# YJJ06P03A
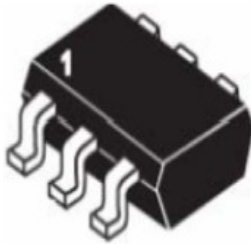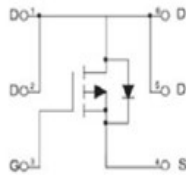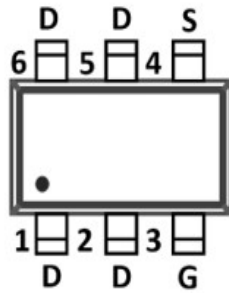
# P-Channel Enhancement Mode Field Effect Transistor



**SOT-23-6L**

## Product Summary
- $V_{DS}$      -30V
- $I_D$      -6.0A
- $R_{DS(ON)}$( at $V_{GS}$=-10V)   ＜49 mohm
- $R_{DS(ON)}$( at $V_{GS}$=-4.5V)   ＜65 mohm

## General Description
- Trench Power LV MOSFET technology
- High density cell design for Low $R_{DS(ON)}$
- High Speed switching

## Applications
- Battery protection
- Load switch
- Power management

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

| Parameter | | Symbol | Maximum | Unit |
|---|---|---|---|---|
| Drain-source Voltage | | $V_{DS}$ | -30 | V |
| Gate-source Voltage | | $V_{GS}$ | ±20 | V |
| Drain Current | $T_A$=25℃ @ Steady State | $I_D$ | -6.0 | A |
| | $T_A$=70℃ @ Steady State | | -4.8 | |
| Pulsed Drain Current [A] | | $I_{DM}$ | -25 | A |
| Total Power Dissipation | $T_A$=25℃ | $P_D$ | 1.2 | W |
| | $T_A$=70℃ | | 1.0 | |
| Thermal Resistance Junction-to-Ambient @ Steady State [B] | | $R_{θJA}$ | 104 | ℃/ W |
| Junction and Storage Temperature Range | | $T_J$ ,$T_{STG}$ | -55～+150 | ℃ |

## ■ Ordering Information (Example)

| PREFERED P/N | PACKING CODE | Marking | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---|---|---|---|---|---|---|
| YJJ06P03A | F2 | 0306 | 3000 | 30000 | 120000 | 7" reel |

# YJJ06P03A

## ■ Electrical Characteristics (T$_J$=25℃ unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Static Parameter** | | | | | | |
| Drain-Source Breakdown Voltage | BV$_{DSS}$ | V$_{GS}$= 0V, I$_D$=-250μA | -30 | | | V |
| Zero Gate Voltage Drain Current | I$_{DSS}$ | V$_{DS}$=-30V,V$_{GS}$=0V,T$_C$=25℃ | | | -1 | μA |
| Gate-Body Leakage Current | I$_{GSS}$ | V$_{GS}$= ±20V, V$_{DS}$=0V | | | ±100 | nA |
| Gate Threshold Voltage | V$_{GS(th)}$ | V$_{DS}$= V$_{GS}$, I$_D$=-250μA | -1 | -1.5 | -2.4 | V |
| Static Drain-Source On-Resistance | R$_{DS(ON)}$ | V$_{GS}$= -10V, I$_D$=-6.0A | | 36 | 49 | mΩ |
| | | V$_{GS}$= -4.5V, I$_D$=-4.0A | | 52 | 65 | |
| Diode Forward Voltage | V$_{SD}$ | I$_S$=-6.0A,V$_{GS}$=0V | | | -1.2 | V |
| Maximum Body-Diode Continuous Current | I$_S$ | | | | -6.0 | A |
| **Dynamic Parameters** | | | | | | |
| Input Capacitance | C$_{iss}$ | V$_{DS}$=-15V,V$_{GS}$=0V,f=1MHZ | | 572 | | pF |
| Output Capacitance | C$_{oss}$ | | | 82 | | |
| Reverse Transfer Capacitance | C$_{rss}$ | | | 70 | | |
| **Switching Parameters** | | | | | | |
| Total Gate Charge | Q$_g$ | V$_{GS}$=-10V,V$_{DS}$=-15V,I$_D$=-6A | | 11.7 | | nC |
| Gate Source Charge | Q$_{gs}$ | | | 2.3 | | |
| Gate Drain Charge | Q$_{gd}$ | | | 2.1 | | |
| Reverse Recovery Chrage | Q$_{rr}$ | I$_F$=-6A, di/dt=100A/us | | 0.64 | | |
| Reverse Recovery Time | t$_{rr}$ | | | 15.7 | | |
| Turn-on Delay Time | t$_{D(on)}$ | V$_{GS}$=-10V, V$_{DS}$=-15V, R$_L$=15Ω R$_{GEN}$=2.5Ω | | 3.8 | | ns |
| Turn-on Rise Time | t$_r$ | | | 17.6 | | |
| Turn-off Delay Time | t$_{D(off)}$ | | | 17.8 | | |
| Turn-off Fall Time | t$_f$ | | | 21.8 | | |

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. R$_{θJA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. R$_{θJC}$ is guaranteed by design, while R$_{θJA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in$^2$ FR-4 board with 2oz copper.

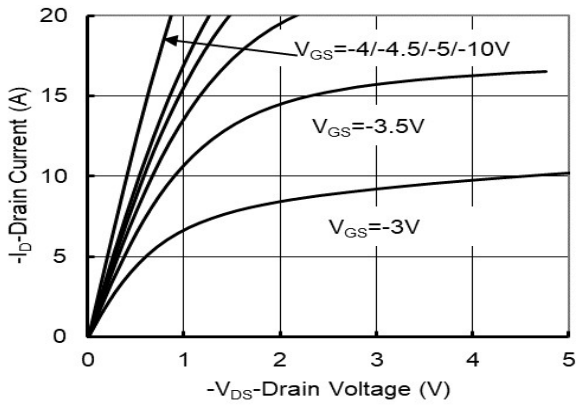## ■ Typical Performance Characteristics


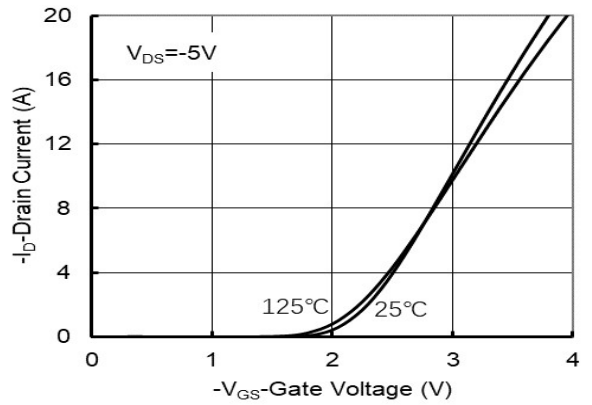
Figure1.  Output Characteristics



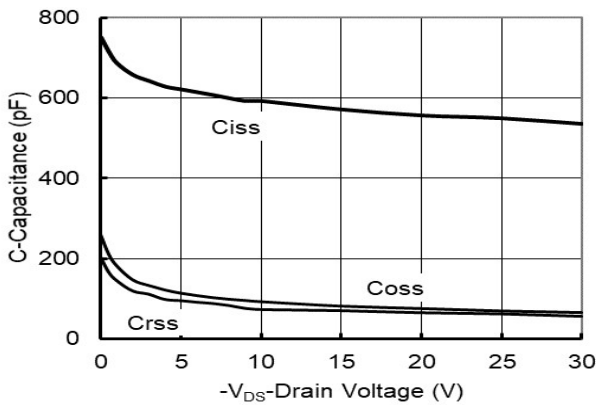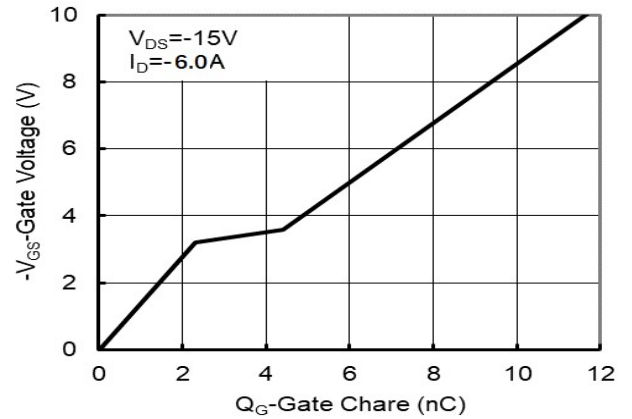Figure2.  Transfer Characteristics



Figure3.  Capacitance Characteristics



Figure4. Gate Charge
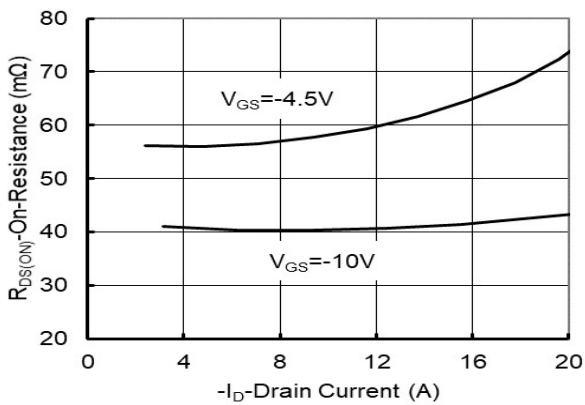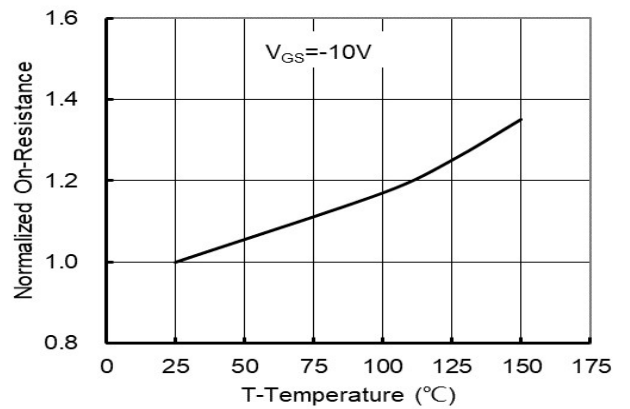


Figure5. Drain-Source on Resistance
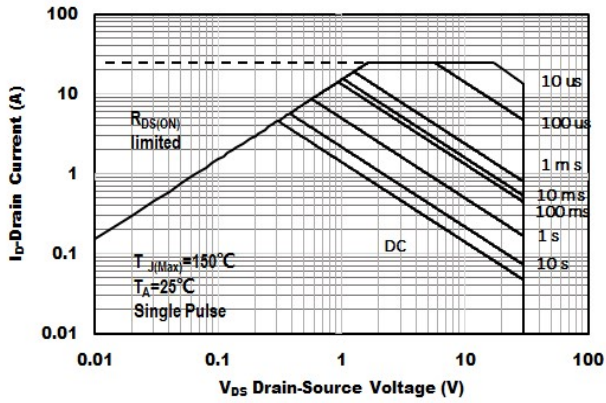


Figure6. Drain-Source on Resistance

Figure7. Safe Operation Area
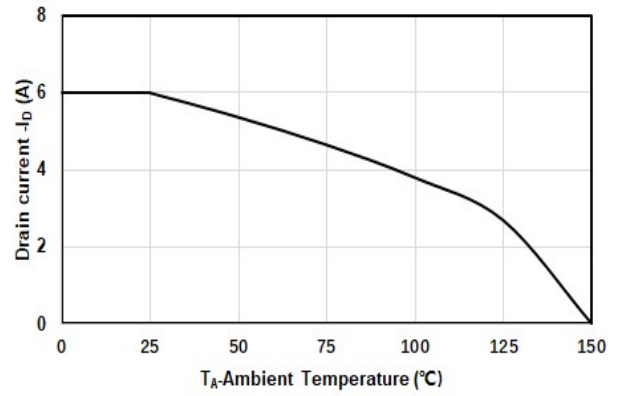


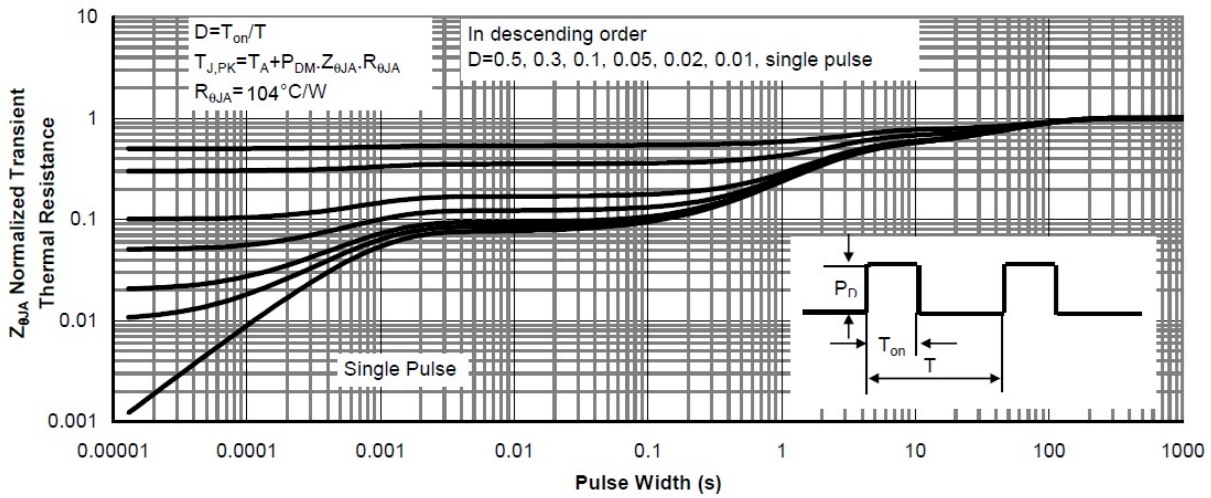Figure8. Maximum Continuous Drain Current vs Ambient Temperature



Figure9. Normalized Maximum Transient Thermal Impedance

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## ■ SOT-23-6L Package information



TOP VIEW

SIDE VIEW

SIDE VIEW

Suggested Solder Pad Layout

Note:
1,Controlling dimension:in millimeters,
2,General tolerance:±0,05mm,
3.The pad layout is for reference purposes only.

| SYMBOL | DIMENSIONS | | | |
|--------|------------|------|------|------|
| | INCHES | | Millimeter | |
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.012 | 0.020 | 0.300 | 0.500 |
| B | 0.059 | 0.067 | 1.500 | 1.700 |
| C | 0.104 | 0.116 | 2.650 | 2.950 |
| D | 0.037BSC | | 0.950BSC | |
| G | 0.075BSC | | 1.900BSC | |
| H | 0.111 | 0.119 | 2.820 | 3.020 |
| J | 0.000 | 0.004 | 0.000 | 0.100 |
| K | 0.041 | 0.045 | 1.050 | 1.150 |
| L | 0.012 | 0.024 | 0.300 | 0.600 |
| M | 0.004 | 0.008 | 0.100 | 0.200 |
| θ | 0° | 8° | 0° | 8° |

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