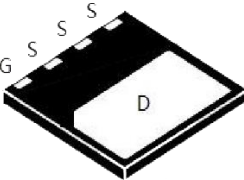
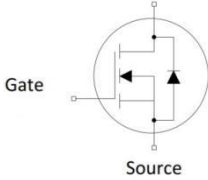



## N-channel 700V, 11A, 0.38Ω Super-Junction Power MOSFET

<p><b>Description</b></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><b>Features</b></p> <ul style="list-style-type: none"> <li>◆ Very low FOM <math>R_{DS(on)} \times Q_g</math></li> <li>◆ 100% UIS tested</li> <li>◆ RoHS compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>◆ Power factor correction (PFC).</li> <li>◆ Switched mode power supplies (SMPS).</li> <li>◆ Uninterrupted power supply (UPS).</li> </ul>	<p><b>Product Summary</b></p> <table> <tr> <td><math>V_{DS} @ T_{j,25^\circ C}</math></td><td>700V</td></tr> <tr> <td><math>R_{DS(on),max}</math></td><td>0.38Ω</td></tr> <tr> <td><math>I_D</math></td><td>11A</td></tr> <tr> <td><math>Q_{g,typ}</math></td><td>19.2 nC</td></tr> </table>  <p><b>DFN8*8</b></p>   <p>N-Channel MOSFET</p>	$V_{DS} @ T_{j,25^\circ C}$	700V	$R_{DS(on),max}$	0.38Ω	$I_D$	11A	$Q_{g,typ}$	19.2 nC
$V_{DS} @ T_{j,25^\circ C}$	700V								
$R_{DS(on),max}$	0.38Ω								
$I_D$	11A								
$Q_{g,typ}$	19.2 nC								

### Marking information

Product	Package	Marking	Packing method
HMS11N70D8	DFN8*8	HMS11N70D8	Reel

### Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	700	V
Continuous drain current ( $T_C = 25^\circ C$ )	$I_D$	11	A
( $T_C = 100^\circ C$ )		7	A
Pulsed drain current <sup>1)</sup>	$I_{DM}$	33	A
Gate-Source voltage	$V_{GSS}$	$\pm 30$	V
Avalanche energy, single pulse <sup>2)</sup>	$E_{AS}$	210	mJ
Avalanche current, repetitive <sup>3)</sup>	$I_{AR}$	1.6	A
Power Dissipation DFN8*8 ( $T_C = 25^\circ C$ )	$P_D$	118	W
- Derate above $25^\circ C$		0.94	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	$R_{\theta JA}$	87	$^{\circ}\text{C/W}$
Soldering temperature, wave soldering only allowed at leads. (1.6mm from case for 10s)	$T_{\text{sold}}$	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 <sub>DSS</sub>	V <sub>GS</sub> =0 V, I <sub>D</sub> =250uA	700	-	-	V
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2.5		4.0	V
Drain cut-off current	I <sub>DSS</sub>	V <sub>DS</sub> =700 V, V <sub>GS</sub> =0 V, T <sub>j</sub> = 25°C T <sub>j</sub> = 125C	- -	- 10	1	μA
Gate leakage current, Forward	I <sub>GSSF</sub>	V <sub>GS</sub> =30 V, V <sub>DS</sub> =0 V	-	-	100	nA
Gate leakage current, Reverse	I <sub>GSSR</sub>	V <sub>GS</sub> =-30 V, V <sub>DS</sub> =0 V	-	-	-100	nA
Drain-source on-state resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10 V, I <sub>D</sub> =5.5 A T <sub>j</sub> = 25°C	- - -	0.34	0.38	Ω
Dynamic characteristics						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V, f = 1MHz	-	852	-	pF
Output capacitance	C <sub>oss</sub>		-	37	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	2.0	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 400V, I <sub>D</sub> =5.5A R <sub>G</sub> = 25Ω, V <sub>GS</sub> =10V	-	16.3	-	ns
Rise time	t <sub>r</sub>		-	35	-	
Turn-off delay time	t <sub>d(off)</sub>		-	78	-	
Fall time	t <sub>f</sub>		-	39.5	-	
Gate charge characteristics						
Gate to source charge	Q <sub>gs</sub>	V <sub>DD</sub> =520 V, I <sub>D</sub> =5.5A, V <sub>GS</sub> =0 to 10 V	-	3.1	-	nC
Gate to drain charge	Q <sub>gd</sub>		-	8.2	-	
Gate charge total	Q <sub>g</sub>		-	19.2	-	
Gate plateau voltage	V <sub>plateau</sub>		-	5.5	-	V
Reverse diode characteristics						
Diode forward voltage	V <sub>SD</sub>	V <sub>GS</sub> =0 V, I <sub>F</sub> =5.5A	-	0.85	-	V
Reverse recovery time	t <sub>rr</sub>	V <sub>R</sub> =400 V, I <sub>F</sub> =5.5A, dI <sub>F</sub> /dt=100 A/μs	-	310	-	ns
Reverse recovery charge	Q <sub>rr</sub>		-	2.8	-	μC
Peak reverse recovery current	I <sub>rrm</sub>		-	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

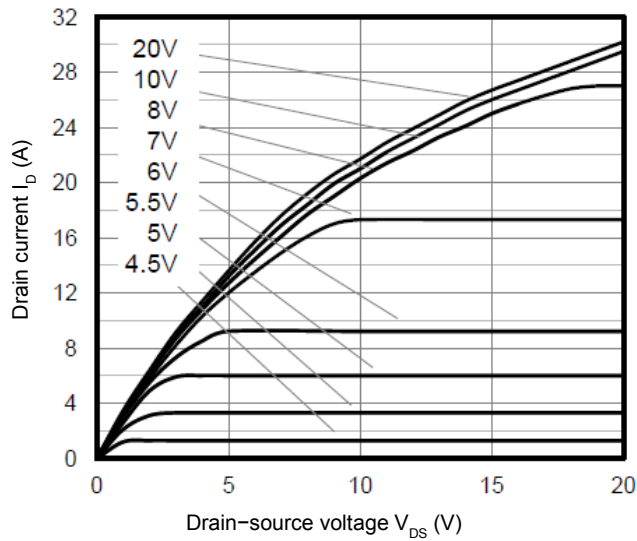


Figure 2. Transfer Characteristics

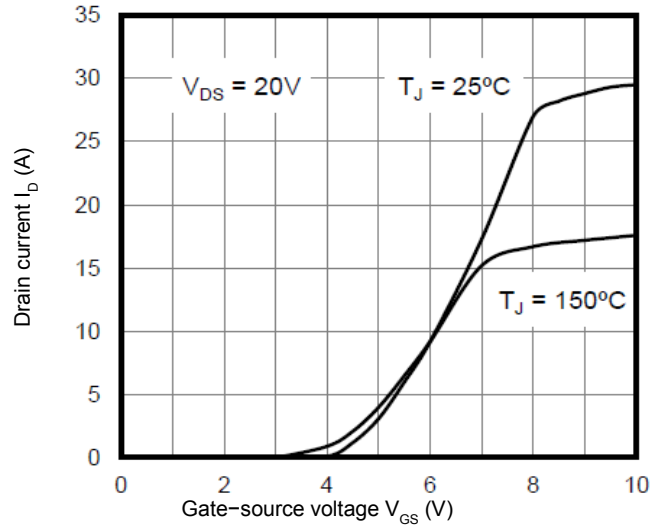


Figure 3. On-Resistance vs. Drain Current

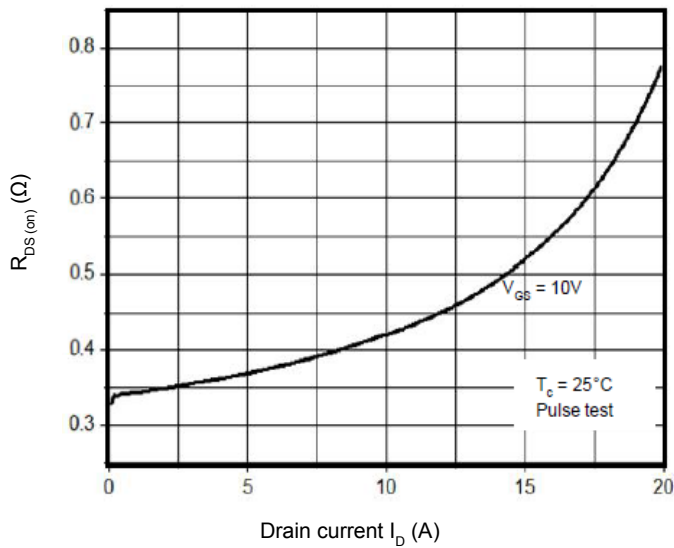


Figure 4. Capacitance Characteristics

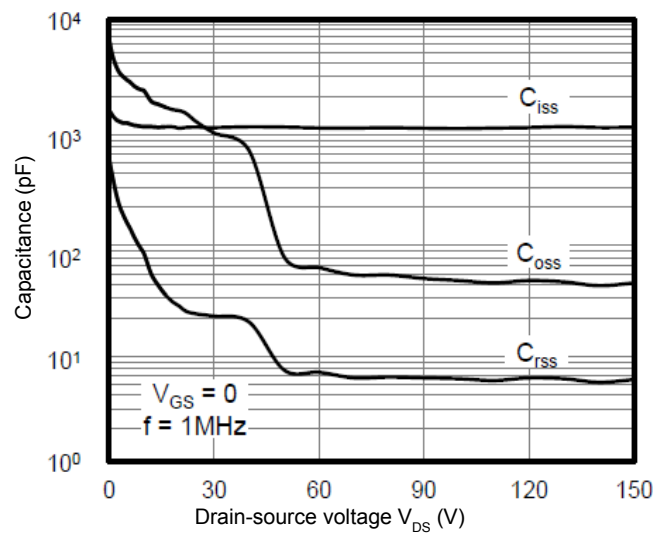


Figure 5. Gate Charge Characteristics

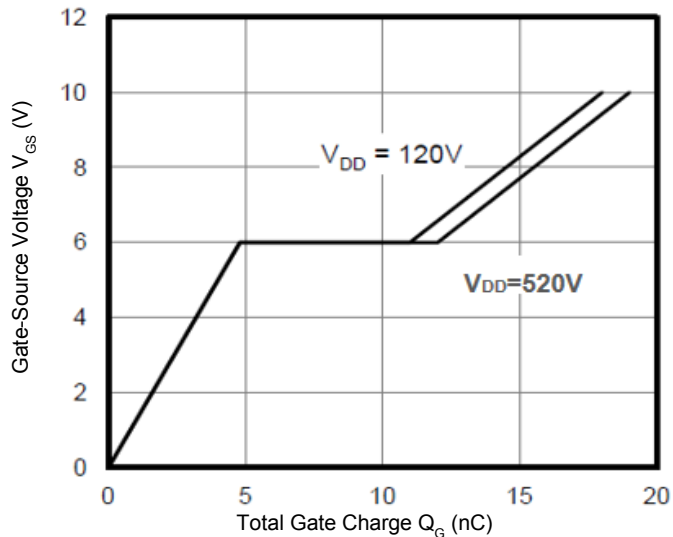


Figure 6. Body Diode Forward Voltage

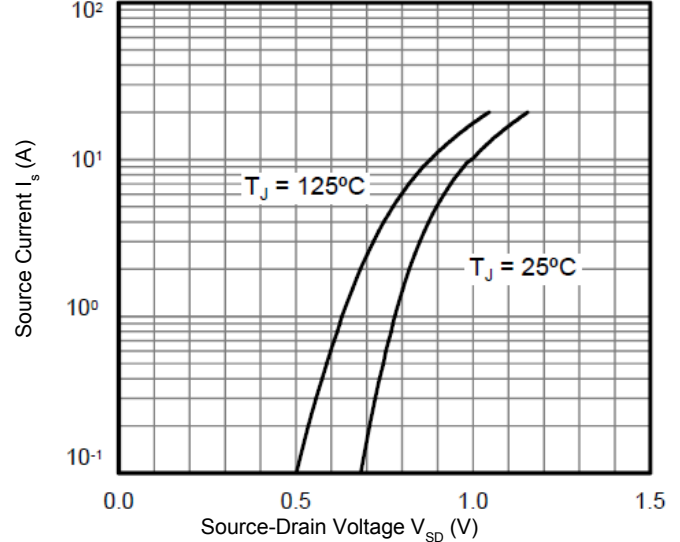


Figure 7. Breakdown Voltage vs. Temperature

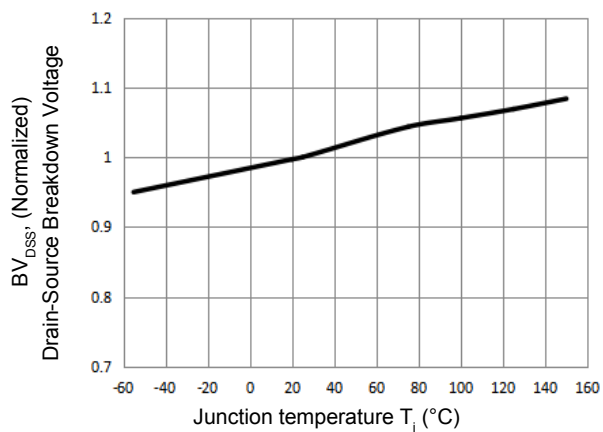


Figure 8. On-Resistance vs. Temperature

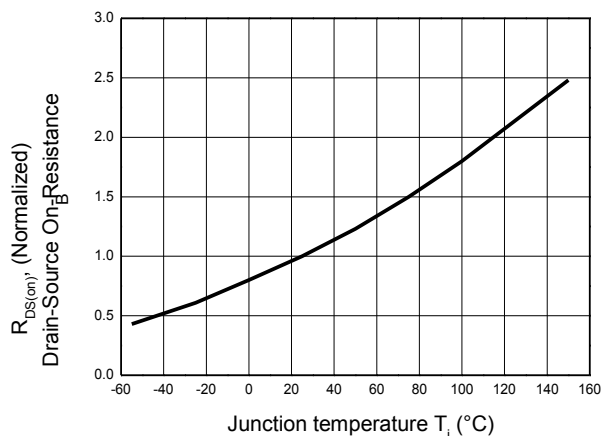


Figure 9. Maximum Safe Operating Area  
DFN8\*8

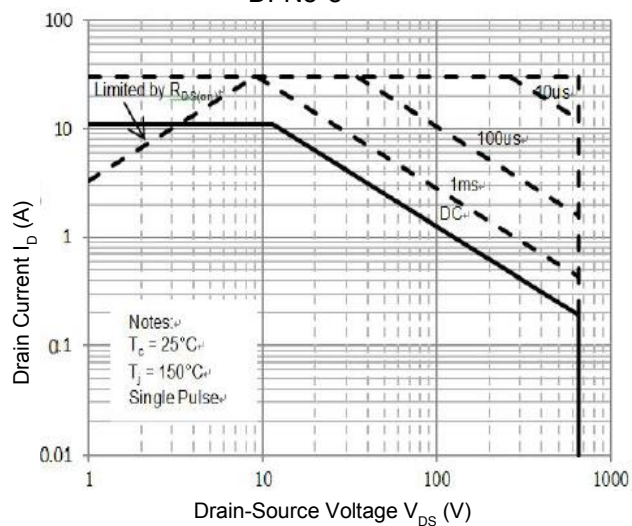
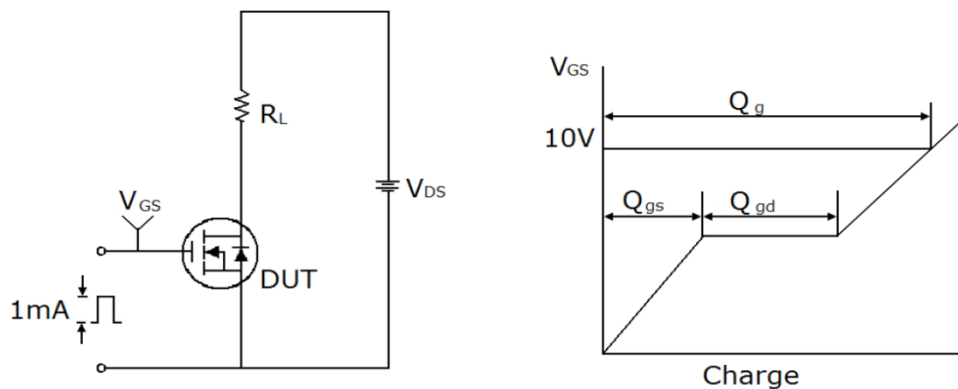


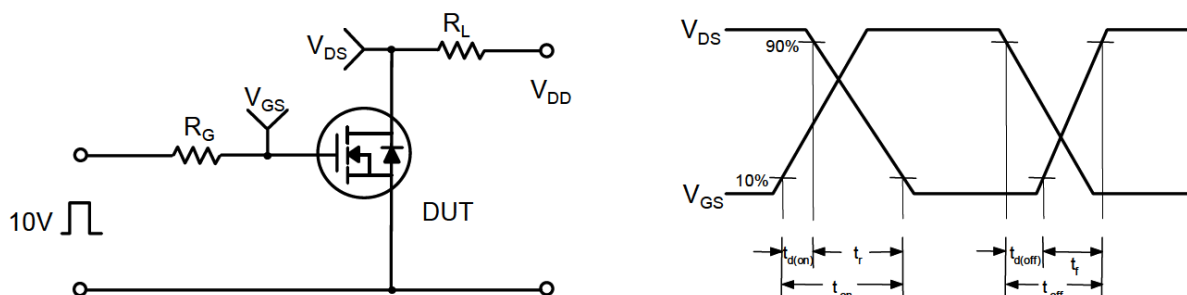
Figure 10. Maximum Safe Operating Area

## Test Circuits

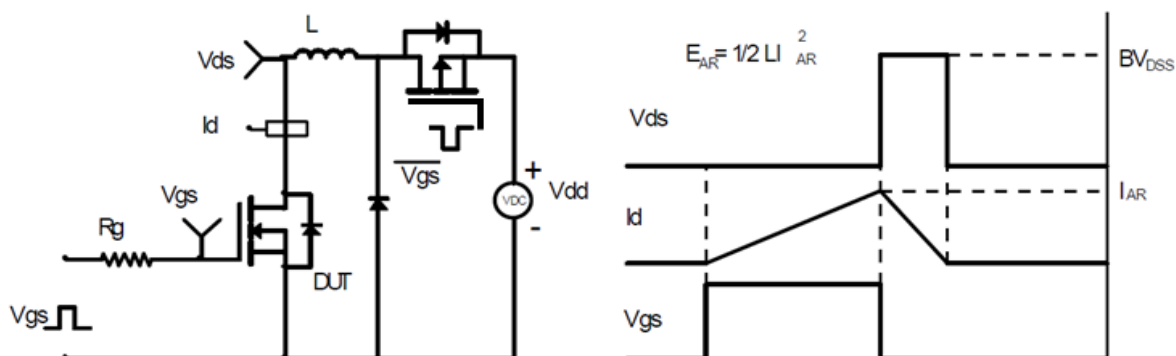
Gate Charge Test Circuit & Waveform



Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



## Mechanical Dimensions for DFN8\*8

