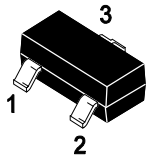
# LP2311LT1G

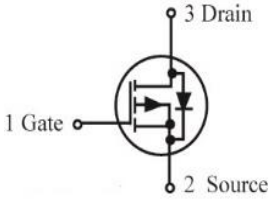
## 20V P-Channel Enhancement-Mode MOSFET

### 1. FEATURES

- VDS =-20V
- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- Advanced trench process technology
- High density cell design for ultra low on-resistance
- Fully characterized avalanche voltage and current improved shoot-through FOM




SOT23(TO-236)




### 2. APPLICATIONS

- Simple drive requirement
- Small package outline
- Surface mount device

### 3. DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|---|---|---|
| LP2311LT1G | AL | 3000/Tape&Reel |
| LP2311LT3G | AL | 10000/Tape&Reel |

### 4. MAXIMUM RATINGS(Ta = 25ºC)

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Drain–Source Voltage | VDSS | -20 | V |
| Gate–to–Source Voltage – Continuous | VGS | ±12 | V |
| Drain Current<br>– Continuous TA = 25°C<br>– Pulsed(Note 1) | <br>ID<br>IDM | <br>-2.5<br>-8 | A |
| Avalanche Current | IAS | 8 | A |
| Avalanche energy (L=0.1mH) | EAS | 3.2 | mJ |

### 5. THERMAL CHARACTERISTICS

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Maximum Power Dissipation | PD | 0.9 | W |
| Thermal Resistance, Junction–to–Ambient(Note 2) | RΘJA | 140 | ºC/W |
| Junction and Storage temperature | TJ,Tstg | −55~+150 | ° C |

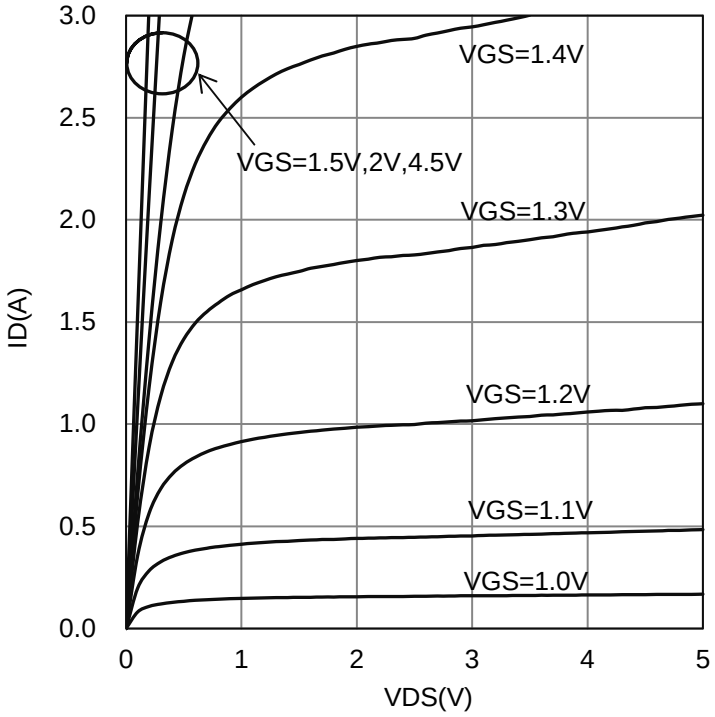
1. Repetitive Rating: Pulse width limited by the Maximum junction temperation.
2. 1-in² 2oz Cu PCB board.

## 6. ELECTRICAL CHARACTERISTICS (Ta= 25ºC)

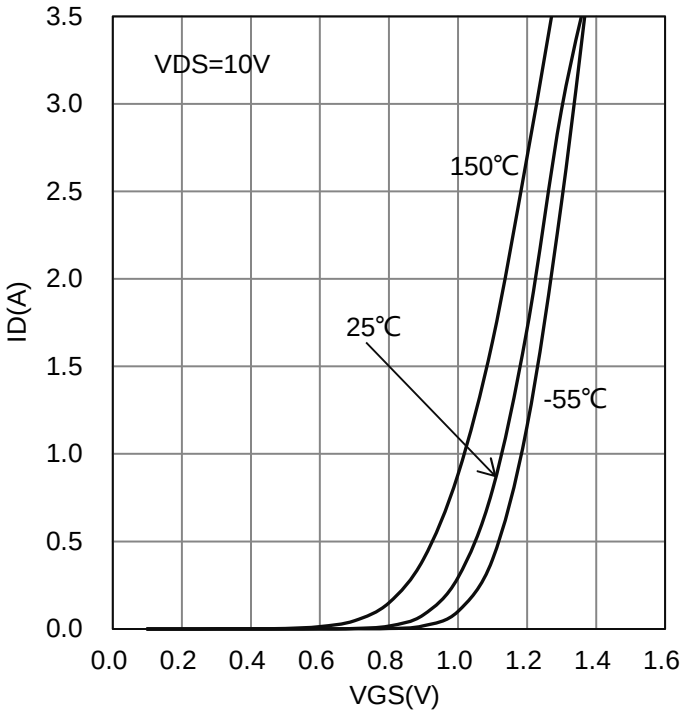
| Characteristic | | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Drain–Source Breakdown Voltage (VGS = 0, ID = -250μA) | | VBRDSS | -20 | - | - | V |
| Zero Gate Voltage Drain Current (VGS = 0, VDS = -9.6 V) | | IDSS | - | - | -1 | μA |
| Gate–Body Leakage Current, Forward (VGS = ± 12 ,VDS=0V) | | IGSS | - | - | ± 10 | uA |
| Gate Threshold Voltage (VDS = VGS, ID = -250μA) | | VGS(th) | -0.4 | - | -0.9 | V |
| Static Drain–Source On–State Resistance (VGS = -4.5 V, ID = -2.8 A)<br>(VGS = -2.5 V, ID = -2 A) | | RDS(on) | -<br>- | 85<br>100 | 100<br>130 | mΩ |
| Forward Transconductance (VDS = -5V, ID = -4.0A) | | gfs | - | 8.5 | - | S |
| Total Gate Charge(4.5V) | (VDS = -6V, ID=-2.8A) | Qg | - | 6 | - | nC |
| Total Gate Charge(10V) | | Qg | - | 11 | - | |
| Gate-Source Charge | | Qgs | - | 1.7 | - | |
| Gate-Drain Charge | | Qgd | - | 1.2 | - | |
| Input Capacitance | (VDS = -6V, VGS=0V, f=1.0MHz) | Ciss | - | 545 | - | pF |
| Output Capacitance | | Coss | - | 62 | - | |
| Reverse Transfer Capacitance | | Crss | - | 53 | - | |
| Turn-On Delay Time | (VDS = -6V,RL= 6.2Ω ,VGEN=-4.5 V,RG=6.2Ω) | td(on) | - | 3.6 | - | ns |
| Rise Time | | tr | - | 10.5 | - | |
| Turn-Off Delay Time | | td(off) | - | 98 | - | |
| Fall Time | | tf | - | 54 | - | |
| Forward Voltage (VGS = 0 V, ISD = -0.75 A) | | VSD | - | -0.8 | -1.2 | V |
| Gate-Resistance (VDS=0V,VGS=0V,f=1.0MHz) | | Rg | - | 39.6 | - | Ω |

3.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.

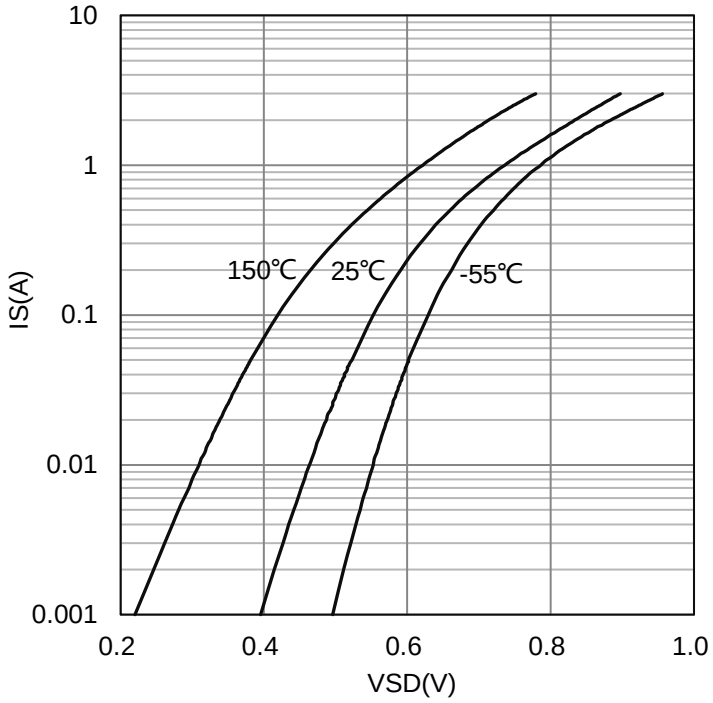
## 7. ELECTRICAL CHARACTERISTICS CURVES



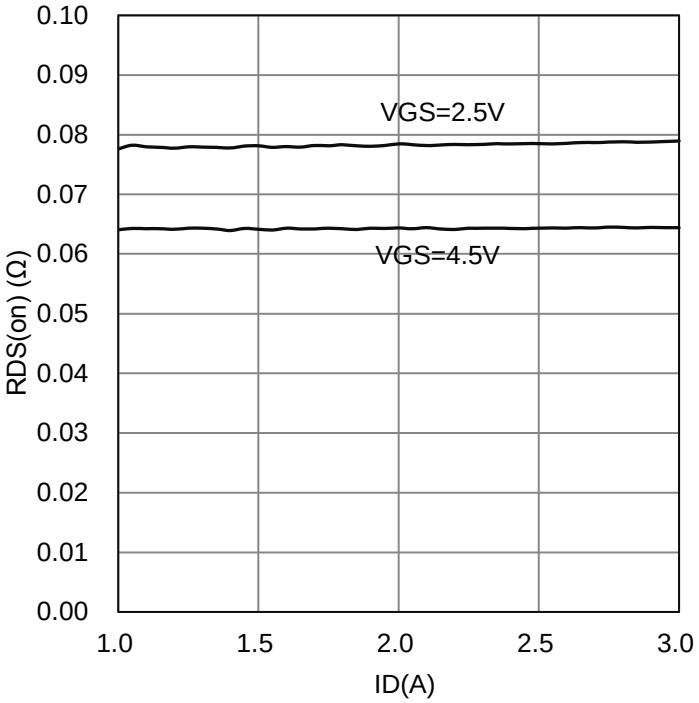

ID vs. VDS




ID vs. VGS

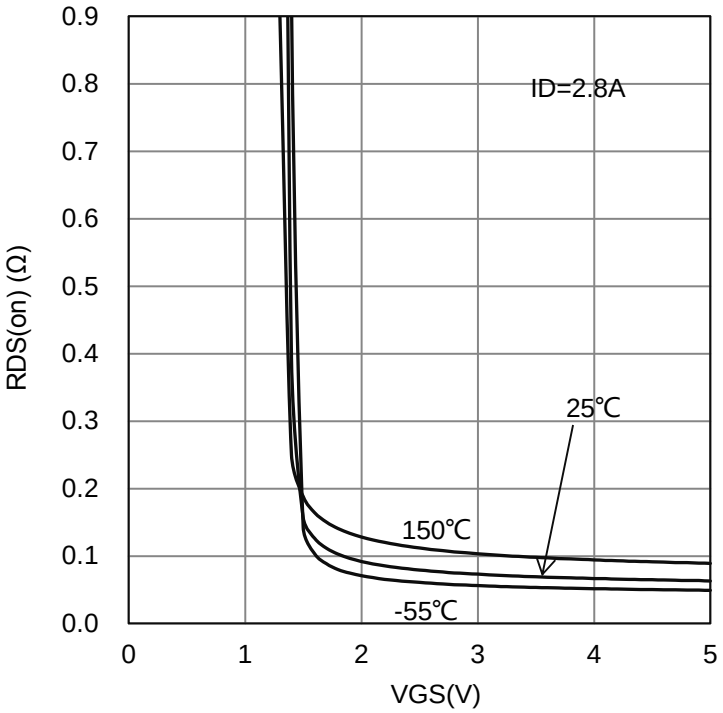



IS vs. VSD

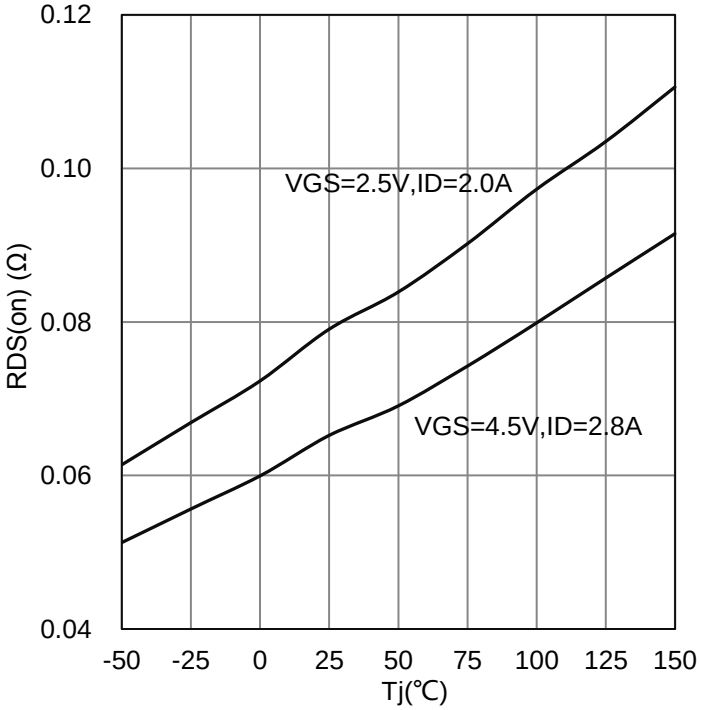



RDS(on) vs. ID

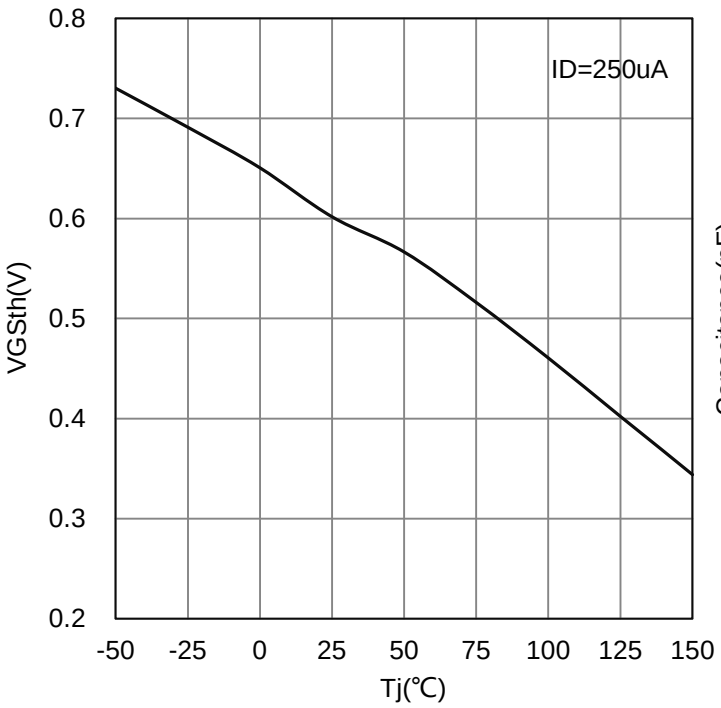
## 7. ELECTRICAL CHARACTERISTICS CURVES(Con.)



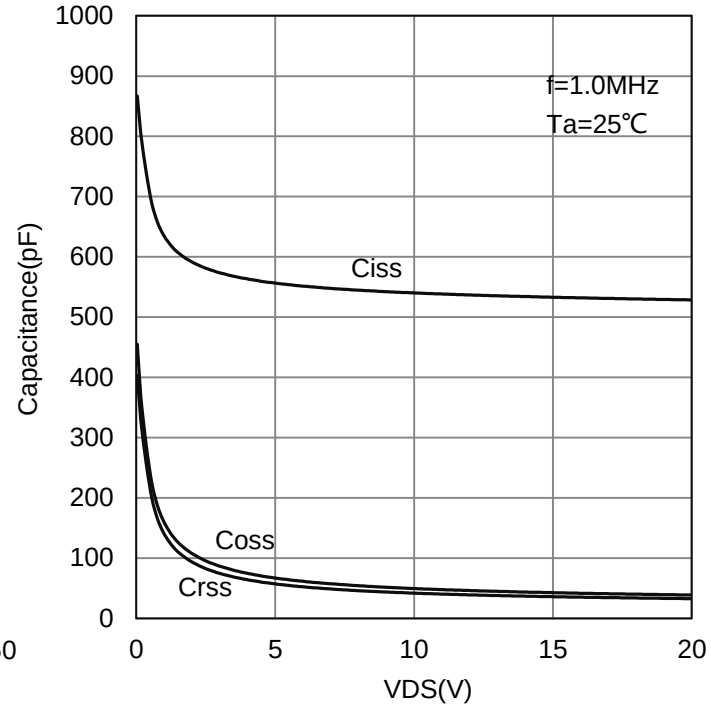

RDS(on) vs. VGS




RDS(on) vs. Tj

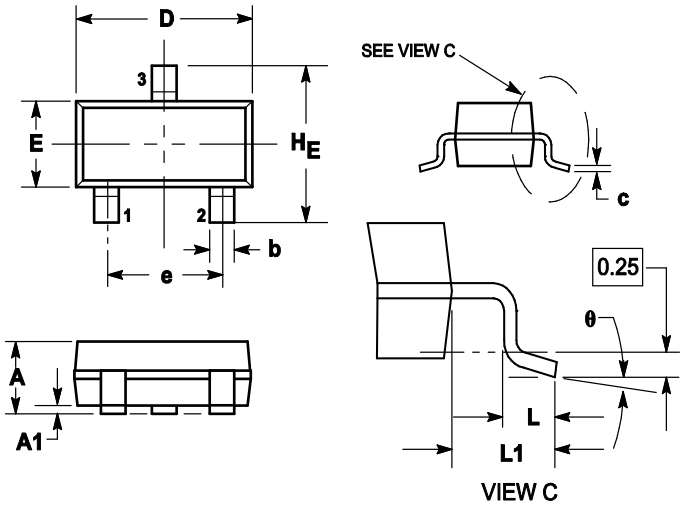



VGSth vs. Tj




Capacitance

## 8.OUTLINE AND DIMENSIONS




Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

| | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| DIM | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.89 | 1 | 1.11 | 0.035 | 0.04 | 0.044 |
| A1 | 0.01 | 0.06 | 0.1 | 0.001 | 0.002 | 0.004 |
| b | 0.37 | 0.44 | 0.5 | 0.015 | 0.018 | 0.02 |
| c | 0.09 | 0.13 | 0.18 | 0.003 | 0.005 | 0.007 |
| D | 2.80 | 2.9 | 3.04 | 0.11 | 0.114 | 0.12 |
| E | 1.20 | 1.3 | 1.4 | 0.047 | 0.051 | 0.055 |
| e | 1.78 | 1.9 | 2.04 | 0.07 | 0.075 | 0.081 |
| L | 0.10 | 0.2 | 0.3 | 0.004 | 0.008 | 0.012 |
| L1 | 0.35 | 0.54 | 0.69 | 0.014 | 0.021 | 0.029 |
| $H_E$ | 2.10 | 2.4 | 2.64 | 0.083 | 0.094 | 0.104 |
| θ | 0° | --- | 10° | 0° | --- | 10° |

## 9.SOLDERING FOOTPRINT