



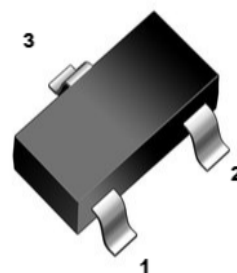
1. Features

- Surface Mount Package
- High Density Cell Design for Extremely Low RDS(ON)
- Voltage Controlled Small Signal Switch
- Rugged and Reliable

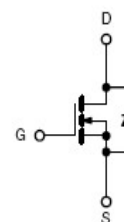
2. Mechanical Data

- Case:Molded Plastic,SOT-23 .
- Epoxy:UL 94V-0 rate flame retardant
- Terminals:Plated Leads Solderable perMIL-STD-750,Method-2026.
- Marking: 03N10
- Mounting Position : Any.

SOT-23



- 1 Gate
2 Source
3 Drain



3. Maximum Ratings and Electrical Characteristics

Rating at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Value | UNIT |
|--|-----------------|-----------|------|
| Drain-Source Voltage | V_{DS} | 100 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ^{1,2} | I_D | 3 | A |
| Drain Current-Pulsed($t_p=10\mu s$) | I_{DM} | 12 | A |
| Power Dissipation | P_D | 1.25 | W |
| Thermal Resistance from Junction to Ambient ^{1,2} | $R_{\theta JA}$ | 100 | °C/W |
| Junction Temperature | T_J | -55~ +150 | °C |
| Storage Temperature | T_{STG} | -55~ +150 | °C |

**4. Electrical Characteristics**

Rating at 25°C ambient temperature unless otherwise specified.

| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|--|-----------------------|--|-----|-------|------|-------|
| Off Characteristics | | | | | | |
| Drain-source breakdown voltage | V _{(BR) DSS} | V _{GS} = 0V, I _D =250μA | 100 | | | V |
| Zero gate voltage drain current | I _{DSS} | V _{DS} =80V, V _{GS} = 0V | | | 1 | μA |
| Gate-source leakage current | I _{GSS} | V _{GS} =±20V, V _{DS} = 0V | | | ±100 | nA |
| On characteristics ³ | | | | | | |
| Drain-source on-resistance | R _{DS(on)} | V _{GS} =10V, I _D =1A | | 110 | 140 | mΩ |
| | | V _{GS} =4.5V, I _D =1A | | 140 | 190 | mΩ |
| Forward tranconductance | g _{FS} | V _{DS} =5V, I _D =3A | | 5 | | S |
| Gate threshold voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250μA | 1 | 1.5 | 3.0 | V |
| Dynamic Characteristics | | | | | | |
| Input capacitance | C _{iss} | V _{DS} =45V, V _{GS} =0V, f =1MHz | | 142.4 | | pF |
| Output capacitance | C _{oss} | | | 56.18 | | pF |
| Reverse transfer capacitance | C _{rss} | | | 4.45 | | pF |
| Total gate charge | Q _g | V _{DS} =50V, V _{GS} =10V, I _D =1A | | 3.29 | | nC |
| Gate-source charge | Q _{gs} | | | 0.21 | | nC |
| Gate-drain charge | Q _{gd} | | | 1.06 | | nC |
| Switching Characteristics | | | | | | |
| Turn-on delay time | t _{d(on)} | V _{GS} =10V, V _{DD} =50V, R _G =19Ω, R _L =3Ω | | 6 | | ns |
| Turn-on rise time | t _r | | | 4 | | ns |
| Turn-off delay time | t _{d(off)} | | | 20 | | ns |
| Turn-off fall time | t _f | | | 4 | | ns |
| Source-drain diode characteristics and maximum ratings | | | | | | |
| Diode forward voltage ³ | V _{SD} | I _S =1A, V _{GS} =0V | | 0.8 | 1.2 | V |

Note :

1. $R_{\theta JA}$ is measured with the device mounted on 1 in2 FR4 board with 1oz. single side copper, in a still air environment with $T_A = 25^\circ C$.
2. $R_{\theta JA}$ is measured in the steady state
3. Pulse test : Pulse width $\leq 380\mu s$, duty cycle $\leq 2\%$.



5. Rating And Characteristic Curves

Fig1: Output Characteristics

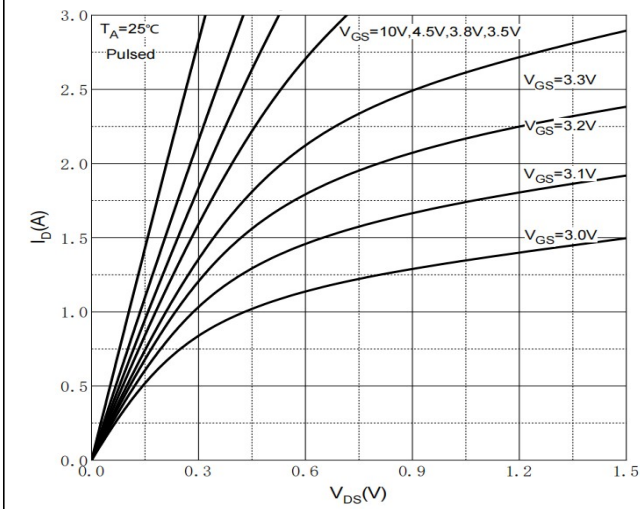


Fig2: Transfer Characteristics

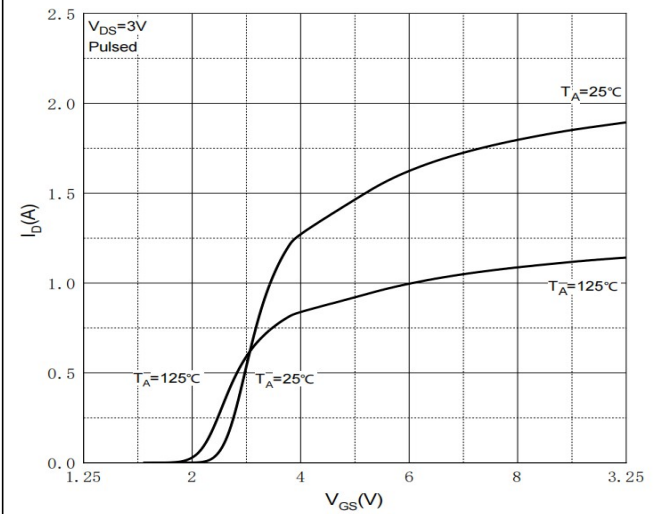


Fig.3 $R_{DS(on)}$ - I_D

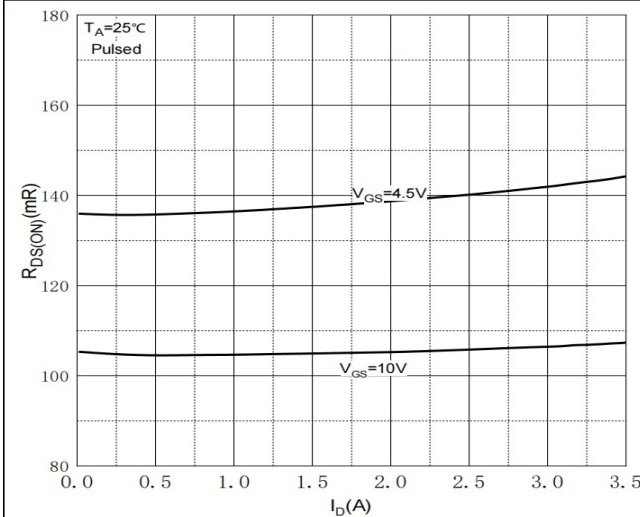


Fig.4 $R_{DS(on)}$ - V_{GS}

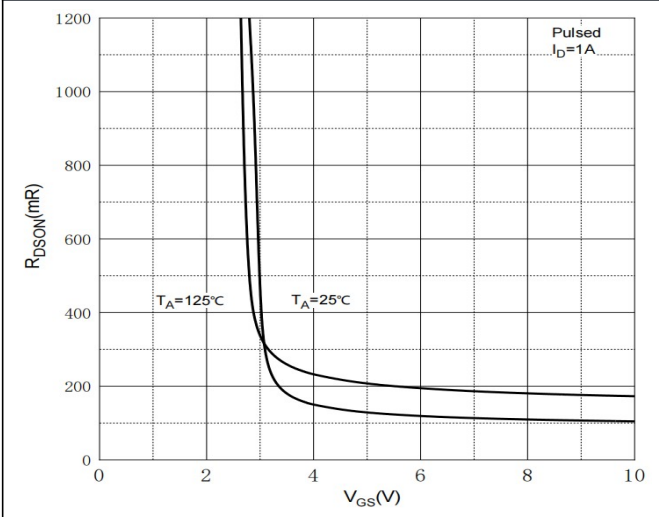


Fig.5 I_S - V_{SD}

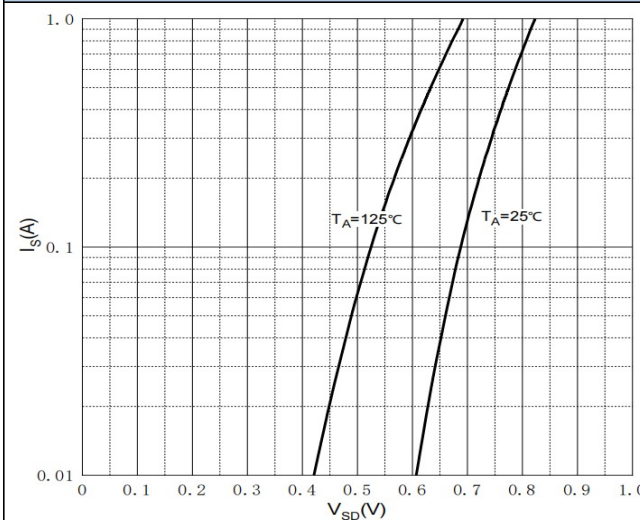
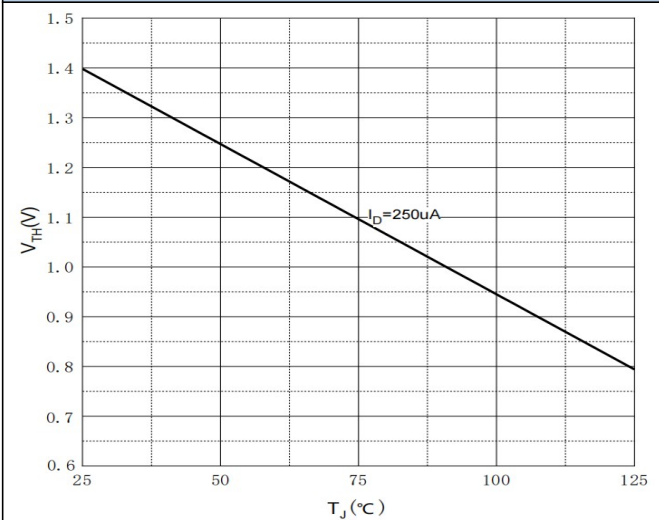
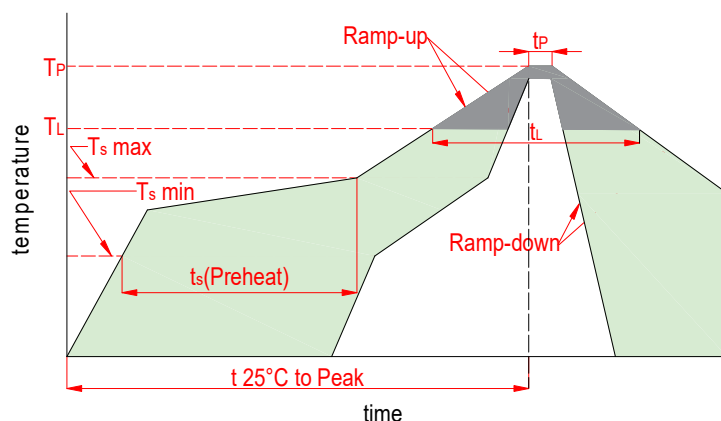


Fig.6 Threshold Voltage



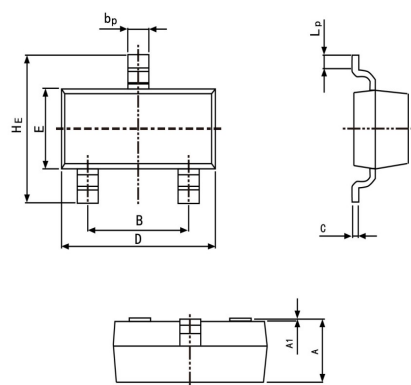


6. Soldering Parameters



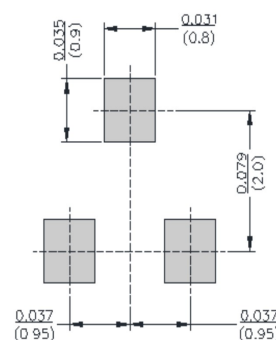
| Reflow Condition | | Lead-free |
|--|---------------------------|------------------------|
| Pre Heat | Temp. min(T_s (min)) | 150℃ |
| | Temp. max(T_s (min)) | 200℃ |
| | Time(min to max)(t_s) | 60~120s |
| Aver. ramp up rate(Liquidus Temp.)(T_L)to peak | | 3℃/s max |
| T_s (max) to T_L -Ramp-up Rate | | 3℃/s max |
| Reflow | Temp.(T_L)(Liquidus) | 217℃ |
| | Temp.(t_L)(Liquidus) | 60~150s |
| Peak Temp.(T_P) | | 260 ^{+0/-5} ℃ |
| Time within actual peak Temp.(t_p) | | 30s max |
| Ramp-down Rate | | 6℃/s max |
| Time 25℃ to peak Tempe.(T_P) | | 8 minutes max |
| Do not exceed | | 260℃ |

7. Dimensions

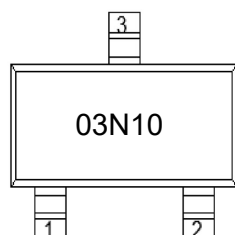


| Dimensions | Inches | | Millimeters | |
|------------|--------|-------|-------------|------|
| | Min | Max | Min | Max |
| A | 0.035 | 0.045 | 0.90 | 1.15 |
| B | 0.070 | 0.081 | 1.78 | 2.05 |
| bp | 0.012 | 0.020 | 0.30 | 0.51 |
| C | 0.003 | 0.007 | 0.08 | 0.18 |
| D | 0.110 | 0.118 | 2.80 | 3.00 |
| E | 0.047 | 0.055 | 1.20 | 1.40 |
| HE | 0.087 | 0.110 | 2.20 | 2.80 |
| A1 | 0.000 | 0.004 | 0.00 | 0.10 |
| LP | 0.008 | 0.020 | 0.20 | 0.50 |

Mounting PAD Layout



8. Part Marking System



9. Package Information

| Package | Part Number | Tape Width(mm) | Quantity(pcs) |
|---------|-------------|----------------|---------------|
| SOT-23 | XN03N10 | 8 | 3000 |



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