

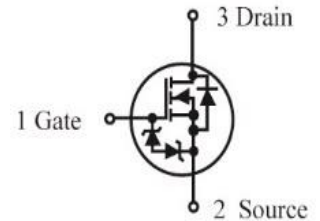
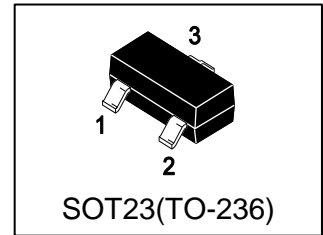
LNTR4003NLT1G

S-LNTR4003NLT1G

30 V, 0.56 A, Single, N-Channel,
Gate ESD Protection, SOT-23

1. FEATURES

- Low gate voltage threshold(VGS(th))to facilitate drive circuit design
- Low gate charge for fast switching
- ESD protected gate
- Minimum breakdown voltage rating of 30 V
- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- S- prefix for automotive and other applications requiring unique site and control change requirements; AEC-Q101 qualified and PPAP capable.



2. APPLICATIONS

- Level shifters
- Level switches
- Low side load switches
- Portable applications

3. DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|---------------|---------|-----------------|
| LNTR4003NLT1G | TR8 | 3000/Tape&Reel |
| LNTR4003NLT3G | TR8 | 10000/Tape&Reel |

4. MAXIMUM RATINGS(Ta = 25°C)

| Parameter | Symbol | Limits | Unit | |
|---|---------|------------|------|---|
| Drain-Source Voltage | VDSS | 30 | V | |
| Gate-to-Source Voltage – Continuous | VGS | ±20 | V | |
| Current (Note 1) Steady State | ID | TA = 25°C | 0.5 | A |
| | | TA = 85°C | 0.37 | |
| Continuous Drain Current (Note 1) t<10s | | TA = 25°C | 0.56 | |
| | | TA = 85°C | 0.4 | |
| Pulsed Drain Current(tp=10µs) | IDM | 1.7 | A | |
| Continuous Source Current (Body Diode) | IS | 1 | A | |
| Maximum Power Dissipation(Note 1) Steady State | PD | | 0.69 | W |
| | | t<5s | 0.83 | |
| Junction and Storage temperature | TJ,Tstg | -55 ~ +150 | °C | |
| Maximum Temperature for Soldering Purposes | TL | 260 | °C | |

5. THERMAL CHARACTERISTICS

| Parameter | Symbol | Limits | Unit |
|---|---------------|--------|------|
| Thermal Resistance, Junction-to-Ambient Steady State(Note 1) | R θ JA | 180 | °C/W |
| t < 10s(Note 1) | | 150 | |

6. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

OFF CHARACTERISTICS

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|---|-----------------|------|------|-----------|-----------|
| Drain-Source Breakdown Voltage (VGS = 0, ID = 100 μ Adc) | V(BR)DSS | 30 | - | - | Vdc |
| Drain-to-Source Breakdown Voltage Temperature Coefficient | V(BR)DSS/ TJ | - | 40 | - | mV/°C |
| Zero Gate Voltage Drain Current (VDS=30V, VGS=0V) | IDSS | - | - | 1.0 | μ Adc |
| Gate-Body Leakage Current, Forward (VDS = 0 V, VGS = \pm 10 V) | IGSS | - | - | \pm 1.0 | μ Adc |

ON CHARACTERISTICS (Note 2)

| | | | | | |
|---|------------|-----|----------|----------|----------|
| Gate Threshold Voltage (VDS = VGS, ID = 250 μ Adc) | VGS(th) | 0.8 | - | 1.6 | Vdc |
| Negative Threshold Temperature Coefficient | VGS(TH)/TJ | - | 3.4 | - | mV/°C |
| Static Drain-Source On-State Resistance (VGS = 4.0 V, ID = 10 mA) (VGS = 2.5 V, ID = 10 mA) | RDS(on) | - | 1 1.5 | 1.5 2 | Ω |
| Forward Transconductance (VDS = 3.0 V, ID = 10 mA) | gfs | - | 0.33 | - | S |

DYNAMIC CHARACTERISTICS

| | | | | | |
|---|------|---|-----|---|----|
| Input Capacitance (VGS = 0 V, f = 1.0MHz, VDS= 5 V) | Ciss | - | 41 | - | pF |
| Output Capacitance (VGS = 0 V, f = 1.0MHz, VDS= 5 V) | Coss | - | 12 | - | pF |
| Reverse Transfer Capacitance (VGS = 0 V, f = 1.0MHz, VDS= 5 V) | Crss | - | 8.1 | - | pF |

SWITCHING CHARACTERISTICS

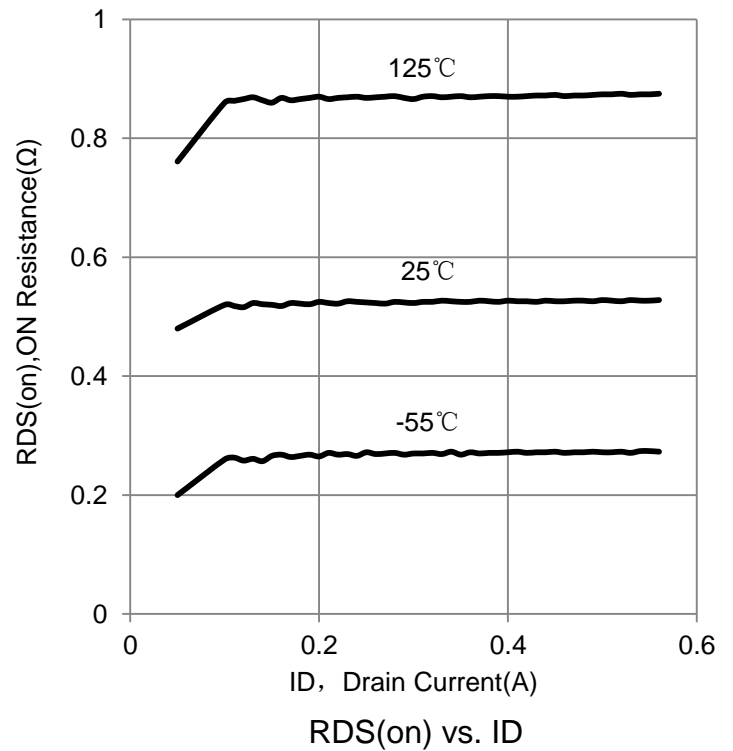
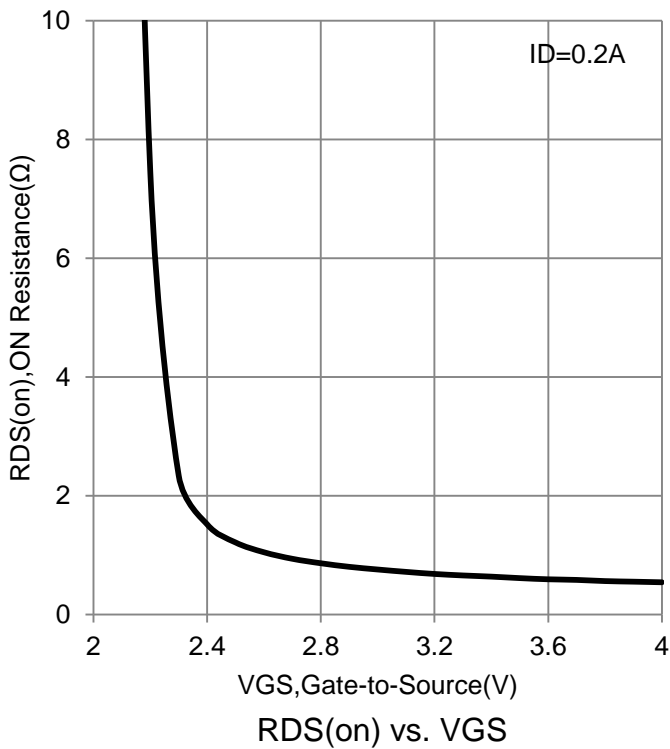
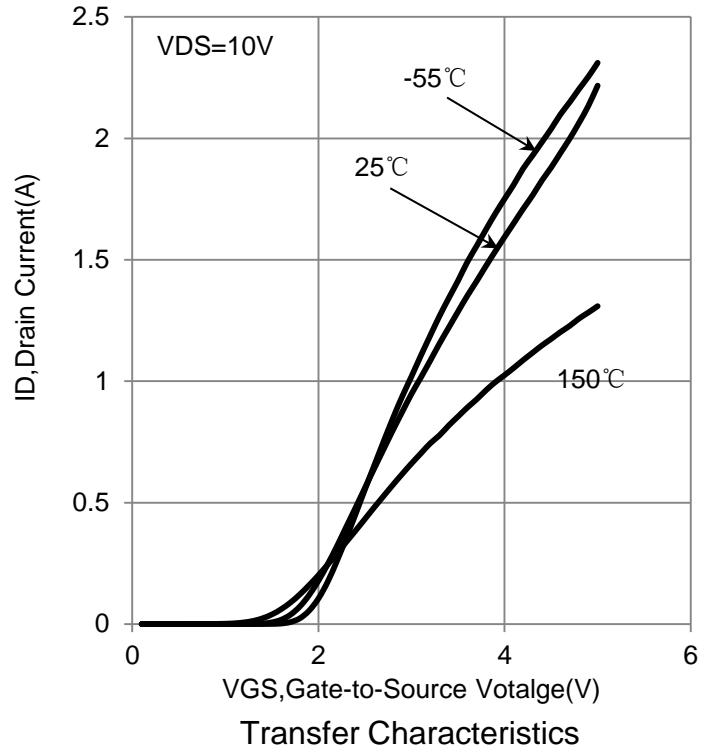
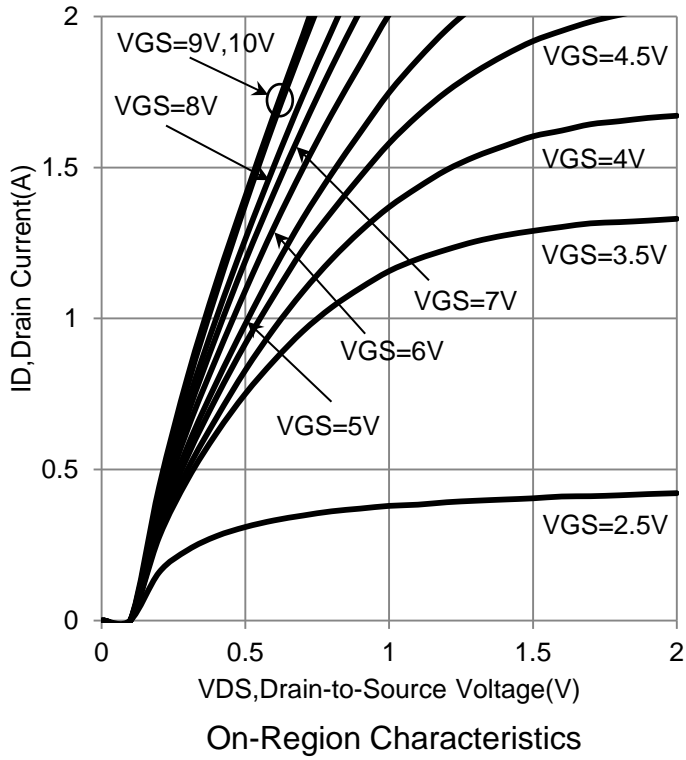
| | | | | | | |
|---------------------|--|---------|---|------|---|----|
| Turn-On Delay Time | (VGS = 4.5 V, VDD = 5.0 V, ID = 0.1 A, RG = 50 Ω) | td(on) | - | 16.7 | - | ns |
| Rise Time | | tr | - | 47.9 | - | |
| Turn-Off Delay Time | | td(off) | - | 65.1 | - | |
| Fall Time | | tf | - | 64.2 | - | |

SOURCE-DRAIN DIODE CHARACTERISTICS

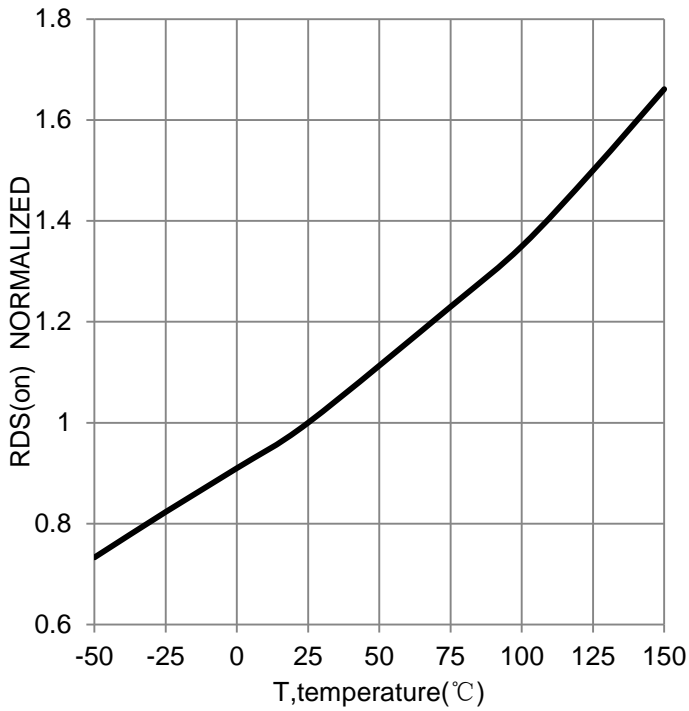
| | | | | | |
|---|-----|---|------|-----|----|
| Forward Voltage (VGS = 0 Vdc, ISD = 10 mAdc) | VSD | - | 0.65 | 0.7 | V |
| Reverse Recovery Time (VGS = 0 V, dIS/dt = 8A/ μ s, IS = 10 mA) | trr | - | 14 | - | ns |

- Surface-mounted on FR4 board using 1 in sq pad size
(Cu area = 1.127 in sq [1 oz] including traces).
- Pulse Test: Pulse Width \leq 300 μ s, Duty Cycle \leq 2.0%.

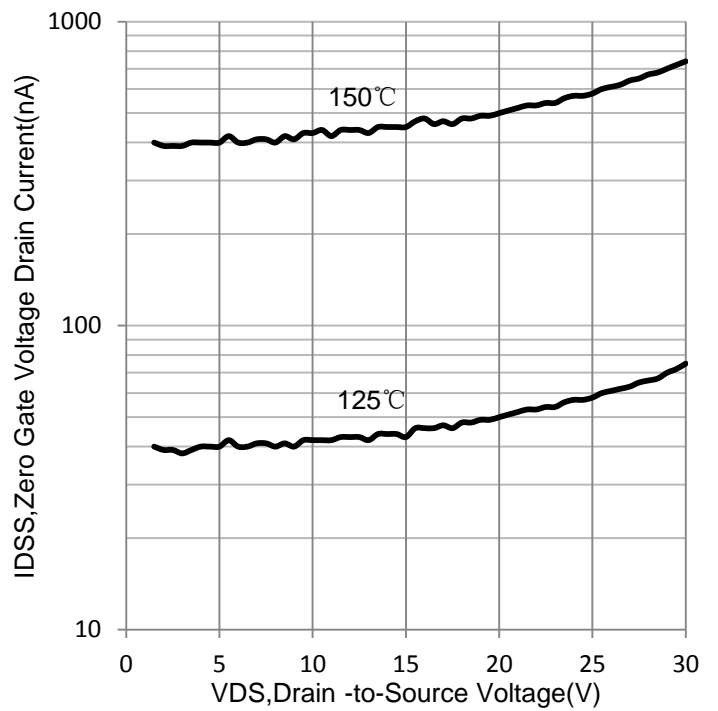
7. ELECTRICAL CHARACTERISTICS CURVES



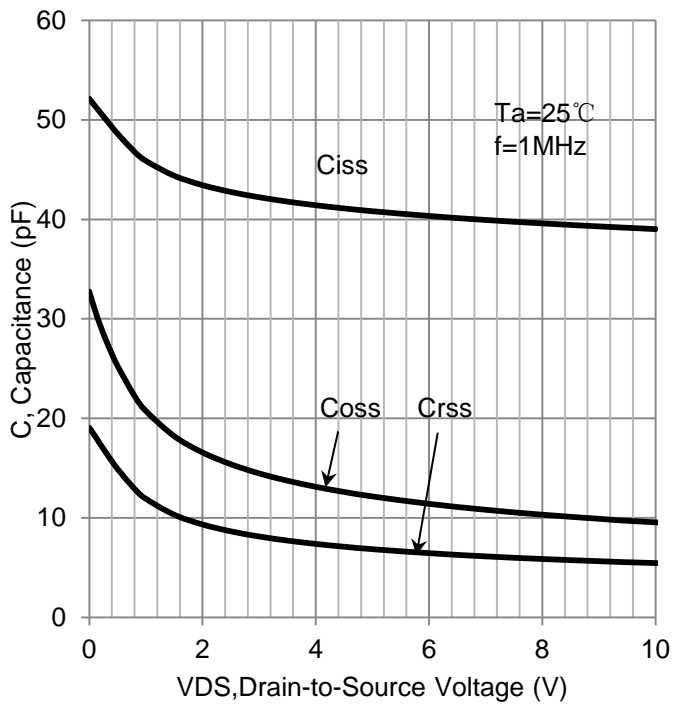
7. ELECTRICAL CHARACTERISTICS CURVES (Con.)



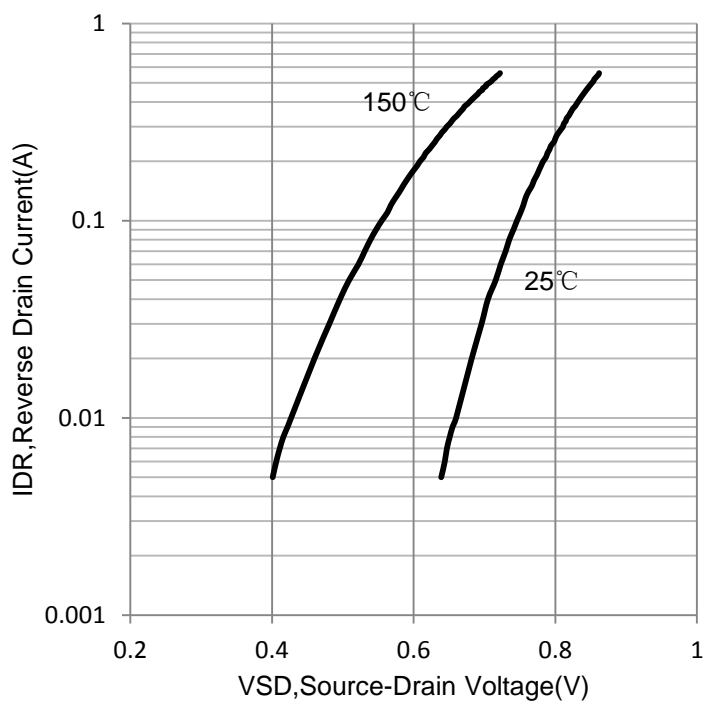
RDS(on) vs. Temperature



IDSS vs. VDS



Capacitance Variation

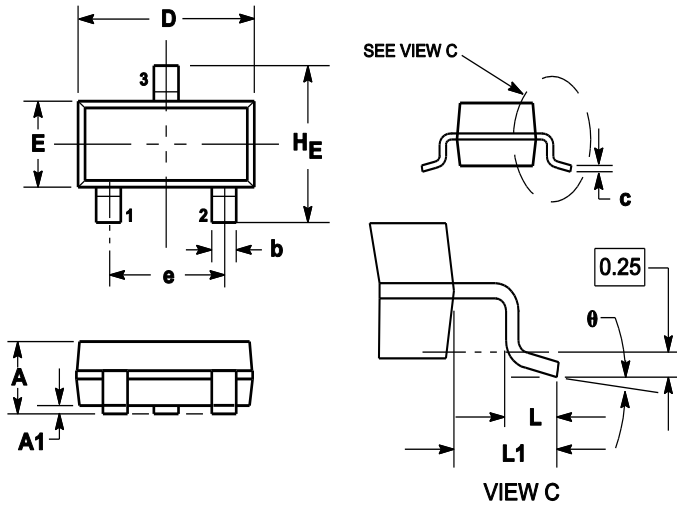


Diode Forward Characteristics

8. OUTLINE AND DIMENSIONS

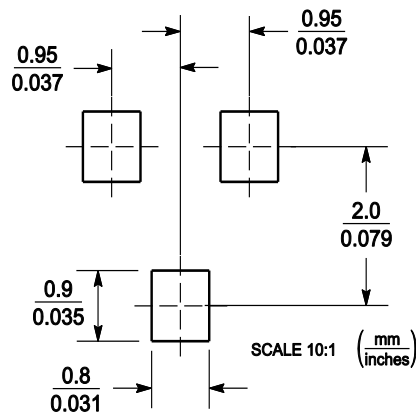
Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.



| DIM | MILLIMETERS | | | INCHES | | |
|-----|-------------|------|------|--------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.89 | 1 | 1.11 | 0.035 | 0.04 | 0.044 |
| A1 | 0.01 | 0.06 | 0.1 | 0.001 | 0.002 | 0.004 |
| b | 0.37 | 0.44 | 0.5 | 0.015 | 0.018 | 0.02 |
| c | 0.09 | 0.13 | 0.18 | 0.003 | 0.005 | 0.007 |
| D | 2.80 | 2.9 | 3.04 | 0.11 | 0.114 | 0.12 |
| E | 1.20 | 1.3 | 1.4 | 0.047 | 0.051 | 0.055 |
| e | 1.78 | 1.9 | 2.04 | 0.07 | 0.075 | 0.081 |
| L | 0.10 | 0.2 | 0.3 | 0.004 | 0.008 | 0.012 |
| L1 | 0.35 | 0.54 | 0.69 | 0.014 | 0.021 | 0.029 |
| HE | 2.10 | 2.4 | 2.64 | 0.083 | 0.094 | 0.104 |
| θ | 0° | --- | 10° | 0° | --- | 10° |

9. SOLDERING FOOTPRINT



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