NCE N-Channel Super Trench II Power MOSFET

Description

The series of devices uses **Super Trench II** technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g. This device is ideal for high-frequency switching and synchronous rectification.

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

General Features

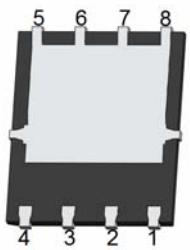
- V_{DS} =120V,I_D =90A
  $R_{DS(ON)}$=5.6mΩ , typical @ V_{GS}=10V
  $R_{DS(ON)}$=6.9mΩ , typical @ V_{GS}=4.5V
- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150°C operating temperature
- Pb-free lead plating

100% UIS TESTED!
100% ΔVds TESTED!

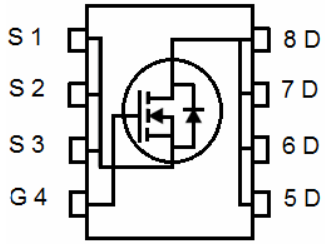
DFN 5X6



Top View



Bottom View



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
P065N12AGU	NCEP065N12AGU	DFN5X6-8L	330mm	12mm	5000units

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	90	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	64	A
Pulsed Drain Current (Note 1)	I_{DM}	360	A
Maximum Power Dissipation	P_D	130	W
Derating factor		1.04	W/℃
Single pulse avalanche energy (Note 4)	E_{AS}	400	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.96	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	120		-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=120V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=45A	-	5.6	6.5	mΩ
		V_{GS}=4.5V, I_D=45A		6.9	7.8	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=45A		60	-	S
Dynamic Characteristics (Note3)						
Input Capacitance	C_{lss}	V_{DS}=60V,V_{GS}=0V, F=1.0MHz	-	4900	-	pF
Output Capacitance	C_{oss}		-	300	-	pF
Reverse Transfer Capacitance	C_{rss}		-	34	-	pF
Switching Characteristics (Note 3)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=60V,I_D=45A V_{GS}=10V,R_G=1.6Ω	-	20	-	nS
Turn-on Rise Time	t_r		-	15	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	40	-	nS
Turn-Off Fall Time	t_f		-	10	-	nS
Total Gate Charge	Q_g	V_{DS}=60V,I_D=45A, V_{GS}=10V	-	90	-	nC
Gate-Source Charge	Q_{gs}		-	21	-	nC
Gate-Drain Charge	Q_{gd}		-	23.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 2)	V_{SD}	V_{GS}=0V,I_S=45A	-	-	1.2	V
Diode Forward Current	I_S		-	-	90	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = 45A di/dt = 100A/μs (Note3)	-	70	-	nS
Reverse Recovery Charge	Qrr		-	137	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3. Guaranteed by design, not subject to production
4. EAS condition : Tj=25℃,V_{DD}=50V,V_G=10V,L=0.25mH,Rg=25Ω

Typical Electrical and Thermal Characteristics

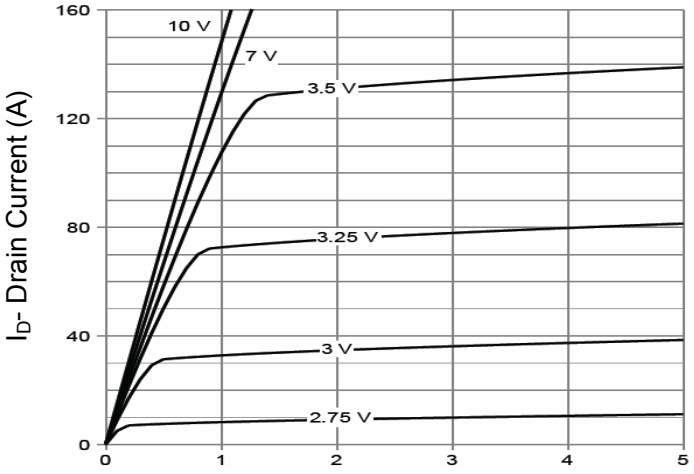


Figure 1 Output Characteristics

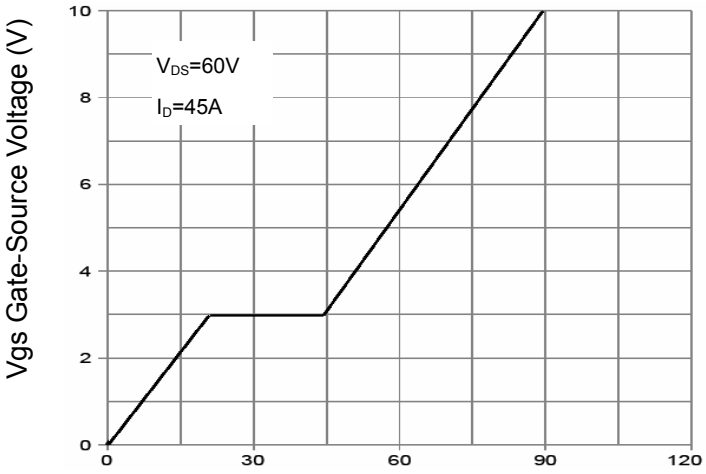


Figure 4 Gate Charge

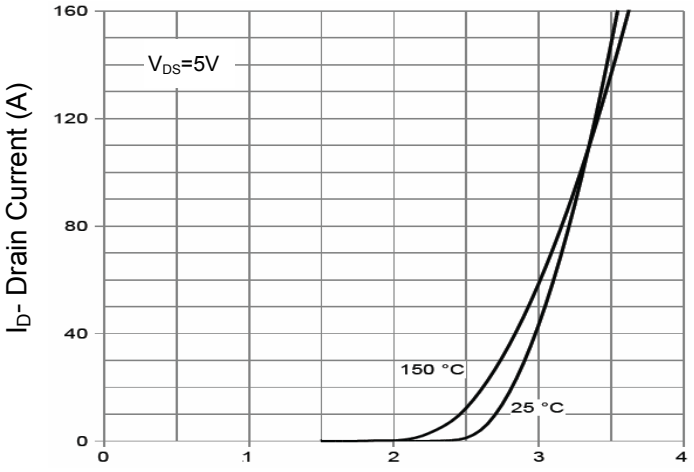


Figure 2 Transfer Characteristics

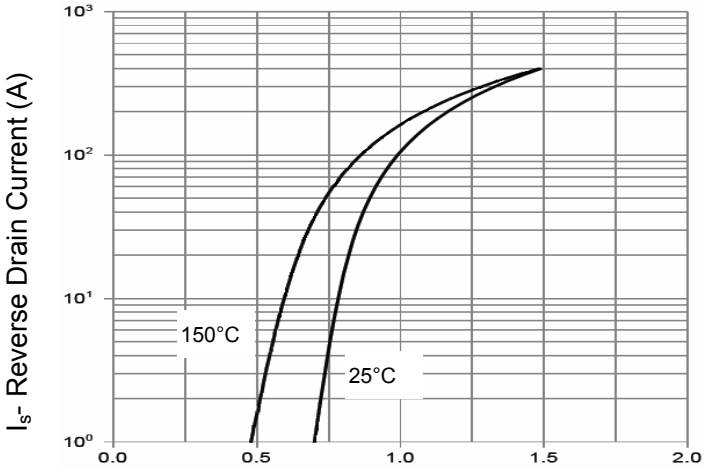


Figure 5 Source- Drain Diode Forward

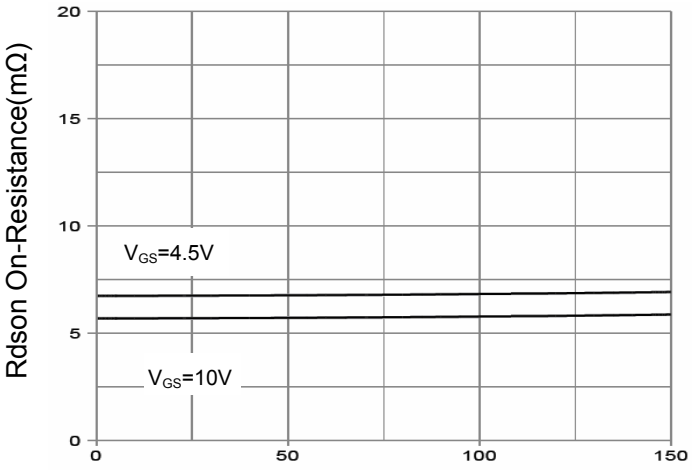


Figure 3 Rdson- Drain Current

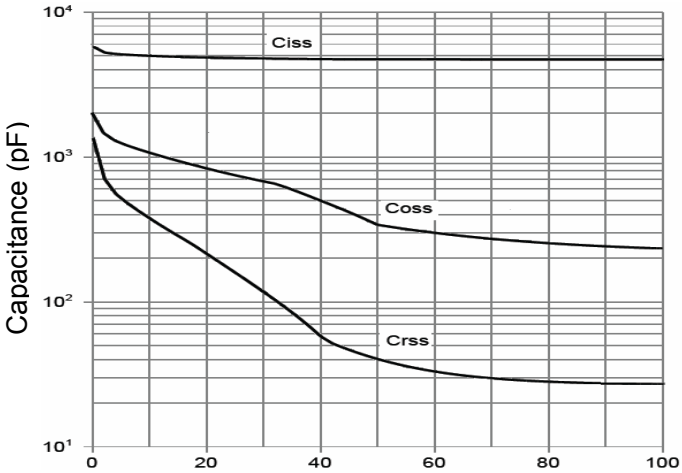


Figure 6 Capacitance vs Vds

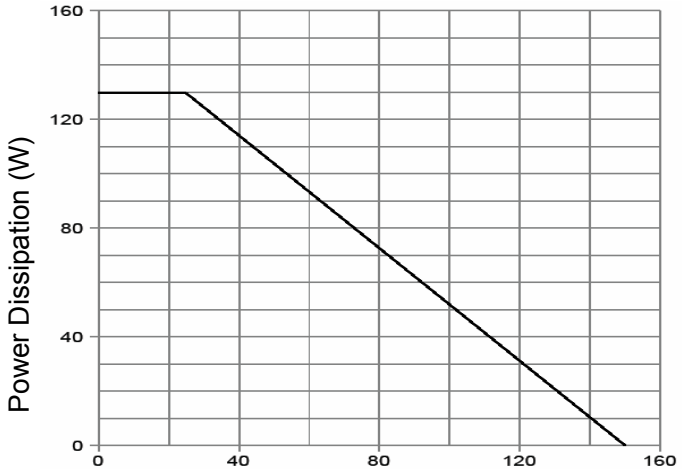


Figure 7 Power De-rating

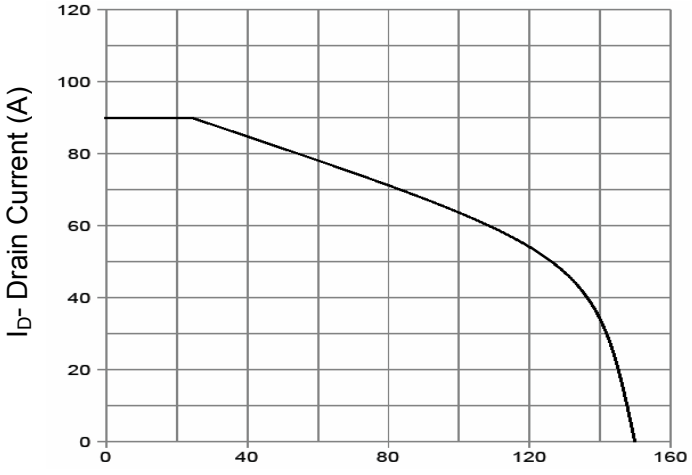


Figure 9 Current De-rating

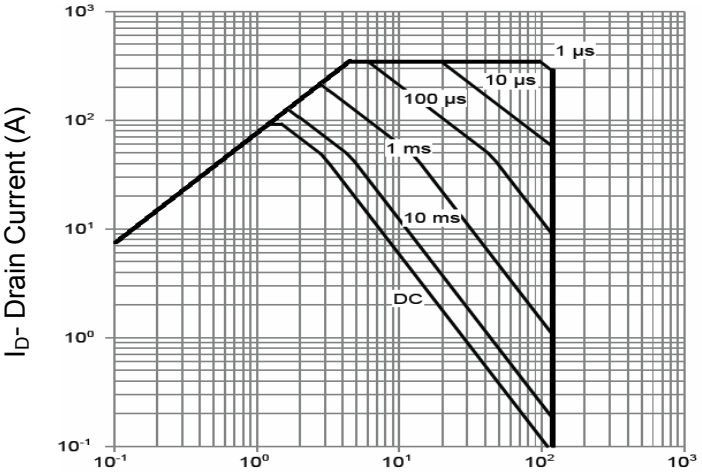


Figure 8 Safe Operation Area

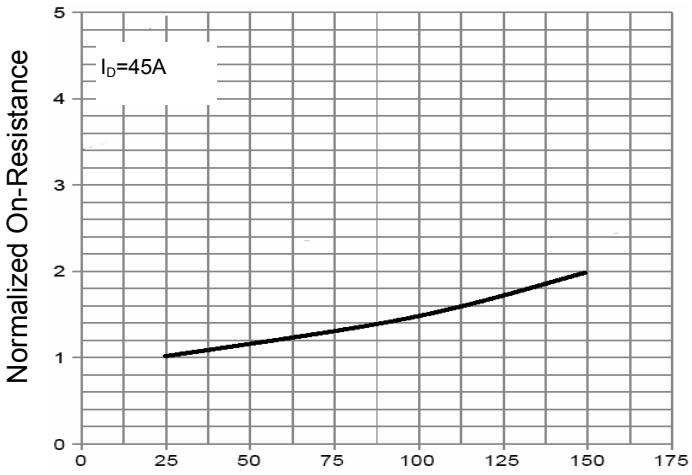


Figure 10 Rdson-Junction Temperature

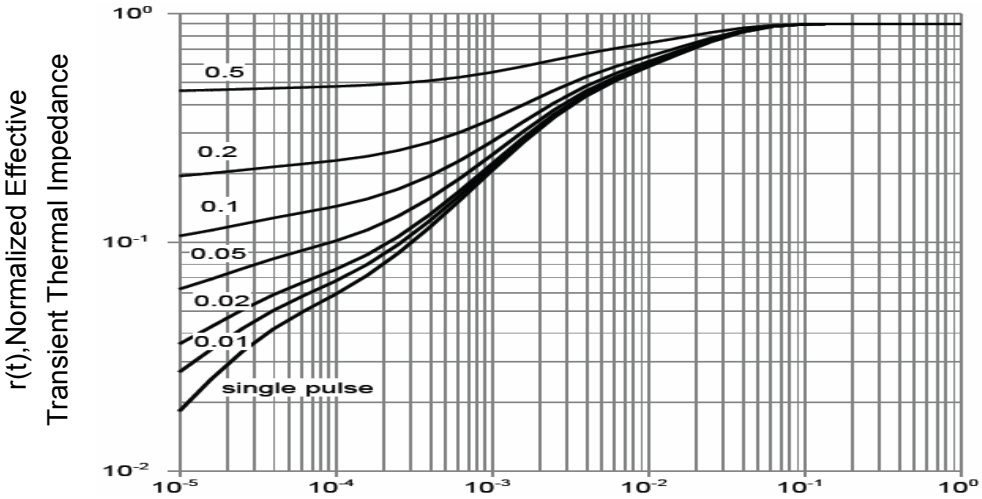
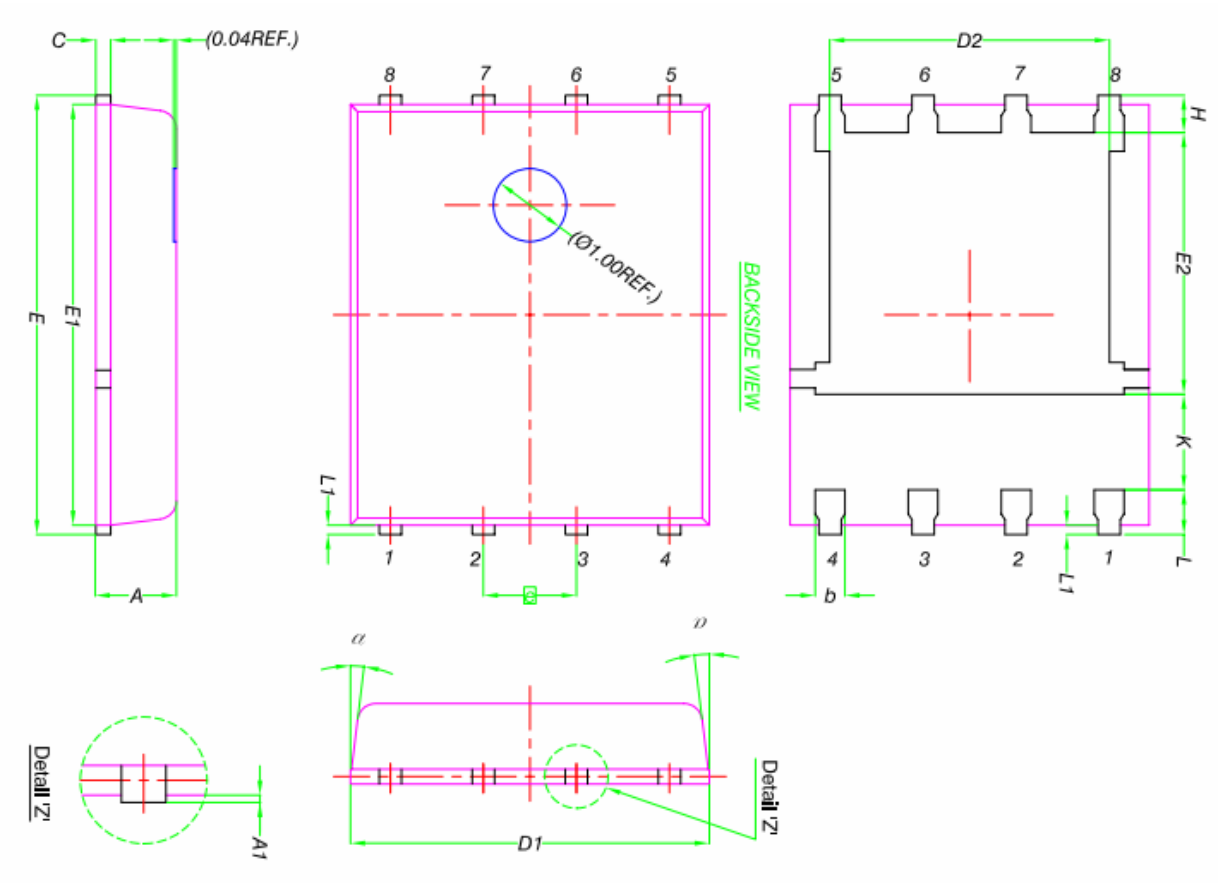
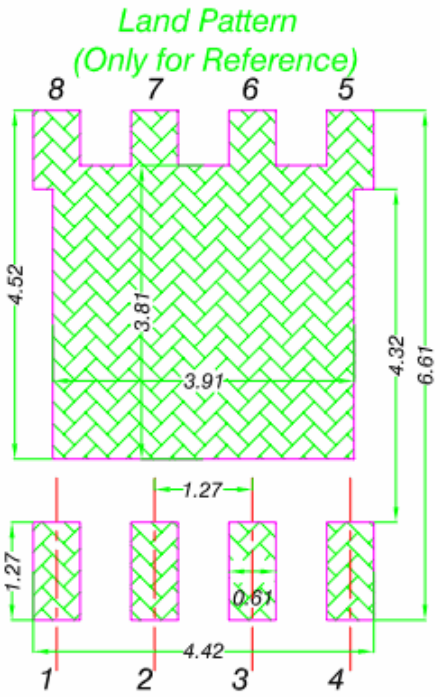


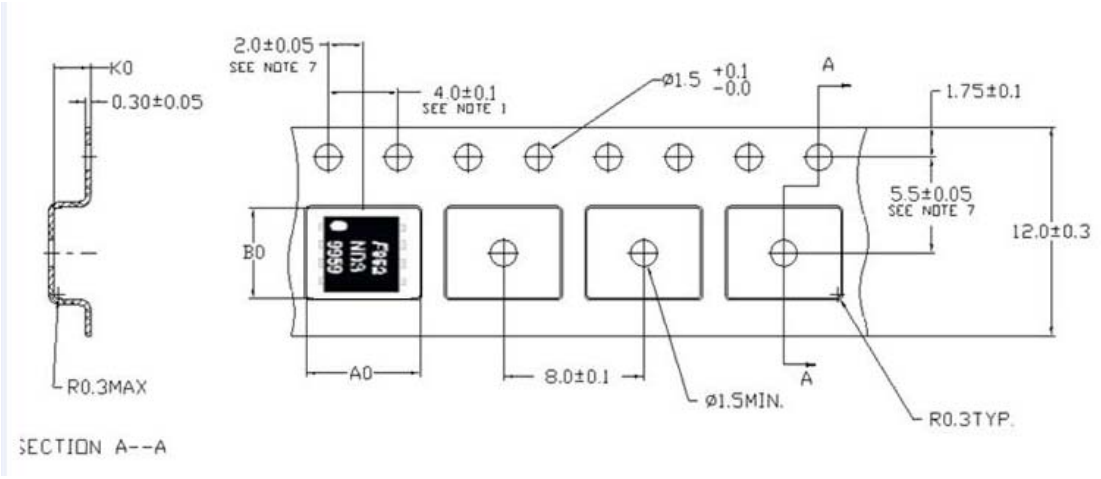
Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
α	0°	-	12°




K0
0.30±0.05
R0.3MAX
SECTION A--A
2.0±0.05
SEE NOTE 7
4.0±0.1
SEE NOTE 1
Ø1.5 +0.1 -0.0
A
1.75±0.1
5.5±0.05
SEE NOTE 7
12.0±0.3
B0
A0
8.0±0.1
Ø1.5MIN.
R0.3TYP.

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