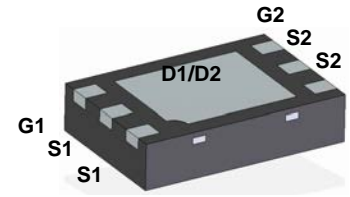


# DN2016D

## 20V N-Channel Enhancement-Mode MOSFET



DFN2030-6A

### 1. FEATURES

- VDS= 20V
- RDS(ON), VGS@4.5V, IDS@5.0A = 15.5mΩ
- RDS(ON), VGS@2.5V, IDS@2.0A = 19mΩ
- We declare that the material of product compliance with RoHS requirements and Halogen Free.

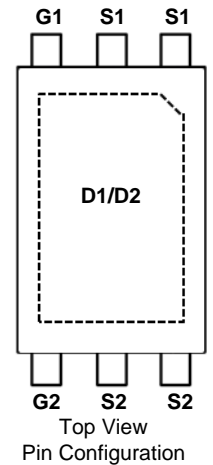
### 2. APPLICATIONS

- Li Battery

### 3. DEVICE MARKING AND ORDERING INFORMATION

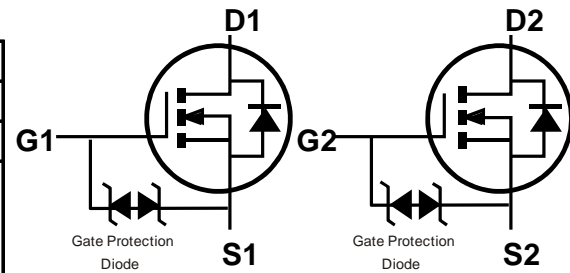
| Device  | Marking | Shipping       |
|---------|---------|----------------|
| DN2016D | 6D      | 4000/Tape&Reel |

Bottom Drain Contact



### 4. MAXIMUM RATINGS(Ta = 25°C)

| Parameter                           | Symbol | Limits | Unit |
|-------------------------------------|--------|--------|------|
| Drain-Source Voltage                | VDSS   | 20     | V    |
| Gate-to-Source Voltage – Continuous | VGS    | ±12    | V    |
| Drain Current                       |        |        | A    |
| – Continuous TA = 25°C              | ID     | 7.5    |      |
| – Pulsed(Note 1)                    | IDM    | 30     |      |



### 5. THERMAL CHARACTERISTICS

| Parameter  | Symbol   | Limits   | Unit |
|--|----------|----------|------|
| Maximum Power Dissipation                          | PD       | 1.2      | W    |
| Thermal Resistance,<br>Junction-to-Ambient(Note 2) | RθJA     | 110      | °C/W |
| Junction and Storage temperature                   | TJ, Tstg | -55~+150 | °C   |

1. Repetitive Rating: Pulse width limited by the Maximum junction temperature.
2. 1-in<sup>2</sup> 2oz Cu PCB board.



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

### OFF CHARACTERISTICS

| Characteristic  | Symbol   | Min. | Typ. | Max. | Unit |
|---|----------|------|------|------|------|
| Drain-Source Breakdown Voltage<br>(VGS = 0, ID = 250μA)       | V(BR)DSS | 20   | -    | -    | V    |
| Zero Gate Voltage Drain Current<br>(VDS=16V, VGS=0V)          | IDSS     | -    | -    | 1    | μA   |
| Gate-Body Leakage Current, Forward<br>(VDS = 0 V, VGS = 8 V)  | IGSSF    | -    | -    | 100  | nA   |
| Gate-Body Leakage Current, Reverse<br>(VDS = 0 V, VGS = -8 V) | IGSSR    | -    | -    | -100 | nA   |
| Forward Transconductance<br>(VDS = 5.0 V, ID = 5 A)           | gfs      | 10   | 14.5 | -    | S    |

### ON CHARACTERISTICS (Note 3)

|  |         |     |                              |                                |    |
|--|---------|-----|------------------------------|--------------------------------|----|
| Gate Threshold Voltage<br>(VDS = VGS, ID = 250μA)  | VGS(th) | 0.5 | -                            | 1.1                            | V  |
| Static Drain-Source On-State Resistance<br>(VGS = 4.5 V, ID =5 A)<br>(VGS = 4 V, ID =4 A)<br>(VGS = 3.1 V, ID = 4 A)<br>(VGS = 2.5 V, ID = 4 A)<br>(VGS = 1.8 V, ID = 2 A) | RDS(on) |     | 13<br>13.5<br>14<br>15<br>21 | 15.5<br>16.5<br>19<br>20<br>31 | mΩ |

### Dynamic Characteristics

|                              |                           |      |   |     |   |    |
|------------------------------|---------------------------|------|---|-----|---|----|
| Input Capacitance            | (VGS=0V, VDS=10V, F=1MHz) | Ciss | - | 565 | - | pF |
| Output Capacitance           |                           | Coss | - | 85  | - |    |
| Reverse Transfer Capacitance |                           | Crss | - | 70  | - |    |

### SWITCHING CHARACTERISTICS

|                     |  |         |   |      |    |    |
|---------------------|--|---------|---|------|----|----|
| Turn-On Delay Time  | (VDD = 15V, RL = 2.7Ω<br>ID = 1A, VGEN = 10V, RG = 3Ω) | td(on)  | - | 7    | 14 | ns |
| Rise Time           |  | tr      | - | 15   | 30 |    |
| Turn-Off Delay Time |  | td(off) | - | 38   | 76 |    |
| Fall Time           |  | tf      | - | 3    | 6  |    |
| Total Gate Charge   | (VDS=10V, VGS=4.5V,<br>ID=5.0A)                        | Qg      | - | 9.06 | -  | nC |
| Gate-Source Charge  |  | Qgs     | - | 1.02 | -  |    |
| Gate-Drain Charge   |  | Qgd     | - | 3.3  | -  |    |

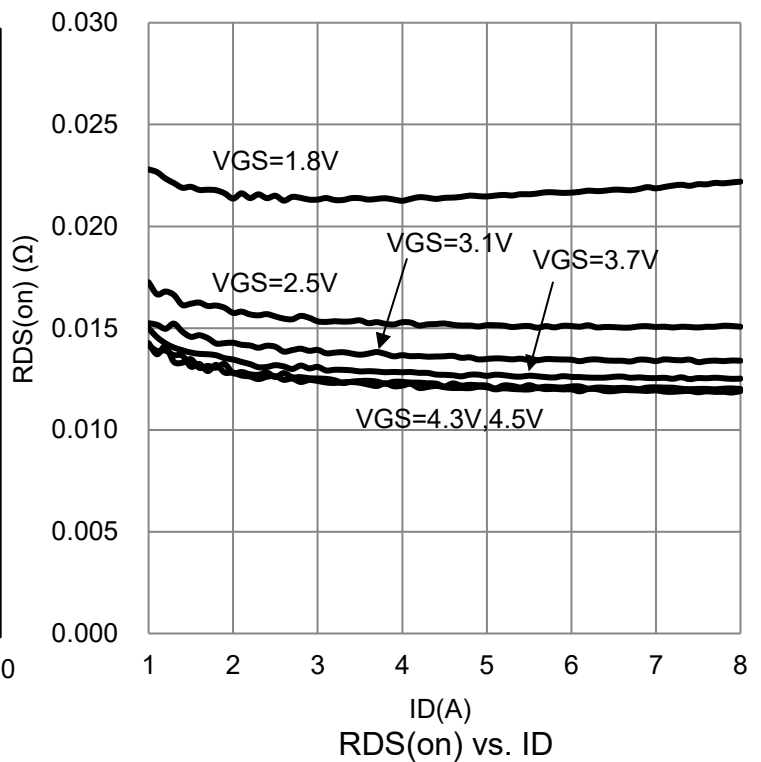
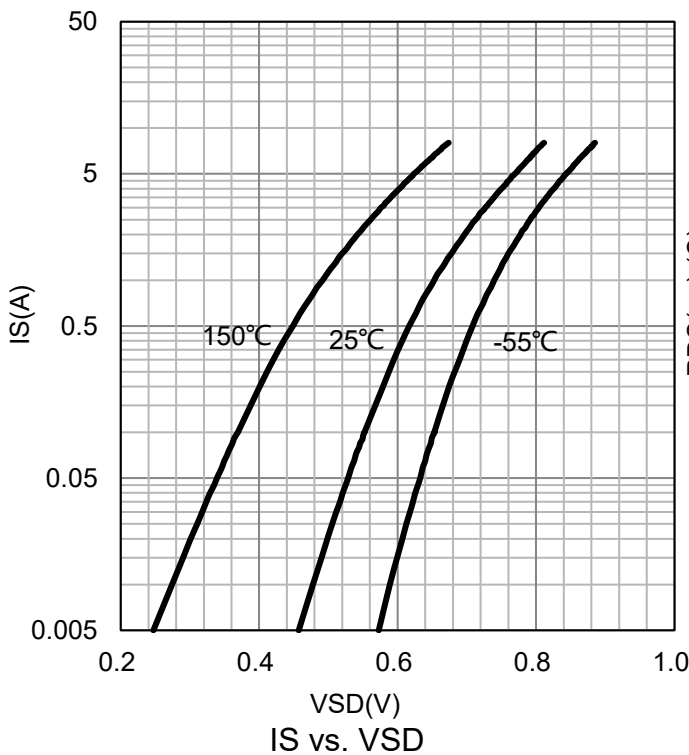
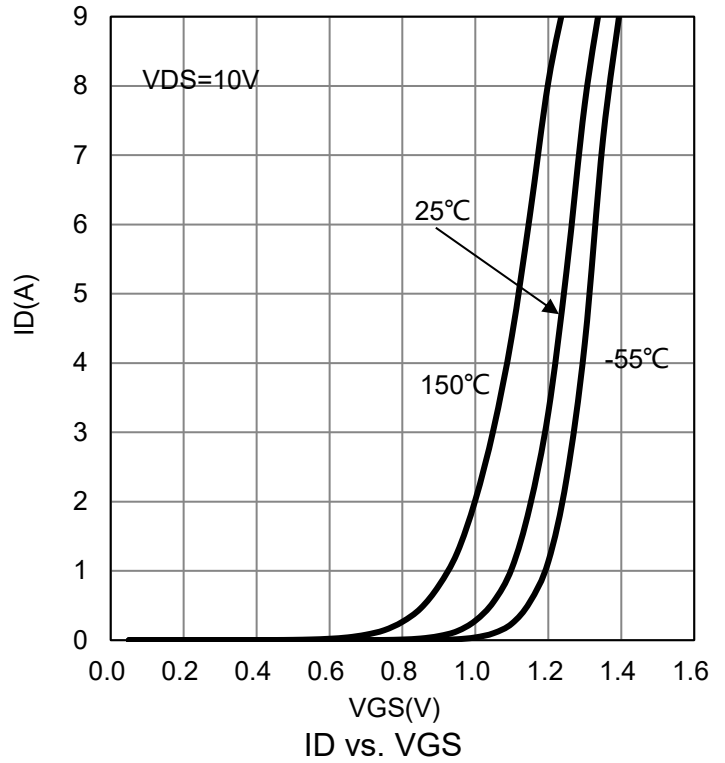
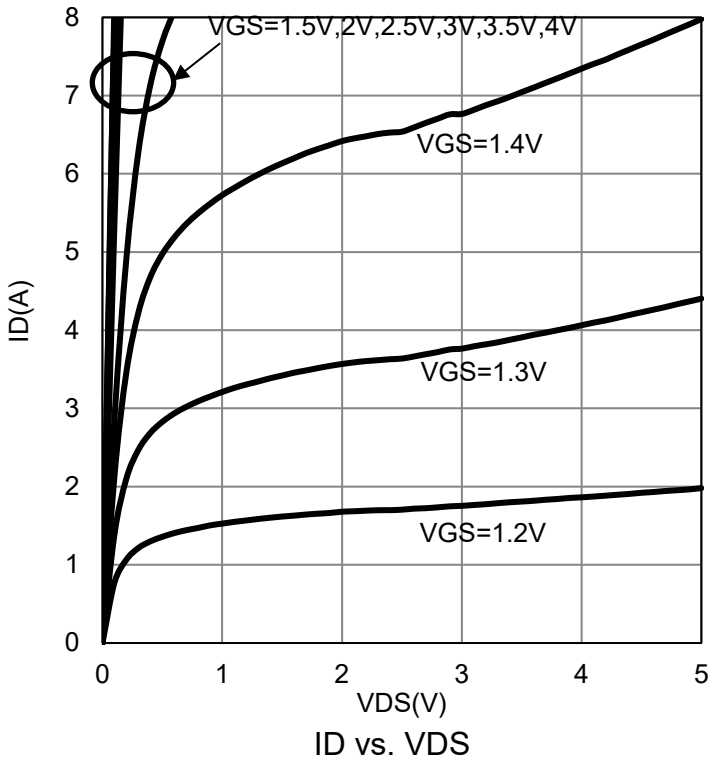
### SOURCE-DRAIN DIODE CHARACTERISTICS

|   |     |   |   |     |   |
|---|-----|---|---|-----|---|
| Forward Voltage<br>(VGS = 0 V, ISD = 3 A) | VSD | - | - | 1.2 | V |
| Max.Diode Forward Current                 | IS  | - | - | 2.5 | A |

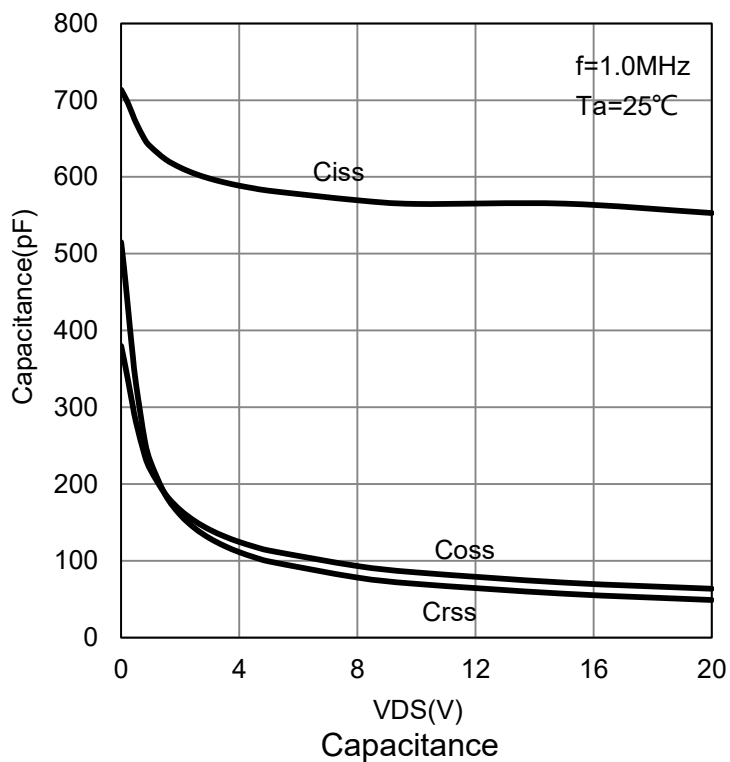
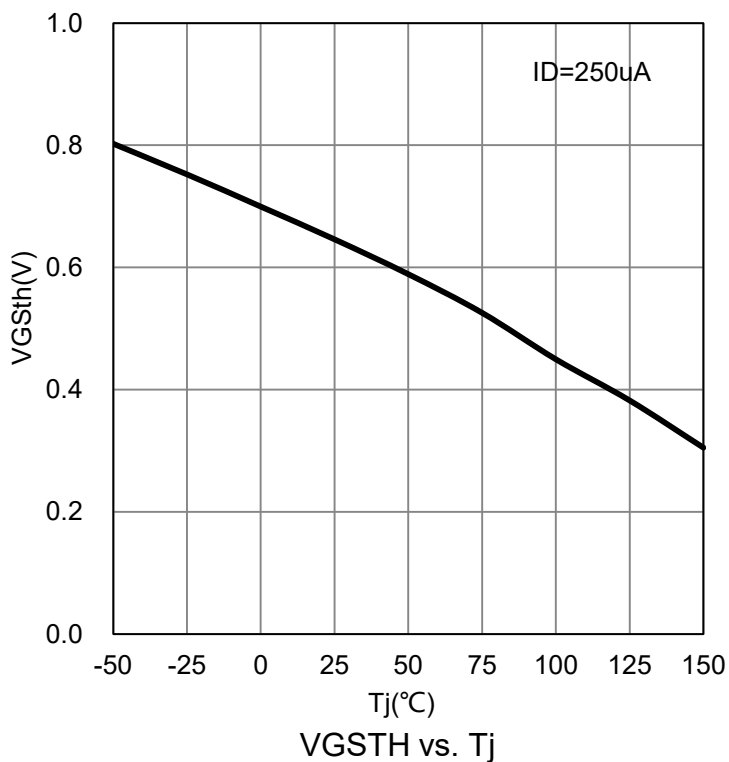
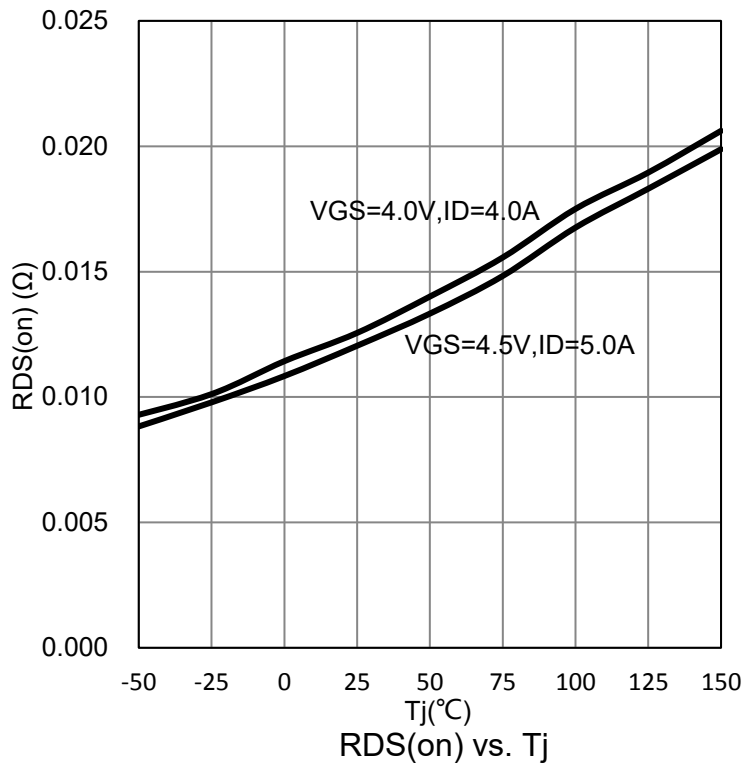
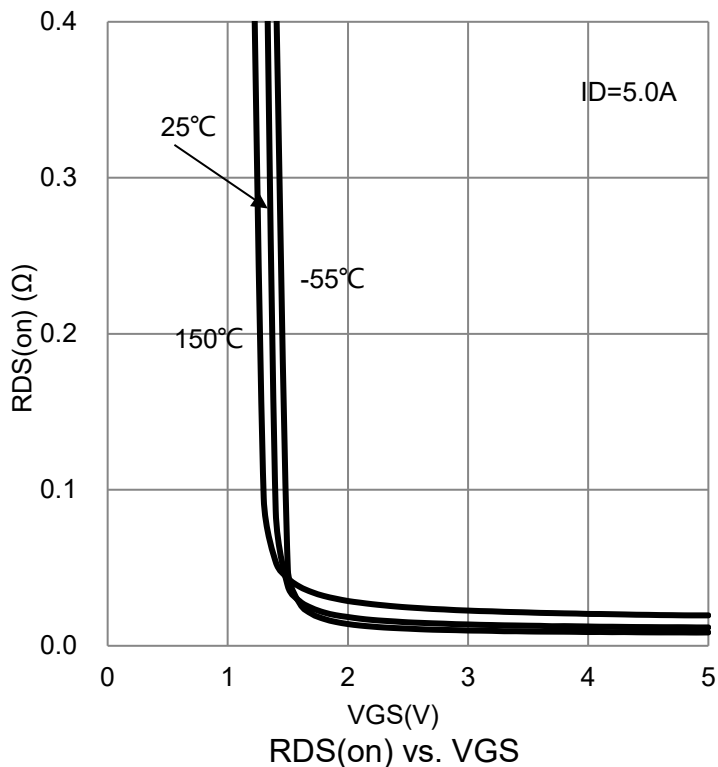
3.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.



7.ELECTRICAL CHARACTERISTICS CURVES

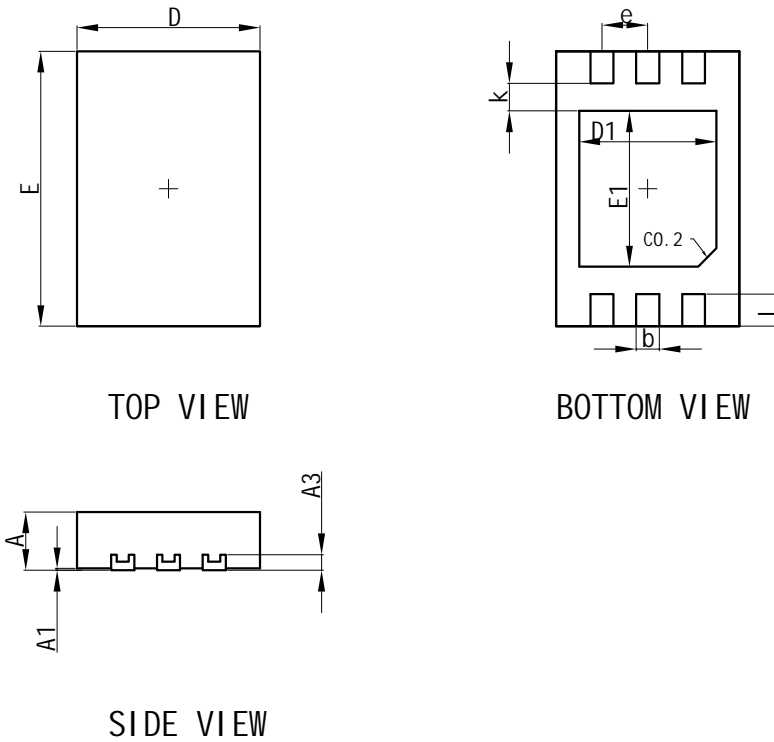


7.ELECTRICAL CHARACTERISTICS CURVES(Con.)



8. OUTLINE AND DIMENSIONS

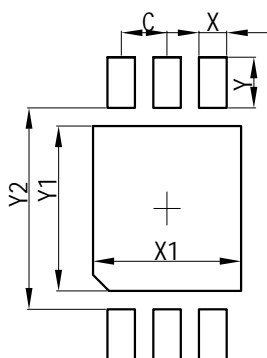
DFN2030-6A



| DFN2030-6A           |           |      |      |
|----------------------|-----------|------|------|
| Dim                  | Min       | Typ  | Max  |
| A                    | 0.60      | 0.65 | 0.70 |
| A1                   | 0         | 0.02 | 0.05 |
| A3                   | 0.152REF. |      |      |
| D                    | 1.95      | 2.00 | 2.05 |
| E                    | 2.95      | 3.00 | 3.05 |
| D1                   | 1.45      | 1.50 | 1.55 |
| E1                   | 1.65      | 1.70 | 1.75 |
| b                    | 0.20      | 0.25 | 0.30 |
| k                    | 0.300TYP. |      |      |
| e                    | 0.500TYP. |      |      |
| L                    | 0.30      | 0.35 | 0.40 |
| All Dimensions in mm |           |      |      |

9. SOLDERING FOOTPRINT

DFN2030-6A



| Dimensions | (mm) |
|------------|------|
| C          | 0.50 |
| X          | 0.30 |
| X1         | 1.62 |
| Y          | 0.55 |
| Y1         | 1.80 |
| Y2         | 2.20 |

