Features

★ Super Low Gate Charge
★ Green Device Available
★ Excellent Cdv/dt effect decline
★ Advanced high cell density Trench technology
★ 100% EAS Guaranteed

Product Summary

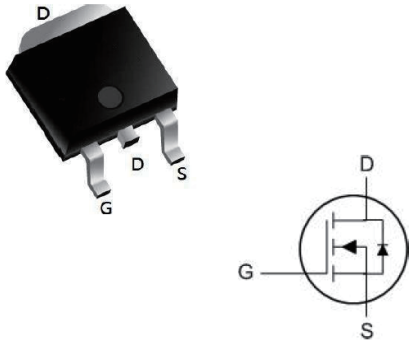
RoHS

BVDSS	RDSON	ID
100V	13.5mΩ	60A

Description

The S60N10 is the highest performance trench Nc-h MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .
The S60N10 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

TO252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	60	A
		T_C = 100℃	28.5	A
I_{DM}	Pulsed Drain Current note1		180	A
EAS	Single Pulsed Avalanche Energy note2		80	mJ
P_D	Power Dissipation	T_C = 25℃	67.5	W
$R_{\theta JC}$	Thermal Resistance from Junction-to-Lead		1.85	℃/W
$R_{\theta JA}$	Thermal Resistance from Junction-to-Ambient note3		45	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to 150	℃

Electrical Characteristics (T_J =25 °C unless otherwise specified)

Symbol	Parameter		Test Condition	Min.	Typ.	Max.	Units
Static Characteristics							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		V_{GS} = 0V, I_D = 250μA	100	-	-	V
I_{GSS}	Gate-Body Leakage Current		V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	T_J=25°C	V_{DS} = 100V, V_{GS} = 0V	-	-	1	μA
		T_J=100°C		-	-	100	
$V_{GS(th)}$	Gate-Threshold Voltage		V_{DS} = V_{GS}, I_D = 250μA	1	1.7	2.5	V
$R_{DS(on)}$	Drain-Source on-Resistance[4]		V_{GS} = 10V, I_D = 20A	-	13.5	17	mΩ
			V_{GS} = 4.5V, I_D = 10A	-	17	20	
g_{fs}	Forward Transconductance[4]		V_{DS} = 10V, I_D = 20A	-	54	-	S
Dynamic Characteristics[5]							
C_{iss}	Input Capacitance		V_{DS} = 50V, V_{GS} =0V, f =1MHz	-	1208	-	pF
C_{oss}	Output Capacitance			-	144	-	
C_{rss}	Reverse Transfer Capacitance			-	11.3	-	
R_G	Gate Resistance		f =1MHz	-	1.8	-	Ω
Switching Characteristics[5]							
Q_g	Total Gate Charge		V_{GS} = 10V, V_{DS} = 50V, I_D= 20A	-	22.7	-	nC
Q_{gs}	Gate-Source Charge			-	3	-	
Q_{gd}	Gate-Drain Charge			-	5	-	
$t_{d(on)}$	Turn-on Delay Time		V_{GS} =10V, V_{DD}= 50V, R_G = 3Ω, I_D= 20A	-	9.2	-	ns
t_r	Rise Time			-	3.6	-	
$t_{d(off)}$	Turn-off Delay Time			-	25.6	-	
t_f	Fall Time			-	4.4	-	
t_{rr}	Body Diode Reverse Recovery Time		I_F = 20A, dI/dt = 100A/μs	-	30	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge			-	42	-	nC
Drain-Source Body Diode Characteristics							
V_{SD}	Diode Forward Voltage[4]		I_S = 20A, V_{GS} = 0V	-	-	1.2	V
I_S	Continuous Source Current		-	-	-	60	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.4mH, IAS=20A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test..

Typical Electrical and Thermal Characteristics (Curves)

Figure1: Output Characteristics

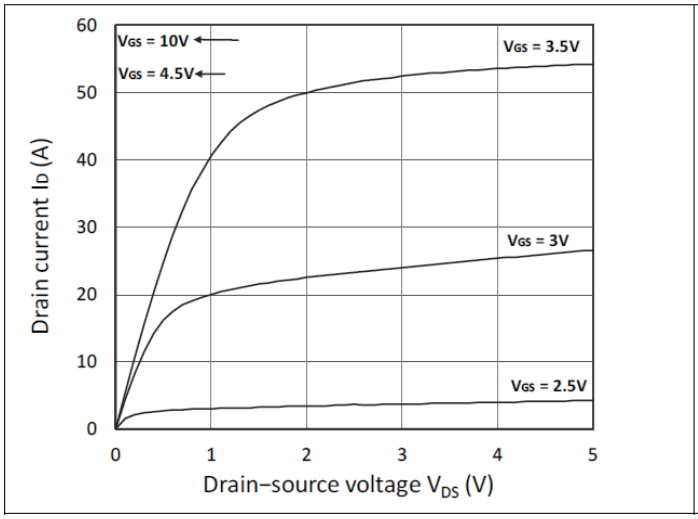


Figure 2: Typical Transfer Characteristics

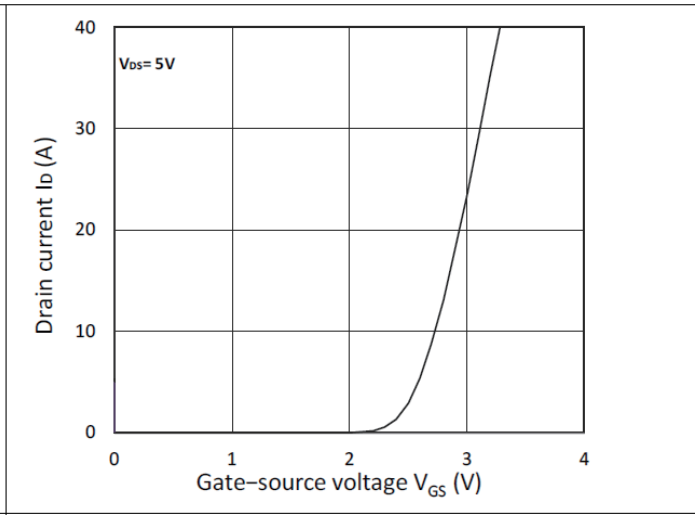


Figure 3:Forward Characteristics of Reve

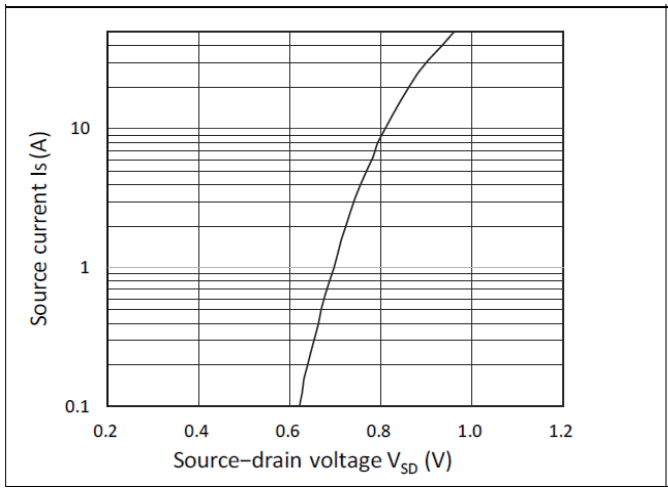


Figure 4: RDS(ON) vs. VGS

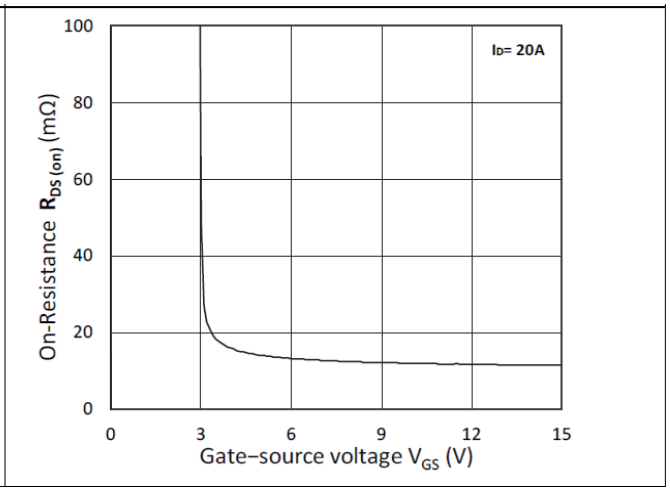


Figure 5: RDS(ON) vs. ID Figure 6. Normal

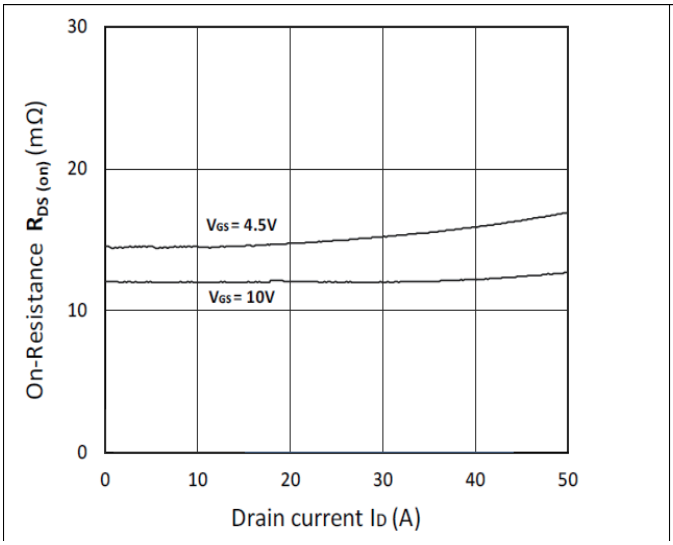
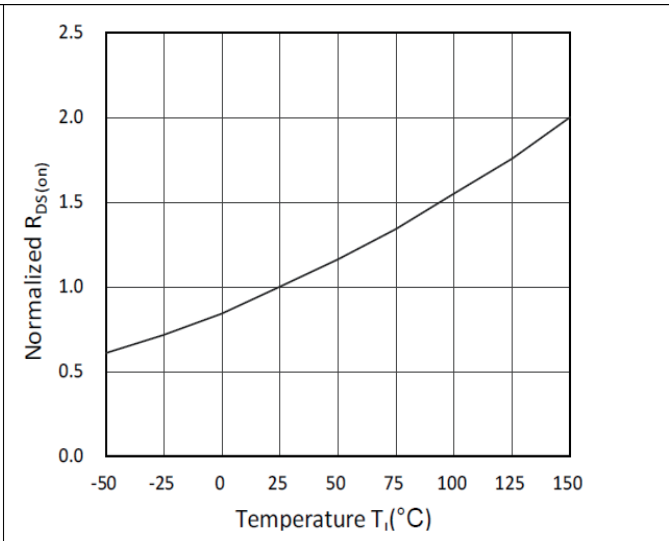


Figure 6:Normalized RDS(on) vs. Tempe



Typical Performance Characteristics

Figure 7:Capacitance Characteristics

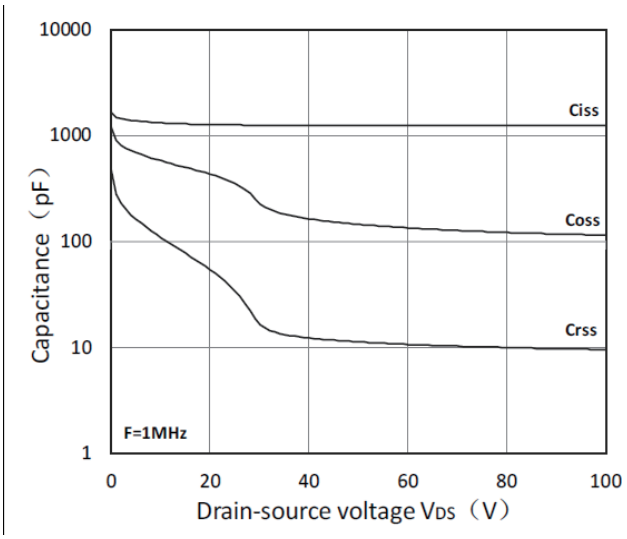


Figure 8: Gate Charge Characteristics

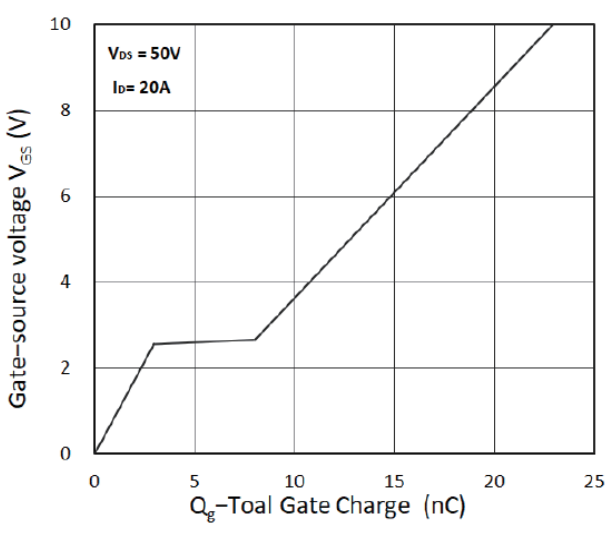


Figure 9:Power Dissipation

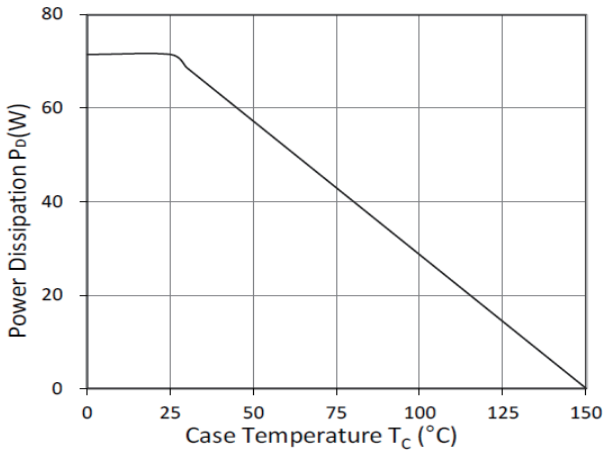


Figure 10: Safe Operating Area

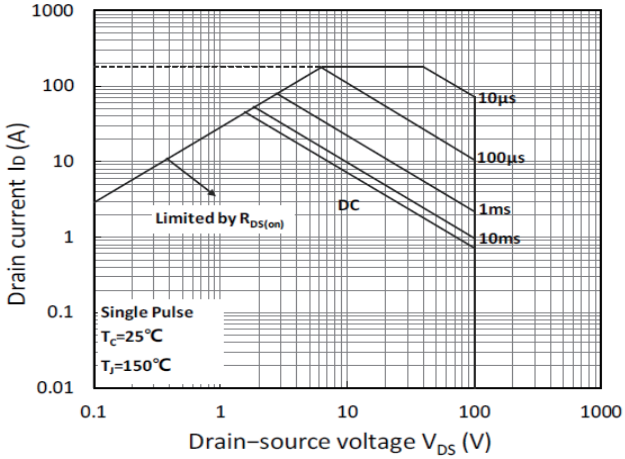
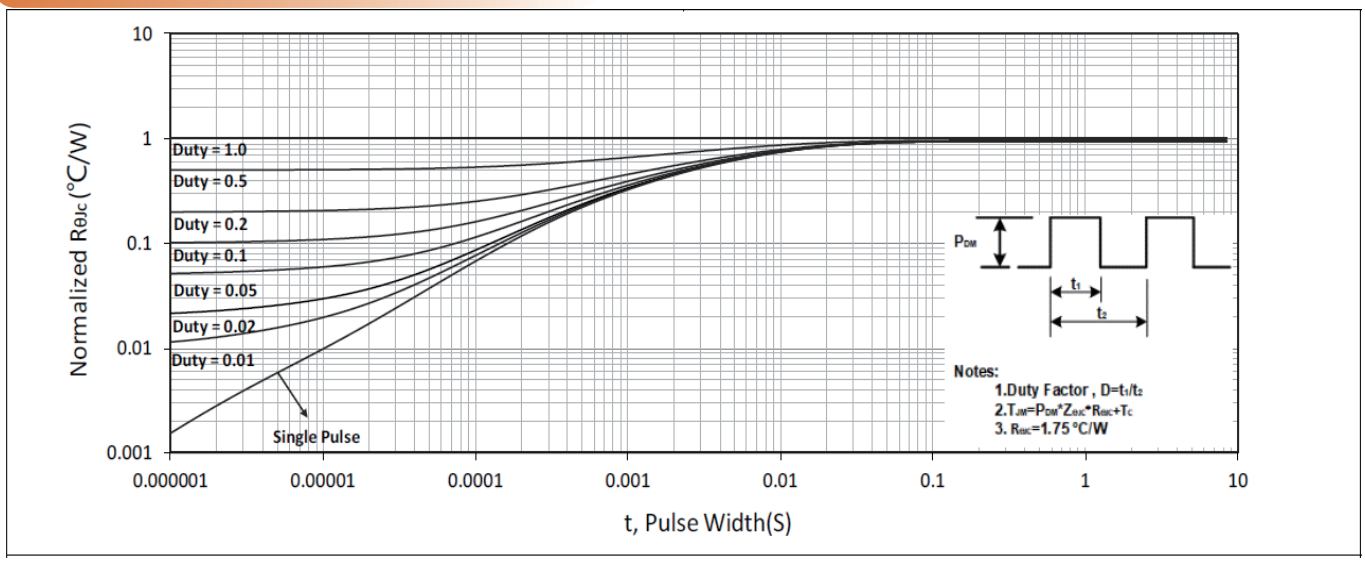


Figure 11 Normalized Maximum Transien



Test Circuit

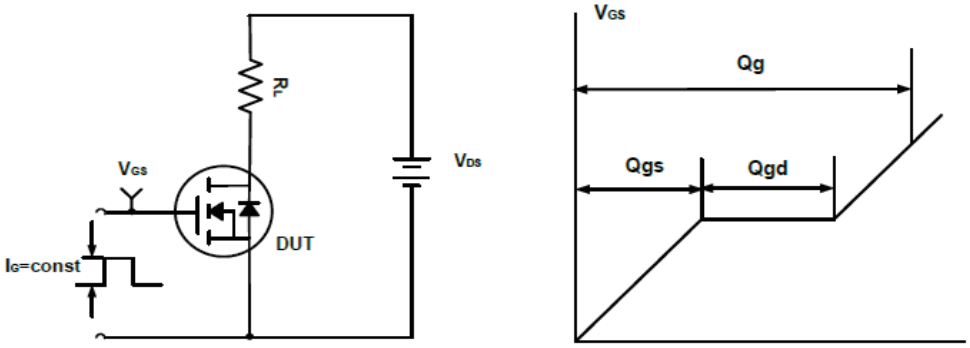


Figure A. Gate Charge Test Circuit & Waveforms

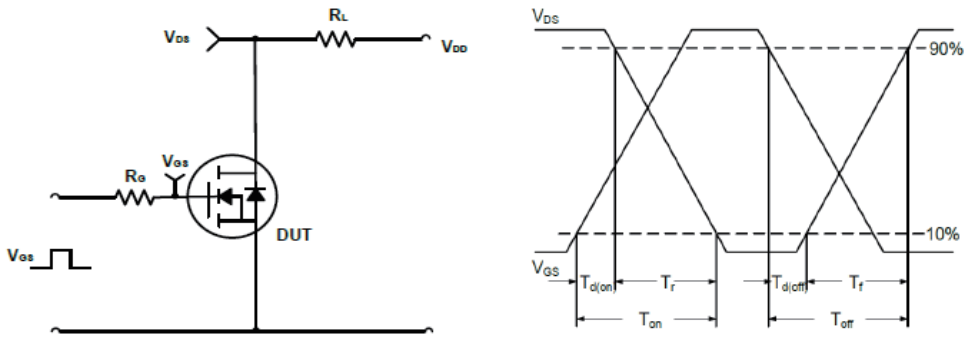


Figure B. Switching Test Circuit & Waveforms

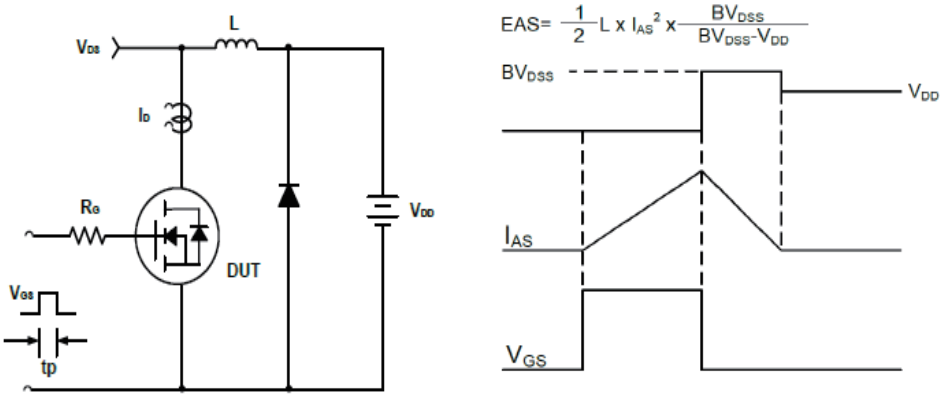
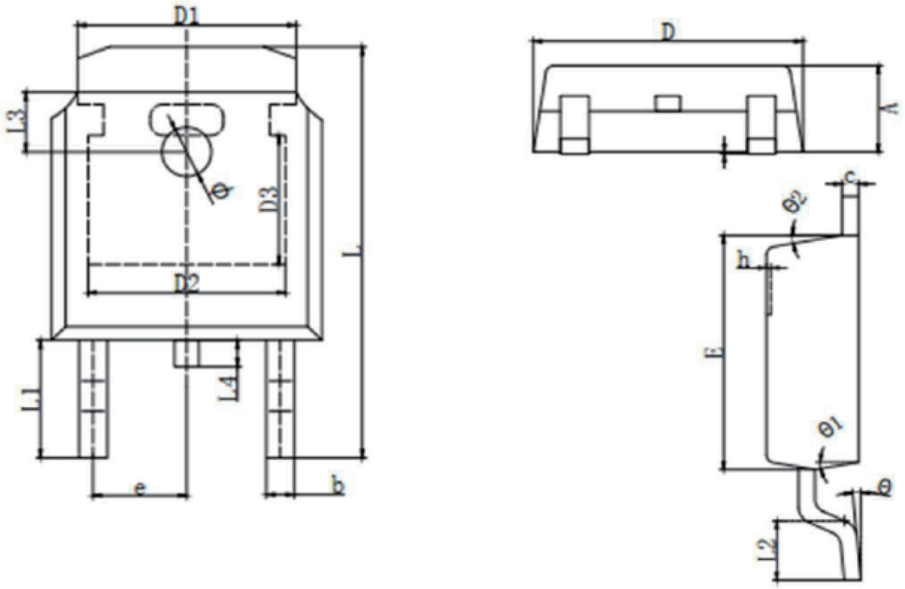


Figure C. Unclamped Inductive Switching Circuit & Waveforms

TO-252 Package outline



SYMBOL	MILLIMETER		SYMBOL	MILLIMETER	
	MIN	MAX		MIN	MAX
A	2.200	2.400	h	0.000	0.200
A1	0.000	0.127	L	9.900	10.30
b	0.640	0.740	L1	2.888 REF	
c	0.460	0.580	L2	1.400	1.700
D	6.500	6.700	L3	1.600 REF	
D1	5.334 REF		L4	0.600	1.000
D2	4.826 REF		ϕ	1.100	1.300
D3	3.166 REF		θ	0°	8°
E	6.000	6.200	θ1	9° TYP2	
e	2.286 TYP		θ2	9° TYP	