Circuit & Waveform

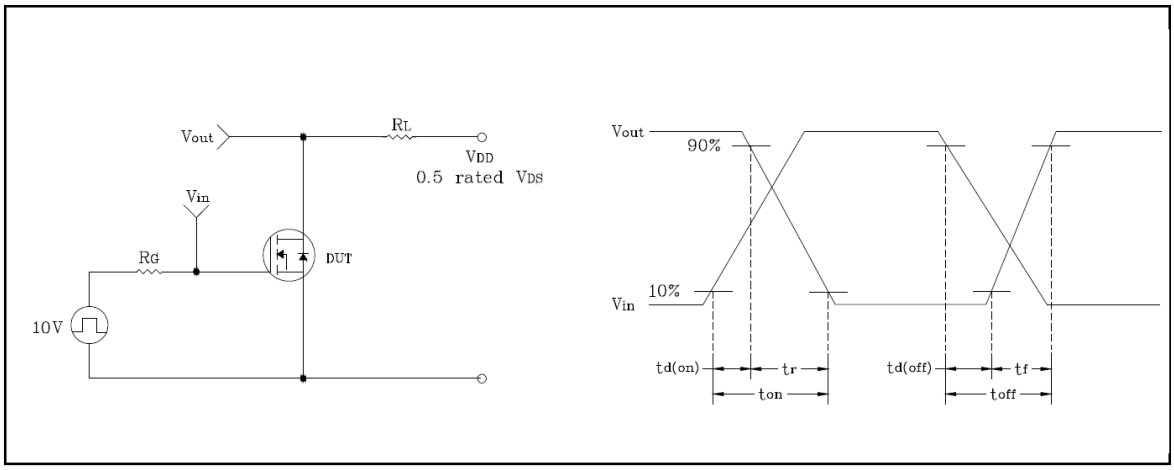


Fig. 13 E_{AS} Test Circuit & Waveform

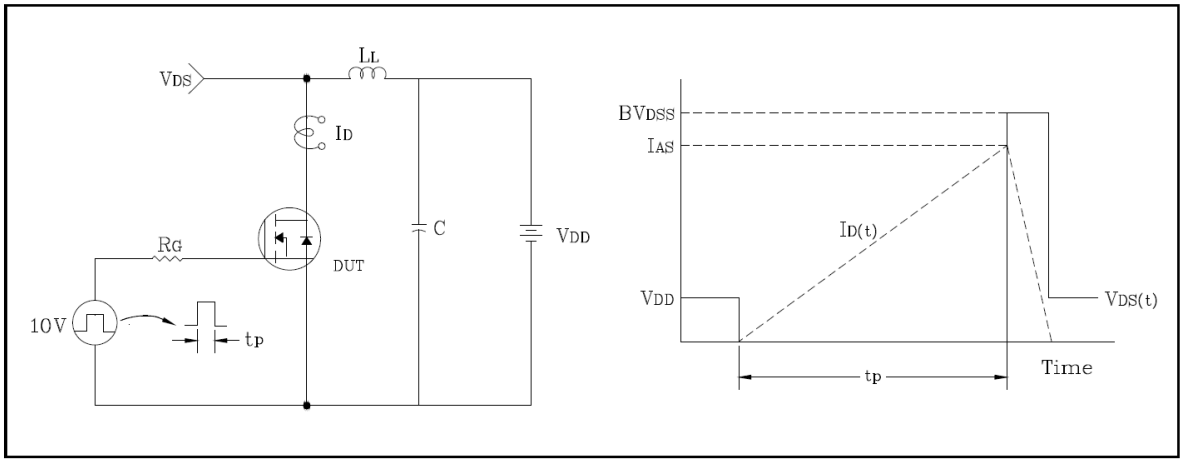
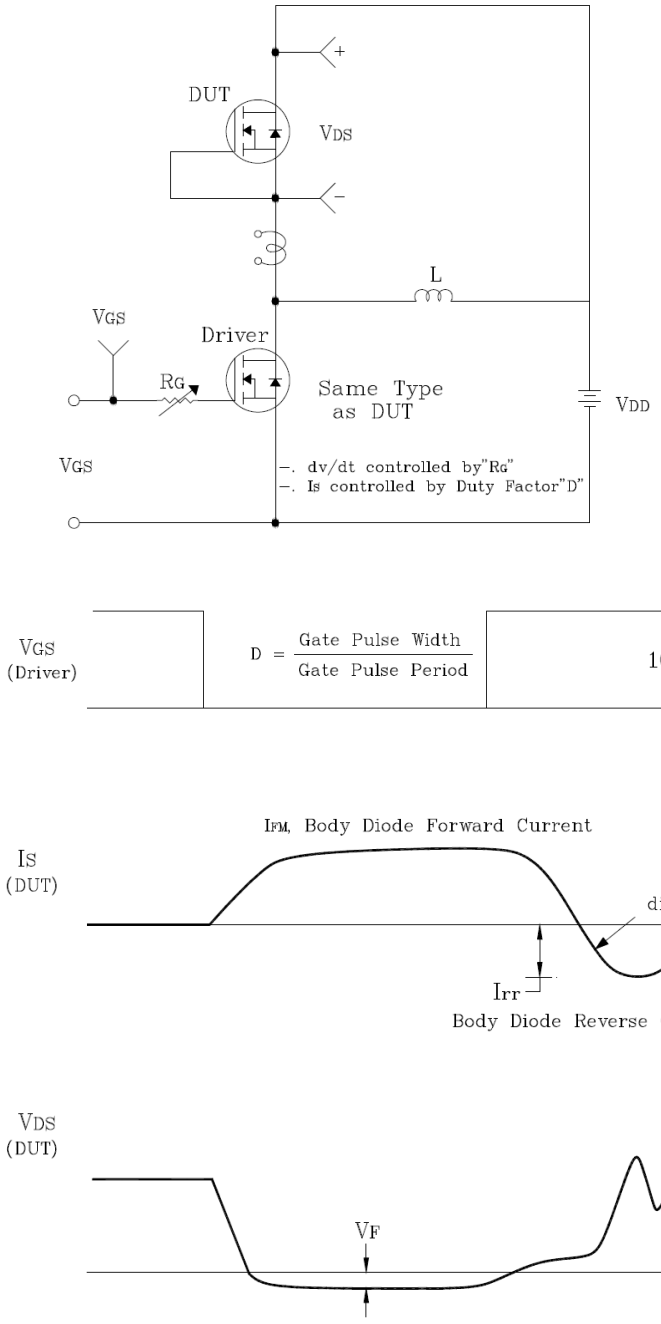
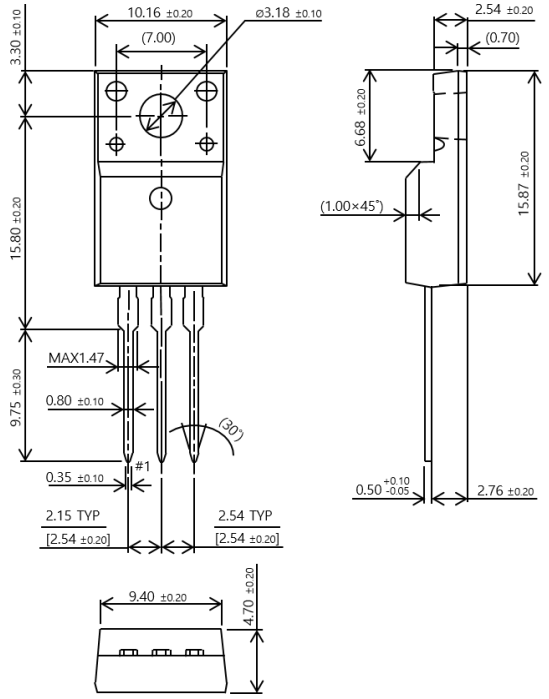


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform

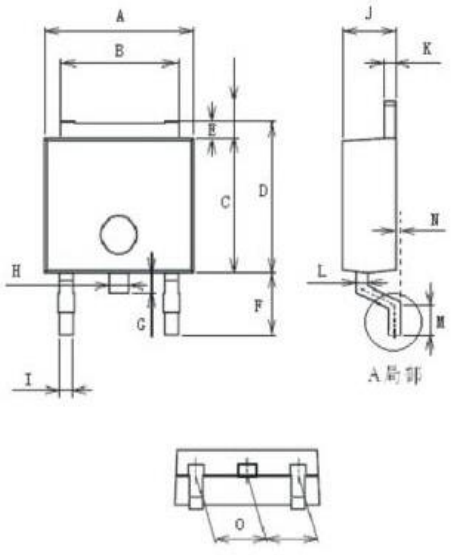


Package Dimensions

TO-220F



TO-252



Unit: mm

Item	Min	Max
A	6.40	6.70
B	5.20	5.40
C	6.00	6.30
D	6.55	6.85
E	0.45	0.60
F	3.07	3.35
G	0.85	1.05
H	0.75	0.95
I	0.55	0.75
J	2.20	2.40
K	0.43	0.58
L	0.43	0.58
M	0.90	1.10
N	0.90	1.10
O	2.20	2.40

Revision History

No	Date	Contents
0	2016-10-10	Initial Brief Datasheet Release
1	2019-01-11	Capacitance Update

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