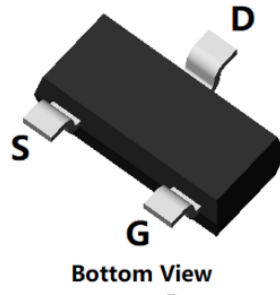
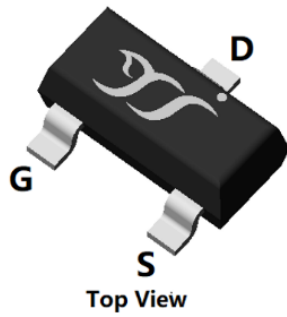
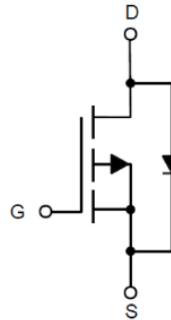


P-Channel Enhancement Mode Field Effect Transistor



SOT-23



Product Summary

| | |
|--------------------------------------|---------|
| • V_{DS} | -20V |
| • I_D | -5.4A |
| • $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) | <39mohm |
| • $R_{DS(ON)}$ (at $V_{GS}=-2.5V$) | <49mohm |
| • $R_{DS(ON)}$ (at $V_{GS}=-1.8V$) | <63mohm |

General Description

- Trench Power LV MOSFET technology
- High Power and Current handling capability
- Low Gate Charge
- Part no. with suffix "Q" means AEC-Q101 qualified

Applications

- Battery protection
- Power management
- 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} | ± 10 | V |
| Drain Current | $T_A=25^\circ C$ | I_D | -5.4 | A |
| | $T_A=70^\circ C$ | | -4.4 | |
| Pulsed Drain Current ^A | | I_{DM} | -22 | A |
| Total Power Dissipation | $T_A=25^\circ C$ | P_D | 1.2 | W |
| | $T_A=70^\circ C$ | | 0.8 | |
| Thermal Resistance Junction-to-Ambient ^B | | $R_{\theta JA}$ | 104 | $^\circ C/W$ |
| Junction and Storage Temperature Range | | T_J, T_{STG} | -55~+150 | $^\circ C$ |

■ Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|-----------------|----------------------|-------------------------|----------------------------|---------------|
| YJL2305BQ | F2 | S5 _B | 3000 | 30000 | 120000 | 7" reel |



YJL2305BQ

■ Electrical Characteristics (T_J=25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|-----------------------------------|---------------------|---|------|-------|------|-------|
| Static Parameter | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =-250μA | -20 | | | V |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} =-20V, V _{GS} =0V, T _J =25°C | | | -1 | μA |
| | | V _{DS} =-20V, V _{GS} =0V, T _J =150°C | | -5 | | uA |
| Gate-Body Leakage Current | I _{GSS} | V _{GS} =±10V, V _{DS} =0V | | | ±100 | nA |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D =-250μA | -0.4 | -0.62 | -1.0 | V |
| Static Drain-Source On-Resistance | R _{DS(on)} | V _{GS} =-4.5V, I _D =-5.4A | | 27 | 39 | mΩ |
| | | V _{GS} =-2.5V, I _D =-4A | | 36 | 49 | |
| | | V _{GS} =-1.8V, I _D =-3A | | 48 | 63 | |
| Diode Forward Voltage | V _{SD} | I _S =-5.4A, V _{GS} =0V | | | -1.2 | V |
| Gate resistance | R _G | f=1MHz, Open drain | - | 14 | - | Ω |
| Dynamic Parameters | | | | | | |
| Input Capacitance | C _{iss} | V _{DS} =-10V, V _{GS} =0V, f=1MHZ | | 1010 | | pF |
| Output Capacitance | C _{oss} | | | 130 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 109 | | |
| Switching Parameters | | | | | | |
| Total Gate Charge | Q _g | V _{GS} =-4.5V, V _{DS} =-10V, I _D =-4A | | 9.4 | | nC |
| Gate-Source Charge | Q _{gs} | | | 1.2 | | |
| Gate-Drain Charge | Q _{gd} | | | 2.3 | | |
| Reverse Recovery Chrage | Q _{rr} | I _F =-4A, di/dt=100A/us | | 4.38 | | |
| Reverse Recovery Time | t _{rr} | | | 24.8 | | |
| Turn-on Delay Time | t _{D(on)} | V _{GS} =-4.5V, V _{DS} =-10V, R _L =2.5Ω R _{GEN} =3Ω | | 8.4 | | ns |
| Turn-on Rise Time | t _r | | | 36.2 | | |
| Turn-off Delay Time | t _{D(off)} | | | 76.8 | | |
| Turn-off fall Time | t _f | | | 56.2 | | |

A. Repetitive rating; pulse width limited by max. junction temperature.

B. The value of R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. Copper, in the still air environment with T_A =25°C. The maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.



■ Typical Performance Characteristics

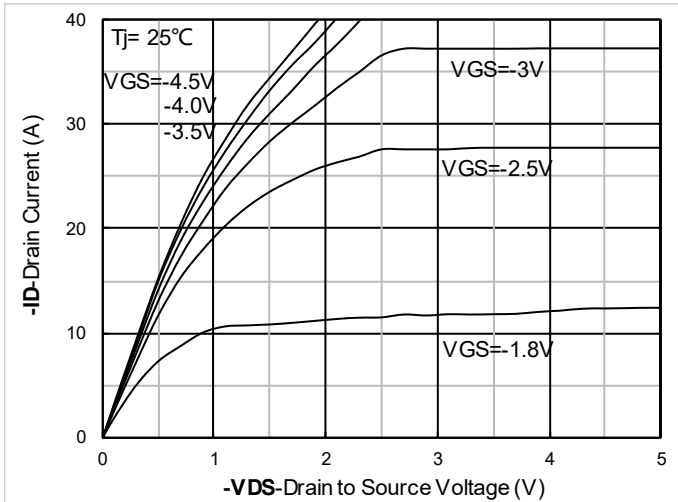


Figure1. Output Characteristics

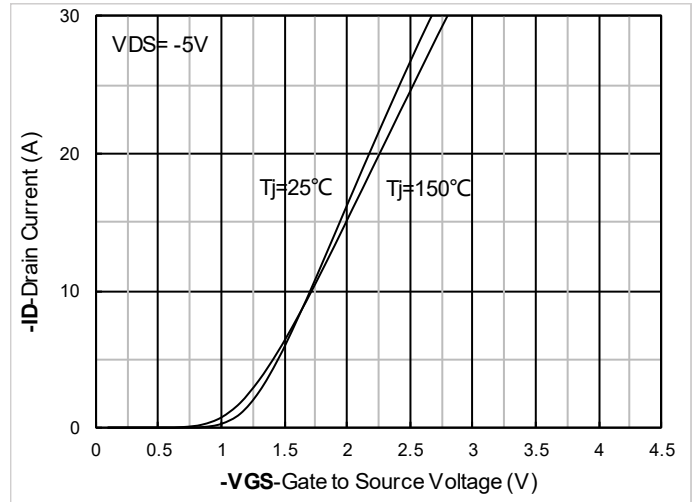


Figure2. Transfer Characteristics

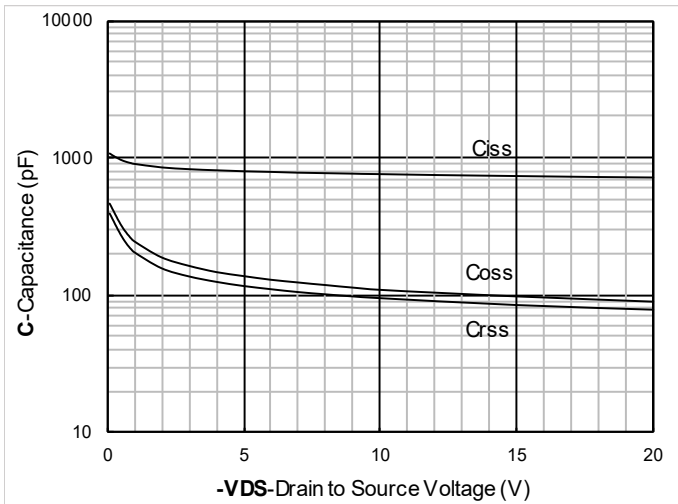


Figure3. Capacitance Characteristics

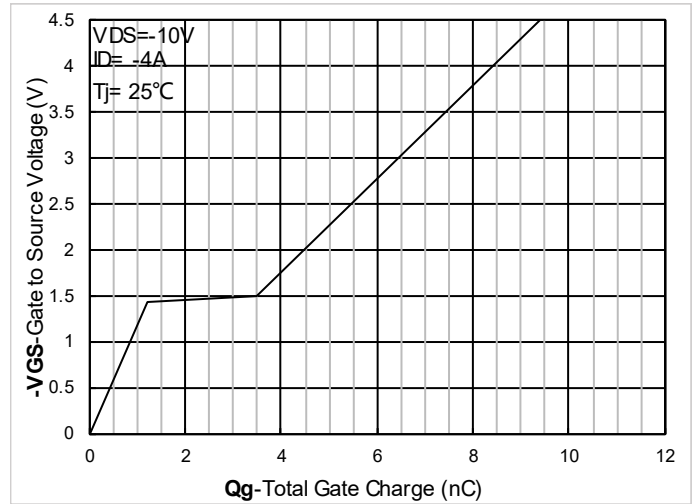


Figure4. Gate Charge

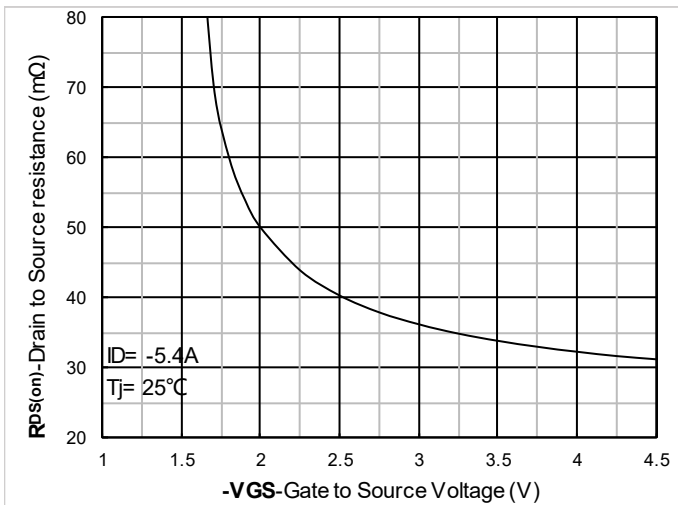


Figure5. On-Resistance vs Gate to Source Voltage

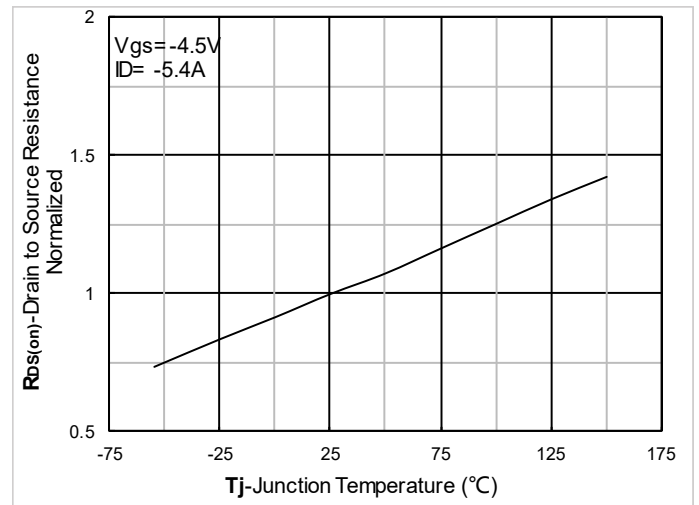


Figure6. Normalized On-Resistance



YJL2305BQ

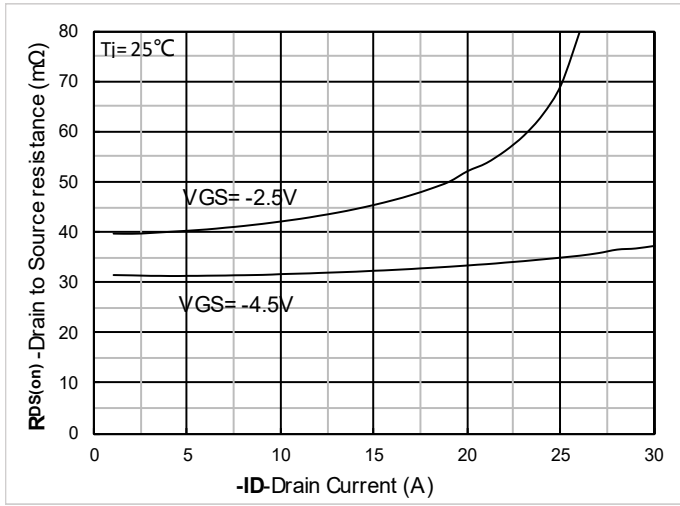


Figure 7. $R_{DS(on)}$ VS Drain Current

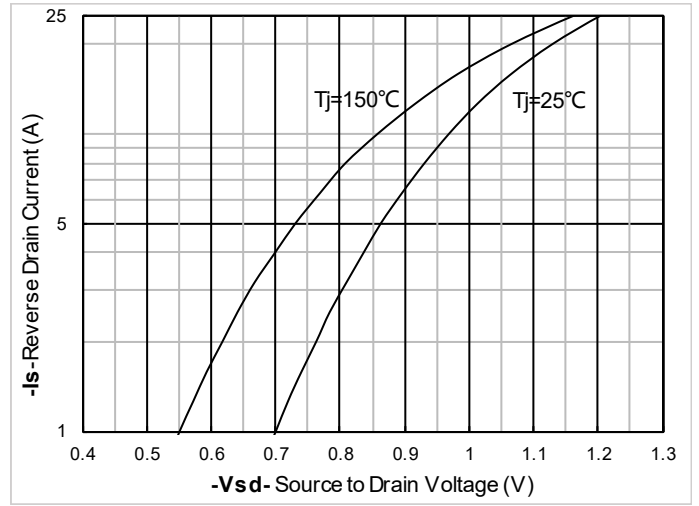


Figure 8. Forward characteristics of reverse diode

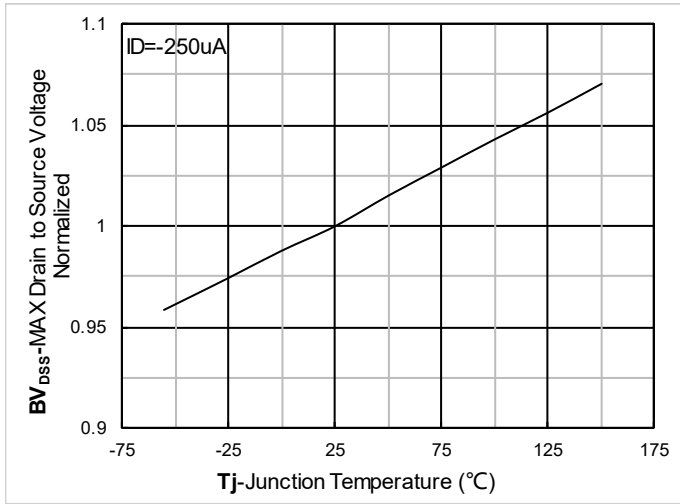


Figure 9. Normalized breakdown voltage

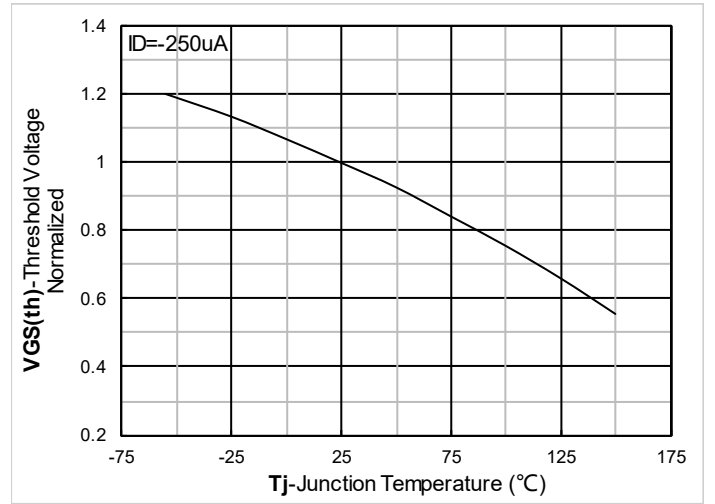


Figure 10. Normalized Threshold voltage

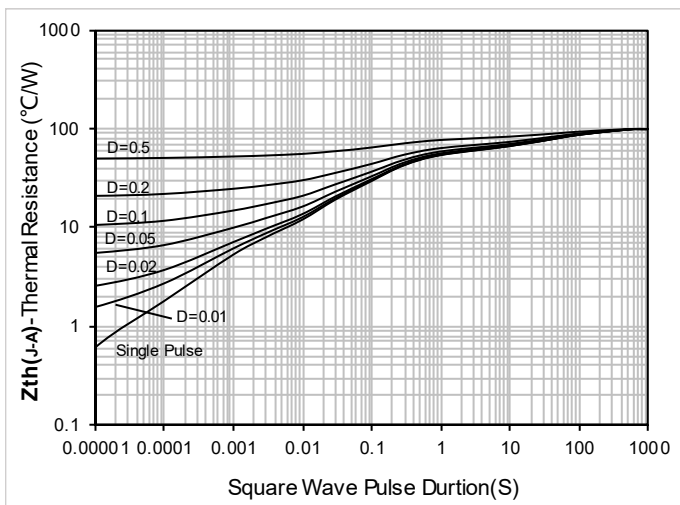


Figure 11. Maximum Transient Thermal Impedance

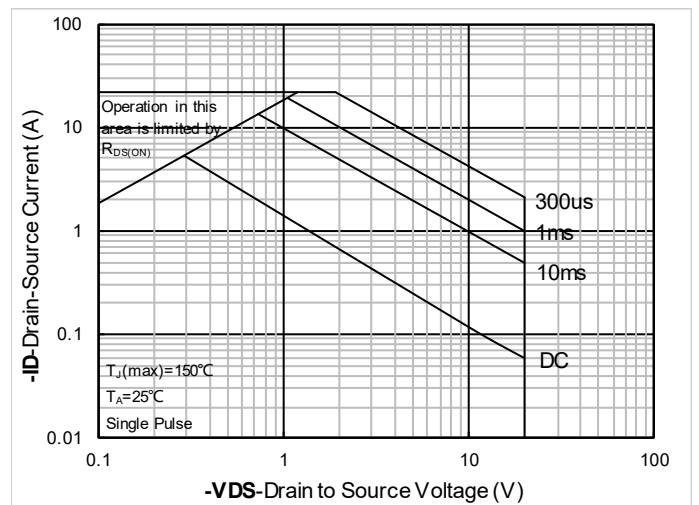
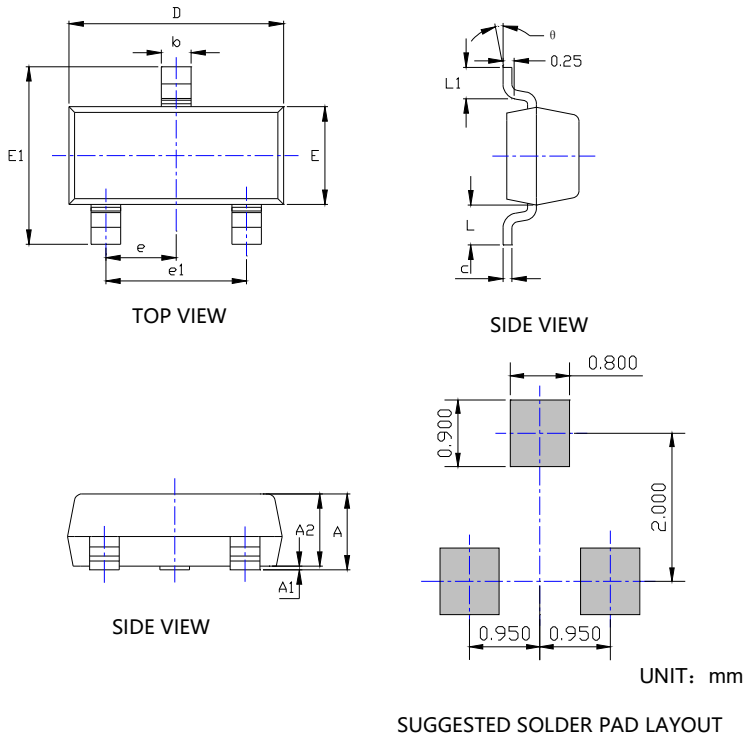


Figure 12. Safe Operation Area



YJL2305BQ

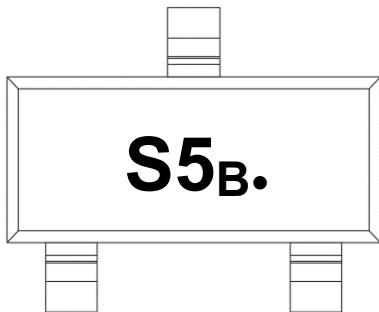
■ SOT-23 Package Outline Dimensions



| SYMBOL | DIMENSIONS | | | |
|--------|------------|-------|------------|-------|
| | INCHES | | Millimeter | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.035 | 0.045 | 0.900 | 1.150 |
| A1 | 0.000 | 0.004 | 0.000 | 0.100 |
| A2 | 0.035 | 0.041 | 0.900 | 1.050 |
| b | 0.012 | 0.020 | 0.300 | 0.500 |
| c | 0.004 | 0.008 | 0.100 | 0.200 |
| D | 0.110 | 0.118 | 2.800 | 3.000 |
| E | 0.047 | 0.055 | 1.200 | 1.400 |
| E1 | 0.089 | 0.100 | 2.250 | 2.550 |
| e | 0.037TYP | | 0.950TYP | |
| e1 | 0.071 | 0.079 | 1.800 | 2.000 |
| L | 0.022REF | | 0.550REF | |
| L1 | 0.012 | 0.020 | 0.300 | 0.500 |
| θ | 0° | 8° | 0° | 8° |

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.

■ Marking Information



- Note:
1. All marking is at middle of the product body
 2. All marking is in laser marking
 3. S5_B is Marking Code
 4. Body color: Black



Disclaimer

The information presented in this document is for reference only. Yangzhou Yangjie Electronic Technology Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with automotive electronics, are not designed for use in medical, life-saving, lifesustaining, or military, Yangjie or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.21yangjie.com](http://www.21yangjie.com) , or consult your nearest Yangjie's sales office for further assistance.