

FEATURES

| $V_{DS}=20V, I_D=5A, R_{DS(ON)_{Typ}}: 14m\Omega @ V_{GS}=4.5V$

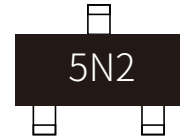
| Advanced Trench Technology

| Excellent $R_{DS(ON)}$ and Low Gate Charge

| ESD Rating: HBM 2.0KV



SOT-323



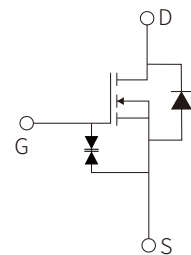
Marking

APPLICATION

| Load Switch

| PWM Application

| Power Management



Schematic Symbol

APPROVALS

RoHS | Compliance with 2011/65/EU

HF | Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}C$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Drain Current	I_D	5	A
Avalanche energy, single pulse ⁽²⁾	E_{AS}	21.6	mJ
Operating and Storage Temperature	T_J, T_{STG}	-55 to +150	$^{\circ}C$

ELECTRICAL CHARACTERISTICS (T_A=25°C)

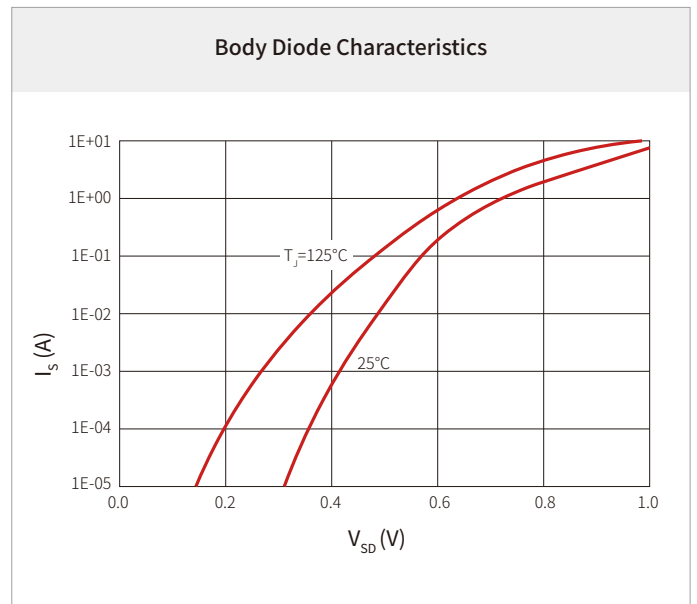
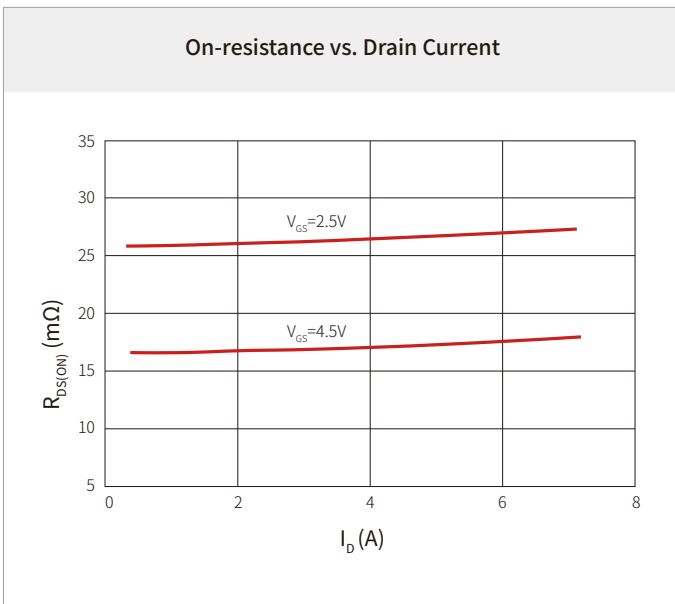
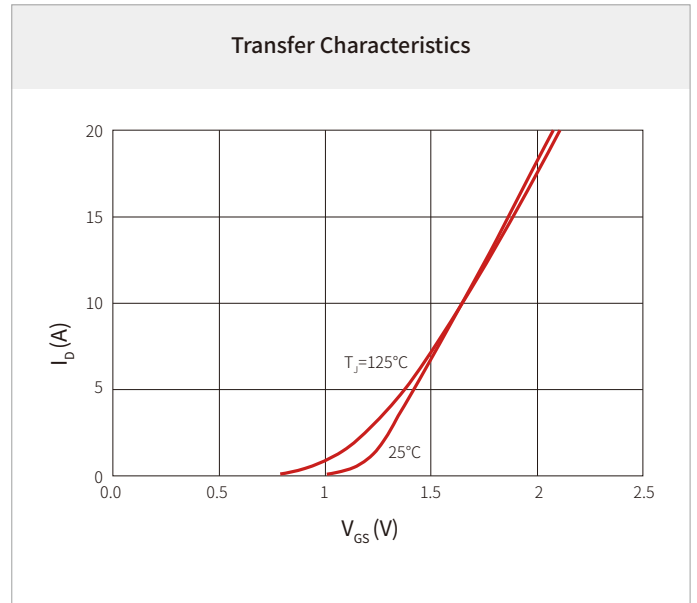
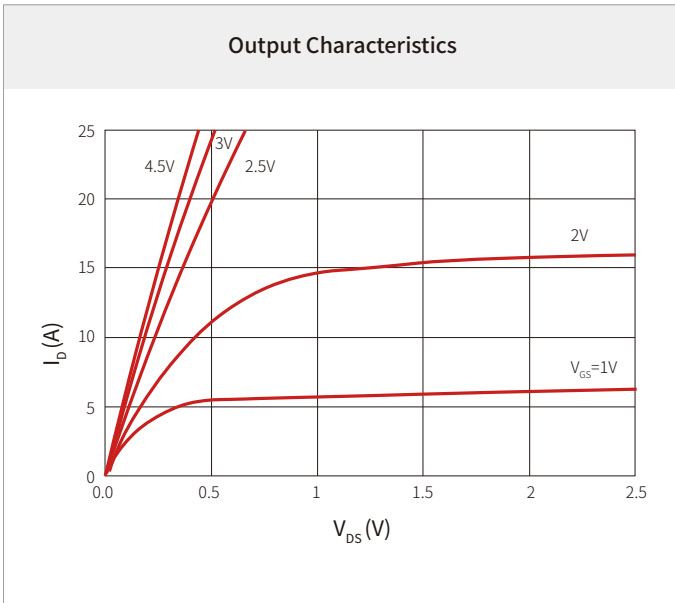
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	20			V
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±10V			±10	μA
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =20V, V _{GS} =0V			1	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	1.0	V
Static Drain-Source On-Resistance ⁽¹⁾	R _{DS(on)}	V _{GS} =4.5V, I _D =5A		14	18	mΩ
		V _{GS} =2.5V, I _D =3A		17	22	mΩ
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f=1MHz		545		pF
Output capacitance	C _{oss}			103		pF
Reverse transfer capacitance	C _{rss}			90		pF
Total gate charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =5A		8		nC
Gate-source charge	Q _{gS}			2.5		nC
Gate-drain charge	Q _{gD}			3		nC
Switching Characteristics						
Turn-on delay time	t _{d(on)}	V _{DS} =10V, R _L =1.5Ω R _{GEN} =3Ω, V _{GS} =5V		0.5		ns
Rise Time	t _r			1		ns
Turn-Off Delay Time	t _{d(off)}			12		ns
Fall yime	t _f			4		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current	I _S				5	A
Maximum Pulsed Drain to Source Diode Forward Current	I _{SM}				20	A
Drain to Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =5A			1.2	V

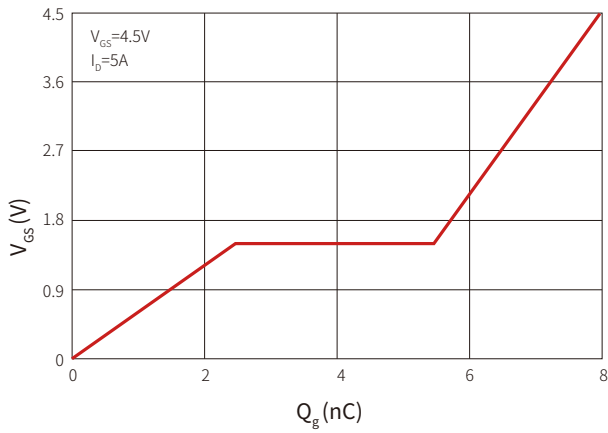
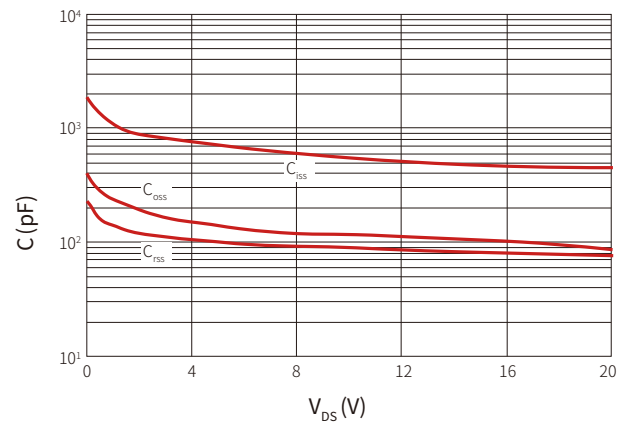
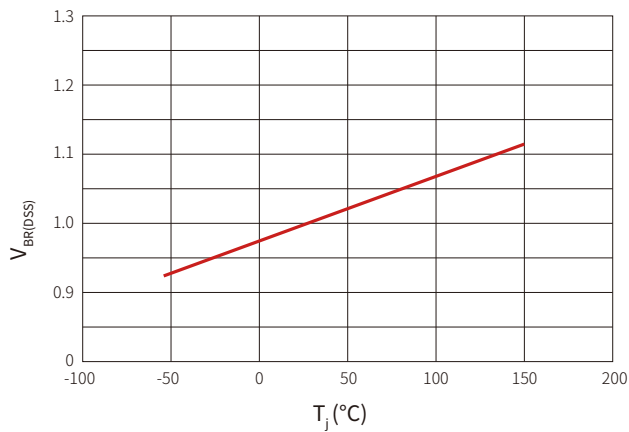
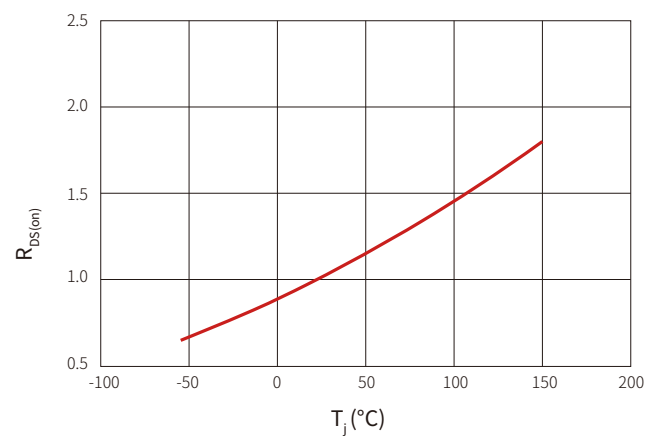
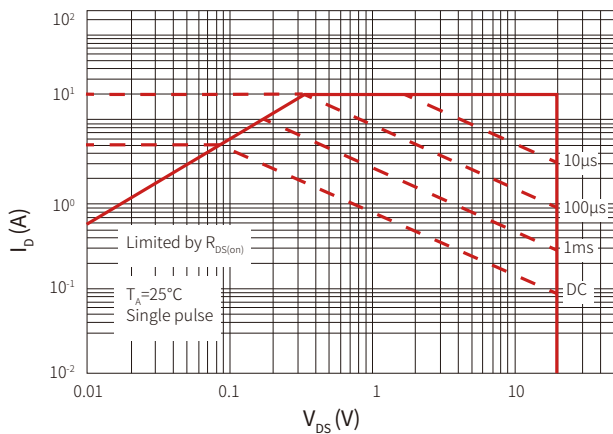
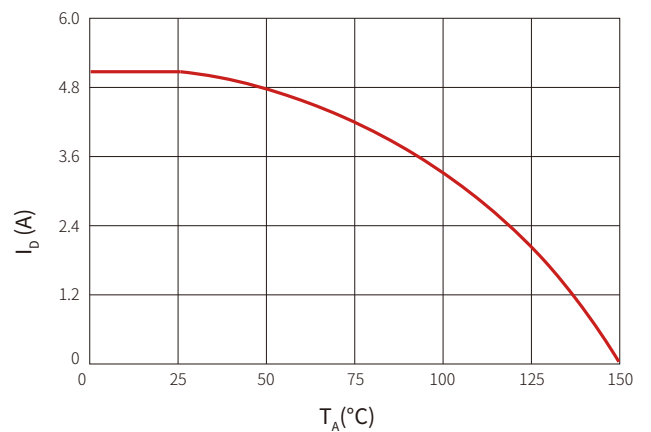
Notes:

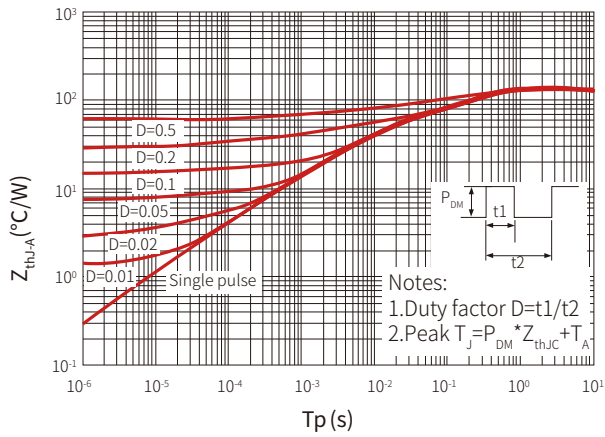
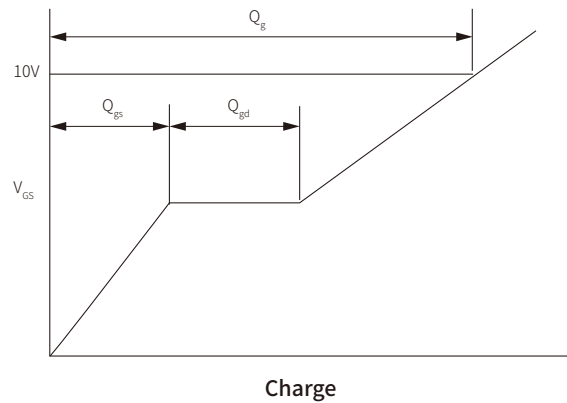
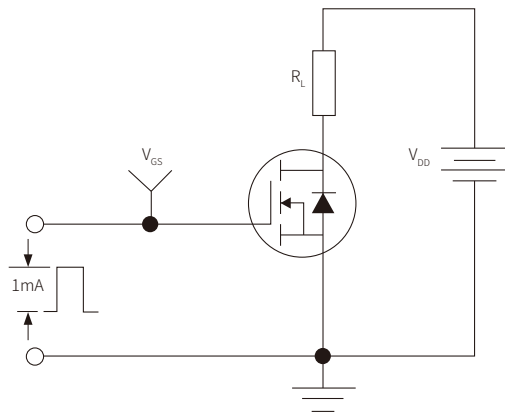
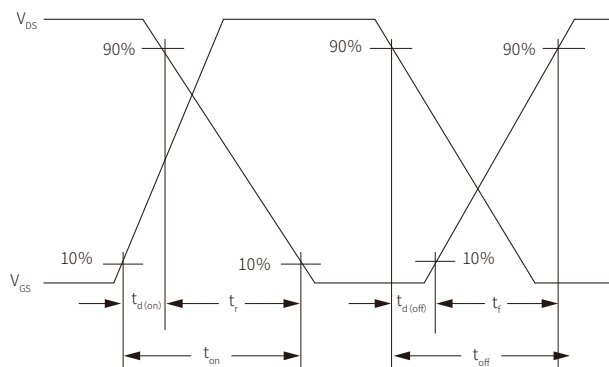
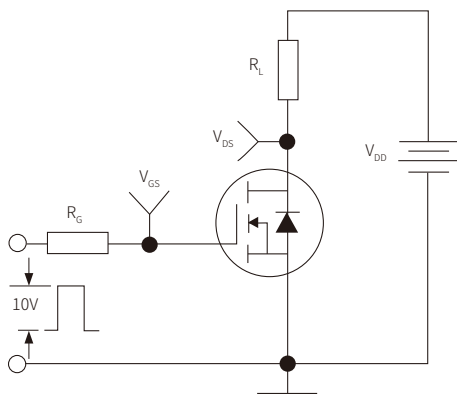
(1) Pulse Width tp ≤ 300μs, Duty Cycle < 2%.

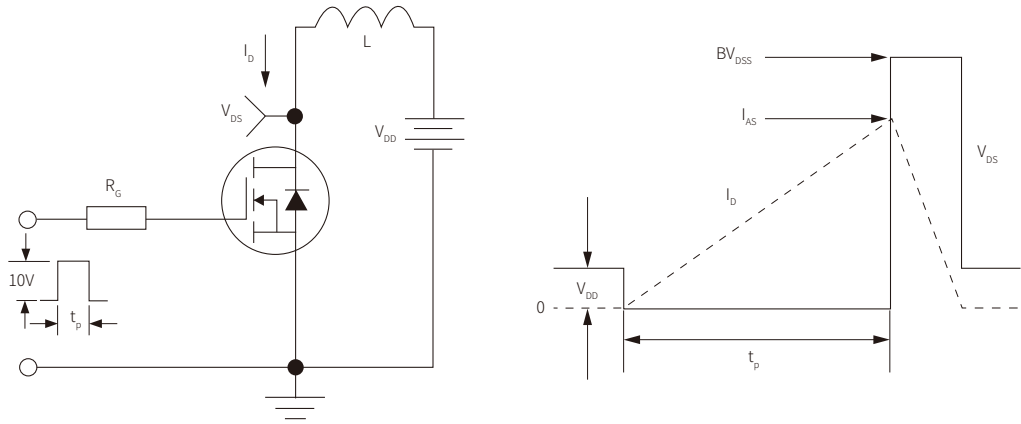
(2) E_{AS} condition: Starting T_J=25°C, V_{DD}=10V, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=9.3A

CHARACTERISTIC CURVES



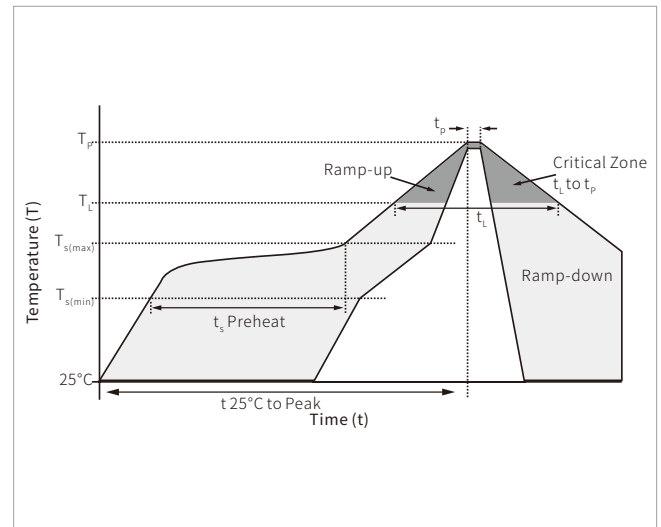
Gate Charge Characteristics

Capacitance Characteristics

Normalized Breakdown Voltage vs. Junction Temperature

Normalized on Resistance vs. Junction Temperature

Maximum Safe Operating Area

Maximum Continuous Drain Current vs. Ambient Temperature


Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms


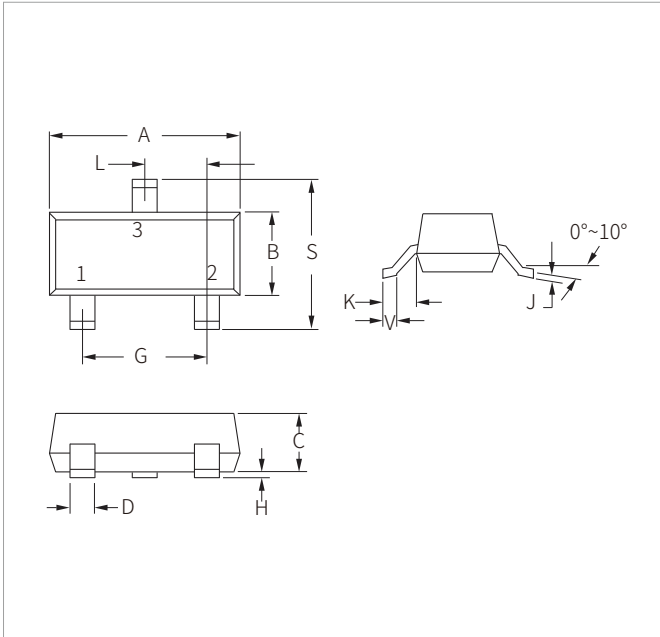
Unclamped Inductive Switching Test Circuit & Waveforms


SOLDERING PARAMETERS

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_L)	60 – 150 seconds
Peak Temperature (T_p)		260°C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260°C

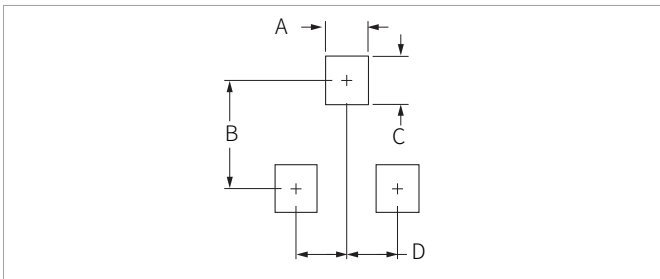


SOT-323 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.00	2.20	0.079	0.087
B	1.15	1.35	0.045	0.053
C	0.80	1.10	0.031	0.043
D	0.20	0.40	0.008	0.016
G	1.20	1.40	0.047	0.055
H	0.00	0.10	0.000	0.004
J	0.08	0.15	0.003	0.006
K	0.525REF		0.021REF	
L	0.650TYP		0.026TYP	
S	2.15	2.45	0.085	0.096
V	0.26	0.46	0.010	0.018

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters	Inches
	NOR	NOR
A	0.50	0.020
B	2.20	0.087
C	0.80	0.031
D	1.30	0.051

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SNM5N02W	SOT-323	3000PCS	7"

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