

## Features

- Complementary MOSFET.
- Low On-Resistance.
- Low Input Capacitance.
- Fast Switching Speed.

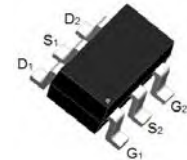
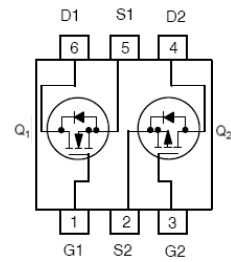
HF

## Typical Applications

- Backlighting.
- Power Management Functions.
- DC-DC Converters

## Mechanical Data

- Case: SOT-23-6L.
- Molding Compound, UL Flammability Classification Rating 94V-0.
- Terminals: Matte Tin Plated Leads, Solderable Per MIL-STD-202, Method 208.



BL6601-6L

SOT-23-6L

## Ordering Information

| Part Number | Package   | Shipping              | Marking Code |
|-------------|-----------|-----------------------|--------------|
| BL6601-6L   | SOT-23-6L | 3000pcs / Tape & Reel | 6601         |

## Maximum Ratings (@T<sub>A</sub>=25°C unless otherwise specified)

| Symbol           | Parameter                 | Q1          | Q2   | Units |
|------------------|---------------------------|-------------|------|-------|
| V <sub>DSS</sub> | Drain-Source Voltage      | 30          | -30  | V     |
| V <sub>GSS</sub> | Gate -Source Voltage      | ±12         | ±12  | V     |
| I <sub>D</sub>   | Continuous Drain Current  | 3.8         | -2.5 | A     |
| I <sub>DM</sub>  | Pulsed Drain Current      | 20          | -15  | A     |
| P <sub>D</sub>   | Power Dissipation         | 0.85        | 1.3  | W     |
| R <sub>θJA</sub> | Junction-to-Air           | 147         | 96   | °C/W  |
| R <sub>θJC</sub> | Junction-to-Case          | 36          |      | °C/W  |
| T <sub>J</sub>   | Junction Temperature      | 150         |      | °C    |
| T <sub>STG</sub> | Storage Temperature Range | -55 to +150 |      | °C    |

### Electrical Characteristics-Q2 (@T<sub>A</sub>=25°C unless otherwise specified)

| Symbol                                       | Parameter                                | Test conditions                                                                       | MIN  | TYP  | MAX  | UNIT |
|----------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------|------|------|------|------|
| OFF Characteristics                          |                                          |                                                                                       |      |      |      |      |
| V <sub>DSS</sub>                             | Drain-Source Breakdown Voltage           | V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA                                           | -30  | -    | -    | V    |
| I <sub>DSS</sub>                             | Drain to Source Leakage Current          | V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V                                            | -    | -    | -1   | uA   |
| I <sub>GSS</sub>                             | Gate-body Leakage                        | V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V                                            | -    | -    | ±100 | nA   |
| ON Characteristics <sup>(NOTE2)</sup>        |                                          |                                                                                       |      |      |      |      |
| R <sub>DS(ON)</sub>                          | Static Drain-Source On-resistance        | V <sub>GS</sub> =-2.5V, I <sub>D</sub> =-1A                                           | -    | -    | 190  | mΩ   |
|                                              |                                          | V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-2A                                           | -    | -    | 142  |      |
|                                              |                                          | V <sub>GS</sub> =-10V, I <sub>D</sub> =-2.3A                                          | -    | -    | 110  |      |
| V <sub>GS(TH)</sub>                          | Gate Threshold Voltage                   | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =-250uA                            | -0.4 | -1   | -1.2 | V    |
| Dynamic Characteristics <sup>(NOTE3)</sup>   |                                          |                                                                                       |      |      |      |      |
| C <sub>iss</sub>                             | Input Capacitance                        | V <sub>GS</sub> = 0V                                                                  | -    | 541  | -    | pF   |
| C <sub>oss</sub>                             | Output Capacitance                       | V <sub>DS</sub> = -15V                                                                | -    | 46   | -    |      |
| C <sub>rss</sub>                             | Reverse Transfer Capacitance             | f = 1.0MHz                                                                            | -    | 43   | -    |      |
| Switching Characteristics <sup>(NOTE3)</sup> |                                          |                                                                                       |      |      |      |      |
| t <sub>d(on)</sub>                           | Turn-on Delay Time                       | V <sub>DD</sub> =-15V, R <sub>L</sub> =6Ω<br>V <sub>GS</sub> =-10V,R <sub>G</sub> =3Ω | -    | 1.7  | -    | nS   |
| t <sub>r</sub>                               | Turn-on Rise Time                        |                                                                                       | -    | 4.6  | -    |      |
| t <sub>d(off)</sub>                          | Turn-Off Delay Time                      |                                                                                       | -    | 18.3 | -    |      |
| t <sub>f</sub>                               | Turn-Off Fall Time                       |                                                                                       | -    | 2.2  | -    |      |
| Q <sub>g</sub>                               | Total Gate Charge                        | V <sub>DS</sub> =-15V, I <sub>D</sub> =-2.3A<br>V <sub>GS</sub> =-10V                 | -    | 13.8 | -    | nC   |
| Q <sub>gs</sub>                              | Gate-Source Charge                       |                                                                                       | -    | 1    | -    |      |
| Q <sub>gd</sub>                              | Gate-Drain Charge                        |                                                                                       | -    | 1.6  | -    |      |
| Source-Drain Diode Characteristics           |                                          |                                                                                       |      |      |      |      |
| V <sub>SD</sub>                              | Diode Forward Voltage <sup>(NOTE1)</sup> | I <sub>SD</sub> =-1A,V <sub>GS</sub> =0V                                              | -    | -0.8 | -1.0 | V    |
| I <sub>S</sub>                               | Diode Continuous Forward Current         | T <sub>C</sub> =25°C                                                                  | -    | -    | -1   | A    |

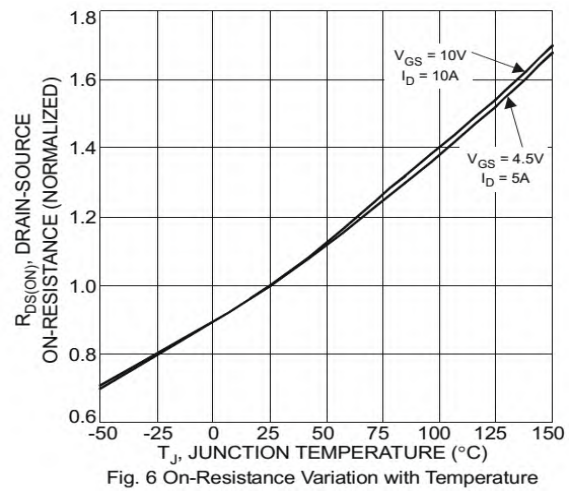
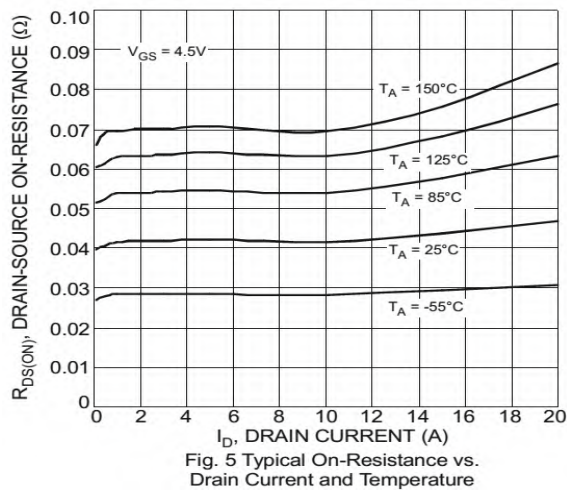
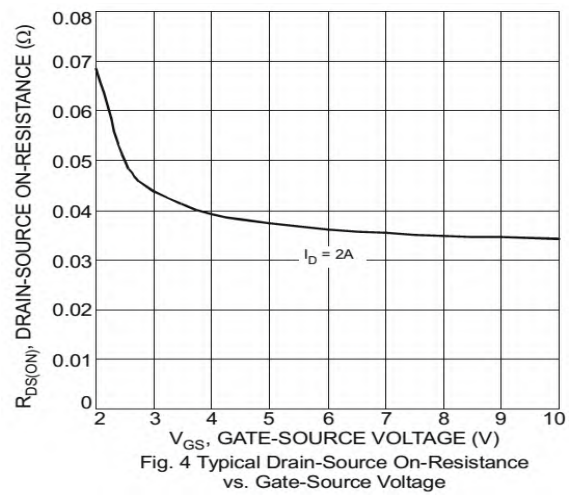
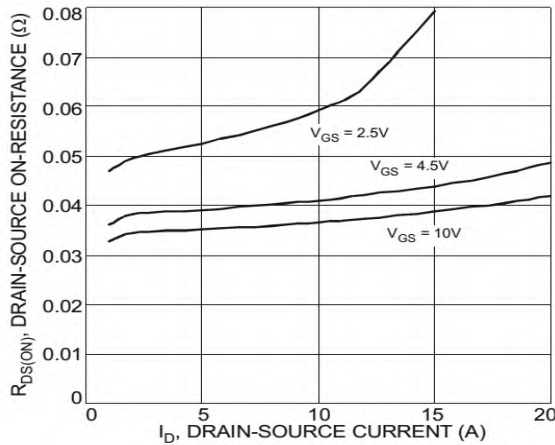
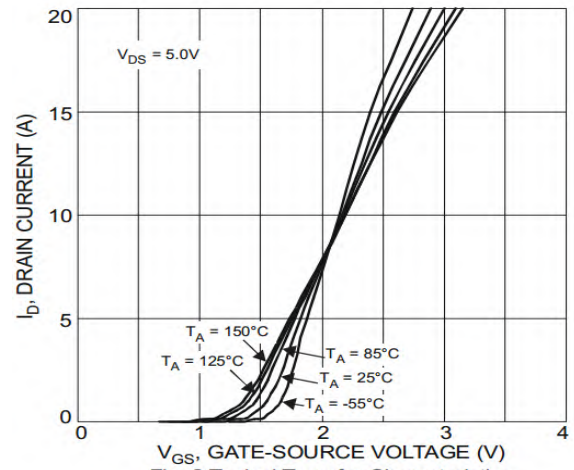
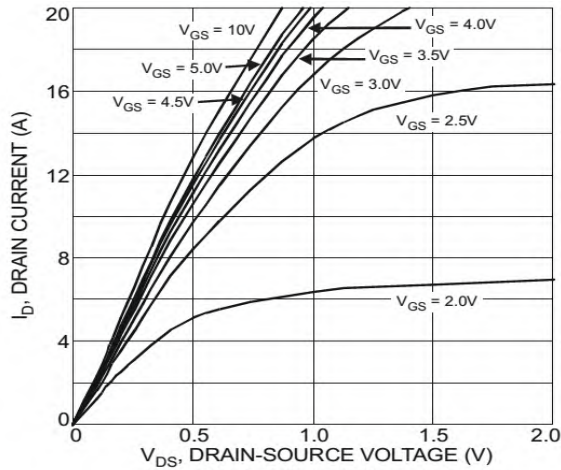
**Electrical Characteristics-Q1** (@T<sub>A</sub>=25°C unless otherwise specified)

| Symbol                                       | Parameter                                | Test conditions                                                                       | MIN | TYP  | MAX  | UNIT |
|----------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------|-----|------|------|------|
| OFF Characteristics                          |                                          |                                                                                       |     |      |      |      |
| V <sub>DSS</sub>                             | Drain-Source Breakdown Voltage           | V <sub>GS</sub> =0V, I <sub>D</sub> =250μA                                            | 30  | -    | -    | V    |
| I <sub>DSS</sub>                             | Drain to Source Leakage Current          | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                                             | -   | -    | 1    | uA   |
| I <sub>GSS</sub>                             | Gate-body Leakage                        | V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V                                            | -   | -    | ±100 | nA   |
| ON Characteristics <sup>(NOTE2)</sup>        |                                          |                                                                                       |     |      |      |      |
| R <sub>DS(ON)</sub>                          | Static Drain-Source On-resistance        | V <sub>GS</sub> =2.5V, I <sub>D</sub> =2A                                             | -   | -    | 85   | mΩ   |
|                                              |                                          | V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A                                             | -   | -    | 65   |      |
|                                              |                                          | V <sub>GS</sub> =10V, I <sub>D</sub> =3.4A                                            | -   | -    | 55   |      |
| V <sub>GS(TH)</sub>                          | Gate Threshold Voltage                   | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250uA                             | 0.5 | 1    | 1.5  | V    |
| Dynamic Characteristics <sup>(NOTE3)</sup>   |                                          |                                                                                       |     |      |      |      |
| C <sub>iss</sub>                             | Input Capacitance                        | V <sub>GS</sub> = 0V                                                                  | -   | 422  | -    | pF   |
| C <sub>oss</sub>                             | Output Capacitance                       | V <sub>DS</sub> =15V                                                                  | -   | 41   | -    |      |
| C <sub>rss</sub>                             | Reverse Transfer Capacitance             | f = 1.0MHz                                                                            | -   | 39   | -    |      |
| Switching Characteristics <sup>(NOTE3)</sup> |                                          |                                                                                       |     |      |      |      |
| t <sub>d(on)</sub>                           | Turn-on Delay Time                       | V <sub>DD</sub> =15V, R <sub>L</sub> =4.7Ω<br>V <sub>GS</sub> =10V,R <sub>G</sub> =3Ω | -   | 1.6  | -    | nS   |
| t <sub>r</sub>                               | Turn-on Rise Time                        |                                                                                       | -   | 7.4  | -    |      |
| t <sub>d(off)</sub>                          | Turn-Off Delay Time                      |                                                                                       | -   | 31.2 | -    |      |
| t <sub>f</sub>                               | Turn-Off Fall Time                       |                                                                                       | -   | 15.6 | -    |      |
| Q <sub>g</sub>                               | Total Gate Charge                        | V <sub>DS</sub> =15V, I <sub>D</sub> =3.1A<br>V <sub>GS</sub> =10V                    | -   | 12.3 | -    | nC   |
| Q <sub>gs</sub>                              | Gate-Source Charge                       |                                                                                       | -   | 0.8  | -    |      |
| Q <sub>gd</sub>                              | Gate-Drain Charge                        |                                                                                       | -   | 1.2  | -    |      |
| Source-Drain Diode Characteristics           |                                          |                                                                                       |     |      |      |      |
| V <sub>SD</sub>                              | Diode Forward Voltage <sup>(NOTE1)</sup> | I <sub>SD</sub> =1A,V <sub>GS</sub> =0V                                               | -   | 0.75 | 1    | V    |
| I <sub>S</sub>                               | Diode Continuous Forward Current         | T <sub>C</sub> =25°C                                                                  | -   | -    | 1    | A    |

NOTE:

- 1、 Surface Mounted on FR4 Board, t ≤ 10 sec
- 2、 Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 3、 Guaranteed by design, not subject to production.

Ratings and Characteristic Curves-Q1 ( $T_A=25^\circ\text{C}$  unless otherwise noted)



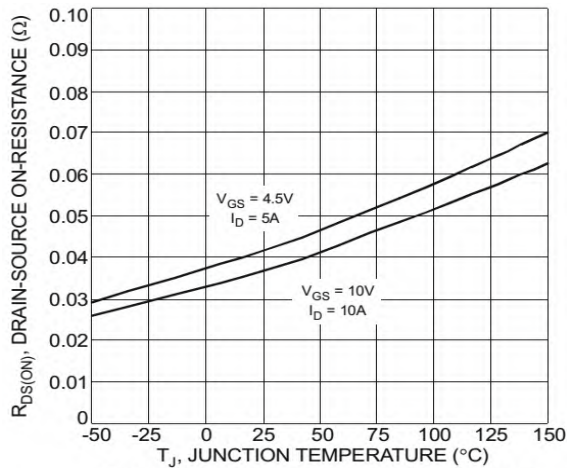


Fig. 7 On-Resistance Variation with Temperature

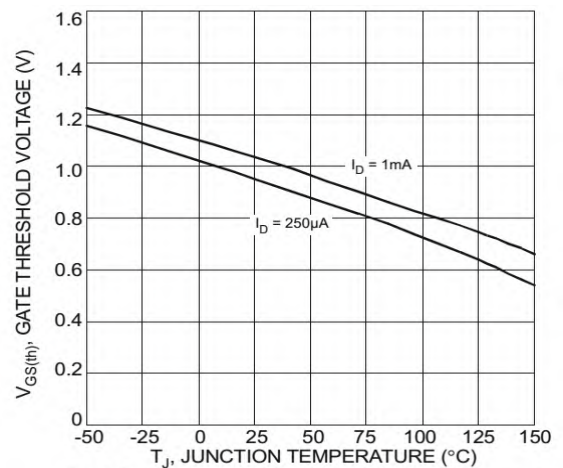


Fig. 8 Gate Threshold Variation vs. Ambient Temperature

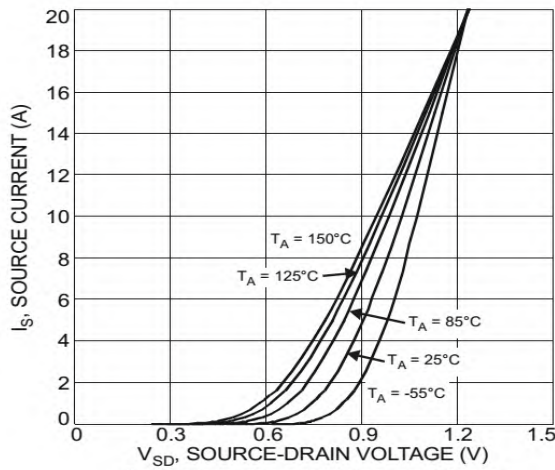


Fig. 9 Diode Forward Voltage vs. Current

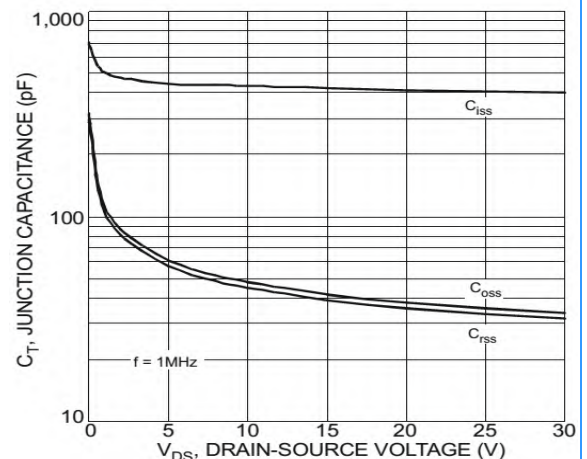


Fig. 10 Typical Junction Capacitance

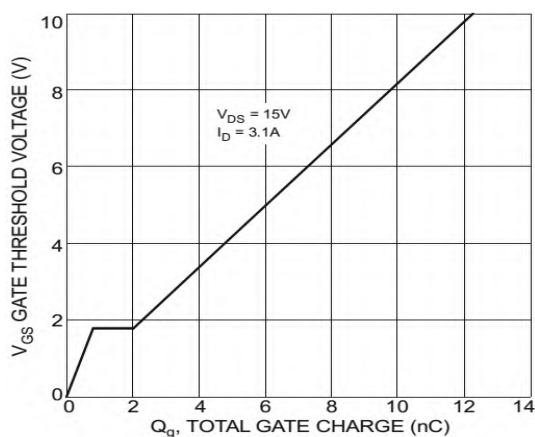


Fig. 11 Gate Charge

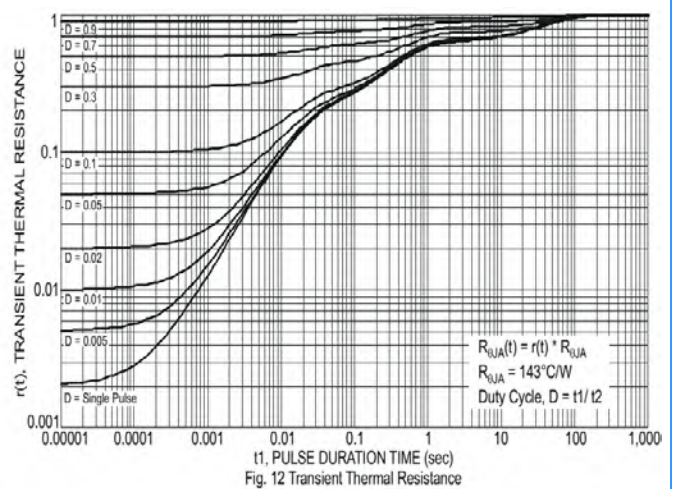
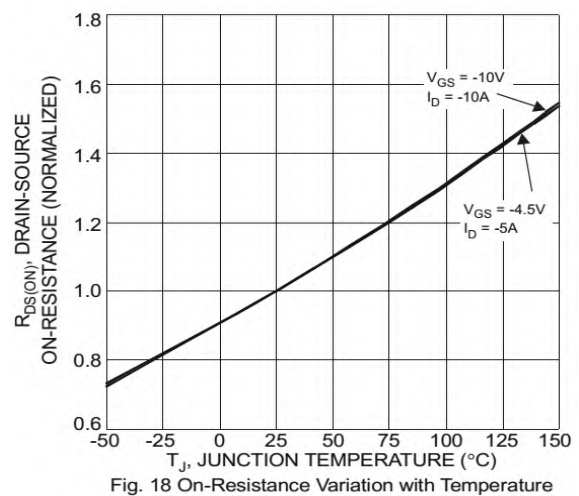
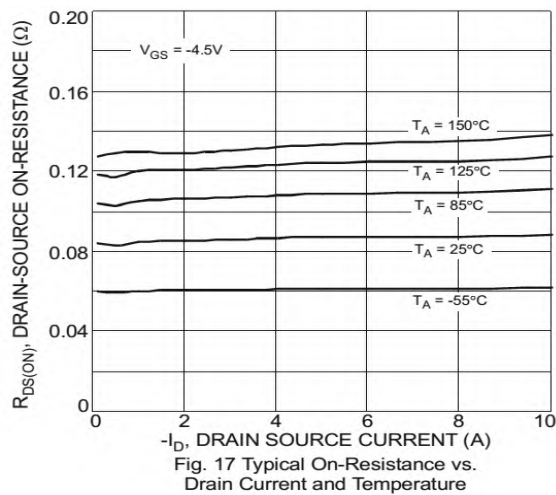
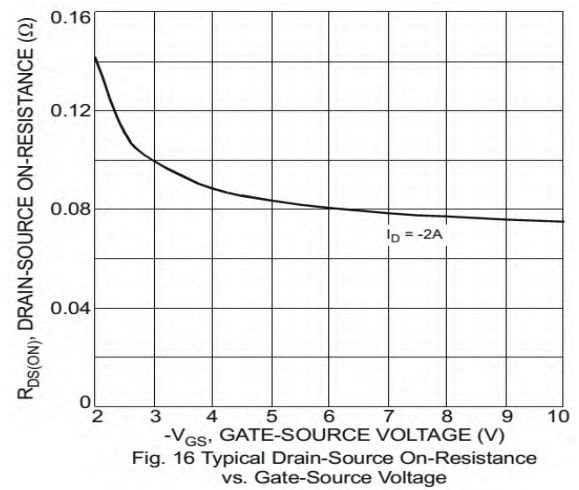
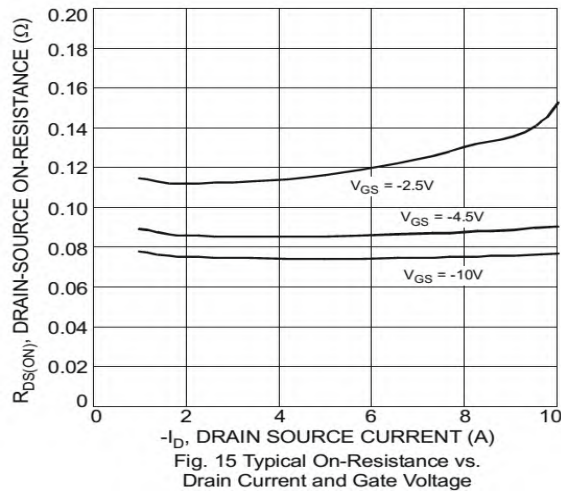
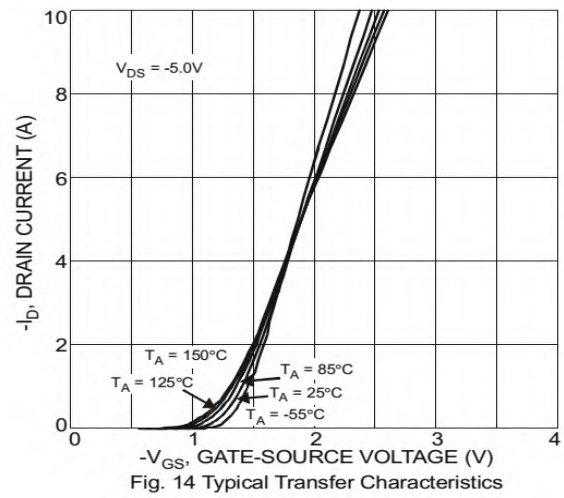
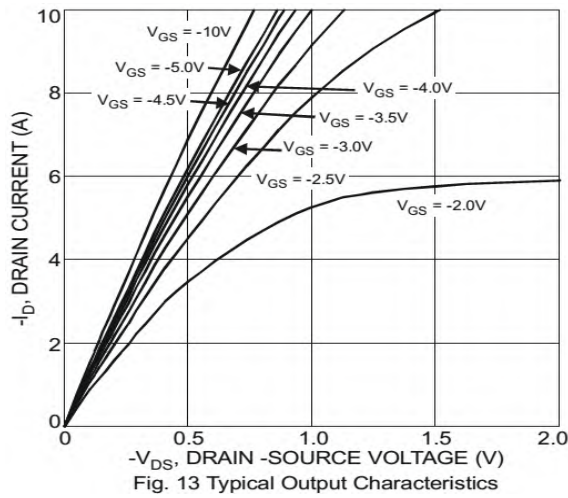


Fig. 12 Transient Thermal Resistance

Ratings and Characteristic Curves-Q2 ( $T_A=25^\circ\text{C}$  unless otherwise noted)



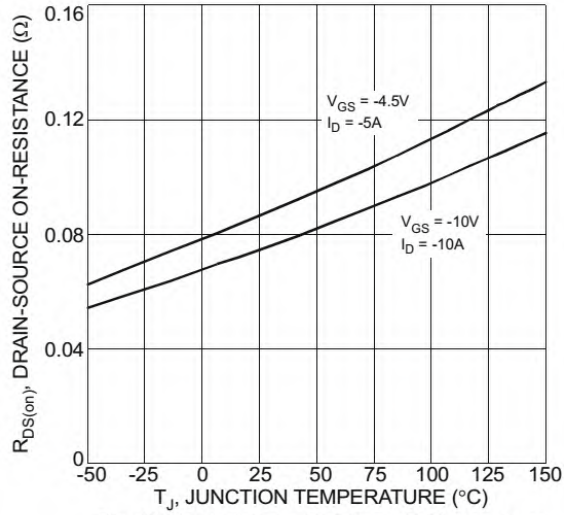


Fig. 19 On-Resistance Variation with Temperature

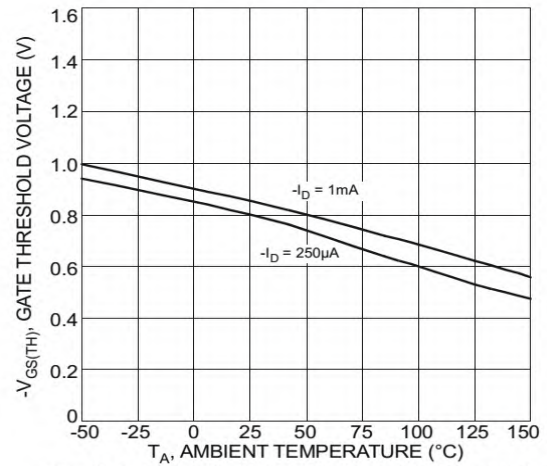


Fig. 20 Gate Threshold Variation vs. Ambient Temperature

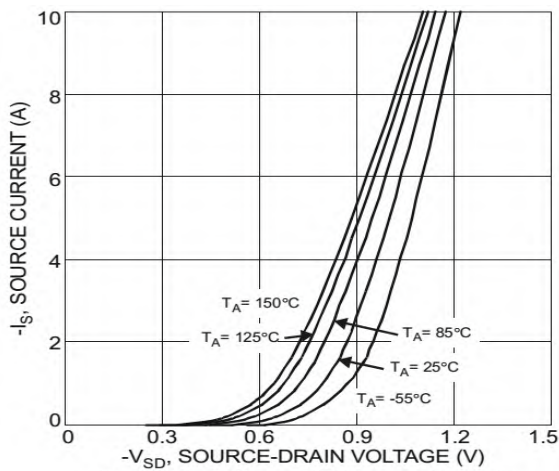


Fig. 21 Diode Forward Voltage vs. Current

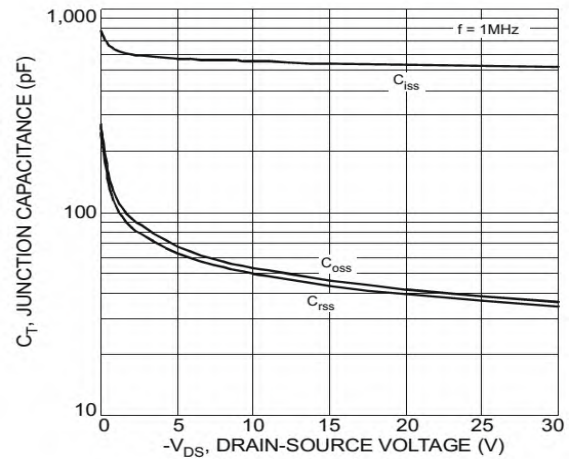


Fig. 22 Typical Junction Capacitance

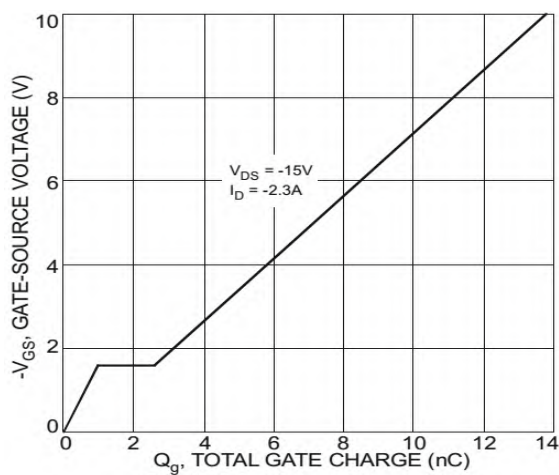
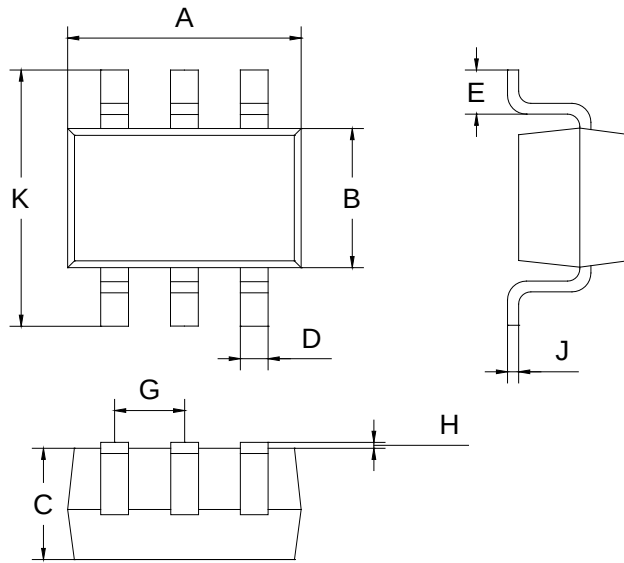


Fig. 23 Gate-Charge Characteristics

## Package Outline Dimensions(unit:mm)

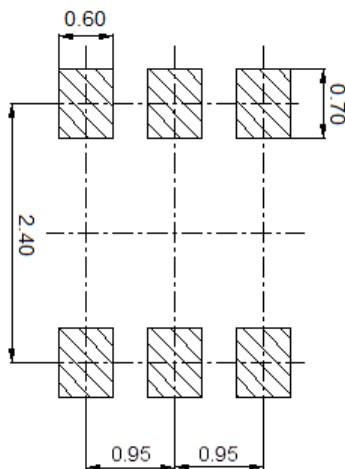
### SOT-23-6L



| SOT-23-6L |      |      |
|-----------|------|------|
| Dim       | Min  | Max  |
| A         | 2.80 | 3.00 |
| B         | 1.50 | 1.70 |
| C         | 1.00 | 1.20 |
| D         | 0.35 | 0.45 |
| E         | 0.35 | 0.55 |
| G         | 0.90 | 1.00 |
| H         | 0.02 | 0.10 |
| J         | 0.10 | 0.20 |
| K         | 2.60 | 3.00 |

## Mounting Pad Layout(unit:mm)

### SOT-23-6L



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