

TM80N03DF

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

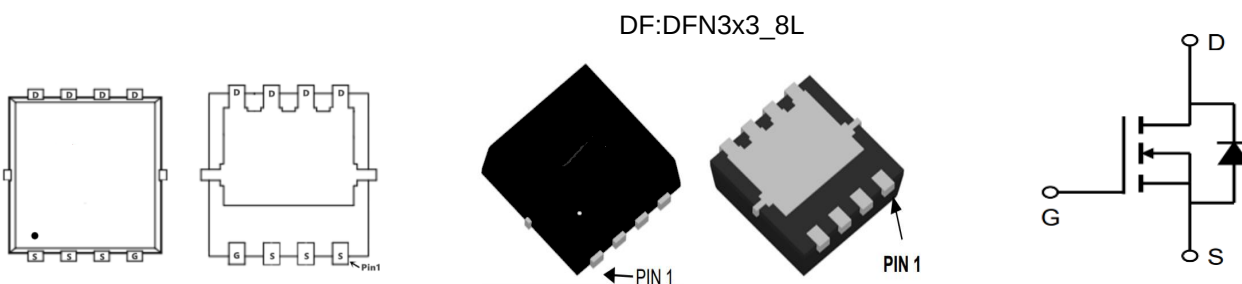
General Features

$V_{DS} = 30V$ $I_D = 80A$

$R_{DS(ON)} = 4.0m\Omega (typ.) @ V_{GS}=10V$

100% UIS Tested

100% R_g Tested



Marking: 005

Absolute Maximum Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current-Continuous ($TC=25^\circ C$)	80	A
	Continuous Drain Current- $TC=100^\circ C$	53	
I_{DM}	Drain Current – Pulsed ¹	330	A
E_{AS}	Single Pulse Avalanche Energy	240	mJ
P_D	Power Dissipation ($TC=25^\circ C$)	45	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Data

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ³	62.5	



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Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V,I _D =250 μ A	30	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{GS} =0V, V _{DS} =24V, T _J =25℃	---	---	10	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.5	3	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =10V,I _D =30A	---	4.0	5.1	m Ω
		V _{GS} =4.5V,I _D =20A	---	5.2	7	
G _{FS}	Forward Transconductance	V _{DS} =5V, I _D =6A	---	13	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	1750	2350	pF
C _{oss}	Output Capacitance		---	320	---	
C _{rss}	Reverse Transfer Capacitance		---	240	---	
R _g	Gate Resistance	f=1MHz	---	0.9	---	Ω
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =15V , V _{GS} =10V , R _G =3.3 Ω ,I _D =15A	---	13	---	ns
t _r	Rise Time		---	36	---	ns
t _{d(off)}	Turn-Off Delay Time		---	43	---	ns
t _f	Fall Time		---	16	---	ns
Q _g	Total Gate Charge	V _{DS} =24V , V _{GS} =10V , I _D =20A	---	42	---	nC
Q _{gs}	Gate-Source Charge		---	3.9	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	14	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ²	V _{GS} =0V , I _S =30A , T _J =25℃	---	---	1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} =0V,I _S =10A , di/dt=100A	---	16	---	nS
Q _{rr}	Reverse Recovery Charge		---	5	---	nC

Notes:

1. Pulse width limited by max. junction temperature
2. Pulse test
3. Surface mounted on 1 in² copper pad of FR4 board

Typical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

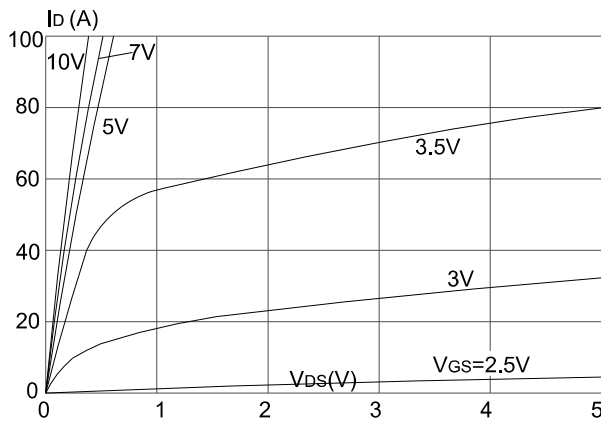


Figure1: Output Characteristics

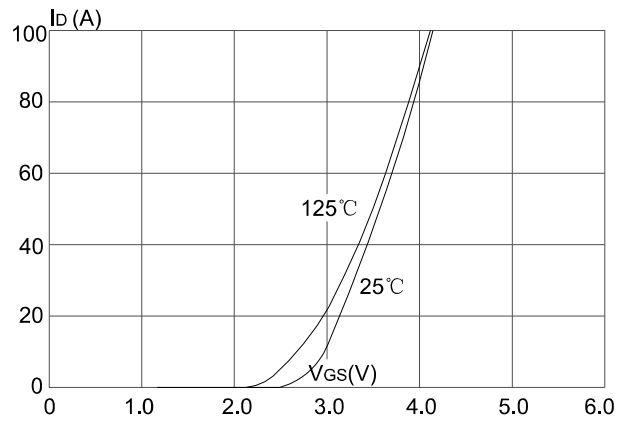


Figure 2: Typical Transfer Characteristics

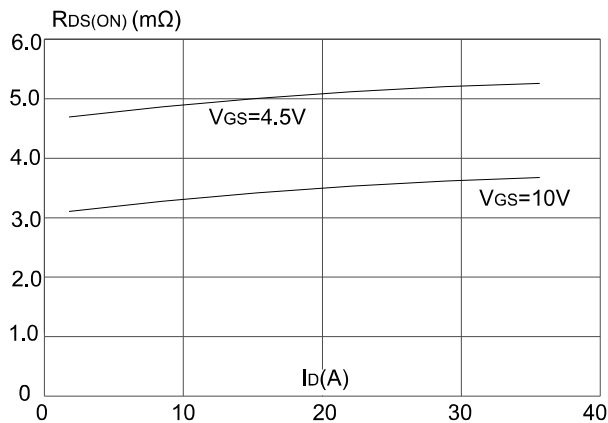


Figure 3: On-resistance vs Drain Current

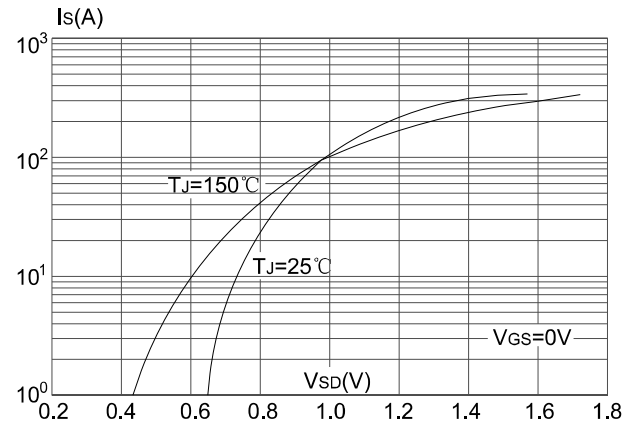


Figure 4: Body Diode Characteristics

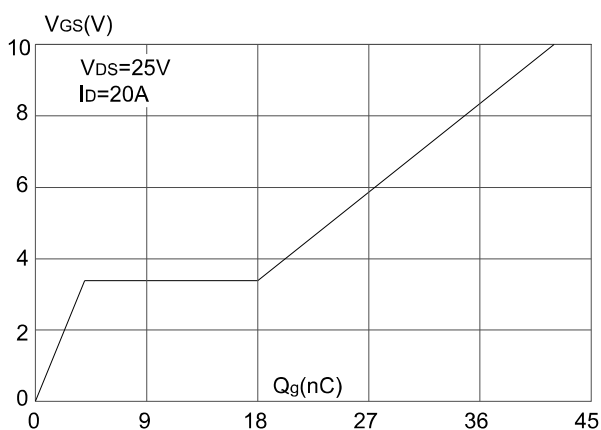


Figure 5: Gate Charge Characteristics

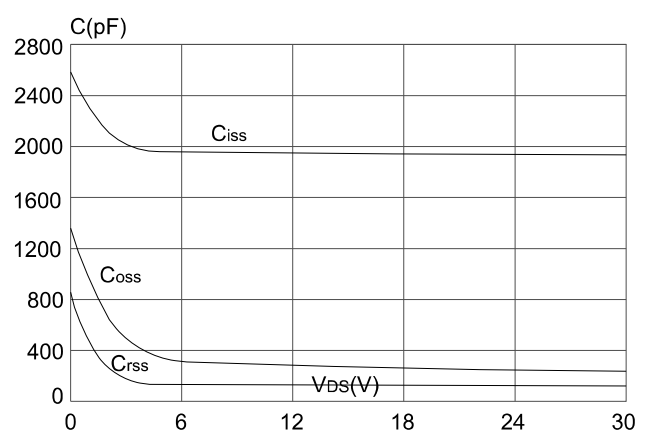


Figure 6: Capacitance Characteristics

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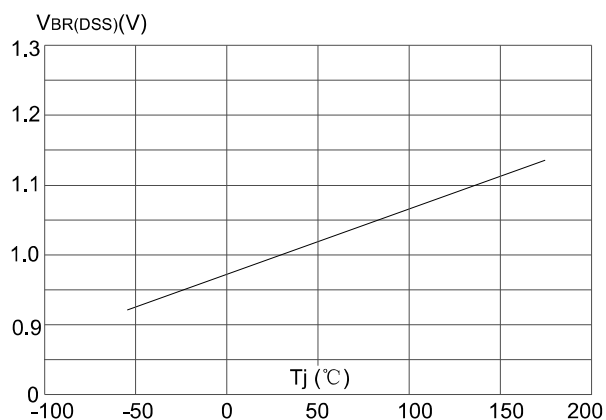


Figure 7: Normalized Breakdown Voltage vs.

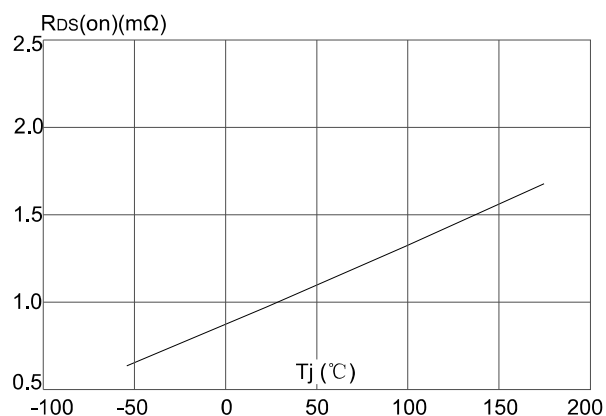


Figure 8: Normalized on Resistance vs.

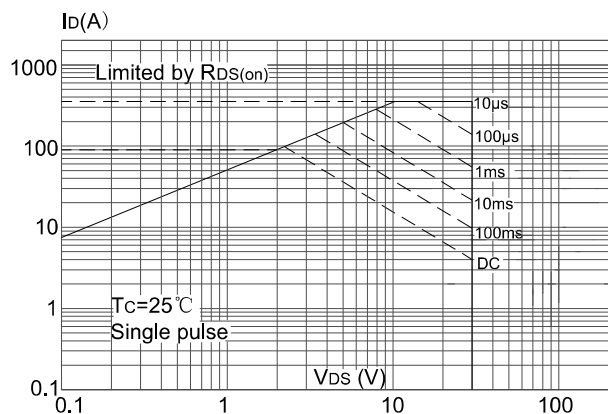


Figure 9: Maximum Safe Operating Area

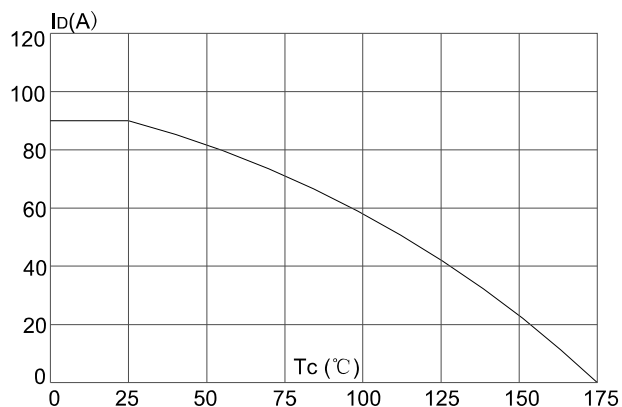


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

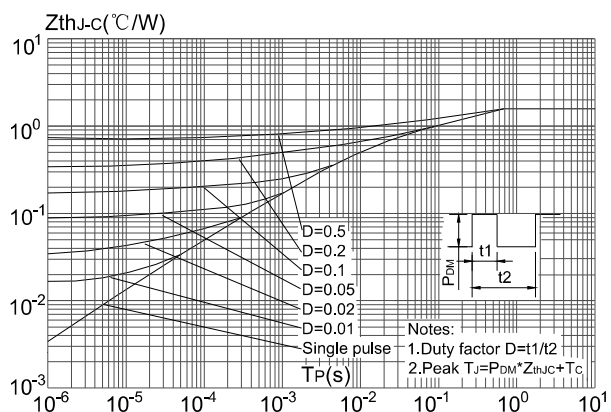
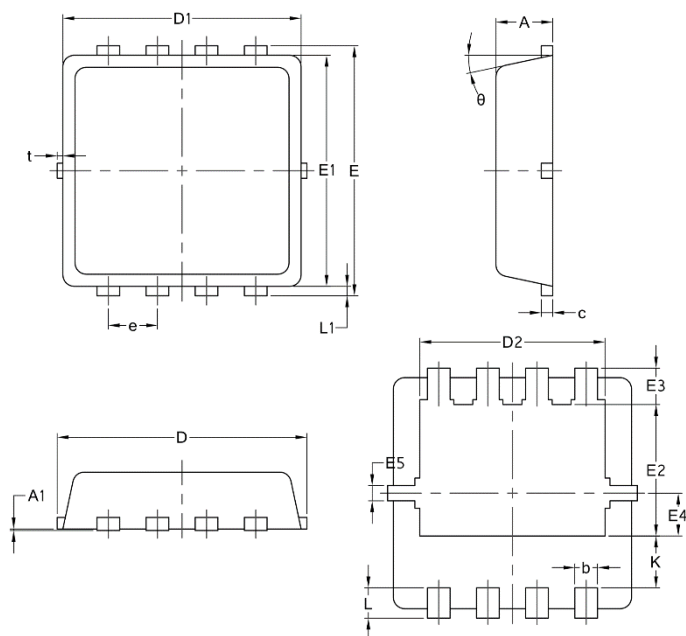


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Mechanical Data:DFN3x3-8L



Symbol	Common		
	mm		
	Mim	Nom	Max
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.20	0.30	0.40
c	0.10	0.152	0.25
D	3.15	3.30	3.45
D1	3.00	3.15	3.25
D2	2.29	2.45	2.65
E	3.15	3.30	3.45
E1	2.90	3.05	3.20
E2	1.54	1.74	1.94
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.59	0.69	0.89
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
t	0	0.075	0.13
Φ	10	12	14