

Single N-channel MOSFET

ELM4NB3058FNA-N

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

■General description

ELM4NB3058FNA-N uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■Features

- $V_{ds}=30V$
- $I_d=28A$ ($V_{gs}=10V$)
- $R_{ds(on)}=8m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)}=11m\Omega$ ($V_{gs}=4.5V$)

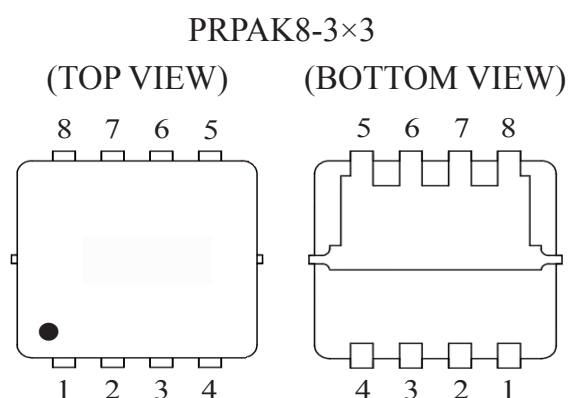
■Maximum absolute ratings

Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		V_{ds}	30	V	
Gate-source voltage		V_{gs}	± 20	V	
Continuous drain current ($V_{gs}=10V$)	$T_c=25^\circ C$	I_d	28	A	1
	$T_c=100^\circ C$		20		
Pulsed drain current		I_{dm}	100	A	2
Single pulse avalanche energy		E_{as}	39.2	mJ	3
Avalanche current		I_{as}	28	A	
Total power dissipation	$T_c=25^\circ C$	P_d	21	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

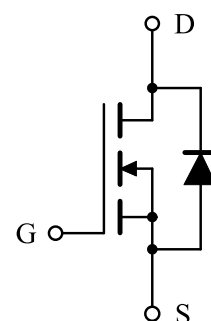
Parameter	Symbol	Typ.	Max.	Unit	Note
Thermal resistance junction-ambient	$R_{\theta ja}$	--	65	$^\circ C/W$	1
Thermal resistance junction-case	$R_{\theta jc}$	--	6	$^\circ C/W$	1

■Pin configuration



Pin No.	Pin name
1	SOURCE
2	SOURCE
3	SOURCE
4	GATE
5	DRAIN
6	DRAIN
7	DRAIN
8	DRAIN

■Circuit



Single N-channel MOSFET

ELM4NB3058FNA-N

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

■Electrical characteristics

Tj=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	30	--	--	V	
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =12A	--	6.0	8.0	mΩ	2
		V _{gs} =4.5V, I _d =12A	--	9.4	11.0		
Gate threshold voltage	V _{gs(th)}	V _{gs} =V _{ds} , I _d =250μA	1.2	1.7	2.2	V	
Drain-source leakage current	I _{dss}	V _{ds} =30V, V _{gs} =0V	--	--	1	μA	
		V _{ds} =30V, V _{gs} =0V, Tj=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 =12A	--	55	--	S	
Continuous source current	I _s	V _{gs} =V _{ds} =0V, Force current	--	--	12	A	1, 5
Diode forward voltage	V _{sd}	V _{gs} =0V, I _s =1A	--	--	1	V	2
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{ds} =15V, V _{gs} =0V, f=1MHz	--	693	--	pF	
Output capacitance	C _{oss}		--	332	--	pF	
Reverse transfer capacitance	C _{rss}		--	34	--	pF	
Gate resistance	R _g	V _{ds} =0V, V _{gs} =0V, f=1MHz	0.8	1.7	2.6	Ω	
SWITCHING PARAMETERS							
Total gate charge (4.5)	Q _g	V _{ds} =15V, V _{gs} =10V, I _d =12A	--	7.1	--	nC	
Gate-source charge	Q _{gs}		--	2.2	--	nC	
Gate-drain charge	Q _{gd}		--	3.1	--	nC	
Turn-on delay time	t _{d(on)}	V _{dd} =15V, V _{gs} =10V R _{gen} =3Ω, I _d =12A	--	7.0	--	ns	
Turn-on rise time	t _r		--	18.8	--	ns	
Turn-off delay time	t _{d(off)}		--	19.5	--	ns	
Turn-off fall time	t _f		--	3.4	--	ns	

NOTE :

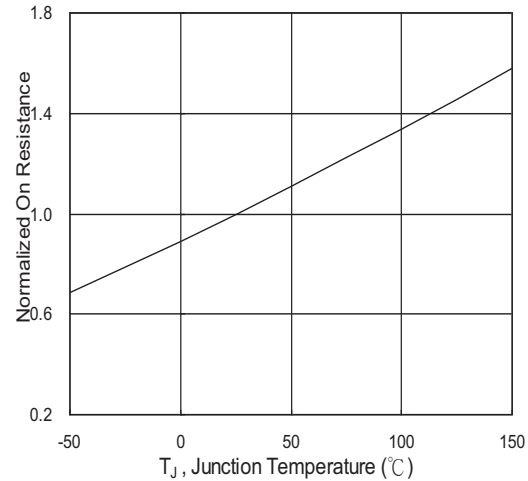
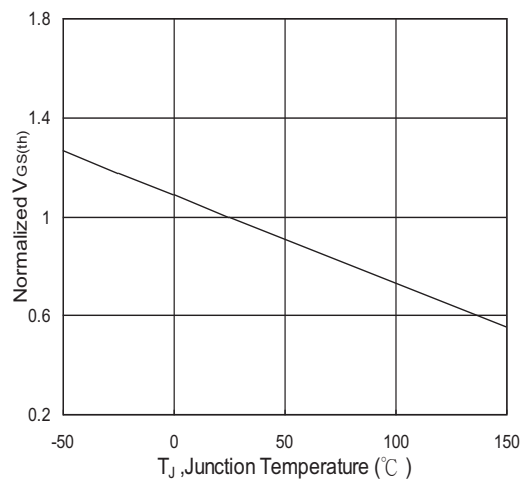
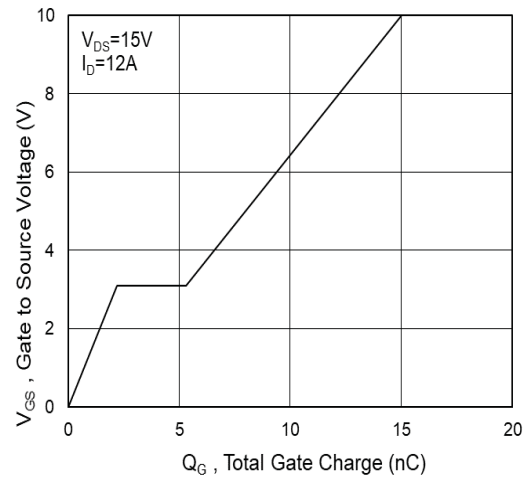
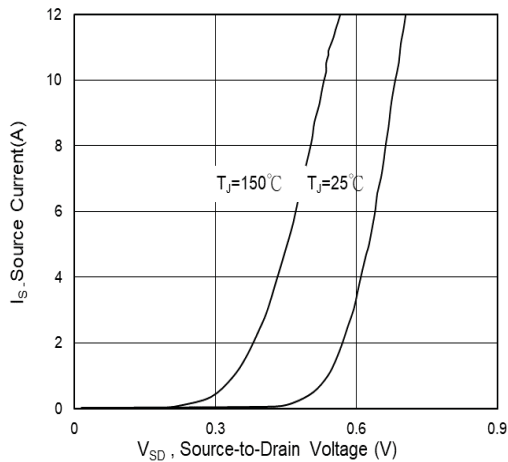
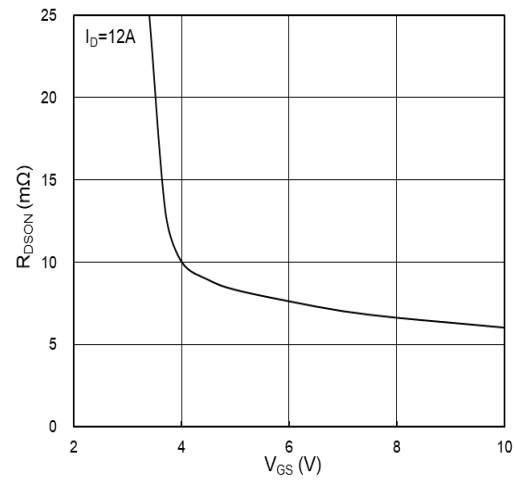
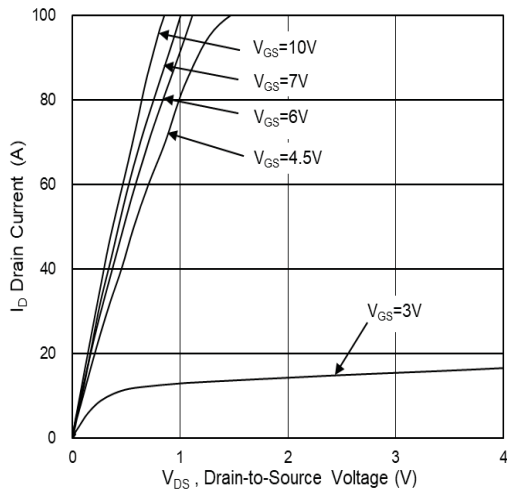
1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs and duty cycle ≤ 2%.
3. The Eas data shows Max. rating . The test condition is V_{dd}=25V, V_{gs}=10V, L=0.1mH, I_{as}=28A.
4. The power dissipation is limited by 150°C junction temperature.
5. The data is theoretically the same as I_d and I_{dm}, in real applications, should be limited by total power dissipation.

Single N-channel MOSFET

ELM4NB3058FNA-N

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

■ Typical electrical and thermal characteristics



Single N-channel MOSFET

ELM4NB3058FNA-N

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

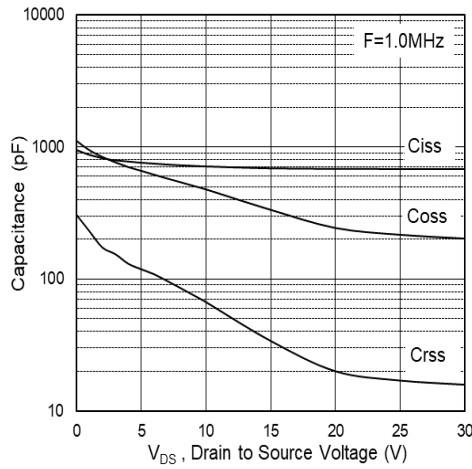


Fig.7 Capacitance

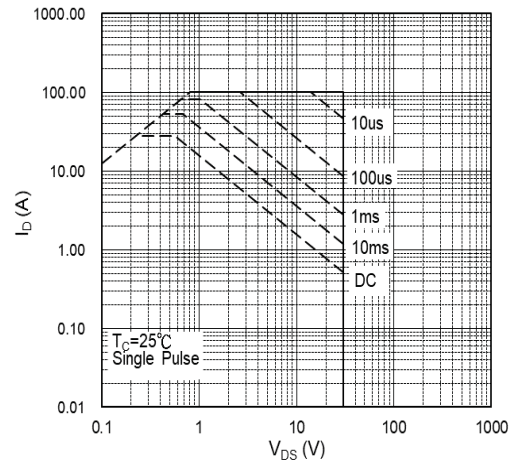


Fig.8 Safe Operating Area

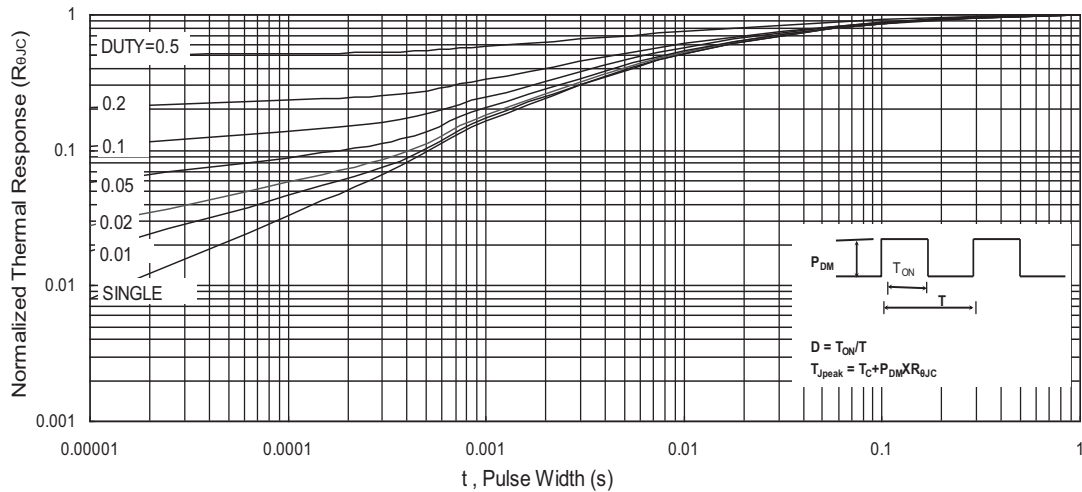


Fig.9 Normalized Maximum Transient Thermal Impedance

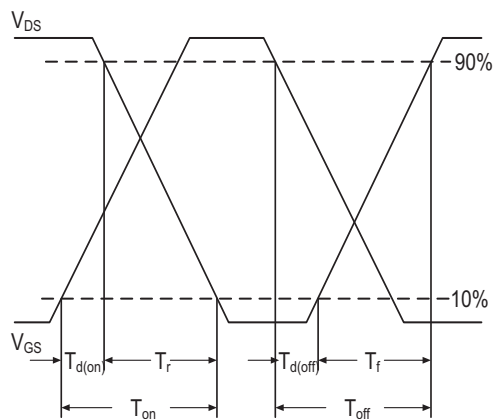


Fig.10 Switching Time Waveform

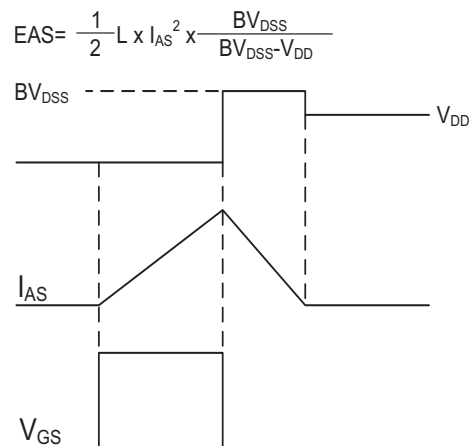


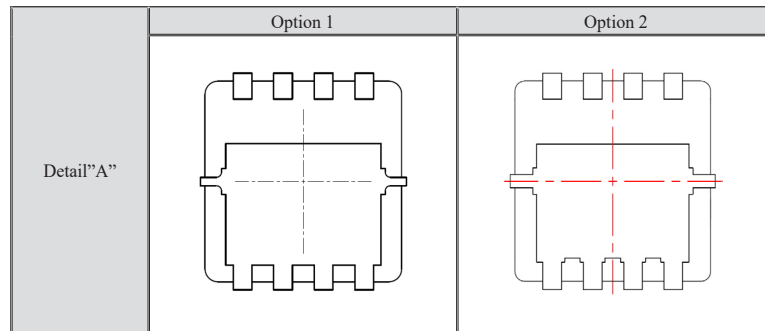
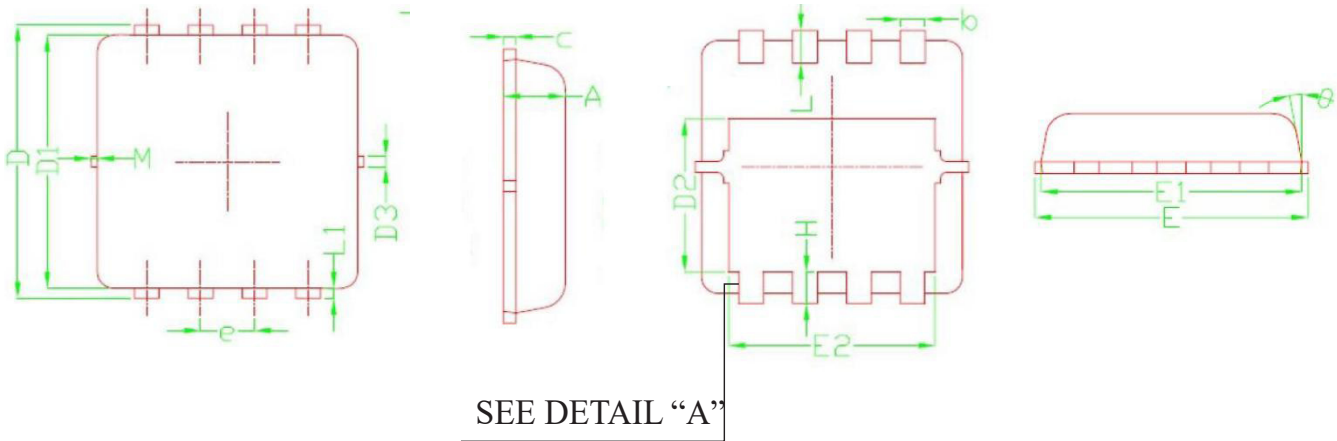
Fig.11 Unclamped Inductive Switching Waveform

Single N-channel MOSFET

ELM4NB3058FNA-N

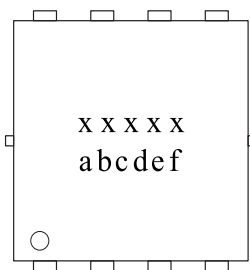
<https://www.elm-tech.com>

■PRPAK8-3×3 dimension (3,000pcs/reel)



Symbols	Millimeters		Inches		Symbols	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.70	0.90	0.028	0.035	E1	2.90	3.25	0.114	0.128
b	0.20	0.40	0.008	0.016	E2	2.25	2.65	0.089	0.104
c	0.10	0.25	0.004	0.010	e	0.65 BSC		0.026 BSC	
D	3.10	3.45	0.122	0.136	H	0.28	0.65	0.011	0.026
D1	2.90	3.20	0.114	0.126	θ	0°	14°	0°	14°
D2	1.54	1.98	0.061	0.078	L	0.30	0.50	0.012	0.020
D3	0.08	0.30	0.003	0.012	L1	0.06	0.20	0.002	0.008
E	3.00	3.45	0.118	0.136	M	0.00	0.15	0.000	0.006

■Marking



Symbols	Content
XXXXX	Product code
a	Yearly code: 2019=K, 2020=L, 2021=M, 2022=N ...
b, c	Weekly code: 01 to 53
d, e	Sequence: 01 to 99 or 0A to 0Z
f	Assembly code: A to Z (I, O excepted)