

DUAL P-CHANNEL 60V ENHANCEMENT MODE MOSFET
Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ Max	I_D $T_A = +25^\circ\text{C}$
-60V	55mΩ @ $V_{GS} = -10\text{V}$	-4.8A

Description

This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

Applications

- Disconnect Switches
- Motor Drive

Features

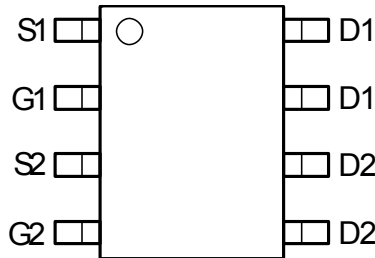
- Low On-Resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- Low Profile SOIC Package
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP capable (Note 4)

Mechanical Data

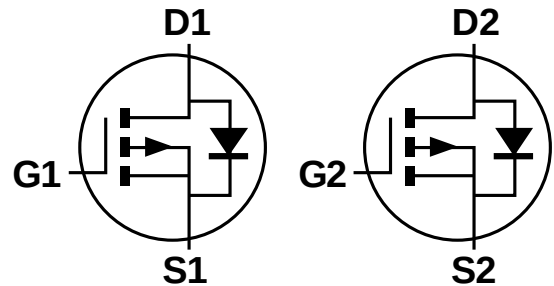
- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.074 grams (Approximate)



Top View



Top View

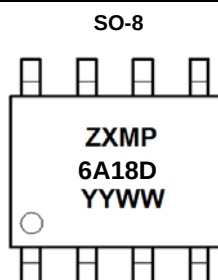


Equivalent Circuit

Ordering Information (Notes 4 & 5)

Product	Compliance	Case	Quantity per reel
ZXMP6A18DN8TA	Standard	SO-8	500
ZXMP6A18DN8TC	Standard	SO-8	2,500
ZXMP6A18DN8QTC	Automotive	SO-8	2,500

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 - See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information


ZXMP6A18D = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 11 = 2011)
 WW = Week (01 - 53)

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

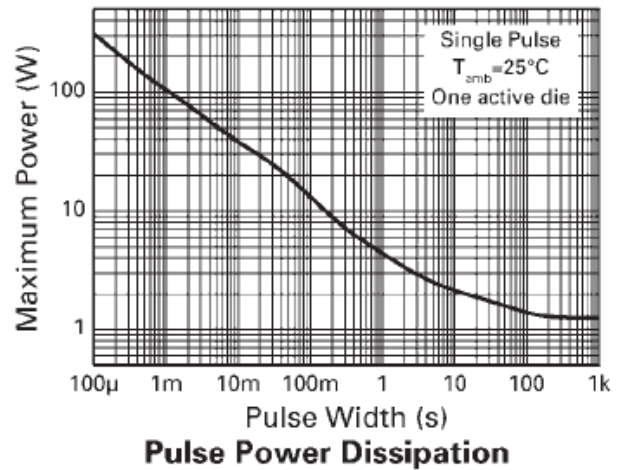
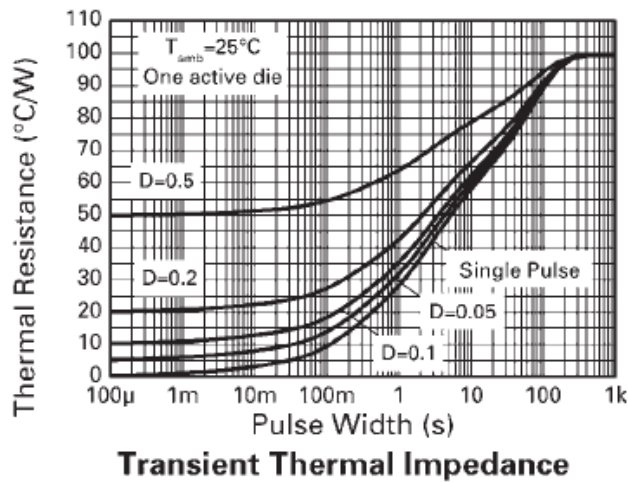
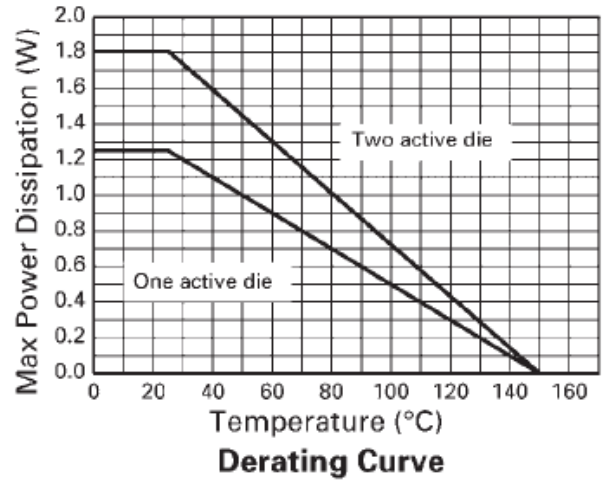
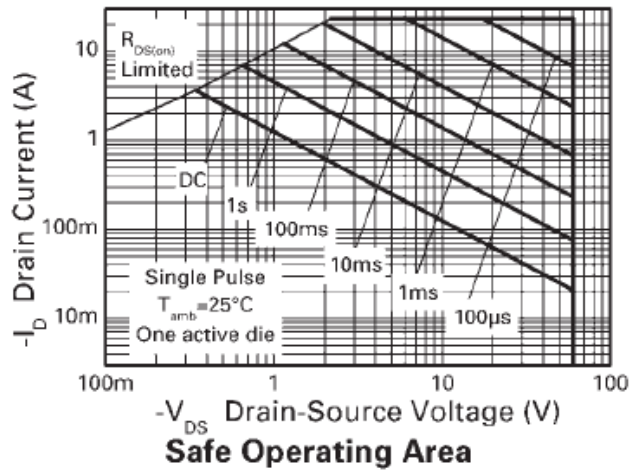
Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	-60	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current (V _{GS} = 10V)	(Notes 7 & 9)	I _D	-4.8	A
	T _A = +70°C (Notes 7 & 9)		-3.8	
	(Notes 6 & 9)		-3.7	
Pulsed Drain Current	(Notes 8)	I _{DM}	-23	A
Continuous Source Current (Body Diode)	(Notes 7)	I _S	-3.3	A
Pulsed Source Current (Body Diode)	(Notes 8)	I _{SM}	-23	A
Single Pulsed Avalanche Energy (L = 0.1mH)	(Note 11)	E _{AS}	38.2	mJ
Single Pulsed Avalanche Current (L = 0.1mH)	(Note 11)	I _{AS}	27.6	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 6 & 9)	P _D	1.25 10	W mW/°C
	(Notes 6 & 10)		1.8 14	
	(Notes 7 & 9)		2.1 17	
Thermal Resistance, Junction to Ambient	(Notes 6 & 9)	R _{θJA}	+100	°C/W
	(Notes 7 & 10)		+69	
	(Notes 7 & 9)		+58	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

- Notes:
6. For a dual device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 1oz copper in still air conditions.
 7. For a dual device surface mounted FR4 PCB measured at t ≤ 10 sec.
 8. Repetitive rating 25mm x 25mm x 1.6mm FR4 PCB, D = 0.02, pulse width = 300μs – pulse width limited by maximum junction temperature.
 9. For a dual device with one active die.
 10. For a device with two active die running at equal power.
 11. IAR and EAR rating are based on low frequency and duty cycles to keep T_J = +25°C.

Thermal Characteristics

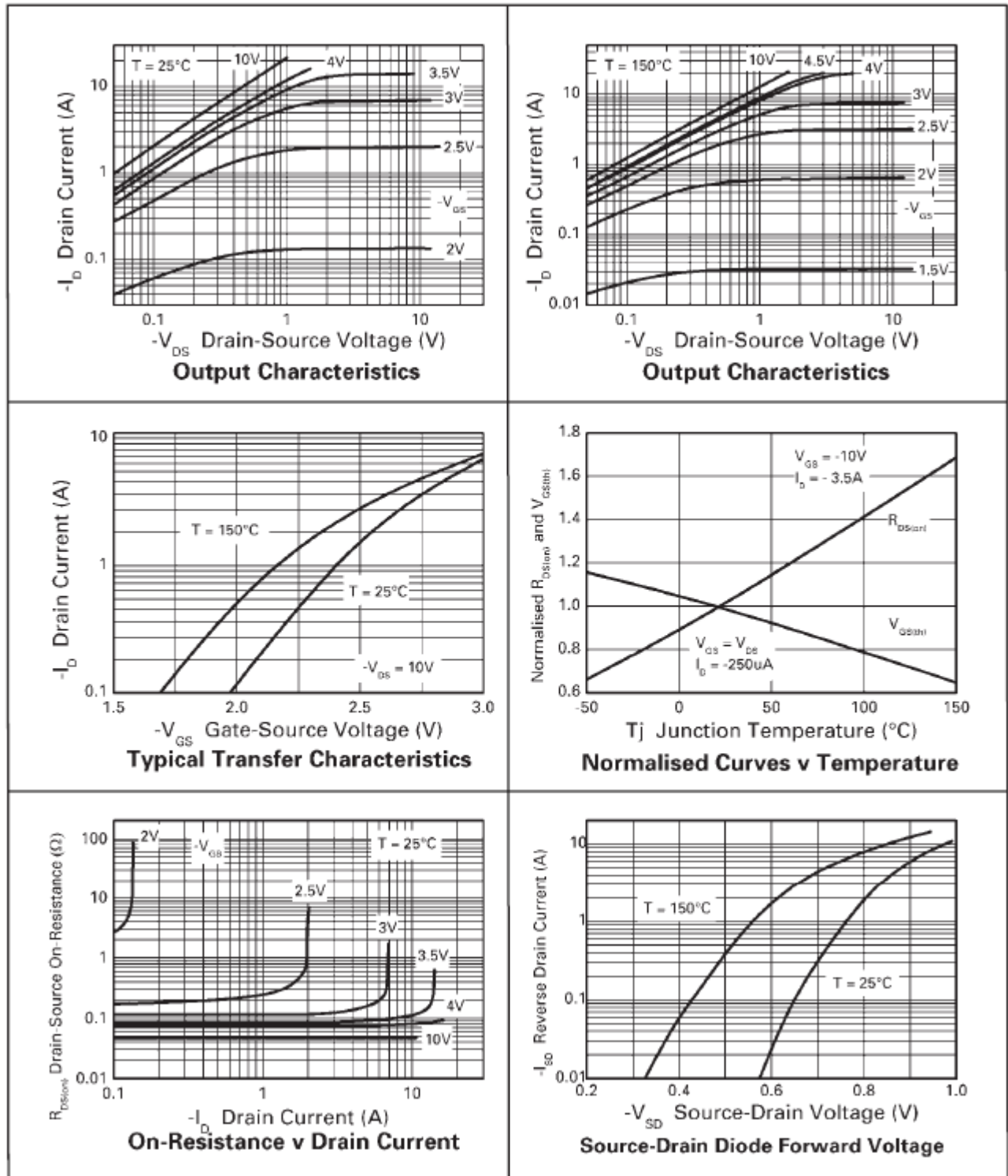


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

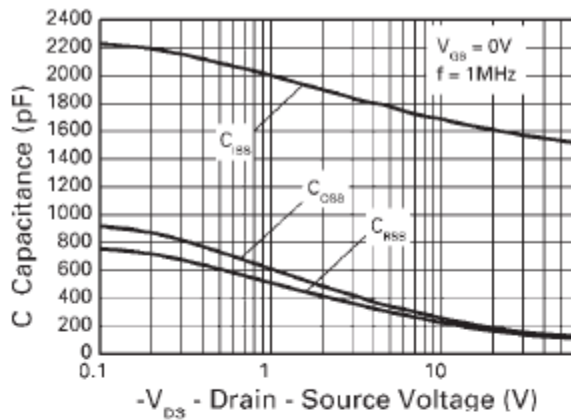
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage	BV _{DSS}	-60	—	—	V	I _D = -250μA, V _{GS} = 0V	
Zero Gate Voltage Drain Current	I _{DSS}	—	—	-1	μA	V _{DS} = -60V, V _{GS} = 0V	
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V	
ON CHARACTERISTICS							
Gate Threshold Voltage	V _{GS(th)}	-1	—	—	V	I _D = -250μA, V _{DS} = V _{GS}	
Static Drain-Source On-Resistance (Note 12)	R _{DS(ON)}	—	—	0.055	Ω	V _{GS} = -10V, I _D = -3.5A	
				0.08		V _{GS} = -4.5V, I _D = -2.9A	
Forward Transconductance (Notes 12 & 14)	g _{fs}	—	8.7	—	S	V _{DS} = -15V, I _D = -3.5A	
Diode Forward Voltage (Note 12)	V _{SD}	—	-0.85	-0.95	V	I _S = -4.2A, V _{GS} = 0V, T _J = +25°C	
Reverse Recovery Time (Note 14)	t _{rr}		37	—	ns	I _F = -2.1A, di/dt = 100A/μs, T _J = +25°C	
Reverse Recovery Charge (Note 14)	Q _{rr}	—	56	—	nC		
DYNAMIC CHARACTERISTICS (Note 14)							
Input Capacitance	C _{iss}	—	1580	—	pF	V _{DS} = -30V, V _{GS} = 0V f = 1MHz	
Output Capacitance	C _{oss}	—	160	—	pF		
Reverse Transfer Capacitance	C _{rss}	—	140	—	pF		
Total Gate Charge (Note 13)	Q _g	—	23	—	nC	V _{GS} = -5V	V _{DS} = -30V I _D = -3.5A
Total Gate Charge (Note 13)	Q _g	—	44	—	nC	V _{GS} = -10V	
Gate-Source Charge (Note 13)	Q _{gs}	—	3.9	—	nC		
Gate-Drain Charge (Note 13)	Q _{gd}	—	9.8	—	nC		
Turn-On Delay Time (Note 13)	t _{D(on)}	—	4.6	—	ns	V _{DD} = -30V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω	
Turn-On Rise Time (Note 13)	t _r	—	5.8	—	ns		
Turn-Off Delay Time (Note 13)	t _{D(off)}	—	55	—	ns		
Turn-Off Fall Time (Note 13)	t _f	—	23	—	ns		

- Notes:
- 12. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 - 13. Switching characteristics are independent of operating junction temperatures.
 - 14. For design aid only, not subject to production testing.

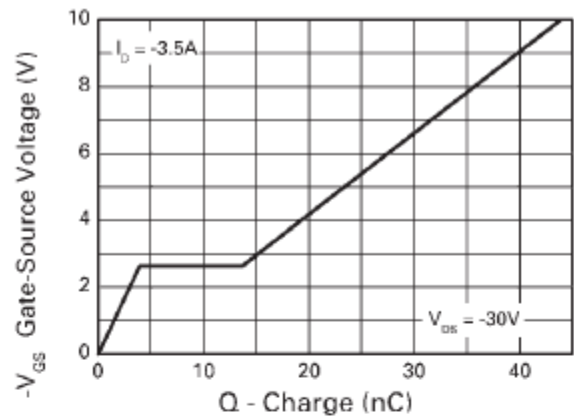
Typical Characteristics



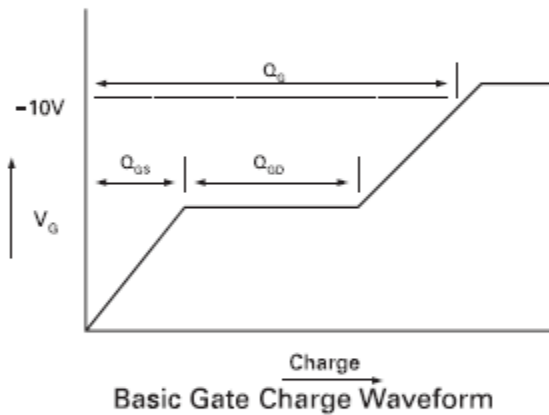
Typical Characteristics (cont.)



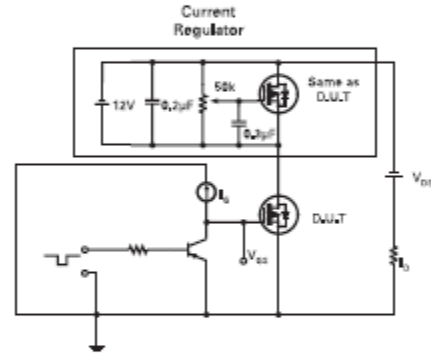
Capacitance v Drain-Source Voltage



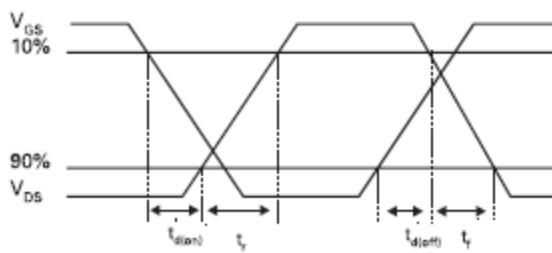
Gate-Source Voltage v Gate Charge



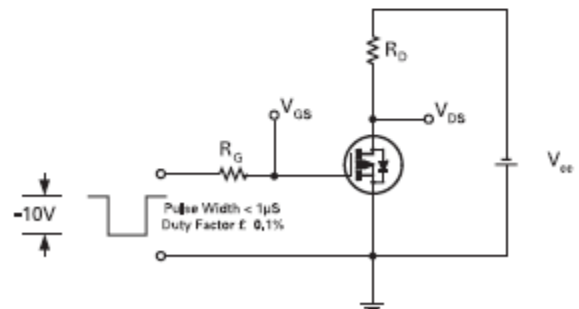
Basic Gate Charge Waveform



Gate Charge Test Circuit



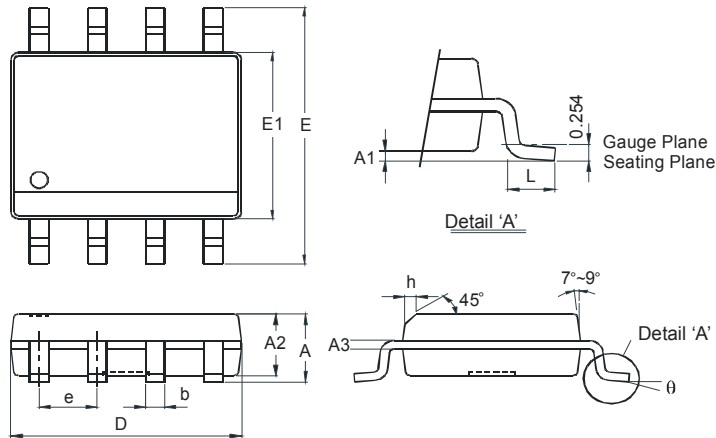
Switching Time Waveforms



Switching Time Test Circuit

Package Outline Dimensions

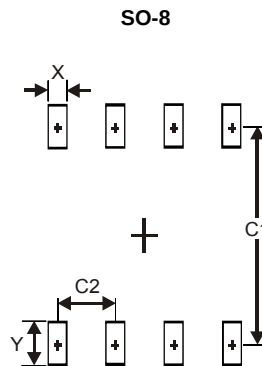
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



SO-8		
Dim	Min	Max
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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