



## 30V N-Channel Trench Power MOSFET

### General Description

The SJH30N015A uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a wide variety of applications.

### Features

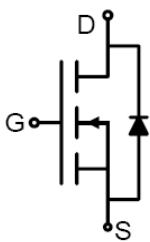
- Low Gate Charge
- 100% UIS Tested, 100% DVDS Tested
- High Power and current handling capability
- Lead free product is acquired

### Application

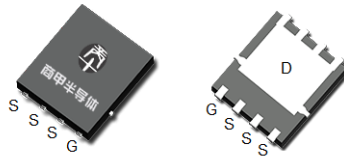
- Load switch
- PWM applications
- Power management

### Key Performance Parameters

| Parameter         | Value | Unit       |
|-------------------|-------|------------|
| $V_{DS}$          | 30    | V          |
| $R_{DS(ON\_TYP)}$ | 1.6   | m $\Omega$ |
| $I_D$             | 150   | A          |
| $Q_G$             | 115   | nC         |



Schematic Diagram



PDFN5X6-8L top&bottom view



### Package Marking and Ordering Information

| Device/Ordering Code | Marking    | Package    | Packing | Reel Size | Tape width | Quantity |
|----------------------|------------|------------|---------|-----------|------------|----------|
| SJH30N015A           | SJH30N015A | PDFN5X6-8L | Tape    | \         | \          | 5000 Pcs |

Table 1. Absolute Maximum Ratings ( $T_C=25^{\circ}\text{C}$  unless otherwise noted)

| Symbol           | Parameter                                              | Limit      | Unit               |
|------------------|--------------------------------------------------------|------------|--------------------|
| $V_{DS}$         | Drain-Source Voltage ( $V_{GS}=0V$ )                   | 30         | V                  |
| $V_{GS}$         | Gate-Source Voltage ( $V_{DS}=0V$ )                    | $\pm 20$   | V                  |
| $I_D$            | Drain Current-Continuous( $T_C=25^{\circ}\text{C}$ )   | 150        | A                  |
|                  | Drain Current-Continuous( $T_C=100^{\circ}\text{C}$ )  | 95         | A                  |
| $I_{DM}$ (pluse) | Drain Current-Continuous@ Current-Pulsed (Note 1)      | 600        | A                  |
| $P_D$            | Maximum Power Dissipation( $T_C=25^{\circ}\text{C}$ )  | 79         | W                  |
|                  | Maximum Power Dissipation( $T_C=100^{\circ}\text{C}$ ) | 32         | W                  |
| $E_{AS}$         | Avalanche energy (Note 2)                              | 756        | mJ                 |
| $T_J, T_{STG}$   | Operating Junction and Storage Temperature Range       | -55 To 150 | $^{\circ}\text{C}$ |

Table 2. Thermal Characteristic

| Symbol          | Parameter                            | Typ | Max  | Unit                        |
|-----------------|--------------------------------------|-----|------|-----------------------------|
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case |     | 1.58 | $^{\circ}\text{C}/\text{W}$ |



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**Table 3. Electrical Characteristics ( $T_J=25^{\circ}\text{C}$  unless otherwise noted)**

| Symbol                             | Parameter                         | Conditions                                                                                 | Min | Typ  | Max  | Unit |
|------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------|-----|------|------|------|
| On/Off States                      |                                   |                                                                                            |     |      |      |      |
| BV <sub>DSS</sub>                  | Drain-Source Breakdown Voltage    | V <sub>GS</sub> =0V I <sub>D</sub> =250μA                                                  | 30  |      |      | V    |
| I <sub>DSS</sub>                   | Zero Gate Voltage Drain Current   | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V T <sub>J</sub> =25℃                              |     |      | 1    | μA   |
|                                    |                                   | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V T <sub>J</sub> =125℃                             |     |      | 100  | μA   |
| I <sub>GSS</sub>                   | Gate-Body Leakage Current         | V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V                                                 |     |      | ±100 | nA   |
| V <sub>GS(th)</sub>                | Gate Threshold Voltage            | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                   | 1.0 |      | 2.5  | V    |
| g <sub>FS</sub>                    | Forward Transconductance          | V <sub>DS</sub> =5V, I <sub>D</sub> =20A                                                   |     | 45   |      | S    |
| R <sub>DS(ON)</sub>                | Drain-Source On-State Resistance  | V <sub>GS</sub> =10V, I <sub>D</sub> =20A T <sub>J</sub> =25℃                              |     | 1.6  | 2.1  | mΩ   |
|                                    |                                   | V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A T <sub>J</sub> =25℃                             |     | 2.4  | 3.2  | mΩ   |
| Dynamic Characteristics            |                                   |                                                                                            |     |      |      |      |
| C <sub>iSS</sub>                   | Input Capacitance                 | V <sub>DS</sub> =15V,V <sub>GS</sub> =0V,<br>f=1.0MHz                                      |     | 6510 |      | pF   |
| C <sub>oSS</sub>                   | Output Capacitance                |                                                                                            |     | 737  |      | pF   |
| C <sub>rSS</sub>                   | Reverse Transfer Capacitance      |                                                                                            |     | 598  |      | pF   |
| R <sub>g</sub>                     | Gate resistance                   | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, f=1.0MHz                                         |     | 0.54 |      | Ω    |
| Switching Parameters               |                                   |                                                                                            |     |      |      |      |
| t <sub>d(on)</sub>                 | Turn-on Delay Time                | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V,<br>R <sub>L</sub> =0.75Ω, R <sub>GEN</sub> =3Ω |     | 21   |      | nS   |
| t <sub>r</sub>                     | Turn-on Rise Time                 |                                                                                            |     | 18   |      | nS   |
| t <sub>d(off)</sub>                | Turn-Off Delay Time               |                                                                                            |     | 64   |      | nS   |
| t <sub>f</sub>                     | Turn-Off Fall Time                |                                                                                            |     | 16.5 |      | nS   |
| Q <sub>g</sub>                     | Total Gate Charge                 | V <sub>GS</sub> =10V, V <sub>DS</sub> =15V, I <sub>D</sub> =20A                            |     | 115  |      | nC   |
| Q <sub>gs</sub>                    | Gate-Source Charge                |                                                                                            |     | 15.4 |      | nC   |
| Q <sub>gd</sub>                    | Gate-Drain Charge                 |                                                                                            |     | 27.2 |      | nC   |
| Source-Drain Diode Characteristics |                                   |                                                                                            |     |      |      |      |
| I <sub>SD</sub>                    | Source-Drain Current (Body Diode) |                                                                                            |     |      | 150  | A    |
| V <sub>SD</sub>                    | Forward on Voltage (Note 3)       | V <sub>GS</sub> =0V, I <sub>S</sub> =20A                                                   |     |      | 1.2  | V    |
| t <sub>rr</sub>                    | Reverse Recovery Time             | I <sub>F</sub> =20A, dI/dt=100A/μs                                                         |     | 33   |      | ns   |
| Q <sub>rr</sub>                    | Reverse Recovery Charge           | I <sub>F</sub> =20A, dI/dt=100A/μs                                                         |     | 29   |      | nC   |

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

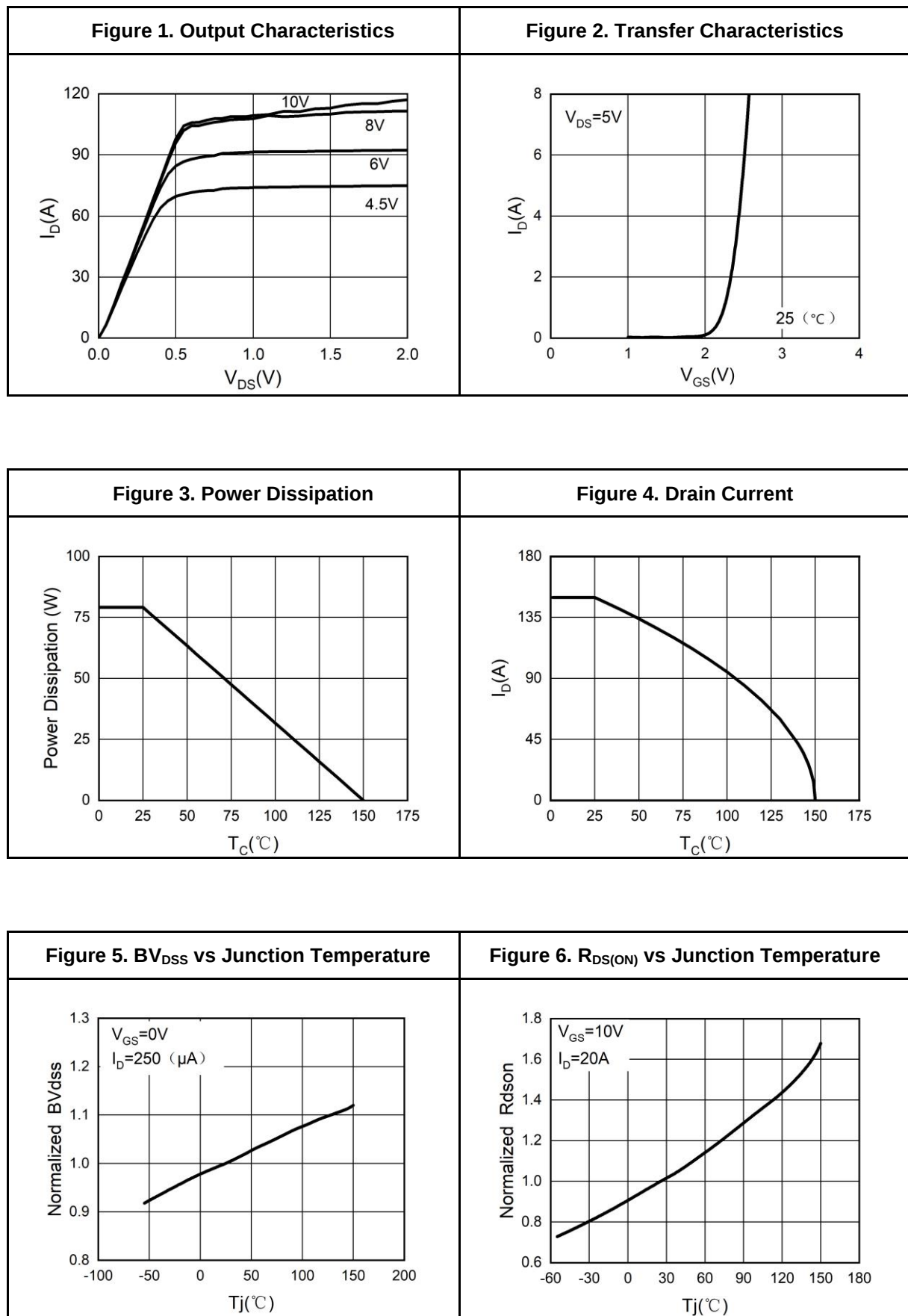
Notes 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=30V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$ .

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.



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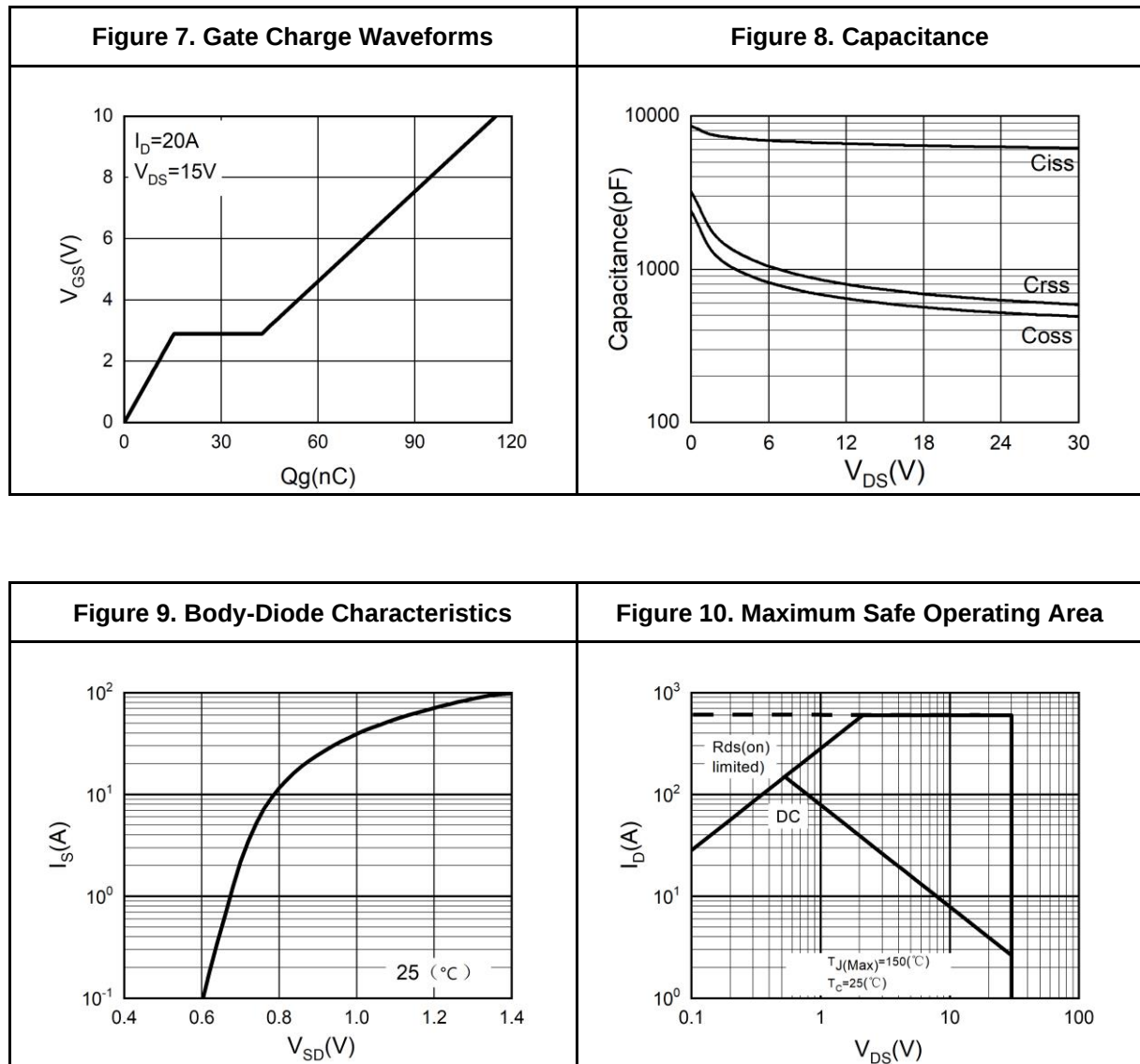
### Typical Electrical And Thermal Characteristics (Curves)





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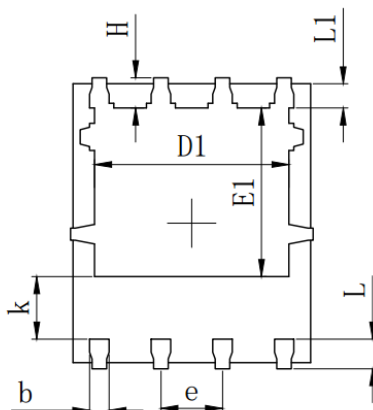
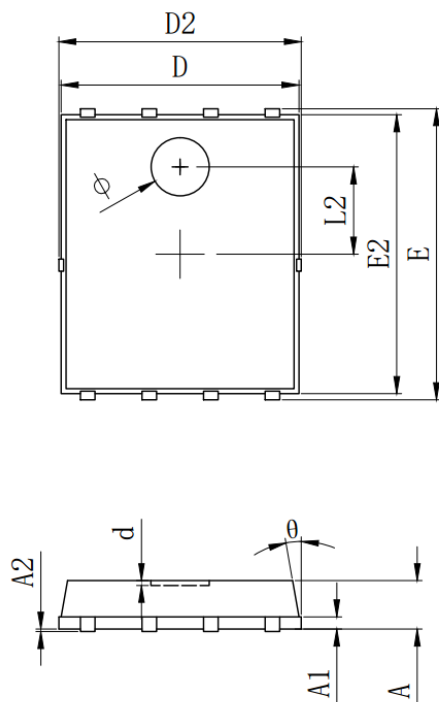
### Typical Electrical And Thermal Characteristics (Curves)





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### PDFN5X6-8L Package Information



| SYMBOL | MILLIMETER |       |       |
|--------|------------|-------|-------|
|        | MIN        | Typ.  | MAX   |
| A      | 0.900      | 1.000 | 1.100 |
| A1     | 0.254 REF. |       |       |
| A2     | 0~0.05     |       |       |
| D      | 4.824      | 4.900 | 4.976 |
| D1     | 3.910      | 4.010 | 4.110 |
| D2     | 4.924      | 5.000 | 5.076 |
| E      | 5.924      | 6.000 | 6.076 |
| E1     | 3.375      | 3.475 | 3.575 |
| E2     | 5.674      | 5.750 | 5.826 |
| b      | 0.350      | 0.400 | 0.450 |
| e      | 1.270 TYP. |       |       |
| L      | 0.534      | 0.610 | 0.686 |
| L1     | 0.424      | 0.500 | 0.576 |
| L2     | 1.800 REF. |       |       |
| k      | 1.190      | 1.290 | 1.390 |
| H      | 0.549      | 0.625 | 0.701 |
| θ      | 8°         | 10°   | 12°   |
| Φ      | 1.100      | 1.200 | 1.300 |
| d      |            |       | 0.100 |

| Symbol | MILLIMETER |       |       |
|--------|------------|-------|-------|
|        | Min.       | Typ.  | Max.  |
| A      | 0.900      | 1.000 | 1.100 |
| A1     | 0.254 REF. |       |       |
| A2     | 0~0.05     |       |       |
| D      | 4.824      | 4.900 | 4.976 |
| D1     | 3.910      | 4.010 | 4.110 |
| D2     | 4.924      | 5.000 | 5.076 |
| E      | 5.924      | 6.000 | 6.076 |
| E1     | 3.375      | 3.475 | 3.575 |
| E2     | 5.674      | 5.75  | 5.826 |
| b      | 0.350      | 0.400 | 0.450 |
| e      | 1.270 TYP. |       |       |
| L      | 0.534      | 0.610 | 0.686 |
| L1     | 0.424      | 0.500 | 0.576 |
| L2     | 1.800 REF. |       |       |
| k      | 1.190      | 1.290 | 1.390 |
| H      | 0.549      | 0.625 | 0.701 |
| θ      | 8°         | 10°   | 12°   |
| Φ      | 1.100      | 1.200 | 1.300 |
| d      |            |       | 0.100 |



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### Attention

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