

20V N-Channel Enhancement-Mode MOSFET

● APPLICATIONS

- 1) High Density Cell Design For Ultra Low On-Resistance
Improved Shoot-Through FOM
- 2) We declare that the material of product compliant with RoHS requirements and Halogen Free

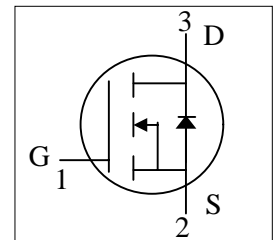
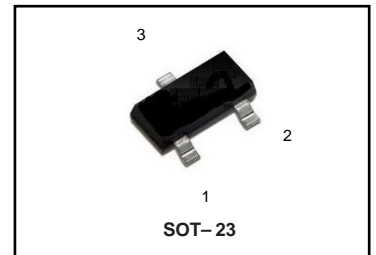
● FEATURES

- V_{DS} = 20V
- R_{DS(ON)}, V_{GS}@4.5V, I_{DS}@2.8A = 60mΩ
- R_{DS(ON)}, V_{GS}@2.5V, I_{DS}@2.0A = 115mΩ

● DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|-----------|---------|----------------|
| RSN23T15M | N02 | 3000/Tape&Reel |

RSN23T15M



● MAXIMUM RATINGS (T_a = 25°C)

| Parameter | Symbol | Limits | Unit |
|---|-----------------------------------|-----------------------|------|
| Drain-to-Source Voltage | V _{DSS} | 20 | V |
| Gate-to-Source Voltage | V _{GS} | ±8 | V |
| Continuous Drain Current | I _D | 2.3 | A |
| Pulsed Drain Current (Note 1) | I _{DM} | 8 | A |
| Maximum Power Dissipation | P _D | T _A = 25°C | 0.9 |
| | | T _A = 75°C | 0.57 |
| Operating and Storage Temperature Range | T _J , T _{stg} | -55 to +150 | °C |
| Junction to Ambient Thermal Resistance (PCB mounted) (Note 2) | R _{θJA} | 145 | °C/W |

1. Repetitive Rating: Pulse width limited by the Maximum junction temperature
2. 1-in2 2oz Cu PCB board

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● ELECTRICAL CHARACTERISTICS (Ta= 25°C)

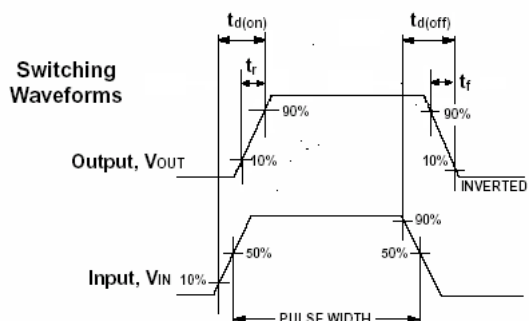
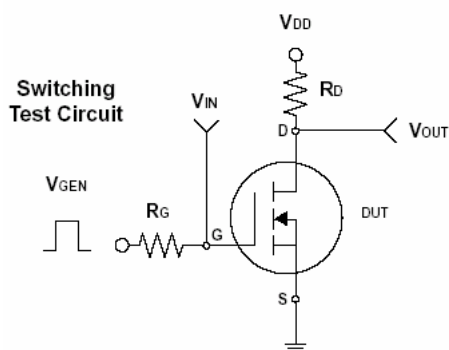
STATIC

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-----------------------------------|----------|------|------|------|------|------------------------|
| Drain-to-Source Breakdown Voltage | V(BR)DSS | 20 | – | – | V | VGS = 0 V, ID = 250 μA |
| Gate Threshold Voltage | VGS(TH) | 0.6 | 0.95 | 1.2 | V | VGS = VDS, ID = 250 μA |
| Zero Gate Voltage Drain Current | IDSS | – | – | -1 | μA | VDS=9.6V, VGS=0V |
| Gate-to-Source Leakage Current | IGSS | – | – | ±100 | nA | VDS = 0 V, VGS = ±8 V |
| Drain-to-Source On Resistance | RDS(on) | – | 40 | 60 | mΩ | VGS = 4.5 V, ID =2.8 A |
| | | – | 50 | 115 | mΩ | VGS = 2.5 V, ID = 2 A |
| Forward Diode Voltage | VSD | | | 1.2 | V | VGS = 0 V, ISD = -1.6A |
| Forward Transconductance | gFS | – | 6.5 | – | S | VDS = 5.0 V, ID = 4 A |

DYNAMIC(Note 3)

| | | | | | | |
|------------------------------|---------|---|--------|---|----|--|
| Input Capacitance | Ciss | – | 427.12 | – | pF | VGS = 0 V, f = 1.0 MHz, VDS= 6 V |
| Output Capacitance | Coss | – | 80.56 | – | | |
| Reverse Transfer Capacitance | Crss | – | 57.00 | – | | |
| Total Gate Charge | QG | – | 3.69 | – | nC | VGS =4.5 V, VDS = 6 V ID = 2.8 A |
| Gate-to-Source Gate Charge | QGS | – | 0.70 | – | | |
| Gate-to-Drain Charge | QGD | – | 1.06 | – | | |
| Turn-On Delay Time | td(on) | – | 6.16 | – | ns | VDD = 6V, RL = 6 Ω ID = 1A, VGEN = 4.5V RG = 6 Ω |
| Rise Time | tr | – | 7.56 | – | | |
| Turn-Off Delay Time | td(off) | – | 16.61 | – | | |
| Fall Time | tf | – | 4.07 | – | | |

3.Pulse test: pulse width ≅ 300us, duty cycle ≅ 2%



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ELECTRICAL CHARACTERISTIC CURVES

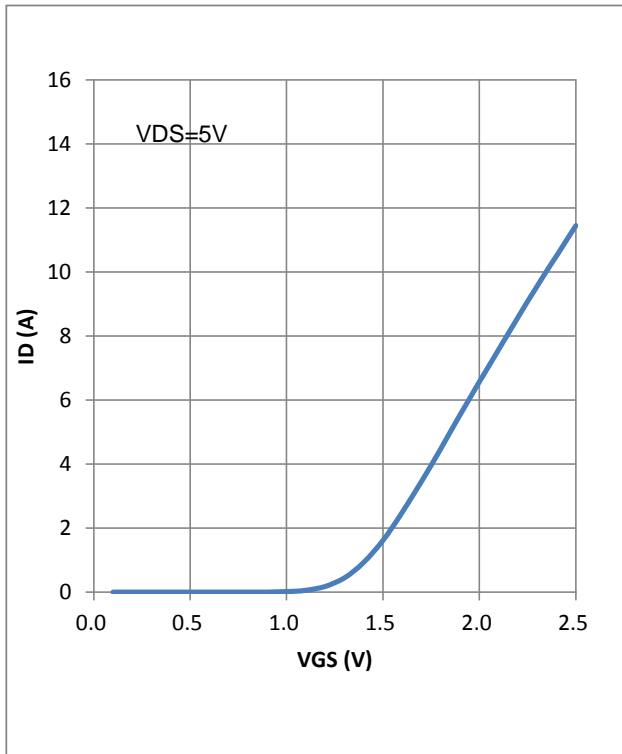


FIG.1 Transfer Characteristics

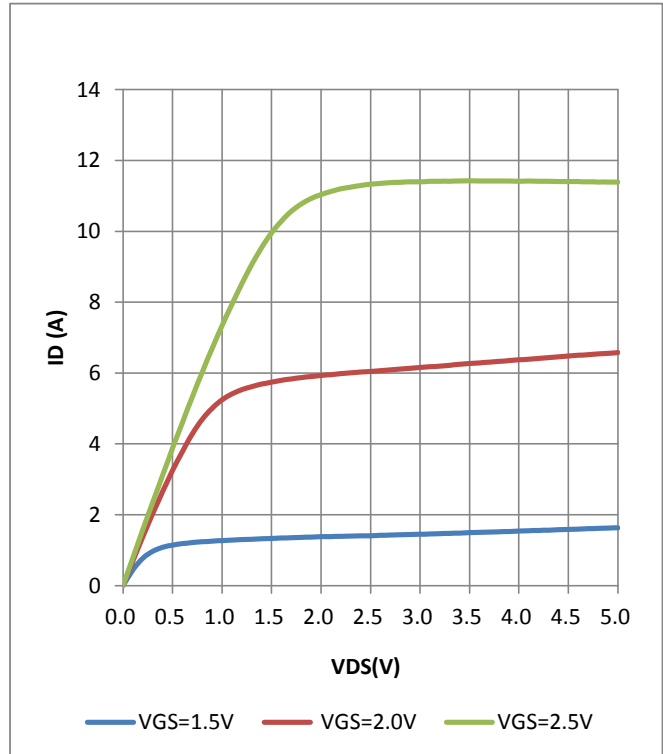


FIG.2 On-Region Characteristics

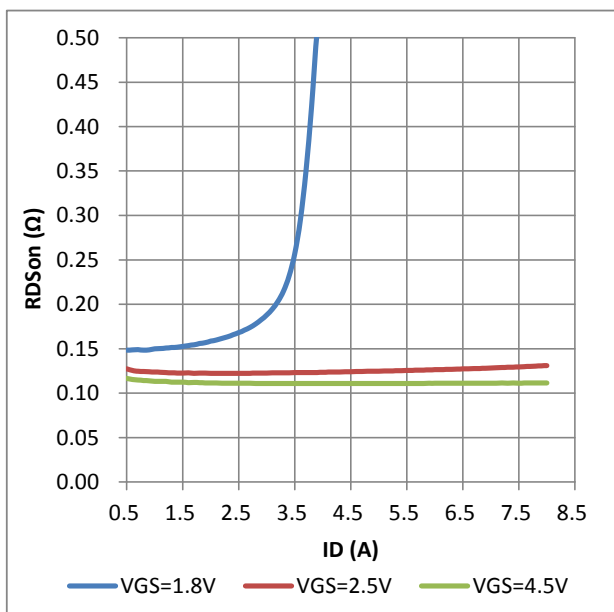


FIG.3 On-Resistance vs. Drain Current

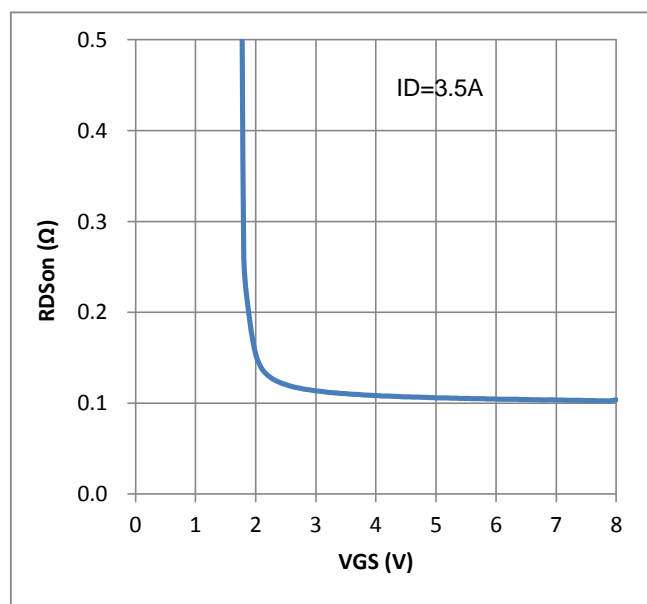


FIG.4 On-Resistance vs. Gate-to-Source Voltage

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ELECTRICAL CHARACTERISTIC CURVES

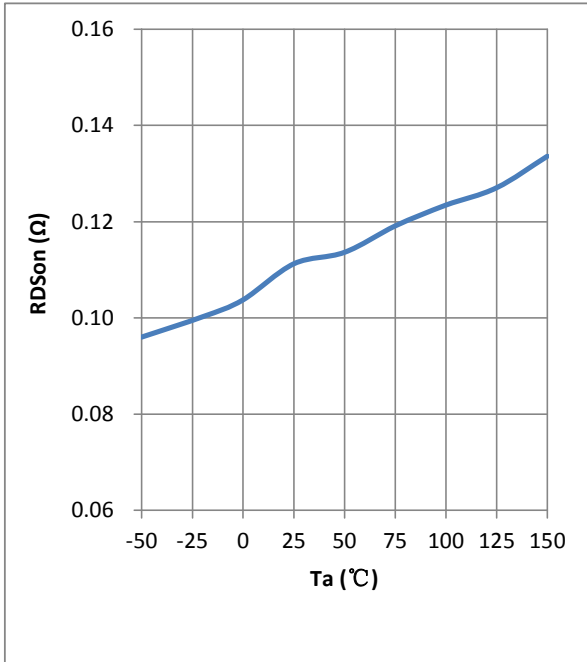


FIG.7 On-Resistance vs. Junction Temperature

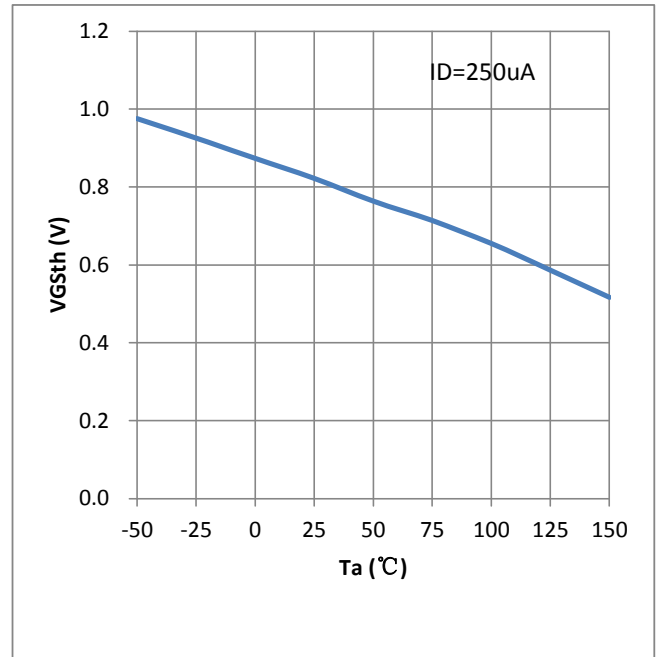


FIG.8 VTH vs. Junction Temperature

