

# GSM2304S

## 30V N-Channel Enhancement Mode MOSFET

### Product Description

GSM2304S, 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.

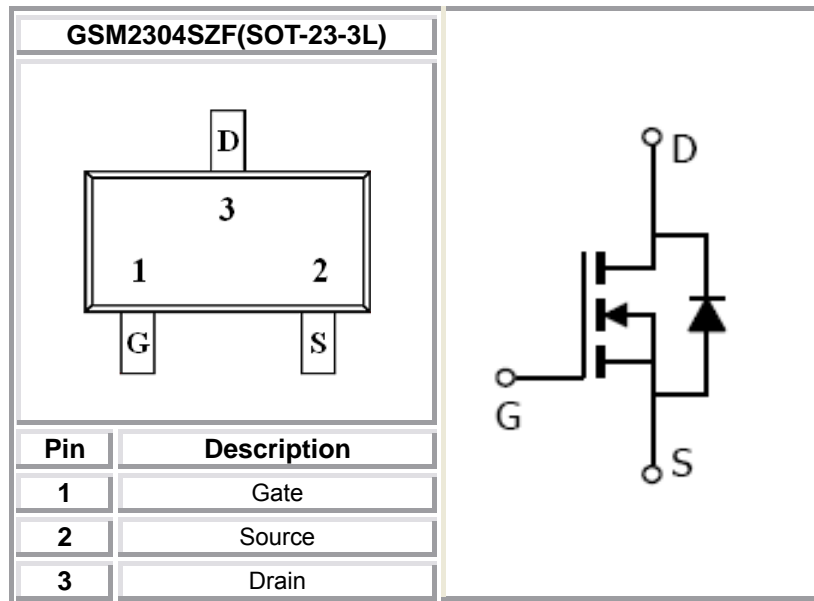
### Features

- 30V/3.6A,  $R_{DS(ON)}=60m\Omega@V_{GS}=10V$
- 30V/2.5A,  $R_{DS(ON)}=85m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- SOT-23-3L package design

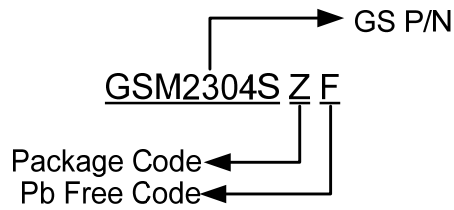
### Applications

- Power Management in Note book
- LED Display
- DC-DC System
- LCD Panel

### Packages & Pin Assignments

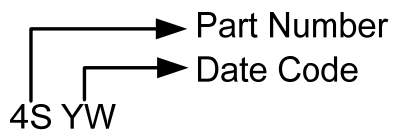


## Ordering Information



Part Number	Package	Quantity Reel
GSM2304SZF	SOT-23-3L	3000 PCS

## Marking Information



## Absolute Maximum Ratings

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

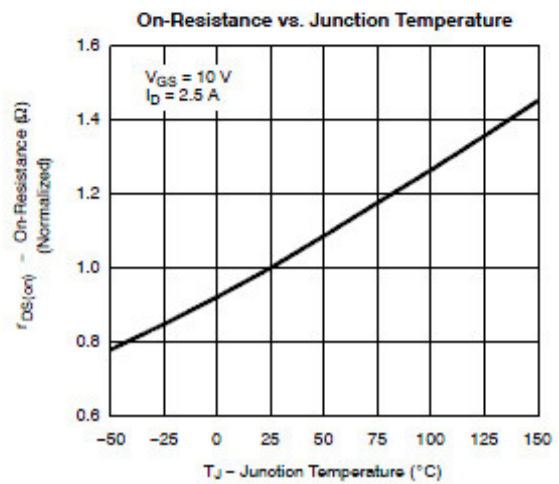
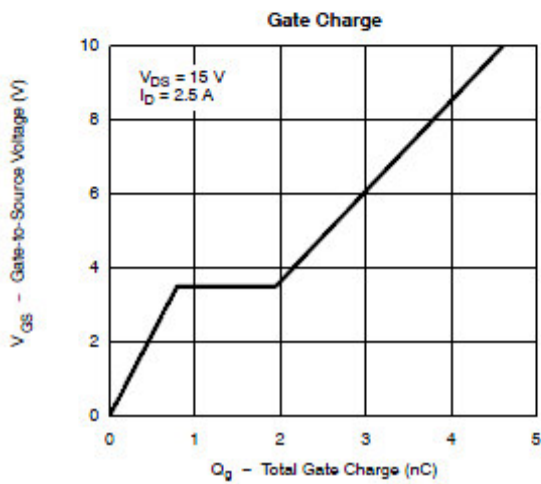
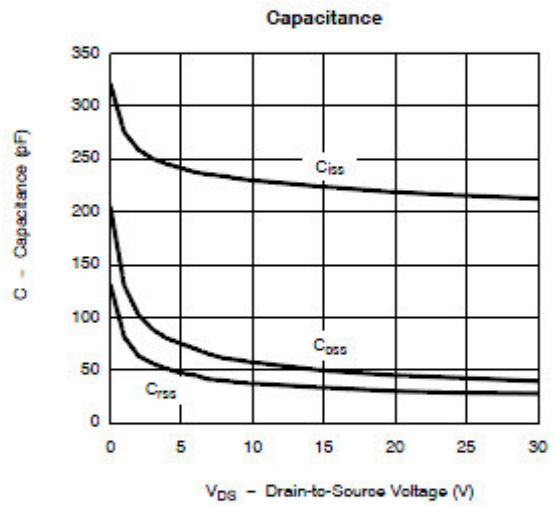
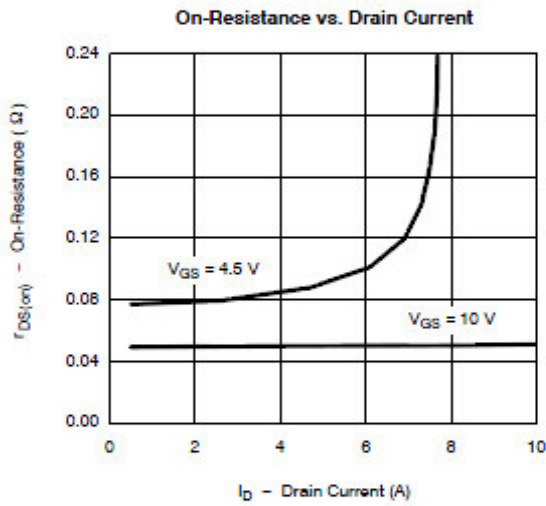
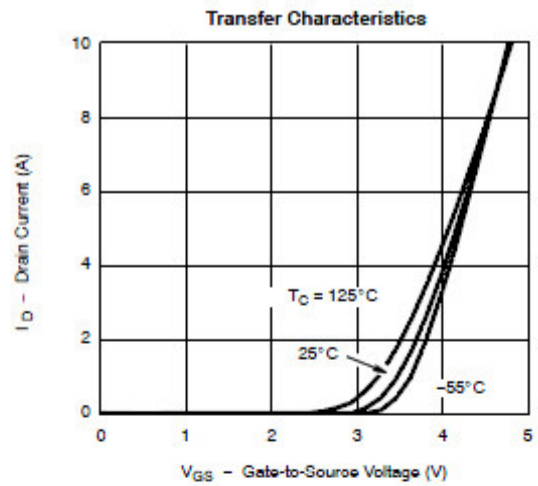
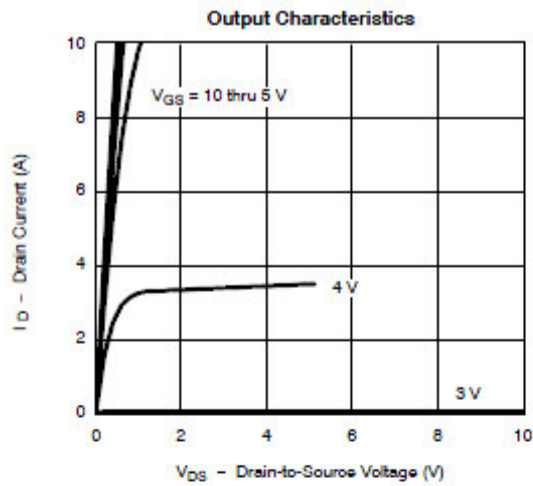
Symbol	Parameter	Typical	Unit	
V <sub>DSS</sub>	Drain-Source Voltage	30	V	
V <sub>GSS</sub>	Gate –Source Voltage	±20	V	
I <sub>D</sub>	Continuous Drain Current(T <sub>J</sub> =150°C)	T <sub>A</sub> =25°C	3.6	A
		T <sub>A</sub> =70°C	2.5	
I <sub>DM</sub>	Pulsed Drain Current	20	A	
I <sub>S</sub>	Continuous Source Current(Diode Conduction)	1.5	A	
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> =25°C	1.25	W
		T <sub>A</sub> =70°C	0.8	
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	120	°C/ W	

## Electrical Characteristics

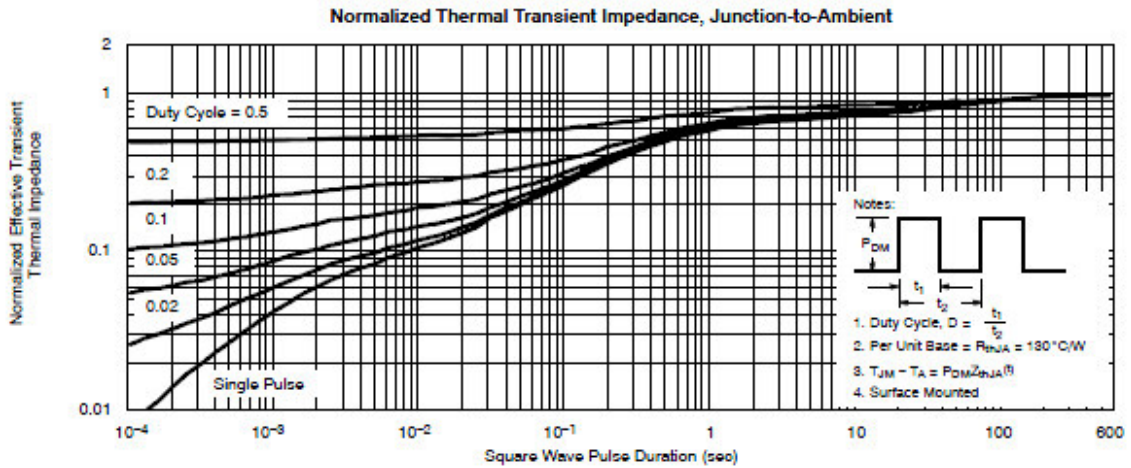
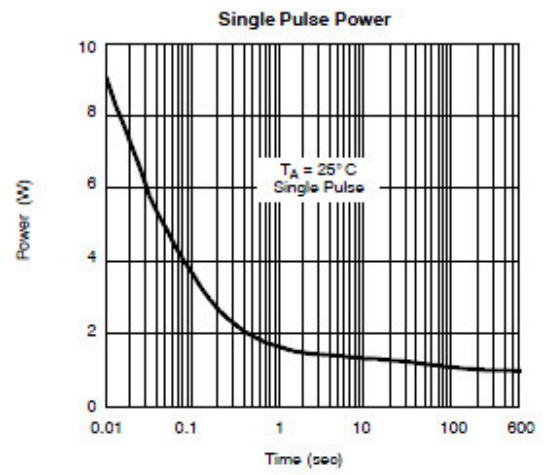
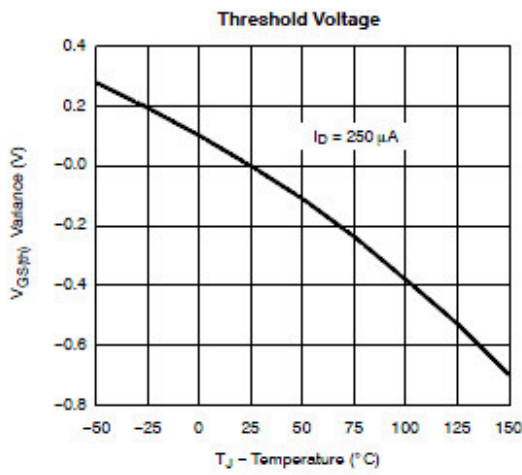
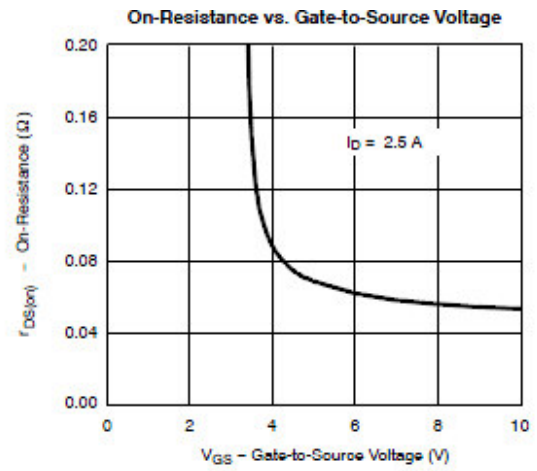
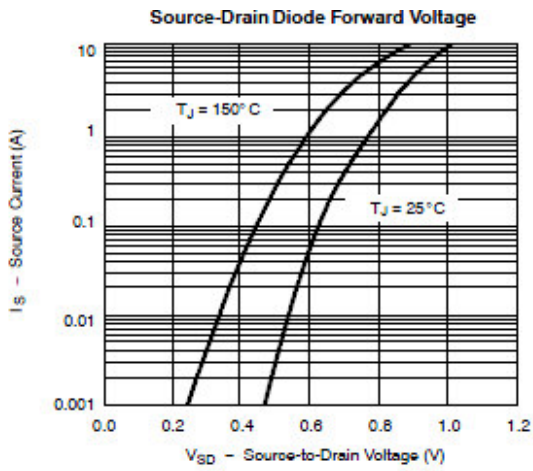
(T<sub>A</sub>=25°C unless otherwise noted)

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	30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0		2.0	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> =24V, V <sub>GS</sub> =0V			1	μA
		V <sub>DS</sub> =24V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			30	
I <sub>D(on)</sub>	On-State Drain Current	V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> =10V	6			A
R <sub>DS(on)</sub>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =3.6A		35	60	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =2.5A		55	85	
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> =4.5V, I <sub>D</sub> =2.5A		6		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V		0.8	1.2	V
<b>Dynamic</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =2.5A		2.0	3.6	nC
Q <sub>gs</sub>	Gate-Source Charge			0.8		
Q <sub>gd</sub>	Gate-Drain Charge			1.0		
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz		200		pF
C <sub>oss</sub>	Output Capacitance			50		
C <sub>rss</sub>	Reverse Transfer Capacitance			25		
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> =15V, R <sub>L</sub> =15Ω, I <sub>D</sub> =1.0A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω		7	10	ns
t <sub>r</sub>				10	18	
t <sub>d(off)</sub>	Turn-Off Time			18	25	
t <sub>f</sub>				10	18	

## Typical Performance Characteristics

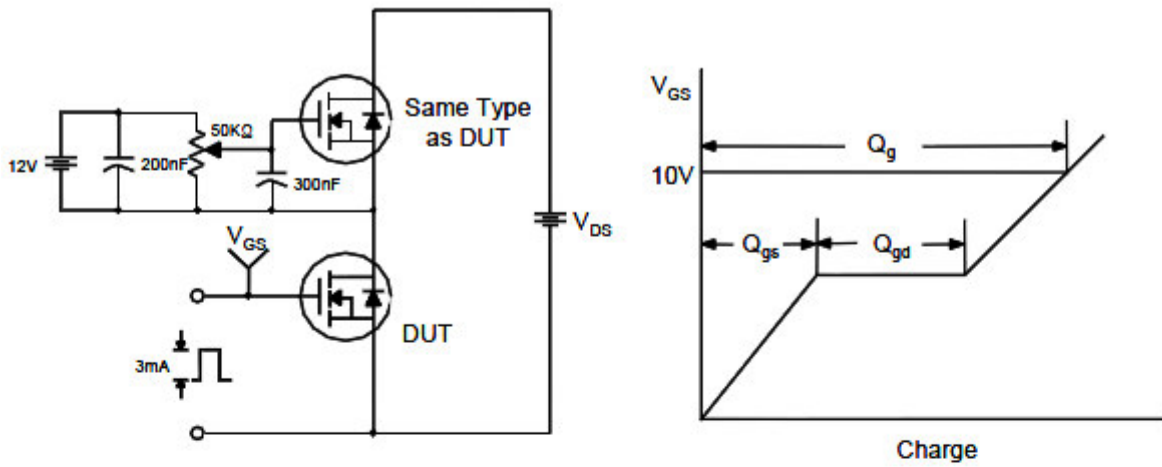


## Typical Performance Characteristics (continue)

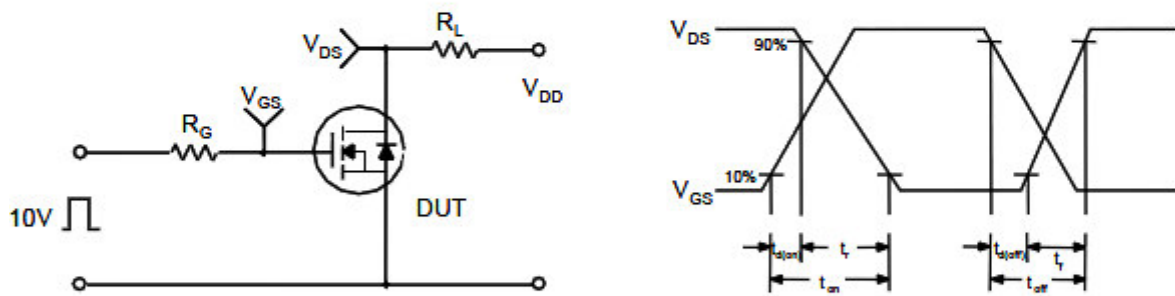


## Typical Performance Characteristics (continue)

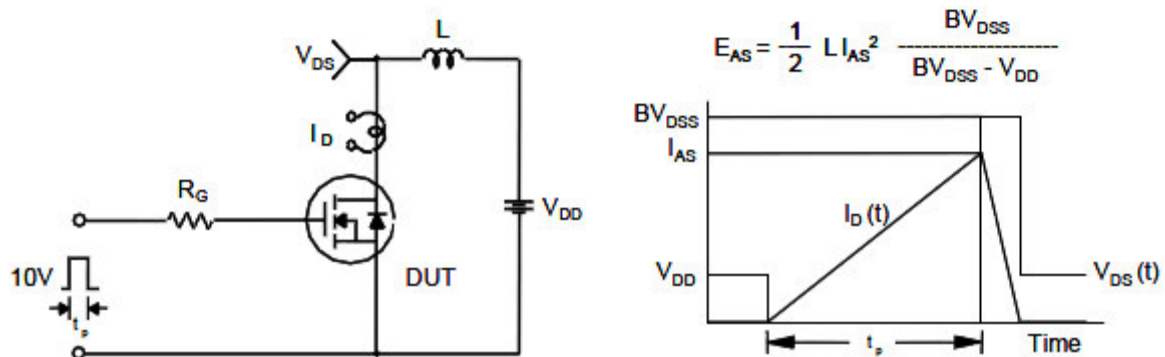
### Gate Charge Test Circuit & Waveform



### Resistive Switching Test Circuit & Waveforms

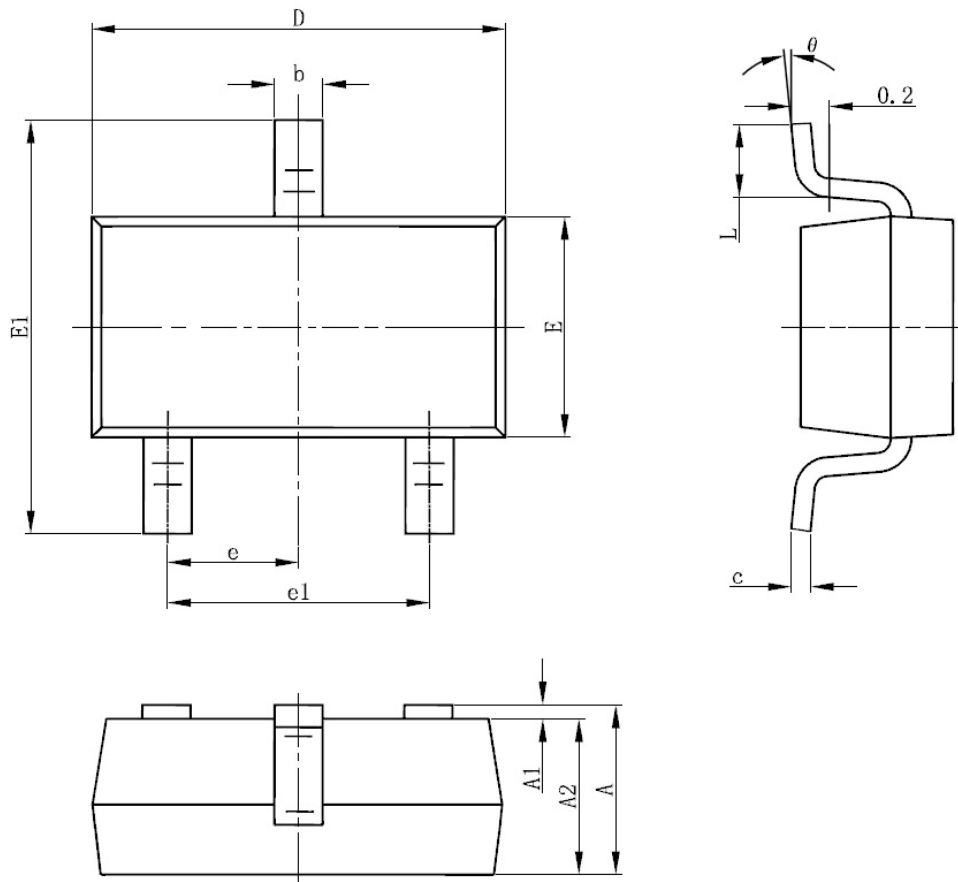


### Unclamped Inductive Switching Test Circuit & Waveforms



## Package Dimension

### 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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