



## HSD80N10-S

100V N-Channel MOSFET

### ● Features:

■ 80A, 100V,  $R_{DS(on)(Typ)} = 7.5m\Omega @ V_{GS}=10V$

■ Low Gate Charge

■ Low  $C_{rSS}$

■ 100% Avalanche Tested

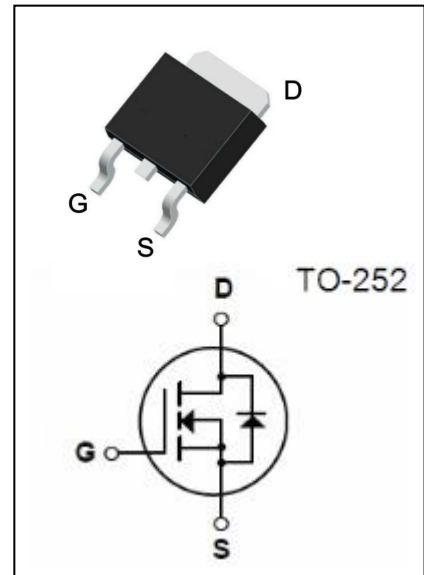
■ Fast Switching

■ Improved dv/dt Capability

### ● Application:

■ High Frequency Switching Mode Power Supply

■ Active Power Factor Correction




### Absolute Maximum Ratings ( $T_c=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$V_{DSS}$	Drain-Source Voltage	100	V
$I_D$	Drain Current - Continuous ( $T_c=25^\circ C$ ) - Continuous ( $T_c=100^\circ C$ )	80*	A
		50.6*	A
$I_{DM}$	Drain Current - Pulsed	320*	A
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulsed Avalanche Energy (Limit Reference Value) (Note5)	245	mJ
$P_D$	Power Dissipation ( $T_c = 25^\circ C$ ) - Derate above $25^\circ C$	109	W
		0.87	W/ $^\circ C$
$T_j$	Operating Junction Temperature	150	$^\circ C$
$T_{stg}$	Storage Temperature Range	-55 to +150	$^\circ C$

### Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case (Note2)	1.15	$^\circ C / W$

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

Symbol	Parameter	Test Conditons	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
BV <sub>DSS</sub>	Drain-source Breakdown Voltage	V <sub>GS</sub> =0V ,I <sub>D</sub> =250μA	100	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSSF</sub>	Gate-Body Leakage Current,Forward	V <sub>GS</sub> =+20V, V <sub>DS</sub> =0V	--	--	100	nA
I <sub>GSSR</sub>	Gate-Body Leakage Current,Reverse	V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V	--	--	-100	nA
<b>On Characteristics</b> (Note3)						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.8	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10 V, I <sub>D</sub> =40A	--	7.5	9.5	mΩ
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5 V, I <sub>D</sub> =40A	--	9.5	15	mΩ
<b>Dynamic Characteristics</b> (Note4)						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1.0MHz	--	3630	--	pF
C <sub>oss</sub>	Output Capacitance		--	408	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	8.6	--	pF
<b>Switching Characteristics</b> (Note4)						
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> = 50 V, I <sub>D</sub> =40 A, R <sub>G</sub> =4.7Ω, V <sub>GS</sub> =10V	--	13	--	ns
t <sub>r</sub>	Turn-On Rise Time		--	29	--	ns
t <sub>d(off)</sub>	Turn-Off Delay Time		--	57	--	ns
t <sub>f</sub>	Turn-Off Fall Time		--	14	--	ns
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =80 V, I <sub>D</sub> =40A, V <sub>GS</sub> = 10 V	--	55	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	15	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	8.2	--	nC
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain-Source Diode Forward Current (Note2)		--	--	80	A
I <sub>SM</sub>	Maximum Pulsed Drain-Source Diode Forward Current		--	--	320	A
V <sub>SD</sub>	Drain-Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =40A (Note3)	--	--	1.4	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =0V, I <sub>S</sub> =12A, d I <sub>F</sub> /dt=100A/μs (Note3)	--	64	--	ns
Q <sub>rr</sub>	Reverse Recovery Charge		--	90	--	nC

Notes:

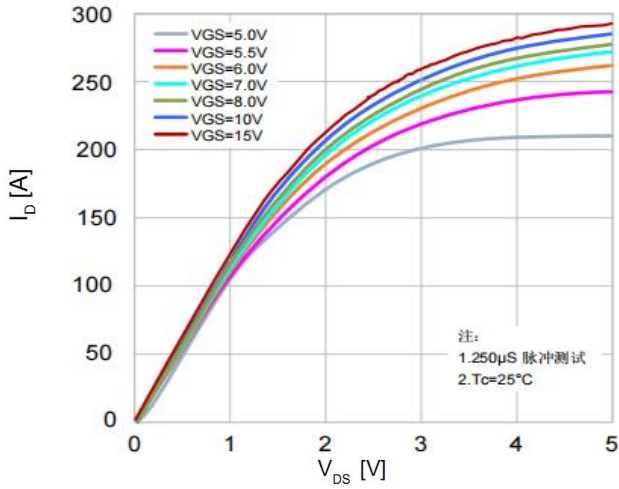
- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、Surface Mounted on FR4 Board, t ≤ 10 sec.
- 3、Pulse Test : Pulse Width ≤300 μ s, Duty Cycle≤2%.
- 4、Guaranteed by design, not subject to production.
- 5、EAS condition: L = 0.5mH, I<sub>AS</sub> =24A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25 Ω, Starting T<sub>J</sub> = 25°C.



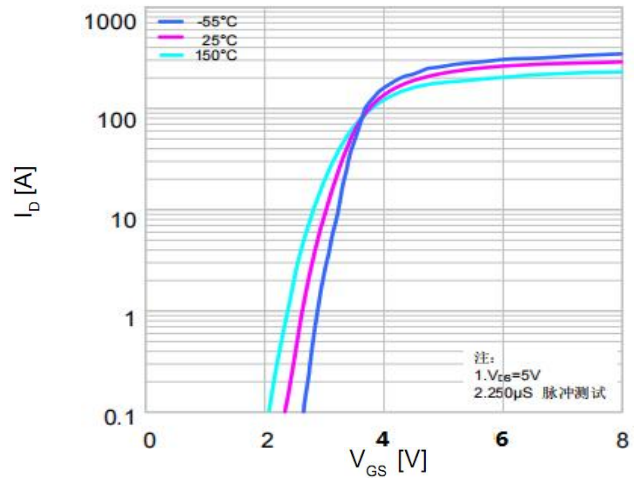
# HSD80N10-S

## 100V N-Channel MOSFET

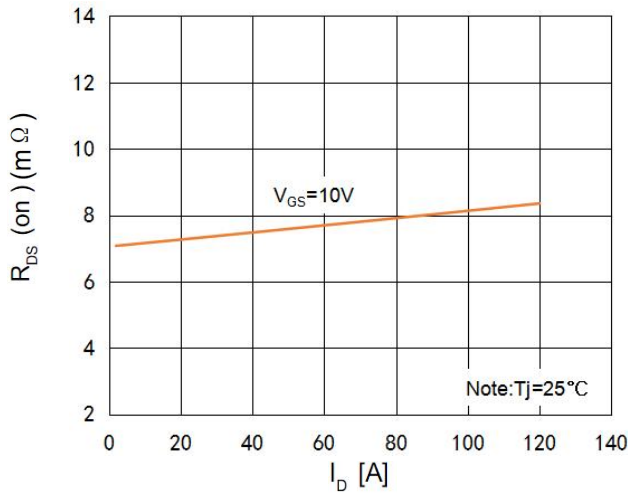
### On-Regin Characteristics



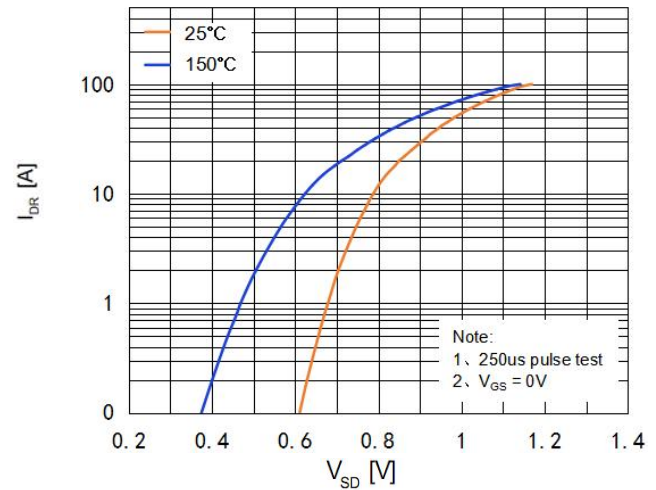
### Transfer Characteristics



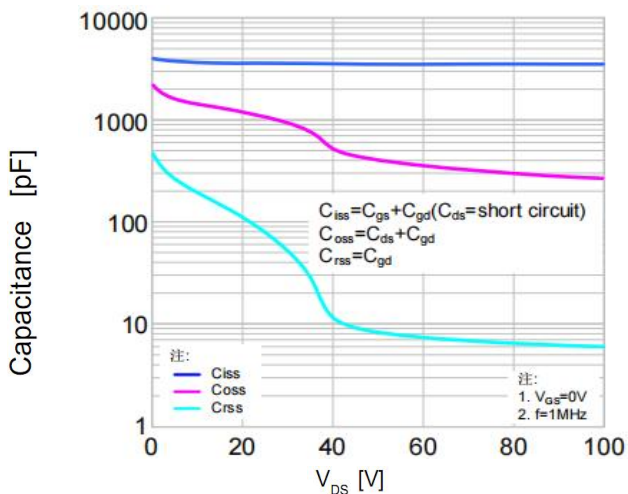
### On-Resistance Variation vs. Drain Current and Gate Voltage



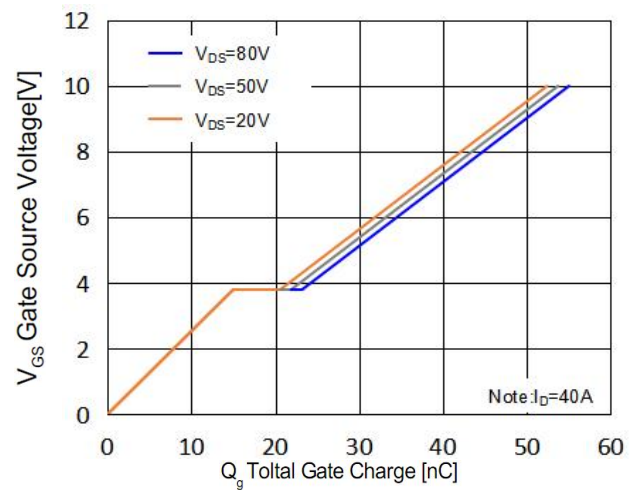
### Body Diode Forward Voltage Variation vs. Source Current and Temperature



### Capacitance Characteristics



### Gate Charge Characteristics

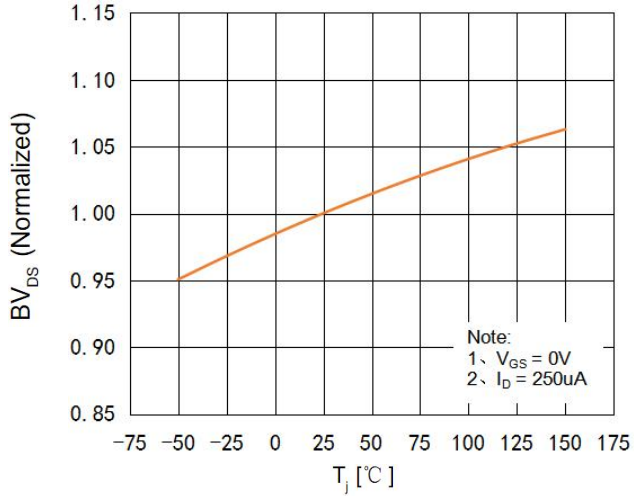




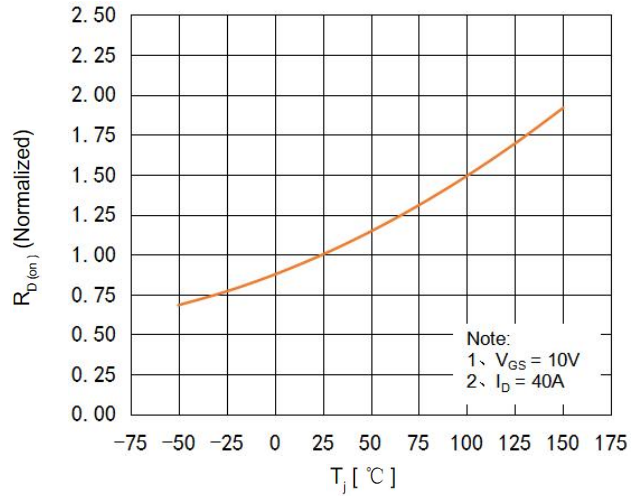
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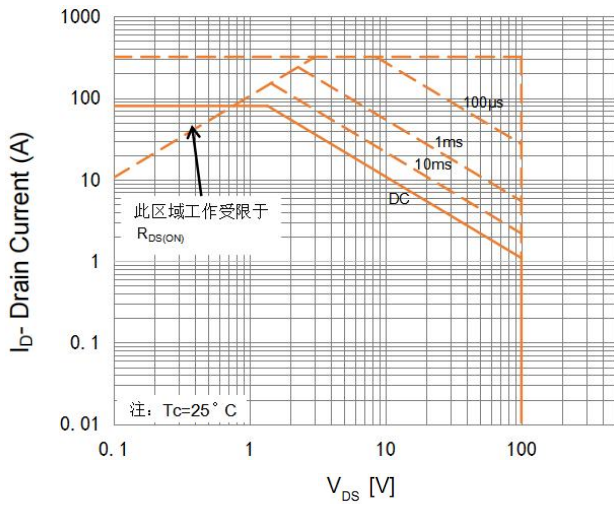
### Breakdown Voltage Variation vs. Temperature



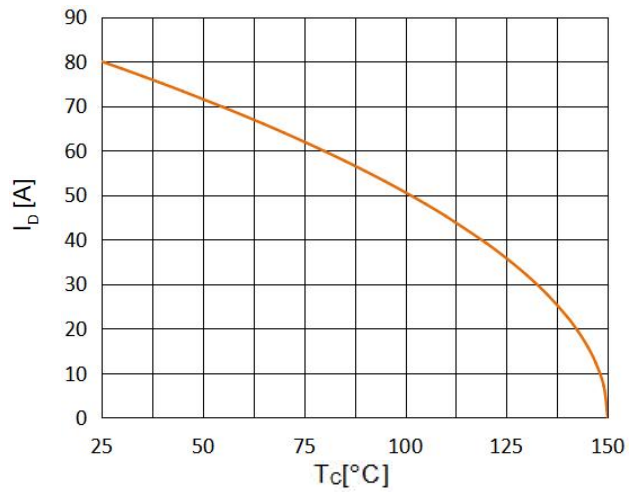
### On-Resistance Variation vs. Temperature



### Maximum Safe Operating Area



### Maximum Drain Current Vs. Case Temperature





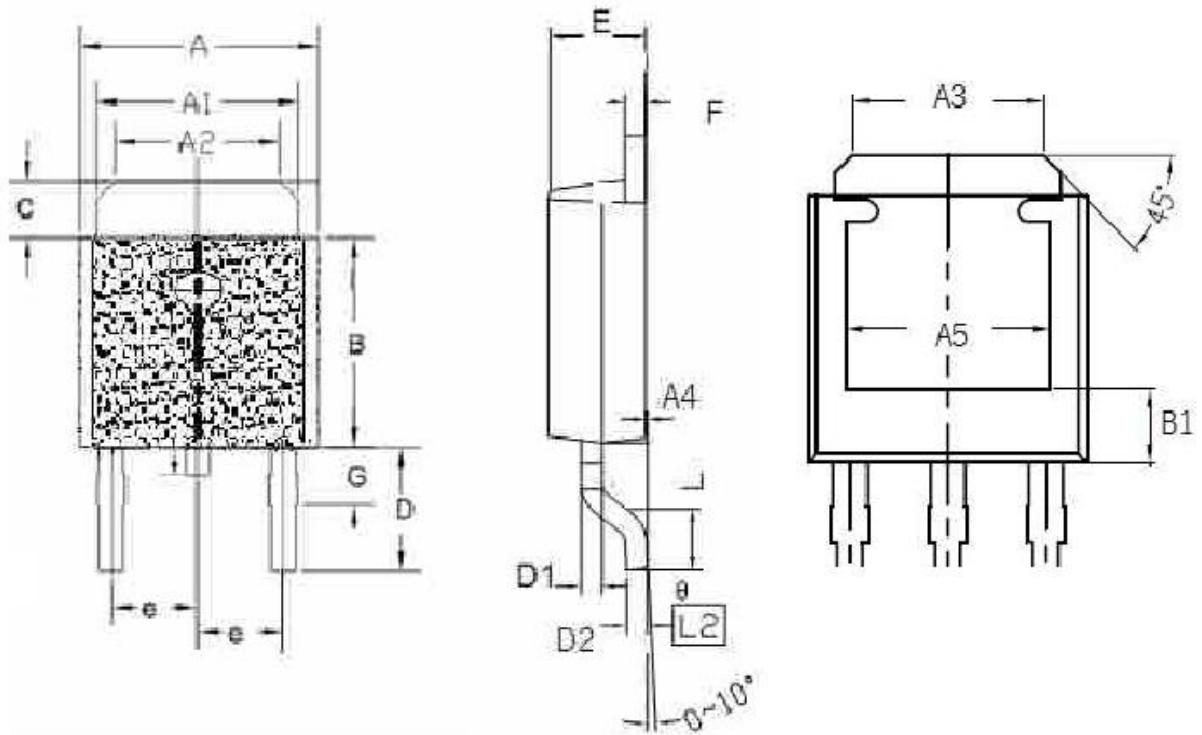
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## TO-252 Package Dimensions

UNIT: mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	6.40		6.60	D	2.90		3.10
A1	5.20		5.40	D1	0.45		0.55
A2	4.40		4.60	D2	0.45		0.55
A3	4.40		4.60	e		2.30	
A4	0		0.15	E	2.20		2.40
A5	4.65		4.95	F	0.45		0.55
B	5.90		6.20	G		1.70	
B1	1.57		1.77	L	1.40		1.60
C	0.90		0.96	$\theta$ (度)	0		10.00





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### 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	2023-3-28	首次发行