

# GSM9977

## 60V N-Channel Enhancement Mode MOSFET

### Product Description

GSM9977, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

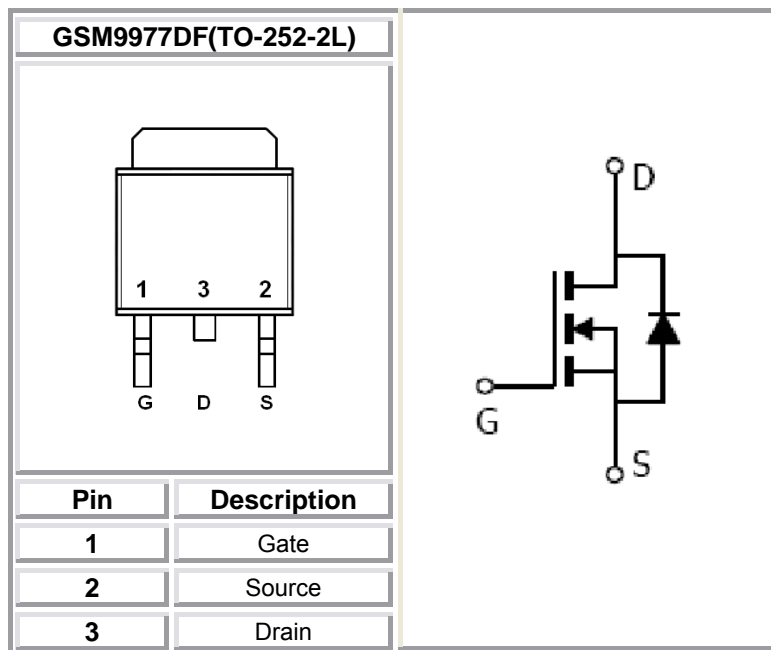
### Features

- 60V/8A,  $R_{DS(ON)}=118m\Omega@V_{GS}=10V$
- 60V/6A,  $R_{DS(ON)}=130m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- TO-252-2L package design

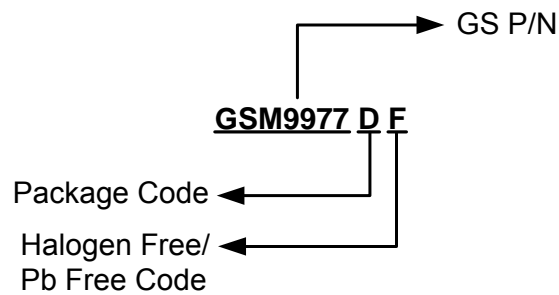
### Applications

- Motor and Load Control
- Power Management in White LED System
- Push Pull Converter
- LCD TV Inverter & AD/DC Inverter Systems.

### Packages & Pin Assignments

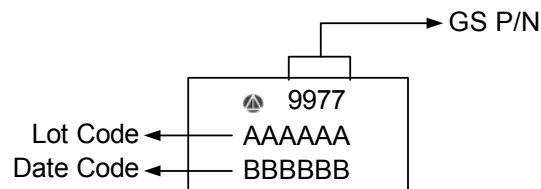


## Ordering Information



Part Number	Package	Quantity Reel
GSM9977DF	TO-252-2L	2500 PCS

## Marking Information



## Absolute Maximum Ratings

T<sub>A</sub>=25°C unless otherwise noted

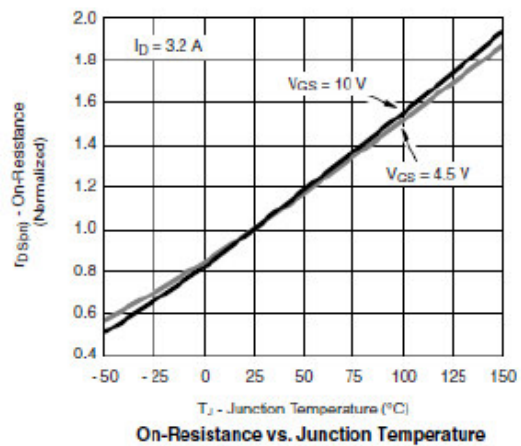
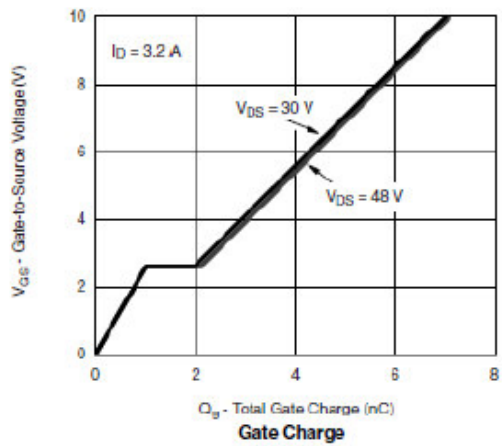
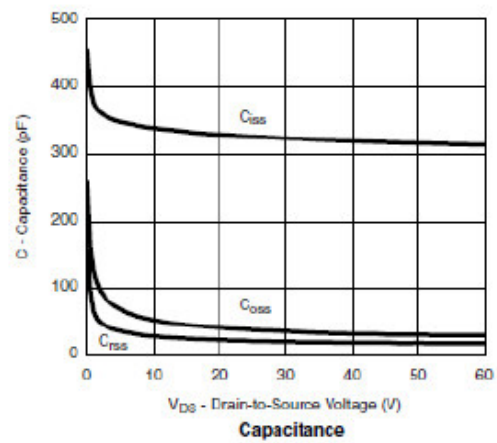
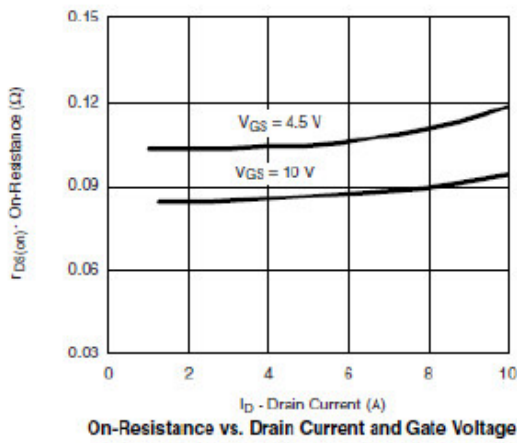
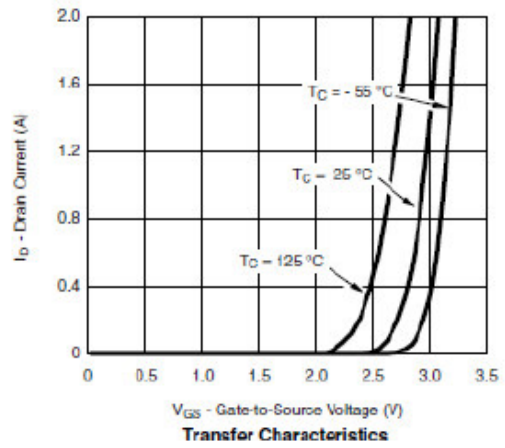
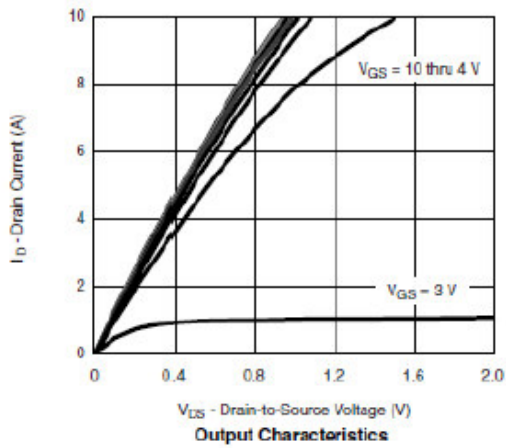
Symbol	Parameter	Typical	Unit
V <sub>DSS</sub>	Drain-Source Voltage	60	V
V <sub>GSS</sub>	Gate -Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current(T <sub>J</sub> =150°C)	T <sub>A</sub> =25°C	12
		T <sub>A</sub> =70°C	8
I <sub>DM</sub>	Pulsed Drain Current	30	A
I <sub>S</sub>	Continuous Source Current(Diode Conduction)	12	
I <sub>AS</sub>	Single Pulse Avalanche Current	15	
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> =25°C	40
		T <sub>A</sub> =70°C	15
T <sub>J</sub>	Operating Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature Range	-55/150	°C
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	62.5	°C/ W

## Electrical Characteristics

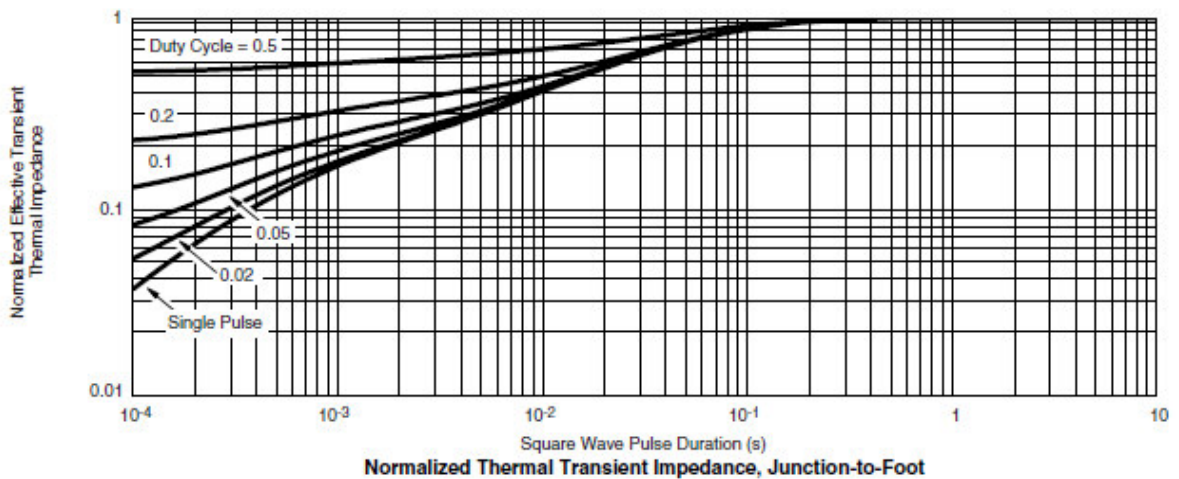
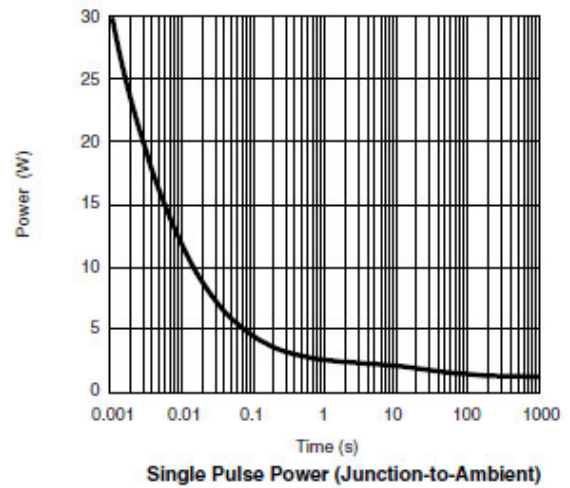
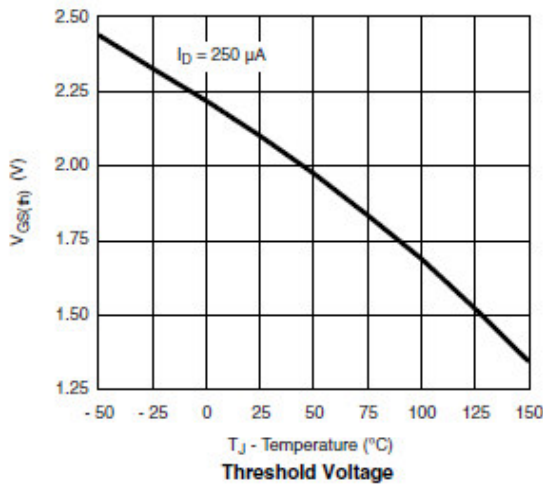
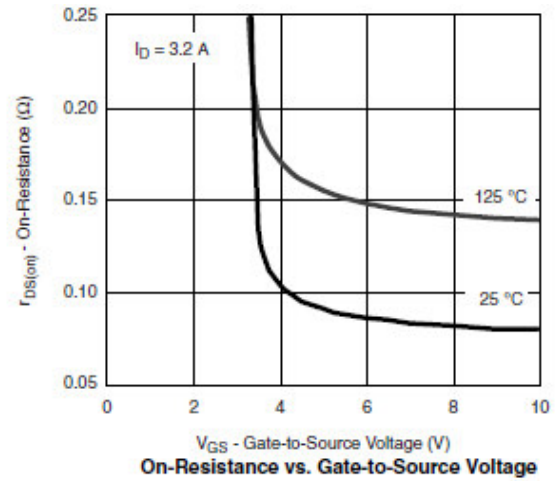
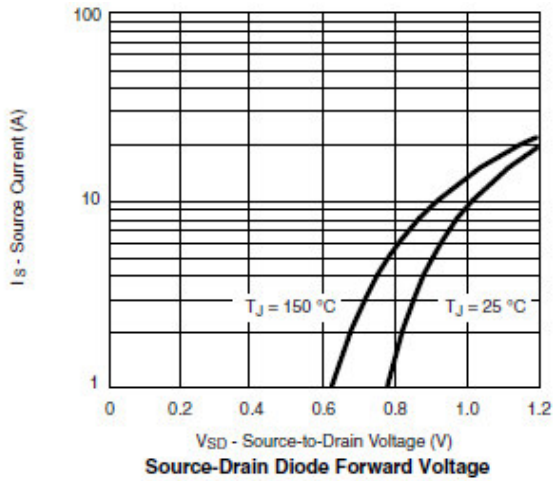
T<sub>A</sub>=25°C unless otherwise noted

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	60			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	0.7		2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =85°C			5	
I <sub>D(on)</sub>	On-State Drain Current	V <sub>DS</sub> ≥5V, V <sub>GS</sub> =4.5V	30			A
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =8A			118	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A			130	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =15V, I <sub>D</sub> =5.3A		12		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =2.0A, V <sub>GS</sub> =0V		0.8	1.2	V
<b>Dynamic</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1MHz		480		pF
C <sub>oss</sub>	Output Capacitance			50		
C <sub>rss</sub>	Reverse Transfer Capacitance			35		
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =48V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A		6	12	nC
Q <sub>gs</sub>	Gate-Source Charge			2.0		
Q <sub>gd</sub>	Gate-Drain Charge			3.0		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =30V, R <sub>L</sub> =6.0Ω, I <sub>D</sub> =5.0A, V <sub>GEN</sub> =10V, R <sub>G</sub> =3.3Ω		6	12	ns
t <sub>r</sub>				6	12	
t <sub>d(off)</sub>	Turn-Off Time			12	20	
t <sub>f</sub>				4	10	

## Typical Performance Characteristics

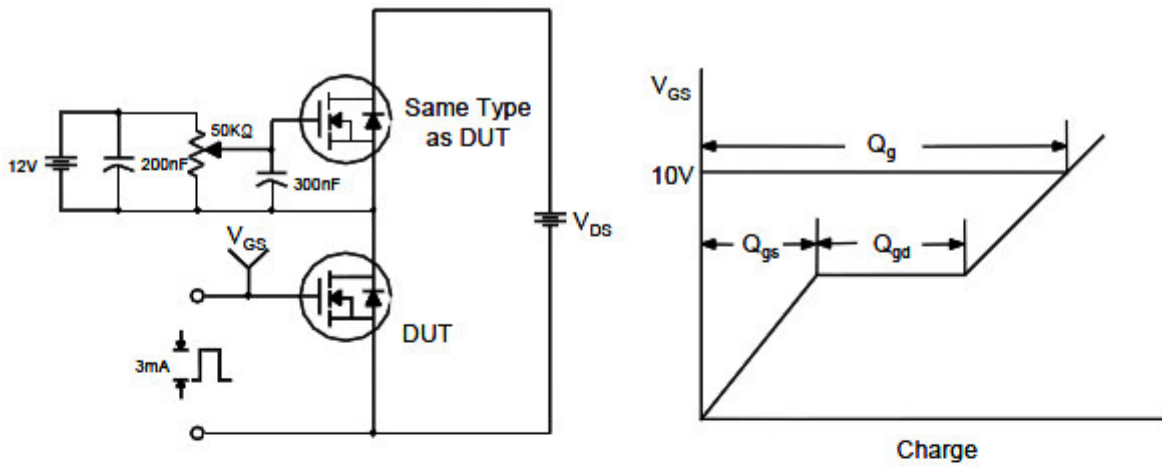


## Typical Performance Characteristics (continue)

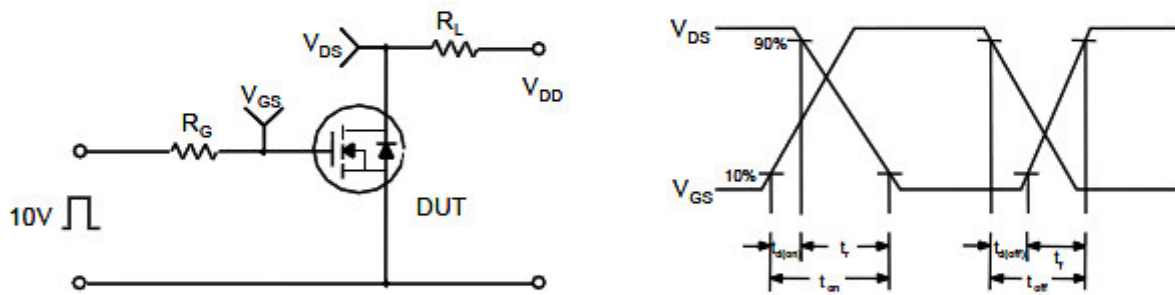


## Typical Performance Characteristics (continue)

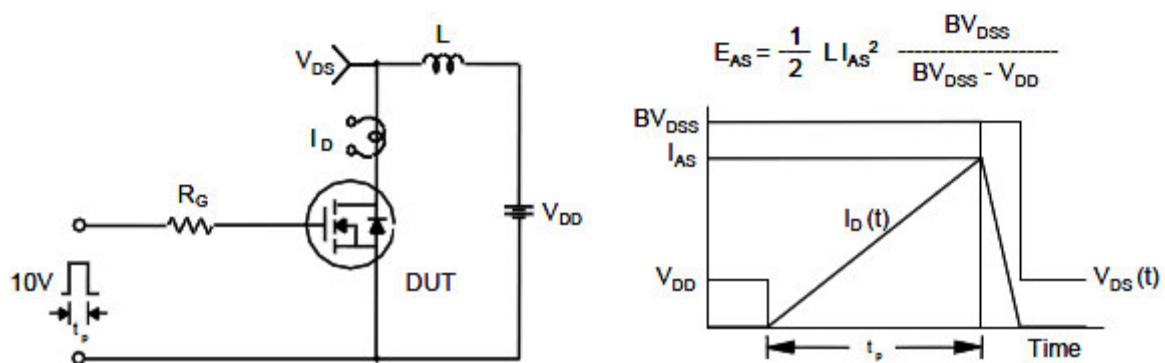
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

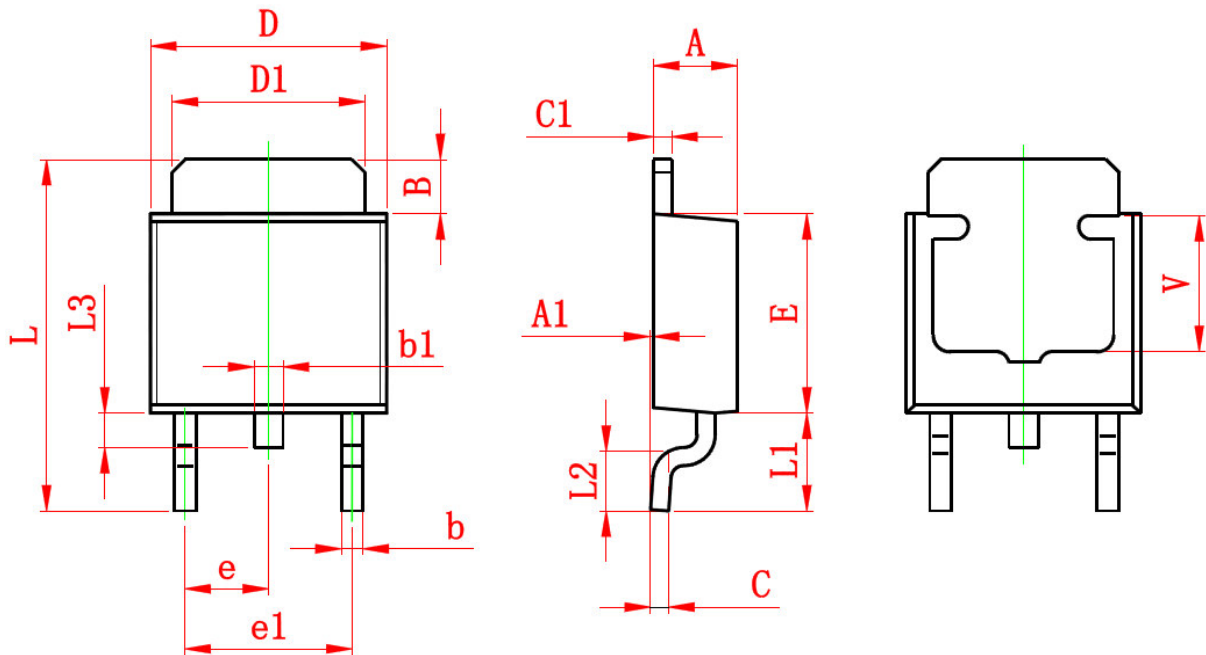


### Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

## TO-252-2L PLASTIC PACKAGE







### Dimensions

SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP		0.091 TYP	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF		0.150 REF	





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