

**/ Descriptions**

PDFN5×6-Clip P

P-Channel MOSFET in a PDFN5×6-Clip Plastic Package.

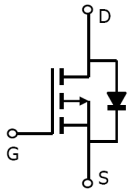
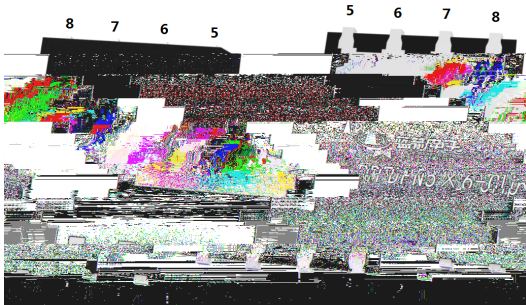
**/ Features** $V_{DS}(V)=-40V$   $I_D=-150A$  $R_{DS(ON)}@-10V<3m\Omega$ (TYP.  $2.5m\Omega$ ) $R_{DS(ON)}@-4.5V<4.5m\Omega$ (TYP.  $3.6m\Omega$ )

。 HF Product.

**/ Applications**

DC - DC

Motor drivers, DC - DC Converter.

**/ Equivalent Circuit****/ Pinning**

PIN1、2、3: S      PIN4: G      PIN5、6、7、8: D

**/ Marking**

See Marking Instructions.

**BRCS030P04SXC**

Rev.B Aug.-2025

**DATA SHEET**

| Parameter                                           | Symbol                  | Rating     | Unit |
|-----------------------------------------------------|-------------------------|------------|------|
| Drain-Source Voltage                                | $V_{DS}$                | -40        | V    |
| Drain Current – Continuous <sup>①</sup>             | $I_D(T_c=25^{\circ}C)$  | -150       | A    |
|                                                     | $I_D(T_c=100^{\circ}C)$ | -94        | A    |
| Drain Current – Pulsed <sup>①②</sup>                | $I_{DM}$                | -360       | A    |
| Gate-Source Voltage                                 | $V_{GS}$                | $\pm 20$   | V    |
| Power Dissipation <sup>①</sup>                      | $P_D(T_c=25^{\circ}C)$  | 110        | W    |
| Single Pulse Avalanche Energy(L=1mH)                | $E_{AS}$                | 760        | mJ   |
| Junction and Storage Temperature Range              | $T_j, T_{stg}$          | -55 to 150 |      |
| Thermal resistance, junction - ambient <sup>①</sup> | $R_{\theta JA}$         | 55         | / W  |
| Thermal resistance, junction - case <sup>①</sup>    | $R_{\theta JC}$         | 1.14       |      |

Notes:

\* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec

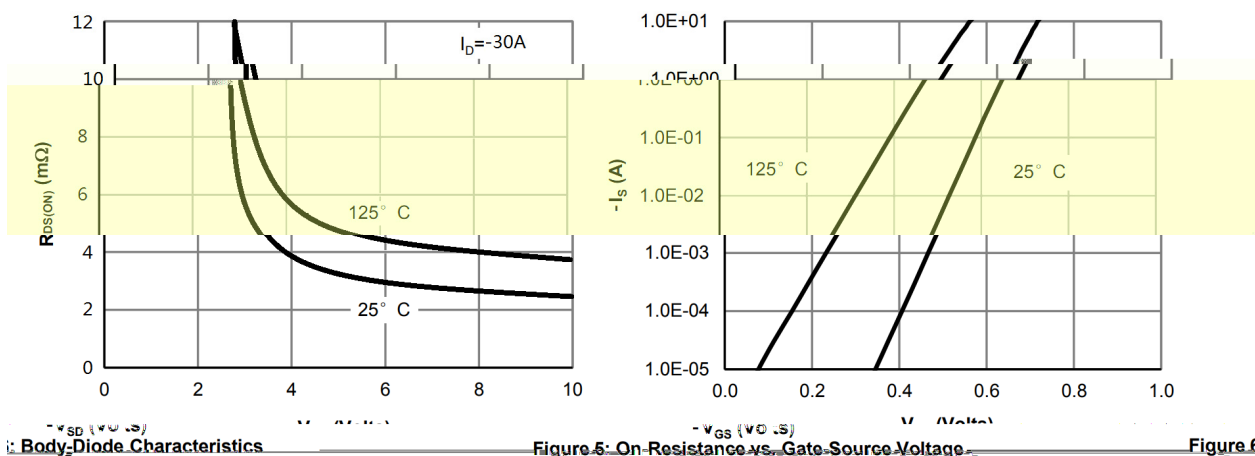
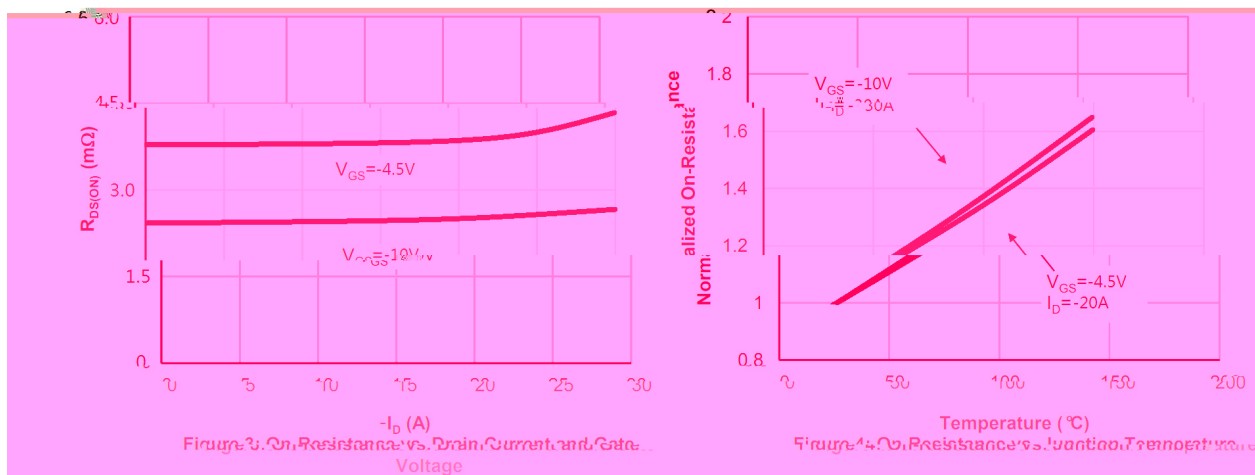
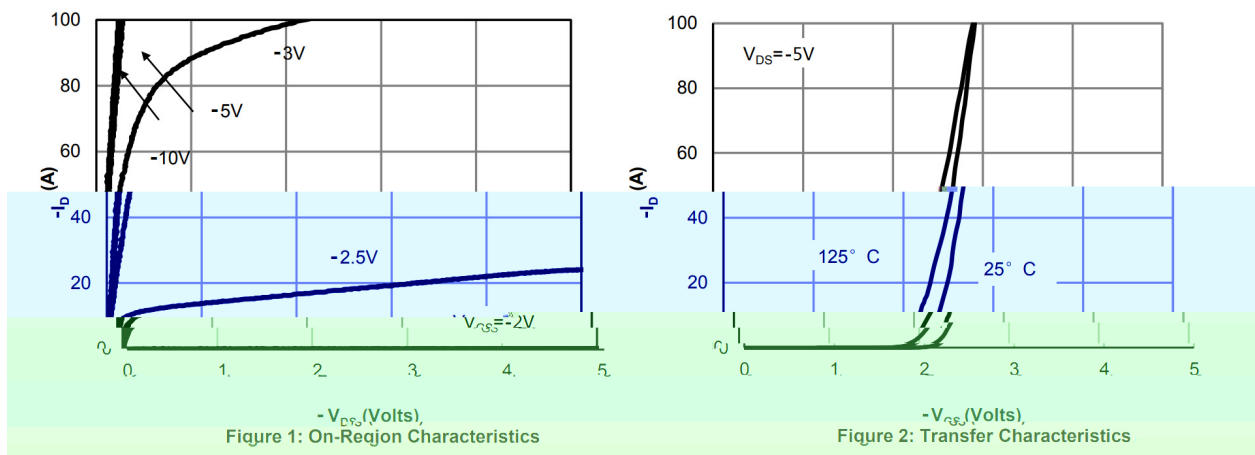
\*\* Pulse width ≤ 300 μs, duty cycle ≤ 2 %

| Parameter                         | Symbol       | Test Conditions                                         | Min | Typ   | Max       | Unit |
|-----------------------------------|--------------|---------------------------------------------------------|-----|-------|-----------|------|
| Drain-Source Breakdown Voltage    | $BV_{DSS}$   | $I_D=-250\mu A$ $V_{GS}=0V$                             | -40 |       |           | V    |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=-32V$ $V_{GS}=0V$                               |     |       | -1        | uA   |
| Gate-Body leakage current         | $I_{GSS}$    | $V_{DS}=0V$ , $V_{GS}=\pm 20V$                          |     |       | $\pm 100$ | nA   |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}$ , $I_D=-250\mu A$                       | -1  |       | -2        | V    |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=-10V$ , $I_D=-30A$                              |     | 2.5   | 3.0       | mΩ   |
|                                   |              | $V_{GS}=-4.5V$ , $I_D=-20A$                             |     | 3.6   | 4.5       |      |
| Diode Forward Voltage             | $V_{SD}$     | $I_S=-30A$ , $V_{GS}=0V$                                |     |       | -1.3      | V    |
| Reverse Recovery Time             | $t_{rr}$     | $I_{DS}=-30A$ , $V_{GS}=0V$<br>$di_{SD}/dt=100 A/\mu s$ |     | 31    |           | nS   |
| Reverse Recovery Charge           | $Q_{rr}$     |                                                         |     | 20    |           | nC   |
| Input Capacitance                 | $C_{iss}$    | $V_{DS}=-20V$ $V_{GS}=0V$<br>$f=1.0MHz$                 |     | 15094 |           | pF   |
| Output Capacitance                | $C_{oss}$    |                                                         |     | 1018  |           |      |
| Reverse Transfer Capacitance      | $C_{rss}$    |                                                         |     | 224   |           |      |

## / Electrical Characteristics(Ta=25 )

| Parameter           | Symbol       | Test Conditions                                                                           | Min | Typ | Max | Unit |
|---------------------|--------------|-------------------------------------------------------------------------------------------|-----|-----|-----|------|
| Total Gate Charge   | $Q_g$        | $V_{GS}=-10V, \quad V_{DS}=-20V,$<br>$I_D=-20A$                                           |     | 249 |     | nC   |
| Gate Source Charge  | $Q_{gs}$     |                                                                                           |     | 53  |     |      |
| Gate Drain Charge   | $Q_{gd}$     |                                                                                           |     | 26  |     |      |
| Turn-On Delay Time  | $t_{d(on)}$  | $V_{GEN}=-10V \quad V_{DS}=-20V$<br>$R_L=0.66\Omega \quad R_G=3.9\Omega$<br>$I_{DS}=-20A$ |     | 15  |     | ns   |
| Turn-On Rise Time   | $t_r$        |                                                                                           |     | 75  |     |      |
| Turn-Off Delay Time | $t_{d(off)}$ |                                                                                           |     | 324 |     |      |
| Turn-Off Fall Time  | $t_f$        |                                                                                           |     | 98  |     |      |

## / Electrical Characteristic Curve



## / Electrical Characteristic Curve

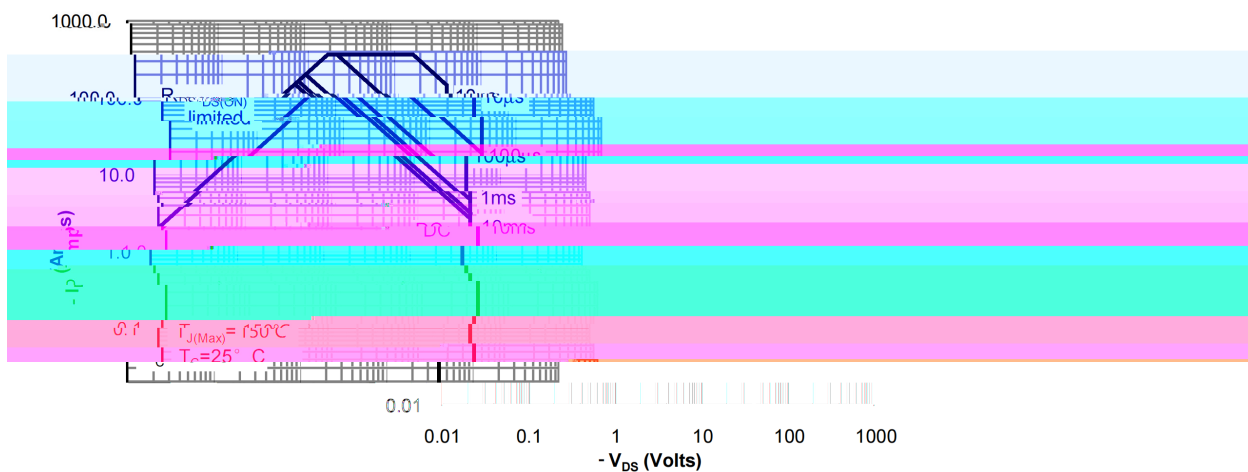
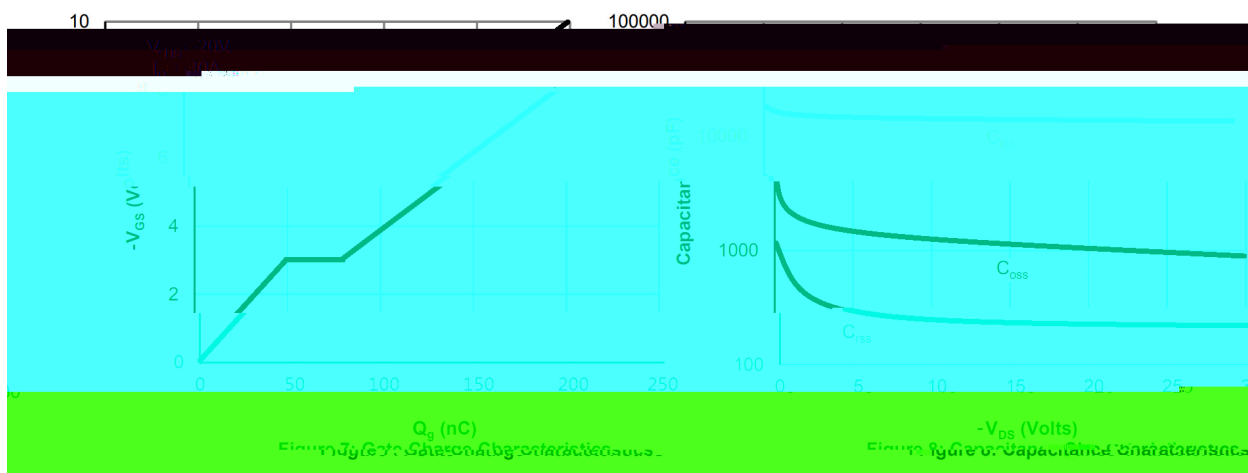
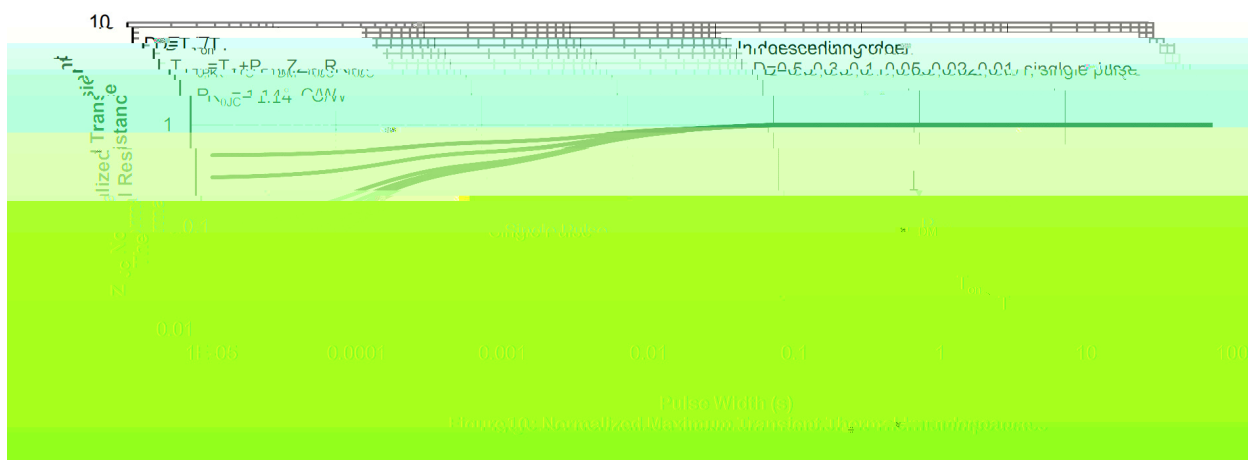


Figure 9: Maximum Forward Biased Safe Operating Area



## 6 / 8

## / Marking Instructions



BR

030P04S

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Note

BR

Company Code

030P04S

Product Type Code

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Lot No. Code, code change with Lot No.

## ( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)

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|--|
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|  |
|  |
|  |

Note:

- |   |         |           |                                         |
|---|---------|-----------|-----------------------------------------|
| 1 | 150 180 | 60 90sec; | 1.Preheating:150~180 , Time:60~90sec.   |
| 2 | 245±5   | 5±0.5sec; | 2.Peak Temp.:245±5 , Duration:5±0.5sec. |
| 3 | 2 10    | /sec.     | 3. Cooling Speed: 2~10 /sec.            |

## / Resistance to Soldering Heat Test Conditions

|       |           |             |               |
|-------|-----------|-------------|---------------|
| 260±5 | 10±1 sec. | Temp.:260±5 | Time:10±1 sec |
|-------|-----------|-------------|---------------|

## / Packaging SPEC.

## / REEL

| Package Type | Units           |                      |                      |                            |                      | Dimension (unit mm <sup>3</sup> ) |            |             |
|--------------|-----------------|----------------------|----------------------|----------------------------|----------------------|-----------------------------------|------------|-------------|
|              | Units/Reel<br>/ | Reels/Inner Box<br>/ | Units/Inner Box<br>/ | Inner Boxes/Outer Box<br>/ | Units/Outer Box<br>/ | Reel                              | Inner Box  | Outer Box   |
| PDFN5×6-Clip | 5,000           | 2                    | 10,000               | 6                          | 60,000               | 13"×12                            | 360×360×50 | 380×335×366 |