General Description

The AGM4005LLM1 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

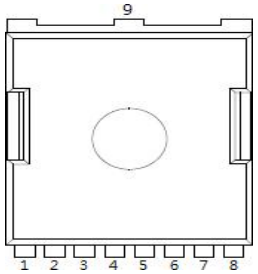
Application

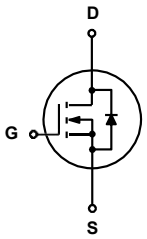
- MB/VGA Vcore
- SMPS 2nd Synchronous Rectifier
- POL application
- BLDC Motor driver

Product Summary

BVDSS	RDSON	ID
40V	0.92mΩ	330A

TOLL-8L Pin Configuration





Pin	Description
1	Gate(G)
2,3,4,5,6,7,8	Source(S)
9	Drain(D)

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
AGM4005LL	AGM4005LLM1	TOLL-8L	----	----	2000

Table 1. Absolute Maximum Ratings (TA=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	40	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	330	A
	Drain Current-Continuous(Tc=100℃)	324	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	1280	A
PD	Maximum Power Dissipation(Tc=25℃)	305	w
	Maximum Power Dissipation(Tc=100℃)	122	w
EAS	Avalanche energy **(Note 3)**	930	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 175	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJA	Thermal Resistance Junction-ambient (Steady State)[1]	---	43	℃/W
RθJC	Thermal Resistance Junction-Case[1]	---	0.41	℃/W

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
IDSS	Zero Gate Voltage Drain Current	VDS=40V,VGS=0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.3	1.8	2.4	V
gFS	Forward Transconductance	VDS=5V,ID=30A	--	--	--	S
RDS(on)	Drain-Source On-State Resistance	VGS=10V, ID=40A	--	0.92	1.2	mΩ
		VGS=4.5V, ID=30A	--	1.35	1.8	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=20V,VGS=0V, F=1MHZ	--	7500	--	pF
Coss	Output Capacitance		--	1890	--	pF
Crss	Reverse Transfer Capacitance		--	130	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	3.9	--	Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V,VDS=20V ID=40A,RGEN=3Ω	--	11	--	nS
tr	Turn-on Rise Time		--	75	--	nS
td(off)	Turn-Off Delay Time		--	139	--	nS
tf	Turn-Off Fall Time		--	78	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=20V, ID=40A	--	65	--	nC
Qgs	Gate-Source Charge		--	26	--	nC
Qgd	Gate-Drain Charge		--	23	--	nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)		--	--	330	A
VSD	Forward on Voltage	VGS=0V,IS=40A	--	--	1.0	V
trr	Reverse Recovery Time	IF=40A , dI/dt=100A/μs , TJ=25℃	--	49	--	ns
Qrr	Reverse Recovery Charge		--	39	--	nc

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃

Typical Characteristics

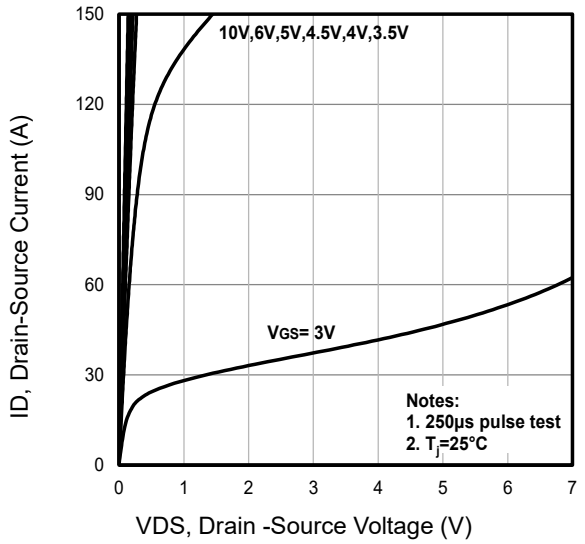


Fig1. Typical Output Characteristics

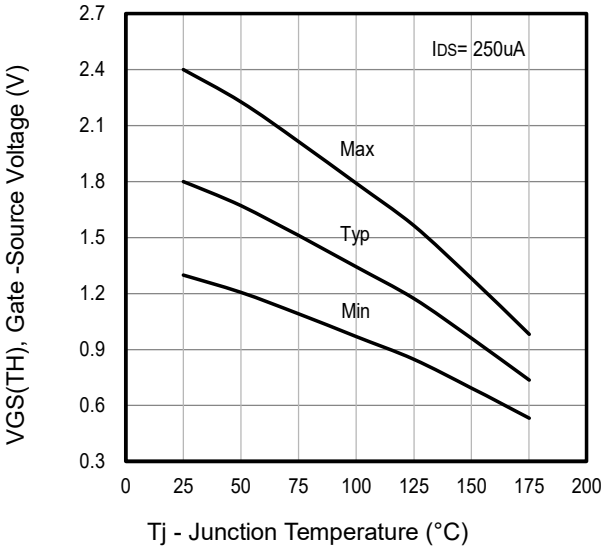


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs. Tj

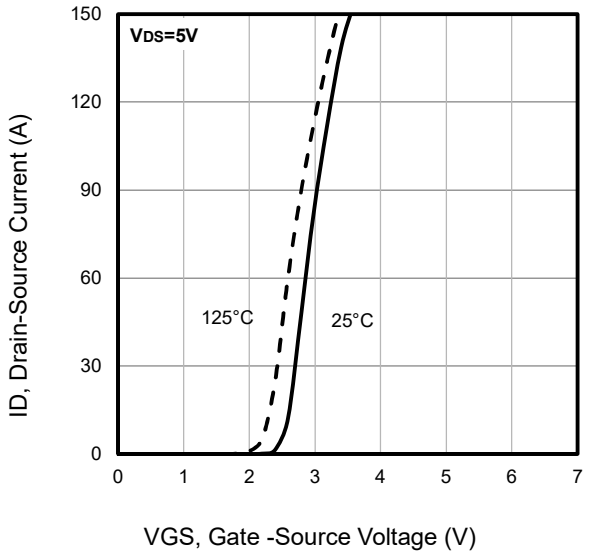


Fig3. Typical Transfer Characteristics

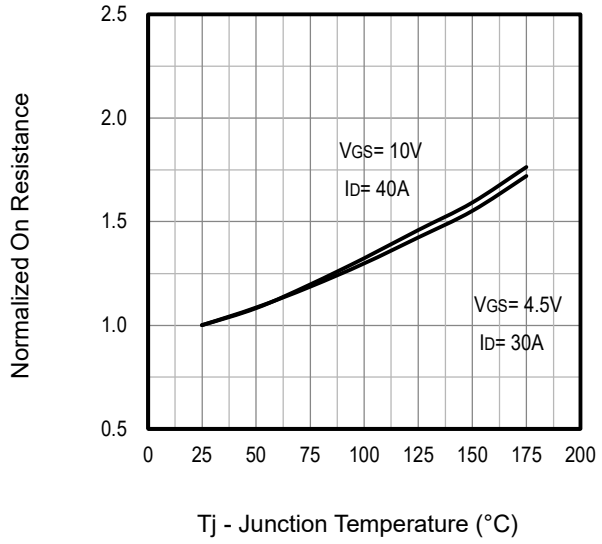


Fig4. Typical Normalized On-Resistance Vs. Tj

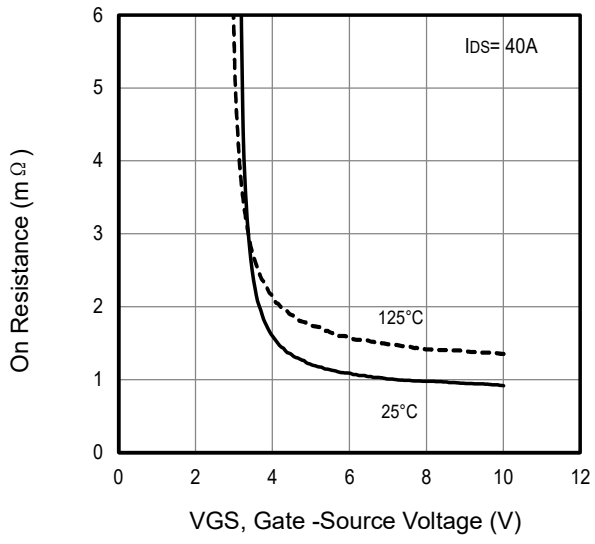


Fig5. Typical On Resistance Vs Gate -Source Voltage

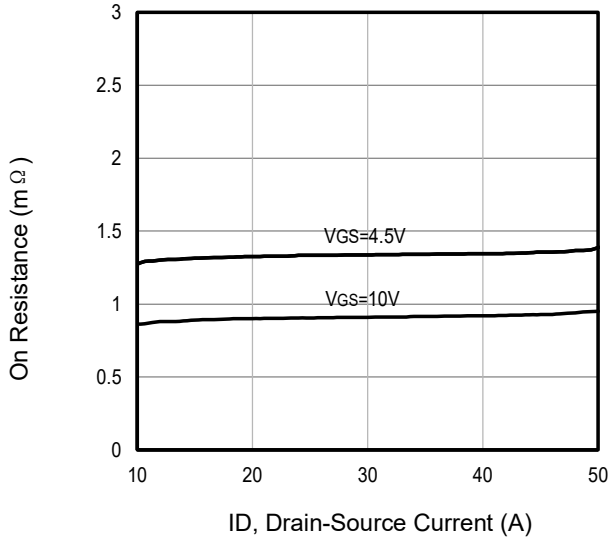


Fig6. Typical On Resistance Vs Drain Current

Typical Characteristics

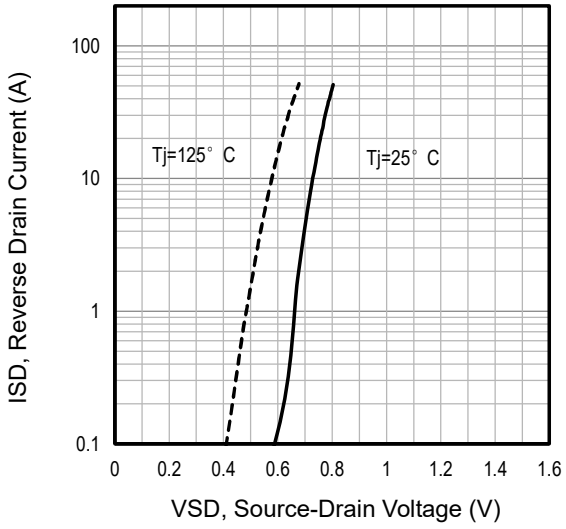


Fig7. Typical Source-Drain Diode Forward Voltage

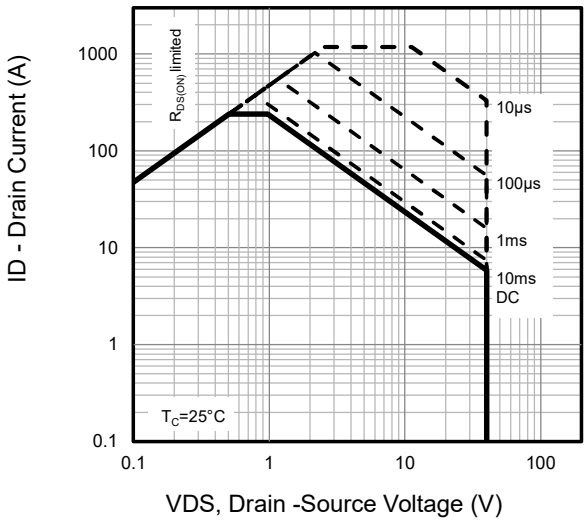


Fig8. Maximum Safe Operating Area

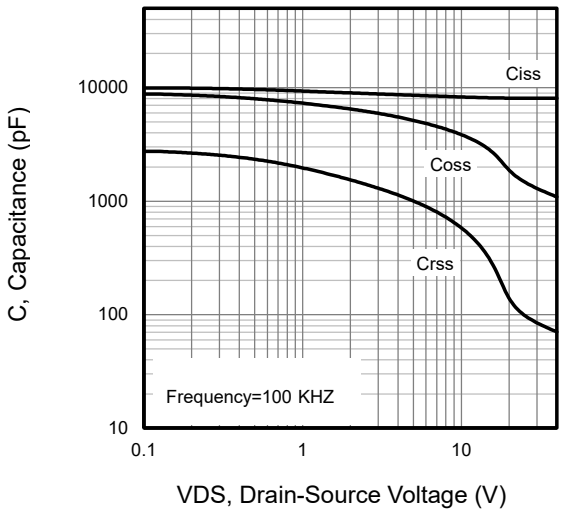


Fig9. Typical Capacitance Vs. Drain-Source Voltage

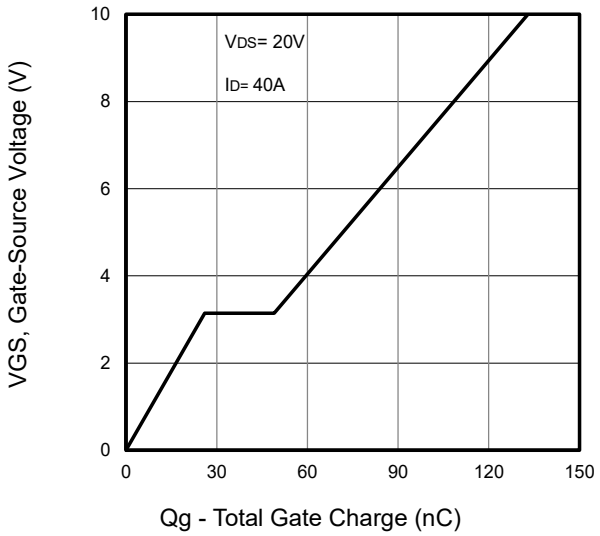


Fig10. Typical Gate Charge Vs. Gate-Source Voltage

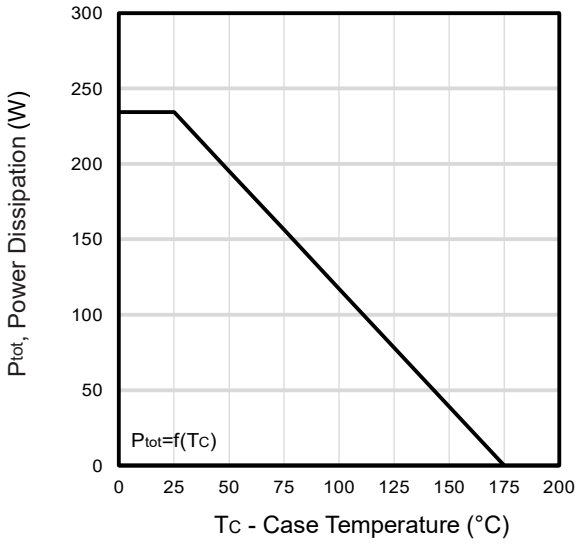


Fig11. Power Dissipation Vs. Case Temperature

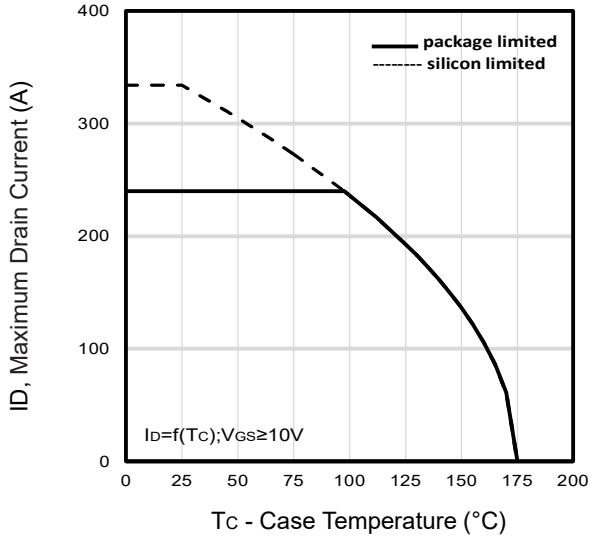


Fig12. Maximum Drain Current Vs. Case Temperature

Typical Characteristics

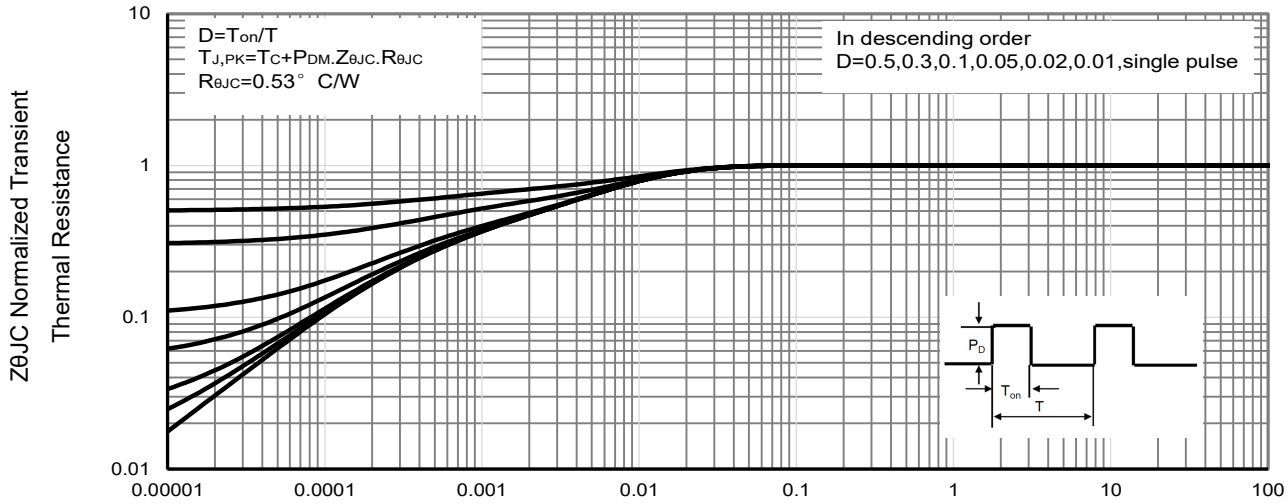


Fig13 . Normalized Maximum Transient Thermal Impedance

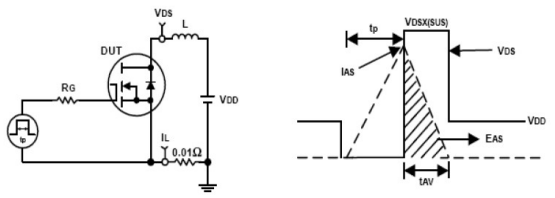


Fig14. Unclamped Inductive Test Circuit and waveforms

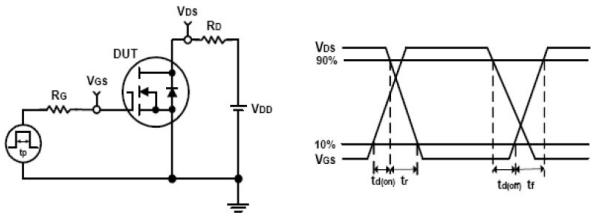
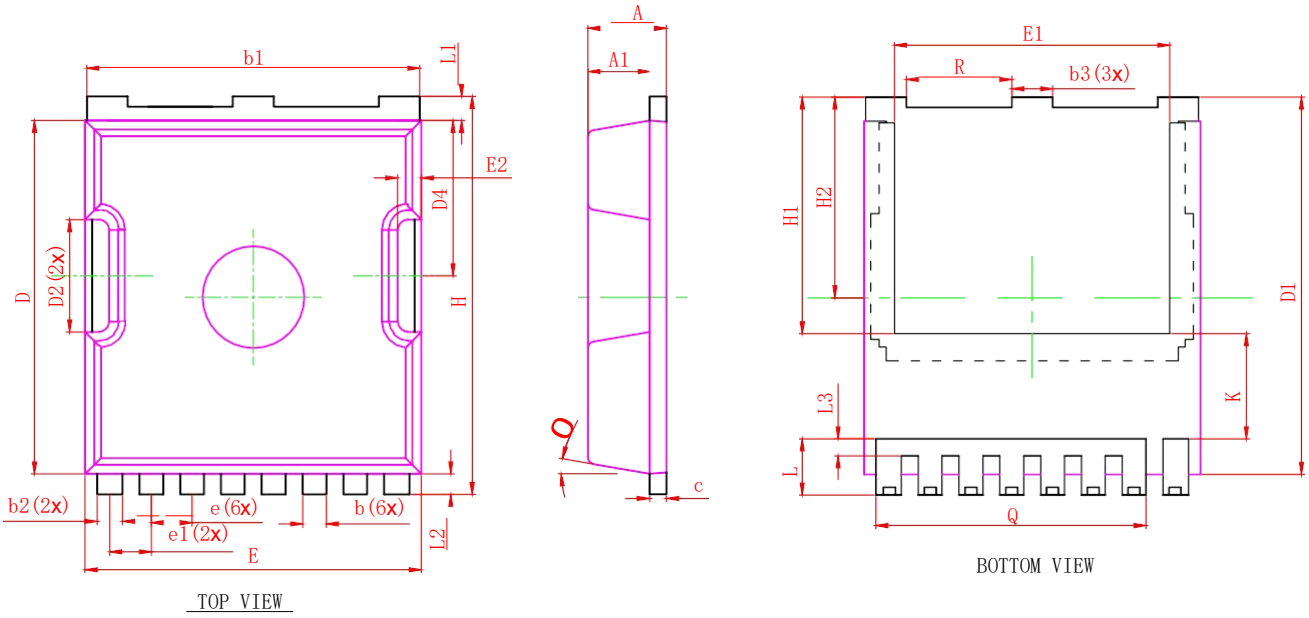
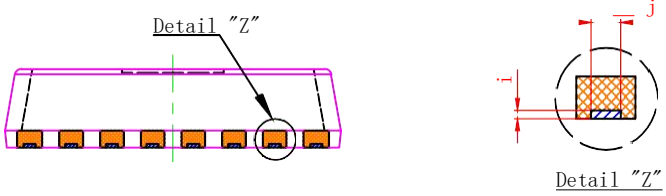


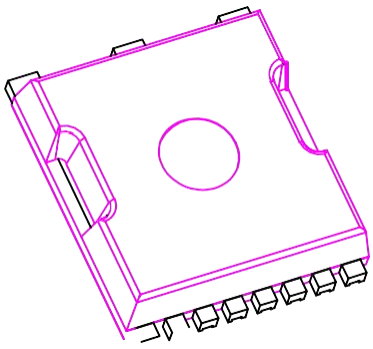
Fig15. Switching Time Test Circuit and waveforms

Package Dimensions

TOLL-8L Package







SYMBOL	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
A1	1.700	1.800	1.900
b	0.600	0.700	0.800
b1	9.700	9.800	9.900
b2	0.650	0.750	0.850
b3	1.100	1.200	1.300
c	0.400	0.500	0.600
D	10.300	10.400	10.500
D1	11.000	11.100	11.200
D2	3.200	3.300	3.400
D4	4.470	4.570	4.670
E	9.800	9.900	10.000
E1	8.000	8.100	8.200
E2	0.500	0.600	0.700
e	1.200 BSC		
e1	1.225 BSC		
H	11.600	11.700	11.800
H1	6.950 BSC		
H2	5.900 BSC		
i	0.100 REF.		
j	0.350 REF.		
K	3.100 REF.		
L	1.550	1.650	1.750
L1	0.600	0.700	0.800
L2	0.500	0.600	0.700
L3	0.400	0.500	0.600
Q	7.950 REF.		
R	3.000	3.100	3.200
O	10°REE.		

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