

GSM3416

20V N-Channel Enhancement Mode MOSFET

Product Description

GSM3416, 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, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

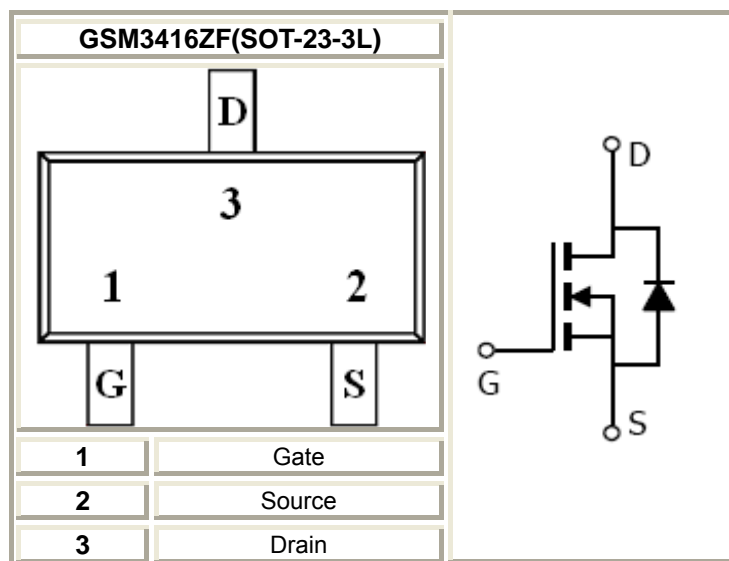
Features

- 20V/4.0A, $R_{DS(ON)}=26m\Omega@V_{GS}=4.5V$
- 20V/3.2A, $R_{DS(ON)}=30m\Omega@V_{GS}=2.5V$
- 20V/2.8A, $R_{DS(ON)}=36m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23-3L package design

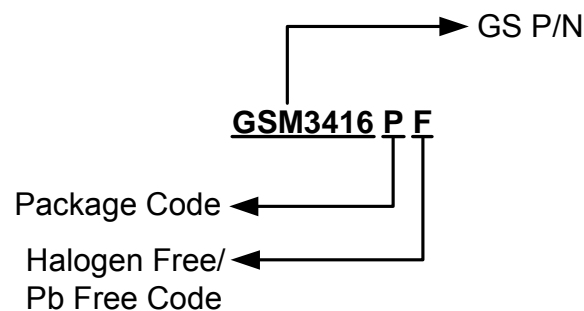
Applications

- Portable Equipment
- Battery Powered System
- Net Working System

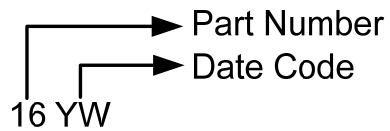
Packages & Pin Assignments



Ordering Information



Marking Information



Part Number	Package	Part Marking
GSM3416ZF	SOT-23-3L	16YW

Absolute Maximum Ratings

($T_A=25^\circ\text{C}$ unless otherwise noted)

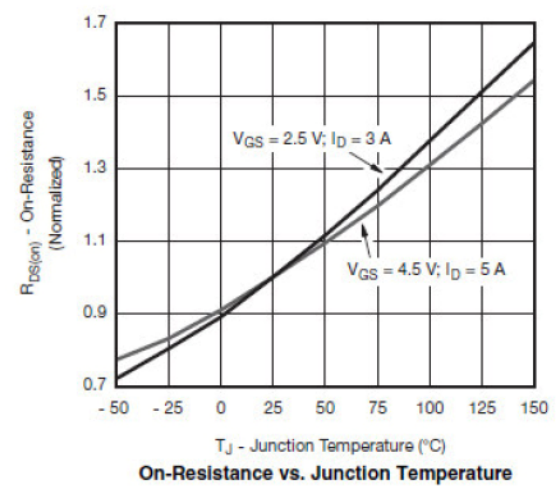
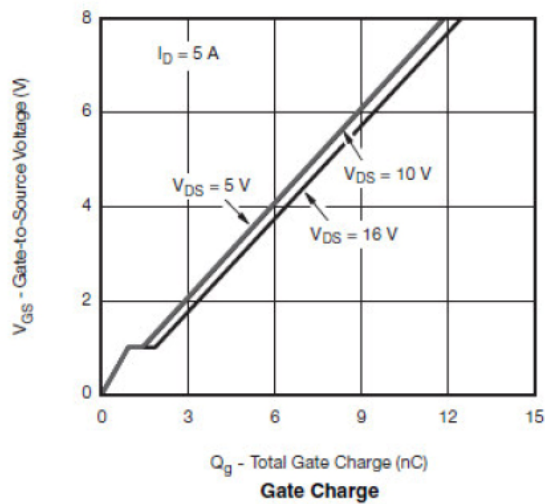
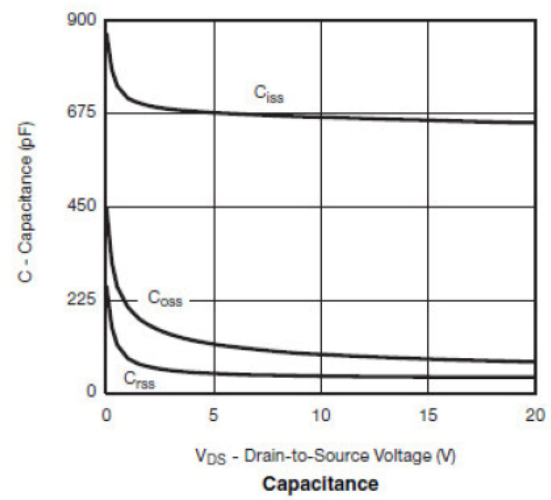
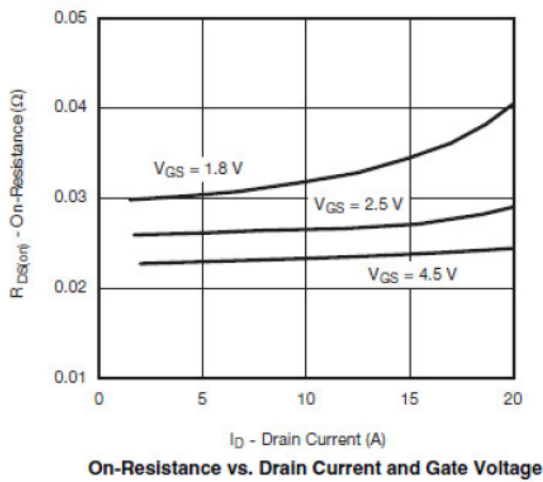
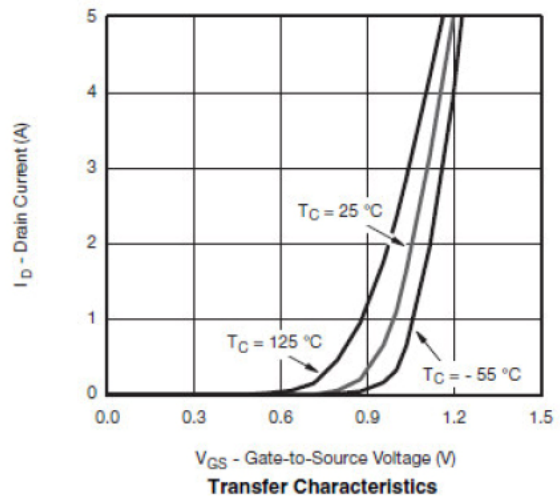
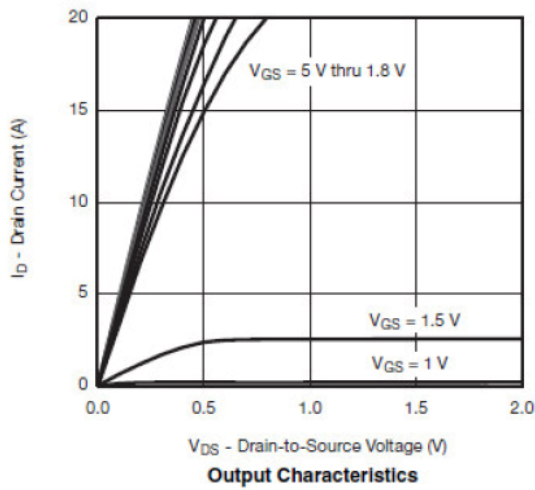
Symbol	Parameter	Typical	Unit	
V_{DSS}	Drain-Source Voltage	20	V	
V_{GSS}	Gate –Source Voltage	± 12	V	
I_D	Continuous Drain Current($T_J=150^\circ\text{C}$)	$T_A=25^\circ\text{C}$	4.0	A
		$T_A=70^\circ\text{C}$	3.2	
I_{DM}	Pulsed Drain Current	10	A	
I_S	Continuous Source Current(Diode Conduction)	1.6	A	
P_D	Power Dissipation	$T_A=25^\circ\text{C}$	1.25	W
		$T_A=70^\circ\text{C}$	0.8	
T_J	Operating Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55/150	$^\circ\text{C}$	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	120	$^\circ\text{C}/\text{W}$	

Electrical Characteristics

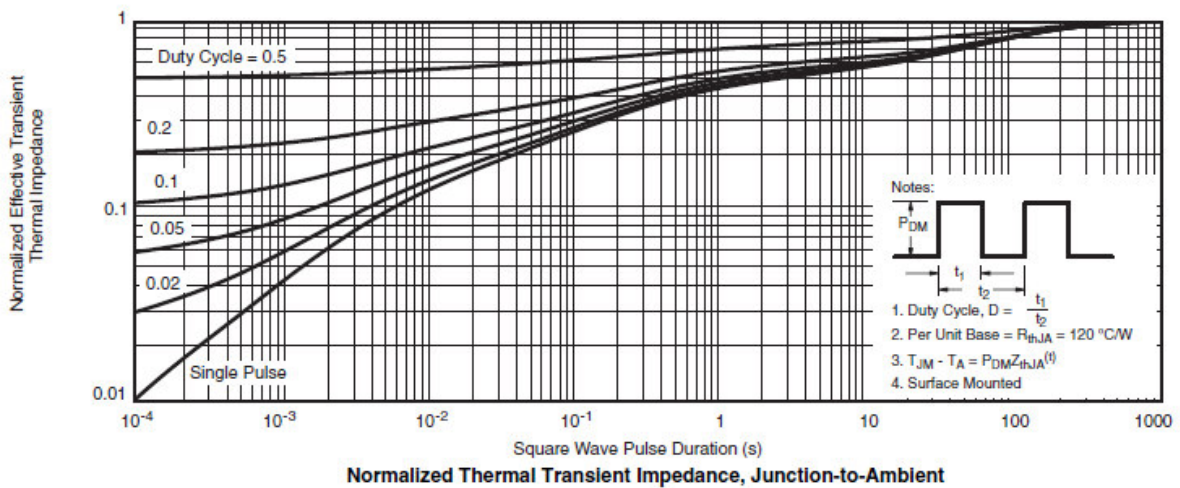
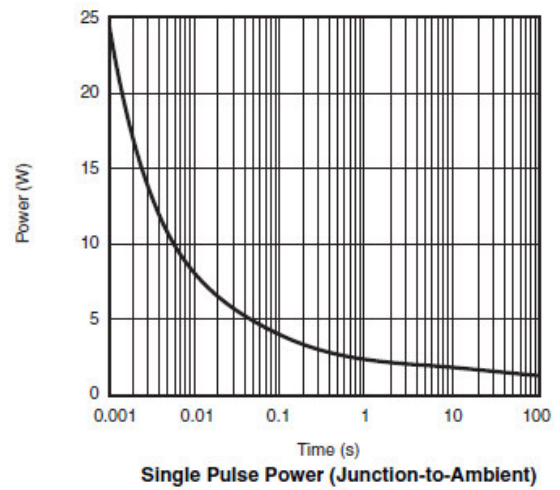
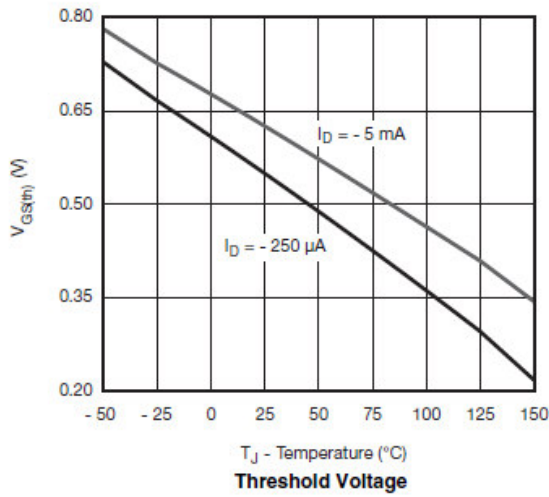
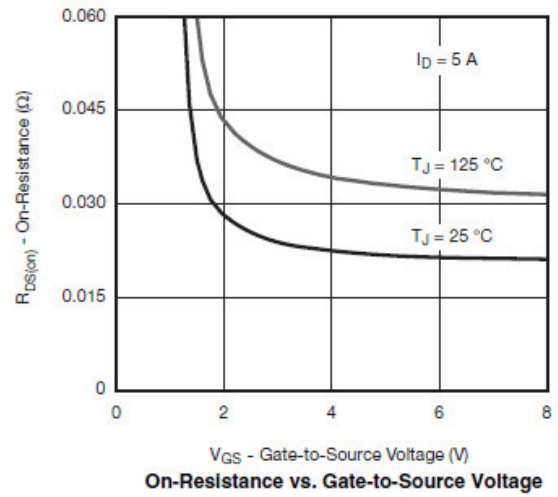
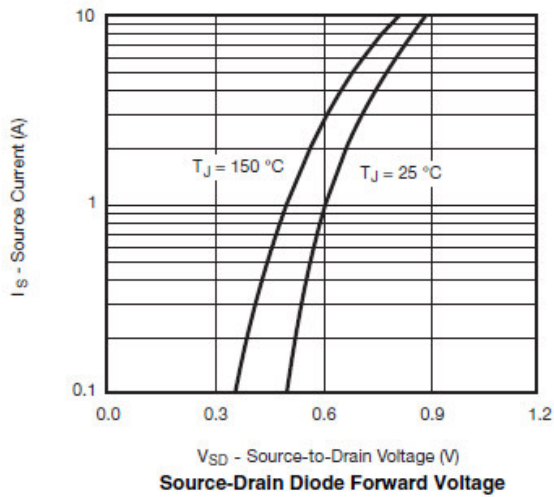
($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ	Max.	Unit	
Static							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20			V	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.4		1.0		
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA	
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=16V, V_{GS}=0V$			1	uA	
		$V_{DS}=16V, V_{GS}=0V, T_J=85^\circ\text{C}$			10		
$I_{D(on)}$	On-State Drain Current	$V_{DS}\geq 5V, V_{GS}=4.5V$	6			A	
		$V_{DS}\geq 5V, V_{GS}=2.5V$	4				
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=4.5V, I_D=4.0A$		23	26	m Ω	
		$V_{GS}=2.5V, I_D=3.2A$		27	30		
		$V_{GS}=1.8V, I_D=2.8A$		30	36		
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=5.0A$		35		S	
V_{SD}	Diode Forward Voltage	$I_S=1.5A, V_{GS}=0V$		0.85	1.2	V	
Dynamic							
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$		1050		pF	
C_{oss}	Output Capacitance			235			
C_{rss}	Reverse Transfer Capacitance			115			
Q_g	Total Gate Charge	$V_{DS}=10V, V_{GS}=4.5V, I_D=3.6A$		13	19	nC	
Q_{gs}	Gate-Source Charge			2.8			
Q_{gd}	Gate-Drain Charge			2.0			
$t_{d(on)}$	Turn-On Time	$V_{DD}=10V, R_L=5.5\Omega, I_D=3.6A, V_{GEN}=4.5V, R_G=6\Omega$		10	20	ns	
T_r				10	20		
$t_{d(off)}$			Turn-Off Time		25		40
T_f					10		20

Typical Performance Characteristics

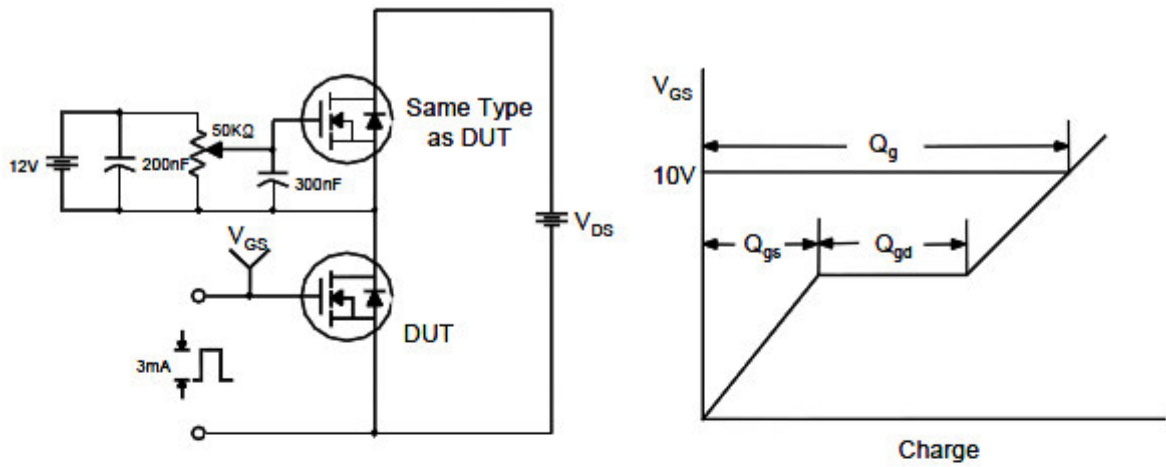


Typical Performance Characteristics (continue)

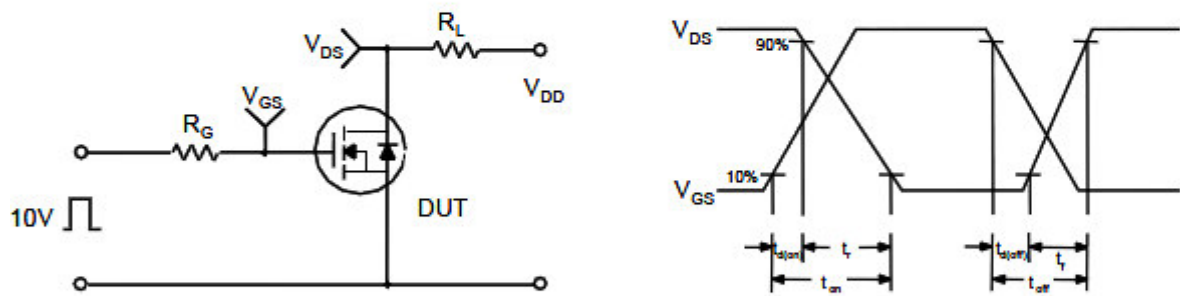


Typical Characteristics

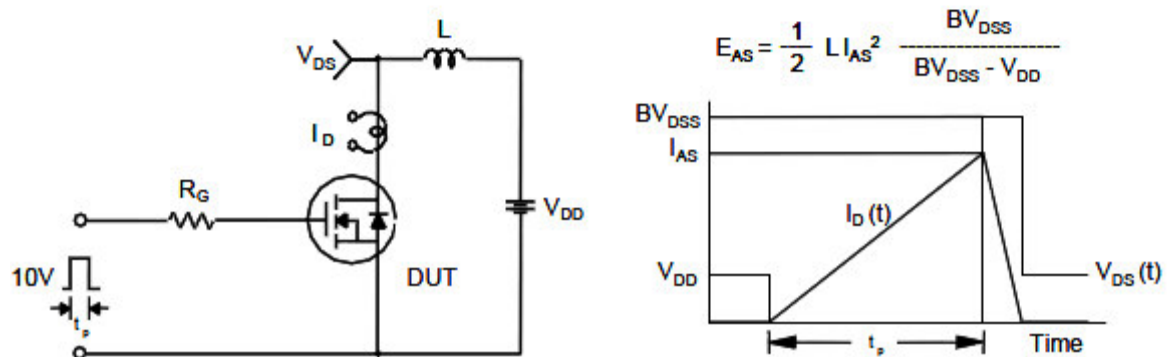
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

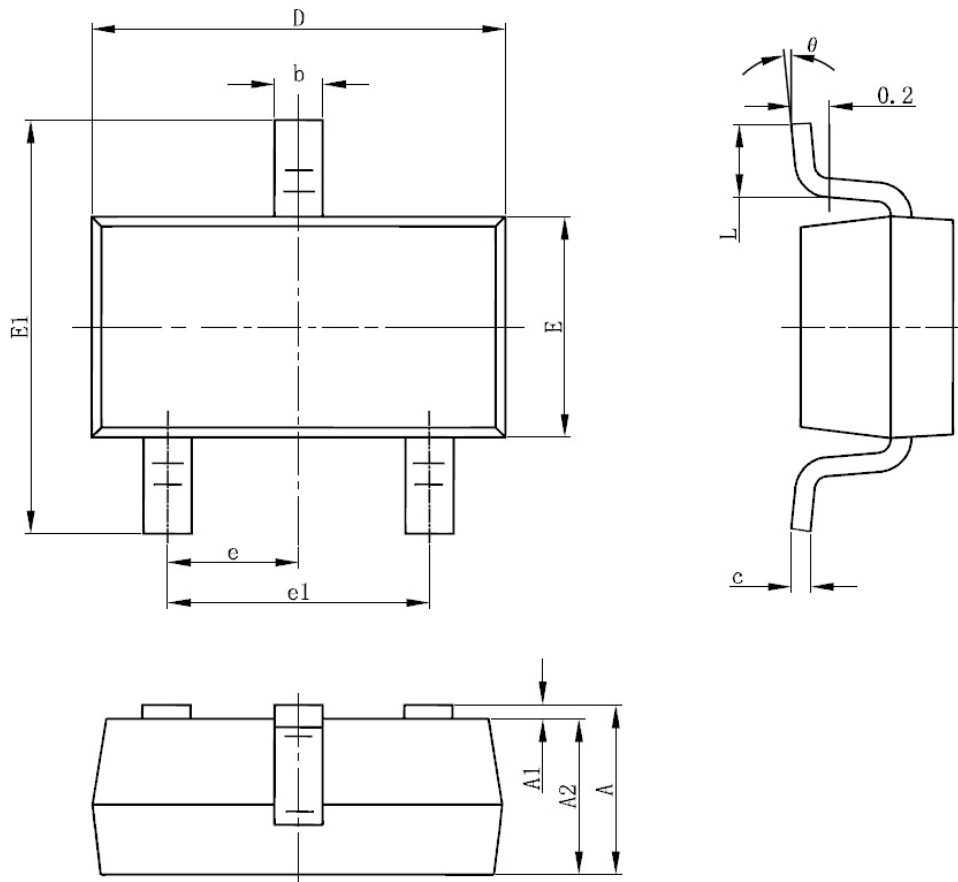


Unclamped Inductive Switching Test Circuit & Waveforms



Package Dimension

SOT-23-3L







Dimensions





SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	1.05	1.25	0.041	0.049
A1	0	0.1	0	0.004
A2	1.05	1.15	0.041	0.045
b	0.3	0.4	0.012	0.016
c	0.1	0.2	0.004	0.008
D	2.82	3.02	0.111	0.119
E	1.5	1.7	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.950 (TYP)		0.037 (TYP)	
e1	1.8	2	0.071	0.079
L	0.700 REF		0.028 REF	
L1	0.3	0.6	0.012	0.024
Q	0°	8°	0°	8°



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