PTP40N120

40V/120A N-Channel Advanced Power MOSFET

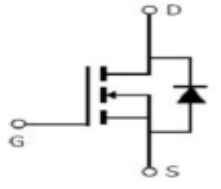
Features

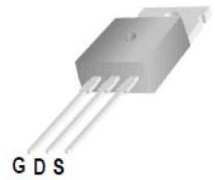
- Lead free and Green Device Available
- Low Rds-on to Minimize Conductive Loss
- High avalanche Current
- 100% Avalanche Tested

BVDSS	40	V
ID	120	A
RDSON@VGS=10V	2.1	mΩ
RDSON@VGS=4.5V	3.2	mΩ

Applications

- Power Supply
- DC-DC Converters
- Load Switch





TO-220

Order Information

Product	Package	Marking	Tube	Carton
PTP40N120	TO-220	PTP40N120	50PCS	5000PCS

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)				
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		40	V
V_{GS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	TC =25°C	120	A
Mounted on Large Heat Sink				
E_{AS}	Single Pulse Avalanche Energy (Note1)		450	mJ
I_{DM}	Pulse Drain Current Tested (Sillicon Limit) (Note2)	TC =25°C	400	A
I_D	Continuous Drain current	TC =25°C	120	A
P_D	Maximum Power Dissipation	TC =25°C	125	W
$R_{\theta Jc}$	Thermal Resistance Junction−to−Case (Note3)		1	°C/W

40V/120A N-Channel Advanced Power MOSFET

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain- Source Breakdown Voltage	VGS=0V ID=250μA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain current	VDS=40V,VGS=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	1	1.5	2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance (Note4)	VGS=10V, ID=30A	--	2.1	3.3	mΩ
		VGS=4.5V, ID=20A	--	3.2	4.5	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note5)						
C_{iss}	Input Capacitance	VDS=20V, VGS=0V, F=1MHz	--	7110	--	pF
C_{oss}	Output Capacitance		--	483	--	pF
C_{rss}	Reverse Transfer Capacitance		--	466	--	pF
Q_g	Total Gate Charge	VDS=20V, ID=30A, VGS=10V	--	130	--	nC
Q_{gs}	Gate-Source Charge		--	22	--	nC
Q_{gd}	Gate-Drain Charge		--	29	--	nC
Switching Characteristics (Note5)						
$t_{d(on)}$	Turn-on Delay Time	VDD=20V, ID=30A, VGS=10V, RG=3Ω, RL=1 Ω	--	17.2	--	nS
t_r	Turn-on Rise Time		--	40	--	nS
$t_{d(off)}$	Turn-off Delay Time		--	120	--	nS
t_f	Turn-off Fall Time		--	35	--	nS
Source- Drain Diode Characteristics@ TJ = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	IS=30A,VGS=0V	--	--	1.2	V
t_{rr}	Reverse Recovery Time	IF=30A, di/dt=100A/us	--	23.6	--	ns
Q_{rr}	Reverse Recovery Charge		--	13	--	nc

Note:

1. Limited by TJmax, starting TJ = 25° C, RG = 25Ω, VD =20V, VGS =10V. Part not recommended for use above this value.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. Surface Mounted on FR4 Board, t ≤ 10 sec.
4. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
5. Guranteed by design, not subject to production testing.

40V/120A N-Channel Advanced Power MOSFET

Typical Characteristics

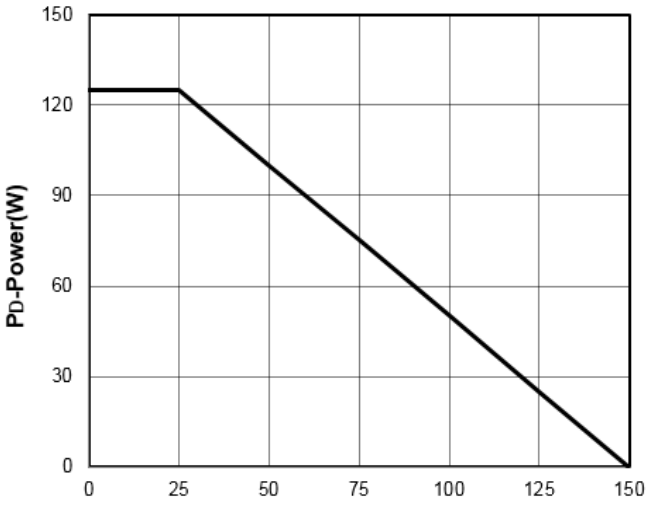


Figure1：T_{J-} Junction Temperature（°C）

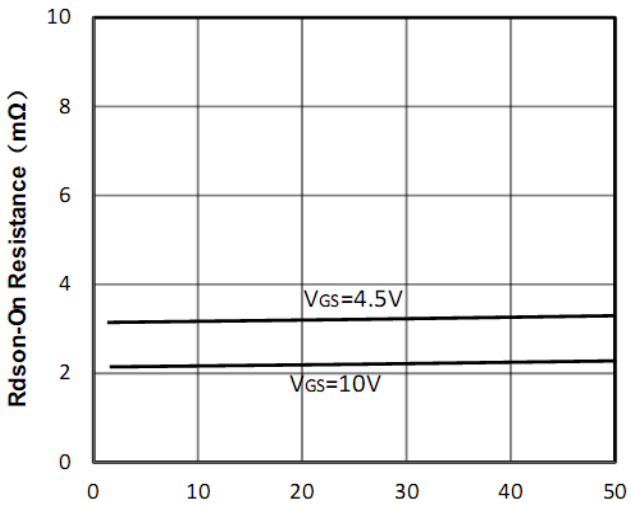


Figure2：I_{D-} Drain Current（A）

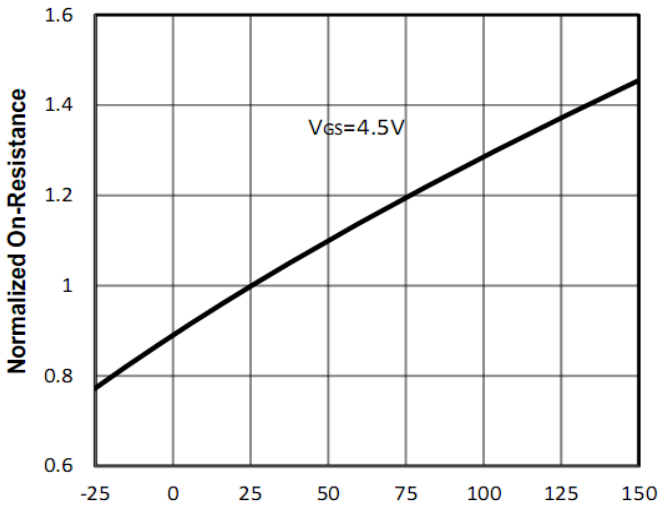


Figure3：T_{J-} Junction Temperature（°C）

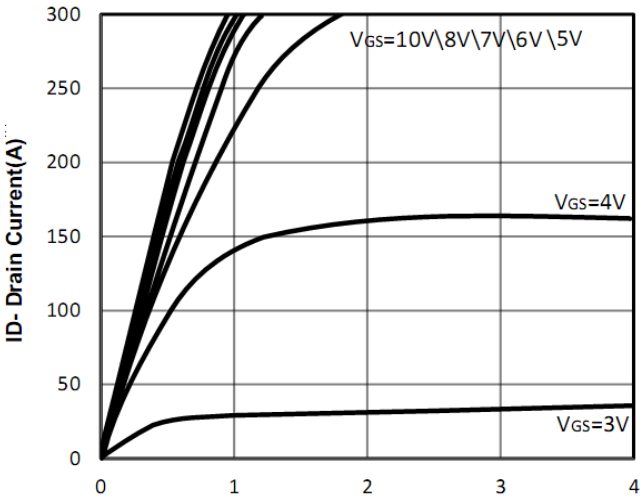


Figure4：V_{DS-} Drain-Source Voltage（V）

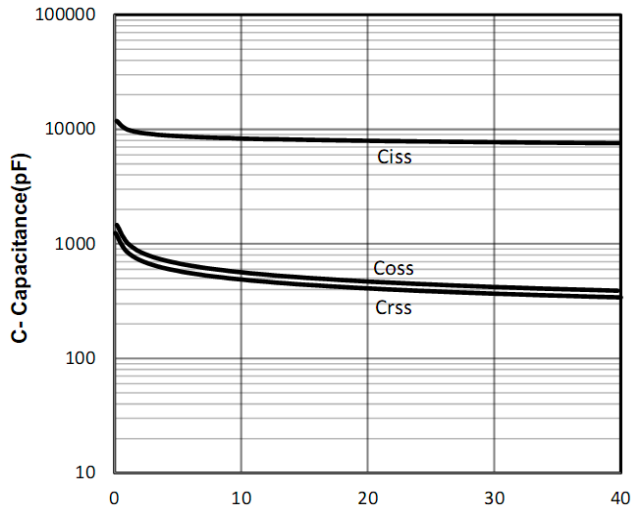


Figure5：V_{DS-} Drain-Source Voltage（V）

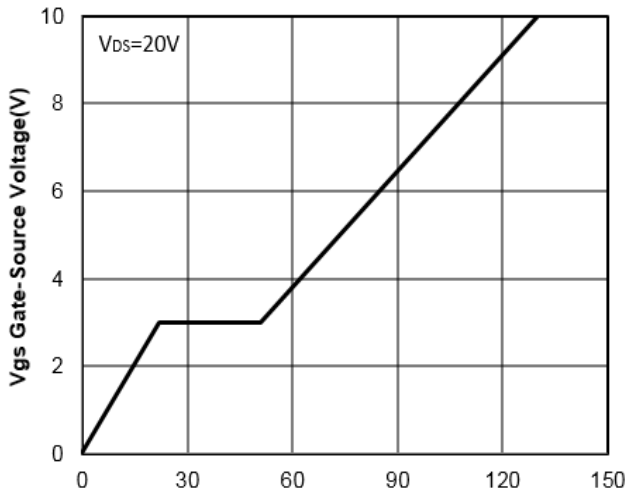


Figure6：Qg- Gate Charge（nC）

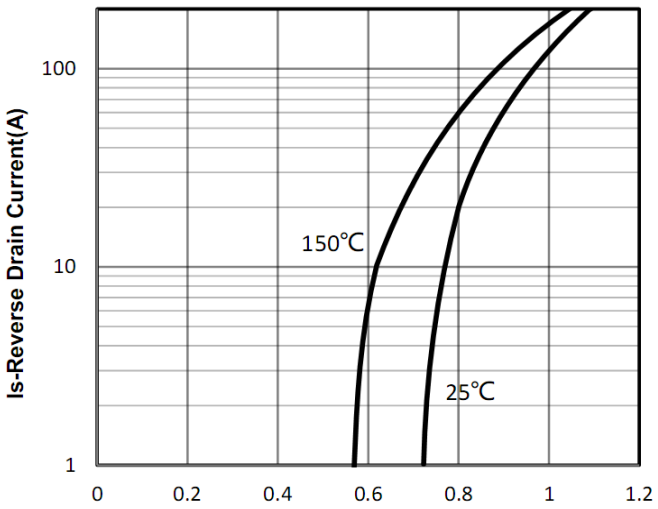


Figure7：Vsd- Source-Drain Voltage（V）

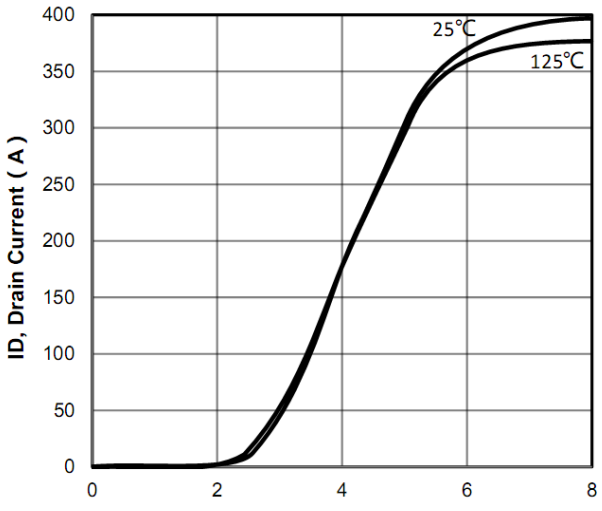


Figure8：VGS- Gate-Source Voltage（V）

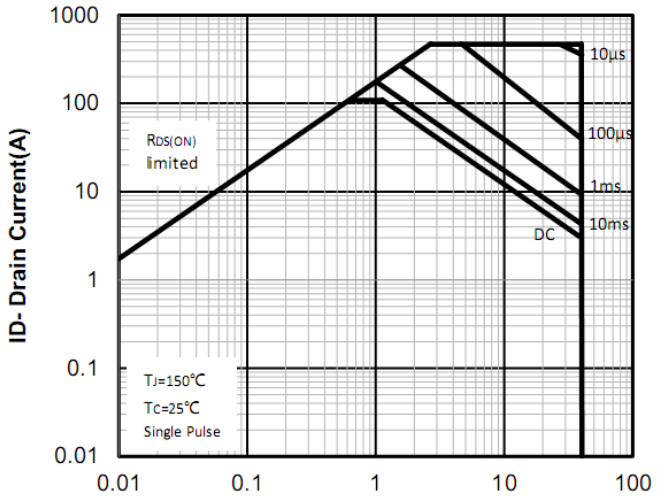


Figure9：VDS- Drain Source Voltage（V）

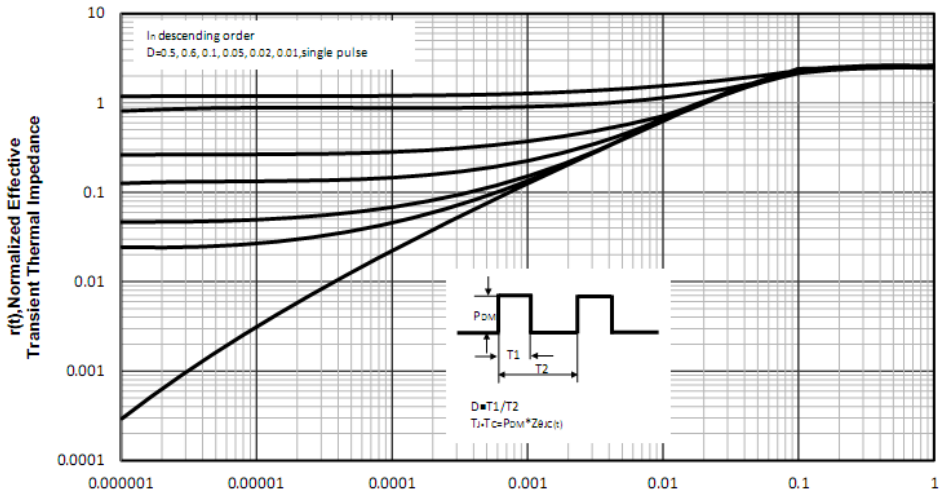


Figure10：Square Wave Pulse Duration（sec）

Test Circuit and Waveform:

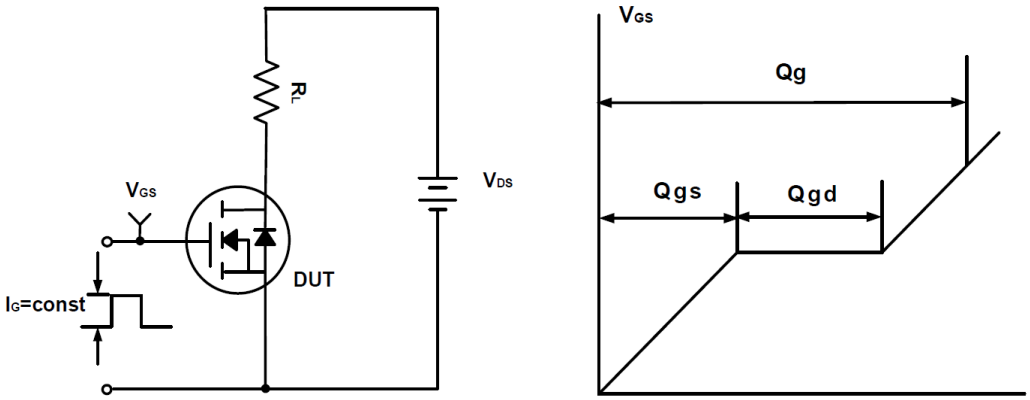


Figure A Gate Charge Test Circuit &Waveforms

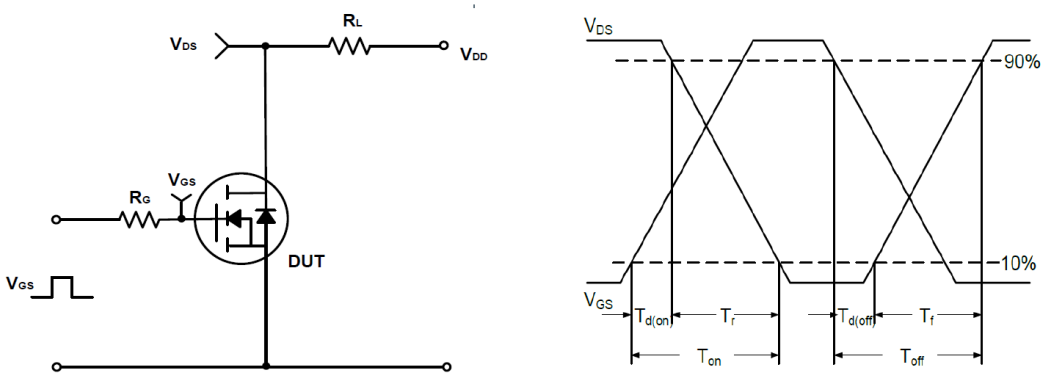


Figure B Switching Test Circuit & Waveforms

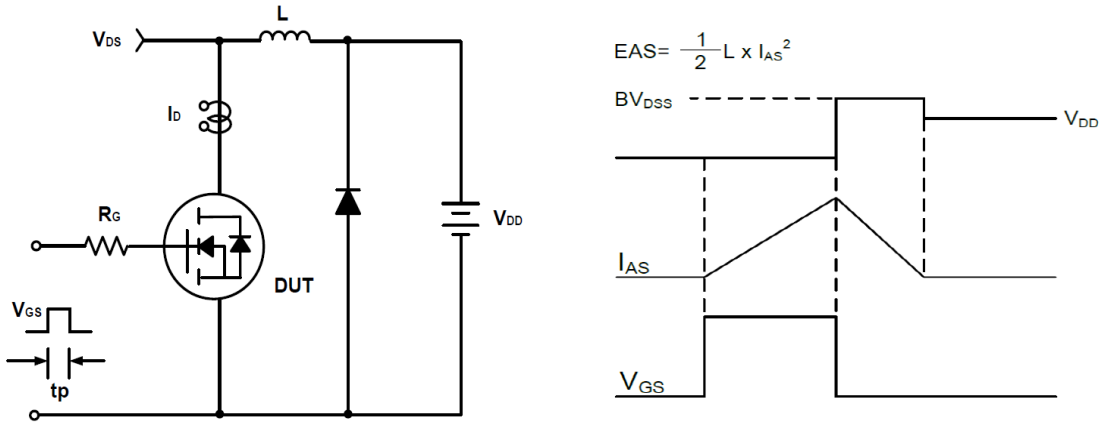
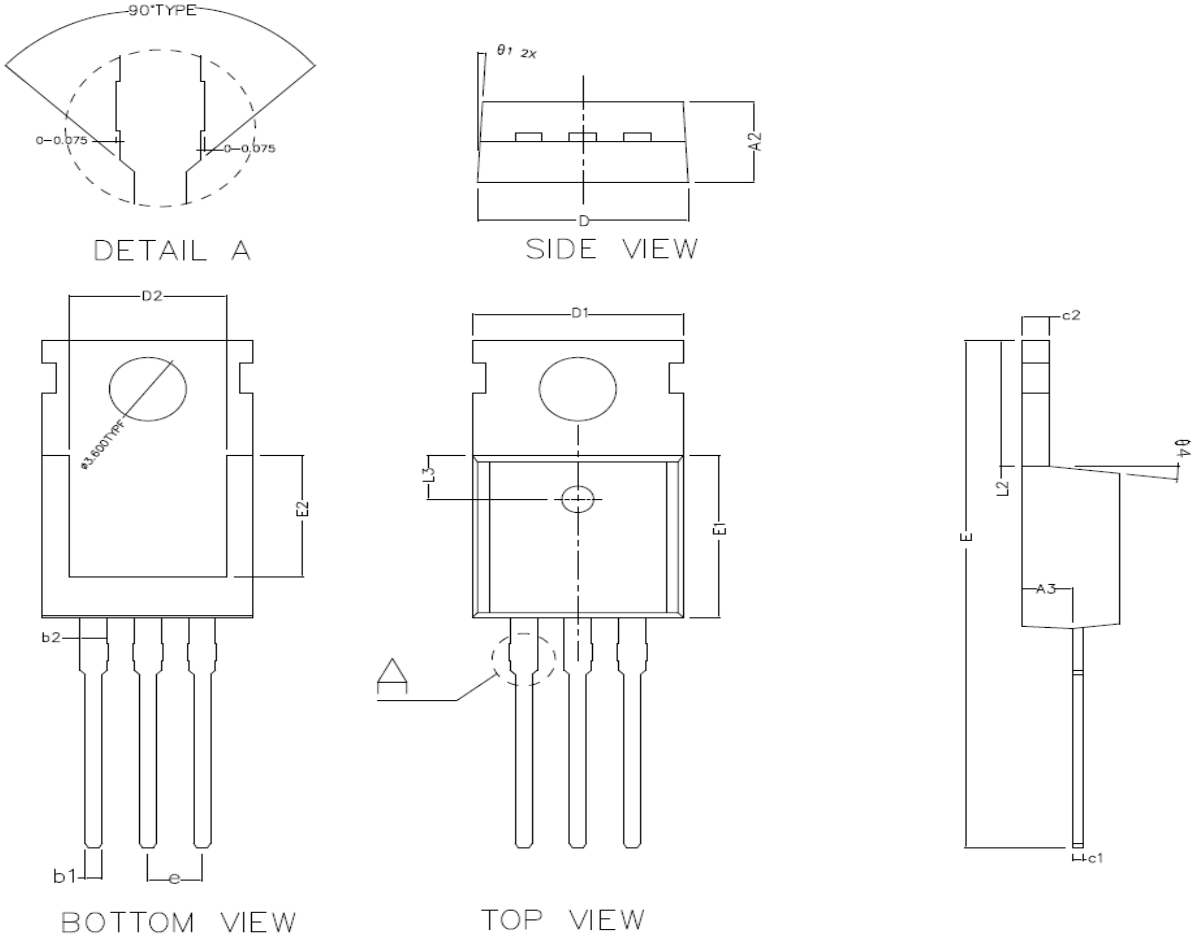


Figure C Unclamped Inductive Switching Circuit & Waveforms

40V/120A N-Channel Advanced Power MOSFET

TO-220 Package Outline Dimensions (Units: mm)



COMMON DIMENSIONS (UNITS OF MEASURE IS mm)			
	MIN	NORMAL	MAX
A2	4.470	4.570	4.670
A3	2.300	2.350	2.400
b1	0.750	0.800	0.850
b2		1.27 TYPE	
c1	0.450	0.500	0.550
c2	1.250	1.300	1.380
D	9.900	10.000	10.100
D1		10.000TYPE	
D2		8.000TYPE	
E	28.660	28.860	29.060
E1	9.000	9.100	9.200
E2		7.000TYPE	
e		2.540TYPE	
L2	6.350	6.500	6.650
L3		2.50TYPE	
θ1		3° TYPE	
θ2		3° TYPE	
θ3		7° TYPE	
θ4		7° TYPE	