TM30EH02DF

N+N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

V_{DS} = 20V I_D =30A

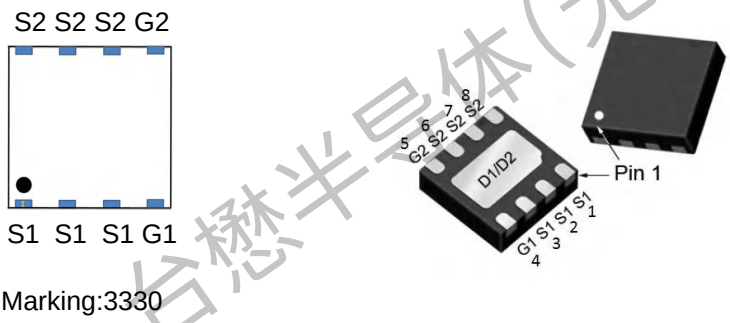
$R_{DS(ON)}$ =5.8mΩ(Typ.) @ V_{GS}=4.5V

ESD protection >2000V

100% UIS Tested
100% R_g Tested

Green Product

DF:DFN3x3-8L



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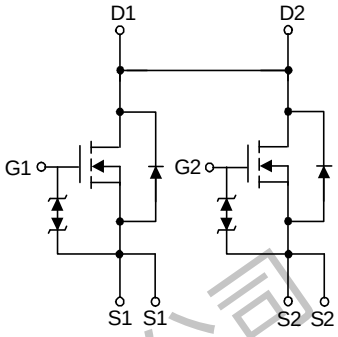

Absolute Maximum Ratings (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	±12	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 4.5V	30	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 4.5V	18	A
I_{DM}	Pulsed Drain Current	111	A
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	---	38	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case	---	3.6	℃/W

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Electrical Characteristics(T_J=25℃ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
STATIC CHARACTERICTISCS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =19V,V_{GS} = 0V			1	uA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V, V_{DS} = 0V			±7	uA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.5	0.7	0.9	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =4.5V, I_D =8.0A		5.8	6.7	mΩ
		V_{GS} =2.5V, I_D =6.0A		6.8	9.5	mΩ
Forward tranconductance	g_{FS}	V_{DS} =5V, I_D =4A		10		S
Diode forward voltage	V_{SD}	I_S=1.50A, V_{GS} = 0V			1.0	V
DYNAMIC CHARACTERICTISCS						
Input Capacitance	C_{iss}	V_{DS} =10V,V_{GS} =0V,f =1MHz		1827		pF
Output Capacitance	C_{oss}			241.5		pF
Reverse Transfer Capacitance	C_{rss}			225.4		pF
SWITCHING CHARACTERICTISCS						
Turn-on delay time	$t_{d(on)}$	V_{GS}=4.5V, V_{DS} =10V, I_D=6A R_{GEN}=3Ω		6.4		ns
Turn-on rise time	t_r			24.5		ns
Turn-off delay time	$t_{d(off)}$			260.4		ns
Turn-off fall time	t_f			143		ns
Total Gate Charge	Q_g	V_{DS} =10V,V_{GS} =4.5V,I_D=6A		25.2		nC
Gate-Source Charge	Q_{gs}			2.24		nC
Gate-Drain Charge	Q_{gd}			9.1		nC

Typical Characteristics

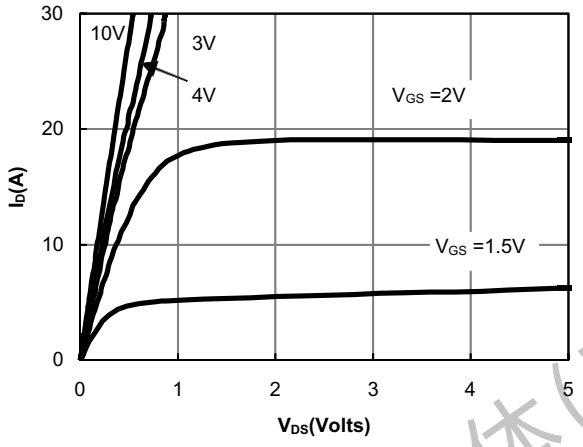

Figure 1: On-Regions Characteristi CS

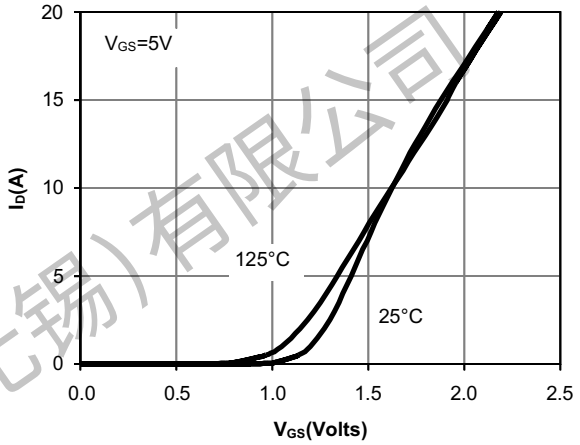

Figure 2: Transfer Characteristics

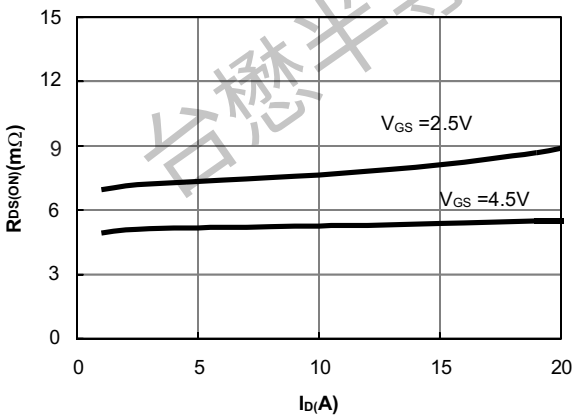

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

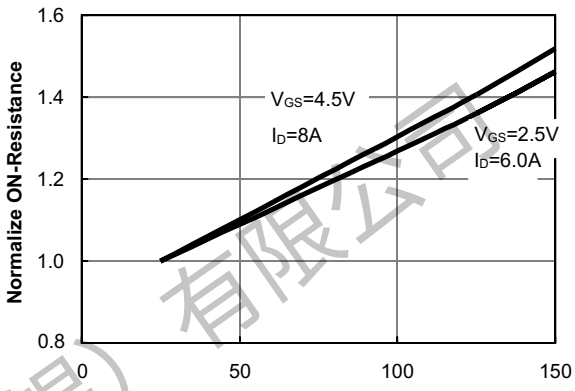

Figure 4: On-Resistance vs. Junction Temperature

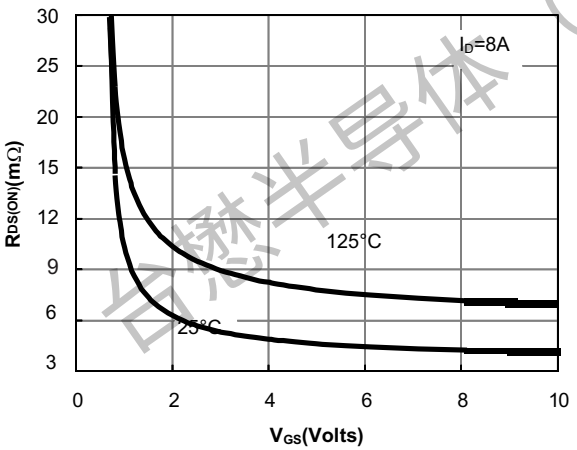

Figure 5: On-Resistance vs. Gate-Source Voltage

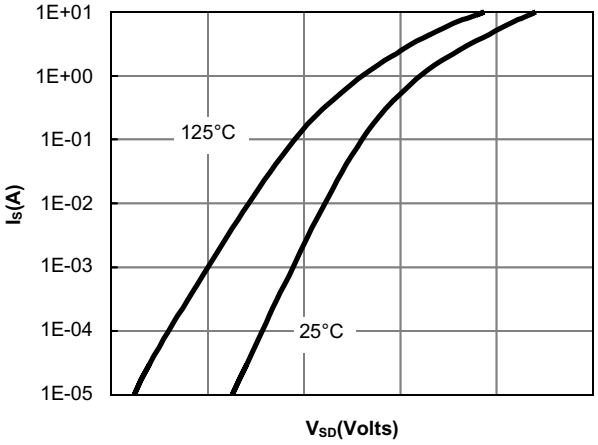

Figure 6: Body-Diode Characteristics

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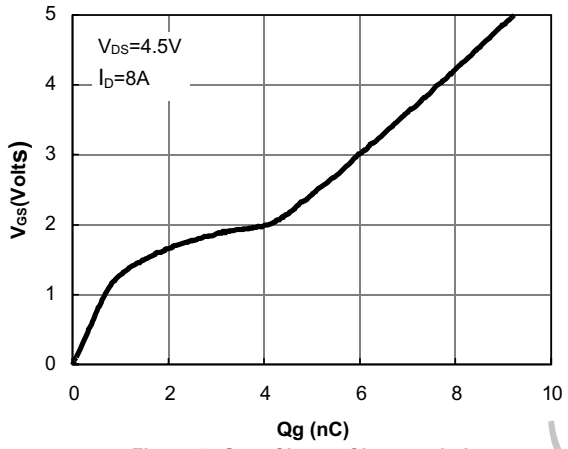


Figure 7: Gate-Charge Characteristics

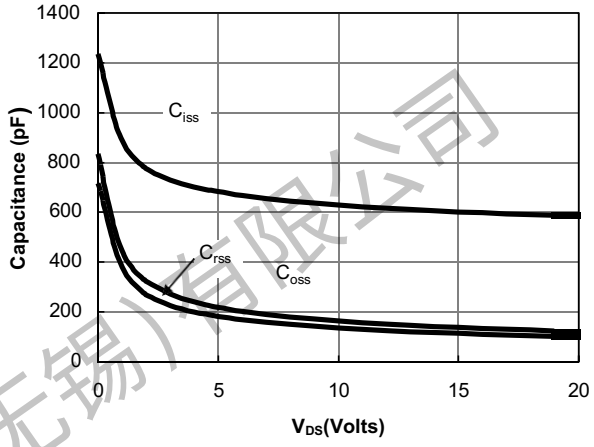


Figure 8: Capacitance Characteristics

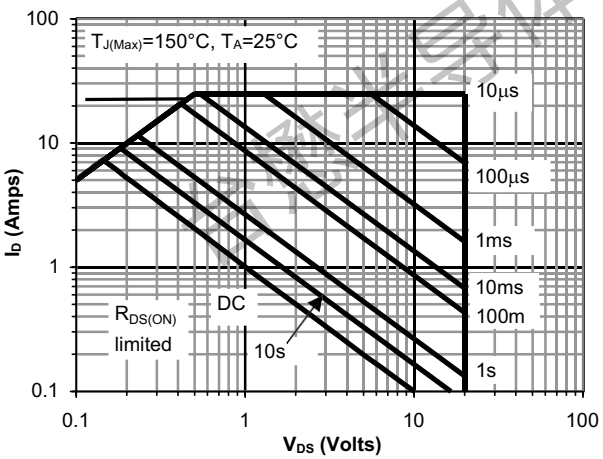


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

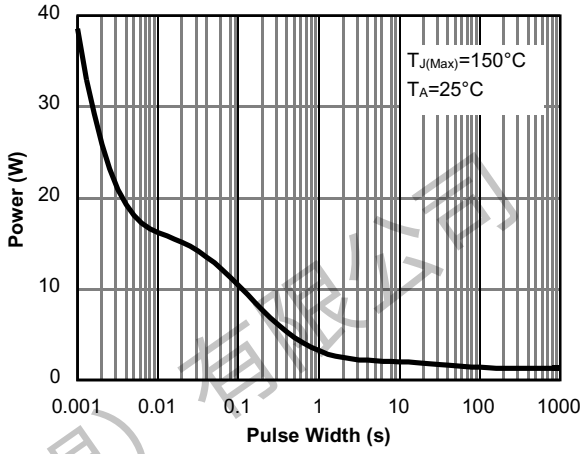


Figure 10: Single Pulse Power Rating Junction-to-

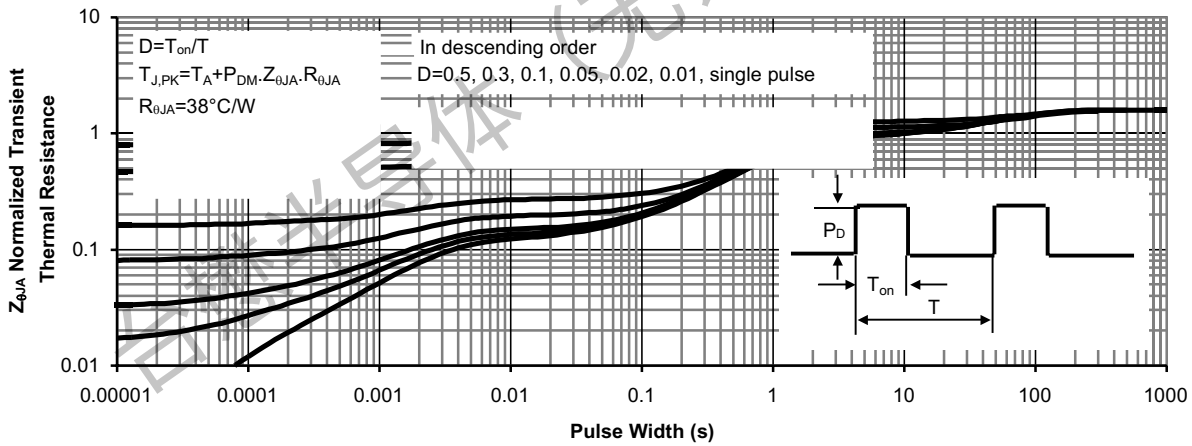
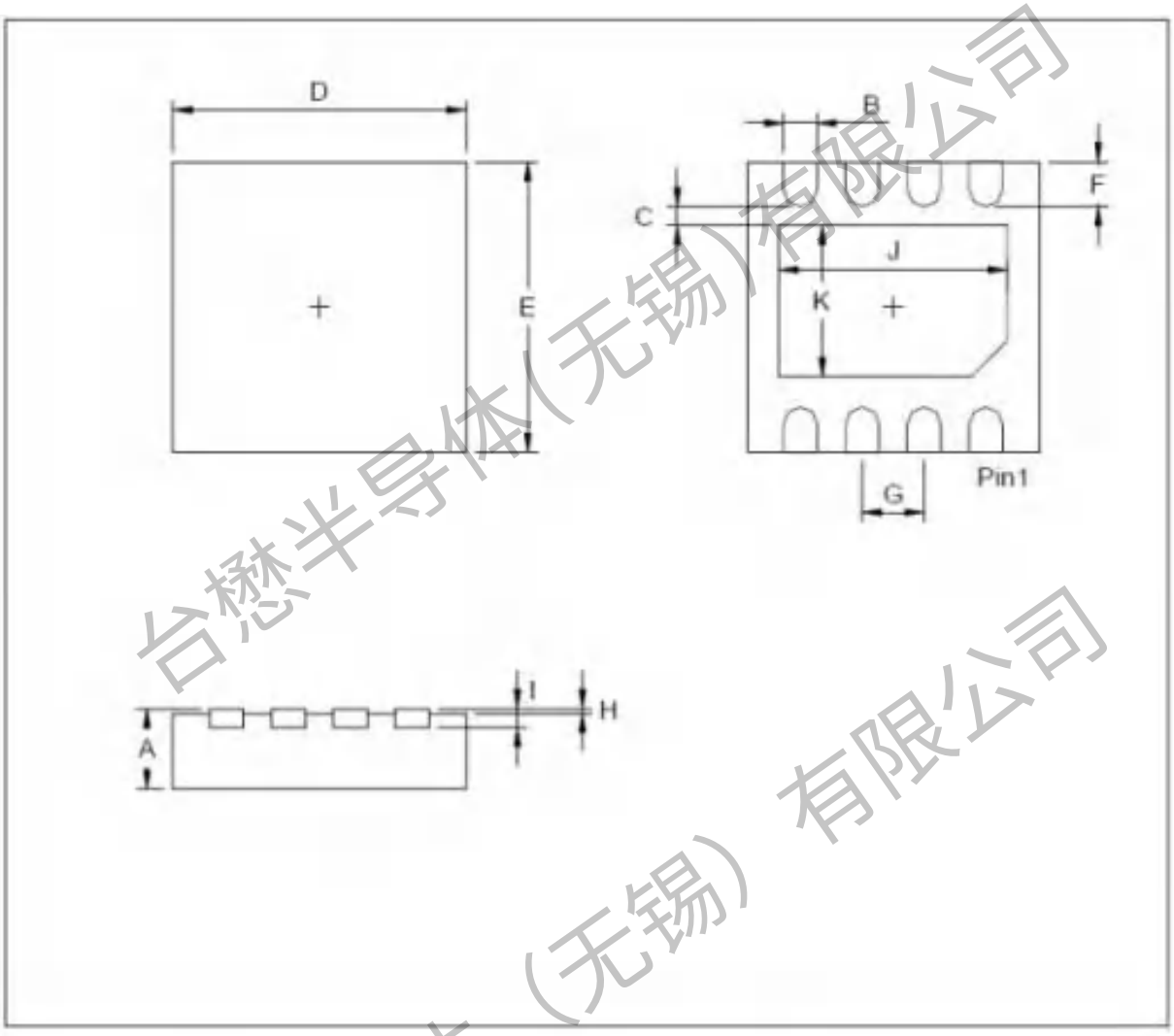


Figure 11: Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:DFN3x3-8L



Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	0.7		0.8	I		0.203	
B	0.25		0.35	J	2.2		2.4
C	0.2			K	1.4		1.6
D	2.924		3.076				
E	2.924		3.076				
F	0.324		0.476				
G		0.65					
H	0		0.05				

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Revision history:

Date	Rev	Description	Page
2023.08.30	23.08	Original	