



2N7002KDW

60V N-Channel Enhancement Mode MOSFET - ESD Protected

FEATURES

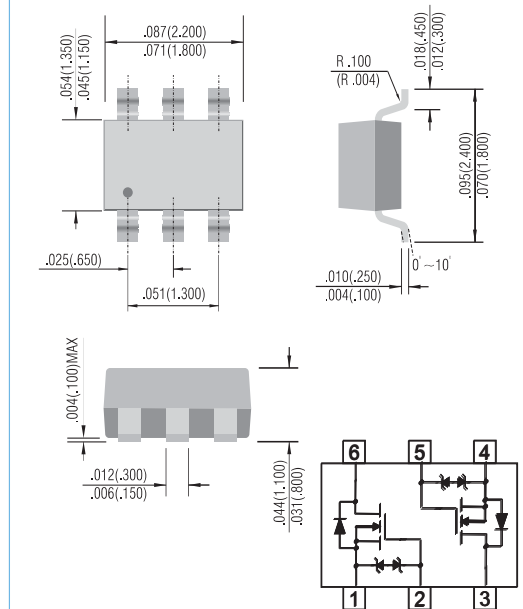
- $R_{DS(ON)}$, V_{GS} @ $10V$, I_{DS} @ $500mA=3\Omega$
- $R_{DS(ON)}$, V_{GS} @ $4.5V$, I_{DS} @ $200mA=4\Omega$
- Advanced Trench Process Technology
- High Density Cell Design For Ultra Low On-Resistance
- Very Low Leakage Current In Off Condition
- Specially Designed for Battery Operated Systems, Solid-State Relays Drivers : Relays, Displays, Lamps, Solenoids, Memories, etc.
- ESD Protected 2KV HBM
- Component are in compliance with EU RoHS 2002/95/EC directives

MECHANICAL DATA

- Case : SOT-363 Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- Marking : K27

SOT-363

Unit: inch (mm)



Maximum RATINGS and Thermal Characteristics ($T_A=25^{\circ}C$ unless otherwise noted)

| PARAMETER | Symbol | Limit | Units |
|--|-----------------|--------------|---------------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Gate-Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current | I_D | 115 | mA |
| Pulsed Drain Current ¹⁾ | I_{DM} | 800 | mA |
| Maximum Power Dissipation | P_D | 200 120 | mW |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 to + 150 | $^{\circ}C$ |
| Junction-to Ambient Thermal Resistance(PCB mounted) ² | $R_{\theta JA}$ | 625 | $^{\circ}C/W$ |

Note: 1. Maximum DC current limited by the package
2. Surface mounted on FR4 board, $t \leq 5$ sec

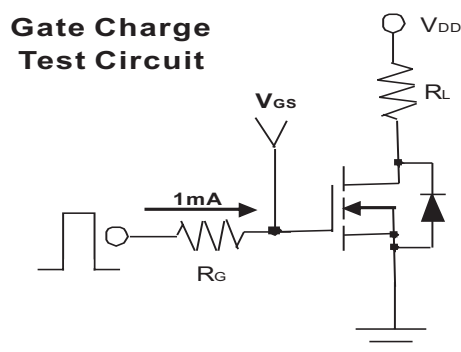
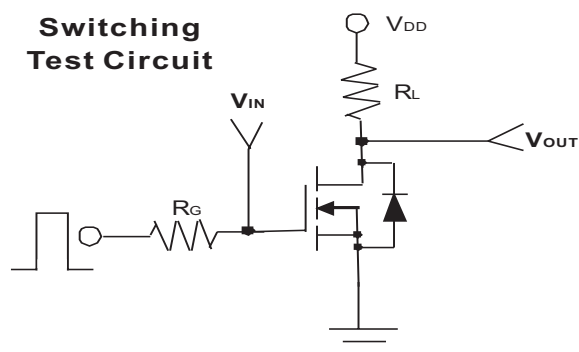
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ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Units |
|----------------------------------|--------------|---|------|------|----------|----------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=10\mu A$ | 60 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 1 | - | 2.5 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=4.5V, I_D=200mA$ | - | - | 4.0 | Ω |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=500mA$ | - | - | 3.0 | |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=60V, V_{GS}=0V$ | - | - | 1 | μA |
| Gate Body Leakage | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | - | - | ± 10 | μA |
| Forward Transconductance | g_{fs} | $V_{DS}=15V, I_D=250mA$ | 100 | - | - | mS |
| Diode Forward Voltage | V_{SD} | $I_S=200mA, V_{GS}=0V$ | - | 0.82 | 1.3 | V |
| Dynamic | | | | | | |
| Total Gate Charge | Q_g | $V_{DS}=15V, I_D=200mA$ $V_{GS}=4.5V$ | - | - | 0.8 | nC |
| Turn-On Delay Time | t_{on} | $V_{DD}=30V, R_L=150\Omega$ $I_D=200mA, V_{GEN}=10V$ $R_G=10\Omega$ | - | - | 20 | ns |
| Turn-Off Delay Time | t_{off} | | - | - | 40 | |
| Input Capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V$ $f=1.0MHz$ | - | - | 35 | pF |
| Output Capacitance | C_{oss} | | - | - | 10 | |
| Reverse Transfer Capacitance | C_{rss} | | - | - | 5 | |





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Typical Characteristics Curves ($T_J=25^\circ\text{C}$, unless otherwise noted)

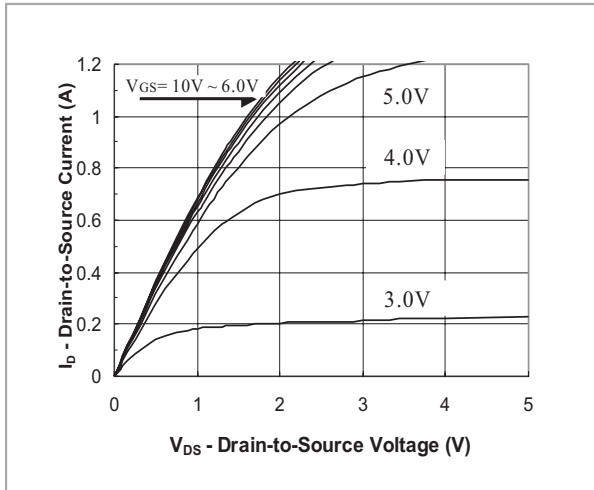


FIG.1- Output Characteristic

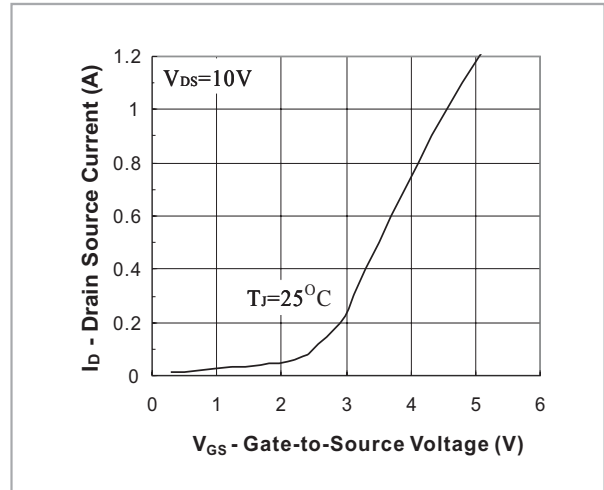


FIG.2- Transfer Characteristic

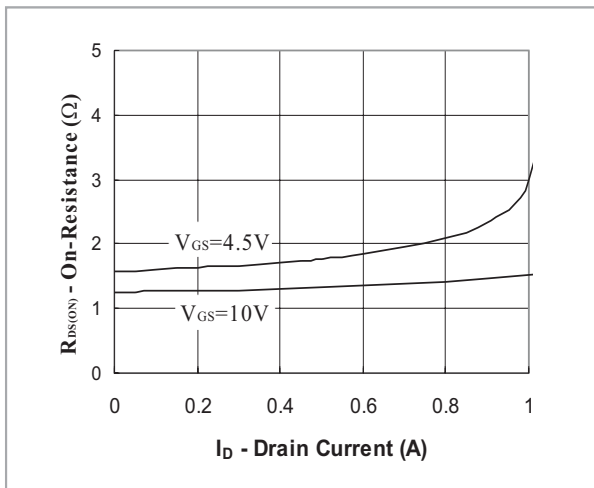


FIG.3- On Resistance vs Drain Current

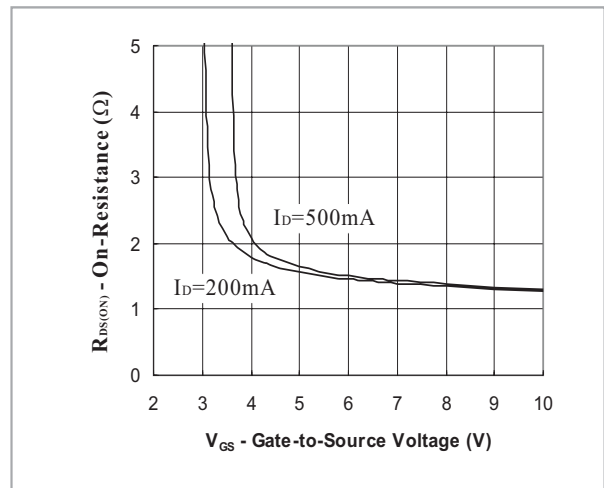


FIG.4- On Resistance vs Gate to Source Voltage

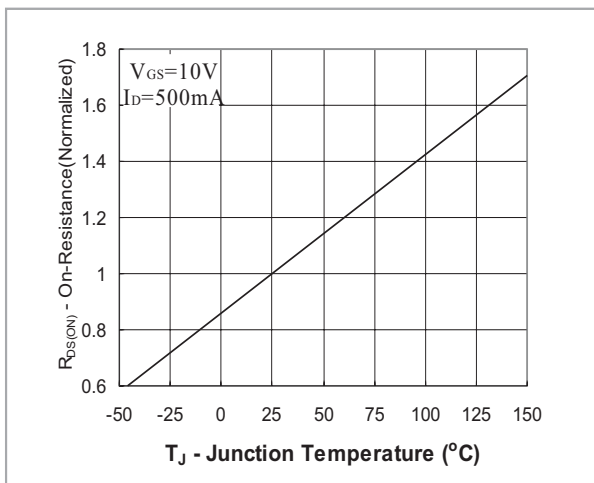


FIG.5- On Resistance vs Junction Temperature



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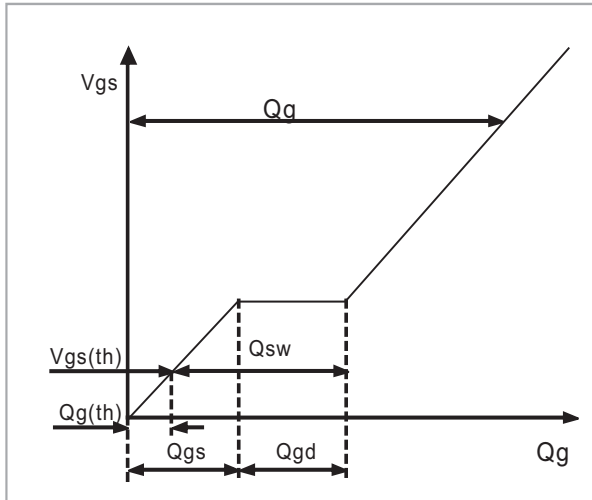


Fig. 6 - Gate Charge Waveform

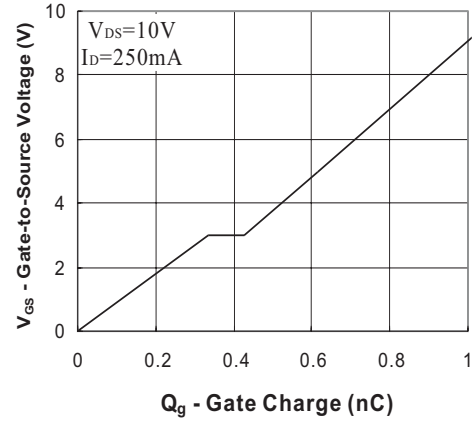


Fig. 7 - Gate Charge

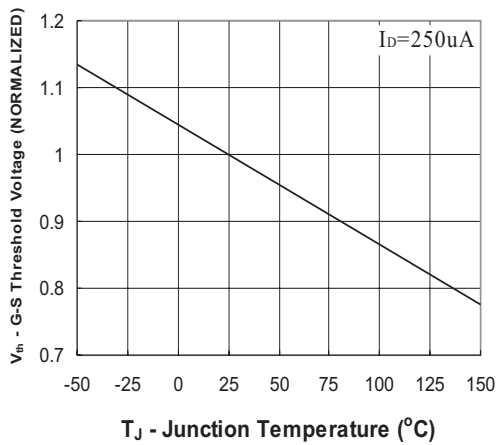


Fig. 8 - Threshold Voltage vs Temperature

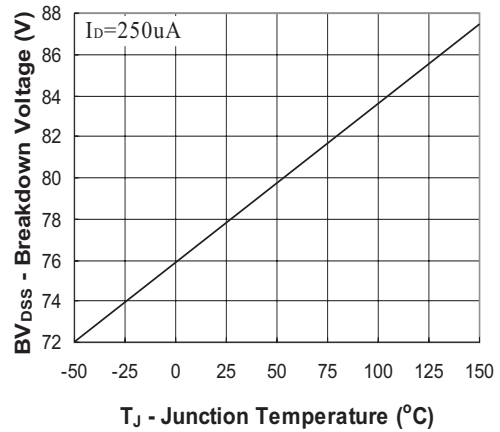


Fig. 9 - Breakdown Voltage vs Junction Temperature

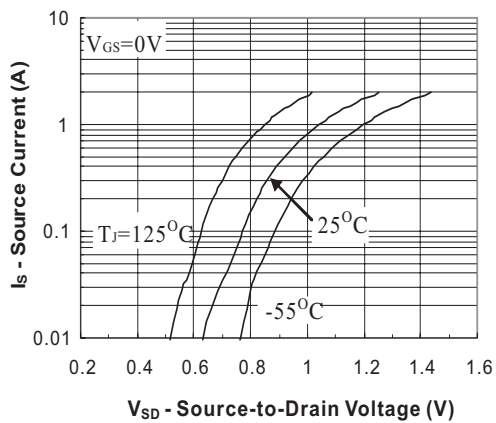
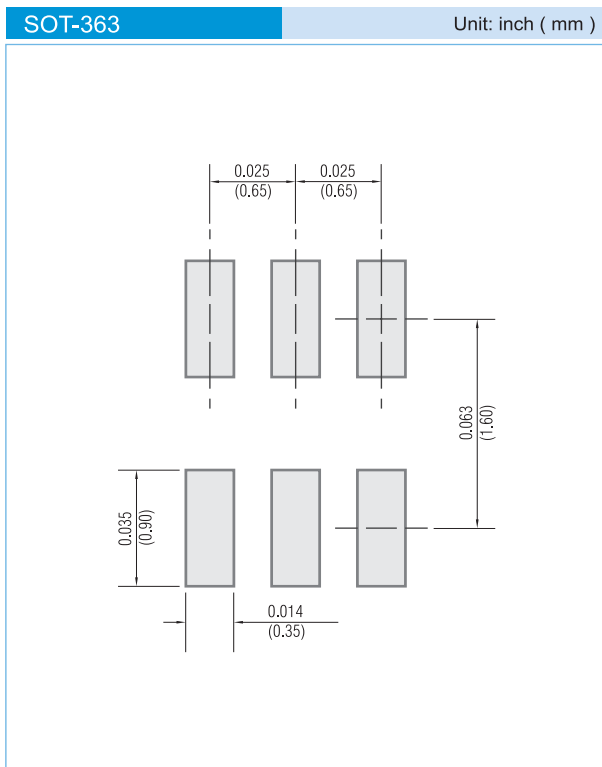


Fig. 10 - Source-Drain Diode Forward Voltage



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MOUNTING PAD LAYOUT



ORDER INFORMATION

- Packing information
 - T/R - 10K per 13" plastic Reel
 - T/R - 3K per 7" plastic Reel

LEGAL STATEMENT

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