

Dual N-channel MOSFET

ELM4DN0208FBA-S

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

■General description

ELM4DN0208FBA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■Features

- $V_{ds}=100V$
- $I_d=1.2A$ ($V_{gs}=10V$)
- $R_{ds(on)} = 310m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} = 320m\Omega$ ($V_{gs}=4.5V$)

■Maximum absolute ratings

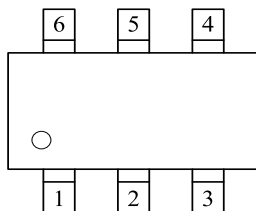
Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		V_{ds}	100	V	
Gate-source voltage		V_{gs}	± 20	V	
Continuous drain current ($V_{gs}=10V$)	$T_a=25^{\circ}C$	I_d	1.2	A	1
	$T_a=70^{\circ}C$		1.0		
Pulsed drain current		I_{dm}	5	A	2
Total power dissipation	$T_a=25^{\circ}C$	P_d	1	W	3
Storage temperature 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-ambient	$R_{\theta ja}$	--	125	$^{\circ}C/W$	1
Thermal resistance junction-case	$R_{\theta jc}$	--	80		

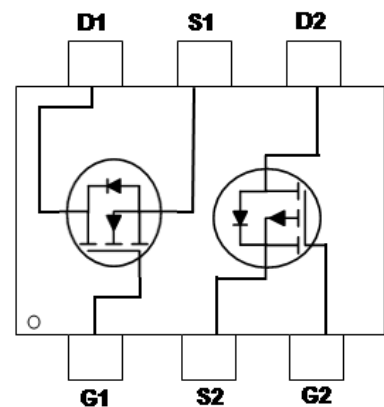
■Pin configuration

TSOP-6(TOP VIEW)



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

■Circuit



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■Electrical characteristics

T_j=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BV _{dss}	V _{gs} =0V, I _d =250μA	100	--	--	V	
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =1.0A	--	260	310	mΩ	2
		V _{gs} =4.5V, I _d =0.5A	--	270	320		
Gate threshold voltage	V _{gs(th)}	V _{gs} =V _{ds} , I _d =250μA	1.0	1.5	2.5	V	
Drain-source leakage current	I _{dss}	V _{ds} =80V, V _{gs} =0V	--	--	1	μA	
		V _{ds} =80V, V _{gs} =0V, T _j =55°C	--	--	5		
Gate-source leakage current	I _{gss}	V _{gs} =±20V, V _{ds} =0V	--	--	±100	nA	
Forward transconductance	G _{fs}	V _{ds} =5V, I _d =1A	--	2.4	--	S	
Continuous source current	I _s	V _{gs} =V _{ds} =0V, Force Current	--	--	1.2	A	1, 4
Diode forward voltage	V _{sd}	V _{gs} =0V, I _s =1A	--	--	1.2	V	2
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{ds} =15V, V _{gs} =0V, f=1MHz	--	508.0	--	pF	
Output capacitance	C _{oss}		--	29.0	--	pF	
Reverse transfer capacitance	C _{rss}		--	16.4	--	pF	
SWITCHING PARAMETERS							
Total gate charge (10V)	Q _g	V _{ds} =80V, V _{gs} =10V I _d =1A	--	9.7	--	nC	
Gate-source charge	Q _{gs}		--	1.6	--	nC	
Gate-drain charge	Q _{gd}		--	1.7	--	nC	
Turn-on delay time	t _{d(on)}	V _{dd} =50V, V _{gs} =10V R _{gen} =3.3Ω, I _d =1A	--	1.6	--	ns	
Turn-on rise time	t _r		--	19.0	--	ns	
Turn-off delay time	t _{d(off)}		--	13.6	--	ns	
Turn-off fall time	t _f		--	19.0	--	ns	

NOTE :

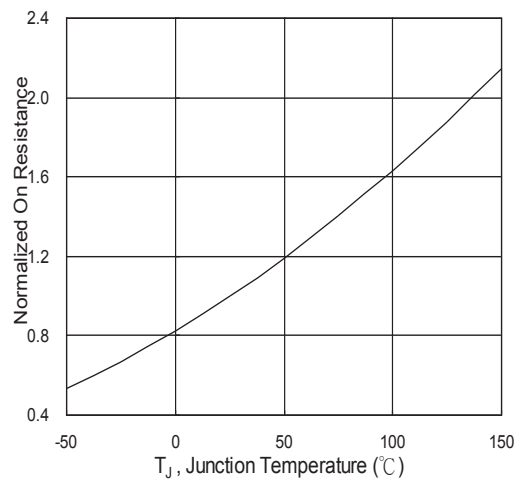
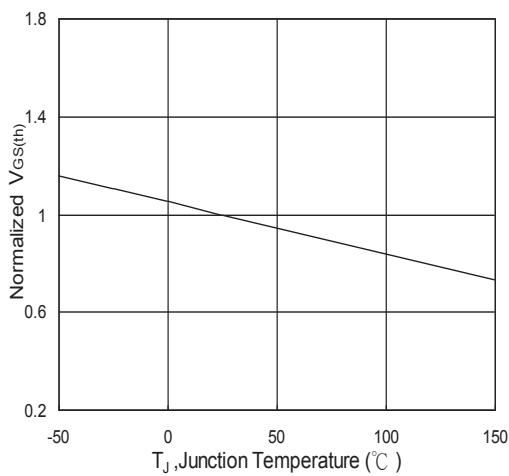
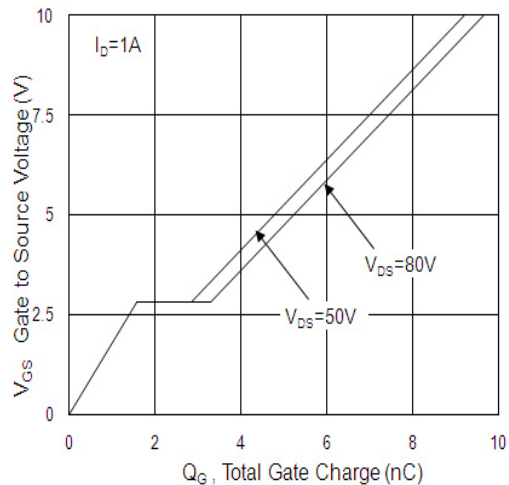
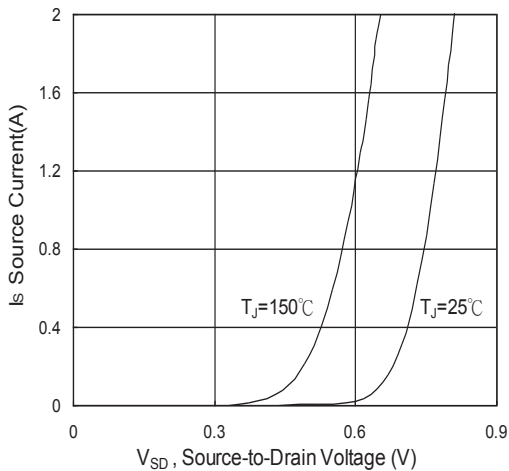
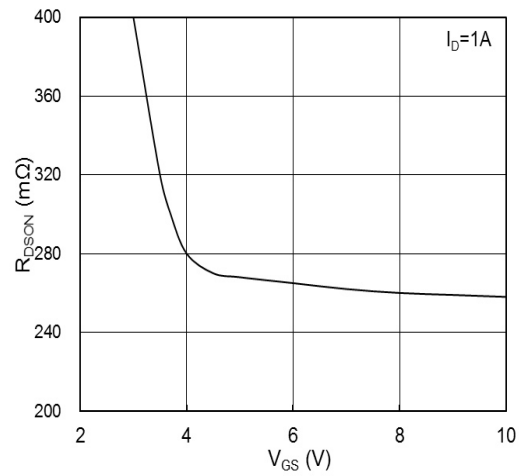
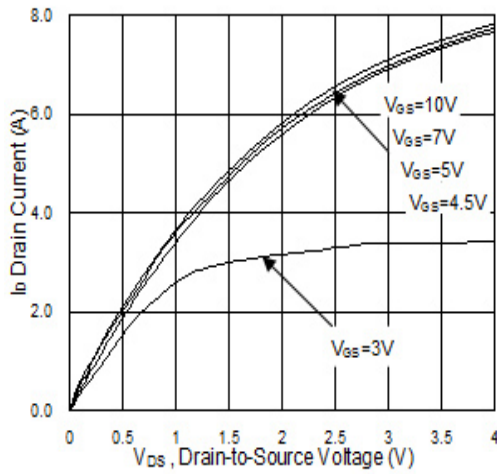
1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs and duty cycle ≤ 2%.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_d and I_{dm}, in real applications, should be limited by total power dissipation.

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■ Typical electrical and thermal characteristics



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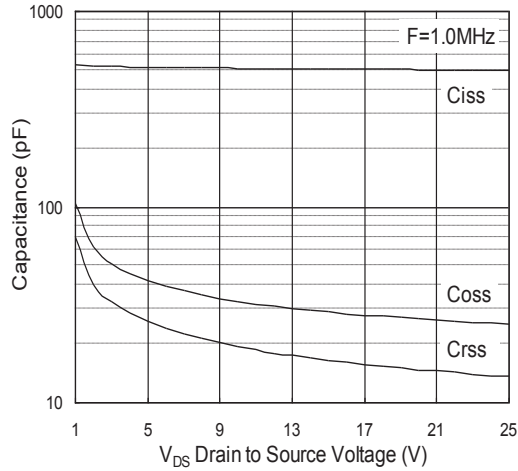


Fig.7 Capacitance

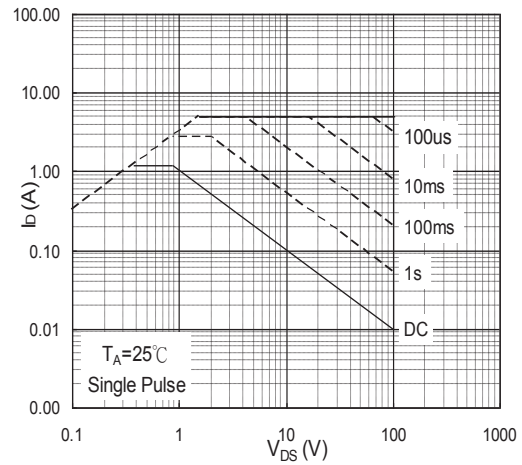


Fig.8 Safe Operating Area

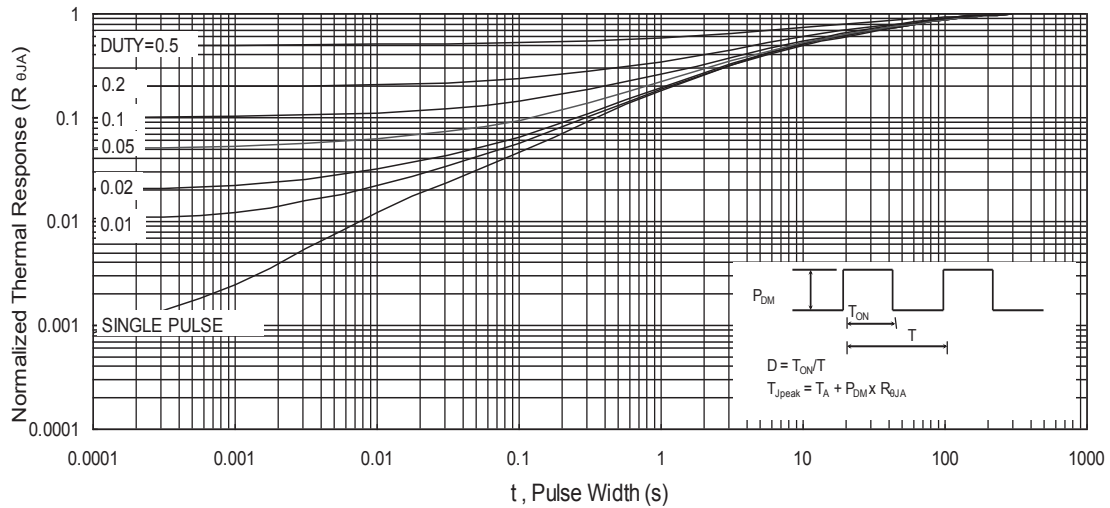


Fig.9 Normalized Maximum Transient Thermal Impedance

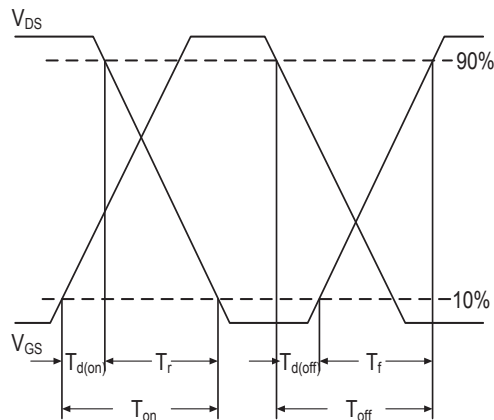


Fig.10 Switching Time Waveform

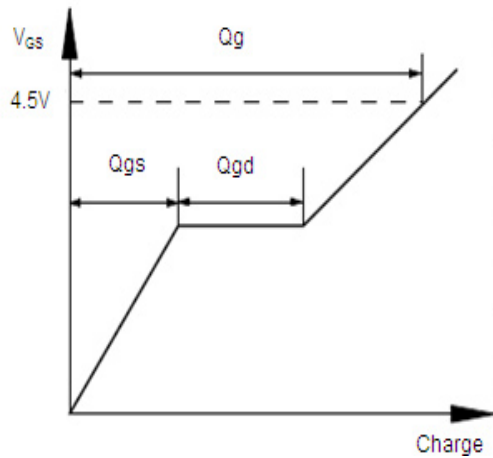


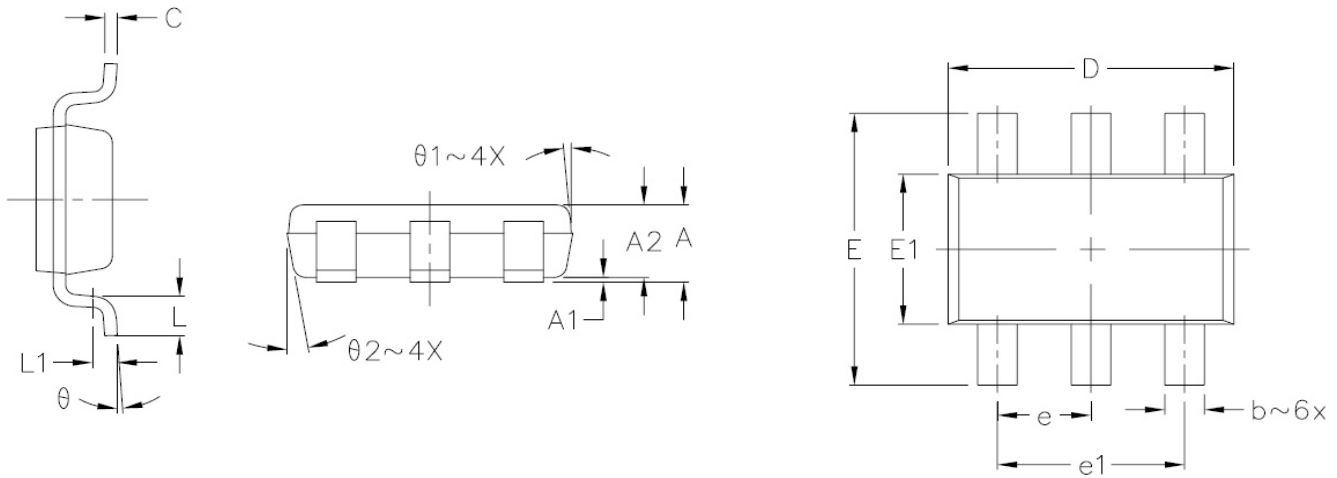
Fig.11 Gate Charge Waveform

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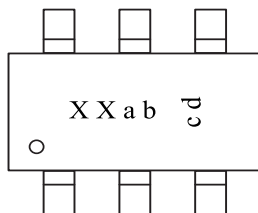
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■TSOP-6 dimension (3,000pcs/reel)



Symbols	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.70	0.90	0.028	0.035
A1	0.00	0.10	0.000	0.004
A2	0.70	0.82	0.028	0.032
b	0.35	0.50	0.014	0.020
C	0.08	0.20	0.003	0.008
D	2.80	3.02	0.110	0.119
E	2.60	3.00	0.102	0.118
E1	1.50	1.70	0.059	0.067
e	0.90	1.00	0.035	0.039
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
L1	0.25 BSC		0.010 BSC	
θ	0°	8°	0°	8°
θ1	4°	12°	4°	12°
θ2	4°	12°	4°	12°

■Marking



Symbols	Content
x x	Product code
a	Yearly code : 2019=9, 2020=A, 2021=B, 2022=C.....
b	Weekly code : A to Z, a to z (53 weeks in total)
c	Sequence : 1 to 9 or A to Z
d	Assembly code : A to Z (I, O excepted)