

# HCF65R260

|                                                                                  |                                                   |
|----------------------------------------------------------------------------------|---------------------------------------------------|
|  | <b>HCF65R260</b>                                  |
|                                                                                  | <b>650V N-Channel Super Junction Power MOSFET</b> |

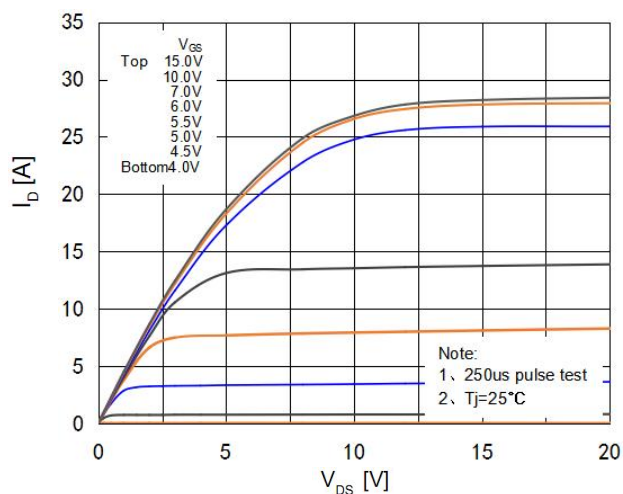
### Electrical Characteristics(Tc=25°C unless otherwise noted)

| Symbol                                                 | Parameter                                             | Test Conditons                                                                       | Min | Typ  | Max  | Unit |
|--------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------|-----|------|------|------|
| Off Characteristics                                    |                                                       |                                                                                      |     |      |      |      |
| BV <sub>DSS</sub>                                      | Drain-source Breakdown Voltage                        | V <sub>GS</sub> =0V ,I <sub>D</sub> =250μA                                           | 650 | --   | --   | V    |
| ΔBV <sub>DSS</sub><br>/ΔT <sub>J</sub>                 | Breakdown Voltage Temperature Coefficient             | I <sub>D</sub> =250μA<br>(Referenced to 25°C)                                        | --  | 0.68 | --   | V/°C |
| I <sub>DSS</sub>                                       | Zero Gate Voltage Drain Current                       | V <sub>DS</sub> =650V,V <sub>GS</sub> =0V                                            | --  | --   | 1    | μA   |
|                                                        |                                                       | V <sub>DS</sub> =520V,Tc=125°C                                                       | --  | --   | 10   | μA   |
| I <sub>GSSF</sub>                                      | Gate-Body Leakage Current,Forward                     | V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V                                           | --  | --   | 100  | nA   |
| I <sub>GSSR</sub>                                      | Gate-Body Leakage Current,Reverse                     | V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V                                           | --  | --   | -100 | nA   |
| On Characteristics                                     |                                                       |                                                                                      |     |      |      |      |
| V <sub>GS(th)</sub>                                    | Gate Threshold Voltage                                | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA                            | 2.0 | --   | 4.0  | V    |
| R <sub>DS(on)</sub>                                    | Static Drain-Source On-Resistance                     | V <sub>GS</sub> =10 V, I <sub>D</sub> =7.5A                                          | --  | 210  | 260  | mΩ   |
| g <sub>FS</sub>                                        | Forward Transconductance                              | V <sub>DS</sub> =20 V, I <sub>D</sub> =7.5A<br>(Note4)                               | --  | 9.3  | --   | S    |
| Dynamic Characteristics                                |                                                       |                                                                                      |     |      |      |      |
| C <sub>iss</sub>                                       | Input Capacitance                                     | V <sub>DS</sub> =25V,V <sub>GS</sub> =0V,<br>f=1.0MHz                                | --  | 1100 | --   | pF   |
| C <sub>oss</sub>                                       | Output Capacitance                                    |                                                                                      | --  | 1280 | --   | pF   |
| C <sub>rss</sub>                                       | Reverse Transfer Capacitance                          |                                                                                      | --  | 20   | --   | pF   |
| Switching Characteristics                              |                                                       |                                                                                      |     |      |      |      |
| t <sub>d(on)</sub>                                     | Turn-On Delay Time                                    | V <sub>DD</sub> = 325 V, I <sub>D</sub> =15.0 A,<br>R <sub>G</sub> = 25 Ω (Note4,5)  | --  | 12   | --   | ns   |
| t <sub>r</sub>                                         | Turn-On Rise Time                                     |                                                                                      | --  | 33   | --   | ns   |
| t <sub>d(off)</sub>                                    | Turn-Off Delay Time                                   |                                                                                      | --  | 50   | --   | ns   |
| t <sub>f</sub>                                         | Turn-Off Fall Time                                    |                                                                                      | --  | 22   | --   | ns   |
| Q <sub>g</sub>                                         | Total Gate Charge                                     | V <sub>DS</sub> = 520 V, I <sub>D</sub> =15.0 A,<br>V <sub>GS</sub> = 10 V (Note4,5) | --  | 34.2 | --   | nC   |
| Q <sub>gs</sub>                                        | Gate-Source Charge                                    |                                                                                      | --  | 9.6  | --   | nC   |
| Q <sub>gd</sub>                                        | Gate-Drain Charge                                     |                                                                                      | --  | 15.3 | --   | nC   |
| Drain-Source Diode Characteristics and Maximum Ratings |                                                       |                                                                                      |     |      |      |      |
| I <sub>S</sub>                                         | Maximum Continuous Drain-Source Diode Forward Current |                                                                                      | --  | --   | 15.0 | A    |
| I <sub>SM</sub>                                        | Maximum Pulsed Drain-Source Diode Forward Current     |                                                                                      | --  | --   | 60   | A    |
| V <sub>SD</sub>                                        | Drain-Source Diode Forward Voltage                    | V <sub>GS</sub> =0V,I <sub>S</sub> =15.0A                                            | --  | --   | 1.4  | V    |
| t <sub>rr</sub>                                        | Reverse Recovery Time                                 | V <sub>GS</sub> =0V, I <sub>S</sub> =15.0A,<br>d I <sub>F</sub> /dt=100A/μs (Note4)  | --  | 461  | --   | ns   |
| Q <sub>rr</sub>                                        | Reverse Recovery Charge                               |                                                                                      | --  | 5.4  | --   | μC   |

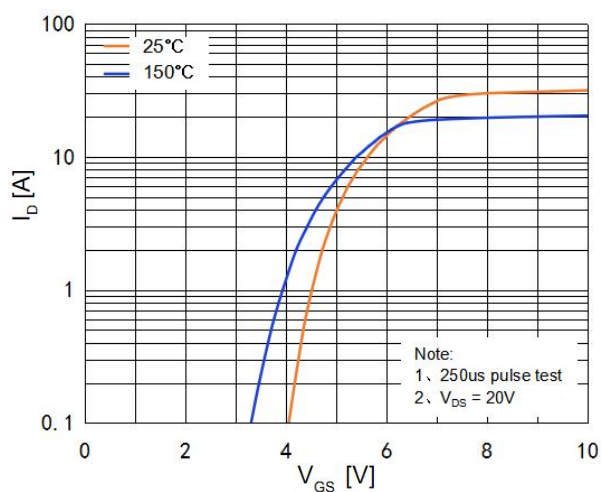
Notes:

- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、 $L=9.5mH, I_{AS}=7.5A, V_{DD}=100V, R_G=25\Omega$ , Starting  $T_J=25^\circ C$ .
- 3、 $I_{SD}\leq 15.0A, di/dt\leq 200A/\mu s, V_{DD}\leq BV_{DSS}$ , Starting  $T_J=25^\circ C$ .
- 4、Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle $\leq 2\%$ .
- 5、Essentially Independent of Operating Temperature.

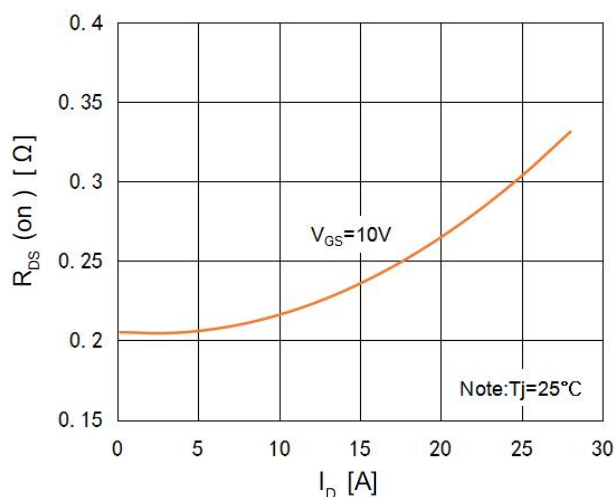
### On-Regin Characteristics



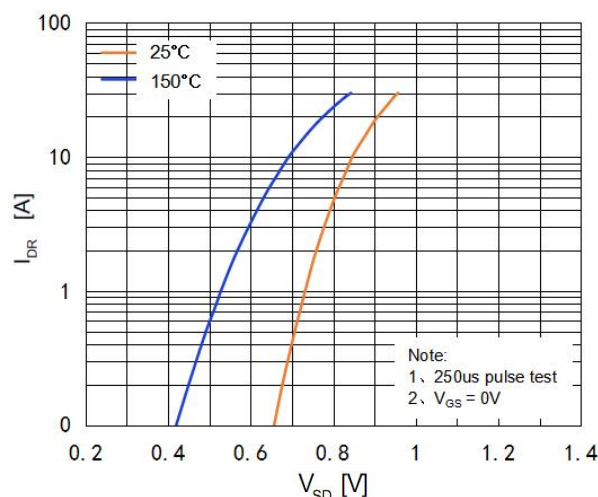
### Transfer Characteristics



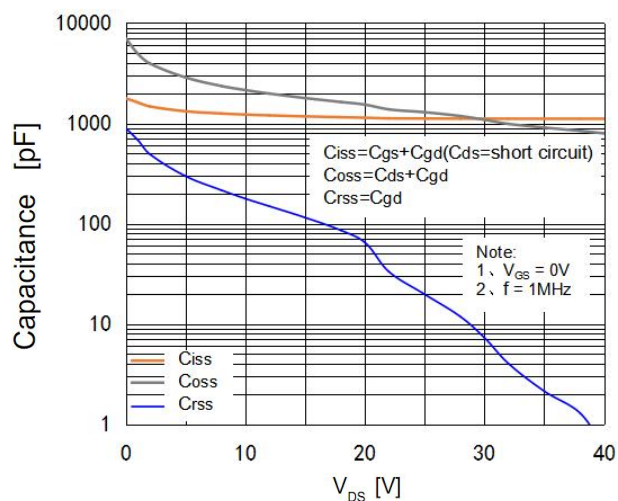
### On-Resistance Variation vs. Drain Current and Gate Voltage



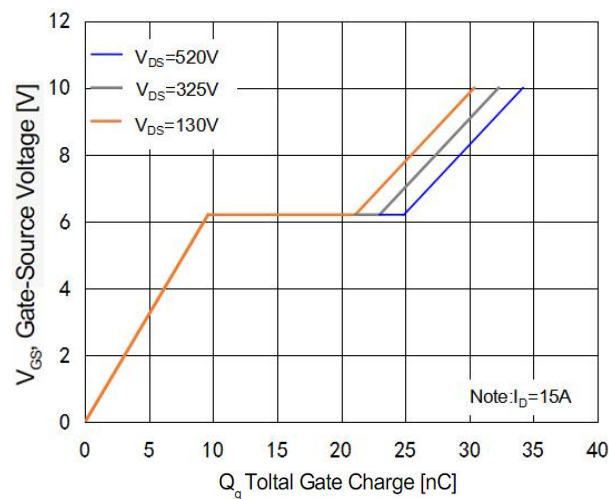
### Body Diode Forward Voltage Variation vs. Source Current and Temperature



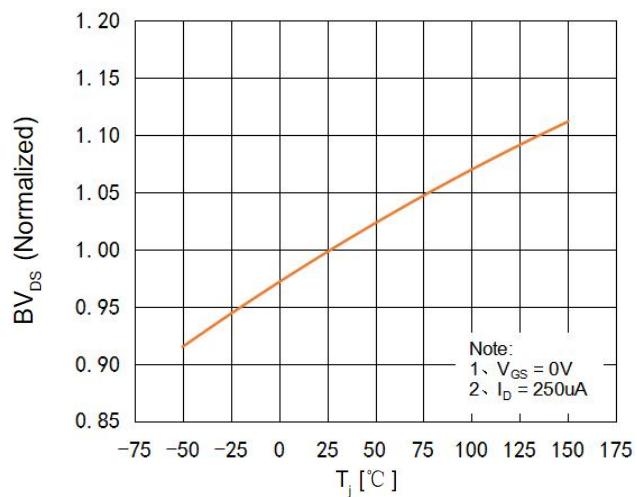
### Capacitance Characteristics



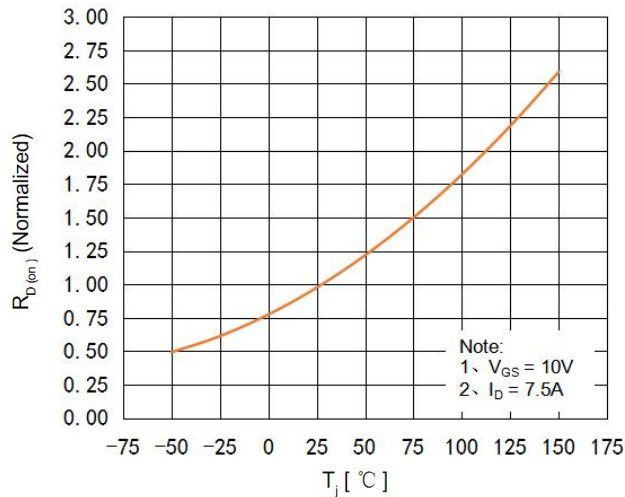
### Gate Charge Characteristics



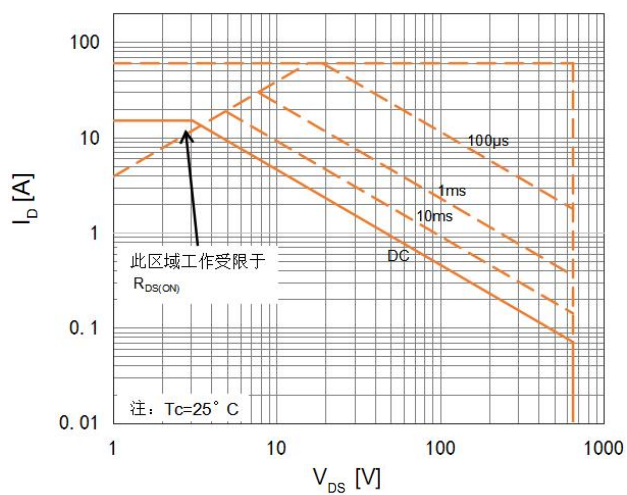
### Breakdown Voltage Variation vs. Temperature



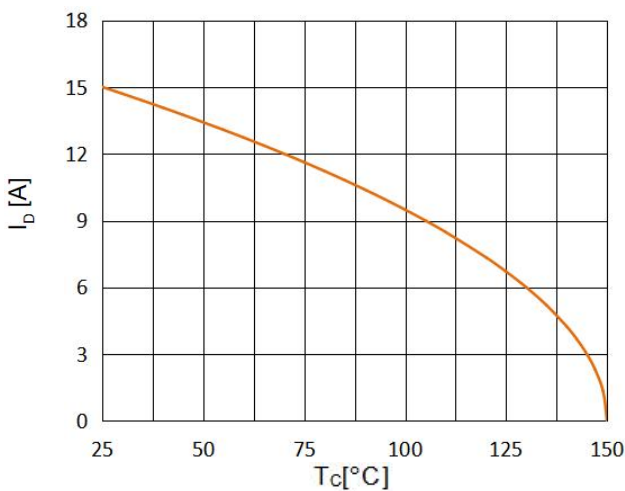
### On-Resistance Variation vs. Temperature



### Maximum Safe Operating Area



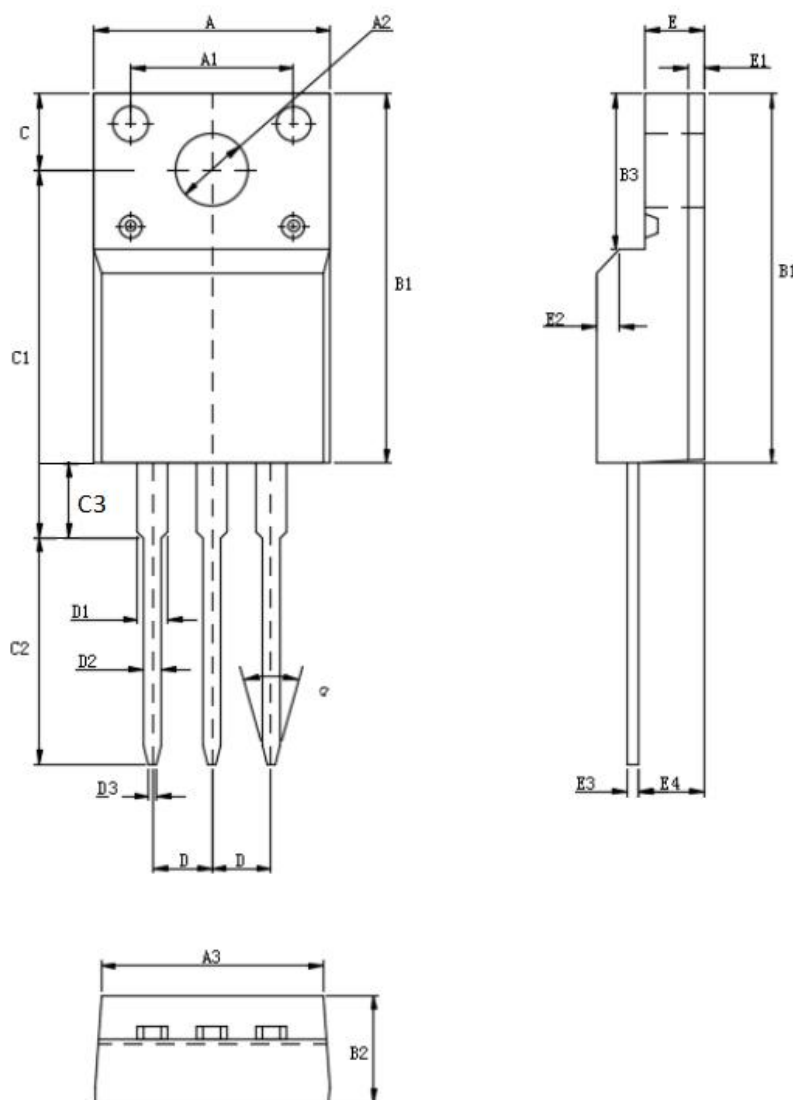
### Maximum Drain Current Vs. Case Temperature



### TO-220F Package Dimensions

UNIT: mm

| SYMBOL | min   | nom  | max   | SYMBOL | min  | nom       | max  |
|--------|-------|------|-------|--------|------|-----------|------|
| A      | 9.80  |      | 10.60 | D      |      | 2.54      |      |
| A1     |       | 7.00 |       | D1     | 1.15 |           | 1.47 |
| A2     | 2.90  |      | 3.40  | D2     | 0.60 |           | 0.90 |
| A3     | 9.10  |      | 9.90  | D3     | 0.20 |           | 0.50 |
| B1     | 15.40 |      | 16.40 | E      | 2.24 |           | 2.84 |
| B2     | 4.35  |      | 4.95  | E1     |      | 0.70      |      |
| B3     | 6.00  |      | 7.40  | E2     |      | 1.0 × 45° |      |
| C      | 3.00  |      | 3.70  | E3     | 0.35 |           | 0.65 |
| C1     | 15.00 |      | 17.00 | E4     | 2.30 |           | 3.30 |
| C2     | 8.80  |      | 10.80 | α (度)  |      | 30°       |      |
| C3     | 2.60  |      | 3.60  |        |      |           |      |



|                                                                                  |                                                   |
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|                                                                                  | <b>650V N-Channel Super Junction Power MOSFET</b> |

注意事项：

- 1、在电路设计时请不要超过器件的最大额定值，否则会影响整机的可靠性。
- 2、MOSFET产品为静电敏感型器件，使用时应注意采取防静电保护措施，如佩戴防静电手环、设备接地等。
- 3、如需安装散热片，请注意控制扭力大小及散热片的平整度。
- 4、该规格书由华科公司制作，并可能不定期更改，恕不另行通知。
- 5、如有疑问，请及时联系我司销售代表。

版本履历表：

| 序号 | 版本号  | 修改时间       | 修改记录 |
|----|------|------------|------|
| 1  | V1.0 | 2022-12-20 | 首次发行 |
|    |      |            |      |