



20V/7A Dual N-Channel Enhancement Mode MOSFET

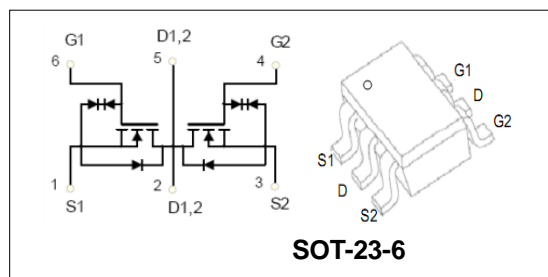
Features

- New technology for high voltage device.
- Low on-resistance and low conduction losses
- Small package
- Ultra Low Gate Charge cause lower driving requirements

| | | |
|----------------|----|----|
| BVDSS | 20 | V |
| ID | 7 | A |
| RDSON@VGS=4.5V | 12 | mΩ |
| RDSON@VGS=2.5V | 15 | mΩ |
| RDSON@VGS=1.8V | 23 | mΩ |

Applications

- Ideal for Li ion battery pack applications



Order Information

| Product | Package | Marking | Reel Size | Reel | Carton |
|---------|----------|---------|-----------|---------|-----------|
| PT8810A | SOT-23-6 | PT8810A | 7inch | 3000PCS | 180000PCS |

Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|--|--|--------------------|-------|
| Common Ratings (TC=25°C Unless Otherwise Noted) | | | |
| $V_{(BR)DSS}$ | Drain-Source Breakdown Voltage | 20 | V |
| V_{GS} | Gate-Source Voltage | ±12 | V |
| T_J | Maximum Junction Temperature | 150 | °C |
| T_{STG} | Storage Temperature Range | -55 to 150 | °C |
| I_S | Diode Continuous Forward Current | $T_A = 25^\circ C$ | 7 |
| Mounted on Large Heat Sink | | | |
| I_{DM} | Pulse Drain Current Tested (Silicon Limit) (Note1) | $T_A = 25^\circ C$ | 30 |
| I_D | Continuous Drain current | $T_A = 25^\circ C$ | 7 |
| P_D | Maximum Power Dissipation | $T_A = 25^\circ C$ | 0.6 |
| $R_{\theta Ja}$ | Thermal Resistance Junction-to-Ambient (Note2) | | 208.3 |

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| Symbol | Parameter | Condition | Min. | Typ. | Max. | Unit |
|--|--|--|------|------|------|------|
| Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| V _{(BR)DSS} | Drain- Source Breakdown Voltage | VGS=0V ID=250μA | 20 | -- | -- | V |
| I _{DSS} | Zero Gate Voltage Drain current | VDS=16V,VGS=0V | -- | -- | 1 | μA |
| I _{GSS} | Gate-Body Leakage Current | VGS=±8V,VDS=0V | -- | -- | ±10 | nA |
| V _{GS(TH)} | Gate Threshold Voltage | VDS=VGS,ID=250μA | 0.4 | 0.77 | 1.0 | V |
| R _{DS(ON)} | Drain-Source On-State Resistance (Note3) | VGS=4.5V, ID=6.6A | -- | 12 | 22 | mΩ |
| | | VGS=2.5V, ID=5.5A | -- | 15 | 26 | |
| | | VGS=1.8V, ID=5A | -- | 23 | 35 | |
| Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note4) | | | | | | |
| C _{iss} | Input Capacitance | VDS=10V, VGS=0V, F=1MHz | -- | 1150 | -- | pF |
| C _{oss} | Output Capacitance | | -- | 185 | -- | pF |
| C _{rss} | Reverse Transfer Capacitance | | -- | 145 | -- | pF |
| Q _g | Total Gate Charge | VDS=10V, ID=7A, VGS=4.5V | -- | 15 | -- | nC |
| Q _{gs} | Gate-Source Charge | | -- | 0.8 | -- | nC |
| Q _{gd} | Gate-Drain Charge | | -- | 3.2 | -- | nC |
| Switching Characteristics (Note4) | | | | | | |
| t _{d(on)} | Turn-on Delay Time | VDD=10V, RL=1.35Ω, VGS=5V RG=3Ω | -- | 6 | -- | nS |
| t _r | Turn-on Rise Time | | -- | 13 | -- | nS |
| t _{d(off)} | Turn-off Delay Time | | -- | 52 | -- | nS |
| t _f | Turn-off Fall Time | | -- | 16 | -- | nS |
| Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated) | | | | | | |
| V _{SD} | Forward on voltage | IS=1A,VGS=0V | -- | -- | 1 | V |
| t _{rr} | Reverse Recovery Time | I _F =20A dI/dt=100A/us | -- | -- | -- | nS |
| Q _{rr} | Reverse Recovery Charge | | -- | -- | -- | nC |

Note:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: pulse width ≤ 300 us, duty cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.



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Typical Characteristics

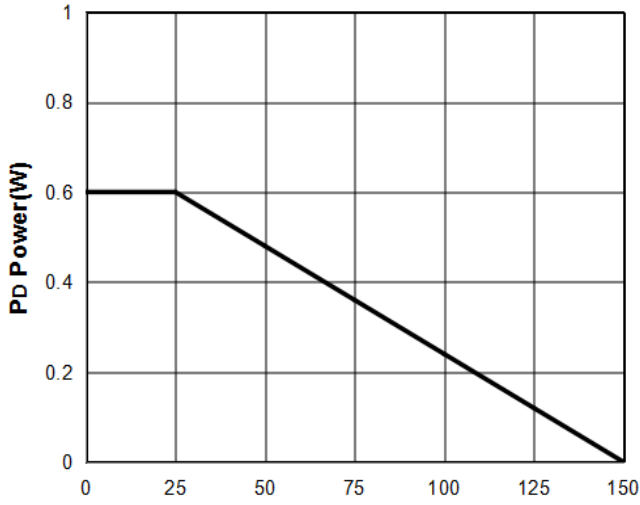


Figure1: Tj Junction Temperature (°C)

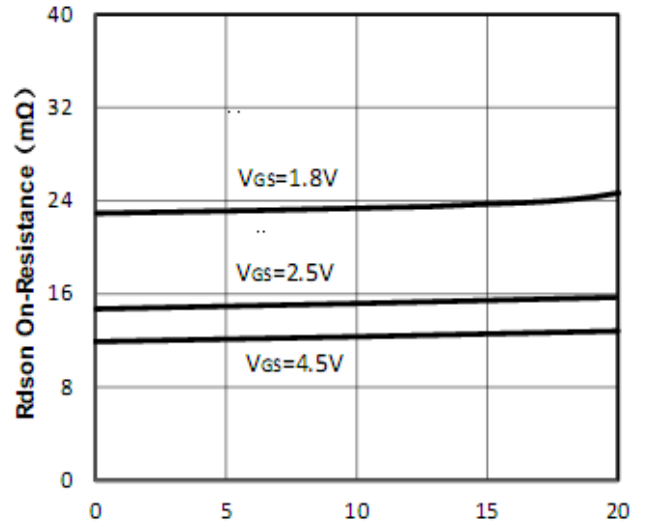


Figure2: Id Drain Current (A)

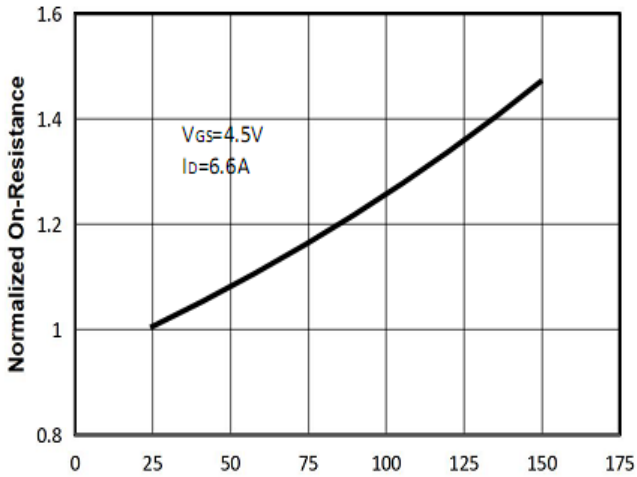


Figure3: Tj Junction Temperature (°C)

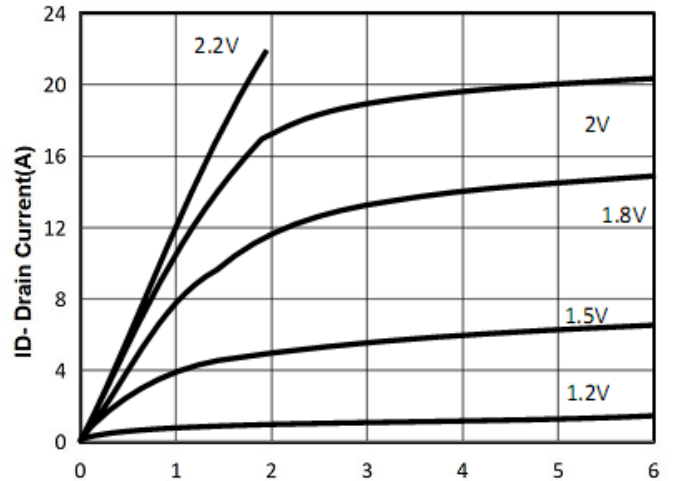


Figure4: Vds Drain-Source Voltage (V)

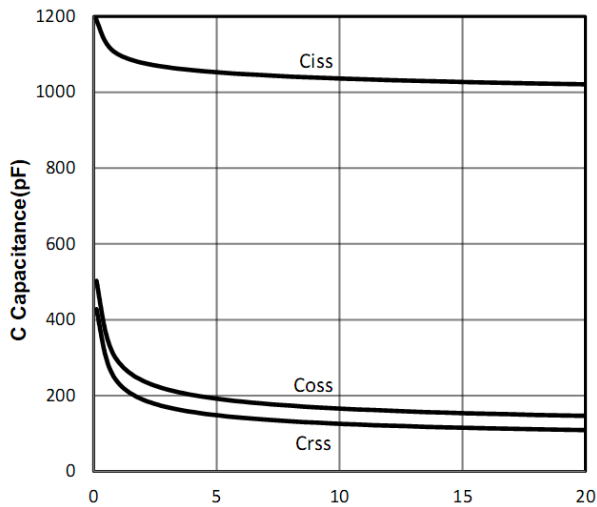


Figure5: Vds Draun-Source Voltage (V)

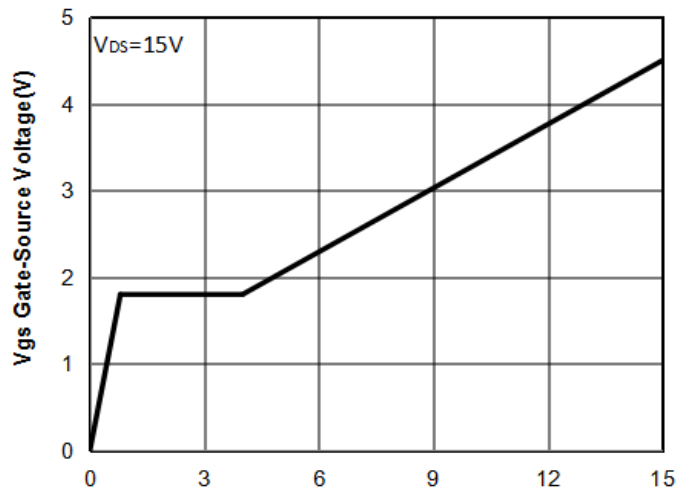


Figure6: Qg Gate Charge (nC)



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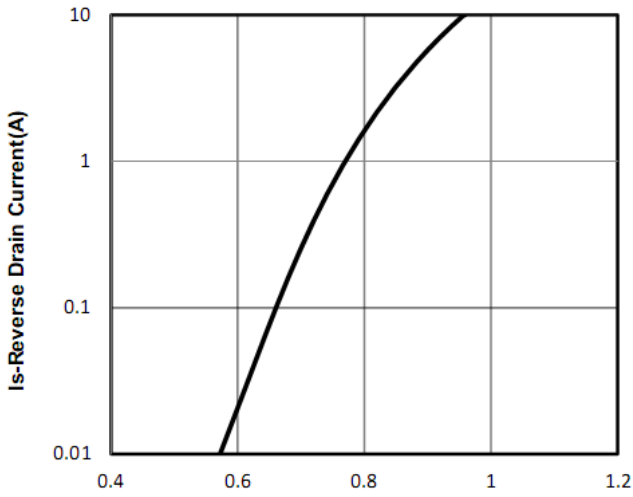


Figure7: Vsd Source-Drain Voltage (V)

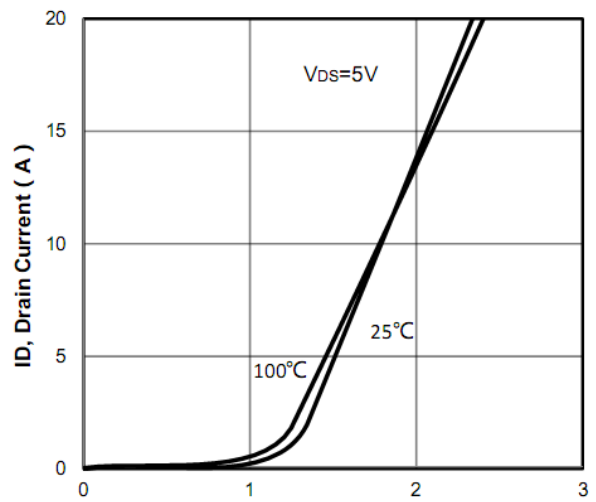


Figure8: Vgs Gate-Source Voltage (V)

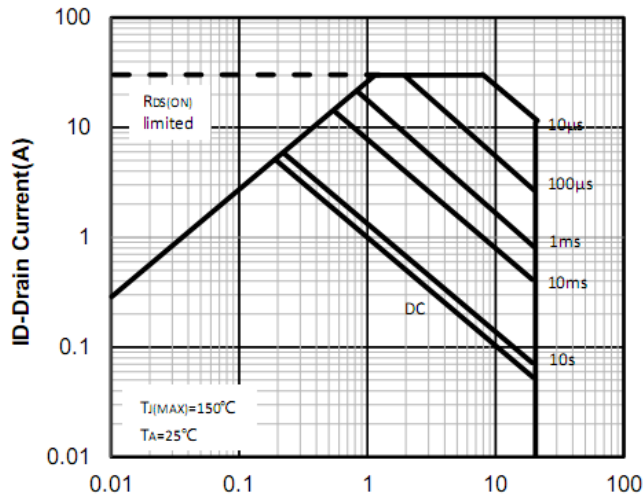


Figure9: VDS Drain-Source Voltage (V)

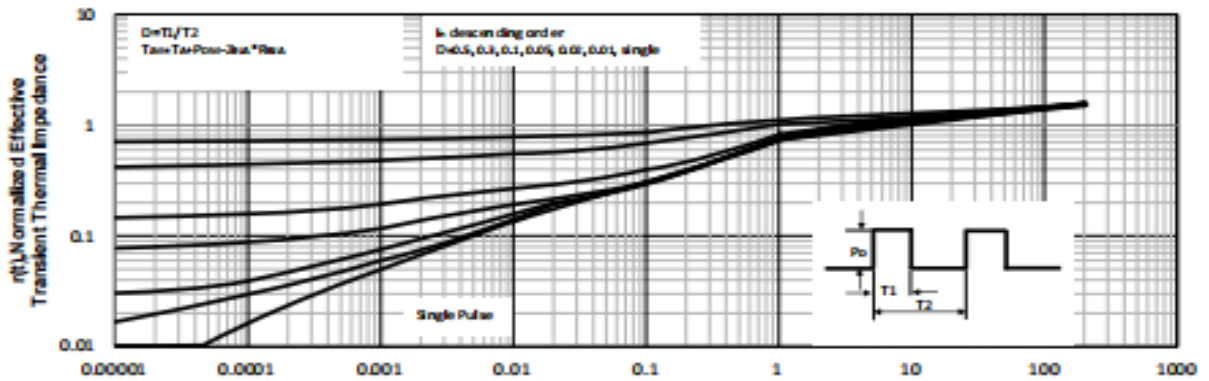
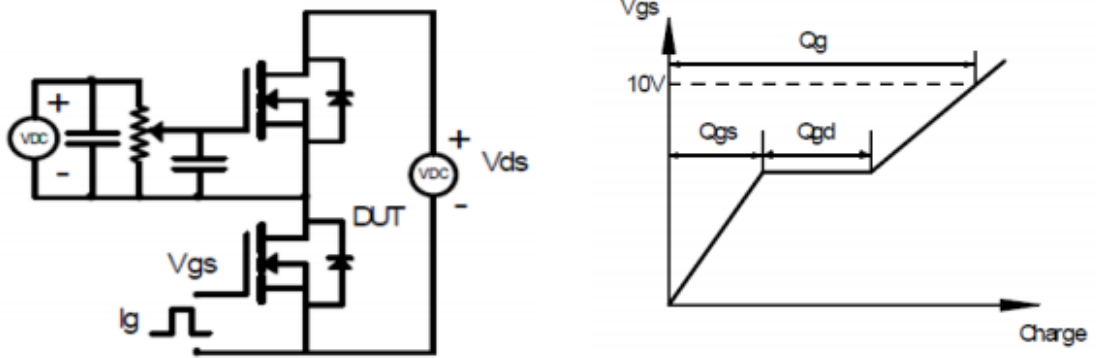
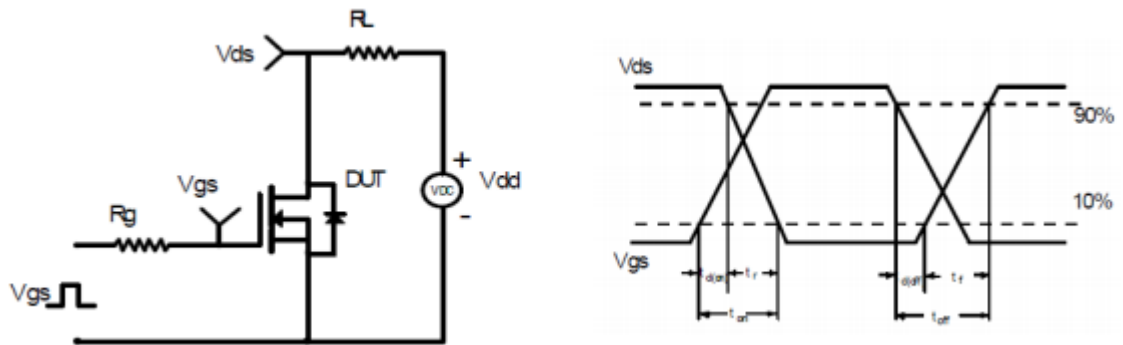
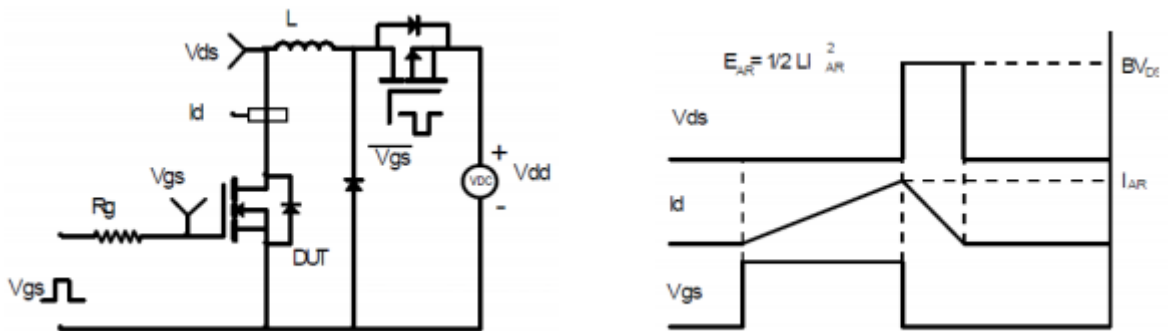


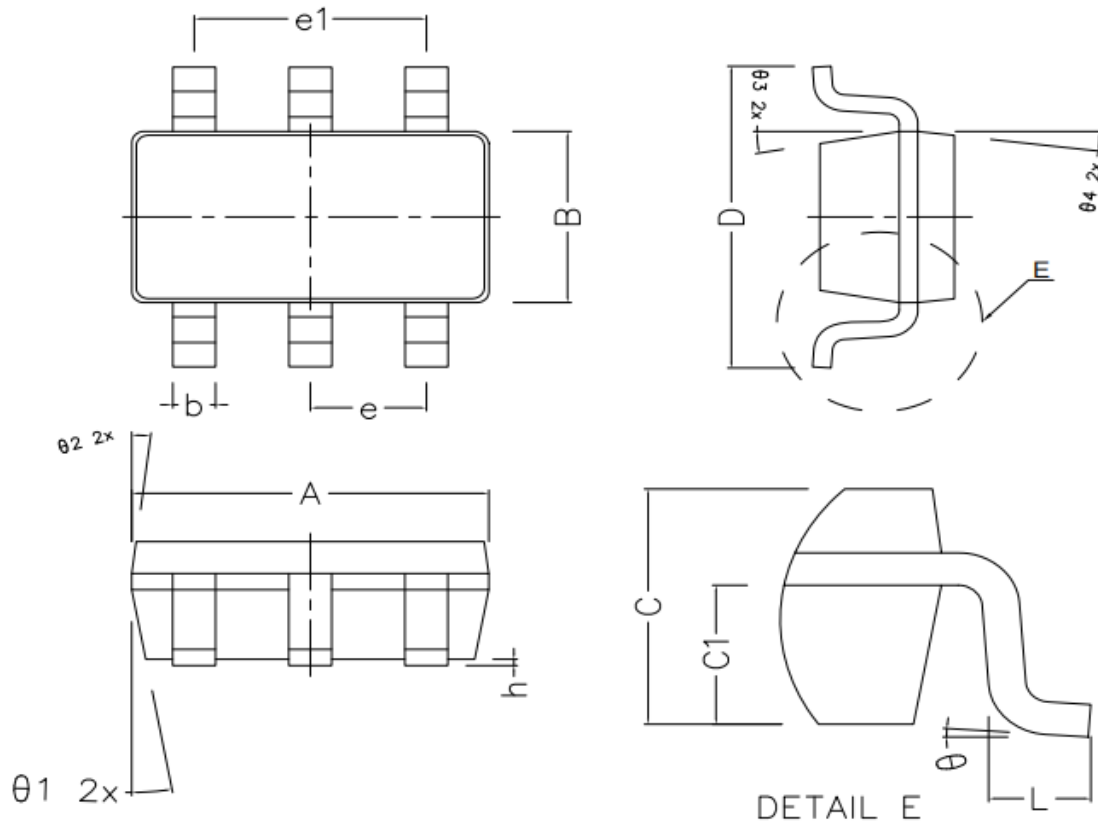
Figure10: Square Wave Pulse Duration (sec)

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Test Circuit and Waveform:

Figure A Gate Charge Test Circuit & Waveforms

Figure B Switching Test Circuit & Waveforms

Figure C Unclamped Inductive Switching Circuit & Waveforms



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SOT-23-6L Package Outline Dimensions (Units: mm)



| COMMON DIMENSIONS (UNITS OF MEASURE IS mm) | | | |
|---|-----------|--------|-------|
| | MIN | NORMAL | MAX |
| A | 2.820 | 2.920 | 3.020 |
| B | 1.500 | 1.600 | 1.700 |
| C | 1.050 | 1.100 | 1.150 |
| C1 | 0.600 | 0.650 | 0.700 |
| D | 2.650 | 2.800 | 2.950 |
| L | 0.300 | 0.450 | 0.600 |
| b | 0.280 | 0.350 | 0.420 |
| h | 0.020 | 0.050 | 0.100 |
| K | 0.120 | — | 0.230 |
| e | 0.950TYPE | | |
| e1 | 1.900TYPE | | |
| theta1 | 10° TYPE | | |
| theta2 | 7° TYPE | | |
| theta3 | 10° TYPE | | |
| theta4 | 7° TYPE | | |
| theta | 0° ~ 8° | | |