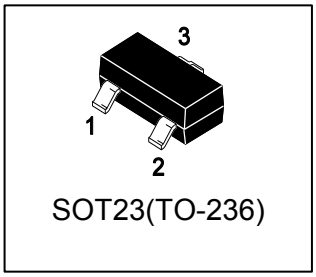
JXND ELECTRONICS CO.,LTD

# 20V P-Channel Enhancement Mode MOSFET
# P2128LT1G

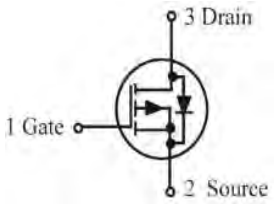
## 1. FEATURES



SOT23(TO-236)

- VDS =-20V
- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- Fully Characterized Avalanche Voltage and Current
- Improved Shoot-Through FOM
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

## 2. APPLICATIONS




- Simple Drive Requirement
- Small Package Outline
- Surface Mount Device

## 3. DEVICE MARKING AND ORDERING INFORMATION

| Device | Marking | Shipping |
|---|---|---|
| P2128LT1G | PA2 | 3000/Tape&Reel |
| P2128LT3G | PA2 | 10000/Tape&Reel |

## 4. MAXIMUM RATINGS(Ta = 25ºC)

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Drain–Source Voltage | VDSS | -20 | V |
| Gate–to–Source Voltage | VGS | ±12 | V |
| Drain Current(Note 1)<br>– Continuous TA = 25°C<br>– Pulsed | <br>ID<br>IDM | <br>-6<br>-24 | A |
| Avalanche Current(L=0.1mH) | IAS | 12 | A |
| Avalanche Energy(L=0.1mH) | EAS | 7.3 | mJ |

## 5. THERMAL CHARACTERISTICS

| Parameter | Symbol | Limits | Unit |
|---|---|---|---|
| Total Device Dissipation FR–5 Board@Ta=25℃ | PD | 1100 | mW |
| Thermal Resistance,<br>Junction–to–Ambient | RΘJA | 110 | ºC/W |
| Junction and Storage temperature | TJ,Tstg | −55~+150 | °C |

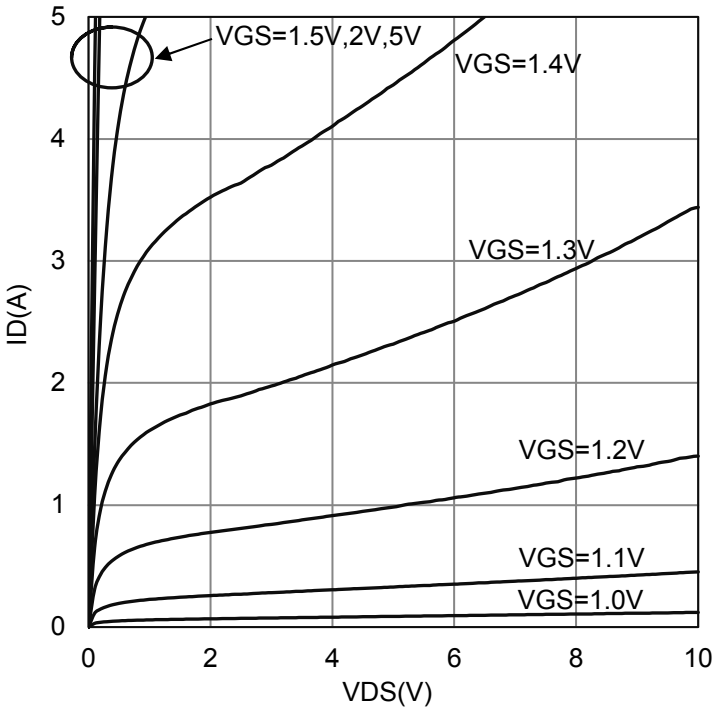
1.Repetitive Rating: Pulse width limited by the maximum junction temperature

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

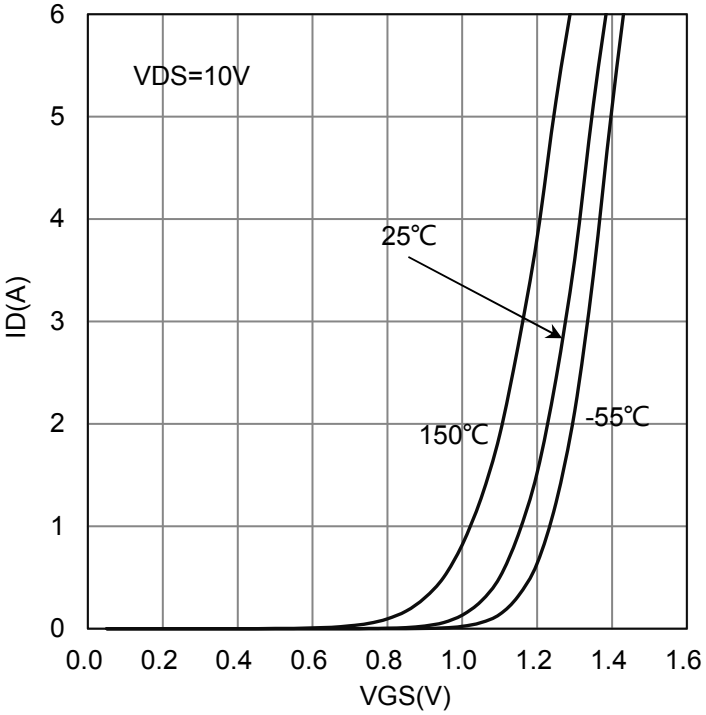
| Characteristic | | Symbol | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain–Source Breakdown Voltage<br>(VGS = 0, ID = -250μA) | | VBRDSS | -20 | - | - | V |
| Zero Gate Voltage Drain Current<br>(VGS = 0, VDS = -6.4 V) | | IDSS | - | - | -1 | μA |
| Gate–Body Leakage Current<br>(VGS = ±12 V,VDS=0V) | | IGSS | - | - | ±100 | nA |
| Gate Threshold Voltage<br>(VDS = VGS, ID = -250μA) | | VGS(th) | -0.45 | - | -0.9 | V |
| Static Drain–Source On–State Resistance<br>(VGS = -4.5 V, ID = -2.4 A)<br>(VGS = -2.5 V, ID = -2 A)<br>(VGS = -1.8 V, ID = -1 A) | | RDS(on) | -<br>-<br>- | 17<br>25<br>47 | 28<br>41<br>78 | mΩ |
| Forward Transconductance<br>(VDS = -5V, ID = -3.5A) | | gfs | - | 8.5 | - | S |
| On-State Drain Current<br>(VDS≤ –5 V, VGS = –4.5 V)<br>(VDS≤ –5 V, VGS = –2.5 V) | | ID(on) | -6<br>-3 | -<br>- | -<br>- | A |
| **Source-Drain Diode** | | | | | | |
| Max. Diode Forward Current | | IS | - | -1.6 | - | A |
| Diode Forward Voltage<br>(IS = -1.6A, VGS = 0V) | | VSD | - | - | -1.2 | V |
| **Dynamic(Note 2)** | | | | | | |
| Input Capacitance<br>(VGS = 0 V, f = 1.0MHz,VDS= -4 V) | | Ciss | - | 1038 | - | pF |
| Output Capacitance<br>(VGS = 0 V, f = 1.0MHz,VDS= -4 V) | | Coss | - | 110 | - | pF |
| Reverse Transfer Capacitance<br>(VGS = 0 V, f = 1.0MHz,VDS= -4 V) | | Crss | - | 92 | - | pF |
| Total Gate Charge | (VDS=-10V,VGS=-4.5V,ID=-2.4A) | Qg | - | 11 | - | nC |
| Gate to Source Charge | | Qgs | - | 1.7 | - | |
| Gate to Drain Charge | | Qgd | - | 2.5 | - | |
| Gate Resistance<br>(VDS=0V,VGS=0V,f=1.0MHz) | | Rg | - | 9.3 | - | Ω |
| **Switching(Note 2)** | | | | | | |
| Turn-On Delay Time | (VDD=-4V,RL=4Ω,RG=6.2Ω,VGEN=-4.5V,ID=-1A) | td(on) | - | 6.2 | - | ns |
| Rise Time | | tr | - | 14.4 | - | |
| Turn-Off Delay Time | | td(off) | - | 46 | - | |
| Fall Time | | tf | - | 24 | - | |

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

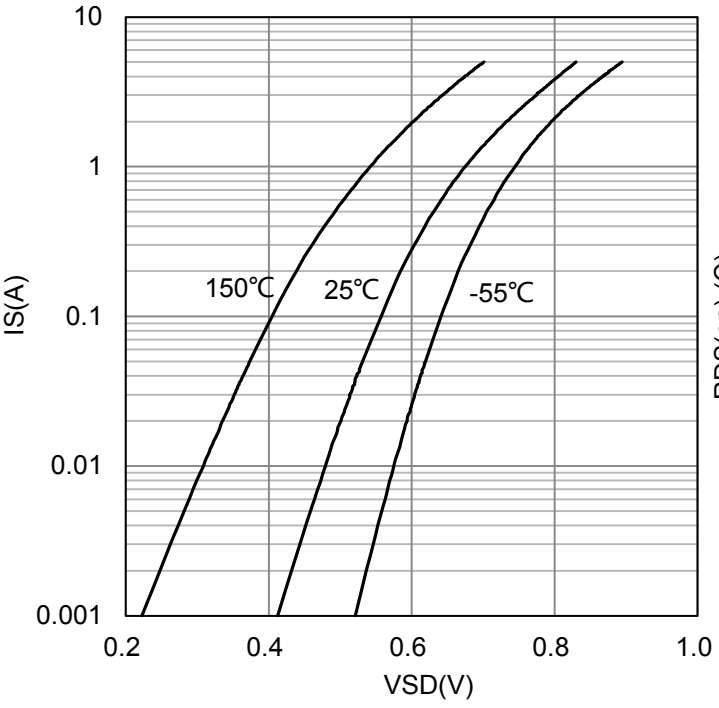
## 7.ELECTRICAL CHARACTERISTICS CURVES



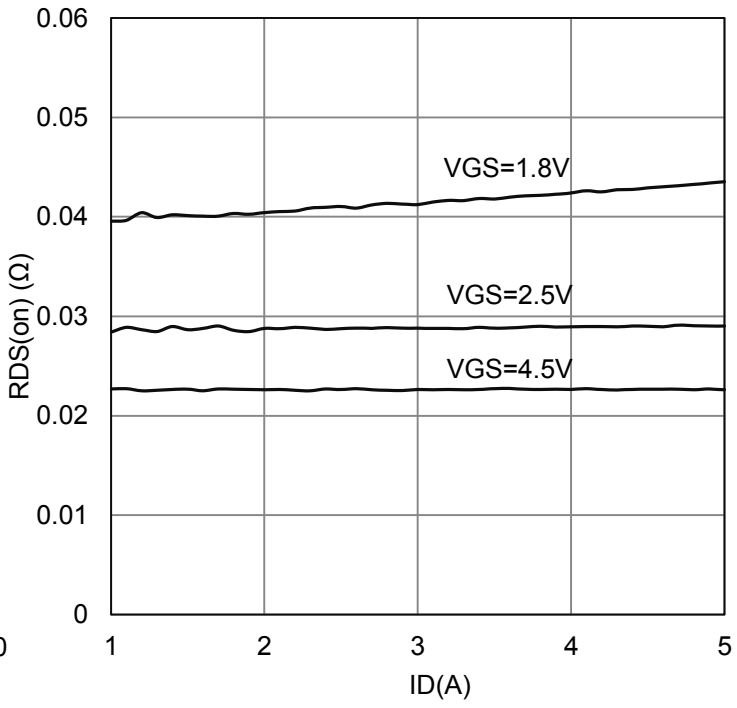

ID vs. VDS




ID vs. VGS

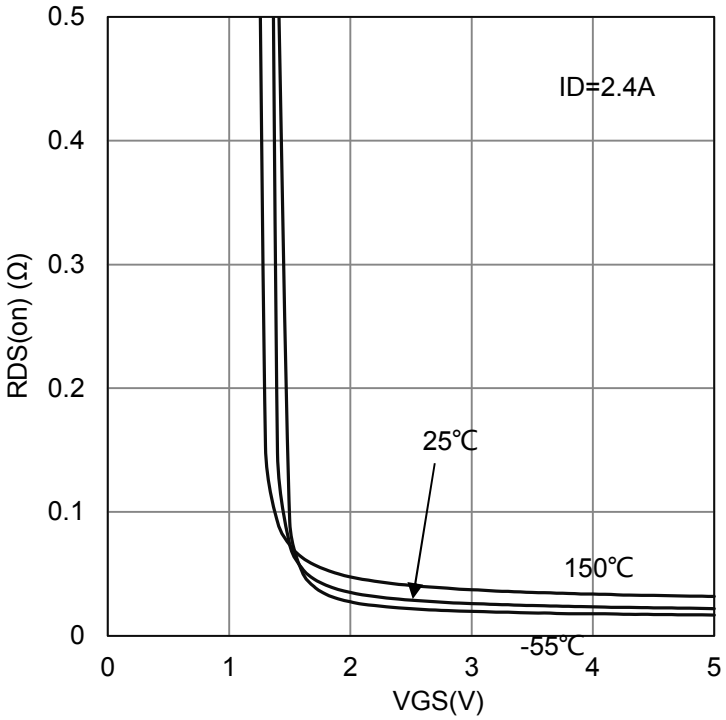



IS vs. VSD

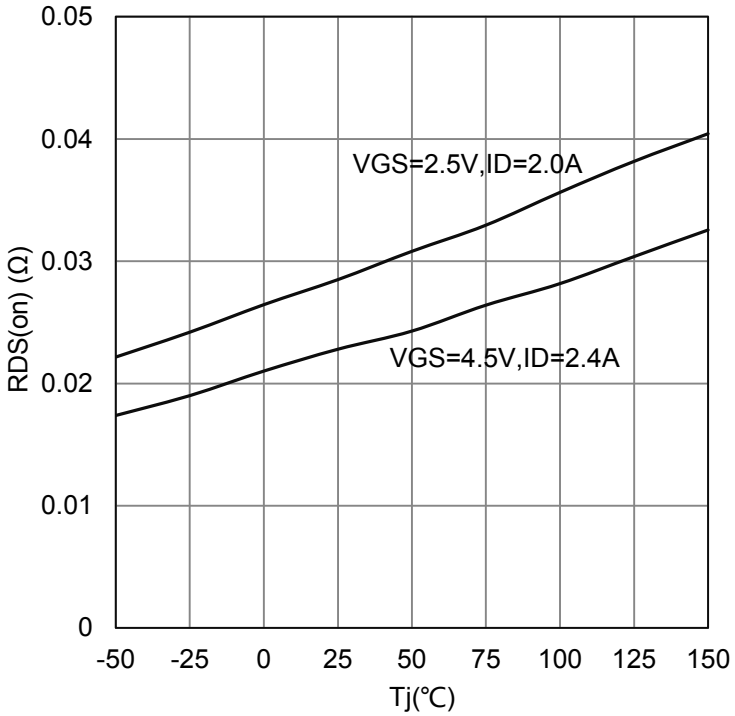



RDS(on) vs. ID

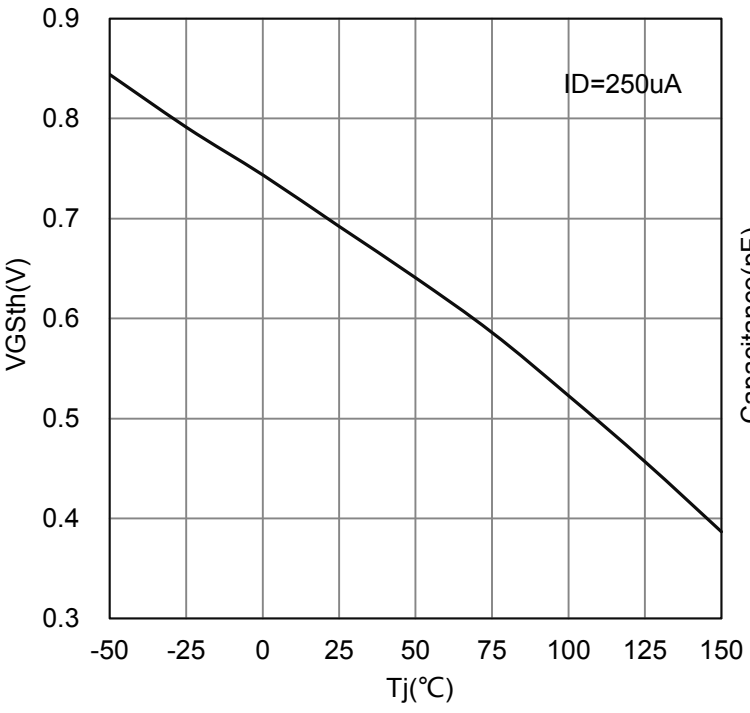
## 7.ELECTRICAL CHARACTERISTICS CURVES(Con.)



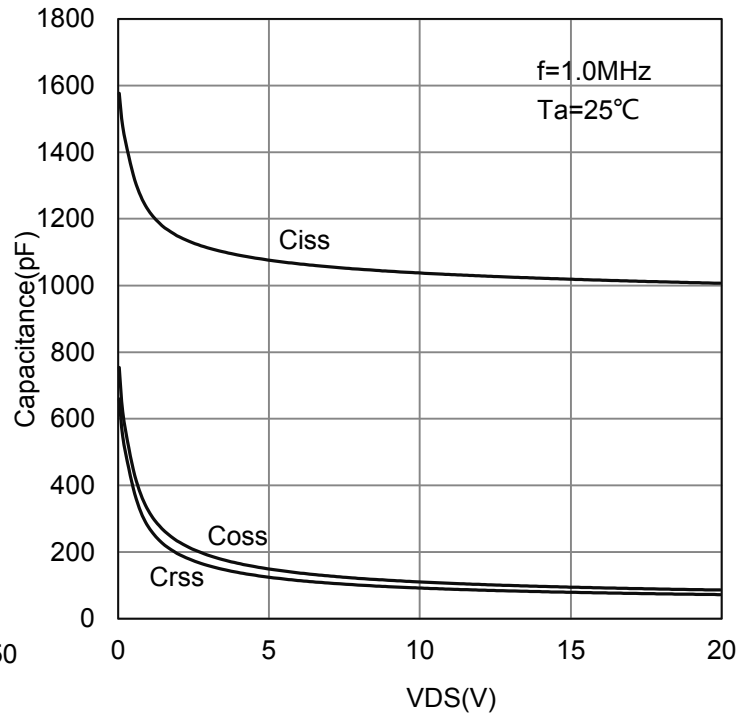

RDS(on) vs. VGS




RDS(on) vs. Tj




VGSth vs. Tj

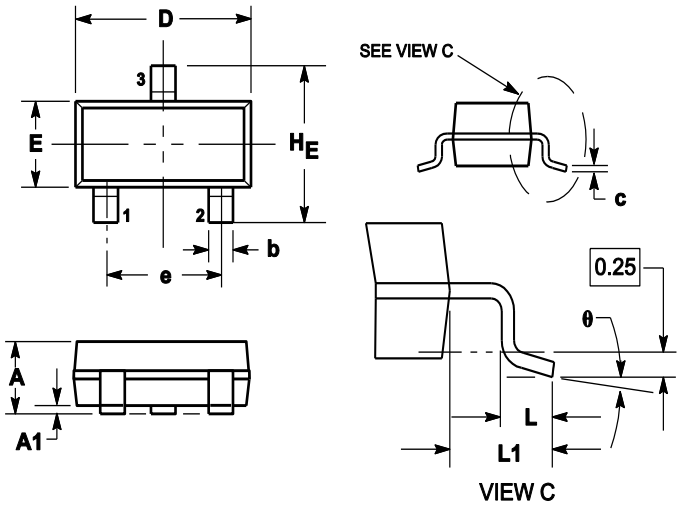



Capacitance

## 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.




| DIM | MILLIMETERS | | | INCHES | | |
|---|---|---|---|---|---|---|
| | 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