

Dual N-Channel 20V(D-S) MOSFET

Product summary		
V_{DS}	20	V
$R_{DS(ON)}$ (at $V_{GS}=4.5V$) Typ.	19	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$) Typ.	25	m Ω
$I_D(T_C=25^{\circ}C)$	5	A

Features

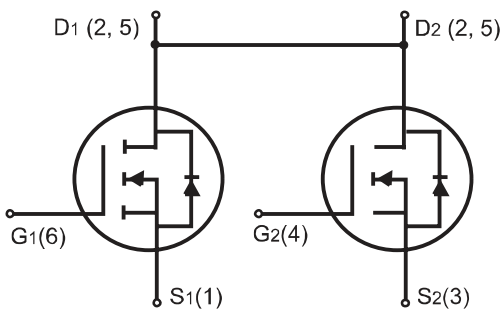
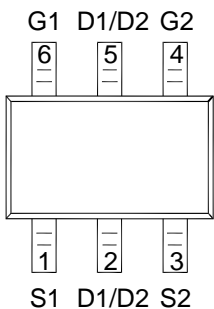
- High density cell trench design for low $R_{ds(on)}$
- Surface mount package
- RoHS and Halogen-Free compliant

Applications

- Li-ion battery management applications

Pin Configuration

SOT23-6 TOP VIEW



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECG8205S	SOT23-6	7"	3000pcs

Absolute Maximum Ratings (at $T_A=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		20	V
V_{GS}	Gate-Source Voltage		± 10	V
I_D	Continuous Drain Current at $V_{GS}=10V$	$T_C=25^{\circ}C$	5	A
		$T_C=70^{\circ}C$	4	A
I_{DM}	Pulse Drain Current Tested		20	A
P_D	Power Dissipation	$T_C=25^{\circ}C$	0.95	W
T_J, T_{STG}	Junction and Storage Temperature Range		-55 to 150	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient	132	$^{\circ}C/W$

Electrical Characteristics (at TJ =25°C Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V,I _D =250uA	20	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V,V _{GS} =0V	--	--	1	uA
I _{GSS}	Gate-Body Leakage Current	V _{DS} =0V,V _{GS} =±12V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250uA	0.45	0.6	0.8	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =4.5V,I _D =4A	--	19	22	mΩ
		V _{GS} =2.5V,I _D =3A	--	25	30	mΩ
V _{SD}	Forward Voltage	I _{SD} =1.7A,V _{GS} =0V	--	0.7	1.3	V
Dynamic Parameters						
C _{iSS}	Input Capacitance	V _{GS} =0V,V _{DS} =10V f=1MHZ	--	595	--	pF
C _{oSS}	Output Capacitance		--	90	--	pF
C _{rSS}	Reverse Transfer Capacitance		--	71	--	pF
Q _g	Total Gate Charge	V _{DS} =10V,I _D =5A V _{GS} =4.5V	--	12	--	nC
Q _{gs}	Gate-Source Charge		--	2.1	--	nC
Q _{gd}	Gate-Drain Charge		--	3.3	--	nC
Switching Parameters						
t _{D(on)}	Turn-on Delay Time	V _{DS} =10V,I _D =5A R _G =6Ω,V _{GS} =4.5V	--	23	--	nS
t _r	Turn-on Rise Time		--	30	--	nS
t _{D(off)}	Turn-off Delay Time		--	56	--	nS
t _f	Turn-off Fall Time		--	21	--	nS
t _{rr}	Reverse Recovery Time	I _F =5A di/dt=100A/us	--	14	--	nS
Q _{rr}	Reverse Recovery Charge		--	5	--	nC

Typical Characteristics

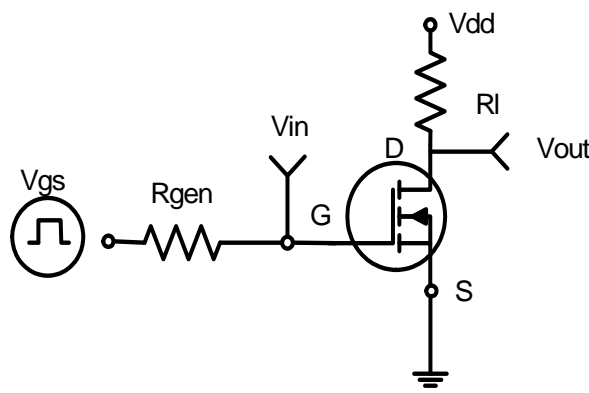


Figure 1: Switching Test Circuit

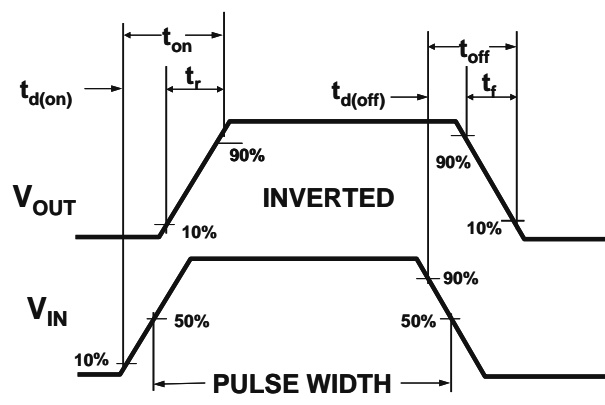


Figure 2: Switching Waveforms

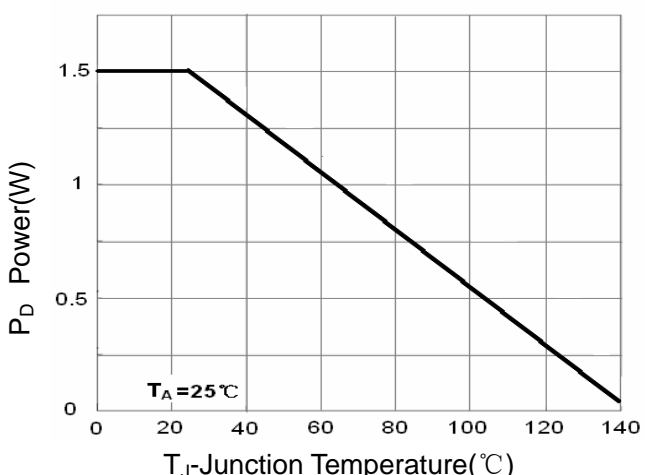


Figure 3 Power Dissipation

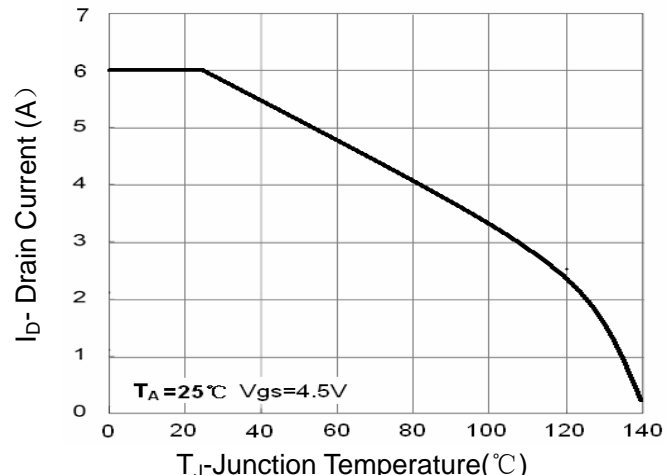


Figure 4 Drain Current

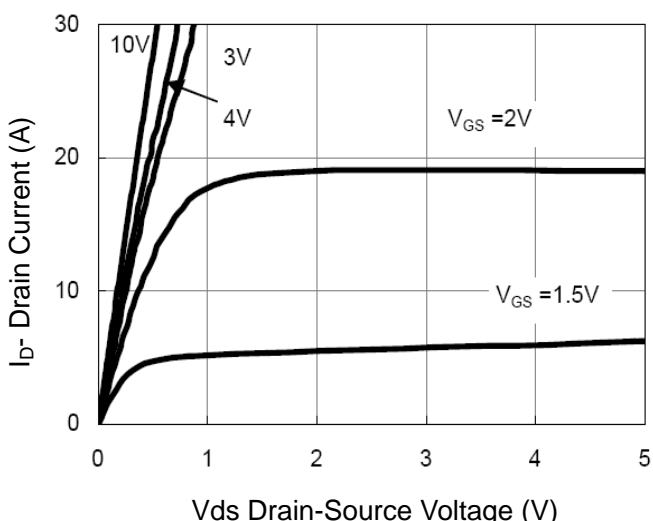


Figure 5 Output CHARACTERISTICS

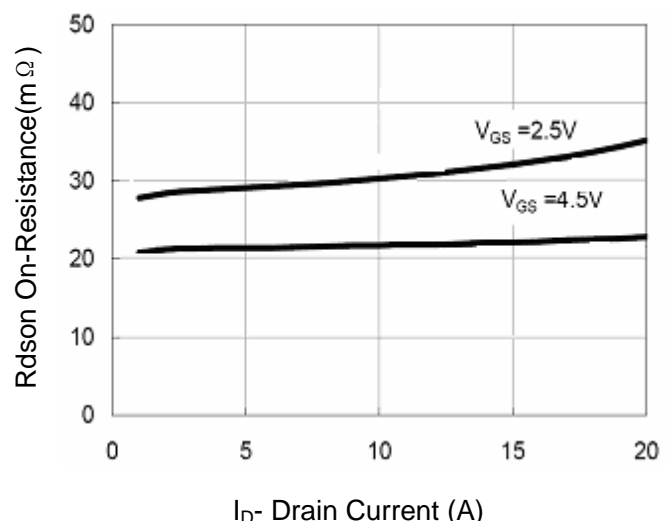


Figure 6 Drain-Source On-Resistance

Typical Characteristics

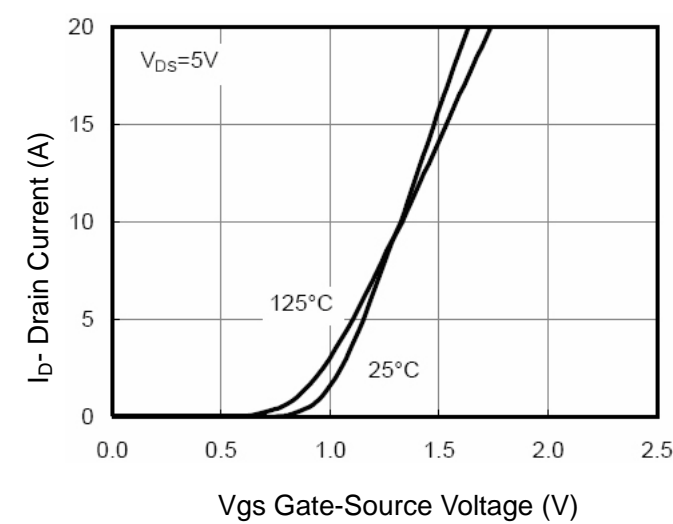


Figure 7 Transfer Characteristics

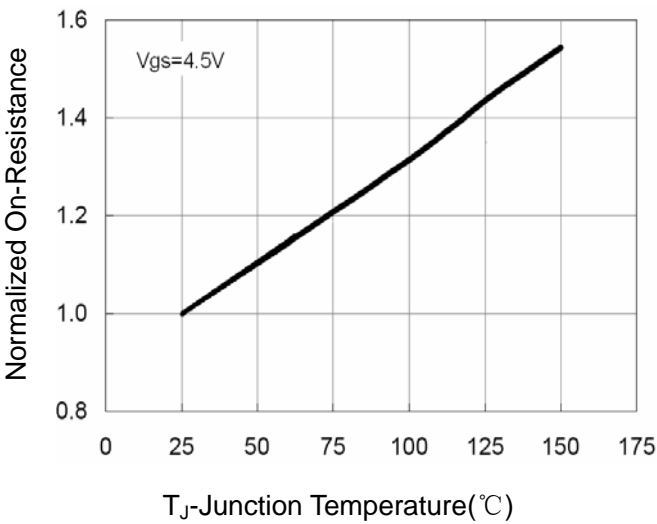


Figure 8 Drain-Source On-Resistance

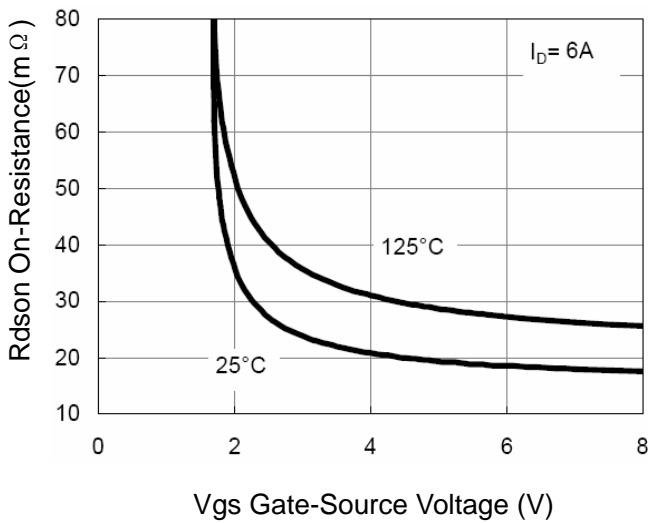


Figure 9 Rdson vs V_GS

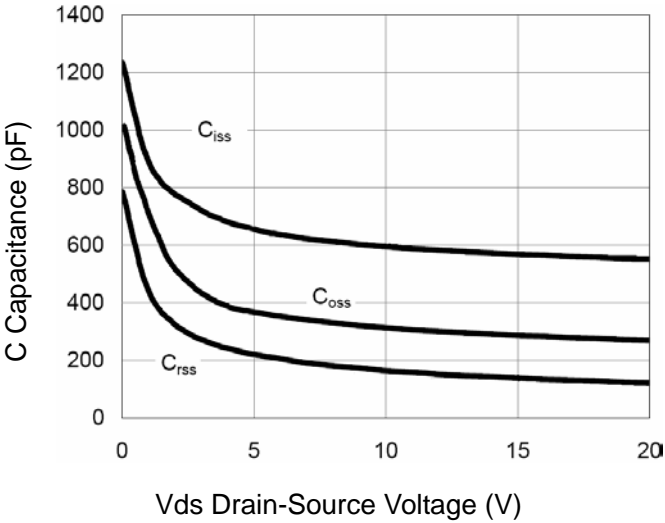


Figure 10 Capacitance vs V_DS

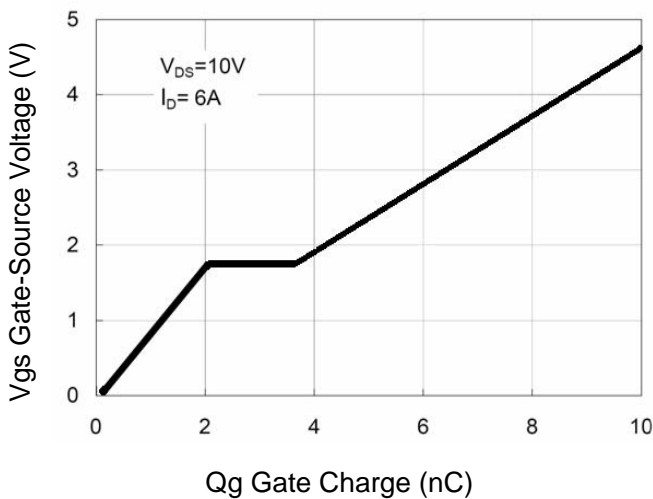


Figure 11 Gate Charge

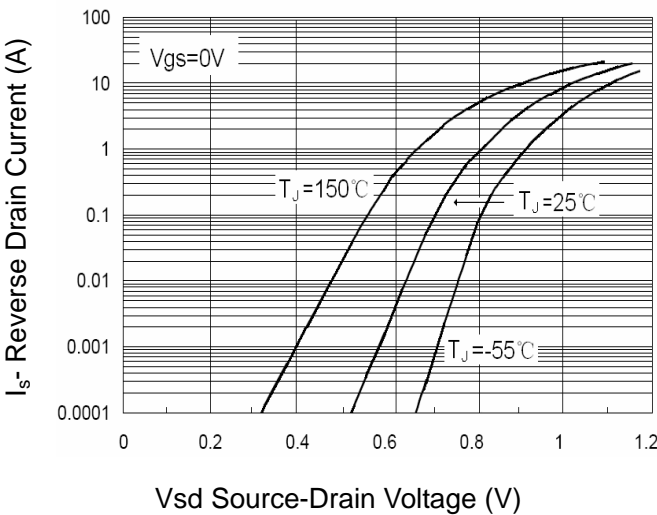


Figure 12 Source- Drain Diode Forward

Typical Characteristics

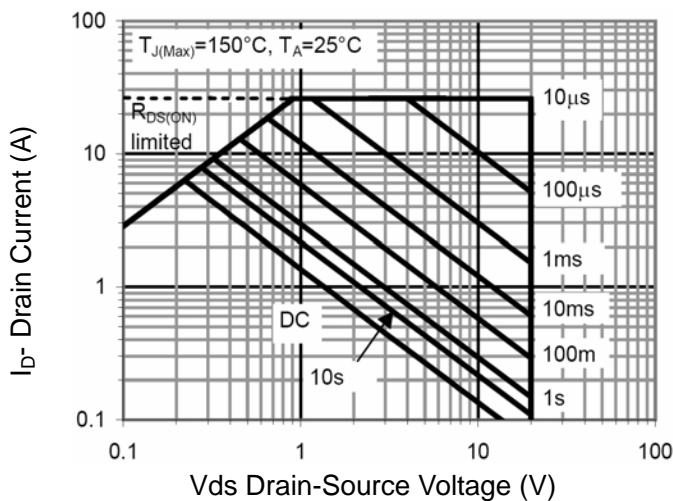


Figure 13 Safe Operation Area

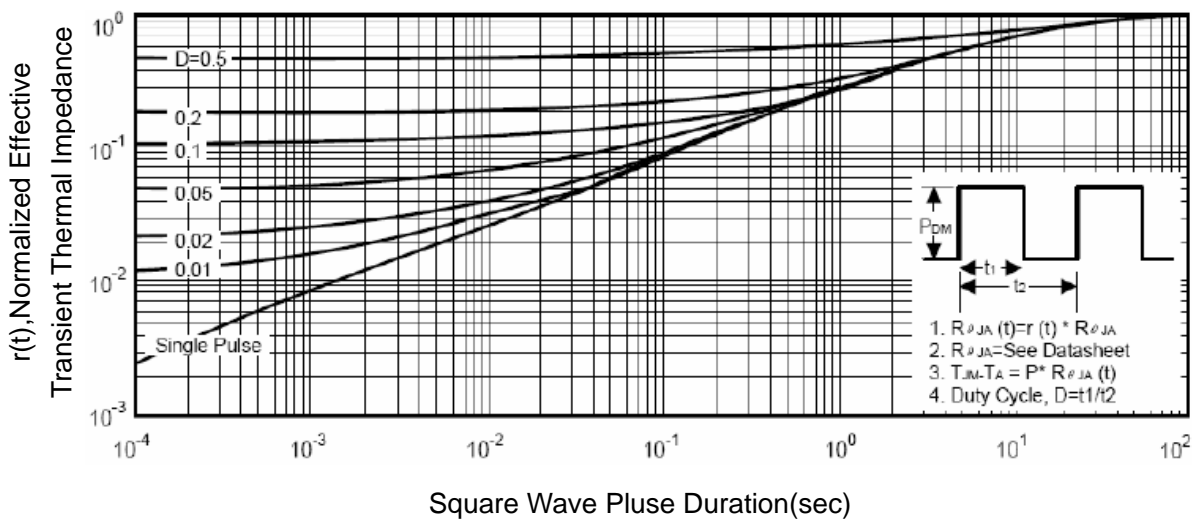
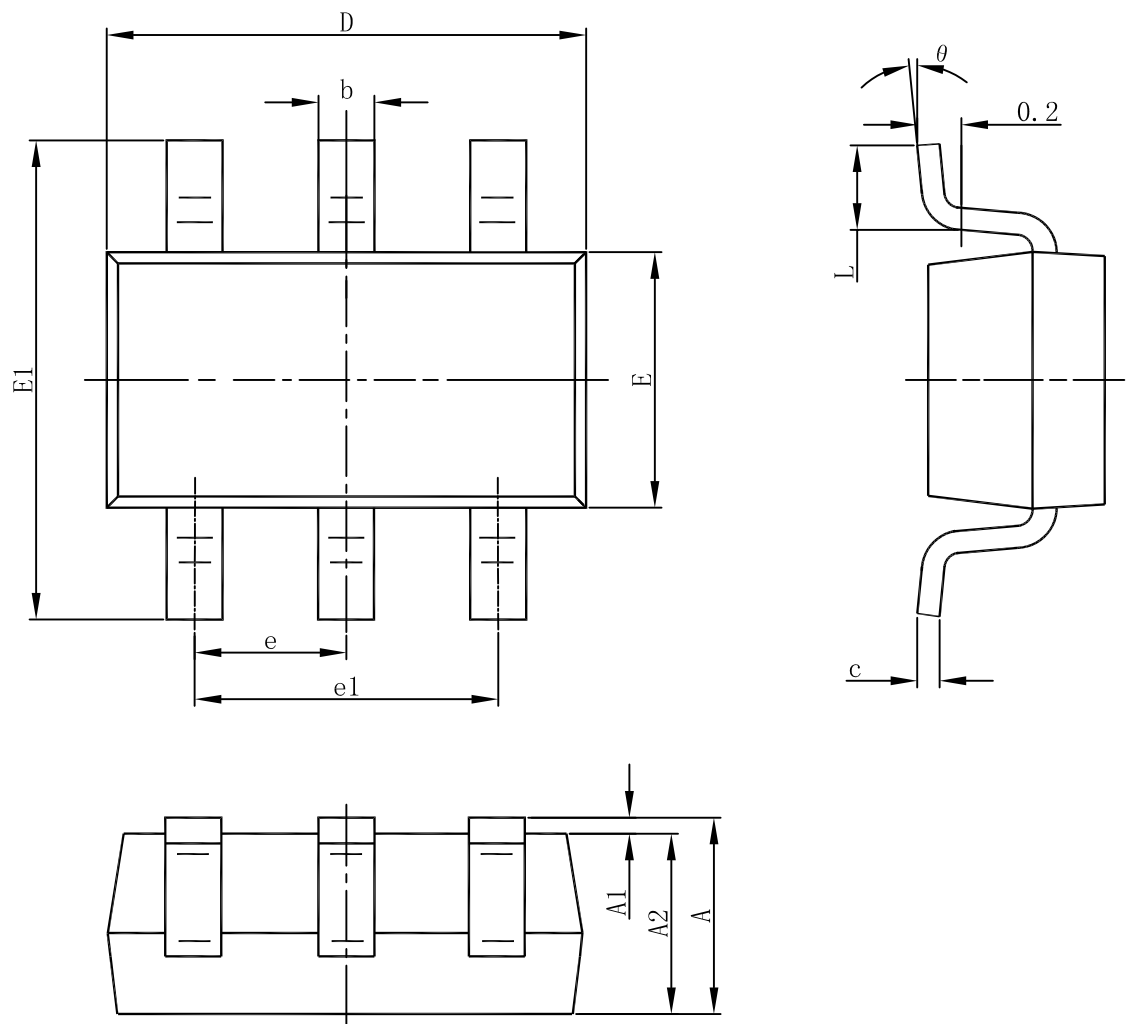


Figure 14 Normalized Maximum Transient Thermal Impedance

SOT23-6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°