# LP03N060TZHG

P-Channel 60-V (D-S) MOSFET

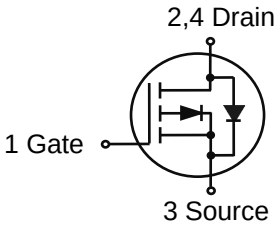
SOT223

## 1. FEATURES

- Low RDS(on) trench technology
- Low thermal impedance
- Fast switching speed
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

## 2. APPLICATIONS

- Power Routing
- DC/DC Conversion
- Motor Drives




## 3. DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|---|---|---|
| LP03N060TZHG | GQ | 1000/Tape&Reel |

## 4. MAXIMUM RATINGS(Ta = 25ºC)

| Parameter | | Symbol | Limits | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | VDS | -60 | V |
| Gate-Source Voltage | | VGS | ±20 | |
| Continuous Drain Current (Note1) | TA = 25℃ | ID | -2.8 | A |
| Pulsed Drain Current (Note2) | | IDM | -12 | |
| Avalanche Current (L = 0.1mH) | | IAS | 8 | A |
| Avalanche Energy (L = 0.1mH) | | EAS | 3.2 | mJ |
| Power Dissipation (Note1) | TA = 25℃ | PD | 1.7 | W |
| Operating Junction and Storage Temperature Range | | TJ , Tstg | -55~+150 | ℃ |

## 5. THERMAL CHARACTERISTICS

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Thermal Resistance,Junction–to–Ambient(Note 1) | RΘJA | 70 | ℃/W |
| Thermal Resistance,Junction-to-Case (Note 3) | RθJA | 160 | ℃/W |
| Thermal Resistance,Junction-to-Case (Note 3) | RθJC | 20 | ℃/W |

1."1.5 x 1.5" FR4 board using 1 sq in pad, 2 oz Cu.

2.Pulse width limited by maximum junction temperature

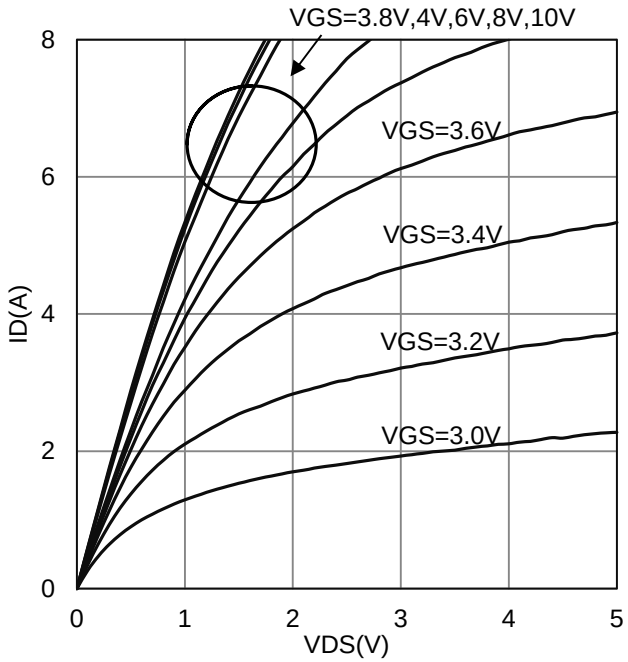
3.Surface−mounted on FR4 board using the minimum recommended pad size.

## 6. ELECTRICAL CHARACTERISTICS (Ta= 25°C)

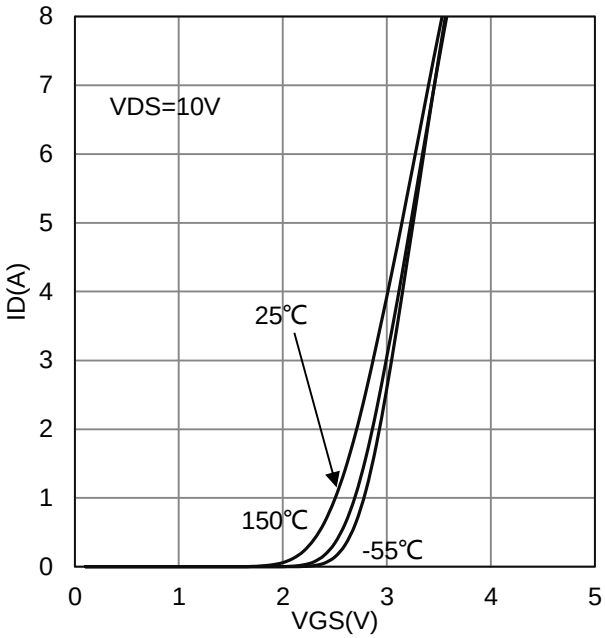
| Characteristic | | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Static | | | | | | |
| Drain–Source Breakdown Voltage (VGS = 0, ID = -250μA) | | VBRDSS | -60 | - | - | V |
| Gate Threshold Voltage (VDS =VGS , ID =-250μA) | | VGS(th) | -1 | - | -3 | V |
| Gate Leakage Current (VDS =0V, VGS =±20V) | | IGSS | - | - | ±100 | nA |
| Zero Gate Voltage Drain Current (VDS = -60 V, VGS = 0 V) | | IDSS | - | - | -10 | μA |
| Drain-Source On-Resistance(Note 4)<br>(VGS = -10 V, ID = -1.8 A)<br>(VGS = -4.5 V, ID = -1.4 A) | | RDS(ON) | -<br>- | 170<br>200 | 215<br>260 | mΩ |
| Diode Forward Voltage (IS = -1.2 A, VGS = 0 V) | | VSD | - | - | -1.2 | V |
| Dynamic | | | | | | |
| Total Gate Charge | (VDS = -48 V, VGS = -4.5 V,ID = -1 A) | Qg | - | 3.6 | - | nC |
| Gate-Source Charge | | Qgs | - | 1.2 | - | |
| Gate-Drain Charge | | Qgd | - | 1.7 | - | |
| Turn-On Delay Time | (VDS = -30 V, RL = 30 Ω,ID = -1 A,VGEN = -10 V, RGEN = 3.1 Ω) | td(on) | - | 3.2 | - | ns |
| Rise Time | | tr | - | 23.6 | - | |
| Turn-Off Delay Time | | td(off) | - | 14.5 | - | |
| Fall Time | | tf | - | 17.2 | - | |
| Input Capacitance | (VDS = -30 V, VGS = 0 V, f = 1 MHz) | Ciss | - | 366 | - | pF |
| Output Capacitance | | Coss | - | 24 | - | |
| Reverse Transfer Capacitance | | Crss | - | 17 | - | |
| Gate Resistance (VDS = 0 V, VGS = 0 V, f = 1 MHz) | | Rg | - | 5 | - | Ω |

4.Pulse test: PW ⩽ 300us duty cycle ⩽ 2%.

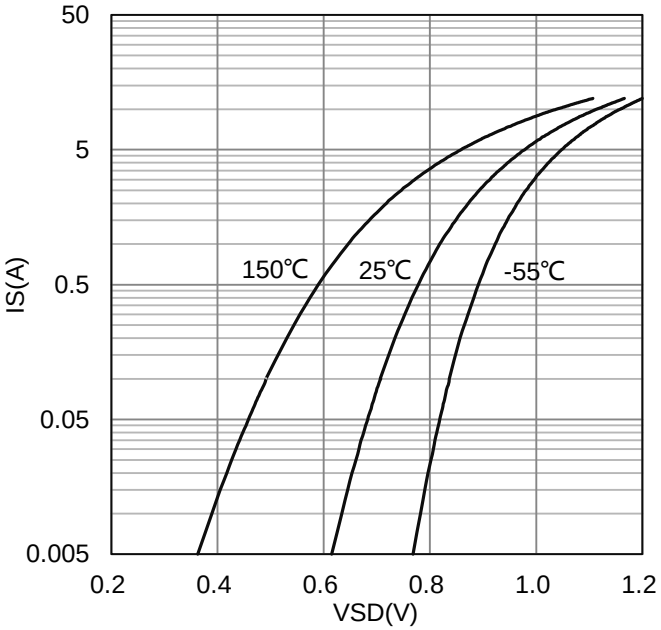
## 7. ELECTRICAL CHARACTERISTICS CURVES



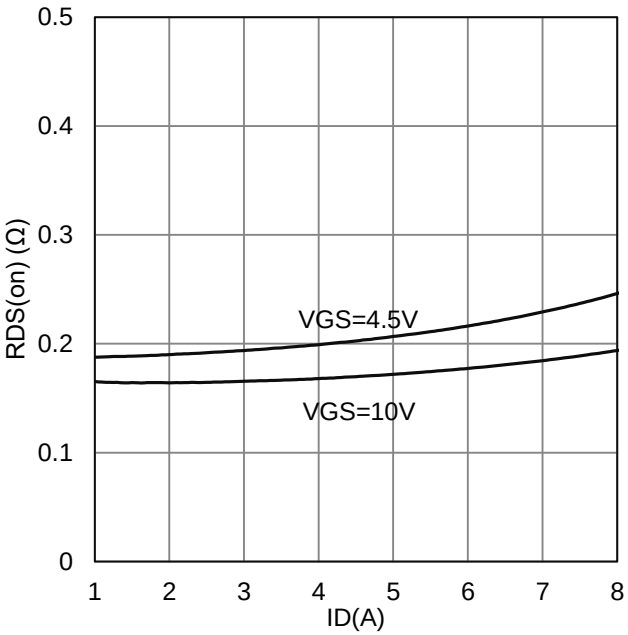

ID vs. VDS




ID vs. VGS

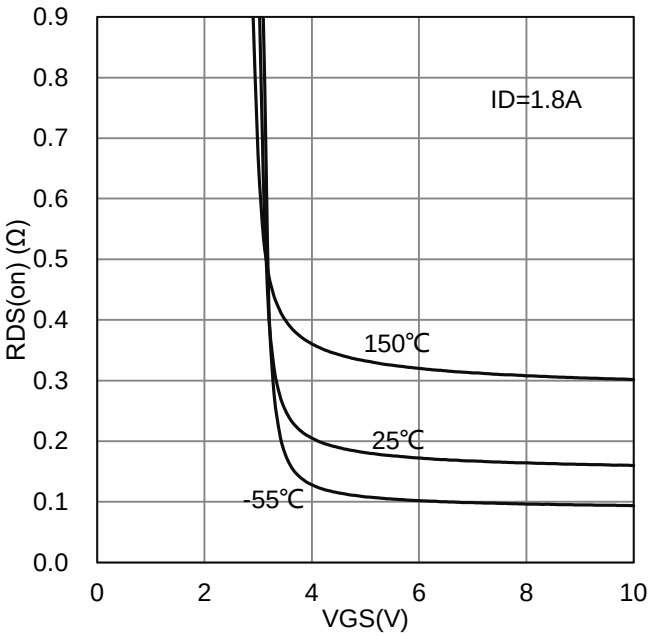



IS vs. VSD

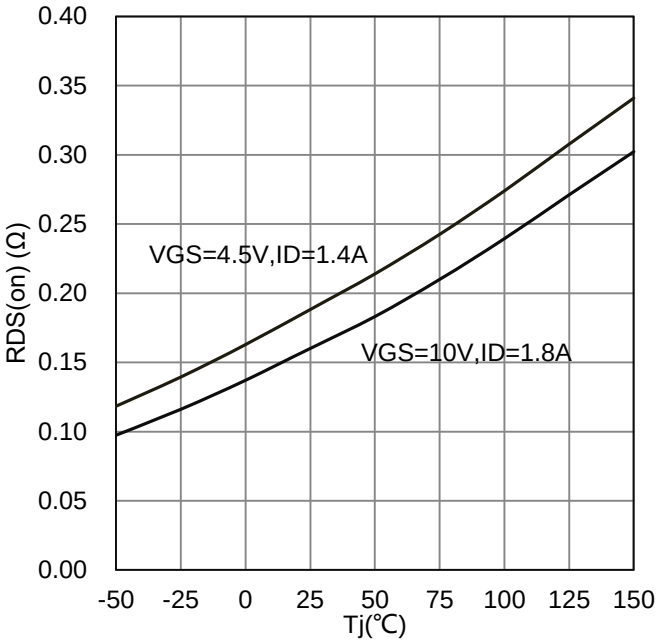



RDS(on) vs. ID

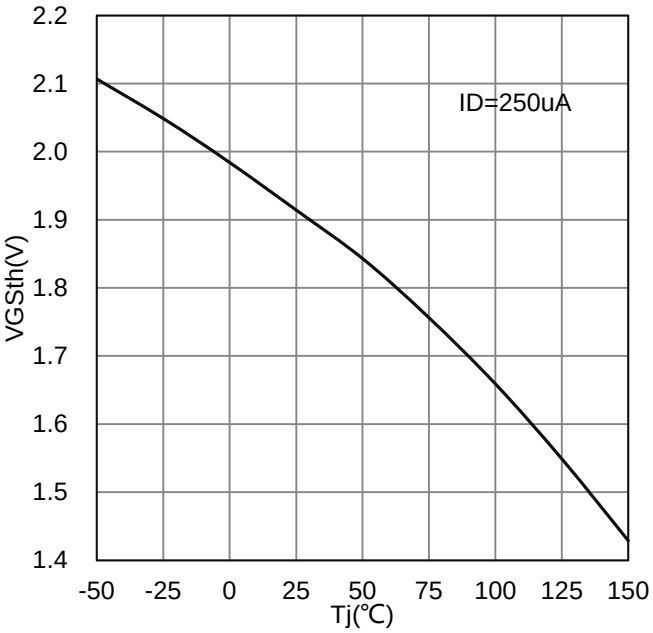
## 7. ELECTRICAL CHARACTERISTICS CURVES(Con.)



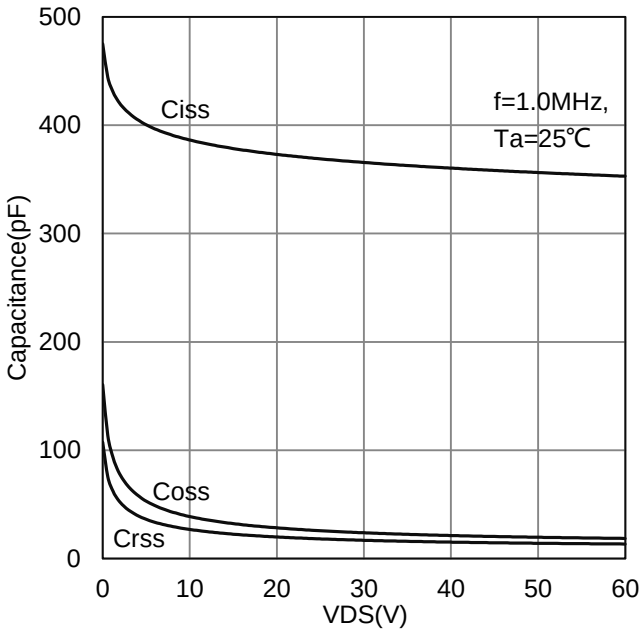

RDS(on) vs. VGS




RDS(on) vs. Tj

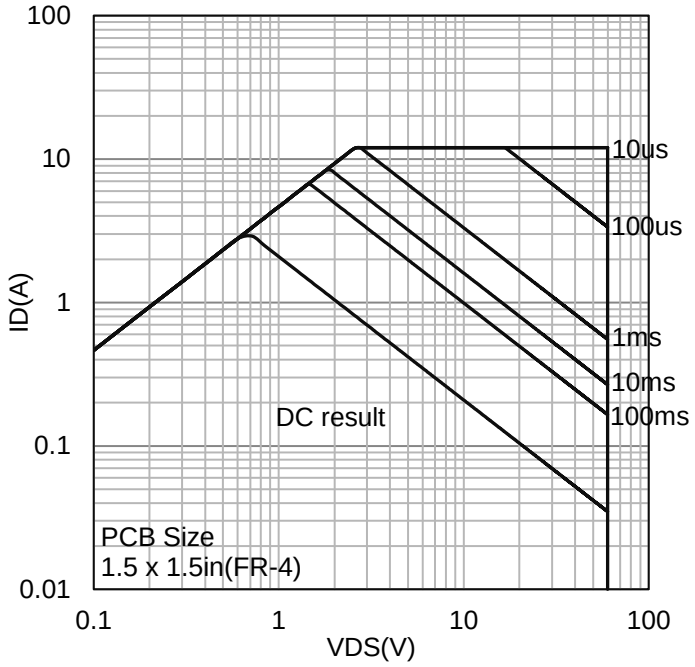



VGSth vs. Tj

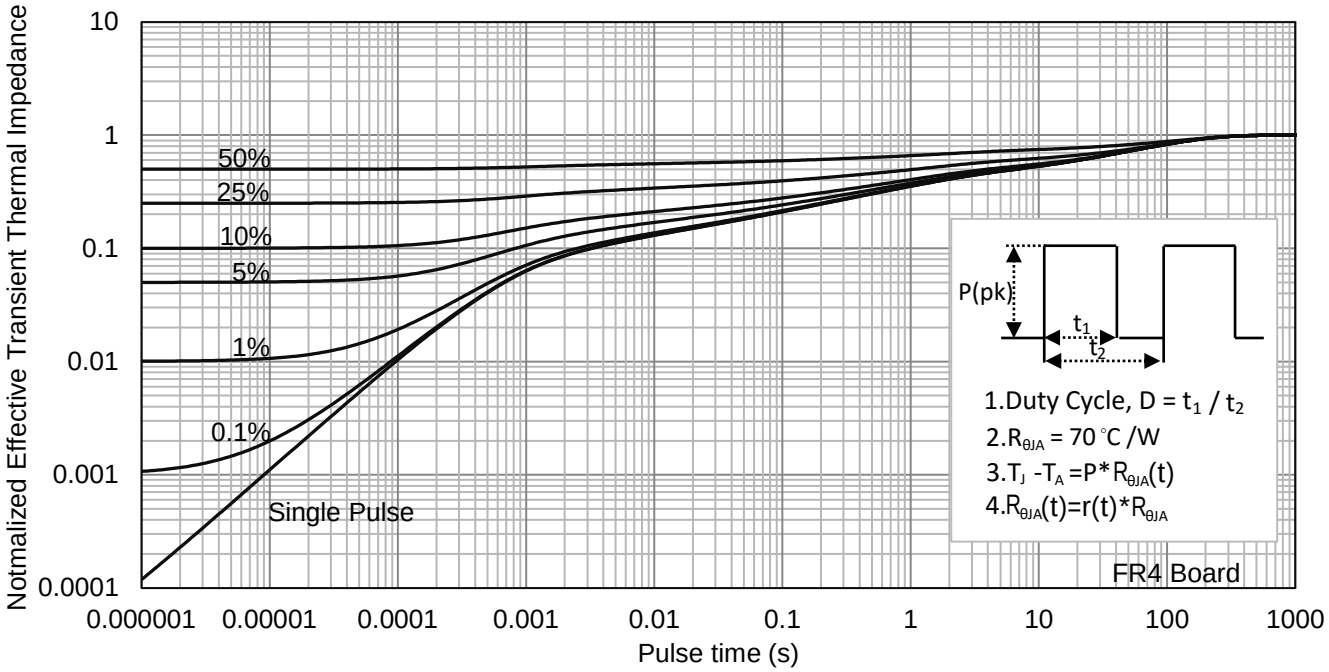



Capacitance

## 7. ELECTRICAL CHARACTERISTICS CURVES(Con.)



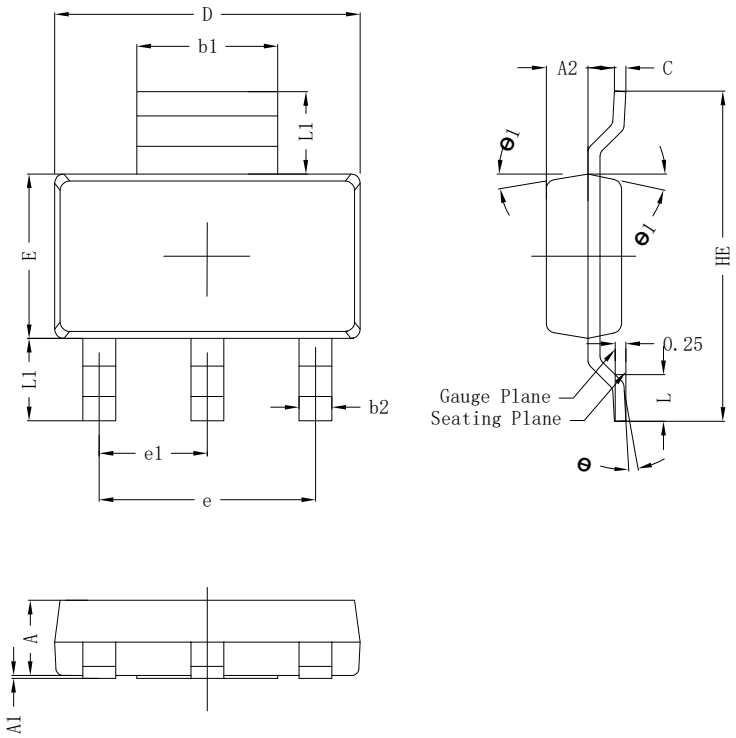

Safe Operating Area




Thermal Response

## 8.OUTLINE AND DIMENSIONS

SOT223

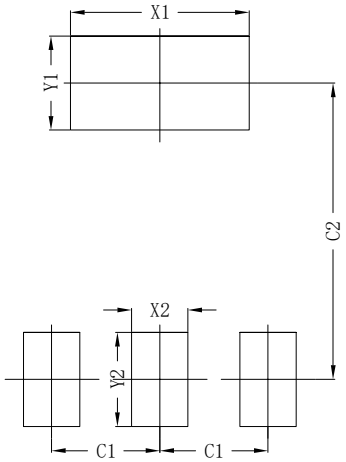



| SOT223 | | | |
|---|---|---|---|
| DIM | MIN | NOR | MAX |
| A | 1.50 | 1.60 | 1.70 |
| A1 | 0.00 | 0.05 | 0.10 |
| A2 | 0.80 | 0.90 | 1.00 |
| b1 | 2.90 | 3.02 | 3.10 |
| b2 | 0.60 | 0.72 | 0.80 |
| c | 0.20 | 0.27 | 0.35 |
| D | 6.30 | 6.50 | 6.70 |
| E | 3.30 | 3.50 | 3.70 |
| e | 4.60BSC | | |
| e1 | 2.30BSC | | |
| HE | 6.80 | 7.00 | 7.20 |
| L | 0.80 | 1.00 | 1.20 |
| L1 | 1.75(REF) | | |
| θ | 0°~8° | | |
| θ 1 | 8° | 10° | 12° |
| All Dimensions in mm | | | |

GENERAL NOTES

1. Top package surface finish Ra0.4±0.2um
2. Bottom package surface finish Ra0.7±0.2um
3. Side package surface finish Ra0.4±0.2um
4. Protrusion or Gate Burrs shall not exceed 0.10mm per side.

## 9.SOLDERING FOOTPRINT




| SOT223 | |
|---|---|
| DIM | (mm) |
| X1 | 3.80 |
| Y1 | 2.00 |
| X2 | 1.20 |
| Y2 | 2.00 |
| C1 | 2.30 |
| C2 | 6.30 |

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