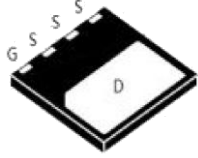
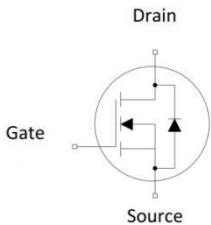



N-channel 650V, 11A, 0.38Ω Super-Junction Power MOSFET

| | | | | | | | | | |
|--|--|-----------------------------|------|------------------|-------|-------|-----|-------------|---------|
| <p>Description</p> <p>Super-junction power MOSFET is a revolutionary technology for high voltage power MOSFET , designed according to the SJ principle. The resulting device has extremely low on resistance,making it especially suitable for applications which require superior power density and outstanding efficiency.</p> <p>Features</p> <ul style="list-style-type: none"> ◆ Very low FOM $R_{DS(on)} \times Q_g$ ◆ 100% UIS tested ◆ RoHS compliant <p>Applications</p> <ul style="list-style-type: none"> ◆ Power factor correction (PFC). ◆ Switched mode power supplies (SMPS). ◆ Uninterrupted power supply (UPS). | <p>Product Summary</p> <table> <tr> <td>$V_{DS} @ T_{j,25^\circ C}$</td><td>650V</td></tr> <tr> <td>$R_{DS(on),max}$</td><td>0.38Ω</td></tr> <tr> <td>I_D</td><td>11A</td></tr> <tr> <td>$Q_{g,typ}$</td><td>19.2 nC</td></tr> </table> <div style="text-align: center;">  <p>DFN8*8</p>  <p>N-Channel MOSFET</p>  </div> | $V_{DS} @ T_{j,25^\circ C}$ | 650V | $R_{DS(on),max}$ | 0.38Ω | I_D | 11A | $Q_{g,typ}$ | 19.2 nC |
| $V_{DS} @ T_{j,25^\circ C}$ | 650V | | | | | | | | |
| $R_{DS(on),max}$ | 0.38Ω | | | | | | | | |
| I_D | 11A | | | | | | | | |
| $Q_{g,typ}$ | 19.2 nC | | | | | | | | |

Marking information

| Product | Package | Marking | Packing method |
|------------|---------|------------|----------------|
| HMS11N65D8 | DFN8*8 | HMS11N65D8 | Reel |

Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---|----------------|-------------|------|
| Drain-Source Voltage | V_{DSS} | 650 | V |
| Continuous drain current ($T_C = 25^\circ C$) | I_D | 11 | A |
| ($T_C = 100^\circ C$) | | 7 | A |
| Pulsed drain current ¹⁾ | I_{DM} | 33 | A |
| Gate-Source voltage | V_{GSS} | ± 30 | V |
| Avalanche energy, single pulse ²⁾ | E_{AS} | 240 | mJ |
| Avalanche current, repetitive ³⁾ | I_{AR} | 1.6 | A |
| Power Dissipation DFN8*8 ($T_C = 25^\circ C$) | P_D | 90 | W |
| - Derate above 25°C | | 0.72 | W/C |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | °C |
| Continuous diode forward current | I_S | 11 | A |
| Diode pulse current | $I_{S,pulse}$ | 33 | A |

Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|--|-------------------|--------|----------------------|
| | | DFN8*8 | |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 1.32 | $^{\circ}\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 45 | $^{\circ}\text{C/W}$ |
| Soldering temperature, wave soldering only allowed at leads. (1.6mm from case for 10s) | T_{sold} | 260 | $^{\circ}\text{C}$ |

Electrical Characteristics $T_c = 25^{\circ}\text{C}$ unless otherwise noted

| Parameter | Symbol | Test Condition | Min. | Typ. | Max. | Unit |
|----------------------------------|----------------------|---|-------------|-----------------|------|------|
| Static characteristics | | | | | | |
| Drain-source breakdown voltage | BV _{DSS} | V _{GS} =0 V, I _D =250uA | 650 | - | - | V |
| Gate threshold voltage | V _{GS(th)} | V _{DS} =V _{GS} , I _D =250uA | 2.5 | | 4.0 | V |
| Drain cut-off current | I _{DSS} | V _{DS} =650 V, V _{GS} =0 V, T _J = 25°C T _J = 125C | - - | - 10 | 1 | μA |
| Gate leakage current, Forward | I _{GSSF} | V _{GS} =30 V, V _{DS} =0 V | - | - | 100 | nA |
| Gate leakage current, Reverse | I _{GSSR} | V _{GS} =-30 V, V _{DS} =0 V | - | - | -100 | nA |
| Drain-source on-state resistance | R _{DS(on)} | V _{GS} =10 V, I _D =5.5 A T _J = 25°C T _J = 150°C | - - - | 0.34 0.9 | 0.38 | Ω |
| Dynamic characteristics | | | | | | |
| Input capacitance | C _{iss} | V _{DS} = 100 V, V _{GS} = 0 V, f = 1MHz | - | 852 | - | pF |
| Output capacitance | C _{oss} | | - | 37 | - | |
| Reverse transfer capacitance | C _{rss} | | - | 2.0 | - | |
| Turn-on delay time | t _{d(on)} | V _{DD} = 400V, I _D =5.5A R _G = 25Ω, V _{GS} =10V | - | 16.3 | - | ns |
| Rise time | t _r | | - | 35 | - | |
| Turn-off delay time | t _{d(off)} | | - | 78 | - | |
| Fall time | t _f | | - | 39.5 | - | |
| Gate charge characteristics | | | | | | |
| Gate to source charge | Q _{gs} | V _{DD} =520 V, I _D =5.5A, V _{GS} =0 to 10 V | - | 3.1 | - | nC |
| Gate to drain charge | Q _{gd} | | - | 8.2 | - | |
| Gate charge total | Q _g | | - | 19.2 | - | |
| Gate plateau voltage | V _{plateau} | | - | 5.5 | - | V |
| Reverse diode characteristics | | | | | | |
| Diode forward voltage | V _{SD} | V _{GS} =0 V, I _F =5.5A | - | 0.85 | - | V |
| Reverse recovery time | t _{rr} | V _R =400 V, I _F =5.5A, dI _F /dt=100 A/μs | - | 310 | - | ns |
| Reverse recovery charge | Q _{rr} | | - | 2.8 | - | μC |
| Peak reverse recovery current | I _{rrm} | | - | 16.8 | - | A |

Notes:

- Limited by maximum junction temperature, maximum duty cycle is 0.75.
- $I_{AS} = 3\text{ A}, V_{DD} = 50\text{ V},$ Starting $T_j = 25^{\circ}\text{C}.$

Electrical Characteristics Diagrams

Figure 1. Output Characteristics

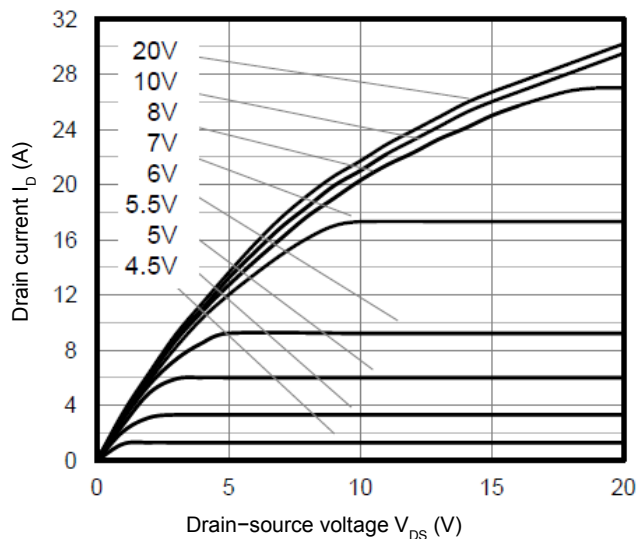


Figure 2. Transfer Characteristics

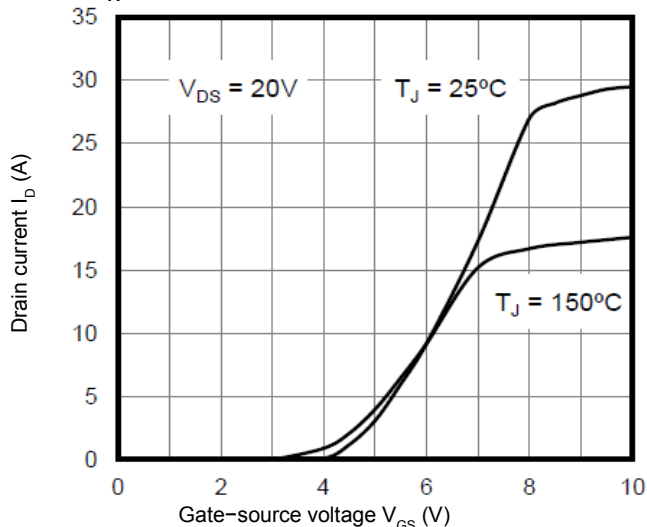


Figure 3. On-Resistance vs. Drain Current

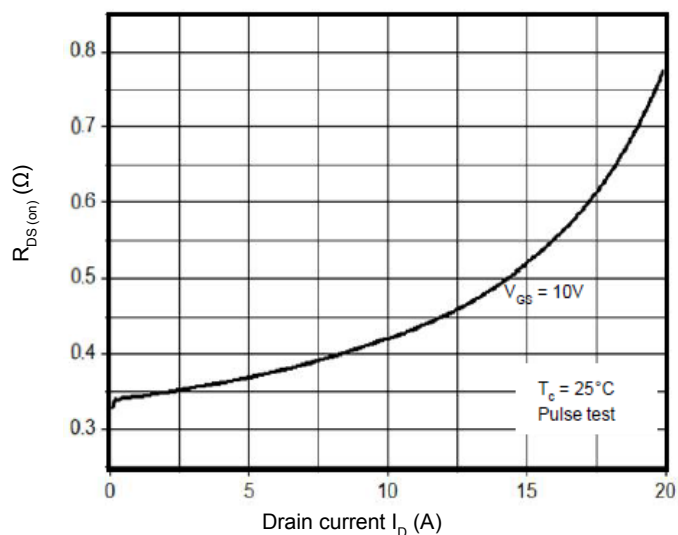


Figure 4. Capacitance Characteristics

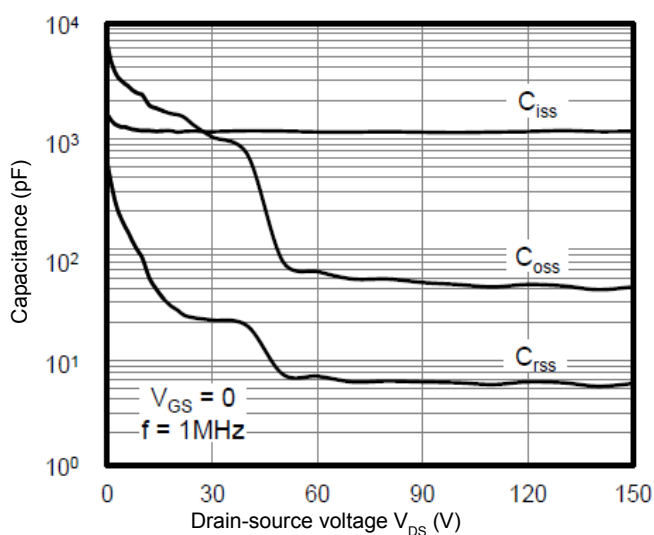


Figure 5. Gate Charge Characteristics

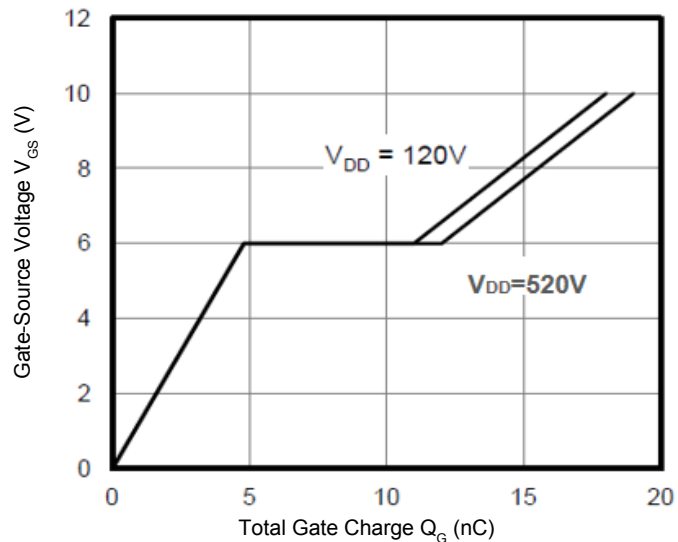


Figure 6. Body Diode Forward Voltage

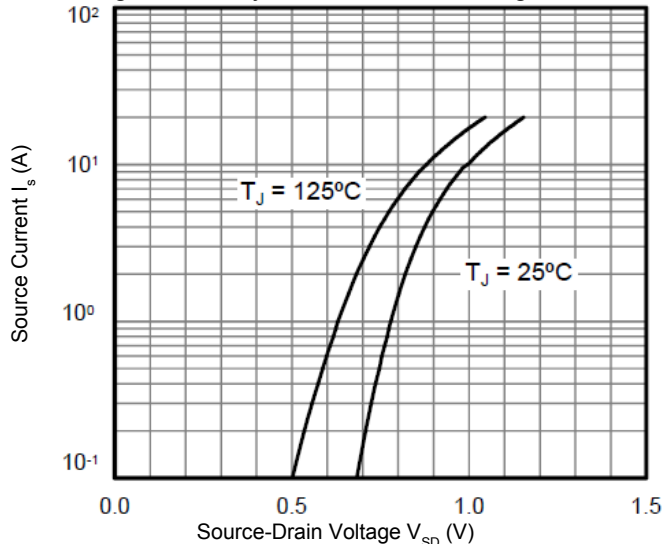


Figure 7. Breakdown Voltage vs. Temperature

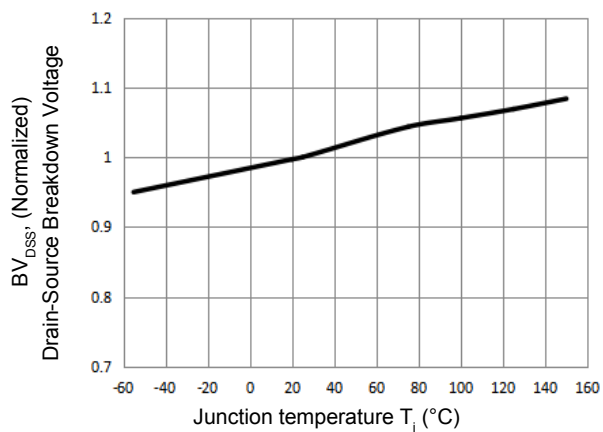


Figure 8. On-Resistance vs. Temperature

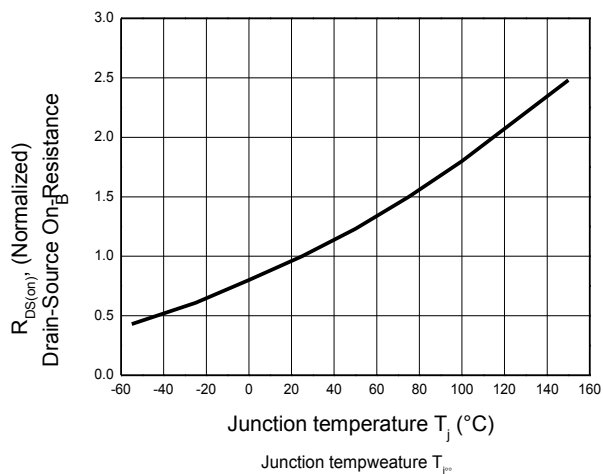
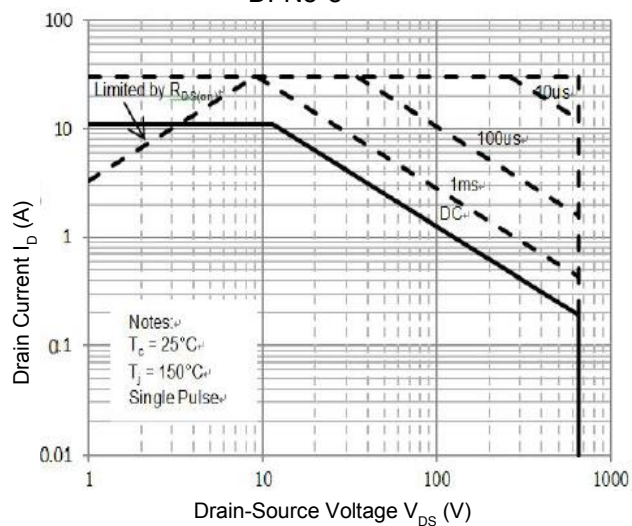
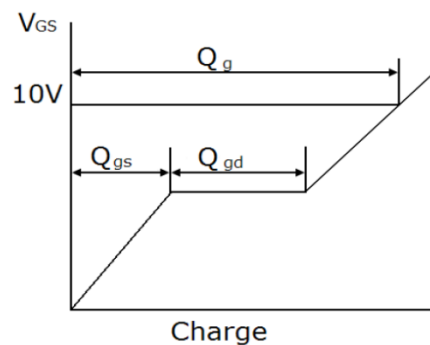
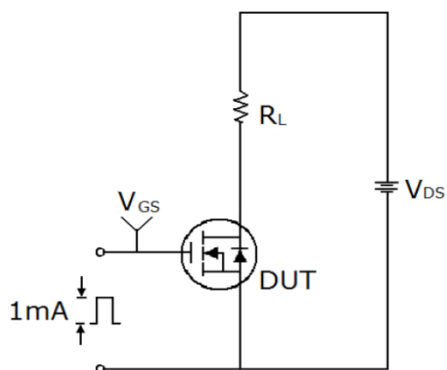


Figure 9. Maximum Safe Operating Area
DFN8*8

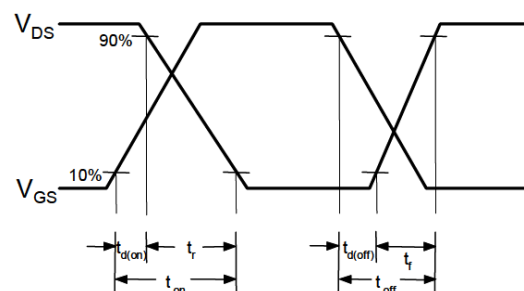
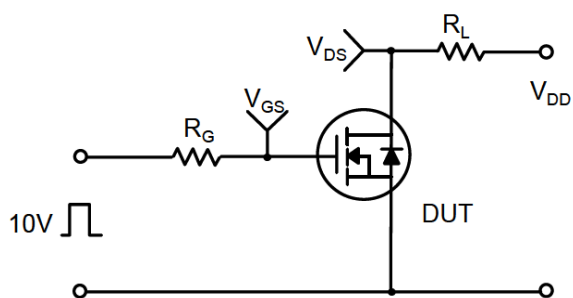


Test Circuits

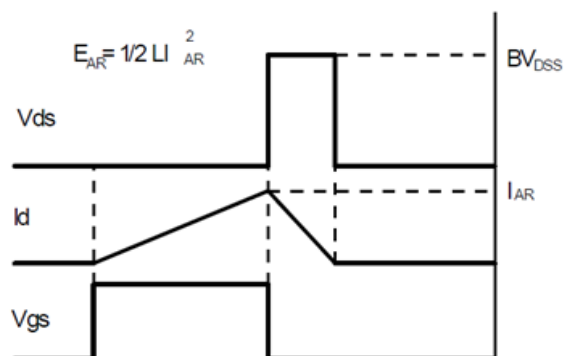
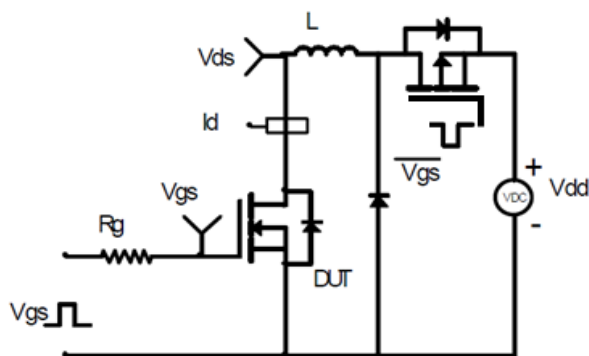
Gate Charge Test Circuit & Waveform



Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Mechanical Dimensions for DFN8*8

