

TMN10010DF

N-Channel Enhancement Mosfet

General Description

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

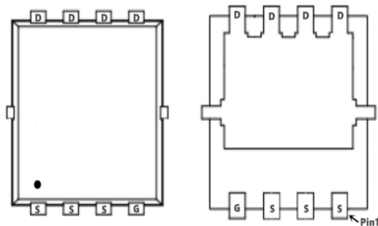
Applications

- Load switch
- PWM

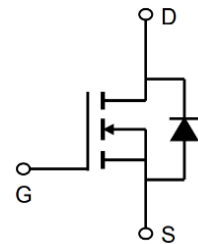
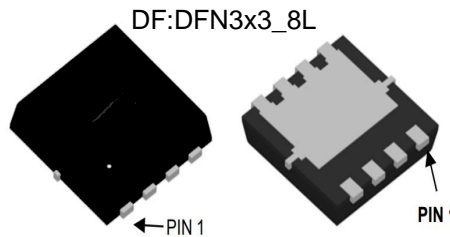
General Features

V_{DS} =100V I_D =10A
 R_{DS(ON)} = 95m Ω (typ.) @ V_{GS} = 10V

100% UIS Tested
 100% R_g Tested



Marking:10N10



Absolute Maximum Ratings (T_A = 25°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°C)	10	A
	Continuous Drain Current-TC=100°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°C)	3.5	W
	Power Dissipation – Derate above 25°C	2	W/°C
T _J , T _{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Thermal Characteristics:

Symbol	Parameter	Max	Units
R _{θJC}	Thermal Resistance, Junction to Case	---	°C/W
R _{θJA}	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	$V_{GS}=0V, I_D=250\ \mu A$	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{GS}=0V, V_{DS}=80V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{GS}=0V, V_{DS}=80V, T_J=55^\circ\text{C}$			10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu A$	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	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	1514	---	pF
C_{oss}	Output Capacitance		---	56	---	
C_{rss}	Reverse Transfer Capacitance		---	54	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time ^{3,4}	$V_{DS} = 50V, R_L = 15.7\ \Omega,$ $I_D = 3.2A,$ $V_{GEN} = 10V, R_{GEN} = 6\ \Omega$	---	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	$V_{GS}=0V, I_S=2.3A, T_J=25^\circ\text{C}$	---	0.81	---	V

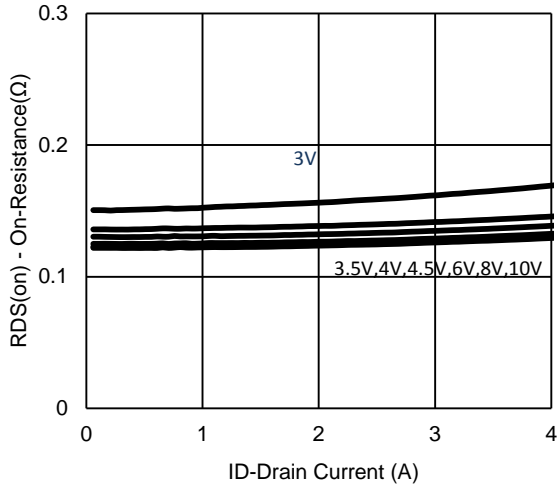
Notes:

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

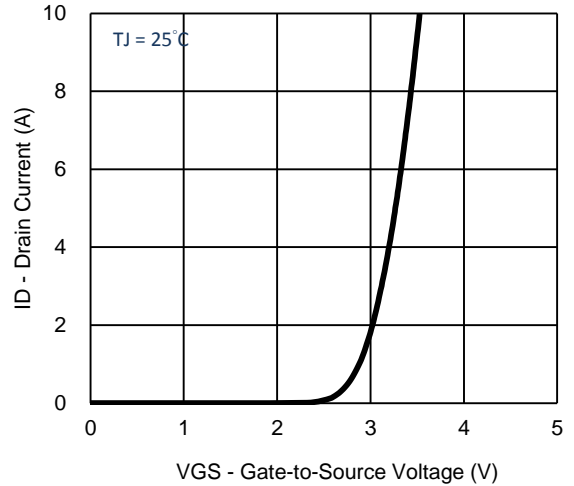
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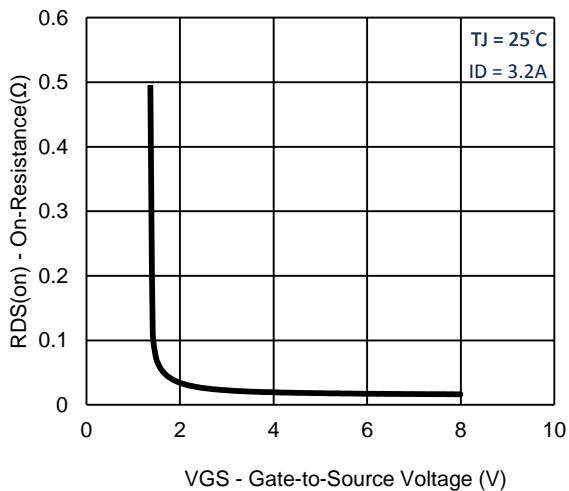
Typical Characteristics: ($T_c=25^\circ\text{C}$ unless otherwise noted)



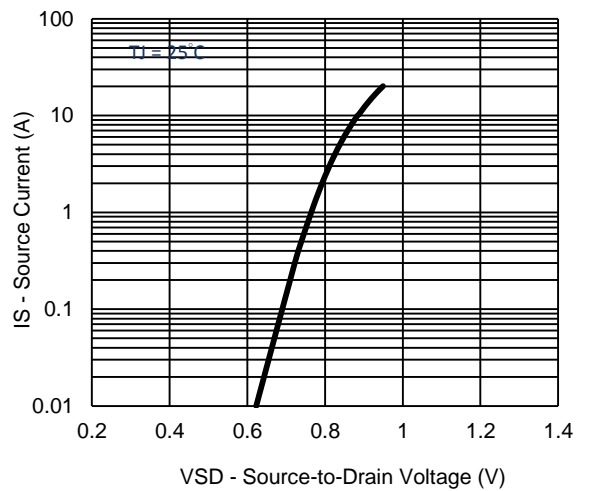
1. On-Resistance vs. Drain Current



2. Transfer Characteristics



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

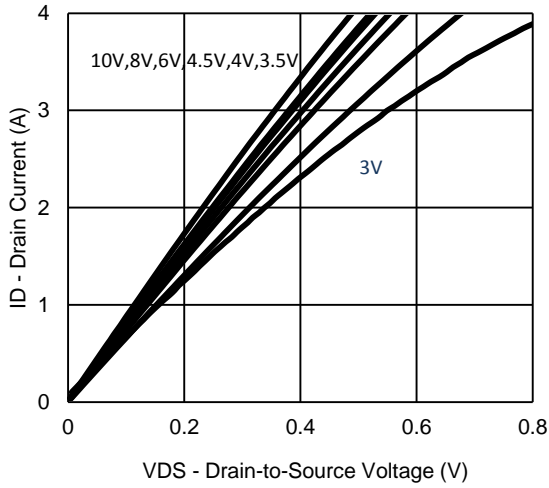


4. Drain-to-Source Forward Voltage

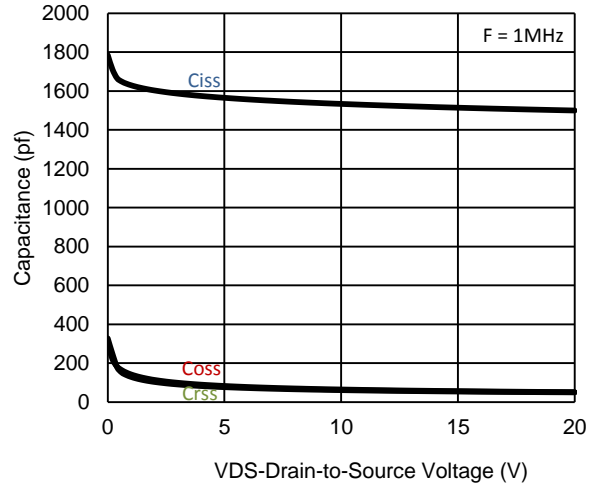


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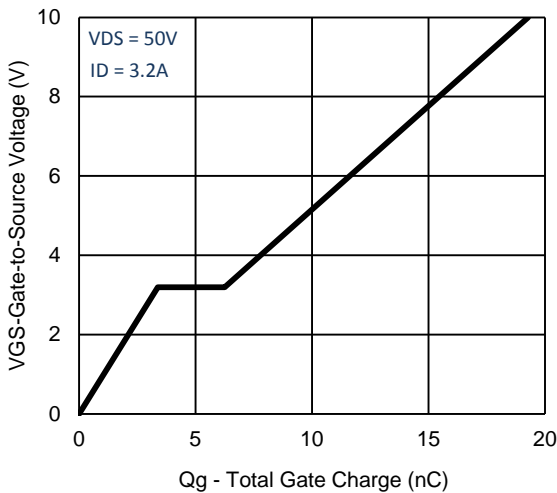
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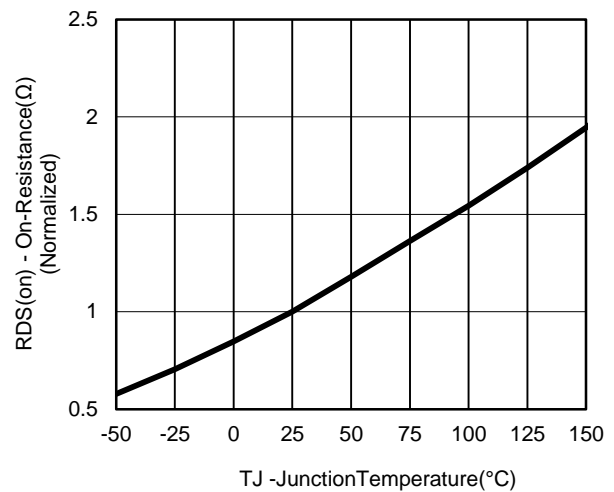
5. Output Characteristics



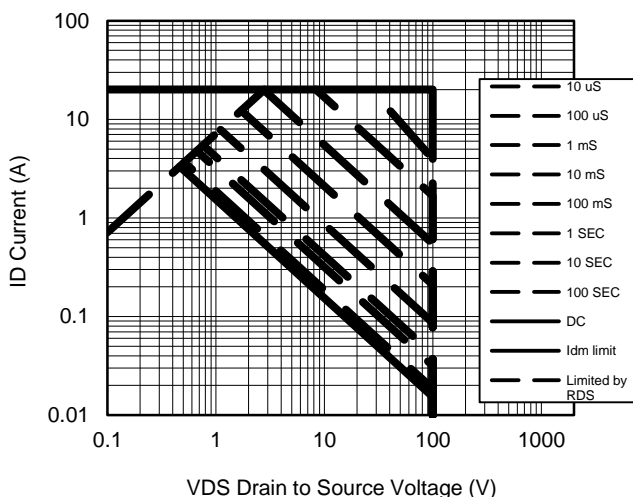
6. Capacitance



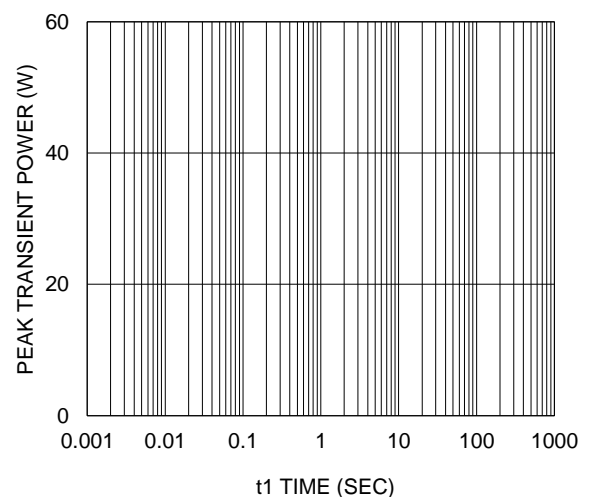
7. Gate Charge



8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area

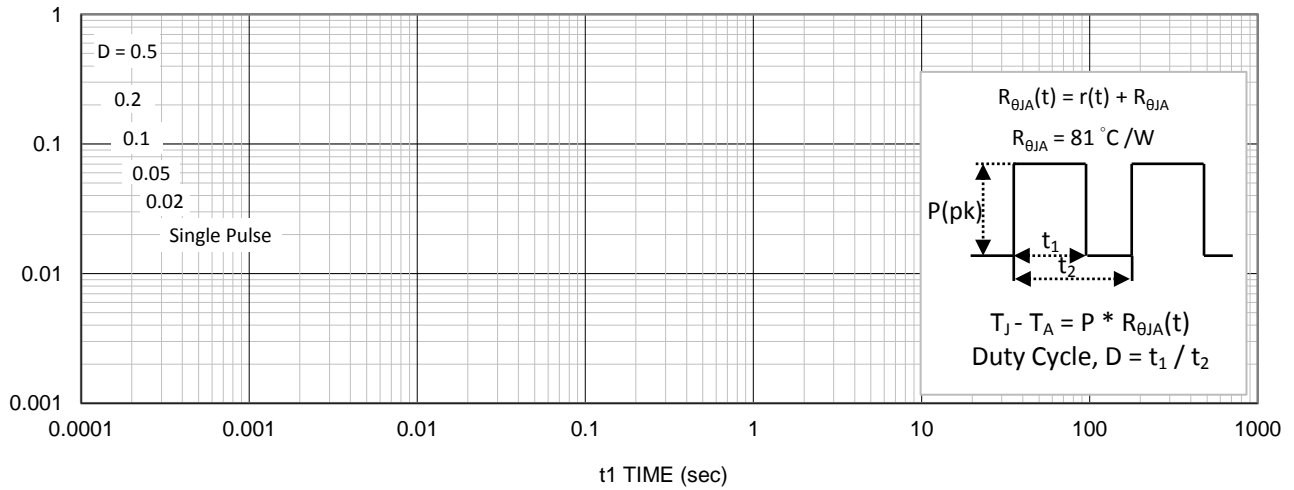


10. Single Pulse Maximum Power Dissipation



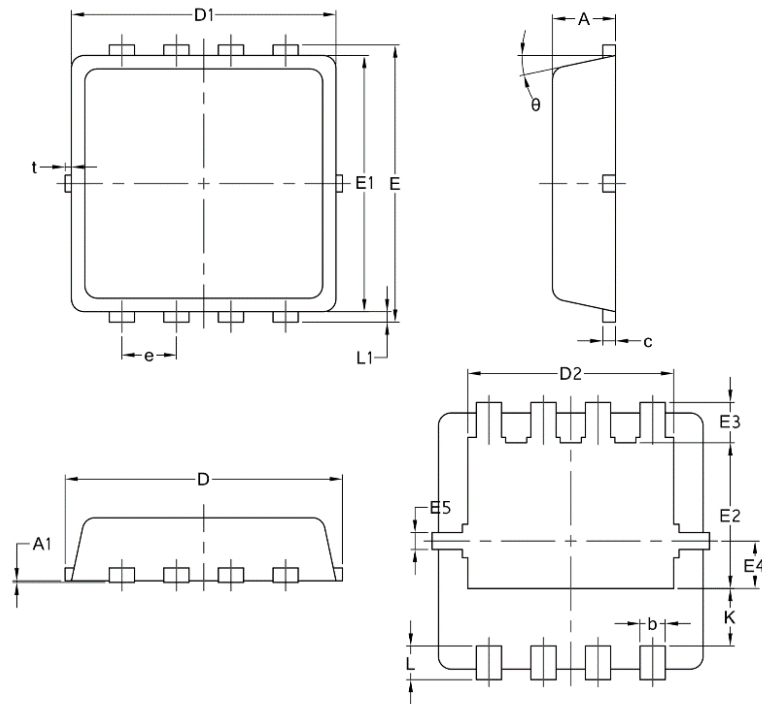
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11. Normalized Thermal Transient Junction to Ambient

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

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