



# YJL3134KAX

## N-Channel Enhancement Mode Field Effect Transistor

### Product Summary

|                                   |           |
|-----------------------------------|-----------|
| $V_{DS}$                          | 20 V      |
| $I_D$                             | 0.5 A     |
| $R_{DS(ON)}$ ( at $V_{GS}=4.5V$ ) | <300 mohm |
| $R_{DS(ON)}$ ( at $V_{GS}=2.5V$ ) | <400 mohm |
| $R_{DS(ON)}$ ( at $V_{GS}=1.8V$ ) | <700 mohm |
| ESD Protected Up to 2.0KV (HBM)   |           |

### General Description

Trench Power LV MOSFET technology  
High Power and current handing capability

Epoxy Meets UL 94 V-0 Flammability Rating  
Halogen Free

### Applications

PWM application  
Load switch

### Absolute Maximum Ratings ( $T_A=25^{\circ}C$ unless otherwise noted)

| Parameter   | Symbol         | Limit                            | Unit          |   |
|---|----------------|----------------------------------|---------------|---|
| Drain-source Voltage                                  | $V_{DS}$       | 20                               | V             |   |
| Gate-source Voltage                                   | $V_{GS}$       | $\pm 12$                         | V             |   |
| Drain Current   | $I_D$          | $T_A=25^{\circ}C$ @ Steady State | 0.5           | A |
|   |                | $T_A=70^{\circ}C$ @ Steady State | 0.4           |   |
| Pulsed Drain Current <sup>A</sup>                     | $I_{DM}$       | 3.3                              | A             |   |
| Total Power Dissipation @ $T_A=25^{\circ}C$           | $P_D$          | 0.18                             | W             |   |
| Thermal Resistance Junction-to-Ambient @ Steady State | $R_{JA}$       | 694                              | $^{\circ}C/W$ |   |
| Junction and Storage Temperature Range                | $T_J, T_{STG}$ | -55~+150                         | $^{\circ}C$   |   |

### Ordering Information

| PREFERRED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) |
|---------------|--------------|---------|----------------------|-------------------------|
|---------------|--------------|---------|----------------------|-------------------------|



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## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

| Parameter                               | Symbol              | Conditions  | Min  | Typ  | Max   | Units |
|---|---------------------|---|------|------|-------|-------|
| <b>Static Parameter</b>                 |                     |   |      |      |       |       |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V, I <sub>D</sub> =250  | 20   |      |       | V     |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | V <sub>DS</sub> =20V, V <sub>GS</sub> =0V   |      |      | 1     |       |
| Gate-Body Leakage Current               | I <sub>GSS</sub>    | V <sub>GS</sub> = ±10V, V <sub>DS</sub> =0V   |      | 2.5  | ±10   |       |
|   |                     | V <sub>GS</sub> = ±8V, V <sub>DS</sub> =0V  |      | 500  | ±2000 | nA    |
| Gate Threshold Voltage                  | V <sub>GS(th)</sub> | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250                                  | 0.35 | 0.75 | 1.1   | V     |
| Static Drain-Source On-Resistance       | R <sub>DS(on)</sub> | V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A   |      | 220  | 300   |       |
|   |                     | V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.45A  |      | 290  | 400   |       |
|   |                     | V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.2A   |      | 420  | 700   |       |
| Diode Forward Voltage <sup>C</sup>      | V <sub>SD</sub>     | I <sub>S</sub> =0.5A, V <sub>GS</sub> =0V   |      | 0.85 | 1.2   | V     |
| Maximum Body-Diode Continuous Current   | I <sub>S</sub>      |   |      |      | 0.5   | A     |
| Gate Resistance                         | R <sub>g</sub>      | f=1 MHz, Open drain   |      | 50   |       | Ω     |
| <b>Dynamic Parameters<sup>B</sup></b>   |                     |   |      |      |       |       |
| Input Capacitance                       | C <sub>iss</sub>    | V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz                                       |      | 33   |       | pF    |
| Output Capacitance                      | C <sub>oss</sub>    |   |      | 20   |       |       |
| Reverse Transfer Capacitance            | C <sub>rss</sub>    |   |      | 10   |       |       |
| <b>Switching Parameters<sup>B</sup></b> |                     |   |      |      |       |       |
| Total Gate Charge                       | Q <sub>g</sub>      | V <sub>GS</sub> =4.5V, V <sub>DS</sub> =10V, I <sub>D</sub> =0.5A                       |      | 0.8  |       | nC    |
| Gate Source Charge                      | Q <sub>gs</sub>     |   |      | 0.3  |       |       |
| Gate Drain Charge                       | Q <sub>gd</sub>     |   |      | 0.15 |       |       |
| Reverse Recovery Charge                 | Q <sub>rr</sub>     | I <sub>F</sub> =0.5A, di/dt=20A/us  |      | 0.4  |       |       |
| Reverse Recovery Time                   | t <sub>rr</sub>     |   |      | 14.4 |       |       |
| Turn-on Delay Time                      | t <sub>D(on)</sub>  | V <sub>GS</sub> =4.5V, V <sub>DD</sub> =10V, R <sub>G</sub> =10Ω, I <sub>D</sub> =500mA |      | 4    |       | ns    |
| Turn-on Rise Time                       | t <sub>r</sub>      |   |      | 18.8 |       |       |
| Turn-off Delay Time                     | t <sub>D(off)</sub> |   |      | 10   |       |       |
| Turn-off Fall Time                      | t <sub>f</sub>      |   |      | 23   |       |       |

A. Repetitive Rating: Pulse width limited by maximum junction temperature.

B. These parameters have no way to verify.

C.



## ■ Typical Performance Characteristics

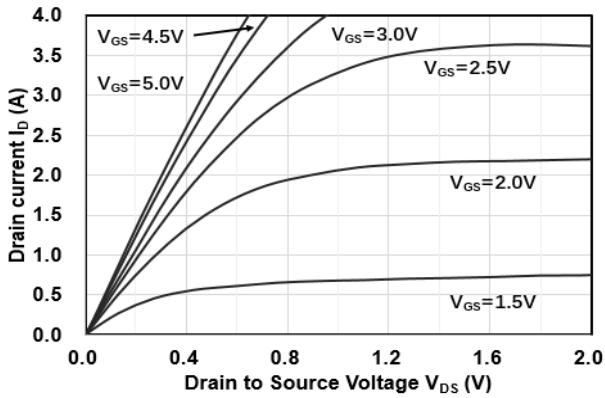


Figure1. Output Characteristics

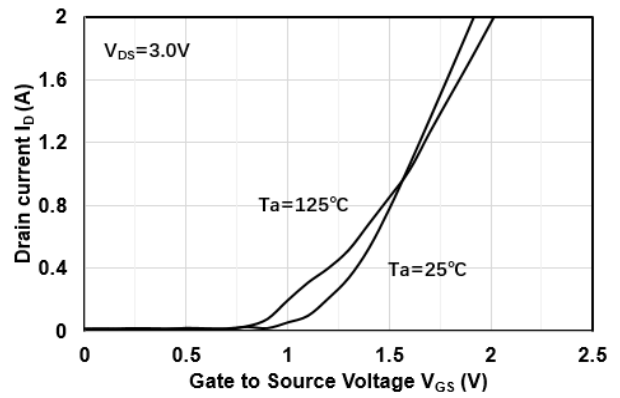


Figure2. Transfer Characteristics

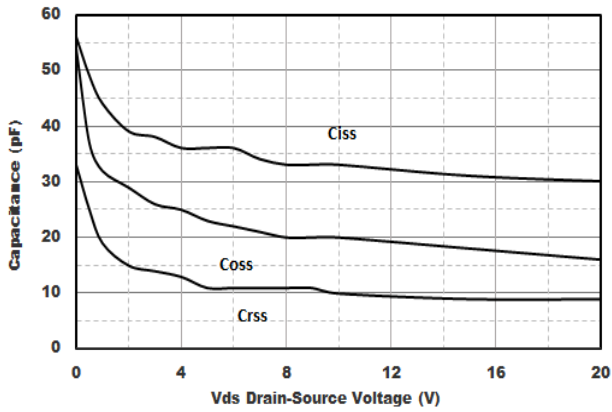


Figure3. Capacitance Characteristics

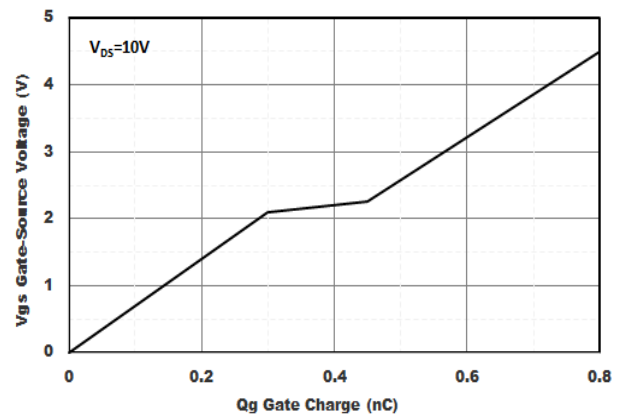


Figure4. Gate Charge

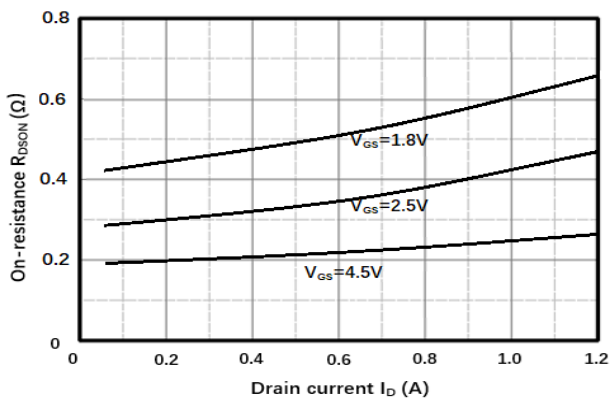


Figure5. Drain-Source on Resistance

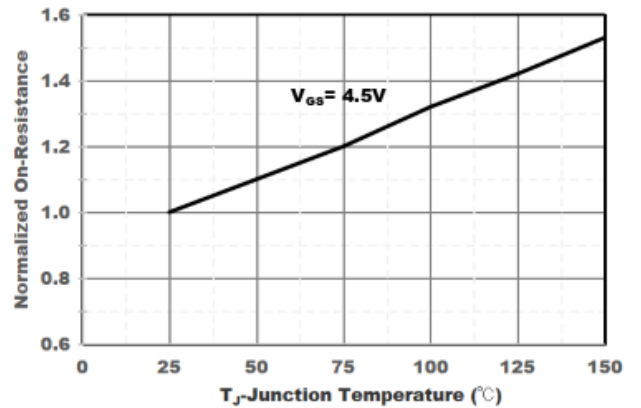


Figure6. Drain-Source on Resistance



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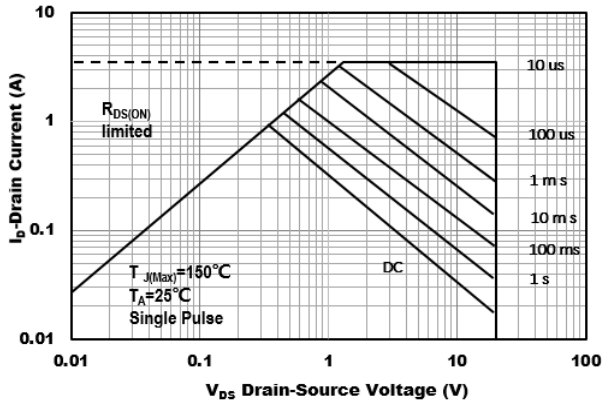


Figure7. Safe Operation Area

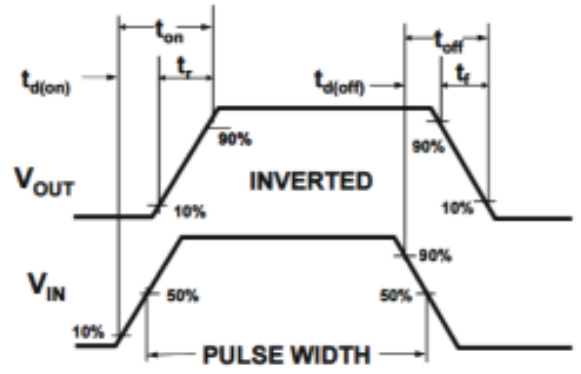
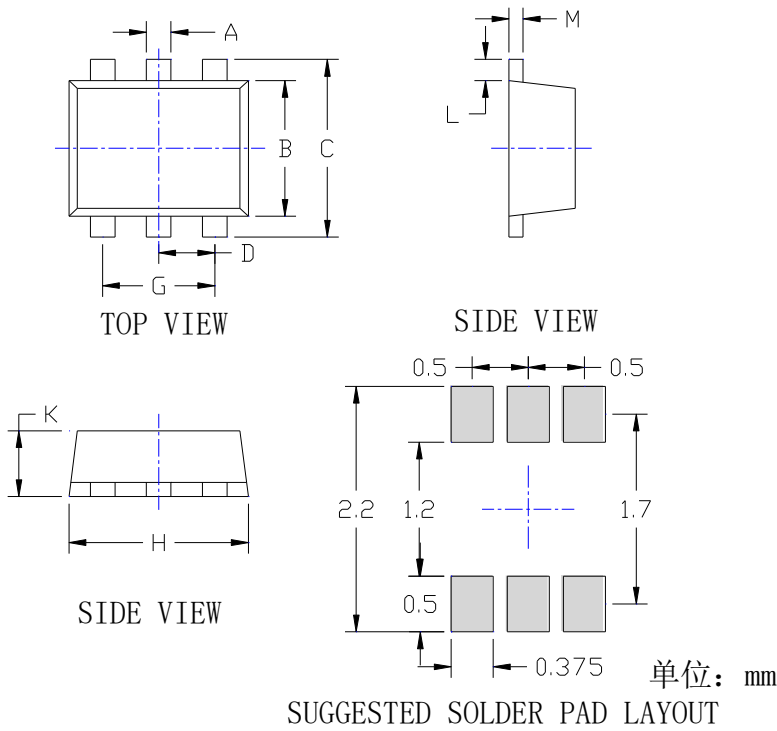


Figure8. Switching wave



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## SOT-563 Package information



| SYMBOL | DIMENSIONS |       |            |       |
|--------|------------|-------|------------|-------|
|        | INCHES     |       | Millimeter |       |
|        | MIN.       | MAX.  | MIN.       | MAX.  |
| A      | 0.006      | 0.011 | 0.150      | 0.300 |
| B      | 0.043      | 0.051 | 1.100      | 1.300 |
| C      | 0.059      | 0.067 | 1.500      | 1.700 |
| D      | 0.016      | 0.024 | 0.400      | 0.600 |
| G      | 0.035      | 0.043 | 0.900      | 1.100 |
| H      | 0.059      | 0.067 | 1.500      | 1.700 |
| K      | 0.021      | 0.026 | 0.550      | 0.650 |
| L      | 0.004      | 0.011 | 0.100      | 0.300 |
| M      | 0.004      | 0.007 | 0.100      | 0.180 |

**NOTE:**

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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