

• General Description

The AGM60P40D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

• Features

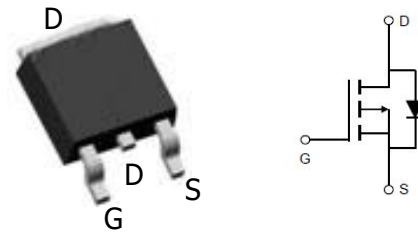
- Advance high cell density Trench technology
- Low $R_{DS(ON)}$ to minimize conductive loss
- Low Gate Charge for fast switching
- Low Thermal resistance

• Application

- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
-60V	23mΩ	-45A

TO-252 Pin Configuration

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM60P40D	AGM60P40D	TO-252	----mm	----mm	2500

• Absolute Maximum Ratings (T_C =25°C)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(TC=25°C)	I_D	-45	A
Pulsed Drain Current ^①	I_{DM}	-76	A
Total Power Dissipation(TC=25°C)	$P_D@TC=25^\circ C$	51.1	W
Total Power Dissipation(TA=25°C)	$P_D@TA=25^\circ C$	2	W
Operating Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Single Pulse Avalanche Energy	E_{AS}	112	mJ

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient (Steady State) ¹	---	62	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	2.4	°C/W

Table 3. Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
B _V DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-60			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V			-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±25V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.6	-2.5	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-6A		23		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-15A			30	mΩ
		V _{GS} =-4.5V, I _D =-6A			38	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1.0MHz		3450		pF
C _{oss}	Output Capacitance			222		pF
C _{rss}	Reverse Transfer Capacitance			147		pF
T _{d(on)}	Turn-On Delay Time	V _{DD} =-30V, I _D =-1A, R _L =15Ω V _{GS} =-10V, R _G =2.5Ω		38		nS
t _r	Turn-on Rise Time			23		nS
t _{d(off)}	Turn-Off Delay Time			100		nS
t _f	Turn-Off Fall Time			6.8		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-12A		25		nC
Q _{gs}	Gate-Source Charge			6.8		nC
Q _{gd}	Gate-Drain Charge			5.5		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)				-45	A
V _{SD}	Forward on Voltage	V _{GS} =0V, I _S =-6A			-1.2	V

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

Typical Characteristics

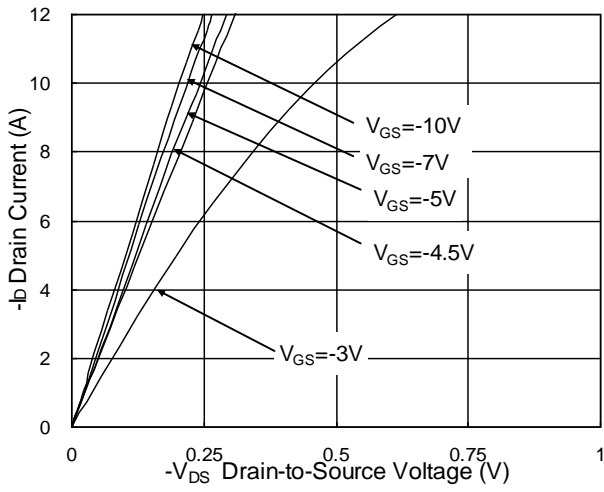


Fig.1 Typical Output Characteristics

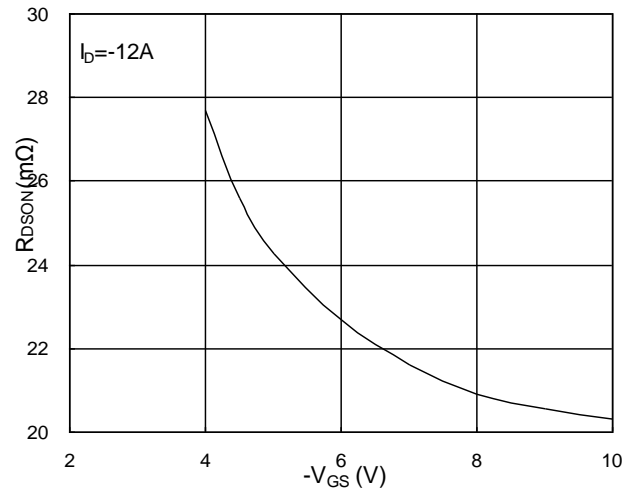


Fig.2 On-Resistance v.s Gate-Source

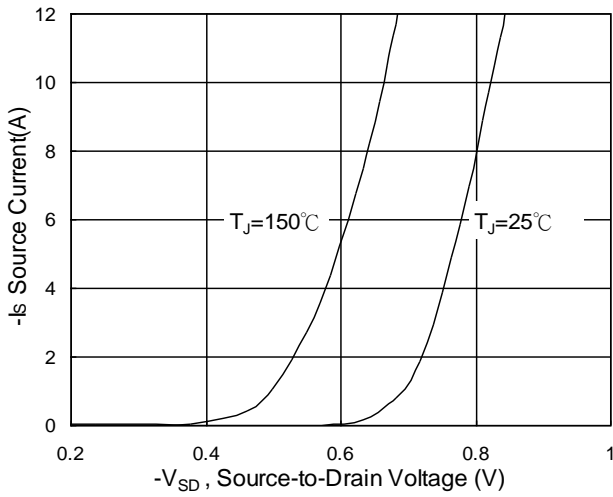


Fig.3 Forward Characteristics Of Reverse

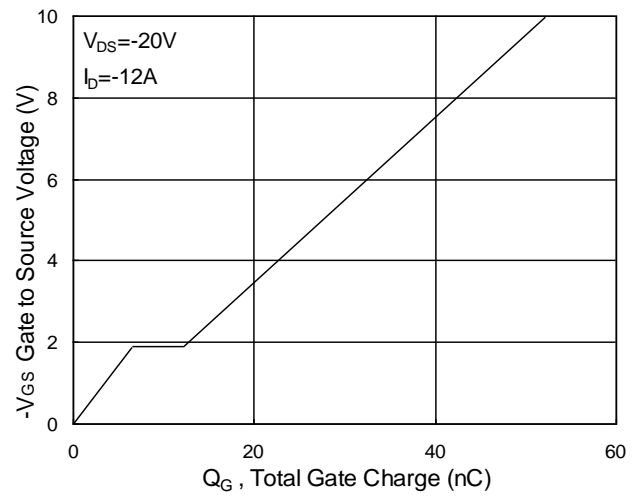


Fig.4 Gate-Charge Characteristics

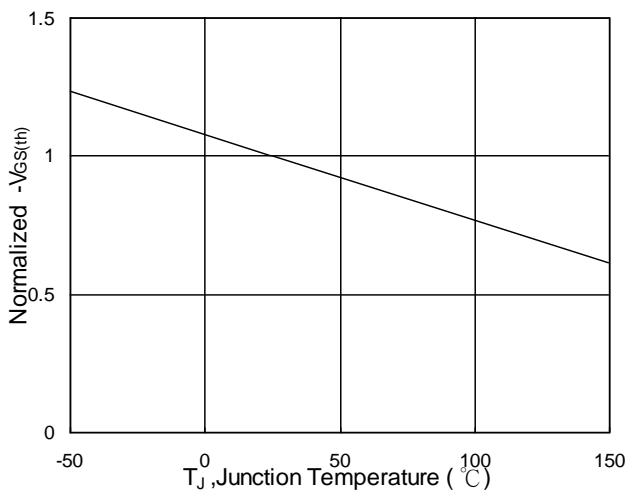


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

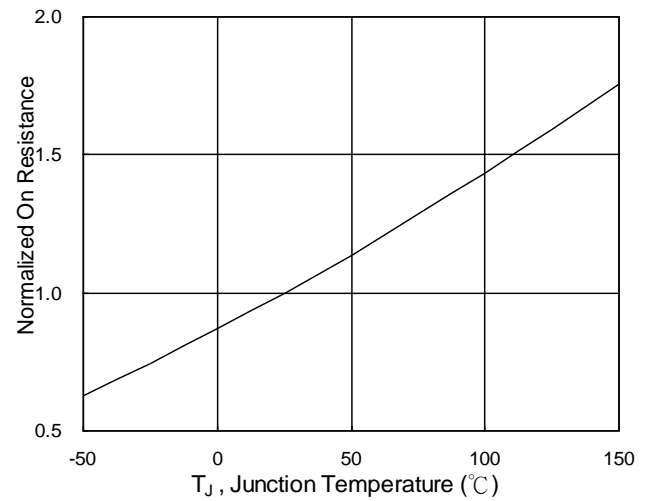


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

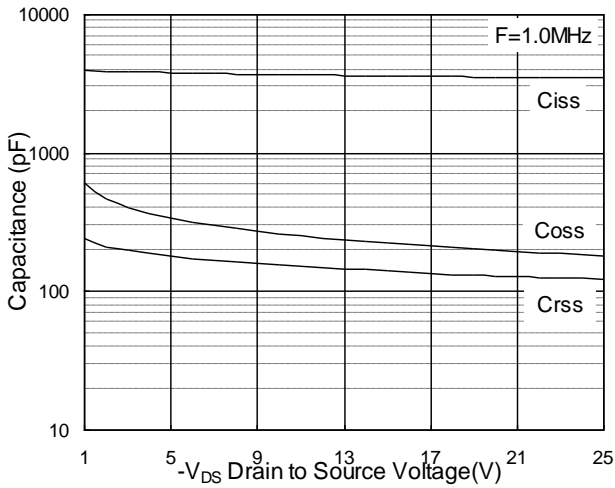


Fig.7 Capacitance

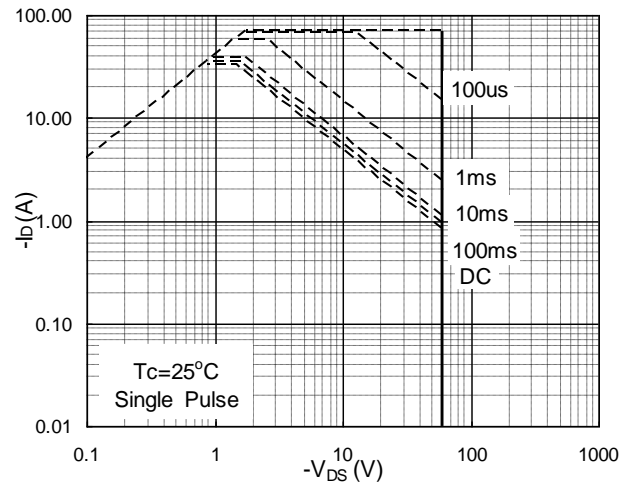


Fig.8 Safe Operating Area

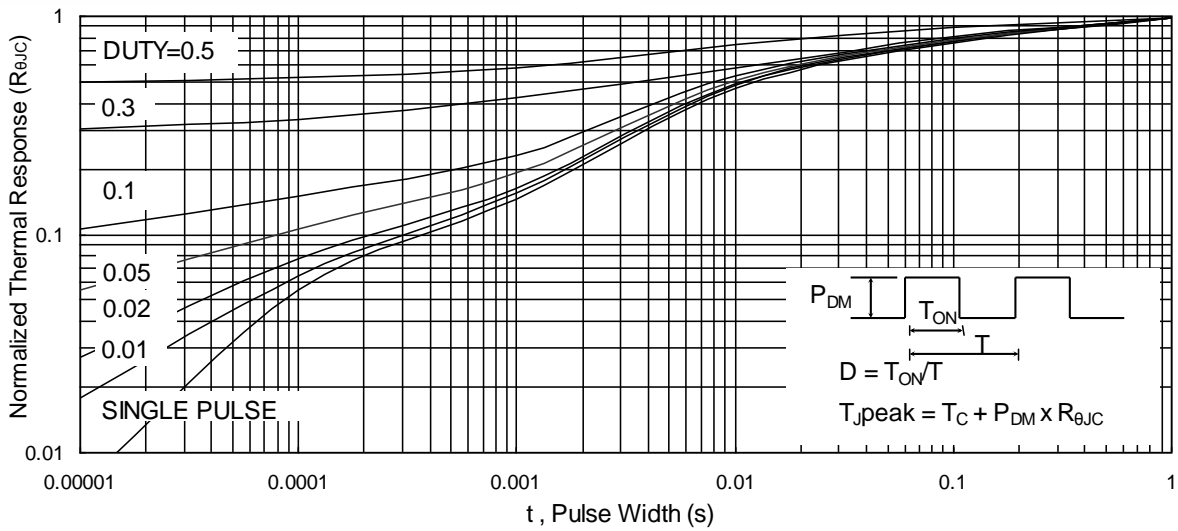


Fig.9 Normalized Maximum Transient Thermal Impedance

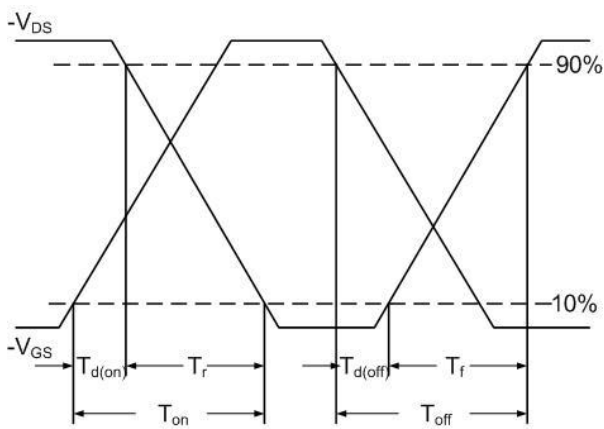


Fig.10 Switching Time Waveform

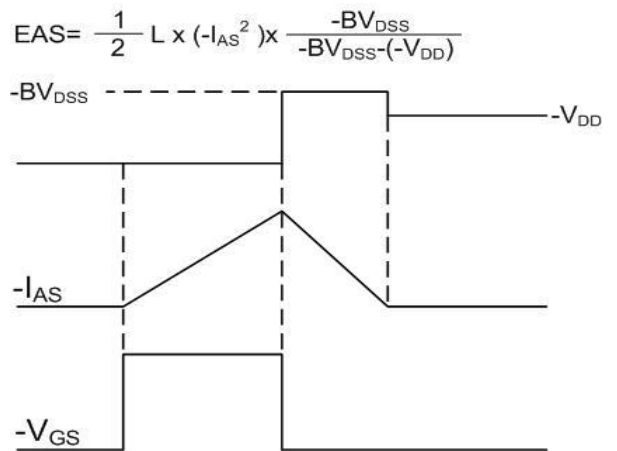
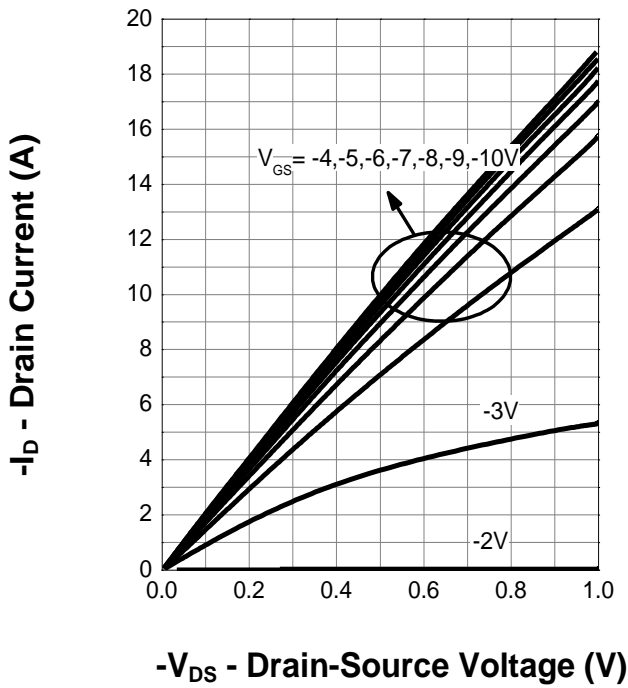


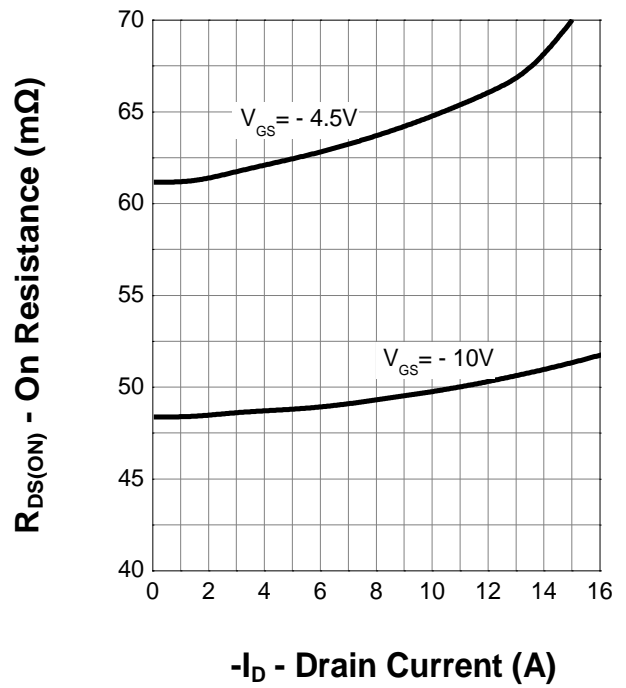
Fig.11 Unclamped Inductive Waveform

Typical Characteristics (cont.)

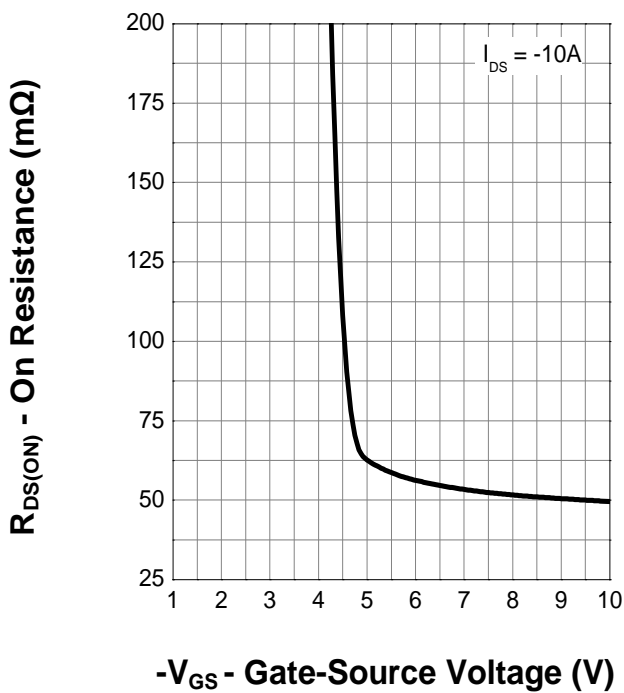
Output Characteristics



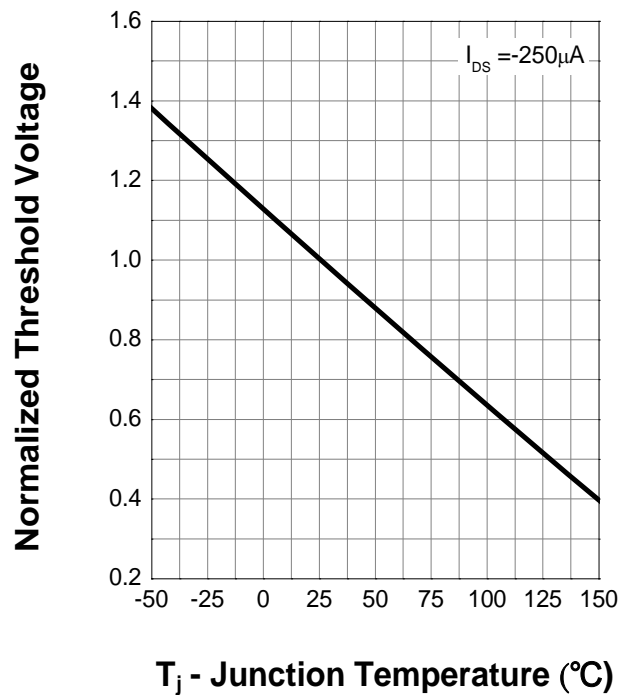
Drain-Source On Resistance



Transfer Characteristics

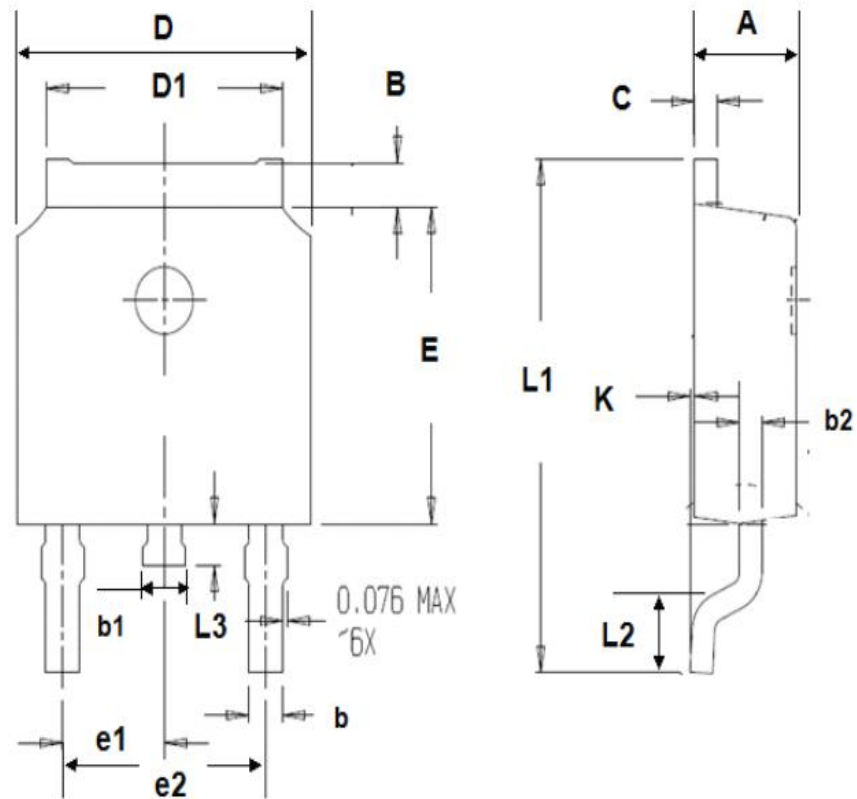


Gate Threshold Voltage



•Dimensions

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			



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