

Description

Features

- Trench LV MOSFET technology
- Fast switching
- Improved dv/dt capability

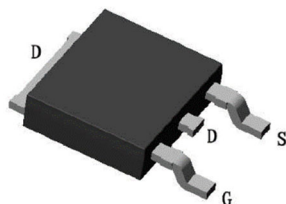
Application

- Load Switch
- PWM Application
- Battery Management

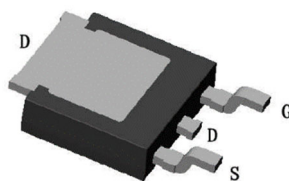
V_{DS}	40	V
$R_{ds(on),typ}@V_{gs}=10V$	2.9	m Ω
$R_{ds(on),typ}@V_{gs}=4.5V$	3.9	m Ω
I_D	100	A



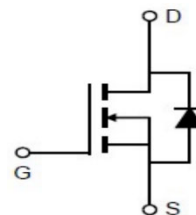
Top View



Bottom View



Pin Configuration



Package Marking and Ordering Information

Part	Marking	Package	Packing	Reel Size	Tape Width	Qty
CMT40H10U	T40H10U	TO252	Reel	NA	NA	2500pcs

Key Performance Parameters

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_c=25^\circ C$	Continuous Drain Current, $V_{GS}=10V$	100	A
$I_D@T_c=100^\circ C$	Continuous Drain Current, $V_{GS}=10V$	78	A
IDM	Pulsed Drain Current ¹	400	A
EAS	Single Pulse Avalanche Energy ⁴	323	mJ
$PD@T_c=25^\circ C$	Total Power Dissipation	90	W
T_{STG}	Storage Temperature Range	-55 to 155	$^\circ C$
T_j	Operating Junction Temperature Range	-55 to 155	$^\circ C$

Thermal Data

Symbol	Parameter	Typ	Max	Units
R _{θJA}	Thermal Resistance Junction-Ambient	37	41	°C/W
R _{θJC}	Thermal Resistance Junction-Case	1.25	1.4	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Values			Unit	Note / Test Condition
		Min.	Typ.	Max.		
BVDSS	Drain-Source Breakdown Voltage	40	--	--	V	VGS=0V, ID=250uA
RDS(ON)	Static Drain-Source On-Resistance	--	2.9	3.8	mΩ	VGS=10V, ID=20A
		--	3.9	5		VGS=4.5V, ID=10A
VGS(th)	Gate Threshold Voltage	1.0	1.4	2.0	V	VGS=VDS, ID=250uA
IDSS	Drain-Source Leakage Current	--	--	1	uA	VDS=40V, VGS=0V, TJ=25°C
		--	--	10	uA	VDS=40V, VGS=0V, TJ=125°C
IGSS	Gate-Source Leakage Current	--	--	±100	nA	VGS=±20V, VDS=0V
Rg	Gate Resistance	--	1.4	--	Ω	VDS=0V, VGS=0V, f=1MHz
Qg	Total Gate Charge (10V) ^{2,3}	--	65	--	nC	VDS=20V, VGS=10V, ID=30A
Qgs	Gate-Source Charge ^{2,3}	--	12	--		
Qgd	Gate-Drain Charge ^{2,3}	--	15	--		
Td(on)	Turn-On Delay Time ^{2,3}	--	11	--	ns	VDD=20V, VGS=10V, RG=3Ω ID=30A
Tr	Rise Time ^{2,3}	--	15	--		
Td(off)	Turn-Off Delay Time ^{2,3}	--	40	--		
Tf	Fall Time ^{2,3}	--	13	--	pF	VDS=20V, VGS=0V, f=1MHz
Ciss	Input Capacitance	--	4290	--		
Coss	Output Capacitance	--	410	--		
Crss	Reverse Transfer Capacitance	--	349	--		

Diode Characteristics

Symbol	Parameter	Conditions	Typ	Max	Units
Is	Continuous Source Current	VG=VD=0V, Force Current	--	100	A
Ism	Pulsed Source Current		--	400	A
VSD	Diode Forward Voltage	VGS=0V, Is=30A, TJ=25°C	--	1.1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.
4. The EAS data shows Max. rating. The test condition is VDD=20V, VGS=10V, L=0.5mH.

Typical Performance Characteristics

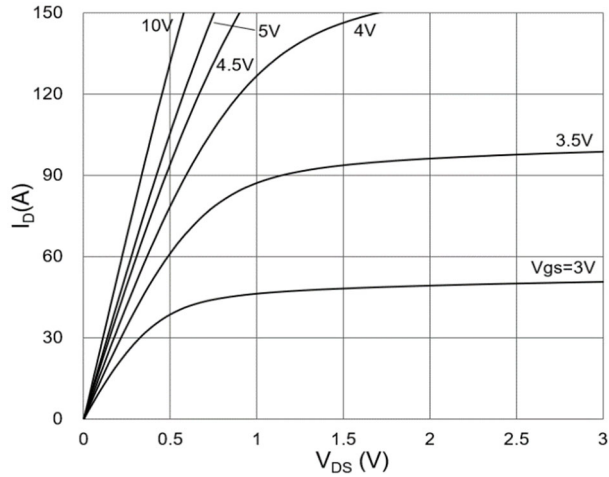
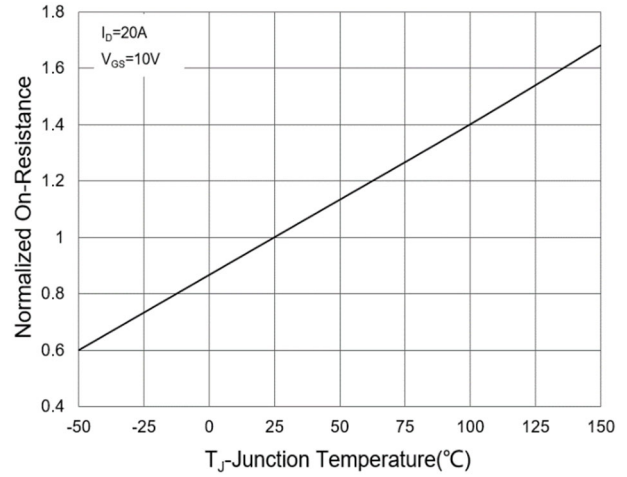
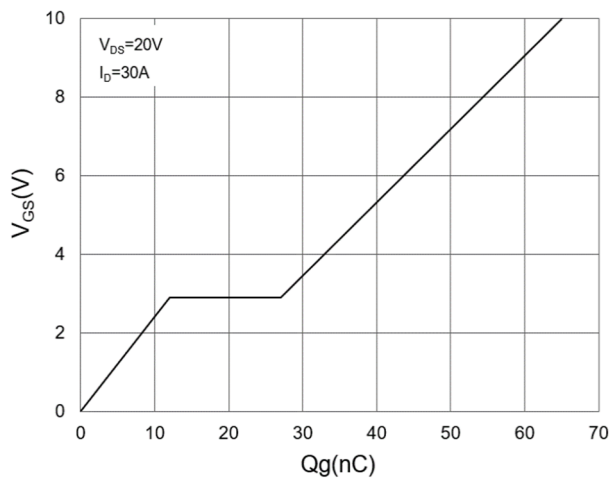
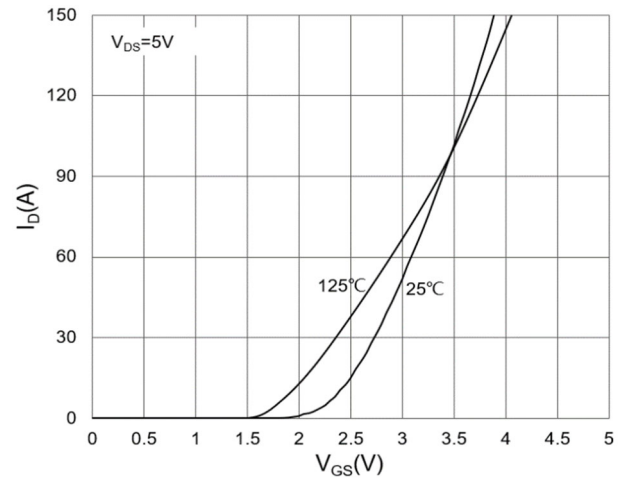
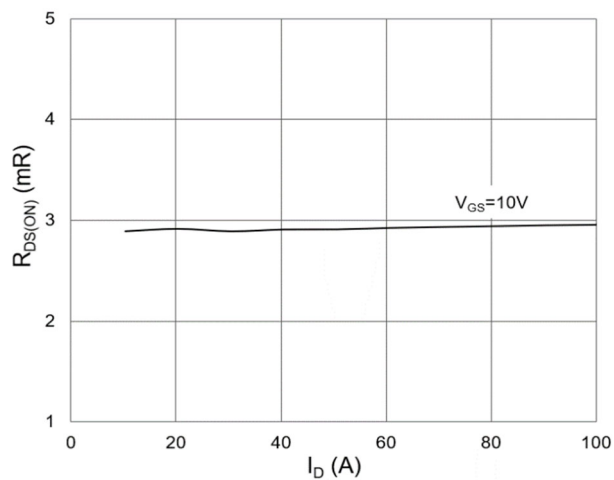
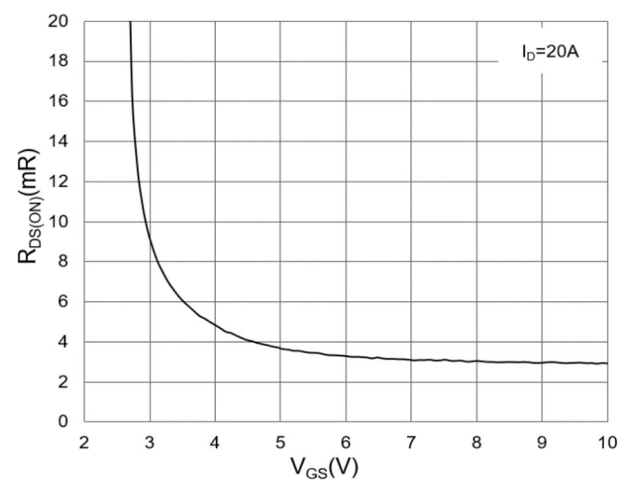
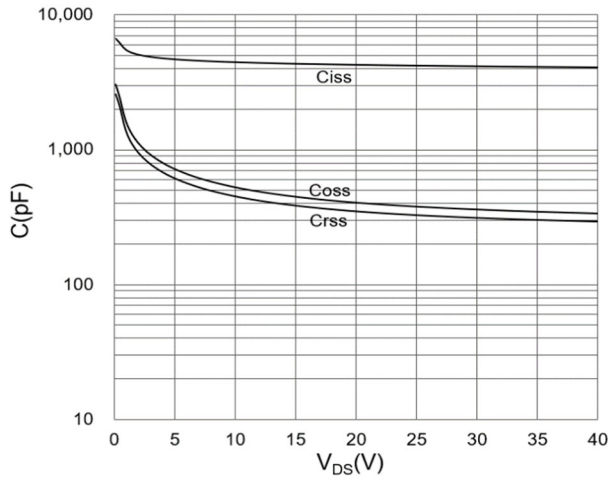
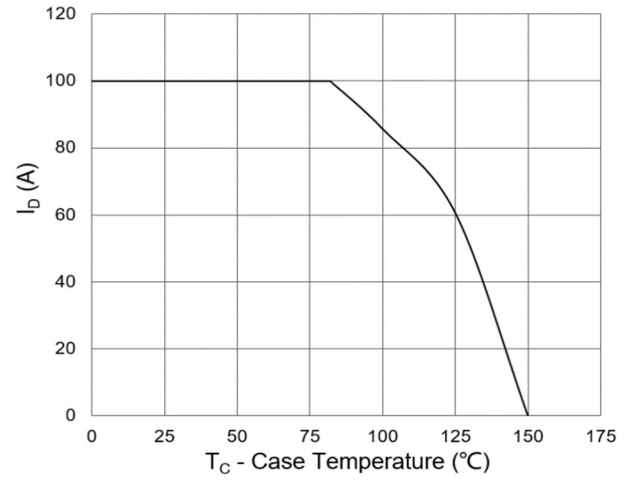
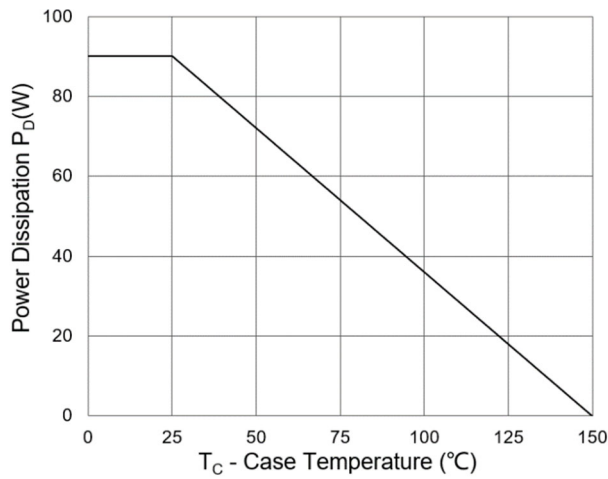
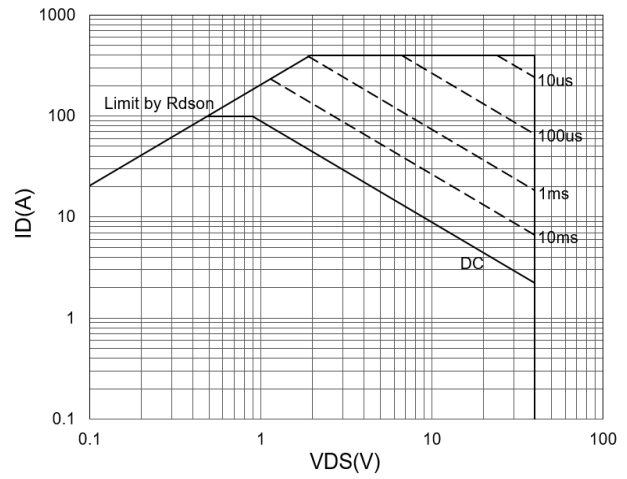
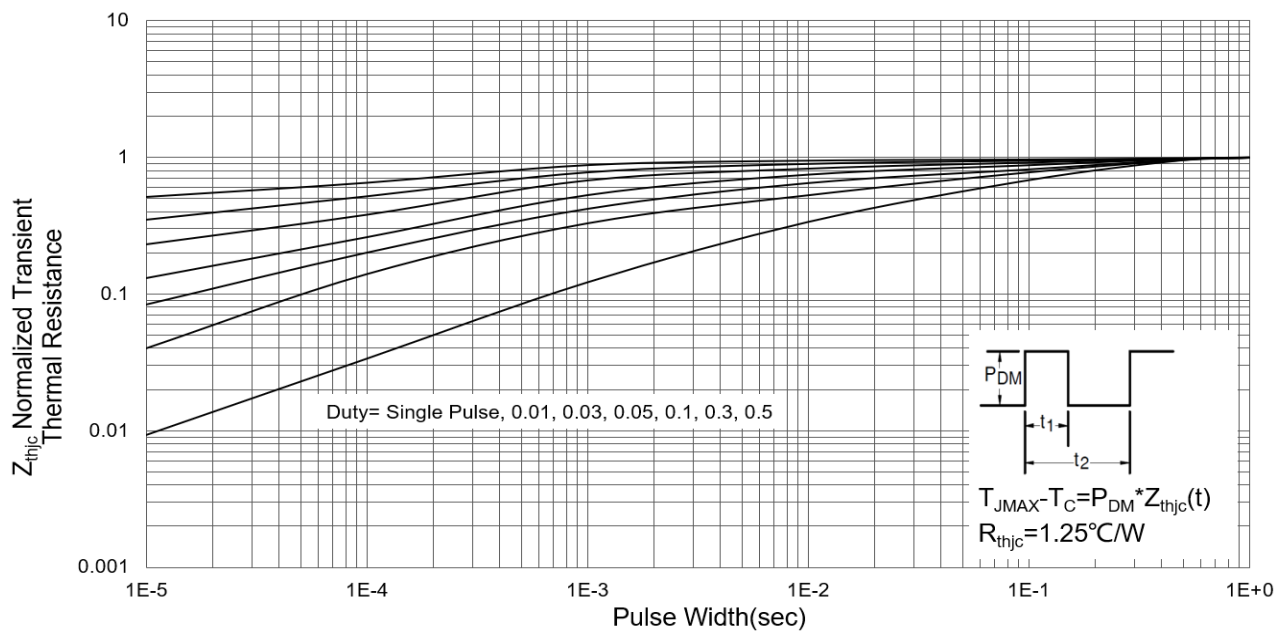
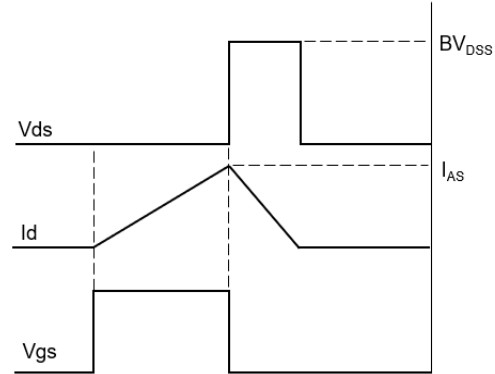
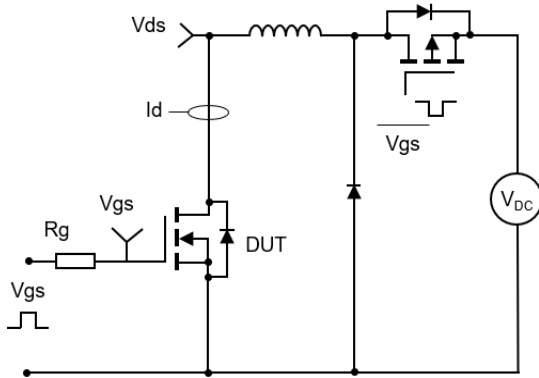
Fig1 Output Characteristics

Fig2 Normalized $R_{DS(on)}$ vs T_J

Fig3 Gate Charge Waveform

Fig4 Transfer Characteristics

Fig5 $R_{DS(on)}$ vs. Drain Current and Gate Voltage

Fig6 $R_{DS(on)}$ vs. Gate Voltage


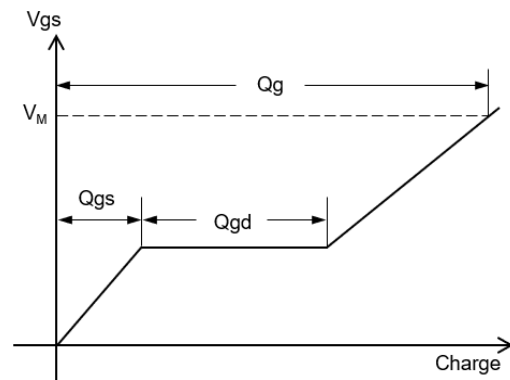
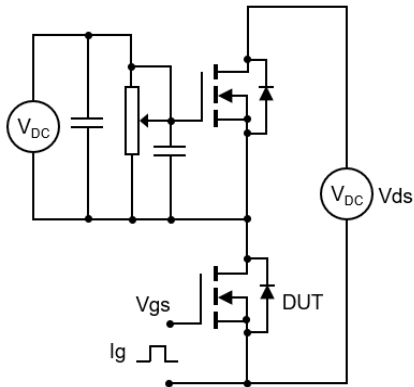
Fig7 Capacitance Characteristics

Fig8 Drain Current Derating

Fig9 Power Dissipation

Fig10 Maximum Safe Operation Area

Fig11 Normalized Transient Impedance


Test Circuit & Waveform

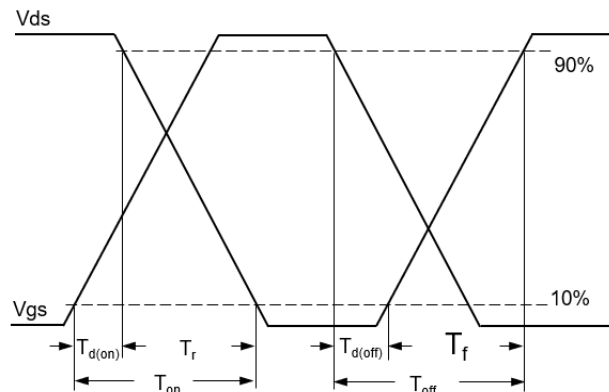
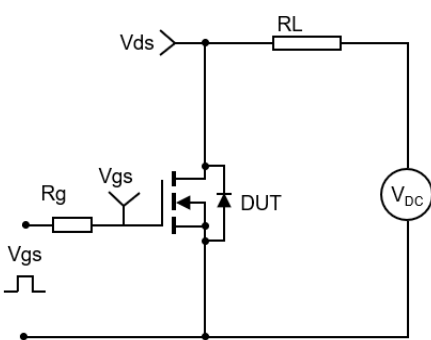
1. Unclamped Inductive Switching Test Circuit & Waveforms



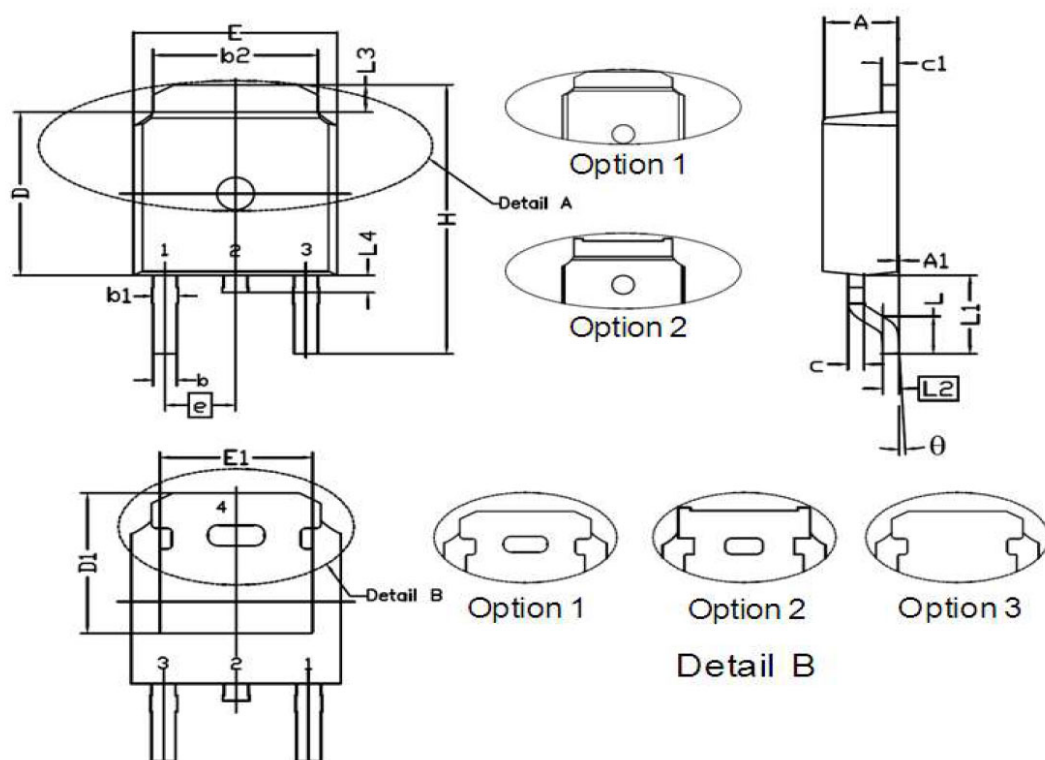
2. Gate Charge Test Circuit & Waveform



3. Resistive Switching Test Circuit & Waveform



TO252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.21	--	0.205	--
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.40	--	0.173	--
H	9.40	10.48	0.370	0.413
L	1.38	1.78	0.054	0.070
L1	2.92 REF		0.115 REF	
L2	0.508 BSC.		0.020 BSC.	
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047
θ	0°	10°	0°	10°