# GP2011L

## 20V P-Channel MOSFET

### Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)TYP}$ | $I_D$ |
|---|---|---|
| -20V | 14mΩ@-4.5V | -11A |
| | 19mΩ@-2.5V | |

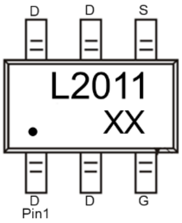
### Feature

- Trench Power MOSFET
- Excellent $R_{DS(on)}$
- Low Gate Charge

### Application

- Load Switch
- Battery Protection

### MARKING:

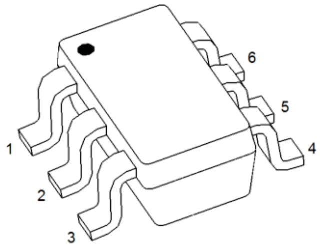


L2011 = Device Code

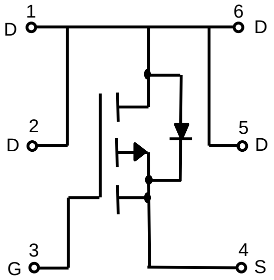
XX = Date Code

Solid Dot = Pin1

**SOT-23-6L**



Schematic diagram



### ABSOLUTE MAXIMUM RATINGS ($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | $I_D$ | -11 | A |
| Plused Drain Current(1) | $I_{DM}$ | -44 | A |
| Power Dissipation(2) | $P_D$ | 0.35 | W |
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 357 | ℃/W |
| Junction Temperature | $T_J$ | 150 | ℃ |
| Storage Temperature | $T_{STG}$ | -55~ +150 | ℃ |

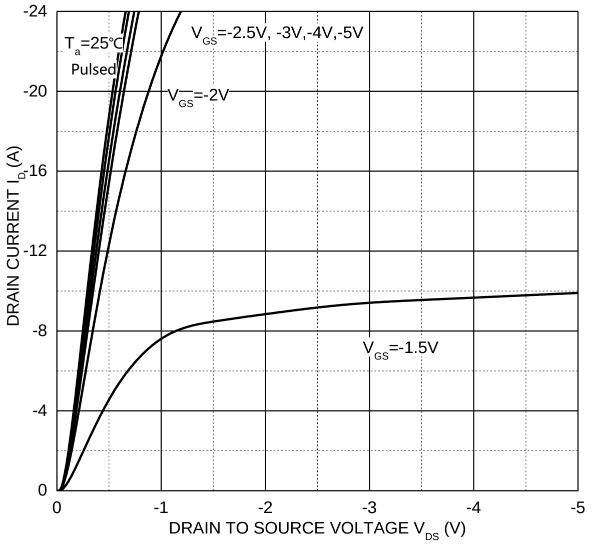
## MOSFET ELECTRICAL CHARACTERISTICS($T_a$=25℃ unless otherwise noted)

| Parameter | Symbol | Test Condition | Min | Type | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ =-250μA | -20 | | | V |
| Zero gate voltage drain current | $I_{DSS}$ | $V_{DS}$ =-16V,$V_{GS}$ = 0V | | | -1 | μA |
| Gate-body leakage current | $I_{GSS}$ | $V_{GS}$ =±12V, $V_{DS}$ = 0V | | | ±100 | nA |
| **On Characteristics**$^{(3)}$ | | | | | | |
| Gate threshold voltage | $V_{GS(th)}$ | $V_{DS}$ =$V_{GS}$, $I_D$ =-250μA | -0.4 | -0.6 | -1.0 | V |
| Drain-source on-resistance | $R_{DS(on)}$ | $V_{GS}$ =-4.5V, $I_D$ =-7.0A | | 14 | 18 | mΩ |
| | | $V_{GS}$ =-2.5V, $I_D$ =-6.0A | | 19 | 27 | |
| Forward tranconductance | $g_{FS}$ | $V_{DS}$ =-10V, $I_D$ =-7A | 10 | | | S |
| **Dynamic characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ =-6V,$V_{GS}$ =0V,f =1MHz | | 1900 | | pF |
| Output Capacitance | $C_{oss}$ | | | 390 | | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 380 | | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ =-6V,$V_{GS}$ =-4.5V,$I_D$ =-10A | | 35 | | nC |
| Gate-Source Charge | $Q_{gs}$ | | | 5 | | |
| Gate-Drain Charge | $Q_{gd}$ | | | 10 | | |
| **SWITCHING CHARACTERISTICS** | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{GEN}$=-4.5V,$V_{DD}$=-10V, $I_D$=-1A,$R_g$=10Ω | | 11 | | ns |
| Turn-on rise time | $t_r$ | | | 35 | | |
| Turn-off delay time | $t_{d(off)}$ | | | 30 | | |
| Turn-off fall time | $t_f$ | | | 10 | | |
| **Drain-Source Diode Characteristics** | | | | | | |
| Diode Forward Current | $I_S$ | | | | -11 | A |
| Diode Forward Voltage$^{(3)}$ | $V_{SD}$ | $V_{GS}$ =0V, $I_{SD}$=-1.9A | | | -1.2 | V |

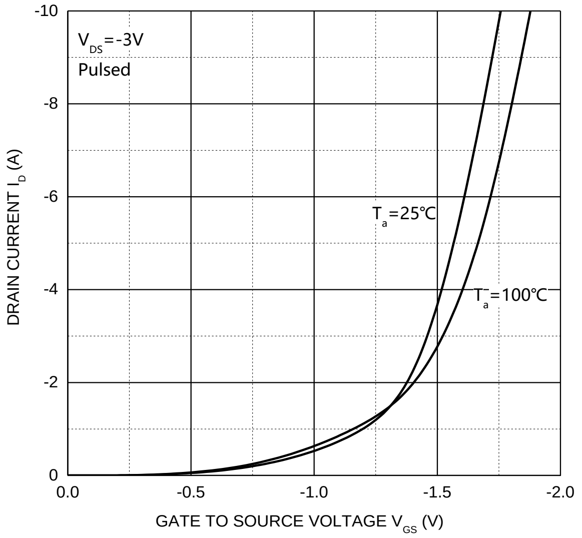
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. This test is performed with no heat sink at Ta=25℃.
3. Pulse Test: Pulse With ≤300μs,Duty Cycle≤2%.

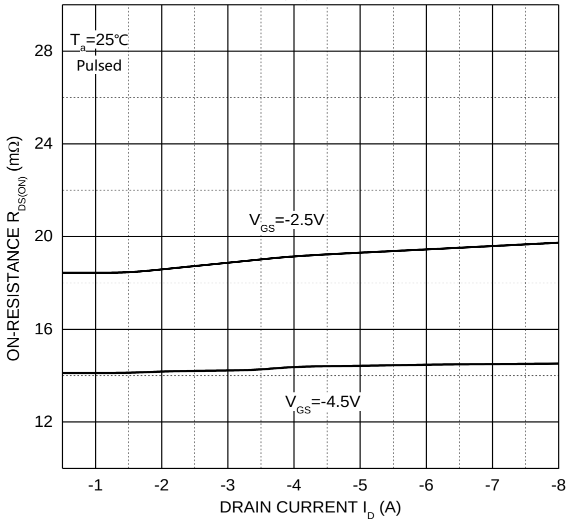
## Typical Electrical and Thermal Characteristics



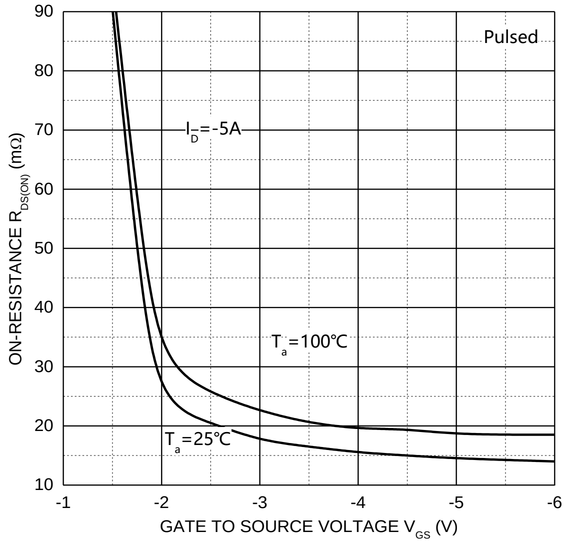
Output Characteristics



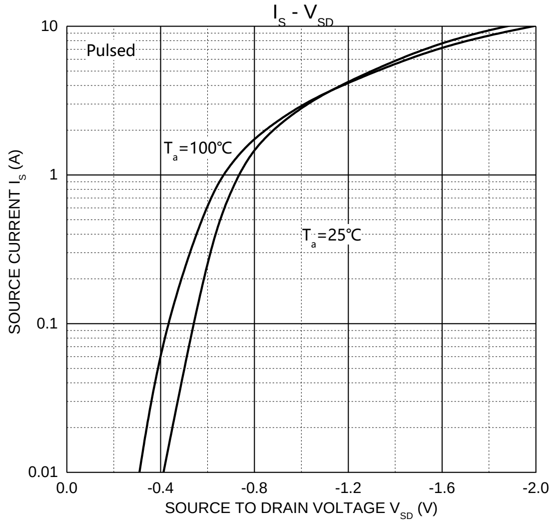
Transfer Characteristics



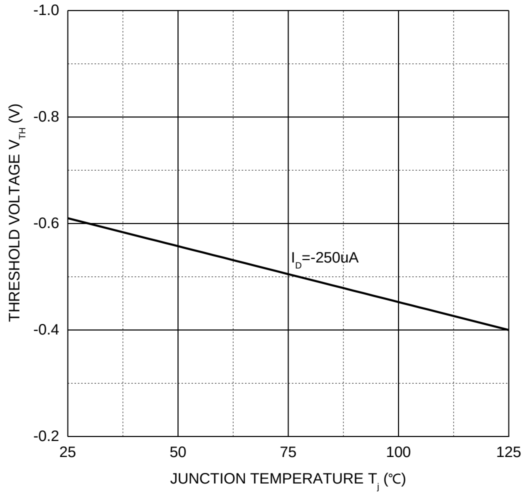
$R_{DS(ON)} - I_D$



$R_{DS(ON)}$ - $V_{GS}$

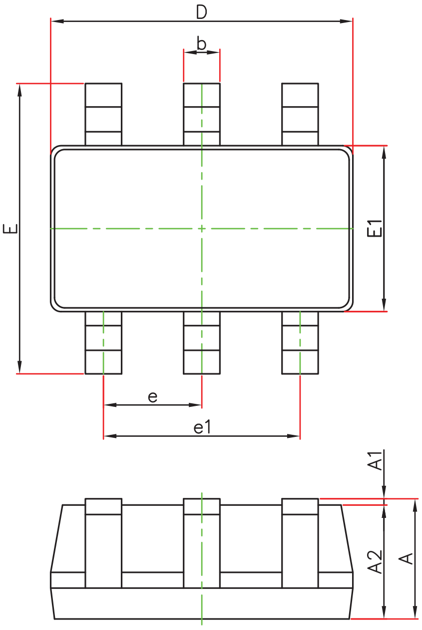


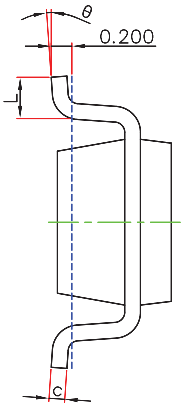
$I_S$ - $V_{SD}$



Threshold Voltage

## SOT-23-6L Package Information

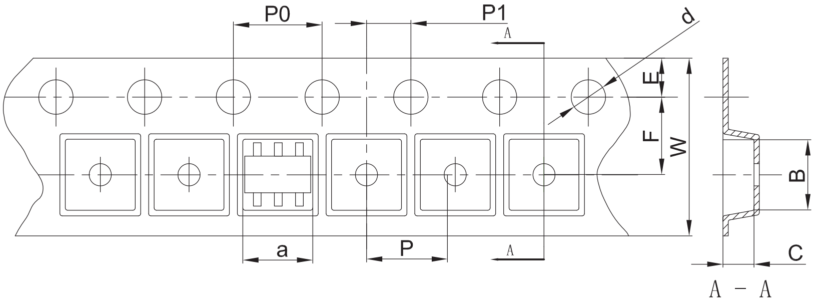




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.100 | 0.200 | 0.004 | 0.008 |
| D | 2.820 | 3.020 | 0.111 | 0.119 |
| E1 | 1.500 | 1.700 | 0.059 | 0.067 |
| E | 2.650 | 2.950 | 0.104 | 0.116 |
| e | 0.950(BSC) | | 0.037(BSC) | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| θ | 0° | 8° | 0° | 8° |

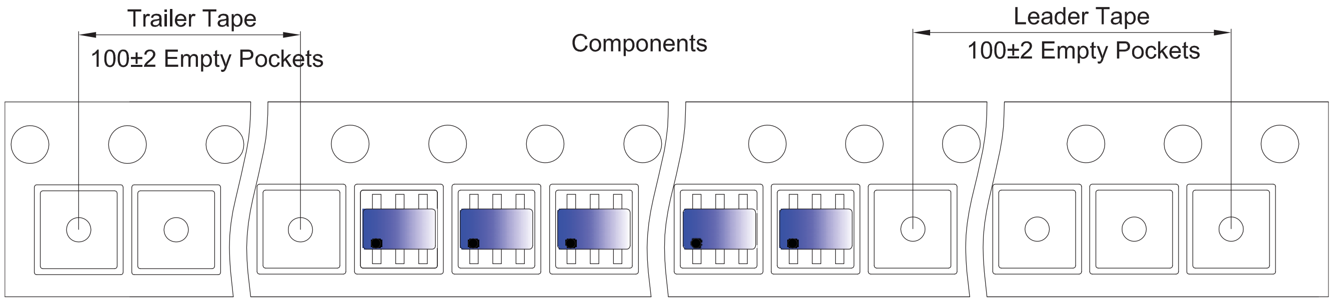
## SOT-23-6L Tape and Reel

### SOT-23-6L Tape and Reel

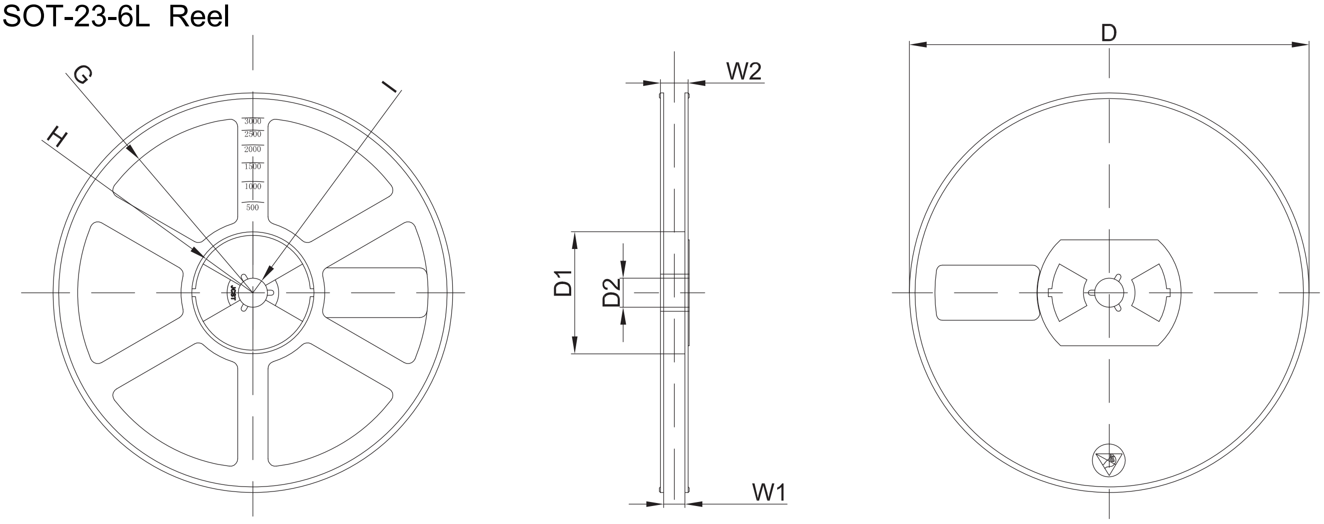


| Dimensions are in millimeter | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Pkg type | a | B | C | d | E | F | P0 | P | P1 | W |
| SOT-23-6L | 3.17 | 3.23 | 1.37 | Ø1.55 | 1.75 | 3.50 | 4.00 | 4.00 | 2.00 | 8.00 |

### SOT-23-6L Tape Leader and Trailer



### SOT-23-6L Reel



| Dimensions are in millimeter | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Reel Option | D | D1 | D2 | G | H | I | W1 | W2 |
| 7"Dia | Ø180.00 | 60.00 | 13.00 | R78.00 | R25.60 | R6.50 | 9.50 | 13.10 |

| REEL | Reel Size | Box | Box Size(mm) | Carton | Carton Size(mm) | G.W.(kg) |
|---|---|---|---|---|---|---|
| 3000 pcs | 7 inch | 30,000 pcs | 203×203×195 | 120,000 pcs | 438×438×220 | |