

TMN10010DF

N -Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

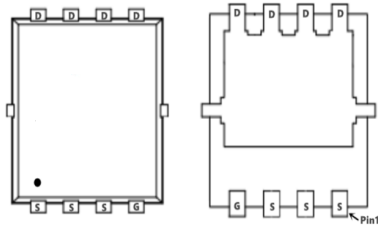
General Features

$V_{DS} = 100V$ $I_D = 10A$

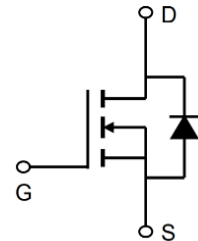
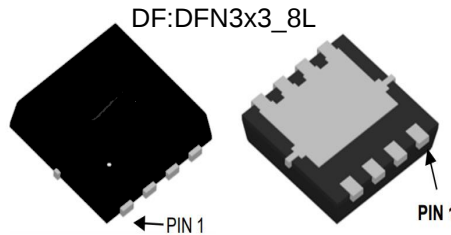
$R_{DS(ON)} = 95m\Omega (typ.) @ V_{GS} = 10V$

100% UIS Tested

100% R_g Tested



Marking:10N10



Absolute Maximum Ratings ($T_A = 25^\circ C$, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current-Continuous ($TC=25^\circ C$)	10	A
	Continuous Drain Current- $TC=100^\circ C$	3.1	
I_{DM}	Drain Current – Pulsed ¹	20	A
E_{AS}	Single Pulse Avalanche Energy ²	---	mJ
P_D	Power Dissipation ($TC=25^\circ C$)	3.5	W
	Power Dissipation – Derate above $25^\circ C$	2	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	---	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	81	

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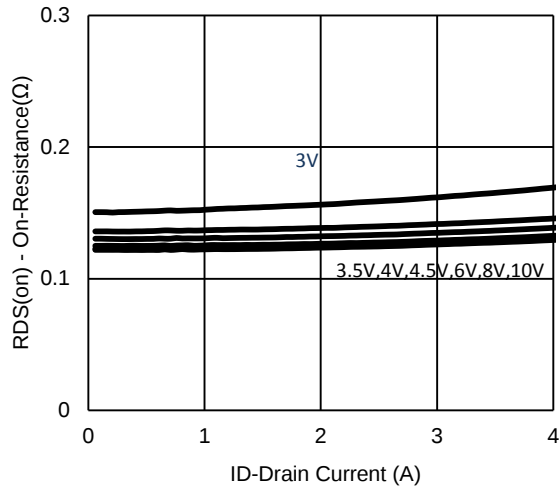
Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	100	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{GS} =0V, V _{DS} =80V, T _J =25 °C	---	---	1	μ A
		V _{GS} =0V, V _{DS} =80V, T _J =55 °C			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	2.5	3.0	V
R _{DS(ON)}	Drain-Source On Resistance ³	V _{GS} =10V, I _D =3.2A	---	95	120	m Ω
		V _{GS} =4.5V, I _D =2.6A	---	120	130	
G _{FS}	Forward Transconductance	V _{DS} =15V, I _D =3.2A	---	8	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	1514	---	pF
C _{oss}	Output Capacitance		---	56	---	
C _{rss}	Reverse Transfer Capacitance		---	54	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time ^{3,4}	V _{DS} = 50 V, R _L = 15.7 Ω, I _D = 3.2 A, V _{GEN} = 10 V, R _{GEN} = 6 Ω	---	7	---	ns
t _r	Rise Time ^{3,4}		---	5	---	ns
t _{d(off)}	Turn-Off Delay Time ^{3,4}		---	31	---	ns
t _f	Fall Time ^{3,4}		---	7	---	ns
Q _g	Total Gate Charge ^{3,4}		---	8.8	---	nC
Q _{gs}	Gate-Source Charge ^{3,4}	V _{DS} =50V , V _{GS} =4.5V , I _D =3.2A	---	3.4	---	nC
Q _{gd}	Gate-Drain “Miller” Charge ^{3,4}		---	2.9	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ²	V _{GS} =0V , I _S =2.3A , T _J =25 °C	---	0.81	---	V

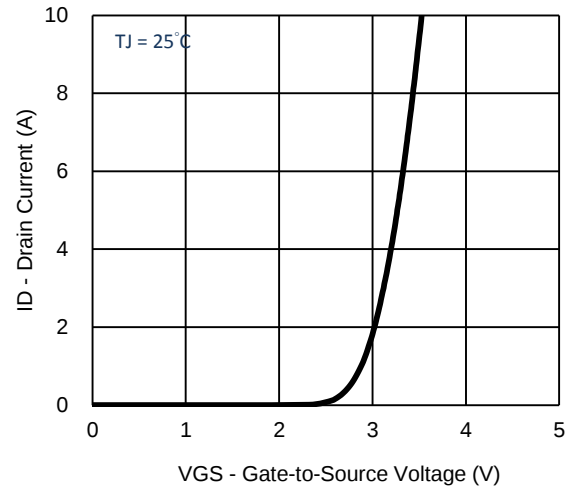
Notes:

- Pulse test: PW $\leq 300\mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

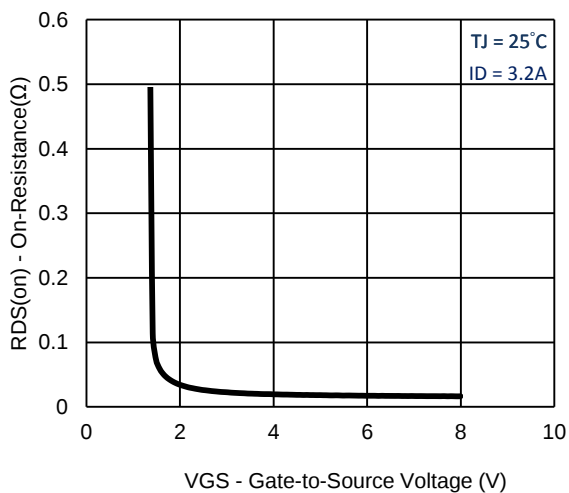
Typical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)



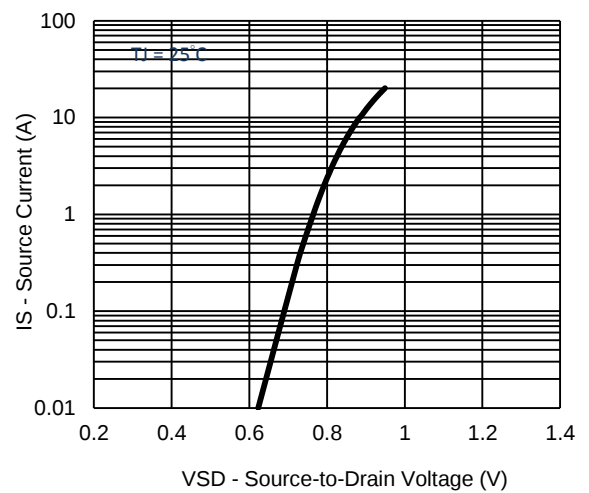
1. On-Resistance vs. Drain Current



2. Transfer Characteristics



3. On-Resistance vs. Gate-to-Source Voltage

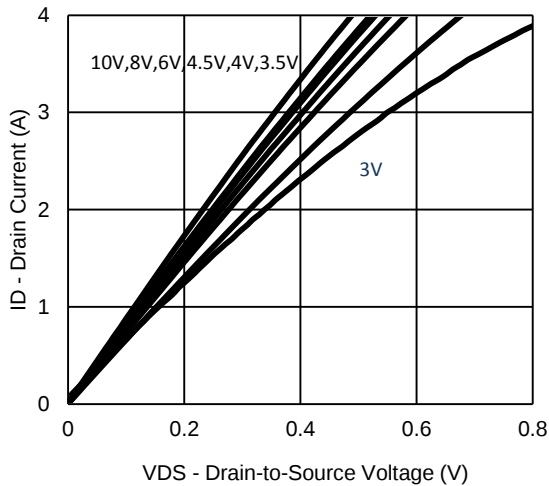


4. Drain-to-Source Forward Voltage

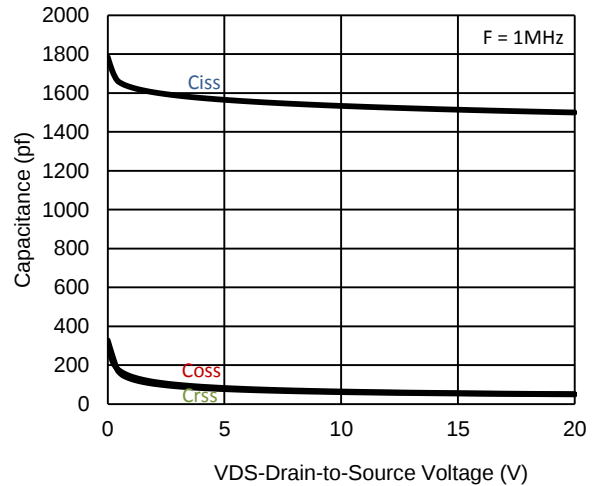


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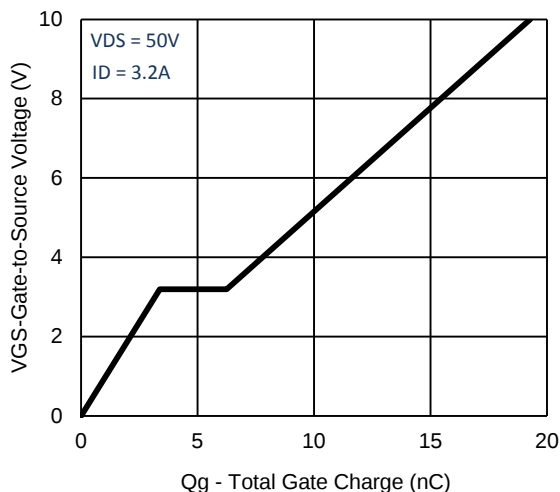
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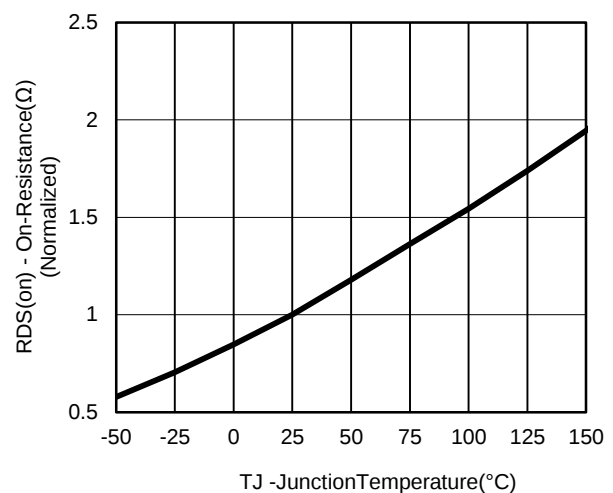
5. Output Characteristics



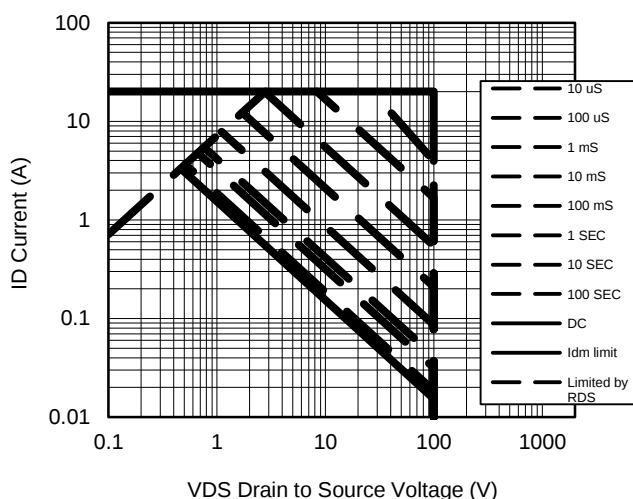
6. Capacitance



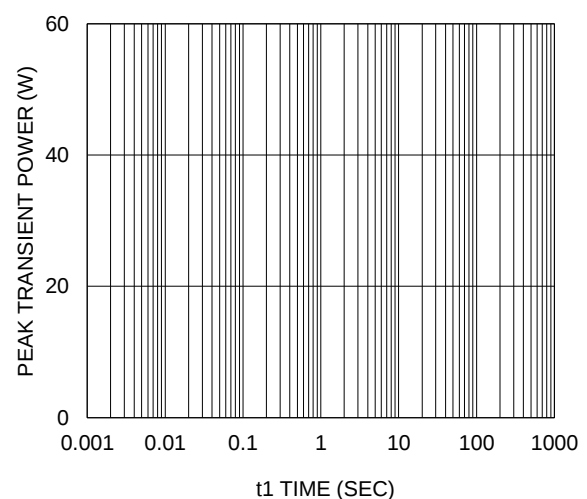
7. Gate Charge



8. Normalized On-Resistance Vs Junction Temperature



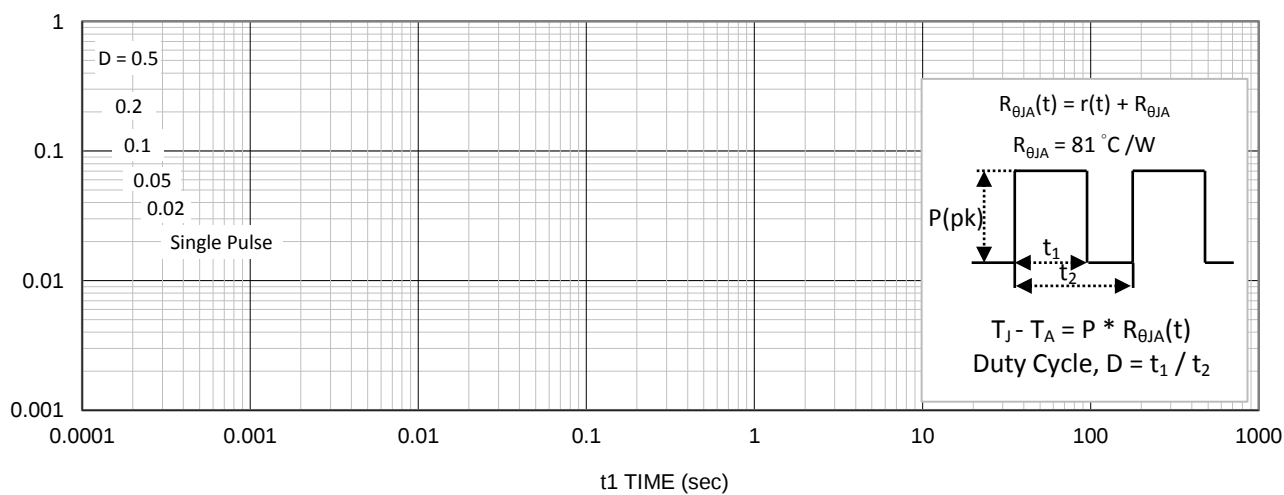
9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation

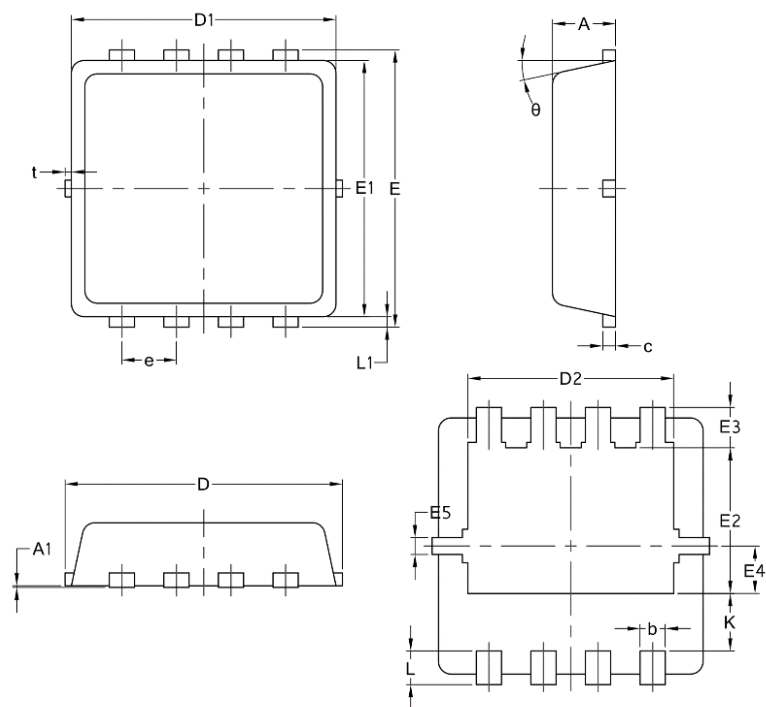
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11. Normalized Thermal Transient Junction to Ambient

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