

Dual N-channel MOSFET

ELM4DN0228FAA-N

<http://www.elm-tech.com>

■ General description

ELM4DN0228FAA-N uses advanced trench technology to provide excellent $R_{ds(on)}$ and low gate charge.

■ Features

- $V_{ds}=100V$
- $I_d=4A$
- $R_{ds(on)} = 68m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} = 94m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

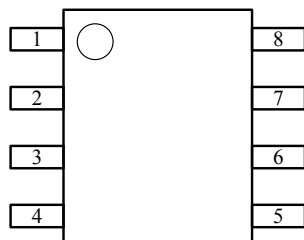
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	100	V		
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current ($V_{gs}=10V$)	I_d	$T_a=25^\circ C$	4	A	1
		$T_a=70^\circ C$	3		
Pulsed drain current	I_{dm}	25	A	2	
Single pulse avalanche energy	E_{as}	0.8	mJ	3	
Avalanche current	A_{as}	4	A		
Total power dissipation	P_d	2	W	4	
Storage temperature range	T_{stg}	-55 to 150	$^\circ C$		
Operating junction temperature range	T_j	-55 to 150	$^\circ C$		

■ Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Thermal resistance junction-to-ambient	$R_{\theta ja}$	-	85	$^\circ C/W$	1
Thermal resistance junction-to-ambient		$t \leq 10s$	-		
Thermal resistance junction-to-case	$R_{\theta jc}$	-	40	$^\circ C/W$	1

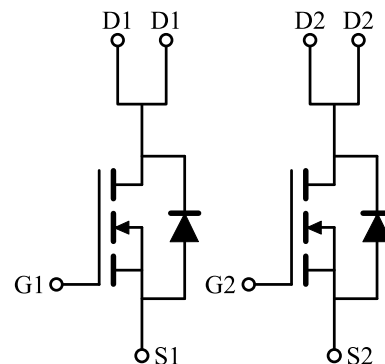
■ Pin configuration

SOP-8(TOP VIEW)



Pin No.	Pin name
1	SOURCE1
2	GATE1
3	SOURCE2
4	GATE2
5	DRAIN2
6	DRAIN2
7	DRAIN1
8	DRAIN1

■ Circuit



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■Electrical characteristics

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	100	-	-	V	
Zero gate voltage drain current	Idss	Vds=80V	-	-	10	μA	
		Vgs=0V	-	-	100		
		Tj=55°C					
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V	-	-	±100	nA	
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	1.5	-	2.9	V	
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=4A	-	-	68	mΩ	2
		Vgs=4.5V, Id=3A	-	-	94		
Forward transconductance	Gfs	Vds=5V, Id=4A	-	14	-	S	
Diode forward voltage	Vsd	Is=1A, Vgs=0V	-	-	1.2	V	2
Continuous source current	Is	Vgs=Vds=0V, Force current	-	-	4	A	1, 5
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=25V, f=1MHz	-	620	-	pF	
Output capacitance	Coss		-	105	-	pF	
Reverse transfer capacitance	Crss		-	63	-	pF	
Gate resistance	Rg	Vds=0V, Vgs=0V, f=1MHz	-	3	-	Ω	
SWITCHING PARAMETERS							
Total gate charge (Vgs=10V)	Qg	Vgs=10V, Vds=50V Id=4A	-	11.9	-	nC	
Gate-source charge	Qgs		-	2.6	-	nC	
Gate-drain charge	Qgd		-	1.7	-	nC	
Turn-on delay time	td(on)	Vgs=10V, Vds=50V, Id=4A Rgen=3Ω	-	3.8	-	ns	
Turn-on rise time	tr		-	25.8	-	ns	
Turn-off delay time	td(off)		-	16.0	-	ns	
Turn-off fall time	tf		-	8.8	-	ns	
Reverse recovery time	trr	If=4A, di/dt=100A/μs	-	30	-	nS	
Reverse recovery charge	Qrr		-	37	-	nC	

NOTE :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs and duty cycle ≤ 2%.
3. The EAS data shows Max. rating . The test condition is Vdd=25V, Vgs=10V, L=0.1mH, Ias=4A .
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as Id and Idm, in real applications, should be limited by total power dissipation.

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■ Typical electrical and thermal characteristics

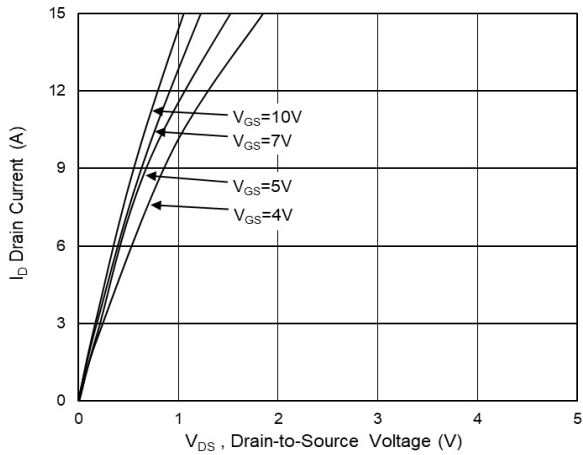


Fig.1 Typical Output Characteristics

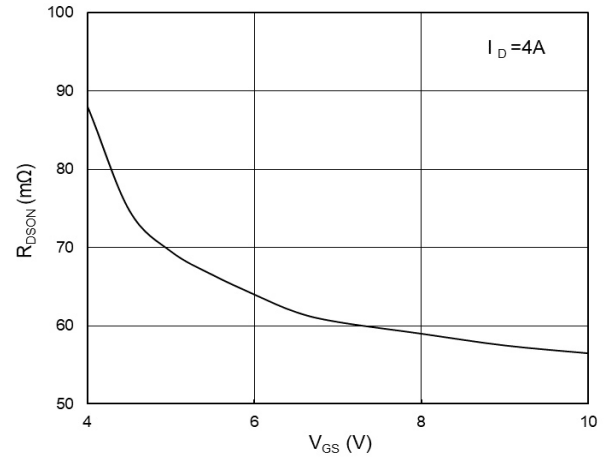


Fig.2 On-Resistance vs G-S Voltage

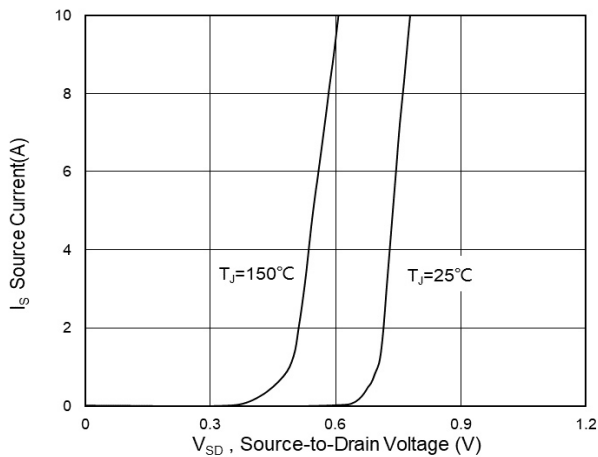


Fig.3 Source Drain Forward Characteristics

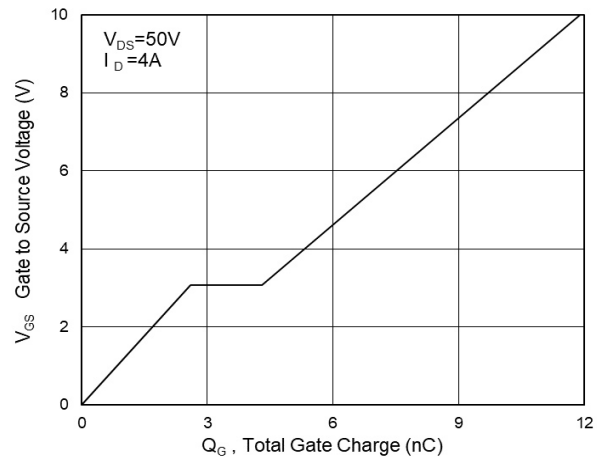


Fig.4 Gate-Charge Characteristics

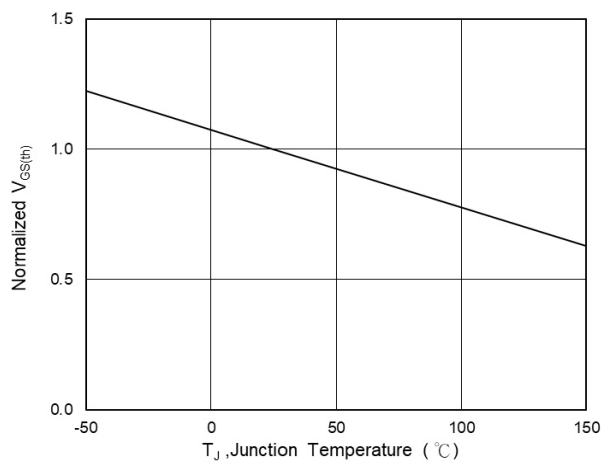


Fig.5 Normalized $V_{GS(th)}$ vs T_J

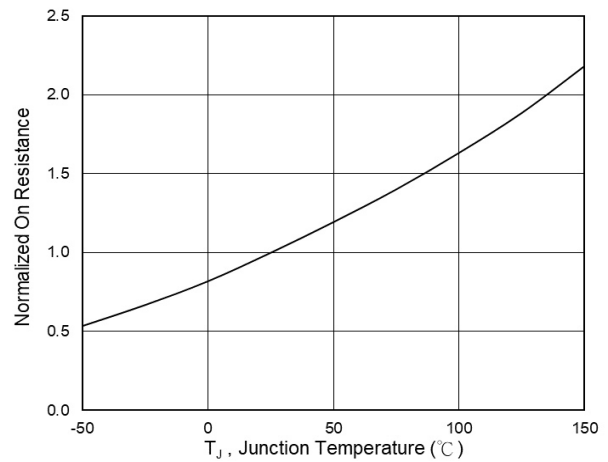


Fig.6 Normalized $R_{DS(on)}$ vs T_J

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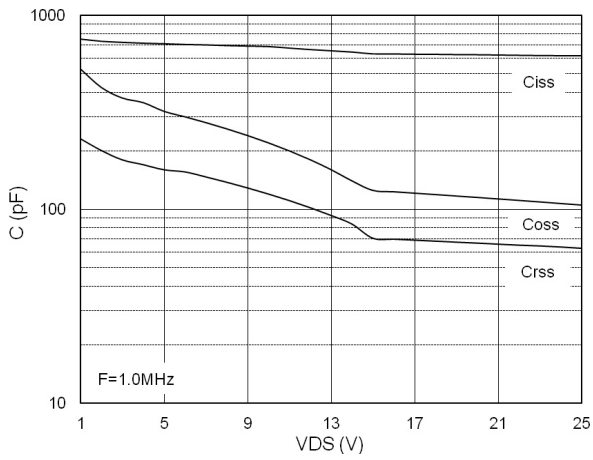


Fig.7 Capacitance

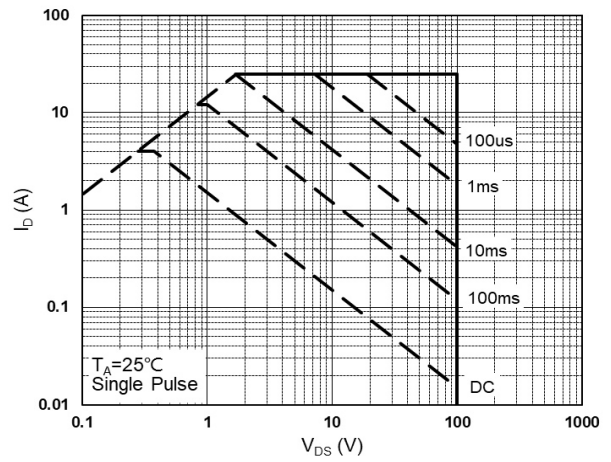


Fig.8 Safe Operating Area

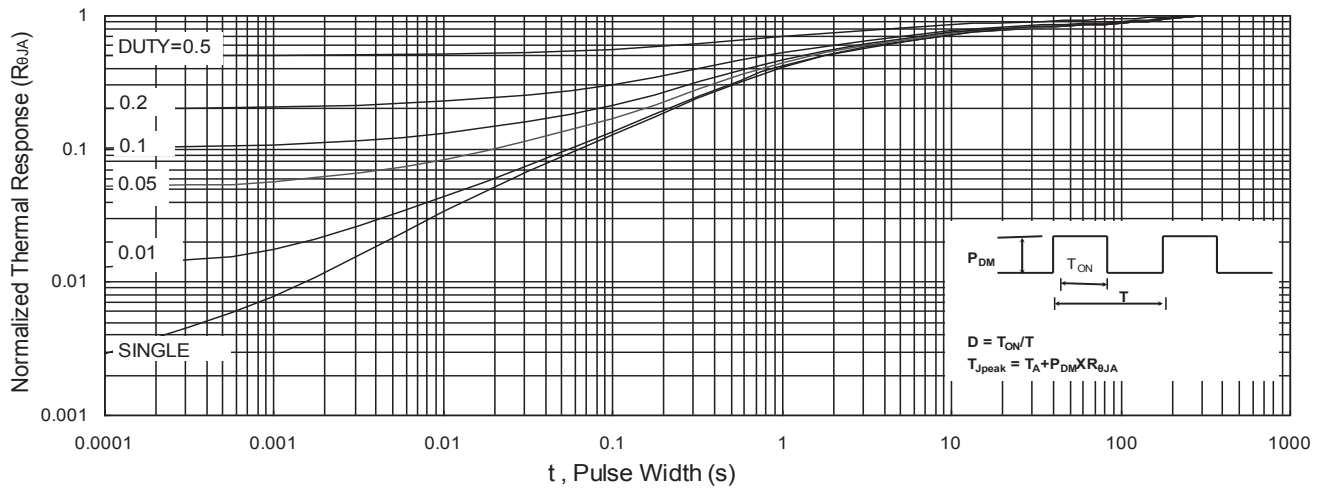


Fig.9 Normalized Maximum Transient Thermal Impedance

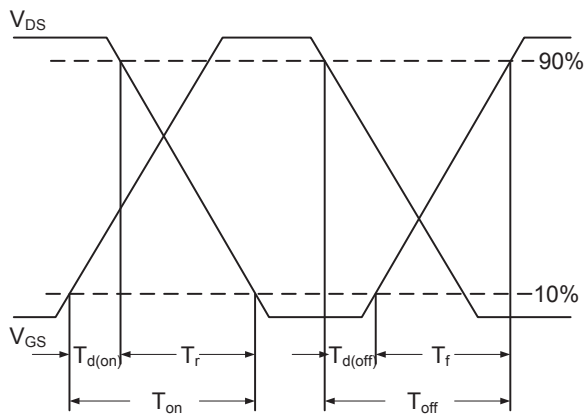


Fig.10 Switching Time Waveform

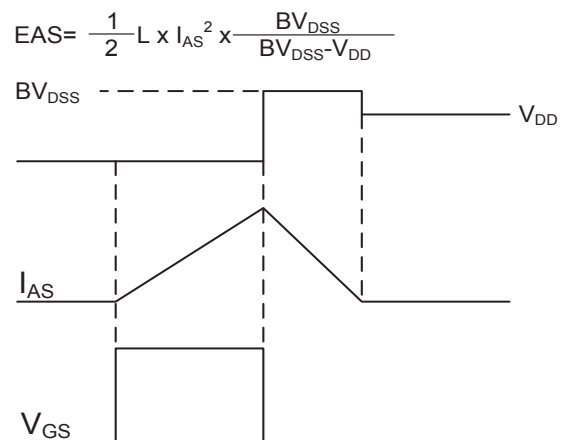


Fig.11 Unclamped Inductive Waveform