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June 2015

FDMD8260LET60

Dual N-Channel Power Trench[®] MOSFET

60 V, 5.8 mΩ

Features

- Extended T_J Rating to 175 °C
- Max $r_{DS(on)}$ = 5.8 mΩ at V_{GS} = 10 V, I_D = 15 A
- Max $r_{DS(on)}$ = 8.7 mΩ at V_{GS} = 4.5 V, I_D = 12 A
- Ideal for Flexible Layout in Primary Side of Bridge Topology
- 100% UIL Tested
- Kelvin High Side MOSFET Drive Pin-out Capability
- Termination is Lead-free and RoHS Compliant

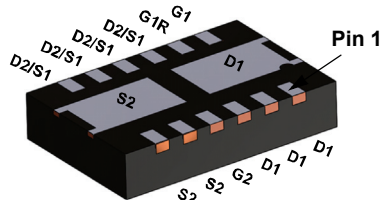
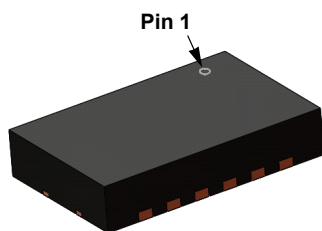


General Description

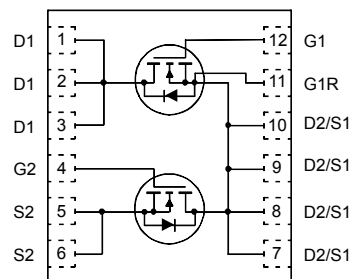
This device includes two 60V N-Channel MOSFETs in a dual Power (3.3 mm X 5 mm) package. HS source and LS Drain internally connected for half/full bridge, low source inductance package, low $r_{DS(on)}$ /Qg FOM silicon.

Applications

- Synchronous Buck : Primary Switch of Half / Full bridge Converter for Telecom
- Motor Bridge : Primary Switch of Half / Full bridge Converter for BLDC Motor
- MV POL : 48V Synchronous Buck Switch



Power 3.3 x 5



MOSFET Maximum Ratings $T_A = 25\text{ °C}$ unless otherwise noted.

Symbol	Parameter	Ratings	Units
V_{DS}	Drain to Source Voltage	60	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current -Continuous $T_C = 25\text{ °C}$ (Note 5)	67	A
	-Continuous $T_C = 100\text{ °C}$ (Note 5)	47	
	-Continuous $T_A = 25\text{ °C}$ (Note 1a)	15	
	-Pulsed (Note 4)	304	
E_{AS}	Single Pulse Avalanche Energy (Note 3)	181	mJ
P_D	Power Dissipation $T_C = 25\text{ °C}$	44	W
	Power Dissipation $T_A = 25\text{ °C}$ (Note 1a)	2.5	
	Power Dissipation $T_A = 25\text{ °C}$ (Note 1b)	1.1	
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.4	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	60	
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1b)	130	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
8260LT	FDMD8260LET60	Power 3.3 x 5	13 "	12 mm	3000 units

Electrical Characteristics $T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise noted.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
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Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = 250\text{ }\mu\text{A}$, $V_{GS} = 0\text{ V}$	60			V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, referenced to $25\text{ }^{\circ}\text{C}$		33		mV/ $^{\circ}\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 48\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0\text{ V}$			± 100	nA

On Characteristics

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\text{ }\mu\text{A}$	1.0	1.5	3.0	V
$\Delta V_{GS(th)}/\Delta T_J$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, referenced to $25\text{ }^{\circ}\text{C}$		-6		mV/ $^{\circ}\text{C}$
$r_{DS(on)}$	Static Drain to Source On Resistance	$V_{GS} = 10\text{ V}$, $I_D = 15\text{ A}$		4.5	5.8	m Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 12\text{ A}$		6.6	8.7	
		$V_{GS} = 10\text{ V}$, $I_D = 15\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$		5.9	7.8	
g_{FS}	Forward Transconductance	$V_{DD} = 5\text{ V}$, $I_D = 15\text{ A}$		56		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 30\text{ V}$, $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$		3745	5245	pF
C_{oss}	Output Capacitance			558	785	pF
C_{rss}	Reverse Transfer Capacitance			22	50	pF
R_g	Gate Resistance		0.1	3.0	6.0	Ω

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 30\text{ V}$, $I_D = 15\text{ A}$ $V_{GS} = 10\text{ V}$, $R_{GEN} = 6\text{ }\Omega$		12	21	ns
t_r	Rise Time			10	20	ns
$t_{d(off)}$	Turn-Off Delay Time			47	74	ns
t_f	Fall Time			11	20	ns
$Q_{g(TOT)}$	Total Gate Charge	$V_{GS} = 0\text{ V to }10\text{ V}$	$V_{DD} = 30\text{ V}$ $I_D = 15\text{ A}$	49	68	nC
	Total Gate Charge	$V_{GS} = 0\text{ V to }5\text{ V}$		25	35	nC
Q_{gs}	Gate to Source Charge			8.6		nC
Q_{gd}	Gate to Drain "Miller" Charge			5.2		nC

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Forward Voltage	$V_{GS} = 0\text{ V}$, $I_S = 15\text{ A}$ (Note 2)		0.8	1.3	V
		$V_{GS} = 0\text{ V}$, $I_S = 1.6\text{ A}$ (Note 2)		0.7	1.2	
t_{rr}	Reverse Recovery Time	$I_F = 15\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		36	58	ns
Q_{rr}	Reverse Recovery Charge			17	30	nC

NOTES:

1. $R_{\theta JA}$ is determined with the device mounted on a 1 in² pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.

a. $60\text{ }^{\circ}\text{C/W}$ when mounted on
a 1 in² pad of 2 oz copper

b. $130\text{ }^{\circ}\text{C/W}$ when mounted on
a minimum pad of 2 oz copper

FDMD8260LET60

FDMD8260LET60

2. Pulse Test: Pulse Width < 300 μs , Duty cycle < 2.0 %.

3. E_{AS} of 181 mJ is based on starting $T_J = 25\text{ }^{\circ}\text{C}$, $L = 3\text{ mH}$, $I_{AS} = 11\text{ A}$, $V_{DD} = 60\text{ V}$, $V_{GS} = 10\text{ V}$. 100% tested at $L = 0.1\text{ mH}$, $I_{AS} = 36\text{ A}$.

4. Pulsed I_D please refer to Fig 11 SOA graph for more details.

5. Computed continuous current limited to Max Junction Temperature only, actual continuous current will be limited by thermal & electro-mechanical application board design. .

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted.

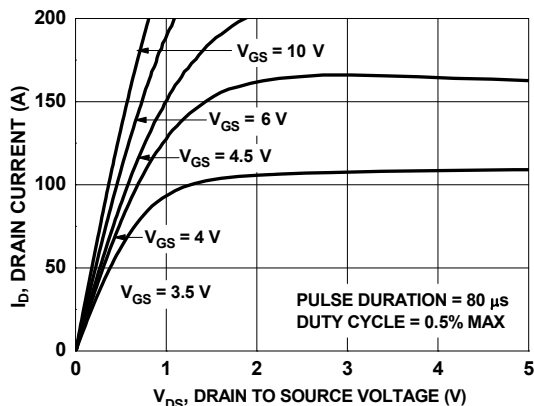


Figure 1. On-Region Characteristics

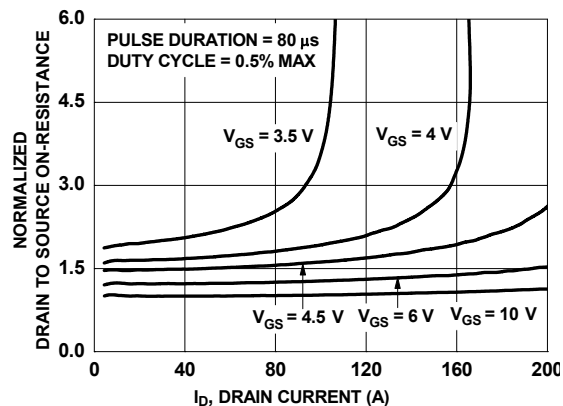


Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage

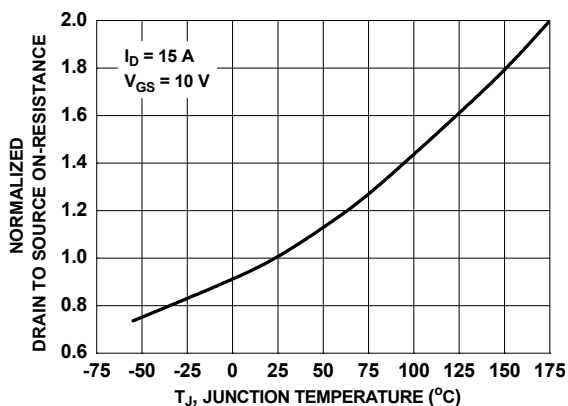


Figure 3. Normalized On Resistance vs. Junction Temperature

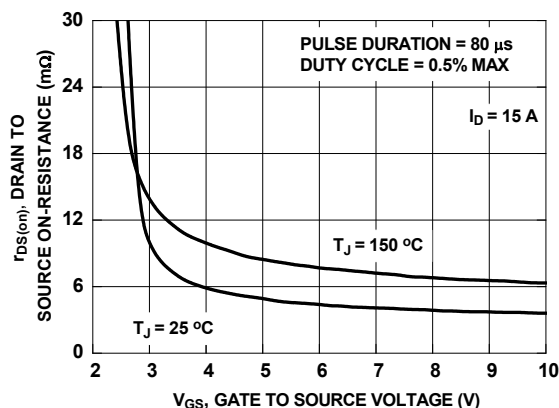


Figure 4. On Resistance vs. Gate to Source Voltage

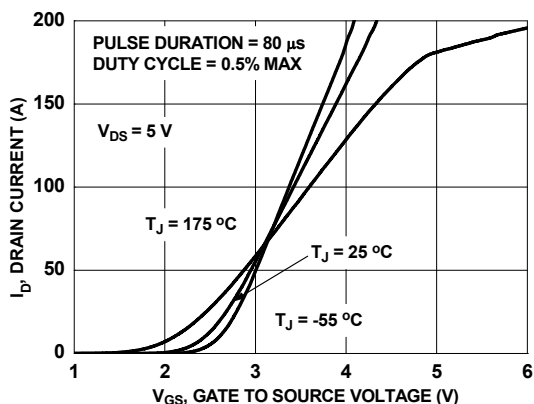


Figure 5. Transfer Characteristics

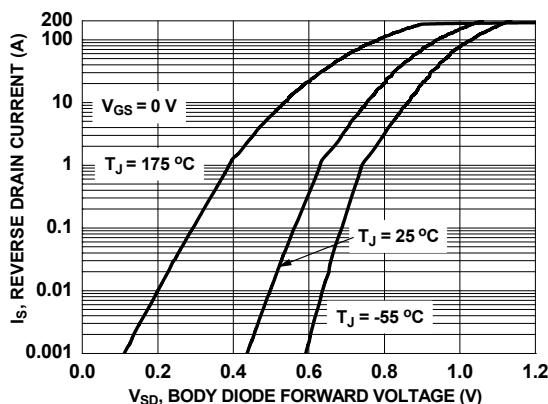


Figure 6. Source to Drain Diode Forward Voltage vs. Source Current

Typical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted.

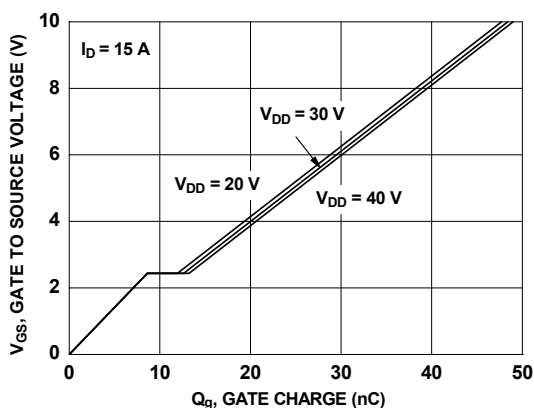


Figure 7. Gate Charge Characteristics

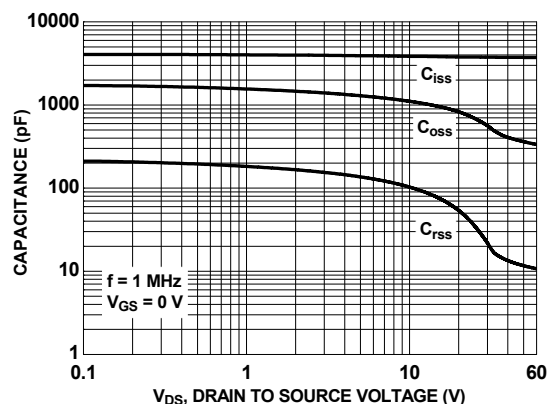


Figure 8. Capacitance vs. Drain to Source Voltage

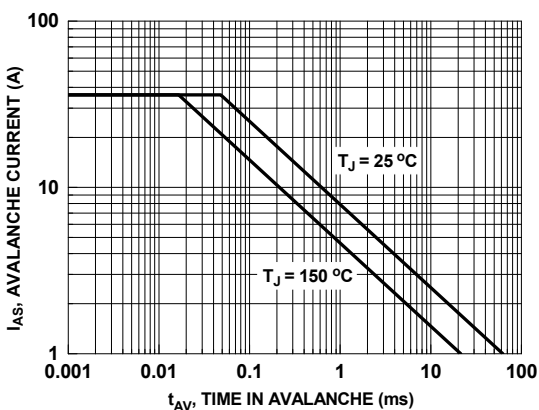


Figure 9. Unclamped Inductive Switching Capability

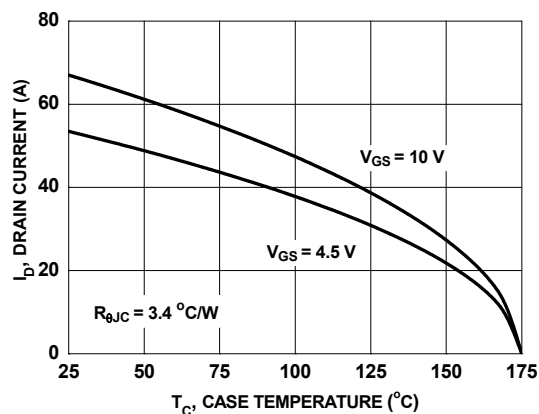


Figure 10. Maximum Continuous Drain Current vs. Case Temperature

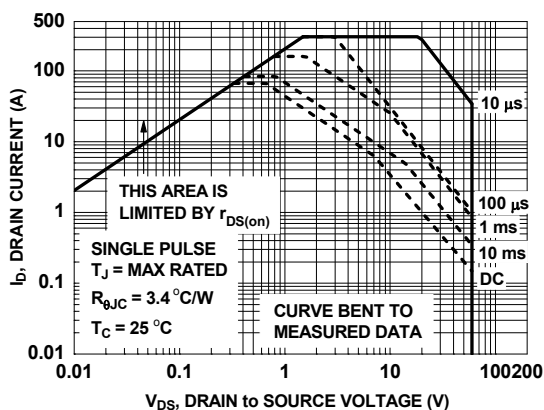


Figure 11. Forward Bias Safe Operating Area

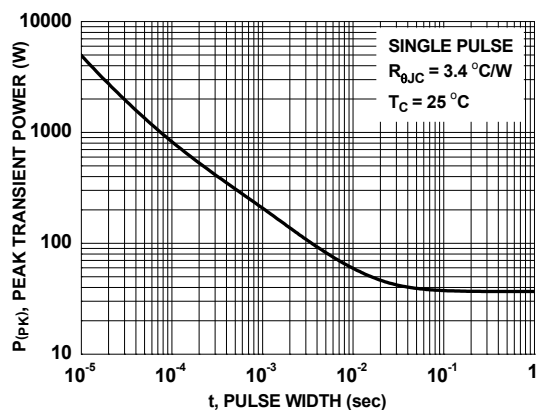


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics $T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise noted.

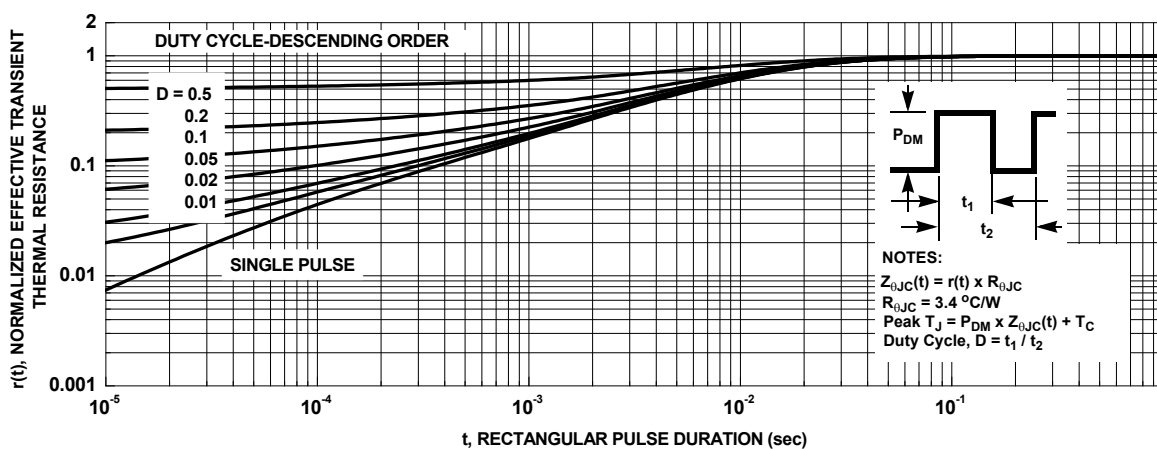
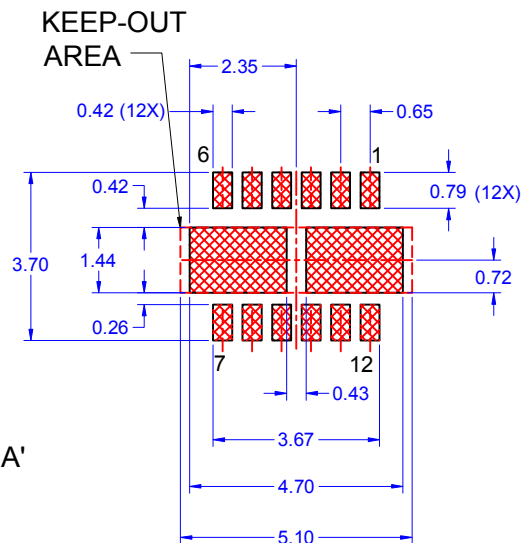
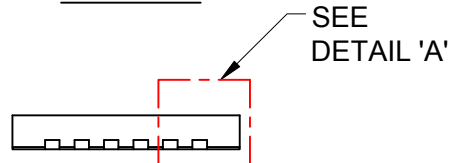
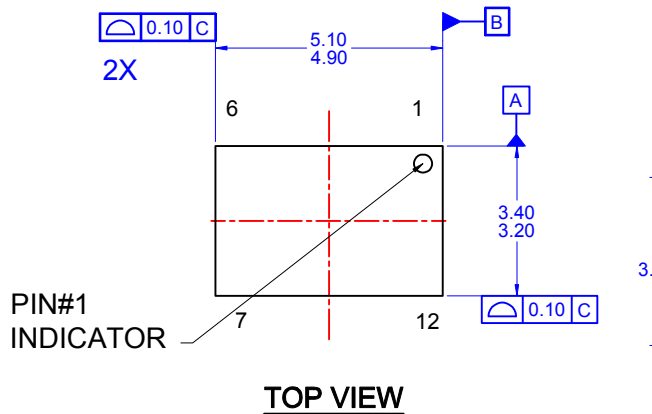
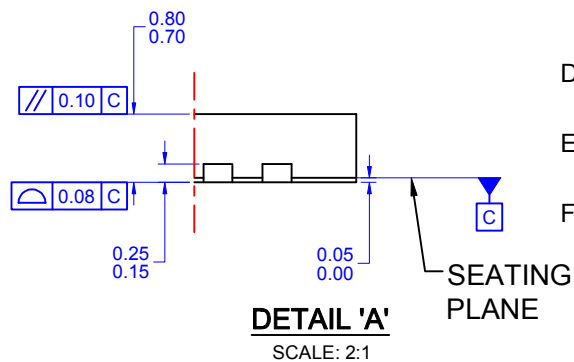
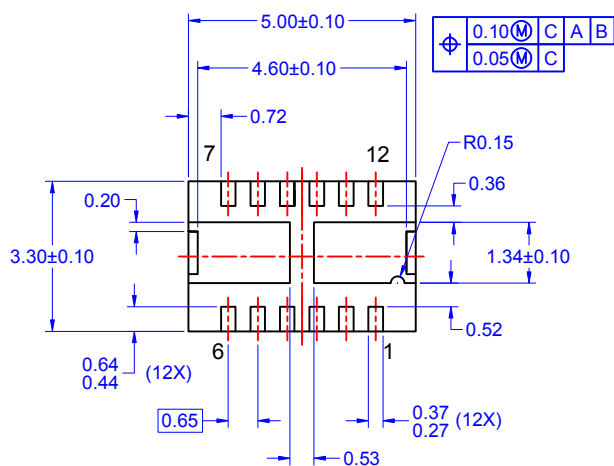


Figure 13. Junction-to-Case Transient Thermal Response Curve



LAND PATTERN RECOMMENDATION



NOTES: UNLESS OTHERWISE SPECIFIED

A) DOES NOT FULLY CONFORM TO JEDEC

REGISTRATION, MO-229 DATED 8/2012

B) ALL DIMENSIONS ARE IN MILLIMETERS.

C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.

D) DIMENSIONING AND TOLERANCING PER
ASME Y14.5M-1994.

E) IT IS RECOMMENDED TO HAVE NO TRACES OR VIAS WITHIN THE KEEP OUT AREA.

F) DRAWING FILE NAME: MKT-PQFN12BREV1

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