



## P-Channel Enhancement Mode Field Effect Transistor

### Product Summary

- $V_{DS}$  -30V
- $I_D$  -4.1A
- $R_{DS(on)}$  ( at  $V_{GS}=-10V$ ) 47m $\Omega$
- $R_{DS(on)}$  ( at  $V_{GS}=-4.5V$ ) 65m $\Omega$

### General Description

- Low  $R_{DS(on)}$  & FOM
- Extremely low switching loss
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free
- Part no. with suffix "Q" means AEC-Q101 qualified

### Applications

- Power management
- Portable equipment

### ■ Absolute Maximum Ratings ( $T_A=25$ unless otherwise noted)

| Parameter                            |           | Symbol   | Limit    | Unit |
|--------------------------------------|-----------|----------|----------|------|
| Drain-source Voltage                 |           | $V_{DS}$ | -30      | V    |
| Gate-source Voltage                  |           | $V_{GS}$ | $\pm 20$ | V    |
| Drain Current                        | $T_A=25$  | $I_D$    | -4.1     | A    |
|                                      | $T_A=100$ |          | -2.5     |      |
| Pulsed Drain Current <sup>A</sup>    |           | $I_{DM}$ | -20      | A    |
| Total Power Dissipation <sup>B</sup> | $T_A=25$  | $P_D$    | 1.2      | W    |
|                                      | $T_A=100$ |          |          |      |



# YJL3407CQ

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

| Parameter                         | Symbol              | Conditions                                                                                    | Min | Typ  | Max  | Units |
|-----------------------------------|---------------------|-----------------------------------------------------------------------------------------------|-----|------|------|-------|
| Static Parameter                  |                     |                                                                                               |     |      |      |       |
| Drain-Source Breakdown Voltage    | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> =-250μA                                                  | -30 |      |      | V     |
| Zero Gate Voltage Drain Current   | I <sub>DSS</sub>    | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V                                                    |     |      | -1   | uA    |
| Gate-Body Leakage Current         | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                    |     |      | ±100 | nA    |
| Gate Threshold Voltage            | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =-250μA                                    | -1  | -1.5 | -2.4 | V     |
| Static Drain-Source On-Resistance | R <sub>DS(ON)</sub> | V <sub>GS</sub> =-10V, I <sub>D</sub> =-4.1A                                                  |     | 35   | 47   | mΩ    |
|                                   |                     | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-3.5A                                                 |     | 50   | 65   | mΩ    |
| Diode Forward Voltage             | V <sub>SD</sub>     | I <sub>S</sub> =-4.1A, V <sub>GS</sub> =0V                                                    |     |      | -1.2 | V     |
| Gate resistance                   | R <sub>G</sub>      | f=1MHz                                                                                        |     | 17.5 |      | Ω     |
| Dynamic Parameters                |                     |                                                                                               |     |      |      |       |
| Input Capacitance                 | C <sub>iss</sub>    | V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz                                            |     | 471  |      | pF    |
| Output Capacitance                | C <sub>oss</sub>    |                                                                                               |     | 84   |      |       |
| Reverse Transfer Capacitance      | C <sub>rss</sub>    |                                                                                               |     | 69   |      |       |
| Switching Parameters              |                     |                                                                                               |     |      |      |       |
| Total Gate Charge                 | Q <sub>g</sub>      | V <sub>GS</sub> =-10V, V <sub>DS</sub> =-15V, I <sub>D</sub> =-4.1A                           | -   | 9    | -    | nC    |
| Gate-Source Charge                | Q <sub>gs</sub>     |                                                                                               | -   | 1.5  | -    |       |
| Gate-Drain Charge                 | Q <sub>gd</sub>     |                                                                                               | -   | 2.3  | -    |       |
| Reverse Recovery Charge           | Q <sub>rr</sub>     | I <sub>F</sub> =-4.1A, di/dt=100A/us                                                          | -   | 12   | -    | nC    |
| Reverse Recovery Time             | t <sub>rr</sub>     |                                                                                               | -   | 32   | -    | ns    |
| Turn-on Delay Time                | t <sub>D(on)</sub>  | V <sub>GS</sub> =-10V, V <sub>DD</sub> =-15V, I <sub>D</sub> =-4.1A<br>R <sub>GEN</sub> =2.5Ω | -   | 9    | -    | ns    |
| Turn-on Rise Time                 | t <sub>r</sub>      |                                                                                               |     | 3    |      |       |
| Turn-off Delay Time               | t <sub>D(off)</sub> |                                                                                               |     | 29   |      |       |
| Turn-off fall Time                | t <sub>f</sub>      |                                                                                               |     | 15   |      |       |

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

B. P<sub>d</sub> is based on max. junction temperature, using junction-ambient thermal resistance.

C. The value of R<sub>θJA</sub> is measured with the device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. Copper, in the still air environment with T<sub>A</sub>=25 .  
The maximum allowed junction temperature of 150 . The value in any given application depends on the user's specific board design.



## ■Typical Electrical and Thermal Characteristics Diagrams

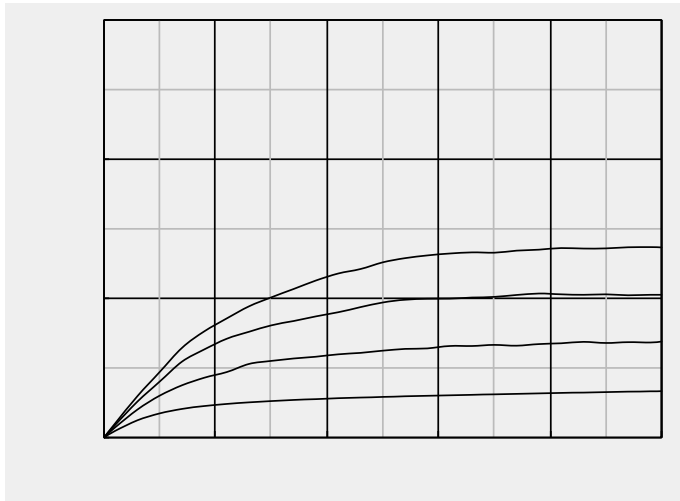


Figure 1. Output Characteristics

Figure 2. Transfer Characteristics

Figure 3. Capacitance Characteristics

Figure 4. Gate Charge

Figure 5. On-Resistance vs Gate to Source Voltage

Figure 6. Normalized On-Resistance

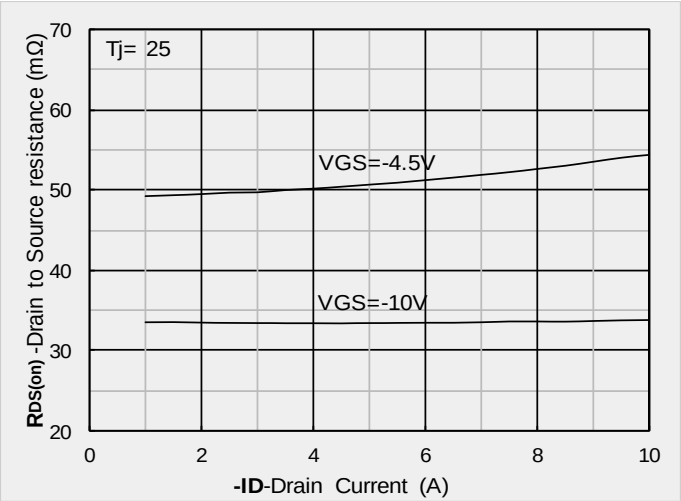


Figure 7.  $R_{DS(on)}$  VS Drain Current

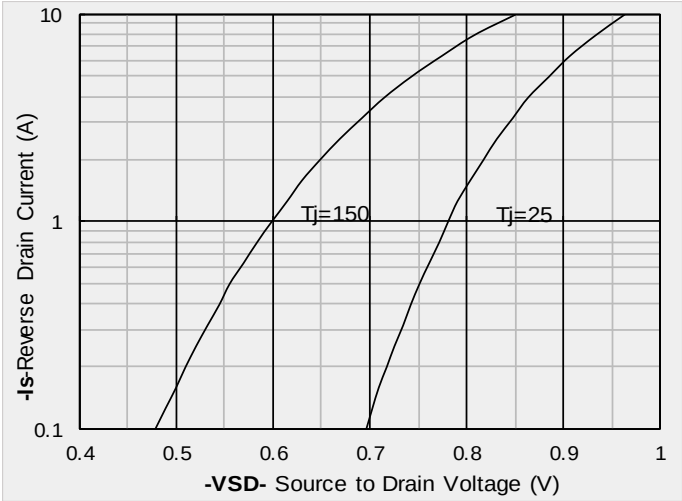


Figure 8. Forward characteristics of reverse diode

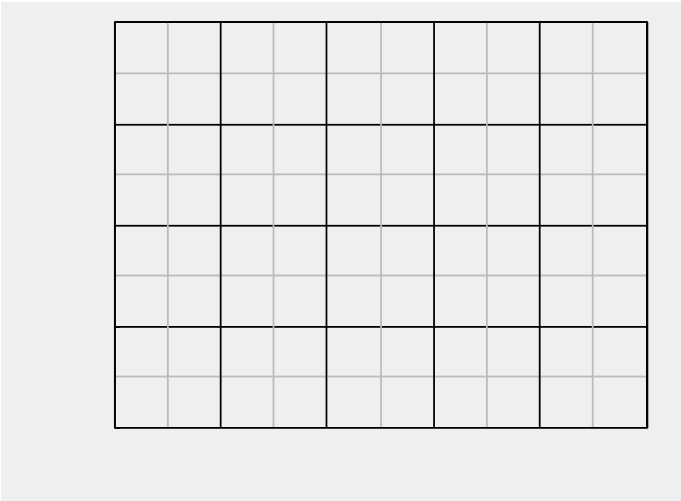


Figure 9. Normalized breakdown voltage



Figure 10. Normalized Threshold voltage

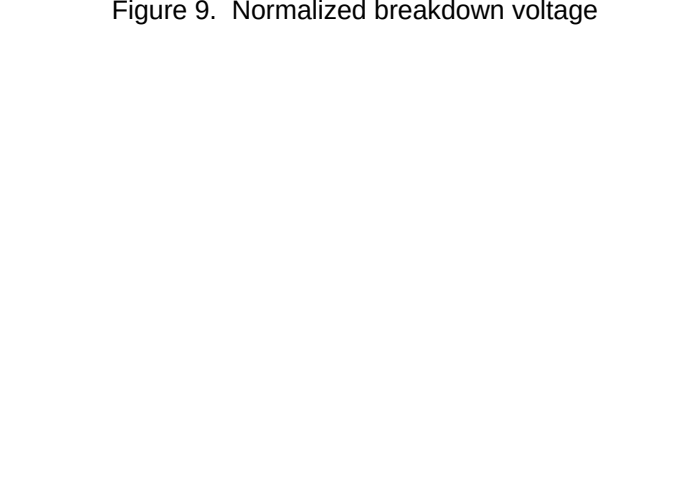


Figure 11. Current dissipation

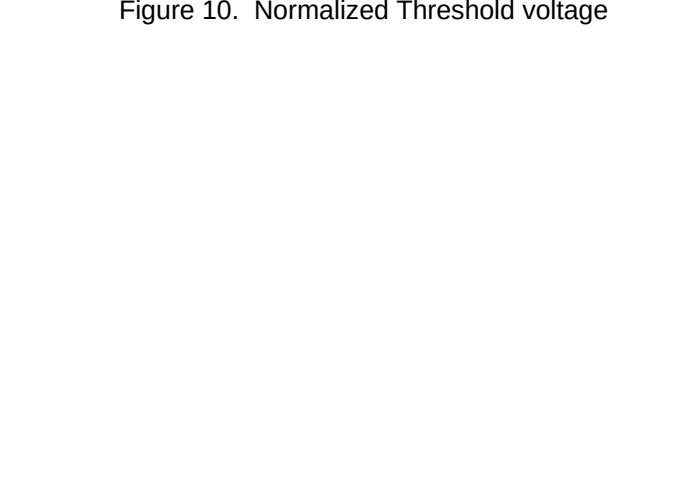


Figure 12. Power dissipation







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