

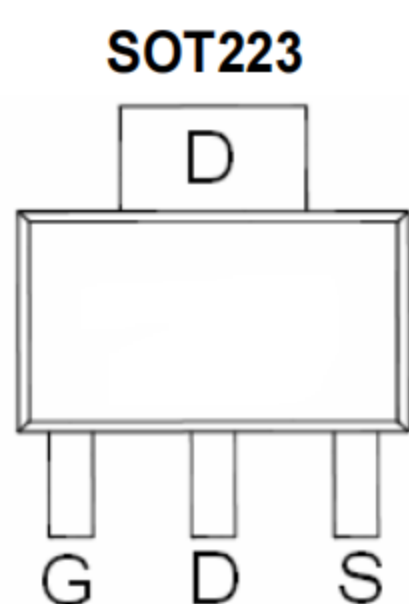
GENERAL FEATURES

- $V_{DS} = 200V$
- $I_D = 1.0 A$ @ $V_{GS} = 10V$
- $R_{DS(ON)} \leq 1.35\Omega$ @ $V_{GS} = 10V$
- SOT-223 package.

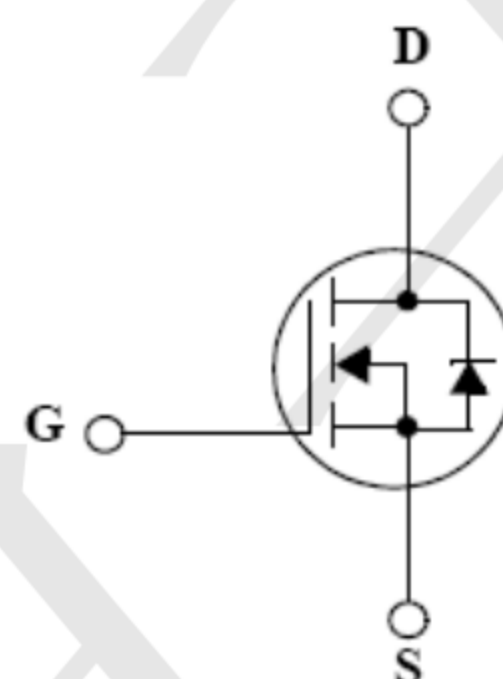
Application

- Power Supply
- PFC
- LED TV

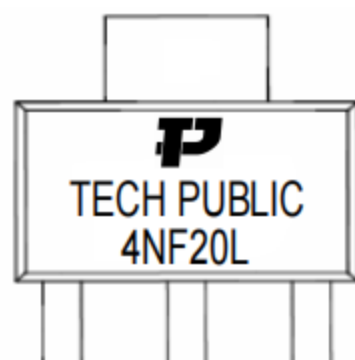
Package and Pin Configuration



Circuit diagram



Marking:



ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ C$ unless otherwise noted

| Characteristics | Symbol | Rating | Unit |
|--|----------------|---------------------------|------------|
| Drain-Source Voltage | V_{DSS} | 200 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| Continuous Drain Current | I_D | $T_C = 25^\circ C$ | 1.0 |
| | | $T_C = 100^\circ C$ | 0.54 |
| Pulsed Drain Current ⁽¹⁾ | I_{DM} | 3.4 | A |
| Power Dissipation | P_D | $T_C = 25^\circ C$ | 2.1 |
| | | Derate above $25^\circ C$ | 0.017 |
| Peak Diode Recovery dv/dt ⁽³⁾ | Dv/dt | 5.5 | V/ns |
| Repetitive Pulse Avalanche Energy ⁽⁴⁾ | E_{AR} | 0.21 | mJ |
| Avalanche current ⁽¹⁾ | I_{AR} | 0.85 | A |
| Single Pulse Avalanche Energy ⁽⁴⁾ | E_{AS} | 52 | mJ |
| Junction and Storage Temperature Range | T_J, T_{stg} | -55~150 | $^\circ C$ |

Thermal Characteristics

| Characteristics | Symbol | Rating | Unit |
|---|-----------------|--------|--------------|
| Thermal Resistance, Junction-to-Ambient * | $R_{\theta JA}$ | 60 | $^\circ C/W$ |

Electrical Characteristics $T_A = 25^\circ\text{C}$ unless otherwise noted

| Characteristics | Symbol | Test Condition | Min | Typ | Max | Unit |
|--|--------------|---|-----|------|------|---------------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$ | 200 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ | 1.0 | 1.6 | 2.0 | |
| Drain Cut-Off Current | I_{DSS} | $V_{DS} = 200\text{V}, V_{GS} = 0\text{V}$ | - | - | 1 | μA |
| Gate Leakage Current | I_{GSS} | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ | - | - | 100 | nA |
| Drain-Source ON Resistance | $R_{DS(ON)}$ | $V_{GS} = 10\text{V}, I_D = 0.425\text{A}$ | - | 0.9 | 1.35 | Ω |
| Forward Transconductance | g_{fs} | $V_{DS} = 30\text{V}, I_D = 0.425\text{A}$ | - | 1.3 | - | S |
| Dynamic Characteristics | | | | | | |
| Total Gate Charge | Q_g | $V_{DS} = 160\text{V}, I_D = 3.8\text{A}, V_{GS} = 5\text{V}$ | - | 3.2 | - | nC |
| Gate-Source Charge | Q_{gs} | | - | 0.64 | - | |
| Gate-Drain Charge | Q_{gd} | | - | 1.6 | - | |
| Input Capacitance | C_{iss} | $V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ | - | 148 | - | pF |
| Reverse Transfer Capacitance | C_{rss} | | - | 11.3 | - | |
| Output Capacitance | C_{oss} | | - | 42.7 | - | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{GS} = 5\text{V}, V_{DS} = 100\text{V}, I_D = 3.8\text{A}, R_G = 25\Omega$ | - | 6 | - | ns |
| Rise Time | t_r | | - | 38 | - | |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 11 | - | |
| Fall Time | t_f | | - | 13 | - | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Maximum Continuous Drain to Source Diode Forward Current | I_S | | - | 1.0 | - | A |
| Source-Drain Diode Forward Voltage | V_{SD} | $I_S = 0.85\text{A}, V_{GS} = 0\text{V}$ | - | - | 1.5 | V |
| Body Diode Reverse Recovery Time | t_{rr} | $I_F = 3.8\text{A}, di/dt = 100\text{A}/\mu\text{s}^{(3)}$ | - | 90 | - | ns |
| Body Diode Reverse Recovery Charge | Q_{rr} | | - | 0.24 | - | μC |

Typical Electrical and Thermal Characteristics

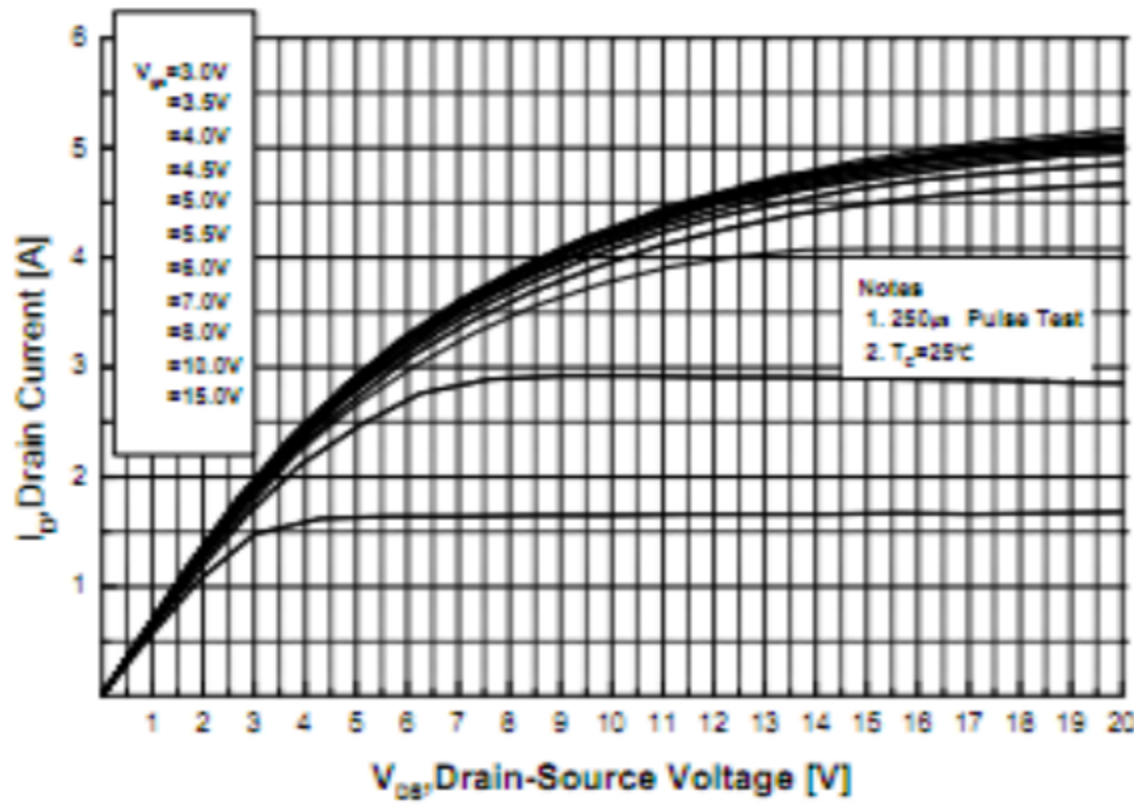


Fig.1 On-Region Characteristics

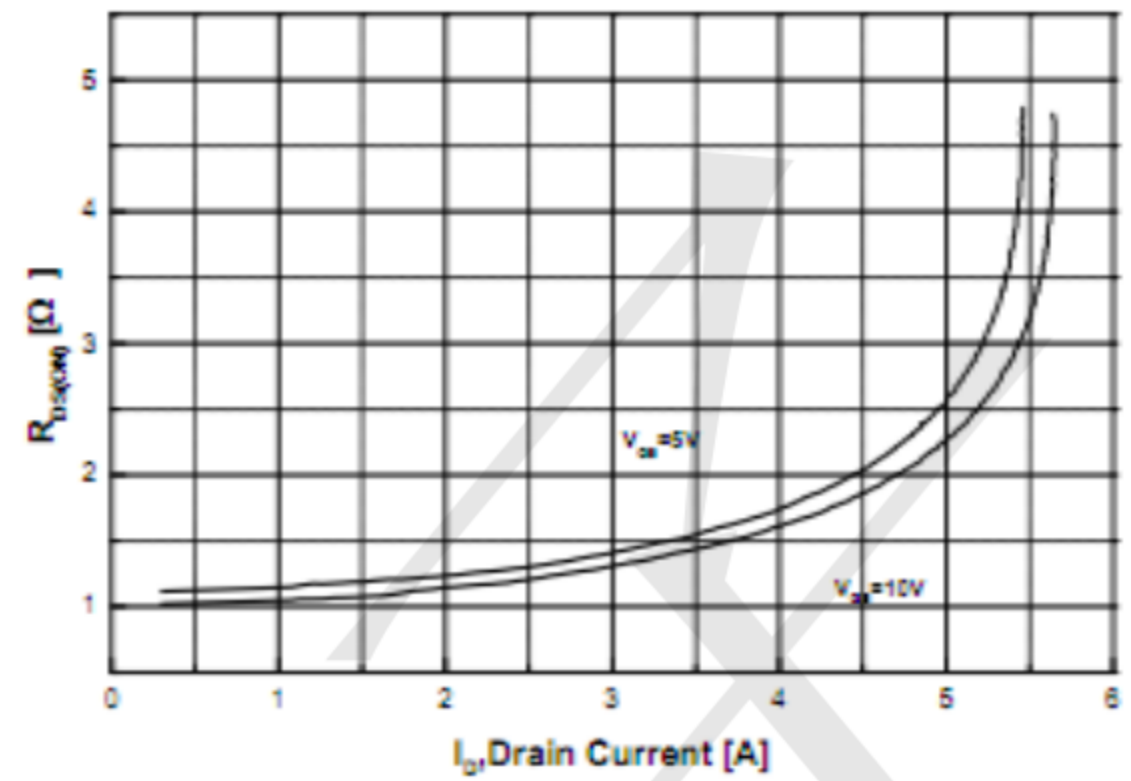


Fig.2 On-Resistance Variation with Drain Current and Gate Voltage

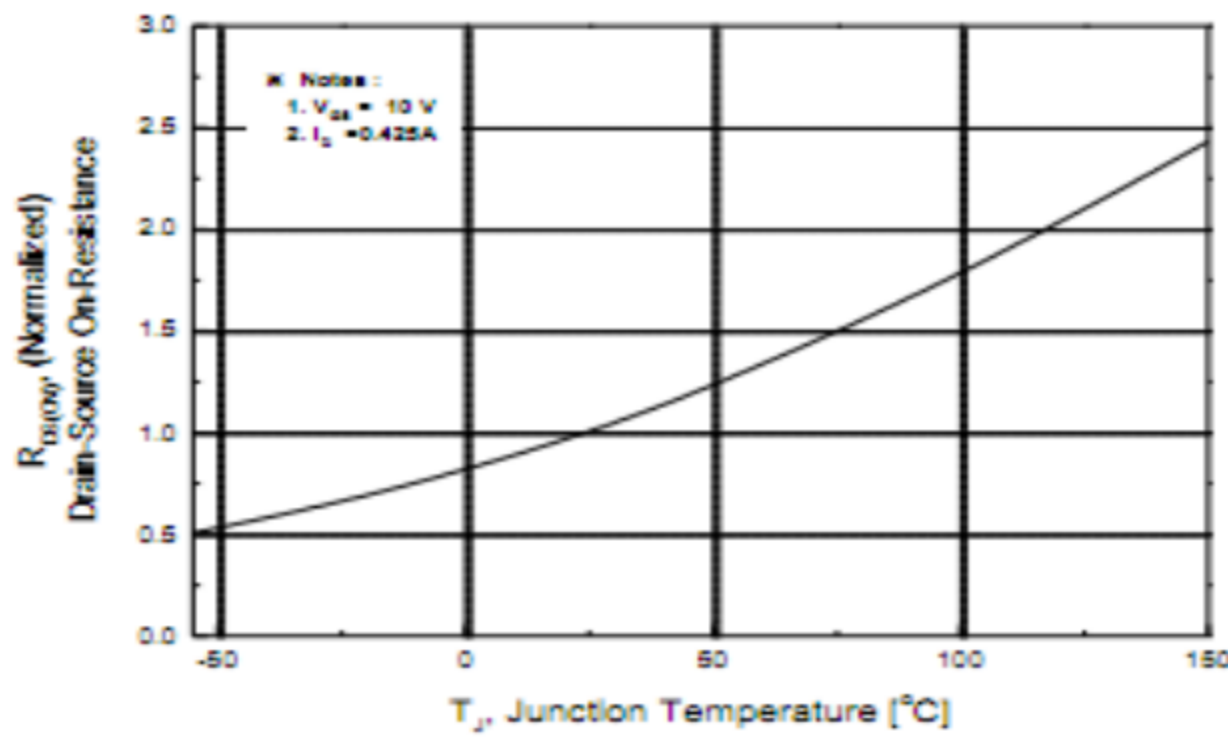


Fig.3 On-Resistance Variation with Temperature

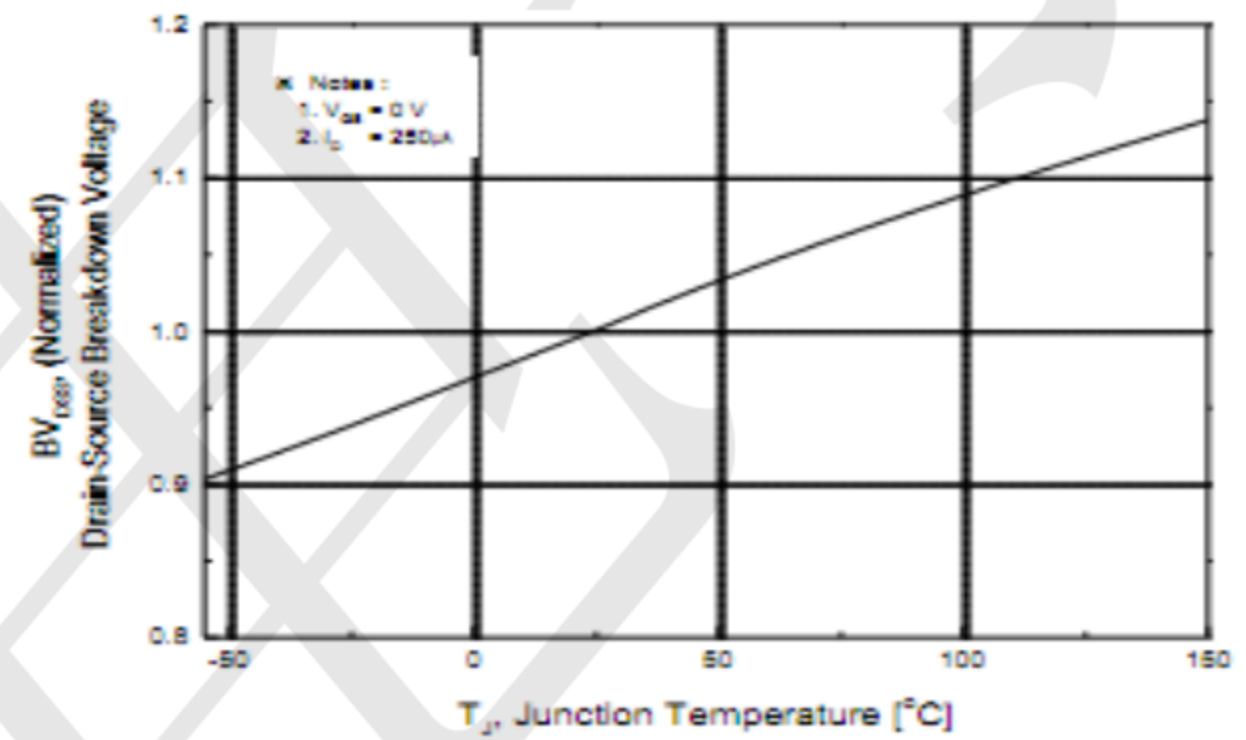


Fig.4 Breakdown Voltage Variation vs. Temperature

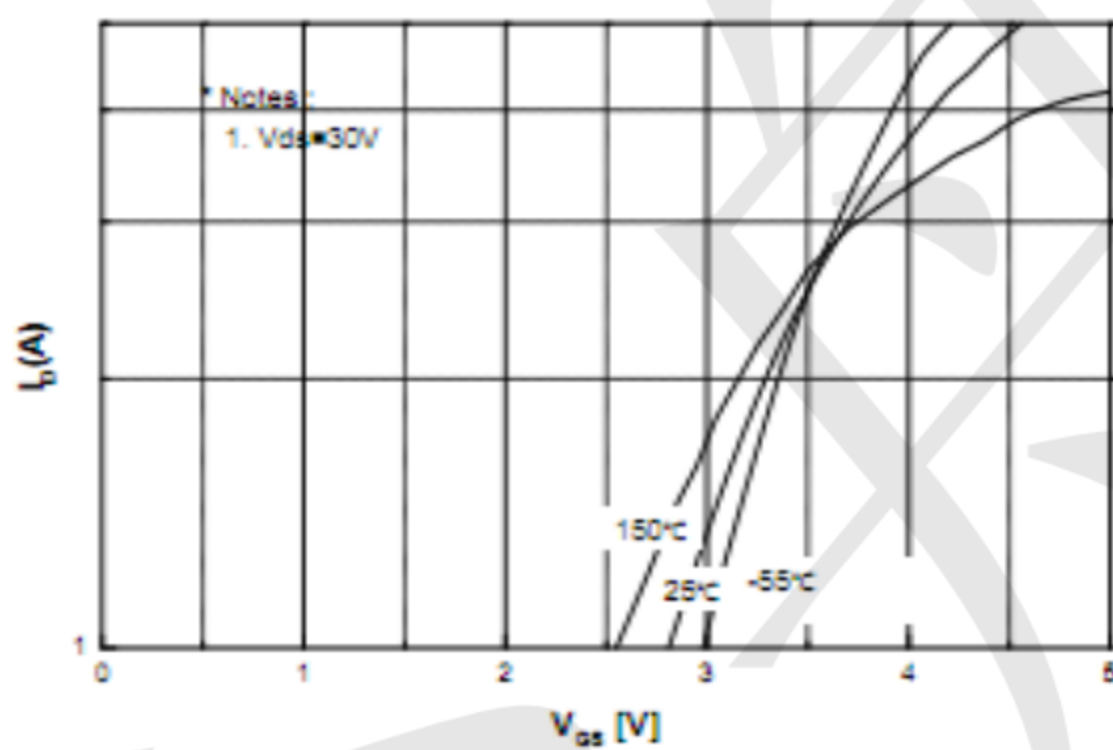


Fig.5 Transfer Characteristics

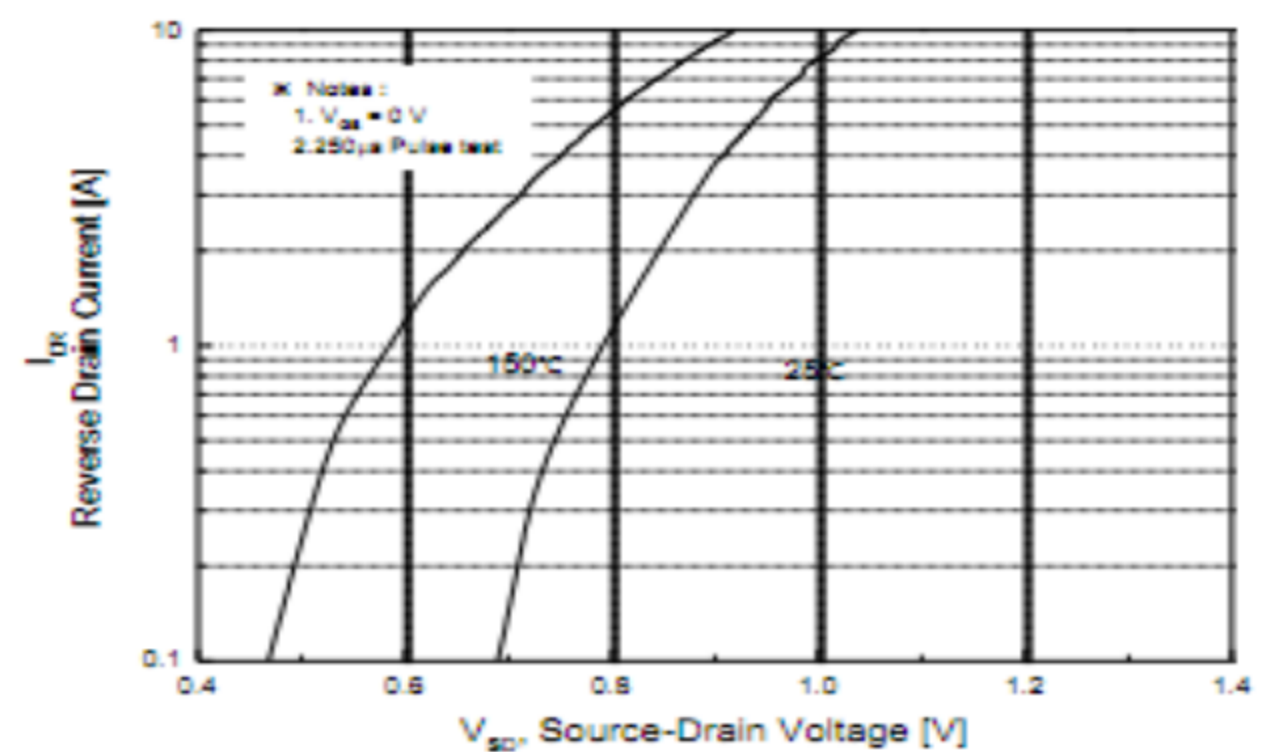


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature

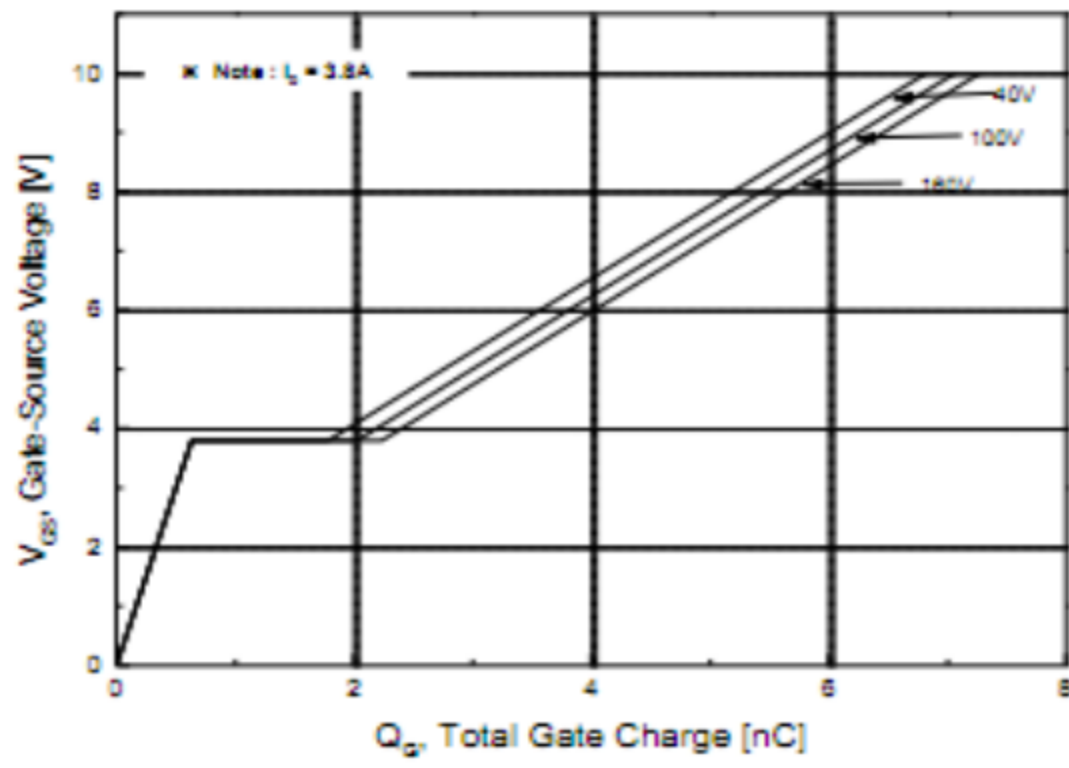


Fig.7 Gate Charge Characteristics

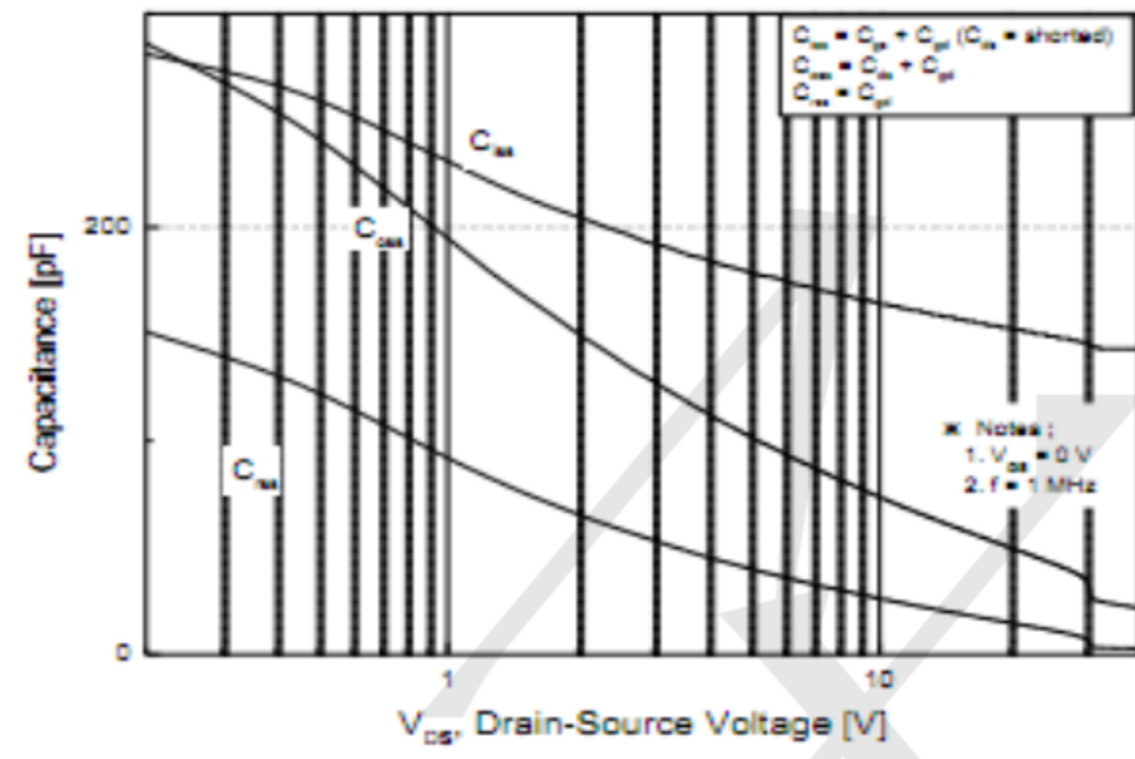


Fig.8 Capacitance Characteristics

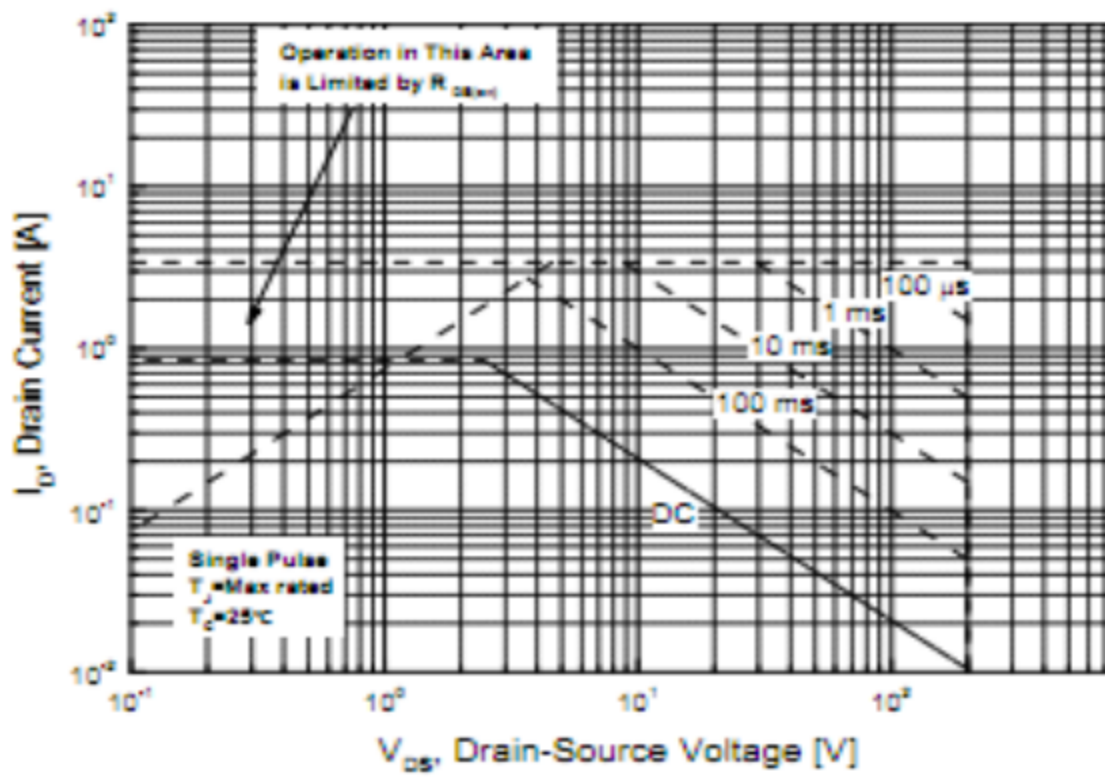


Fig.9 Maximum Safe Operating Area

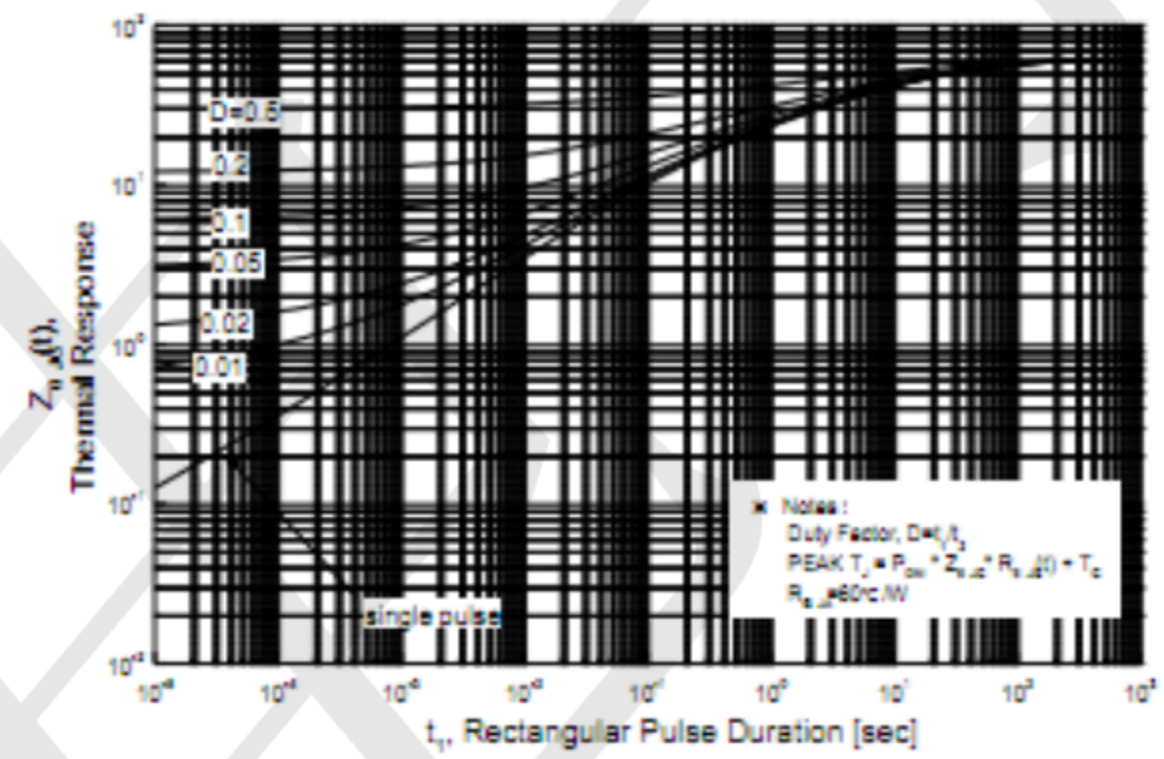


Fig.10 Transient Thermal Response Curve

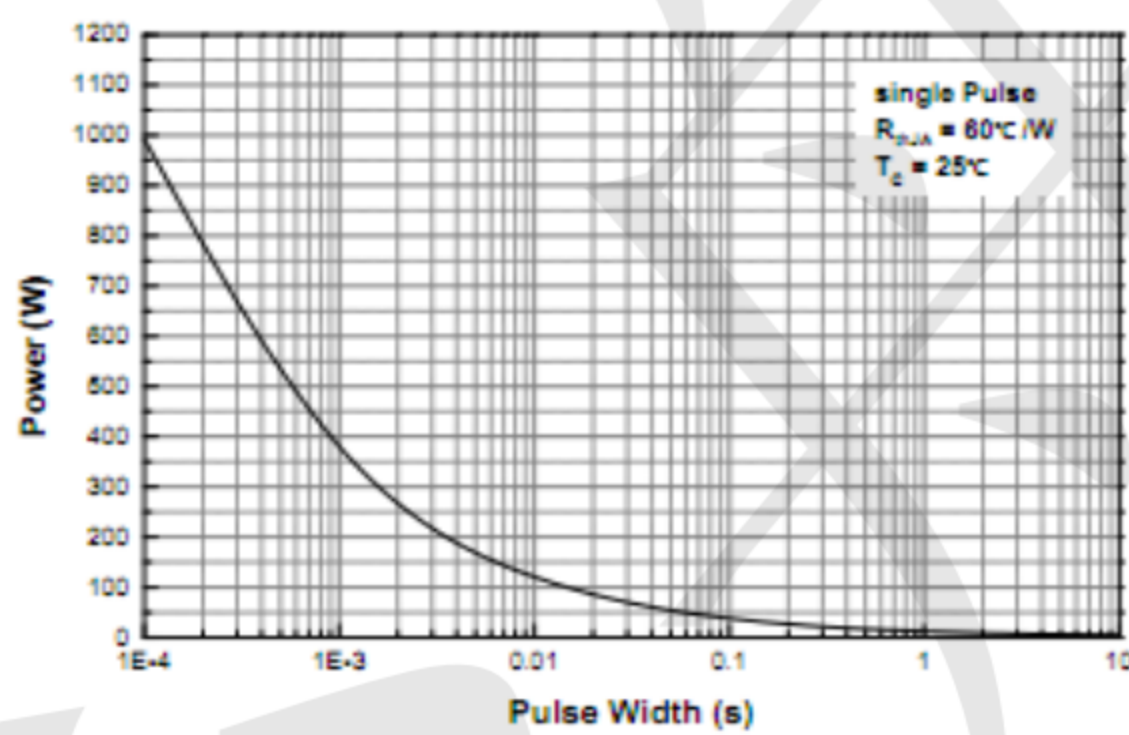


Fig.11 Single Pulse Maximum Power Dissipation

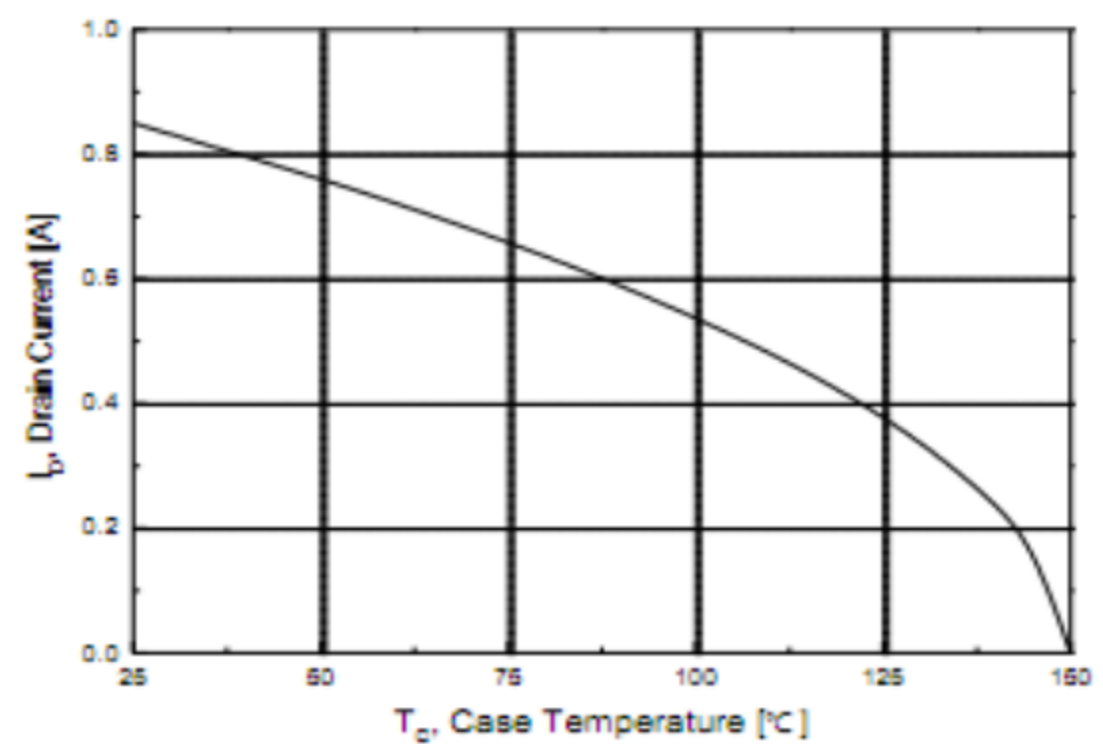
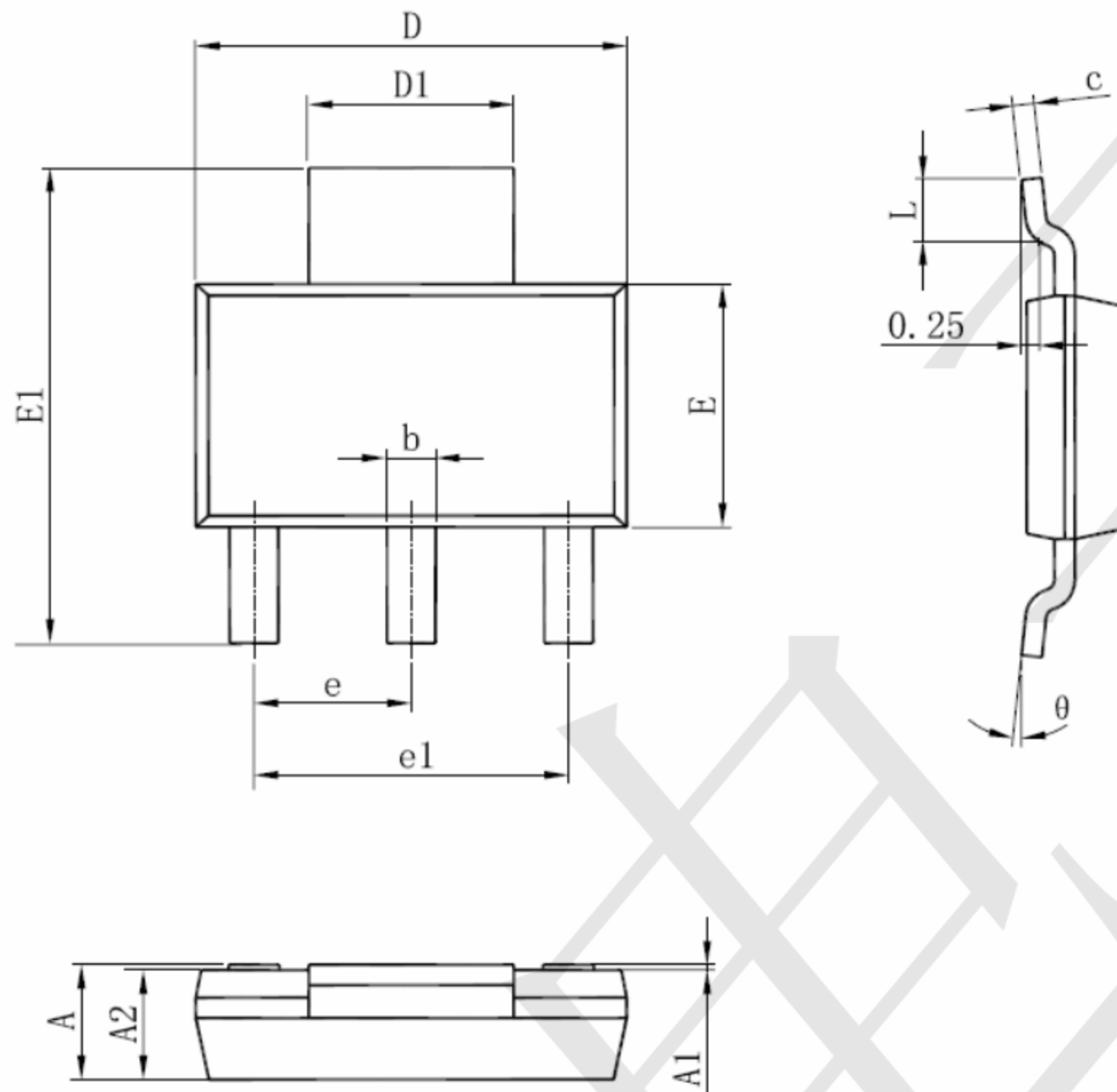


Fig.12 Maximum Drain Current vs. Case Temperature



SOT-223 Package Information



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.520 | 1.800 | 0.060 | 0.071 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.500 | 1.700 | 0.059 | 0.067 |
| b | 0.660 | 0.820 | 0.026 | 0.032 |
| c | 0.250 | 0.350 | 0.010 | 0.014 |
| D | 6.200 | 6.400 | 0.244 | 0.252 |
| D1 | 2.900 | 3.100 | 0.114 | 0.122 |
| E | 3.300 | 3.700 | 0.130 | 0.146 |
| E1 | 6.830 | 7.070 | 0.269 | 0.278 |
| e | 2.300(BSC) | | 0.091(BSC) | |
| e1 | 4.500 | 4.700 | 0.177 | 0.185 |
| L | 0.900 | 1.150 | 0.035 | 0.045 |
| θ | 0° | 10° | 0° | 10° |