Features

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summery

RoHS

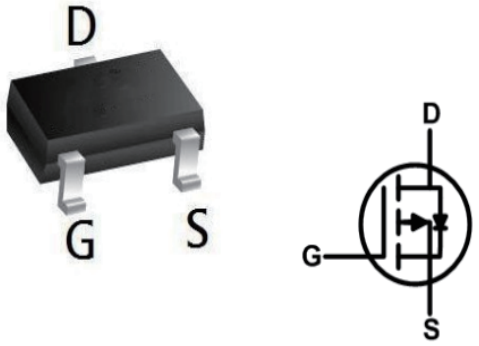
BVDSS	RDSON	ID
-30V	48mΩ	-4A

Description

THE 3401 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and efficiency for most of the small power switching and load switch applications.

The 3401 meet the RoHS and Green Product requireme n t with full function reliability approved.

SOT23 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DS}	Drain-to-Source Voltage		-30	V
V_{GS}	Gate-to-Source Voltage		±12	V
I_D	Continuous Drain Current	T_A = 25°C	-4	
		T_A = 100°C	-3	A
I_{DM}	Pulsed Drain Current (1)		-16	A
P_D	Pow er Dissipation	T_A = 25°C	1.2	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(2)		108	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Electrical Characteristics (T_J =25 °C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250μA, V_{GS} = 0V	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -30V, V_{GS} = 0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-0.6	-0.95	-1.3	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = -10V, I_D = -4A	-	48	62	mΩ
		V_{GS} = -4.5V, I_D = -3A	-	56	73	mΩ
		V_{GS} = -2.5V, I_D = -3A	-	75	98	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -15V,f = 1MHz	-	553	-	pF
C_{oss}	Output Capacitance		-	57	-	pF
C_{rss}	Reverse Transfer Capacitance		-	35	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -4.5V V_{DS} = -15V, I_D = -3A	-	6.5	-	nC
Q_{gs}	Gate Source Charge		-	1.4	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1.7	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -4.5V, V_{DD} = -15V I_D= -3A, R_{GEN} = 3Ω	-	10	-	ns
t_r	Turn-On Rise Time		-	86	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	150	-	ns
t_f	Turn-Off Fall Time		-	357	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-4	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -4A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	I_F = -3A, di/dt = 80A/us	-	36	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	5	-	nC

Note :
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. RθJA is measured with the device mounted on a 1inch2 pad of 2oz copper FR4 PCB
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

P-Channel Typical Performance Characteristics

Figure1:Typical Output Characteristics

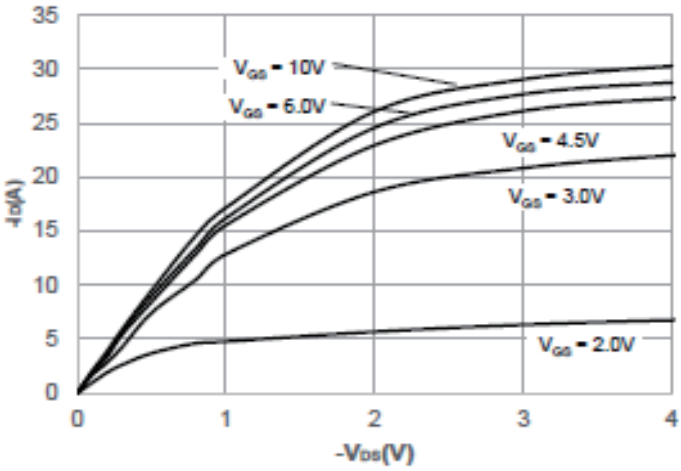


Figure 2:Transfer Characteristics

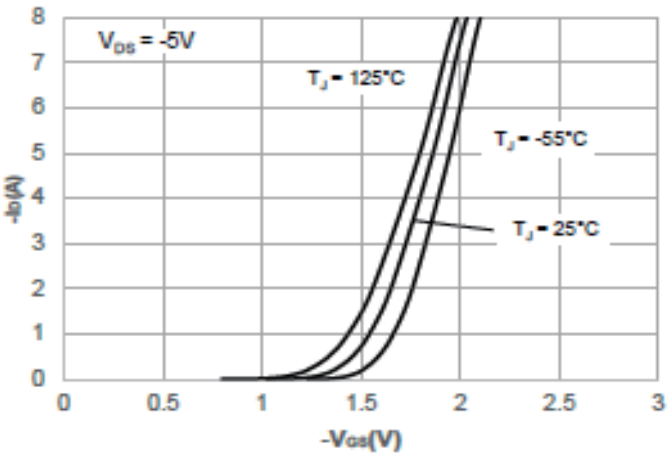


Figure 3:On-resistance vs. Drain Current

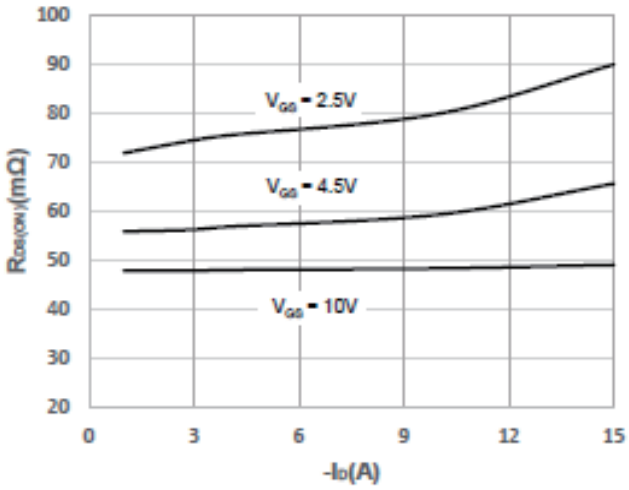


Figure 4: Body Diode Characteristics

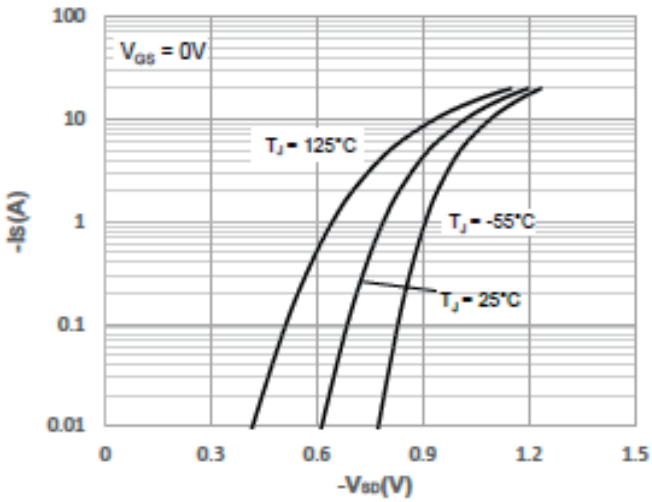


Figure 5: Gate Charge Characteristics

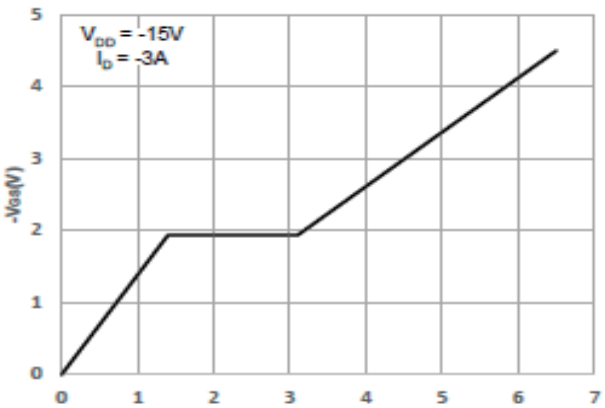
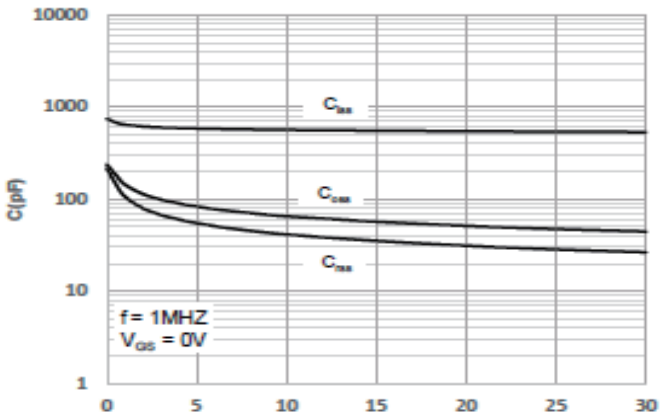


Figure 6: Capacitance Characteristics



P-Channel Typical Performance Characteristics

Figure7:Normalized Breakdown voltage

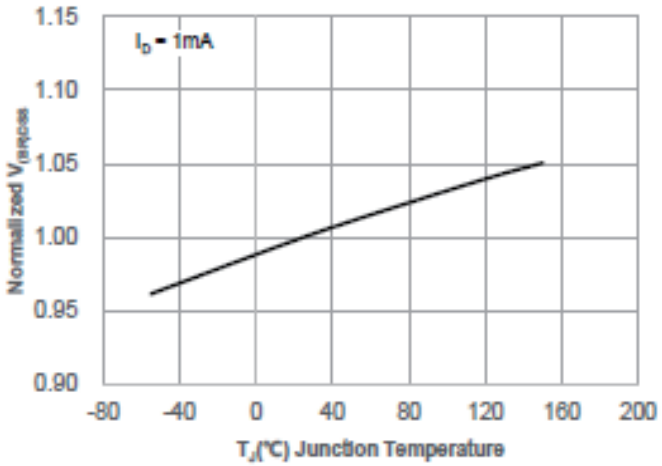


Figure 8: Normalized on Resistance vs. Ju

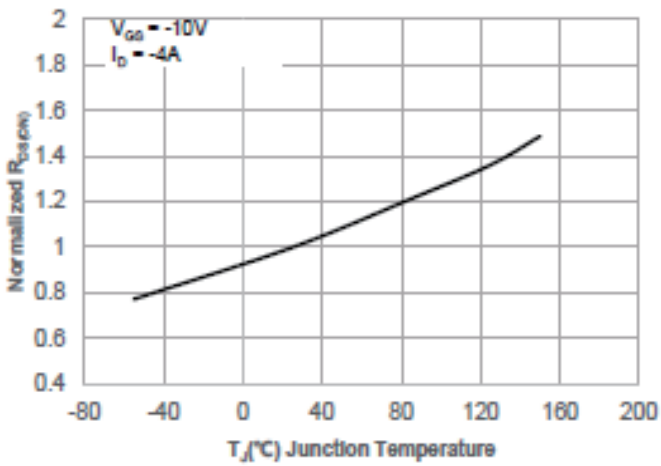


Figure9:Maximum Safe Operating Area

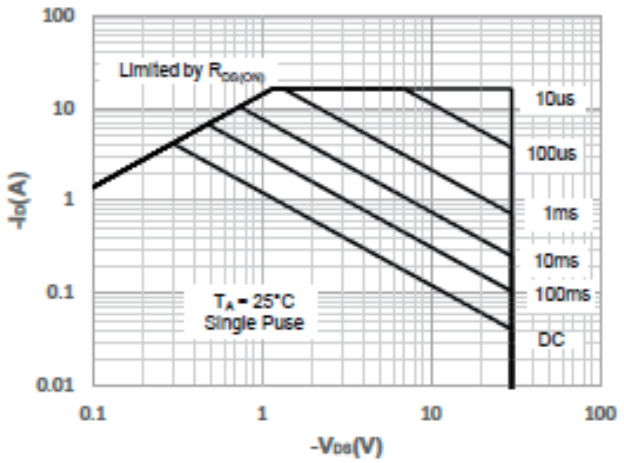


Figure10:Maximum Continuous Drian Cu vs. Ambient Temperature

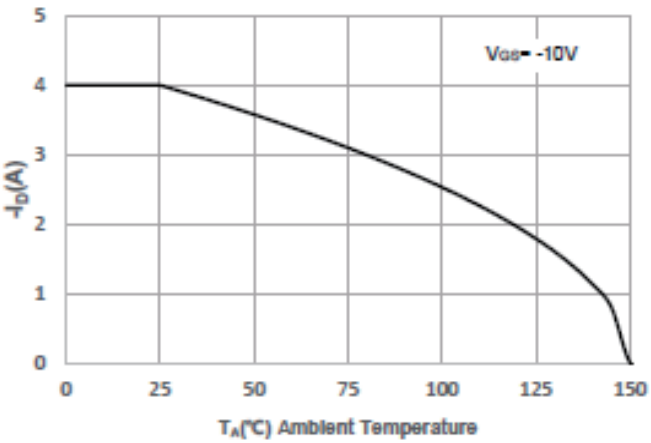


Figure11:Normalized Maximum Transien

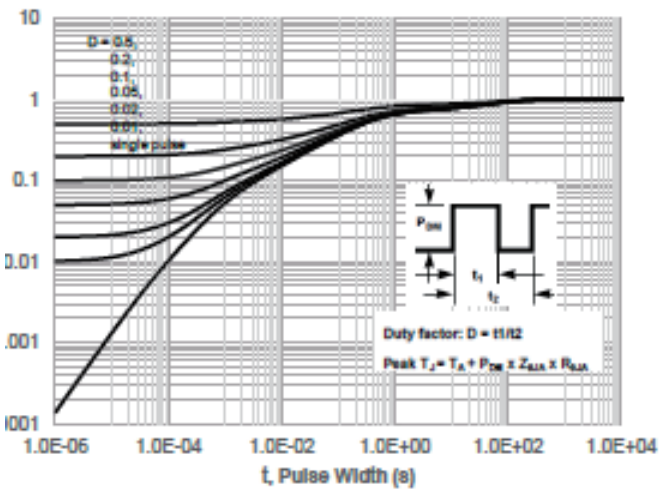
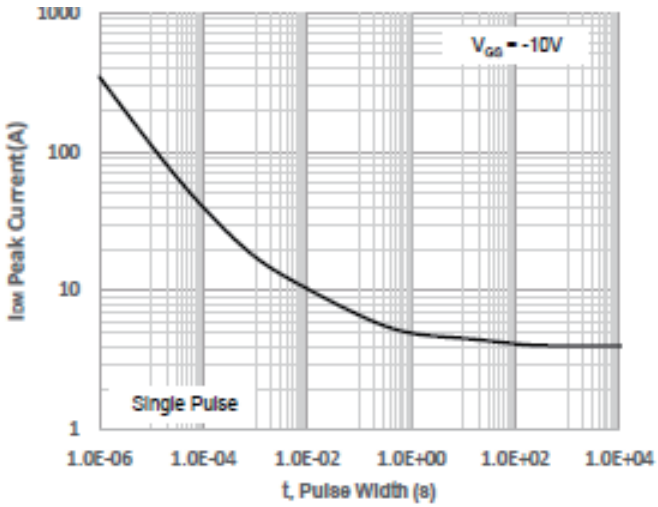


Figure 11: Peak Current Capacity



Test Circuit

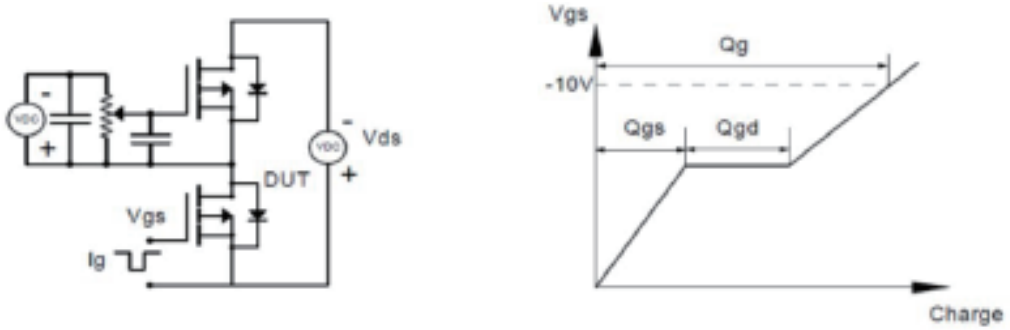


Figure 1: Gate Charge Test Circuit & Waveform

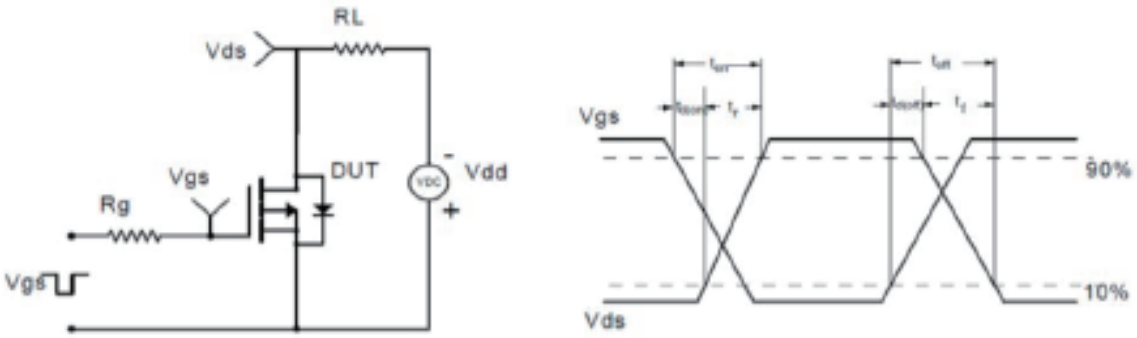


Figure 2: Resistive Switching Test Circuit & Waveform

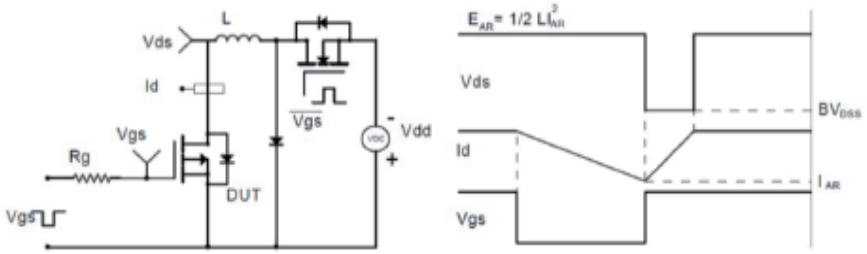


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

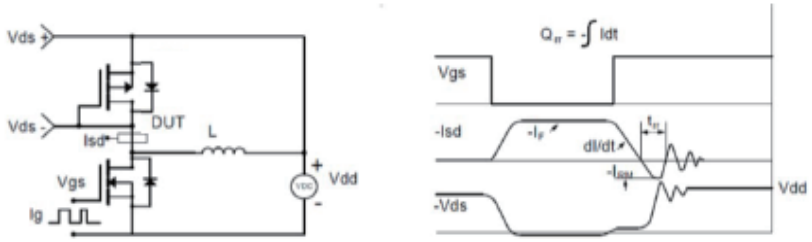


Figure 4: Diode Recovery Test Circuit & Waveform

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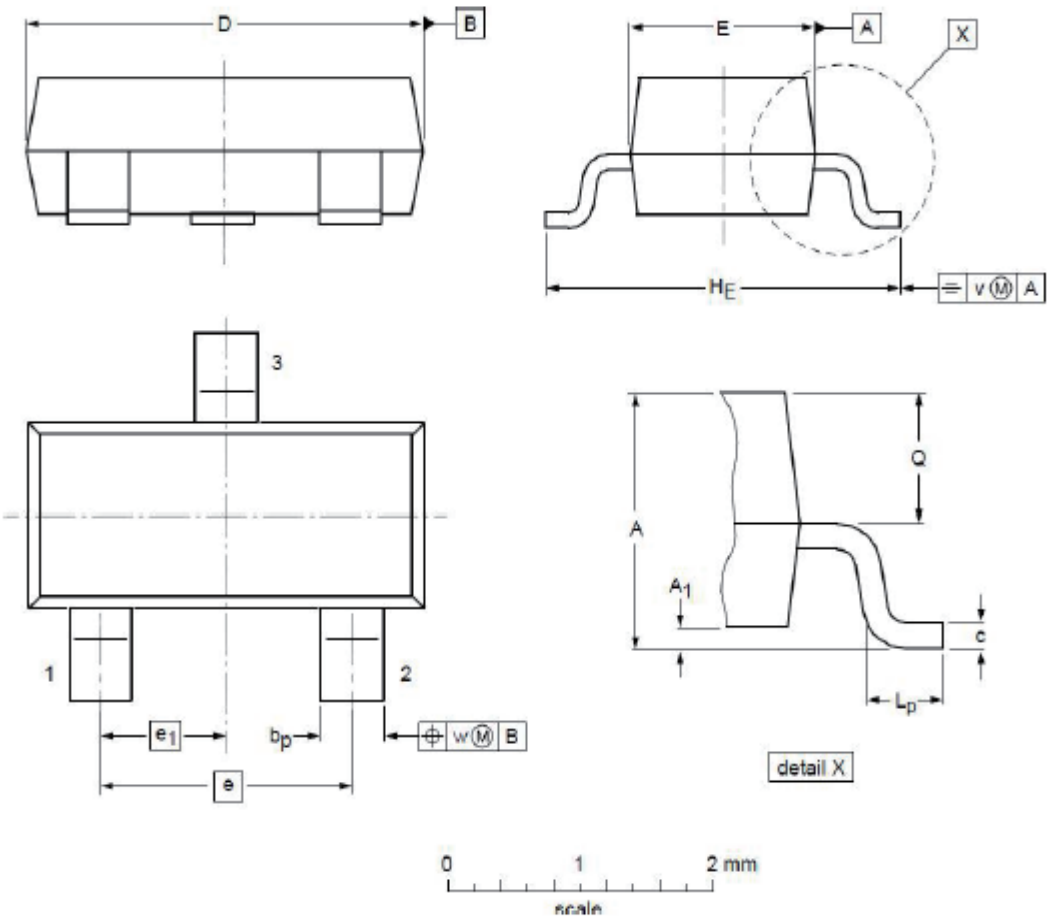

DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A_1	0.01	0.05	0.10
b_p	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e_1	--	0.95	--
H_E	2.25	2.40	2.55	L_p	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				

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