iM18139

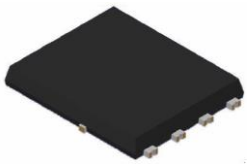
N-Channel Enhancement Mode MOSFET

Datasheet

1. Product Information

1.1 Features

- Advanced Trench Cell Design
- RoHS Compliant and Halogen Free
- Reliable and Rugged
- Moisture Sensitivity Level MSL1



1.2 Package Type

PDFN5X6A-EP1-8L

1.3 Quick Reference

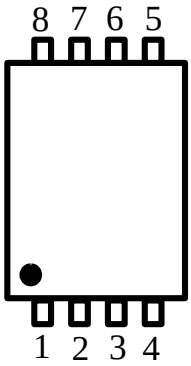
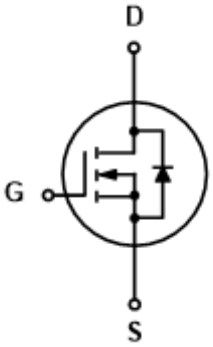
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Limiting Values						
P_{tot}	Total Power Dissipation	T_C = 25 ℃	-	-	68	W
I_D Note1	Drain Current	T_C = 25 ℃, V_{GS} = 10 V	-	-	79	A
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown	V_{GS} = 0 V, I_{DS} = 250 μA	100	-	-	V
$R_{DS(ON)}$ Note2	On-State Resistance	V_{GS} = 10 V, I_{DS} = 30 A	-	3.8	4.8	mΩ
		V_{GS} = 4.5 V, I_{DS} = 20 A	-	6.0	8.0	

2. Ordering Code & Marking Information

Ordering Code	Marking Information
iM18139	iM18139 XXXXX

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3. Pin Description

Pin	Description	Simplified Outline	Symbol
1~3	Source		
4	Gate		
5~8	Drain		

4. Limiting Values

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D Note1	Drain Current	T_C = 25 ℃	79	A
		T_C = 100 ℃	56	A
I_{DM} Note2	Pulsed Source Current	T_C = 25 ℃	316	A
I_S	Diode Forward Current	T_C = 25 ℃	79	A
E_{AS}	Single Pulsed Avalanche Energy	L = 1.0 mH	578	mJ
P_{tot}	Total Power Dissipation	T_C = 25 ℃	68	W
$R_{\theta JA}$ Note3	Thermal Resistance- Junction to Ambient		58	℃ / W
$R_{\theta JC}$	Thermal Resistance- Junction to Case		2.2	℃ / W
T_{stg}	Storage Temperature		- 55 ~ 175	℃
T_J	Junction Temperature		175	℃

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5. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

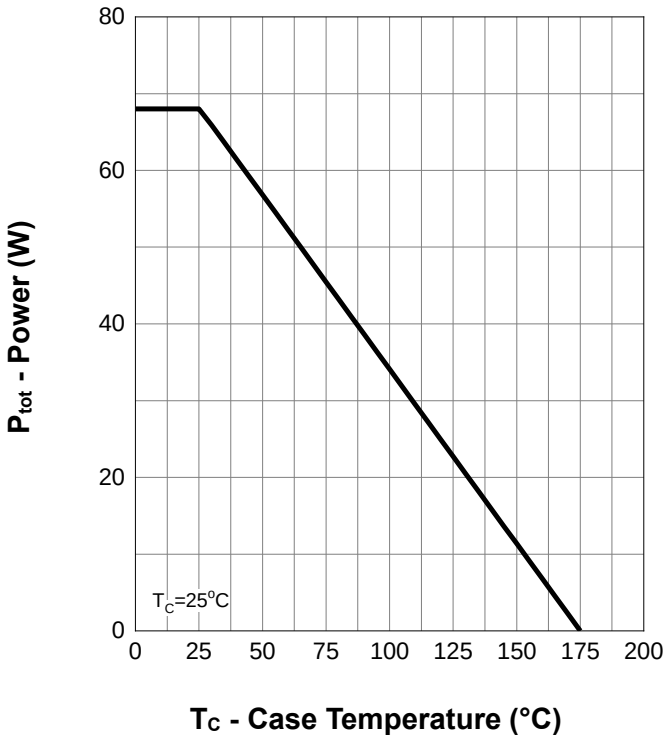
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown	V_{GS} = 0 V, I_{DS} = 250 μA	100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 μA	1	-	3	V
I_{DSS}	Drain Leakage Current	V_{DS} = 80 V, V_{GS} = 0 V	-	-	1	μA
I_{GSS}	Gate Leakage Current	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	±100	nA
$R_{DS(ON)}$ Note2	On-State Resistance	V_{GS} = 10 V, I_{DS} = 30 A	-	3.8	4.8	mΩ
		V_{GS} = 4.5 V, I_{DS} = 20 A	-	6.0	8.0	
Diode Characteristics						
V_{SD} Note2	Diode Forward Voltage	I_{SD} = 30 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr} Note4	Reverse Recovery Time	I_{DS} = 30 A, V_{GS} = 0 V	-	65	-	nS
Q_{rr} Note4	Reverse Recovery Charge	dI_{SD}/dt = 100 A/μs	-	76	-	nC
Dynamic Characteristics Note4						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 50 V Frequency = 1 MHz	-	3651	-	pF
C_{oss}	Output Capacitance		-	500	-	
C_{rss}	Reverse Transfer Capacitance		-	23	-	
t_{d}(on)	Turn-on Delay Time	V_{DS} = 50 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 1.6 Ω, I_{DS} = 30 A	-	12	-	nS
t_r	Turn-on Rise Time		-	32	-	
t_{d}(off)	Turn-off Delay Time		-	58	-	
t_f	Turn-off Fall Time		-	35	-	
Gate Charge Characteristics Note4						
Q_g	Total Gate Charge	V_{DS} = 50 V, V_{GS} = 10 V, I_{DS} = 30 A	-	79	-	nC
Q_{gs}	Gate-Source Charge		-	17	-	
Q_{gd}	Gate-Drain Charge		-	22	-	

Note 1: Limited by bonding wire.
Note 2: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note 3: Surface Mounted on 1 in^2 pad area, t ≤ 10 sec.
Note 4: Guaranteed by design, not subject to production testing.

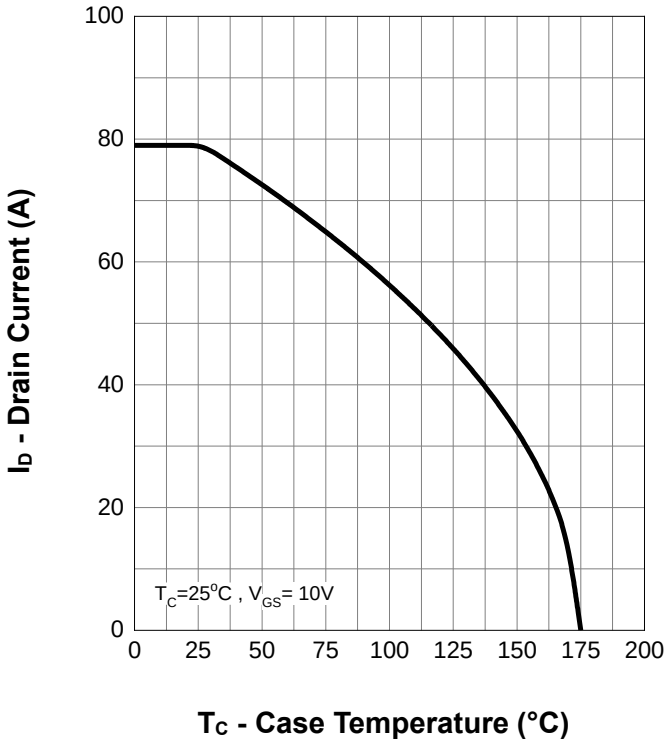
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6. Typical Characteristics

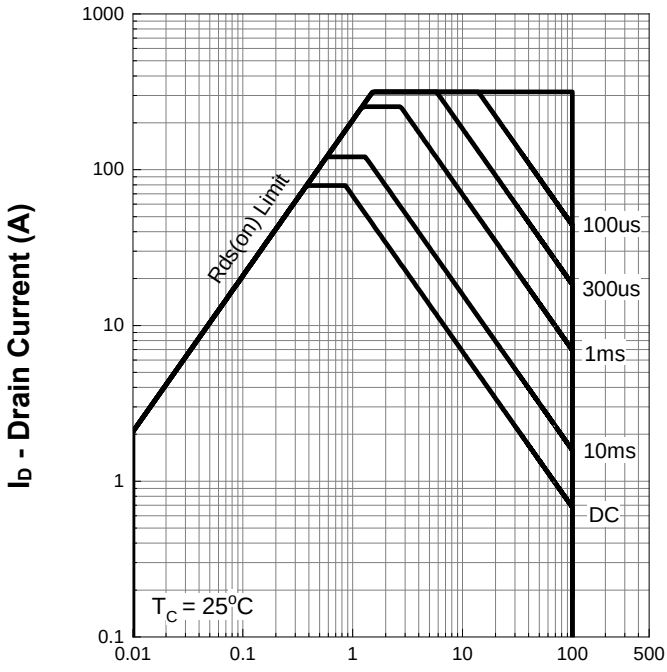
Power Capability



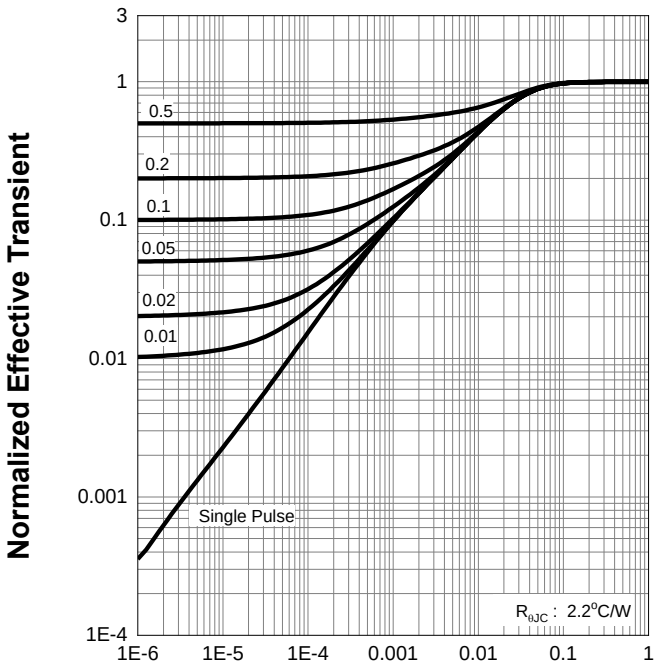
Current Capability



Safe Operating Area



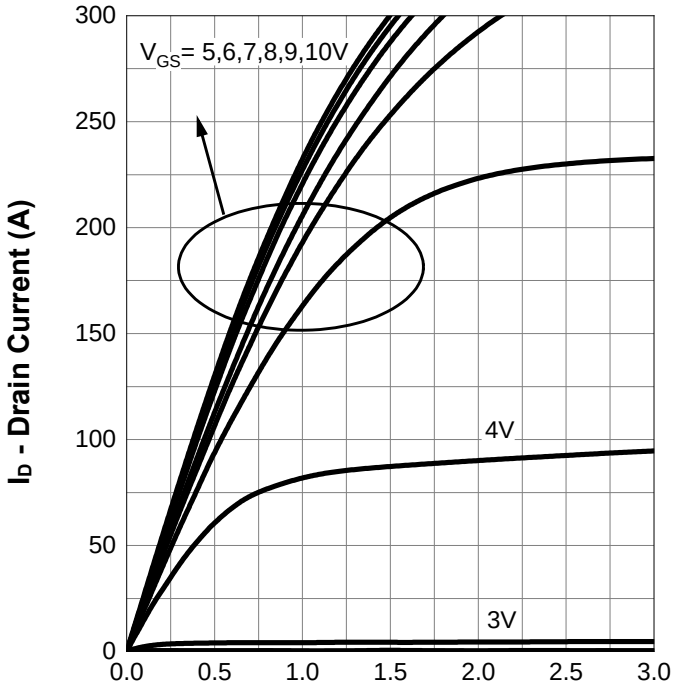
Transient Thermal Impedance



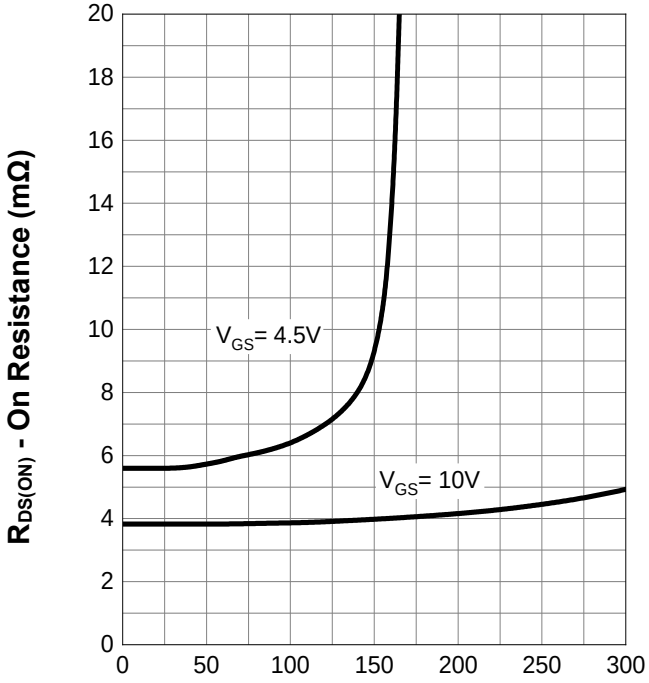
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6. Typical Characteristics

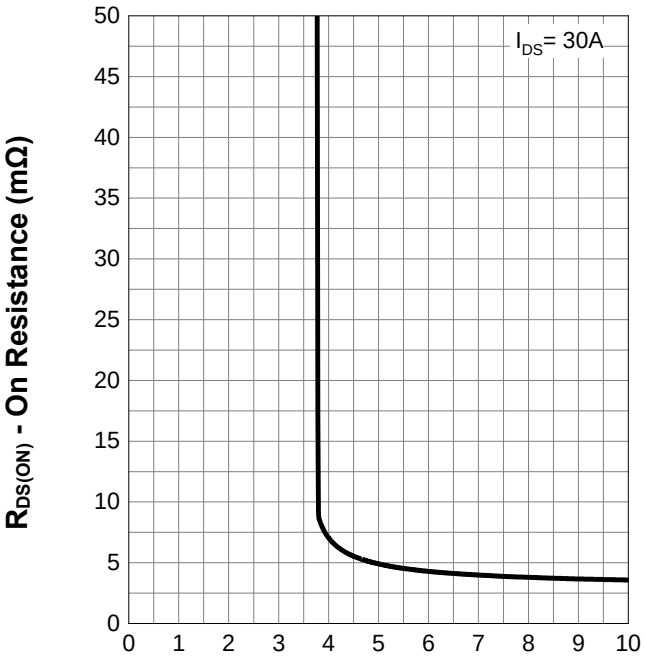
Output Characteristics



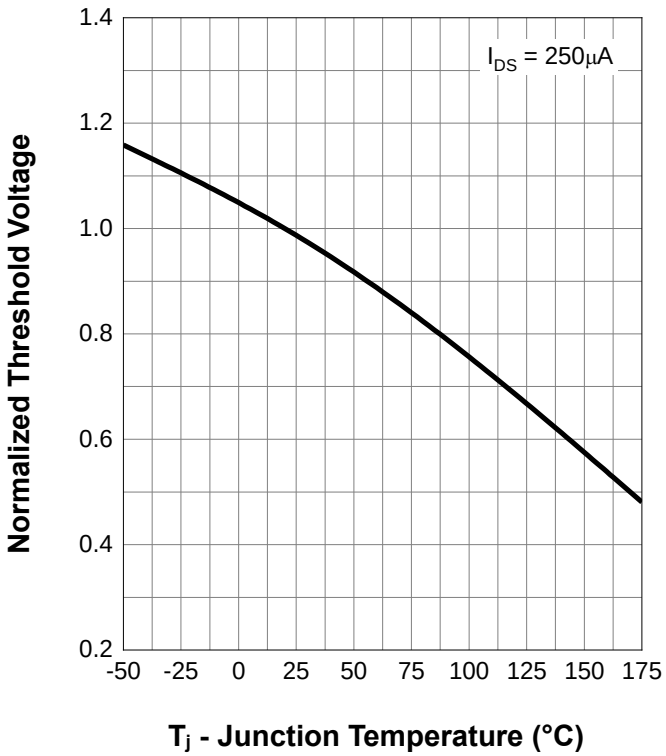
On Resistance



Transfer Characteristics



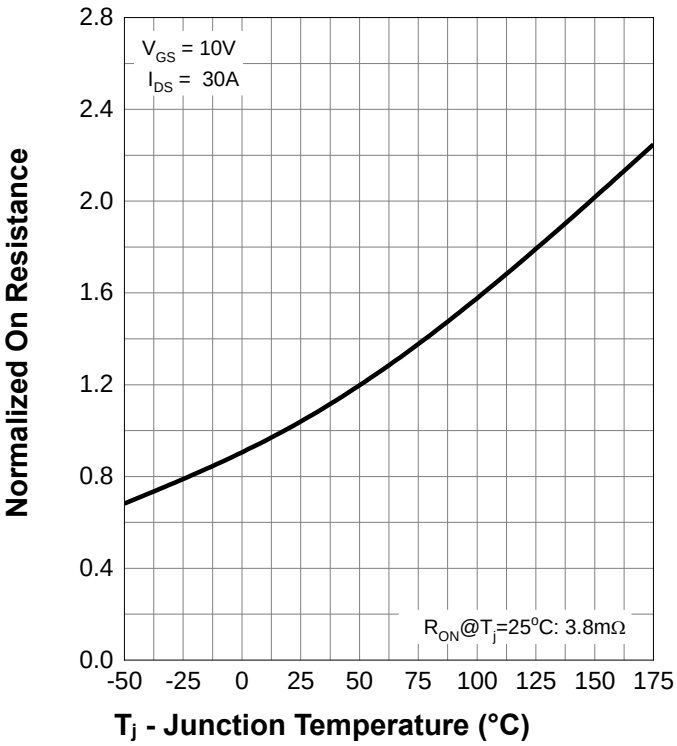
Normalized Threshold Voltage



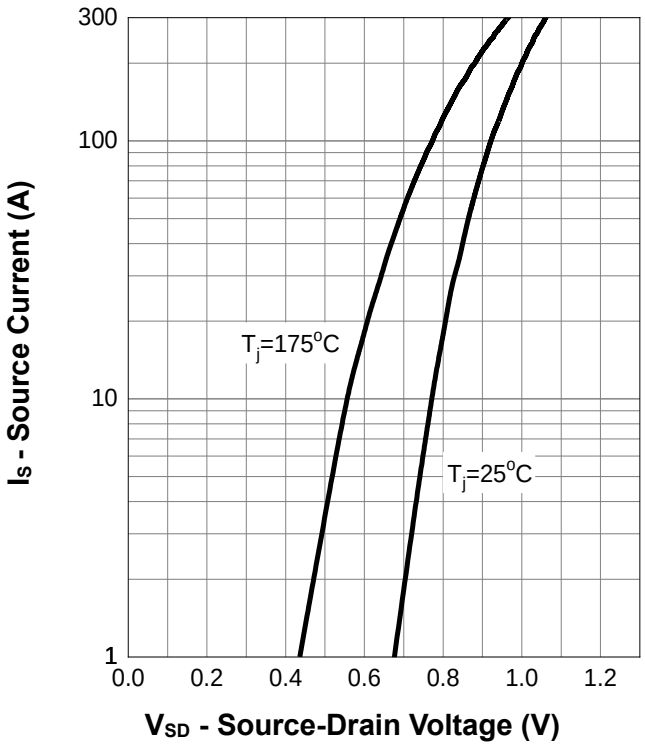
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6. Typical Characteristics

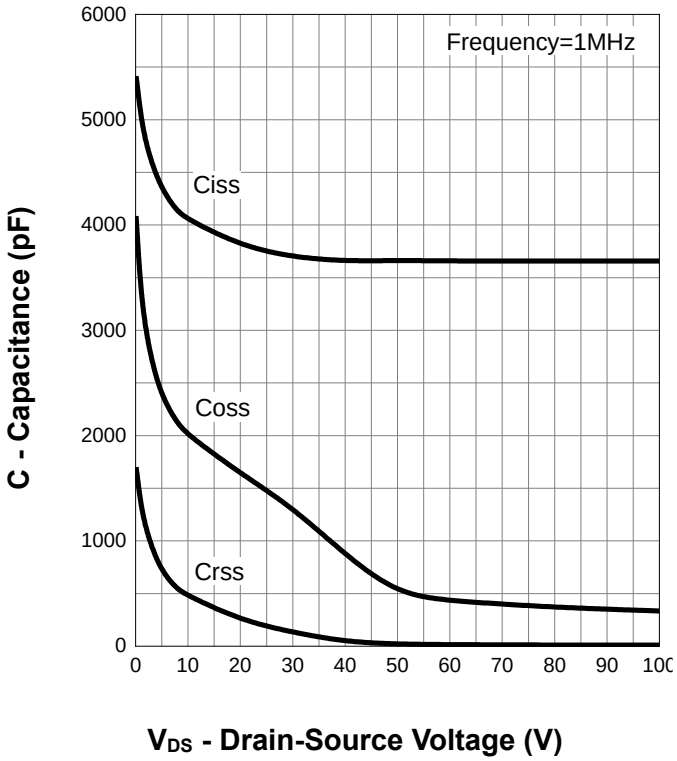
Normalized On Resistance



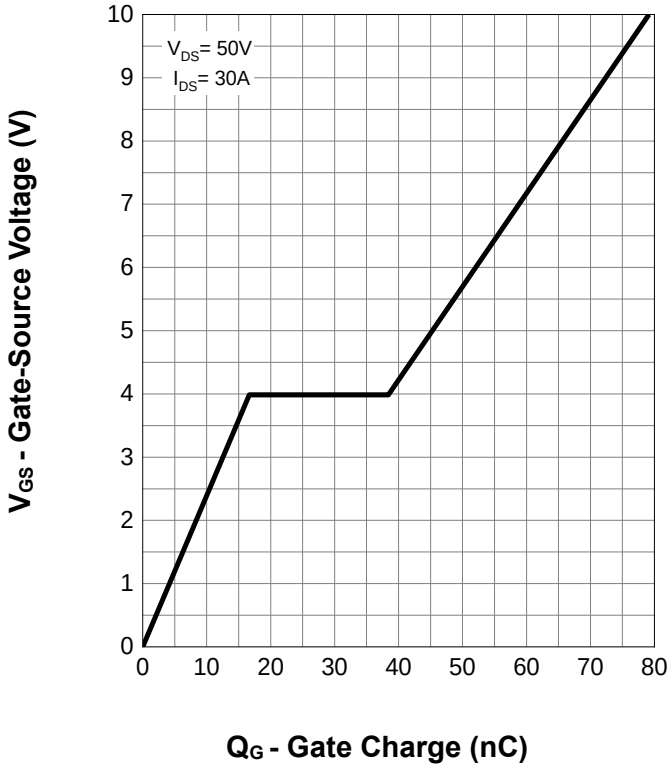
Diode Forward Current



Capacitance



Gate Charge



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