

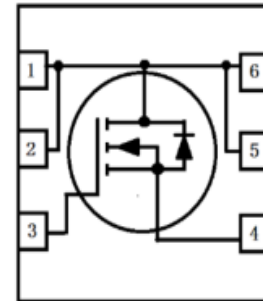
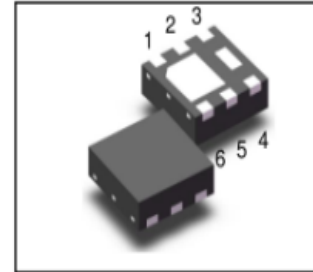
LN2324DT2AG

S-LN2324DT2AG

20V N-Channel (D-S) MOSFET

1. FEATURES

- $V_{DS} = 20V$
 $R_{DS(ON)} \leq 10.5m\Omega, V_{GS}@4.5V, I_{DS}@10A$
 $R_{DS(ON)} \leq 12.5m\Omega, V_{GS}@2.5V, I_{DS}@8A$
- Low $R_{DS(ON)}$ trench technology.
- Low thermal impedance.
- Fast switching speed.
- 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

- Power Routing
- Level Shifting and Driver Circuits

3. DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|-------------|---------|----------------|
| LN2324DT2AG | AN | 4000/Tape&Reel |

4. MAXIMUM RATINGS($T_a = 25^\circ C$)

| Parameter | Symbol | Limits | Unit |
|--|----------------|--------------------|------------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ± 8 | |
| Continuous Drain Current(Note 1) | ID | $T_A = 25^\circ C$ | A |
| | | $T_A = 70^\circ C$ | |
| Pulsed Drain Current(Note 2) | IDM | 60 | |
| Continuous Source Current (Diode Conduction)(Note 1) | IS | 2.9 | |
| Power Dissipation(Note 1) | PD | $T_A = 25^\circ C$ | W |
| | | $T_A = 70^\circ C$ | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55~+150 | $^\circ C$ |

Note: 1. Surface Mounted on 1" x 1" FR4 Board.

2. Pulse width limited by maximum junction temperature.

5. THERMAL CHARACTERISTICS

| Parameter | Symbol | Max | Unit |
|--------------------------------------|-----------------|--------------|--------------|
| Maximum Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | $t \leq 10S$ | $^\circ C/W$ |
| | | Steady State | |

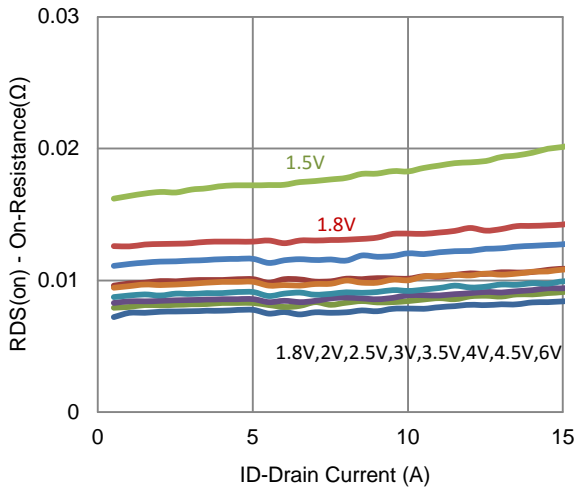
6. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

| Characteristic | Symbol | Min. | Typ. | Max. | Unit |
|--|--|---------|------|--------------|------|
| Static | | | | | |
| Gate-Source Threshold Voltage (VDS =VGS , ID =250μA) | VGS(th) | 0.4 | - | 1 | V |
| Gate-Body Leakage (VDS =0V, VGS =±8V) | IGSS | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current (VDS = 16 V, VGS = 0 V) (VDS = 16 V, VGS = 0 V, TJ = 55°C) | IDSS | - | - | 1 10 | μA |
| On-State Drain Current(Note 3) (VDS = 5 V, VGS = 4.5 V) | ID(ON) | 20 | - | - | A |
| Drain-Source On-Resistance(Note 3) (VGS = 4.5 V, ID = 10 A) (VGS = 2.5 V, ID = 8 A) | RDS(ON) | - | - | 10.5 12.5 | mΩ |
| Forward Transconductance(Note 3) (VDS = 15 V, ID = 10 A) | gfs | - | 5 | - | S |
| Diode Forward Voltage(Note 3) (IS = 1.4 A, VGS = 0 V) | VSD | - | 0.74 | - | V |
| DYNAMIC(Note 4) | | | | | |
| Total Gate Charge | (VDS = 10 V, VGS = 4.5 V, ID = 10 A) | Qg | - | 20 | nC |
| Gate-Source Charge | | Qgs | - | 3.6 | |
| Gate-Drain Charge | | Qgd | - | 5.5 | |
| Input Capacitance | (VDS = 15 V, VGS = 0 V, f = 1 MHz) | Ciss | - | 1920 | pF |
| Output Capacitance | | Coss | - | 160 | |
| Reverse Transfer Capacitance | | Crss | - | 143 | |
| Turn-On Delay Time | (VDS = 10 V, RL = 1 Ω, ID = 10 A, VGEN = 4.5 V, RGEN = 6 Ω) | td(on) | - | 6 | ns |
| Turn-On Rise Time | | tr | - | 14 | |
| Turn-Off Delay Time | | td(off) | - | 84 | |
| Turn-Off Fall Time | | tf | - | 24 | |

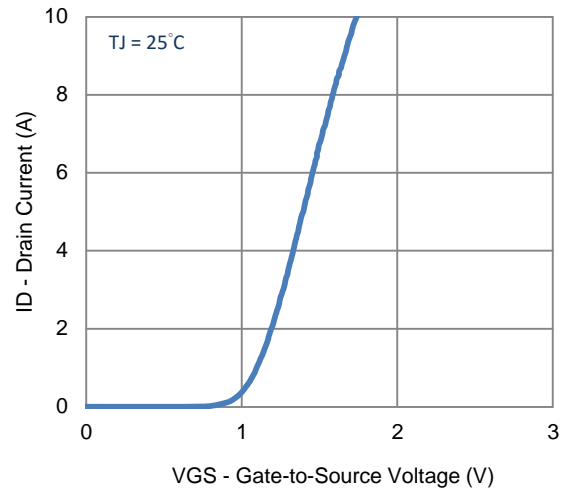
Note: 3. Pulse test; pulse width ≤ 300μs, duty cycle ≤ 2%.

4. Guaranteed by design, not subject to production testing.

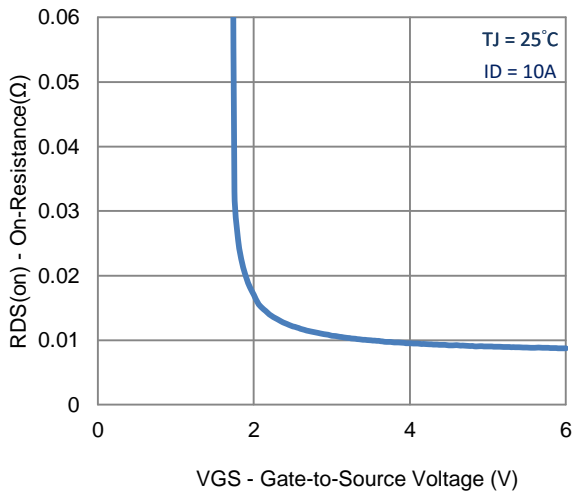
7. ELECTRICAL CHARACTERISTICS CURVES



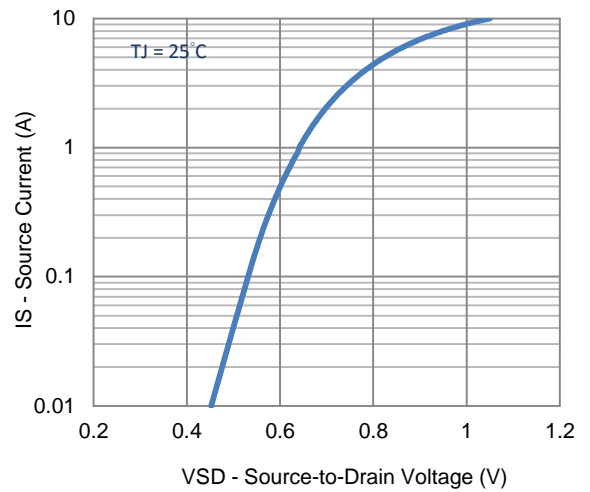
1. On-Resistance vs. Drain Current



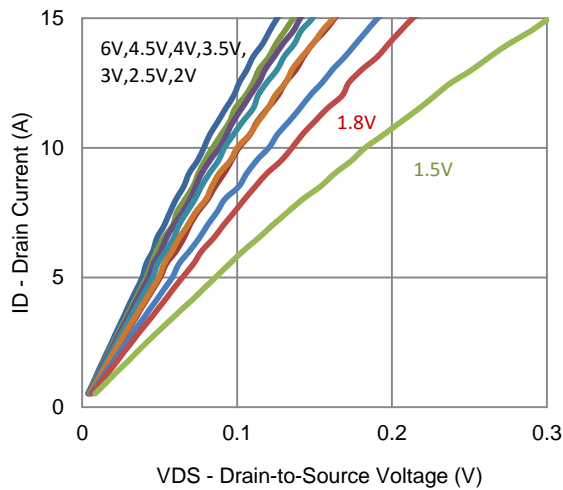
2. Transfer Characteristics



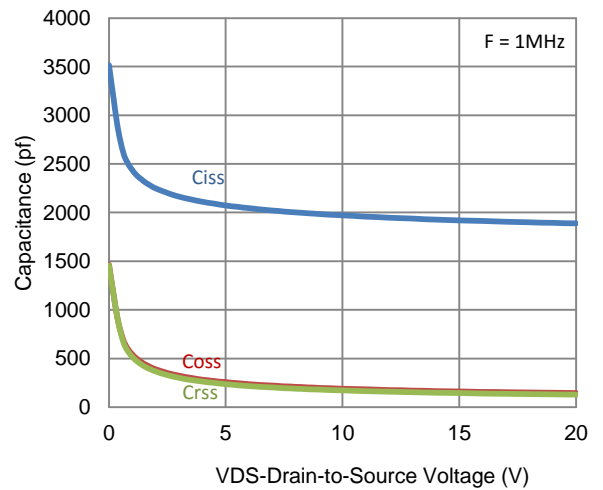
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

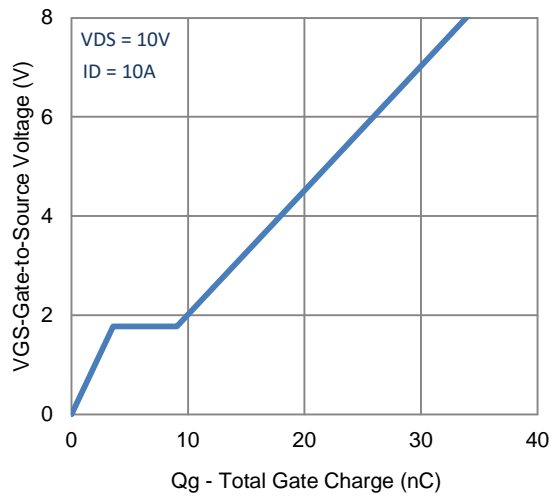


5. Output Characteristics

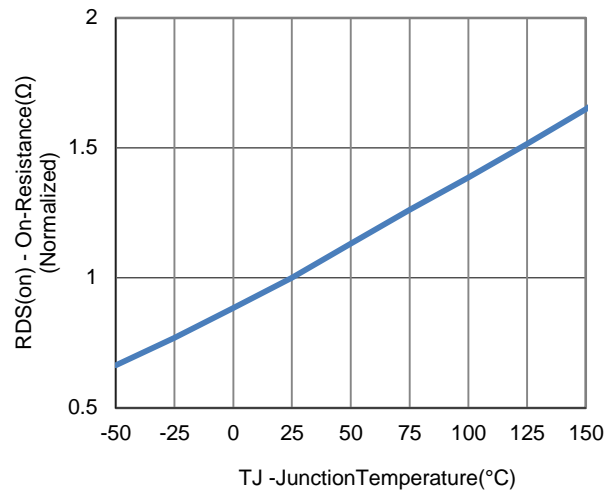


6. Capacitance

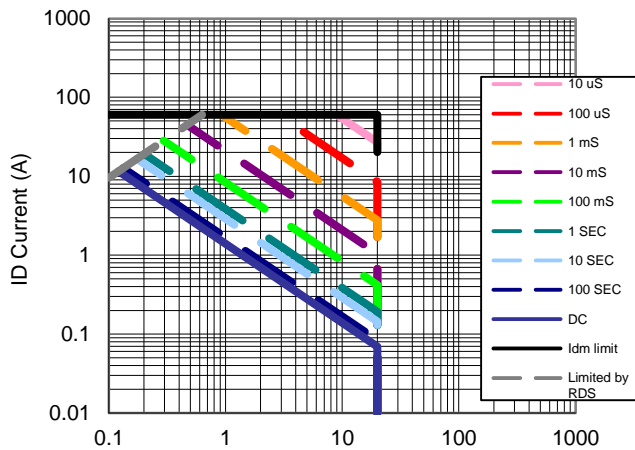
7. ELECTRICAL CHARACTERISTICS CURVES(Con.)



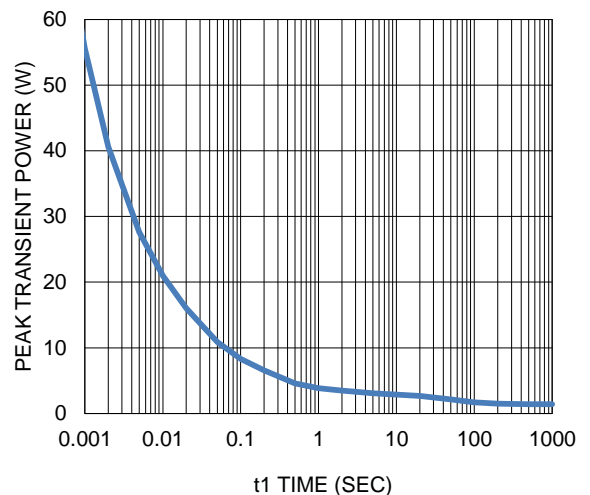
7. Gate Charge



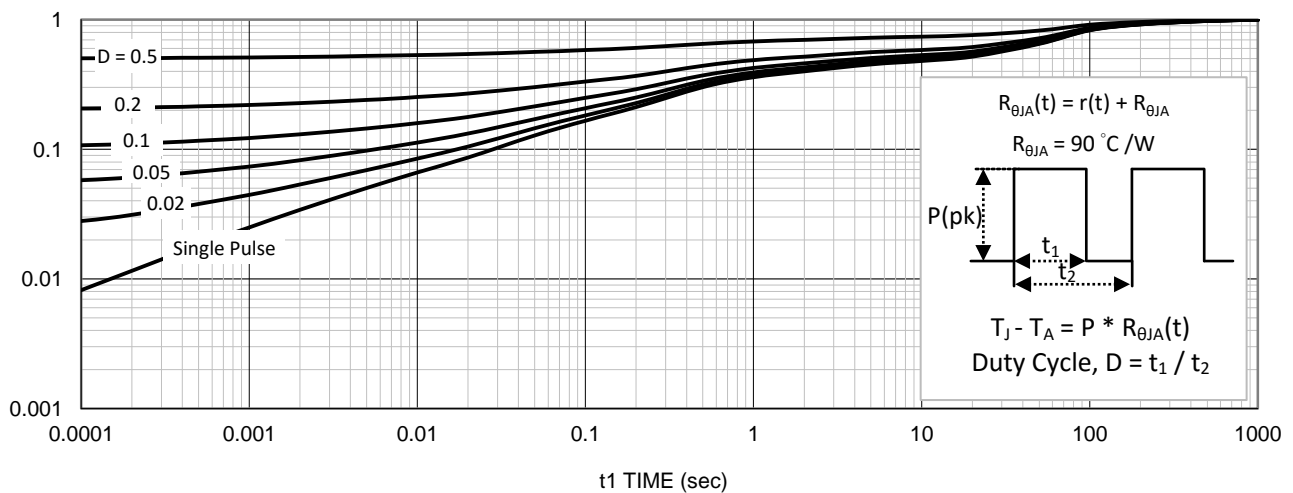
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

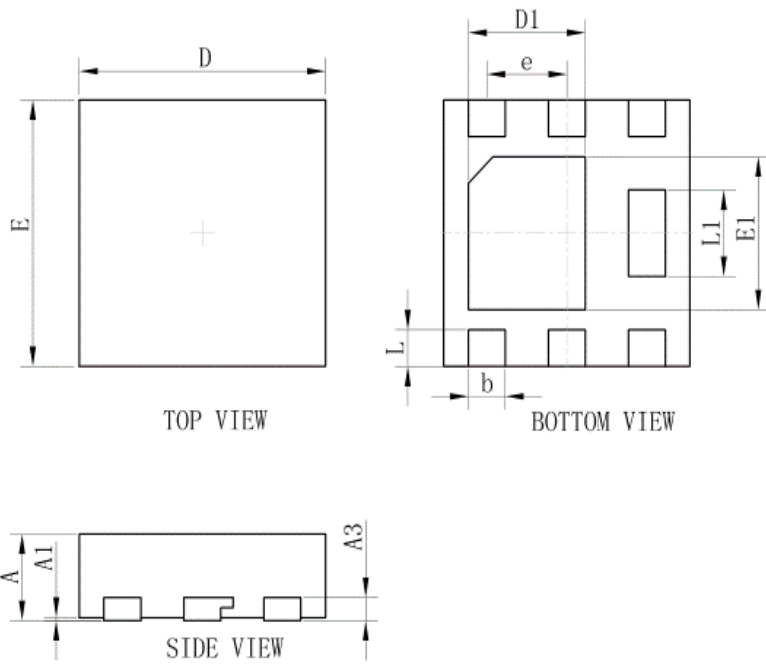


10. Single Pulse Maximum Power Dissipation



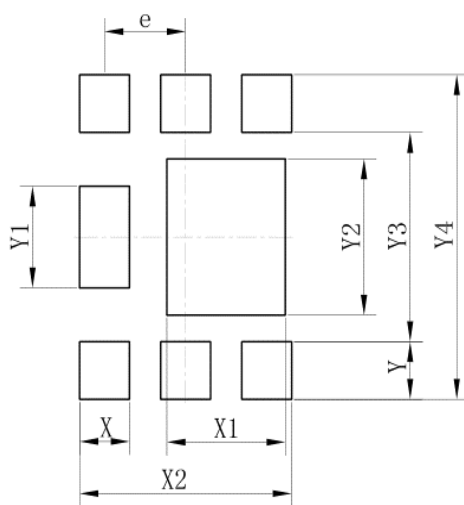
11. Normalized Thermal Transient Junction to Ambient

8.OUTLINE AND DIMENSIONS



| DFN2020-6S | | | |
|----------------------|----------|------|------|
| DIM | MIN | NOR | MAX |
| A | 0.60 | 0.65 | 0.70 |
| A1 | 0.01 | 0.03 | 0.05 |
| b | 0.25 | 0.30 | 0.35 |
| D | 1.95 | 2.00 | 2.05 |
| E | 1.95 | 2.00 | 2.05 |
| e | 0.65TYP. | | |
| L | 0.23 | 0.28 | 0.33 |
| L1 | 0.60 | 0.65 | 0.65 |
| D1 | 0.90 | 0.95 | 1.00 |
| E1 | 1.10 | 1.15 | 1.20 |
| A3 | 0.152REF | | |
| All Dimensions in mm | | | |

9.SOLDERING FOOTPRINT



| DFN2020-6S | |
|------------|------|
| Dim | (mm) |
| X | 0.40 |
| X1 | 0.95 |
| X2 | 1.70 |
| e | 0.65 |
| Y | 0.43 |
| Y1 | 0.75 |
| Y2 | 1.15 |
| Y3 | 1.54 |
| Y4 | 2.39 |

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