Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	I_D T_A = +25°C
-20V	36mΩ @ V_{GS} = -4.5V	U-DFN2020-6 Type E	-6.2A
	56mΩ @ V_{GS} = -2.5V		-5.0A
	75mΩ @ V_{GS} = -1.8V		-4.2A

Features

- 0.6mm profile – ideal for low profile applications
- PCB footprint of 4mm^2
- Low Gate Threshold Voltage
- Low On-Resistance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description

This new generation MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

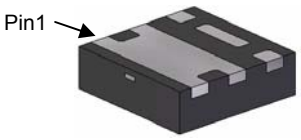
Mechanical Data

- Case: U-DFN2020-6 Type E
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Weight: 0.0065 grams (approximate)

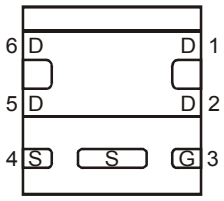
Applications

- General Purpose Interfacing Switch
- Power Management Functions
- Analog Switch

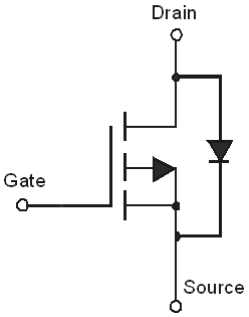
U-DFN2020-6
Type E



Bottom View



Bottom View
Internal Schematic



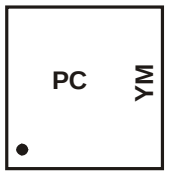
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP2066UFDE-7	U-DFN2020-6 Type E	3,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com.

Marking Information



PC = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: Y = 2011)
M = Month (ex: 9 = September)
Dot Denotes Pin 1

Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±12	V
Continuous Drain Current (Note 5) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-6.2 -4.9	A
	t<5s	T_A = +25°C T_A = +70°C	I_D	-7.5 -5.9	A
Continuous Drain Current (Note 5) V_{GS} = -1.8V	Steady State	T_A = +25°C T_A = +70°C	I_D	-4.2 -3.4	A
	t<5s	T_A = +25°C T_A = +70°C	I_D	-5.2 -4.1	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	-25	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	2.5	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)		P_D	0.66	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	189	°C/W
	t<5s		123	°C/W
Total Power Dissipation (Note 5)		P_D	2.03	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	61	°C/W
	t<5s		40	°C/W
Thermal Resistance, Junction to Case (Note 5)		$R_{\theta Jc}$	9.3	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	µA	V_{DS} = -20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±12.0V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	-0.4	—	-1.1	V	V_{DS} = V_{GS}, I_D = -250µA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	25	36	mΩ	V_{GS} = -4.5V, I_D = -4.6A
		—	33	56		V_{GS} = -2.5V, I_D = -3.8A
		—	50	75		V_{GS} = -1.8V, I_D = -2.0A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	9	—	S	V_{DS} = -10V, I_D = -4.5A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	V_{GS} = 0V, I_S = -2.1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	1537	—	pF	V_{DS} = -10V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	146	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	127	—	pF	
Gate Resistance	R_g	—	10.4	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge	Q_g	—	14.4	—	nC	V_{DS} = -10V, V_{GS} = -4.5V I_D = -4.5A
Gate-Source Charge	Q_{gs}	—	2.6	—		
Gate-Drain Charge	Q_{gd}	—	2.7	—		
Turn-On Delay Time	$t_{D(on)}$	—	13.7	—	ns	V_{DD} = -10V, V_{GS} = -4.5V, R_G = 6Ω, R_L = 10Ω, I_D = -1A
Turn-On Rise Time	t_r	—	14.0	—		
Turn-Off Delay Time	$t_{D(off)}$	—	79.1	—		
Turn-Off Fall Time	t_f	—	35.5	—		

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
6. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

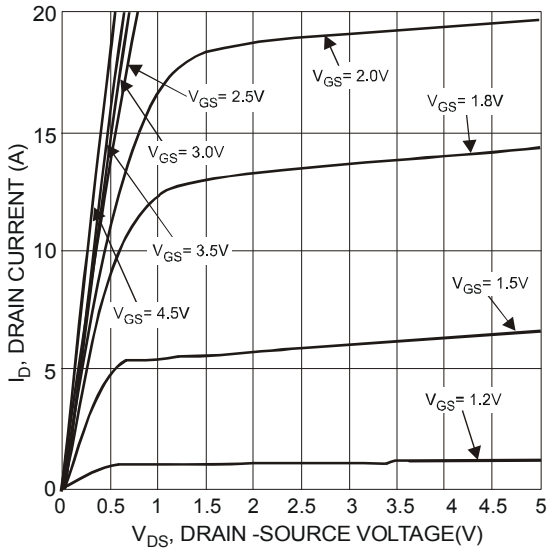


Fig. 1 Typical Output Characteristics

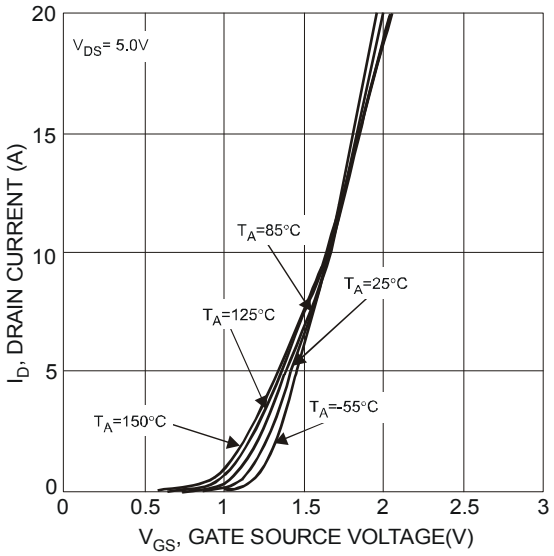


Fig. 2 Typical Transfer Characteristics

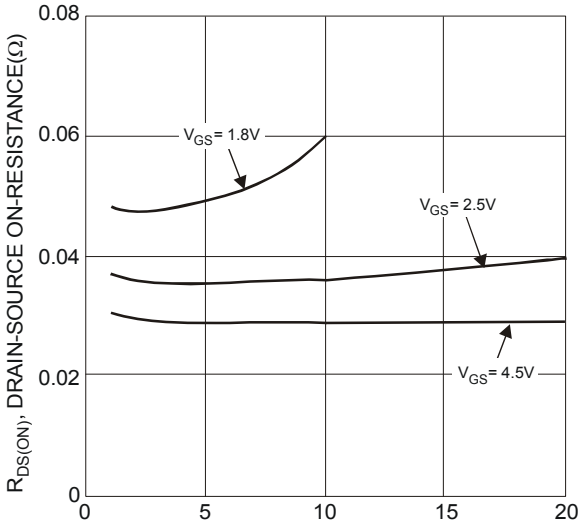


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

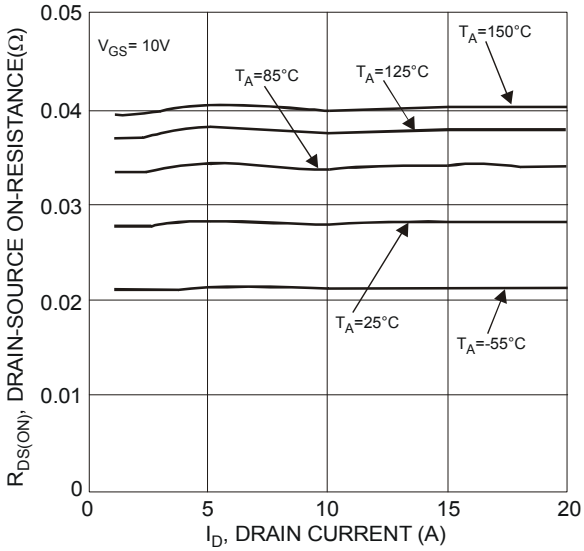


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

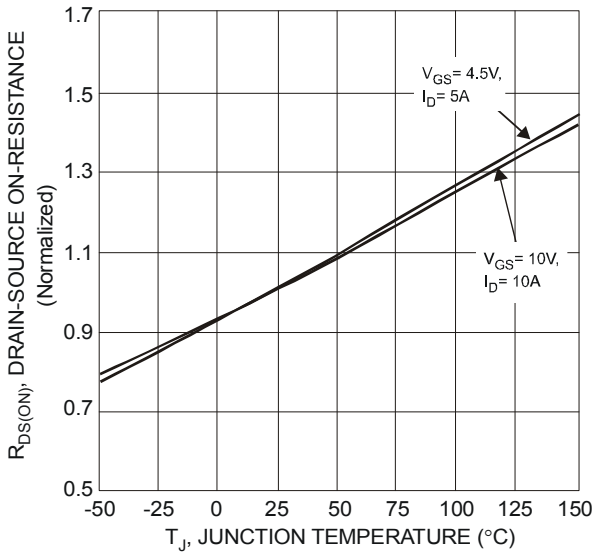


Fig. 5 On-Resistance Variation with Temperature

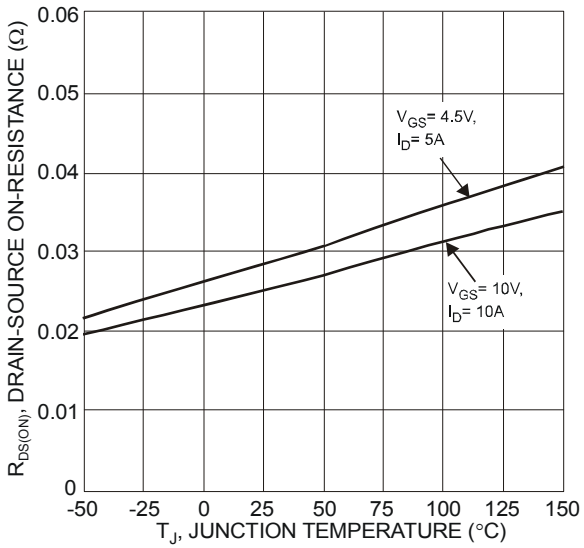


Fig. 6 On-Resistance Variation with Temperature

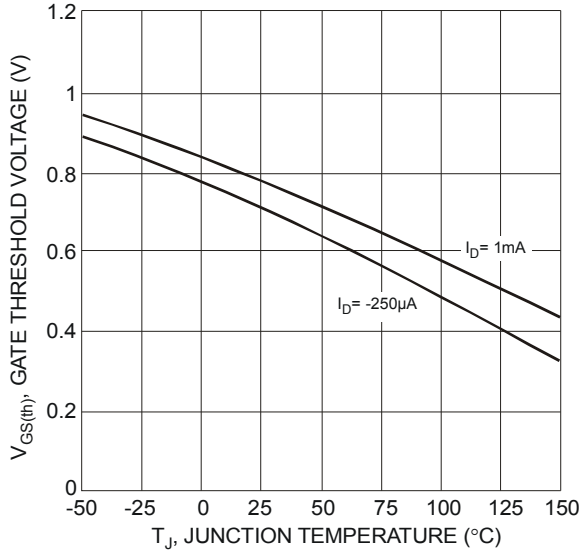


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

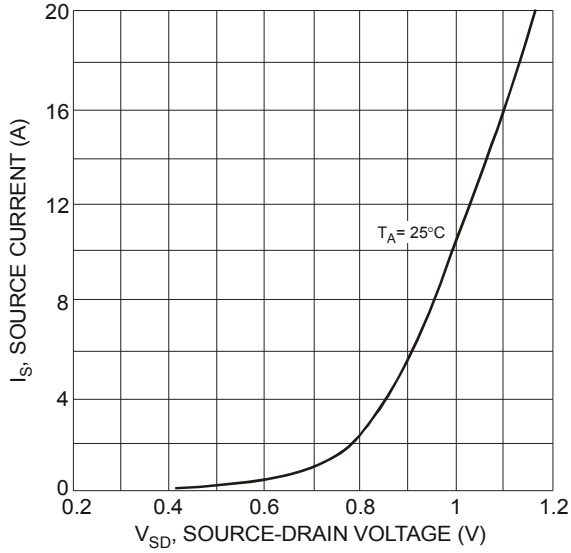


Fig. 8 Diode Forward Voltage vs. Current

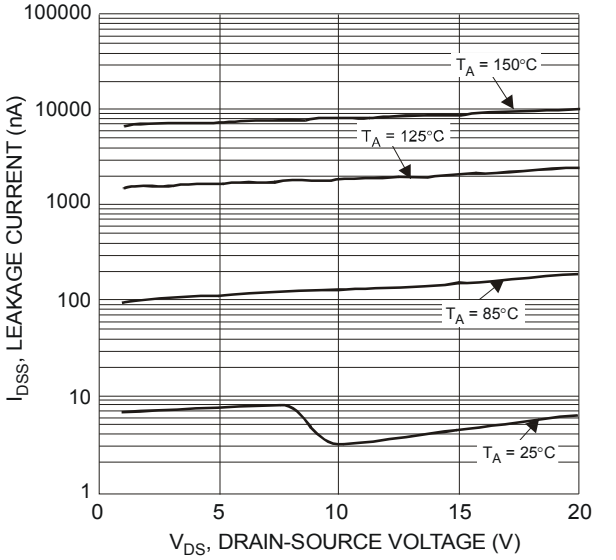


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

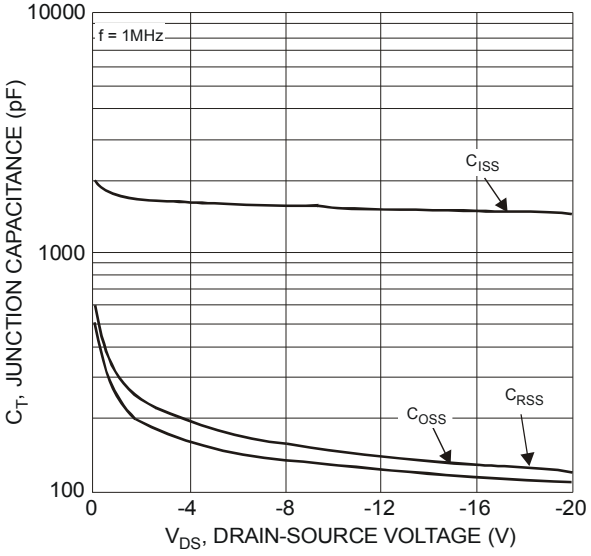


Fig. 10 Typical Junction Capacitance

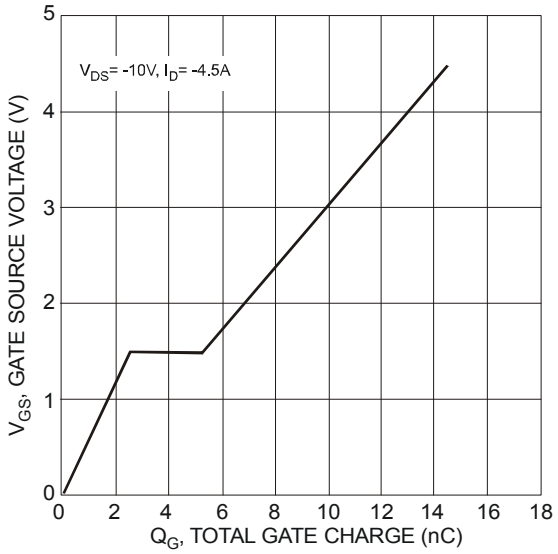


Fig. 11 Gate Charge Characteristics

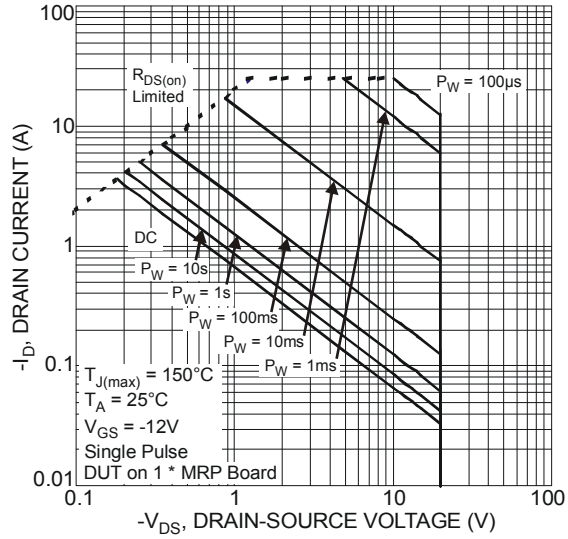


Fig. 12 SOA, Safe Operation Area

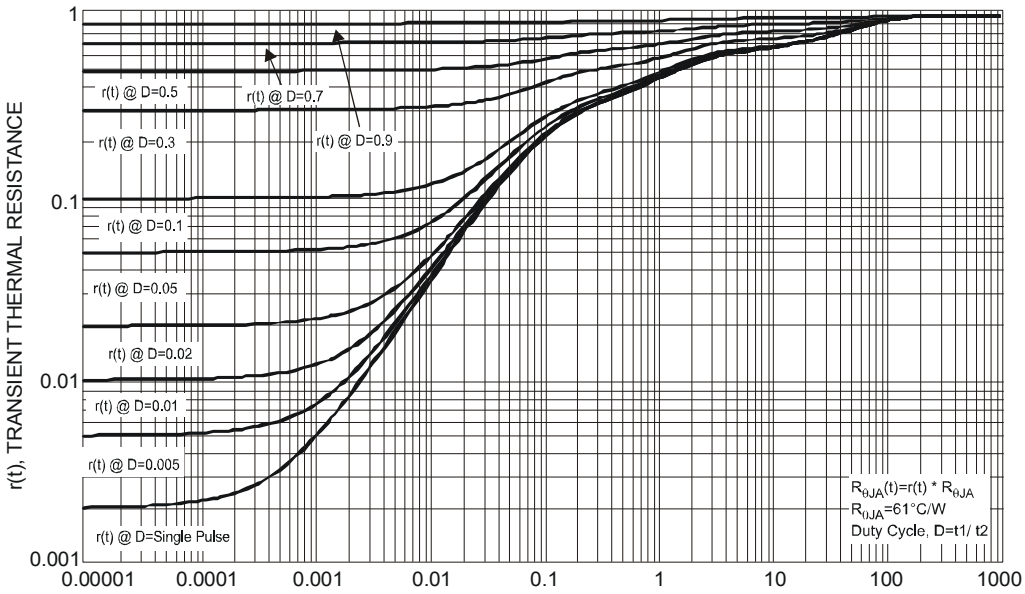
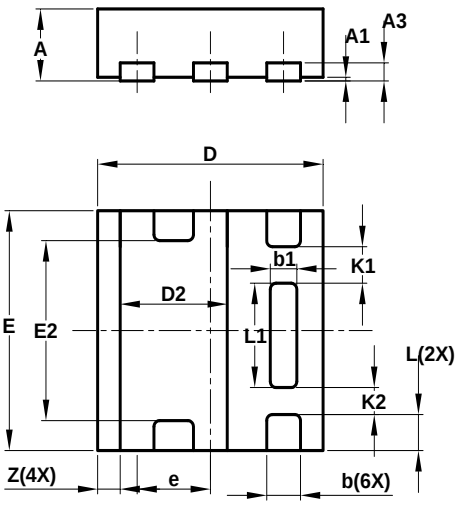


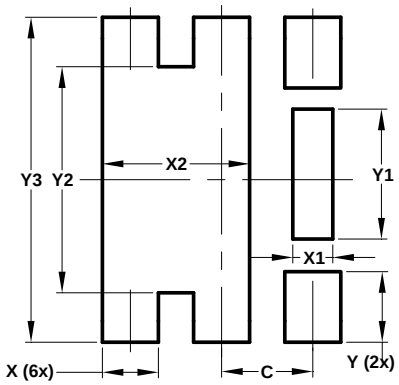
Fig. 13 Transient Thermal Resistance

Package Outline Dimensions



U-DFN2020-6 Type E			
Dim	**Min**	**Max**	**Typ**
A	0.57	0.63	0.60
A1	0	0.05	0.03
A3	–	–	0.15
b	0.25	0.35	0.30
b1	0.185	0.285	0.235
D	1.95	2.05	2.00
D2	0.85	1.05	0.95
E	1.95	2.05	2.00
E2	1.40	1.60	1.50
e	–	–	0.65
L	0.25	0.35	0.30
L1	0.82	0.92	0.87
K1	–	–	0.305
K2	–	–	0.225
Z	–	–	0.20
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.650
X	0.400
X1	0.285
X2	1.050
Y	0.500
Y1	0.920
Y2	1.600
Y3	2.300

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