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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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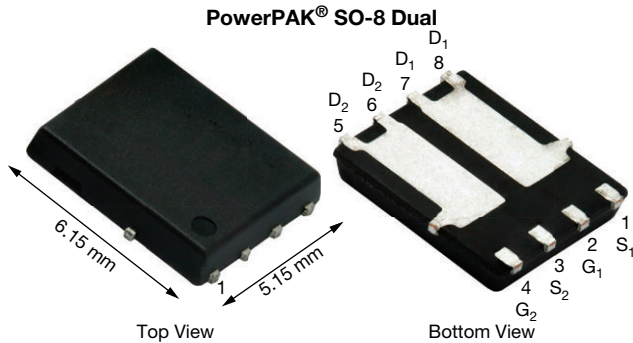
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Dual N-Channel 30 V (D-S) MOSFET



FEATURES

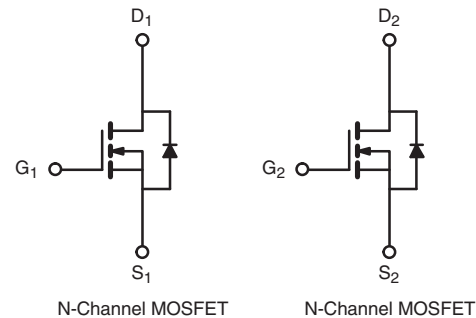
- TrenchFET® power MOSFET
- PWM optimized
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- System power DC/DC



PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (TYP.)
60	0.018 at $V_{GS} = 10$ V	8	7.1
	0.021 at $V_{GS} = 4.5$ V	8	

Ordering Information:

Si7972DP-T1-GE3 (lead (Pb)-free and halogen-free)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C	8 ^a
		$T_C = 70$ °C	8 ^a
		$T_A = 25$ °C	8 ^a
		$T_A = 70$ °C	8 ^a
Pulsed Drain Current	I_{DM}	40	A
Source-Drain Current Diode Current	I_S	$T_C = 25$ °C	
		$T_A = 25$ °C	3 ^{b, c}
Maximum Power Dissipation	P_D	$T_C = 25$ °C	22
		$T_C = 70$ °C	14
		$T_A = 25$ °C	3.6 ^{b, c}
		$T_A = 70$ °C	2.3 ^{b, c}
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to +150	°C
Soldering Recommendations (Peak Temperature) ^{d, e}		260	

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient ^{b, f}	$t \leq 10$ s	R_{thJA}	26	35	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	4	5.5	

Notes

- Package limited.
- Surface mounted on 1" x 1" FR4 board.
- $t = 10$ s.
- See solder profile (www.vishay.com/doc?73257). The PowerPAK SO-8 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.
- Maximum under steady state conditions is 80 °C/W.



SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	60	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$	-	38	-	mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	$I_D = 250\text{ }\mu\text{A}$	-	-4.9	-	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	1.2	-	2.7	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$	-	-	100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$	-	-	1	μA
		$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 85\text{ }^\circ\text{C}$	-	-	10	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 10\text{ V}$	60	-	-	A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 11\text{ A}$	-	0.015	0.018	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 10\text{ A}$	-	0.017	0.021	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 30\text{ V}$, $I_D = 11\text{ A}$	-	38	-	S
Dynamic ^a						
Input Capacitance	C_{iss}	$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$	-	1050	-	pF
Output Capacitance	C_{oss}		-	435	-	
Reverse Transfer Capacitance	C_{rss}		-	20	-	
Total Gate Charge	Q_g	$V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 11\text{ A}$	-	15.2	23	nC
		$V_{DS} = 30\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 11\text{ A}$	-	7.1	11	
Gate-Source Charge	Q_{gs}		-	4.4	-	
Gate-Drain Charge	Q_{gd}		-	1.3	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.12	0.6	1.2	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 30\text{ V}$, $R_L = 3.45\text{ }\Omega$ $I_D \cong 8.7\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_g = 1\text{ }\Omega$	-	15	120	ns
Rise Time	t_r		-	80	30	
Turn-Off Delay Time	$t_{d(off)}$		-	15	30	
Fall Time	t_f		-	15	30	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 30\text{ V}$, $R_L = 3.45\text{ }\Omega$ $I_D \cong 8.7\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_g = 1\text{ }\Omega$	-	10	15	
Rise Time	t_r		-	25	40	
Turn-Off Delay Time	$t_{d(off)}$		-	20	30	
Fall Time	t_f		-	10	15	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$	-	-	8	A
Pulse Diode Forward Current ^a	I_{SM}		-	-	40	
Body Diode Voltage	V_{SD}	$I_S = 8.7\text{ A}$	-	0.8	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 8.7\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25\text{ }^\circ\text{C}$	-	34	51	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	30	45	nC
Reverse Recovery Fall Time	t_a		-	16	-	ns
Reverse Recovery Rise Time	t_b		-	18	-	

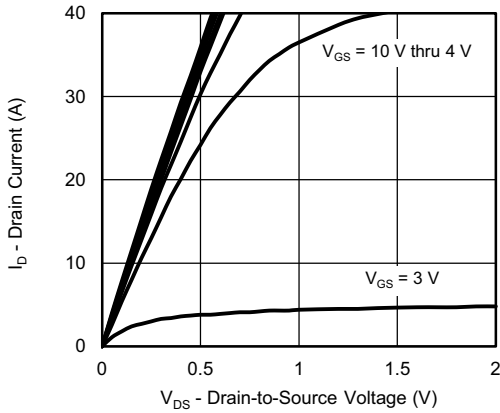
Notes

- a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

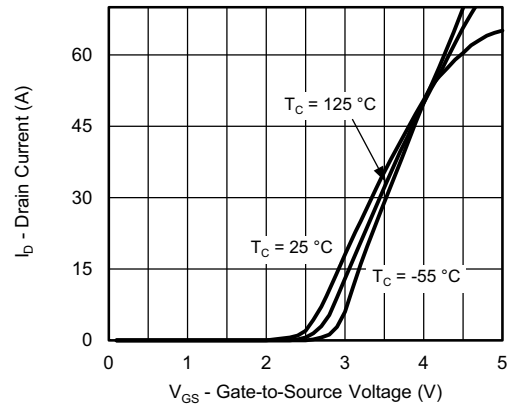
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



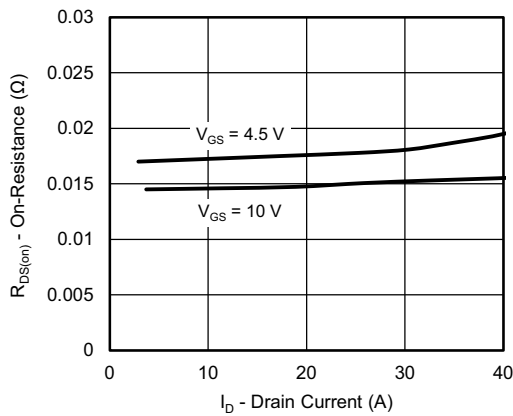
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



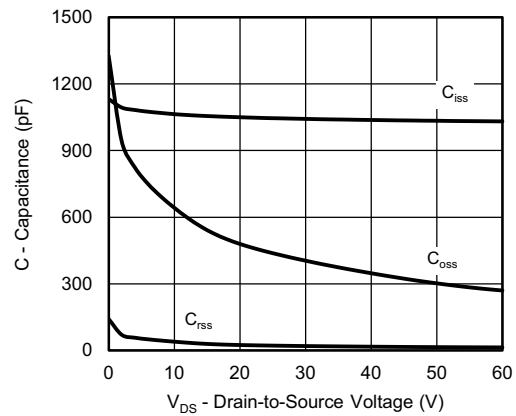
Output Characteristics



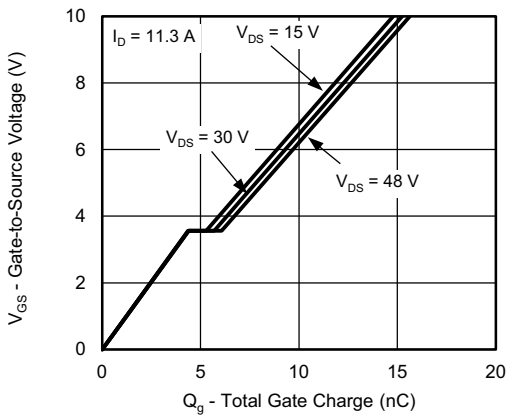
Transfer Characteristics



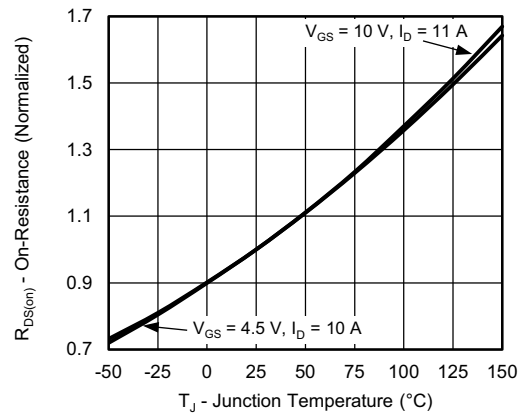
On-Resistance vs. Drain Current



Capacitance



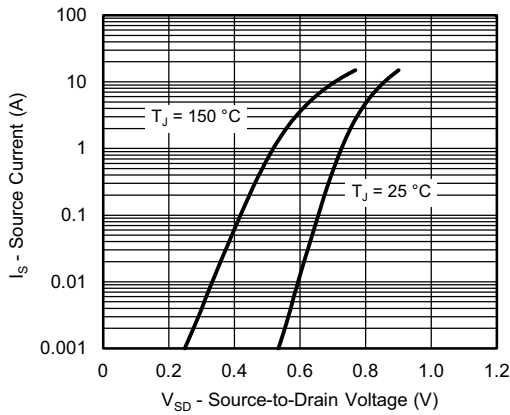
Gate Charge



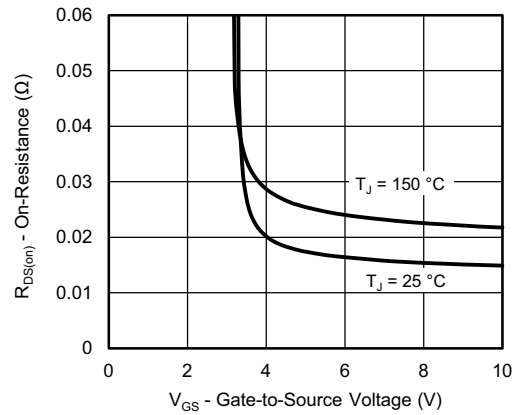
On-Resistance vs. Junction Temperature



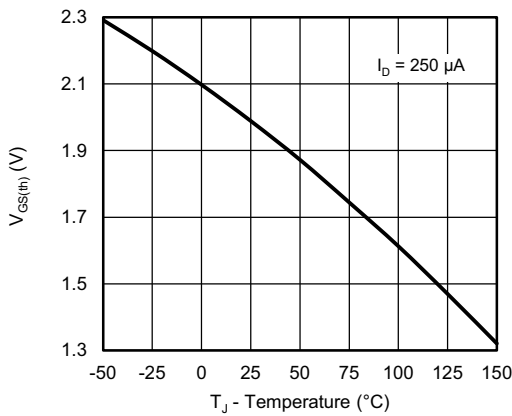
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



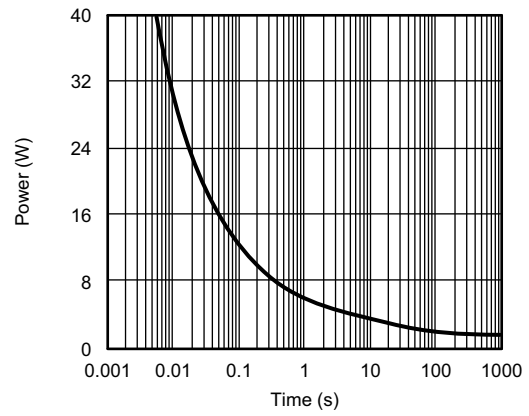
Source-Drain Diode Forward Voltage



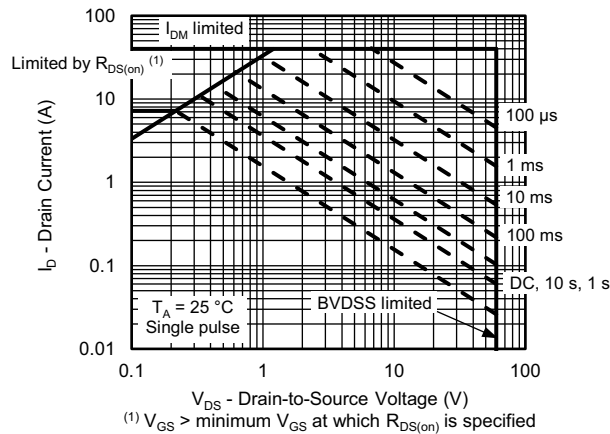
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



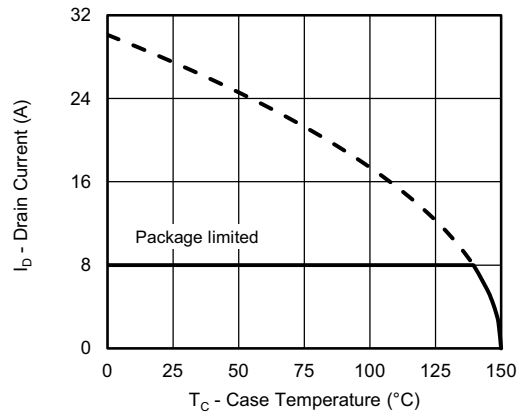
Single Pulse Power



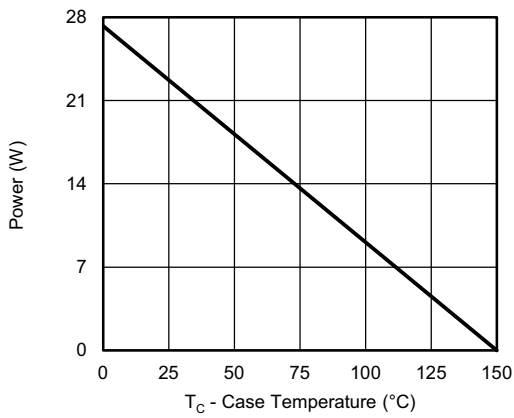
Safe Operating Area, Junction-to-Ambient



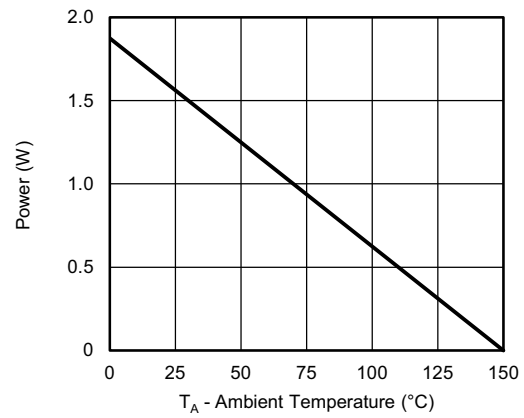
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating ^a



Power, Junction-to-Case



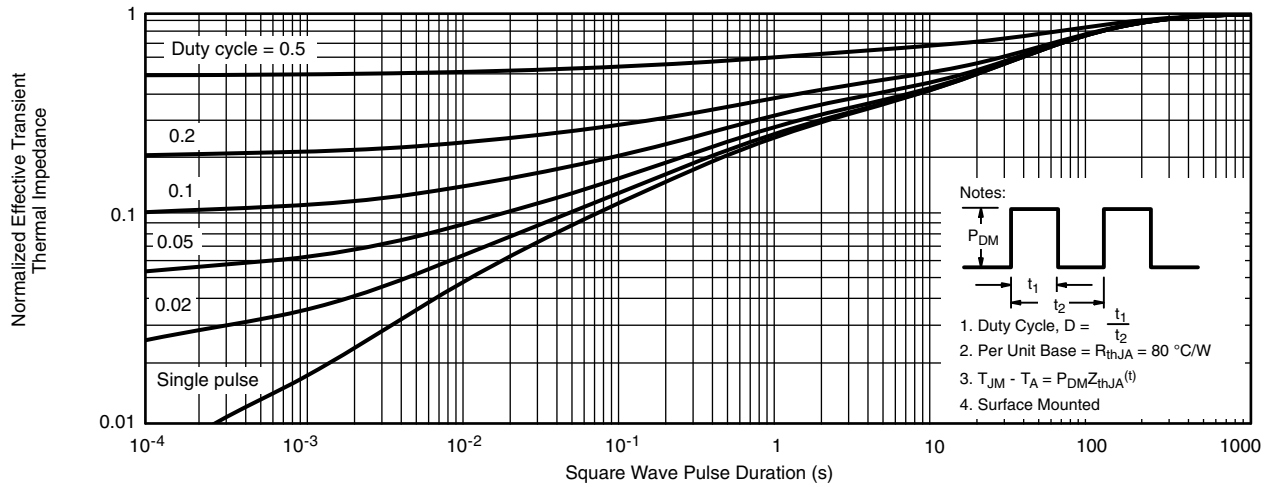
Power, Junction-to-Ambient

Note

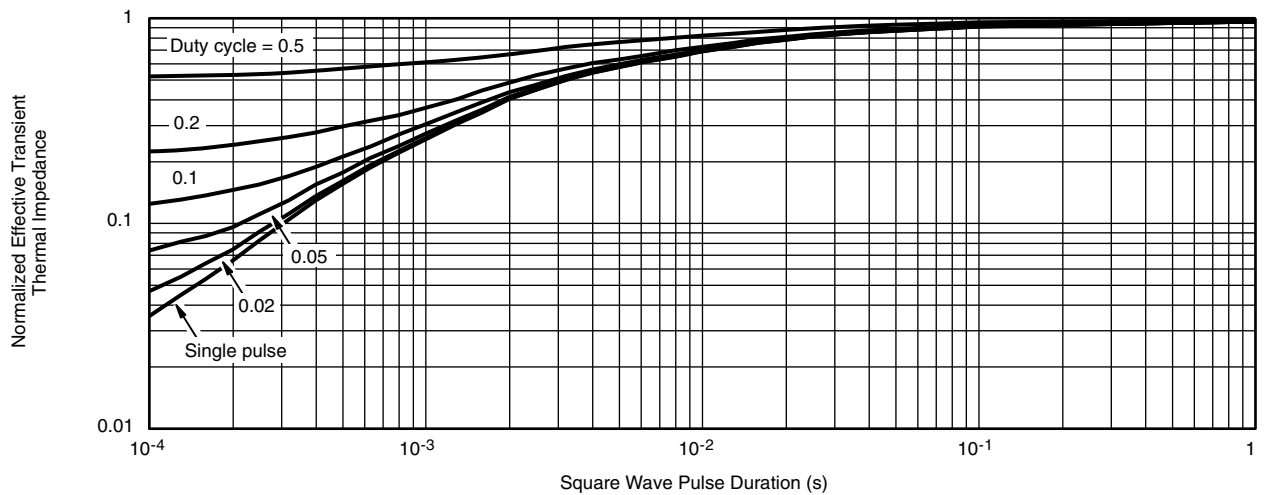
- a. The power dissipation P_D is based on $T_J \text{ max.} = 150 \text{ }^\circ\text{C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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