

Single N-channel MOSFET

ELM4N18N20FTA-T

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

■ General description

ELM4N18N20FTA-T uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■ Features

- $V_{ds}=200V$
- $I_d=18A$ ($V_{gs}=10V$)
- $R_{ds(on)} = 170m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} = 180m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

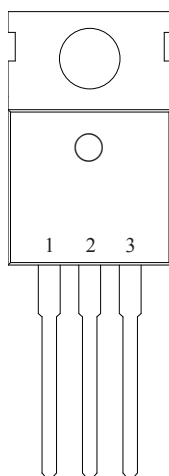
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	200	V		
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current ($V_{gs}=10V$)	I_d	$T_c=25^\circ C$	18.0	A	1
		$T_c=100^\circ C$	11.7		
Pulsed drain current	I_{dm}	40	A	2	
Single pulse avalanche energy	E_{as}	15	mJ	3	
Avalanche current	I_{as}	10	A		
Total power dissipation	P_d	$T_c=25^\circ C$	83	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	$R_{\theta ja}$	--	60.0	$^\circ C/W$	1
Thermal resistance junction-case	$R_{\theta jc}$	--	1.1		

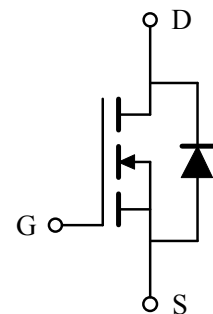
■ Pin configuration

TO-220(TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

■ Circuit



Single N-channel MOSFET

ELM4N18N20FTA-T

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

■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	200	--	--	V	
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V, I _d =9A	--	--	170	mΩ	2
		V _{gs} =4.5V, I _d =9A	--	--	180		
Gate threshold voltage	V _{gs(th)}	V _{gs} =V _{ds} , I _d =250μA	1.2	--	2.5	V	
Drain-source leakage current	I _{dss}	V _{ds} =160V, V _{gs} =0V	--	--	1	μA	
		V _{ds} =160V, 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 =9A	--	22	--	S	
Continuous source current	I _s	V _{gs} =V _{ds} =0V, Force current	--	--	18	A	1, 5
Pulsed source current	I _{sm}		--	--	40	A	2, 5
Diode forward voltage	V _{sd}	V _{gs} =0V, I _s =1A	--	--	1.2	V	2
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{ds} =25V, V _{gs} =0V, f=1MHz	--	2047	--	pF	
Output capacitance	C _{oss}		--	109	--	pF	
Reverse transfer capacitance	C _{rss}		--	70	--	pF	
Gate resistance	R _g	V _{ds} =0V, V _{gs} =0V, f=1MHz	--	2	--	Ω	
SWITCHING PARAMETERS							
Total gate charge (10V)	Q _g	V _{ds} =80V, V _{gs} =10V, I _d =9A	--	45.0	--	nC	
Gate-source charge	Q _{gs}		--	9.0	--	nC	
Gate-drain charge	Q _{gd}		--	10.5	--	nC	
Turn-on delay time	t _{d(on)}	V _{dd} =50V, V _{gs} =10V R _{gen} =3.3Ω, I _d =9A	--	13.0	--	ns	
Turn-on rise time	t _r		--	8.2	--	ns	
Turn-off delay time	t _{d(off)}		--	25.0	--	ns	
Turn-off fall time	t _f		--	11.0	--	ns	
Reverse recovery time	t _{rr}	I _f =10A, di/dt=100A/μs	--	37	--	nS	
Reverse recovery charge	Q _{rr}		--	103	--	nC	

NOTE :

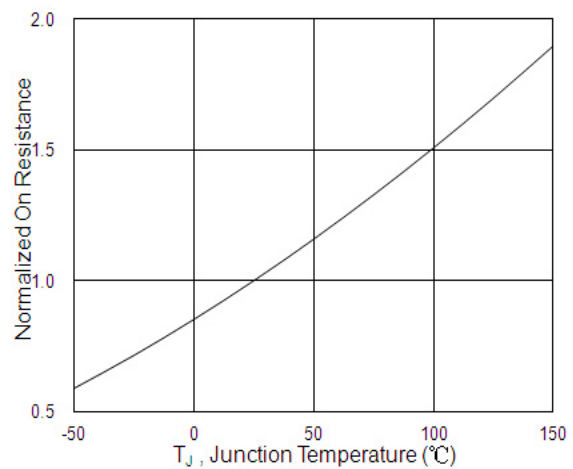
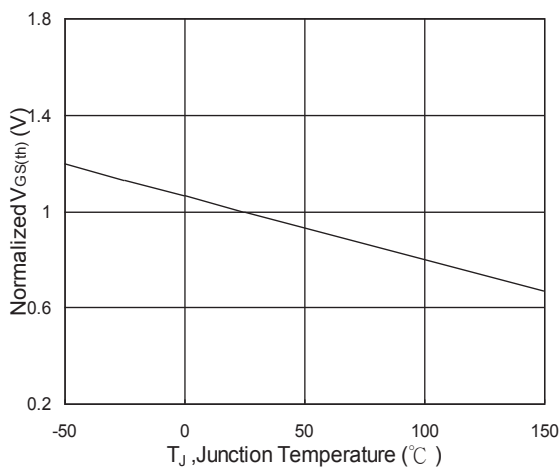
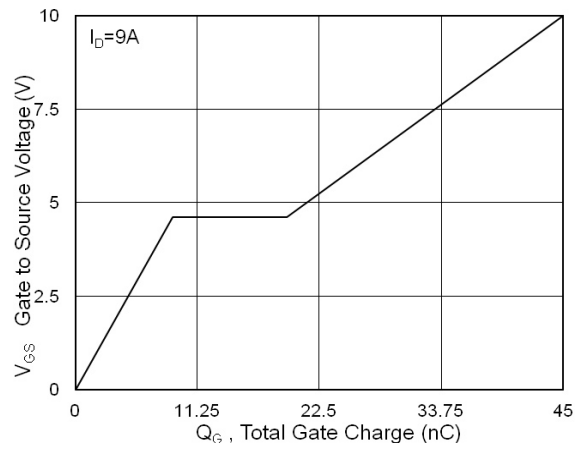
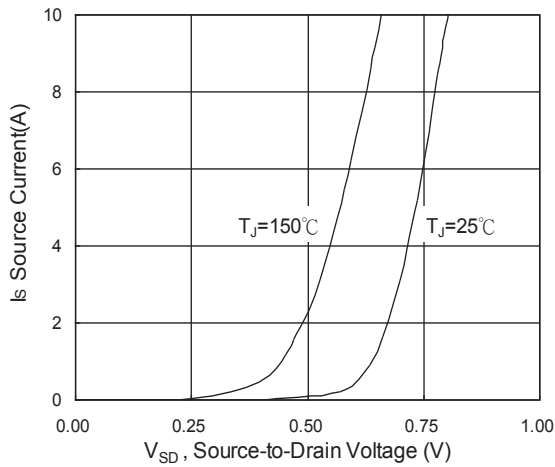
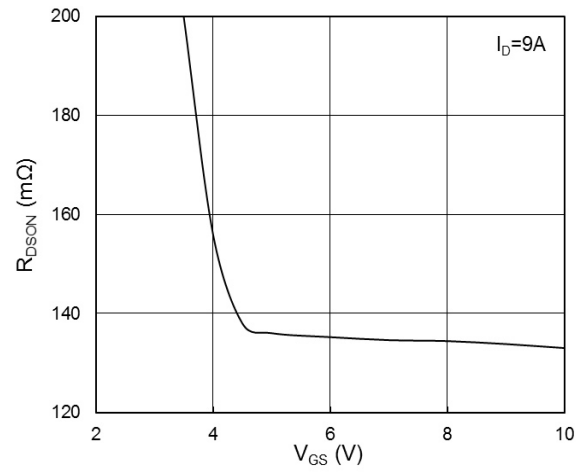
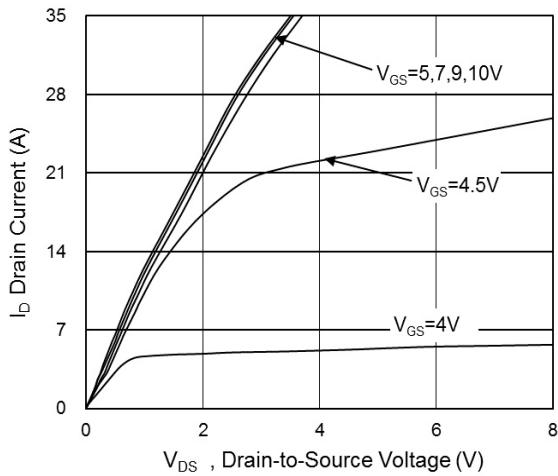
1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs and duty cycle ≤ 2%.
3. The EAS data shows Max. rating . The test condition is V_{dd}=25V, V_{gs}=10V, L=0.3mH, I_{as}=10A.
4. The power dissipation is limited by 150°C junction 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

ELM4N18N20FTA-T

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

■ Typical characteristics



Single N-channel MOSFET

ELM4N18N20FTA-T

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

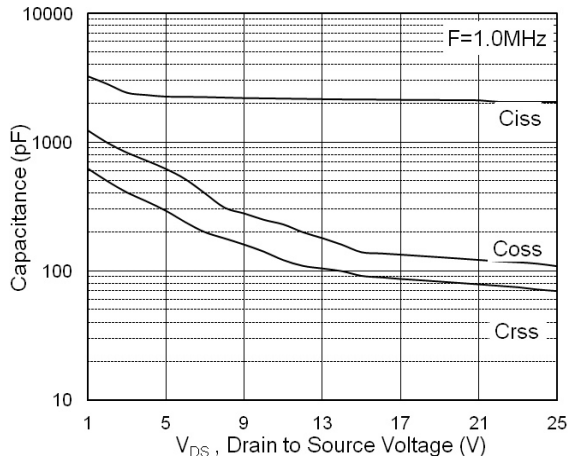


Fig.7 Capacitance

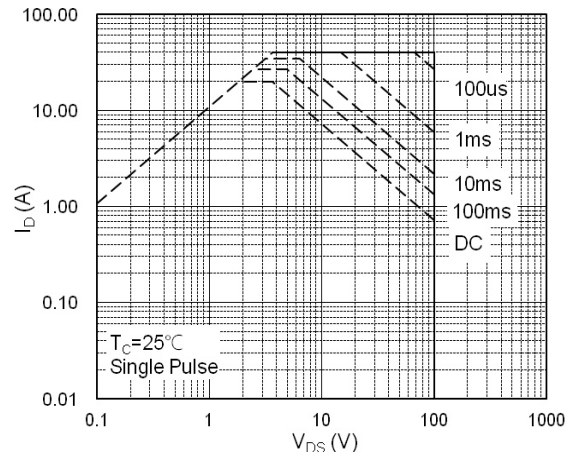


Fig.8 Safe Operating Area

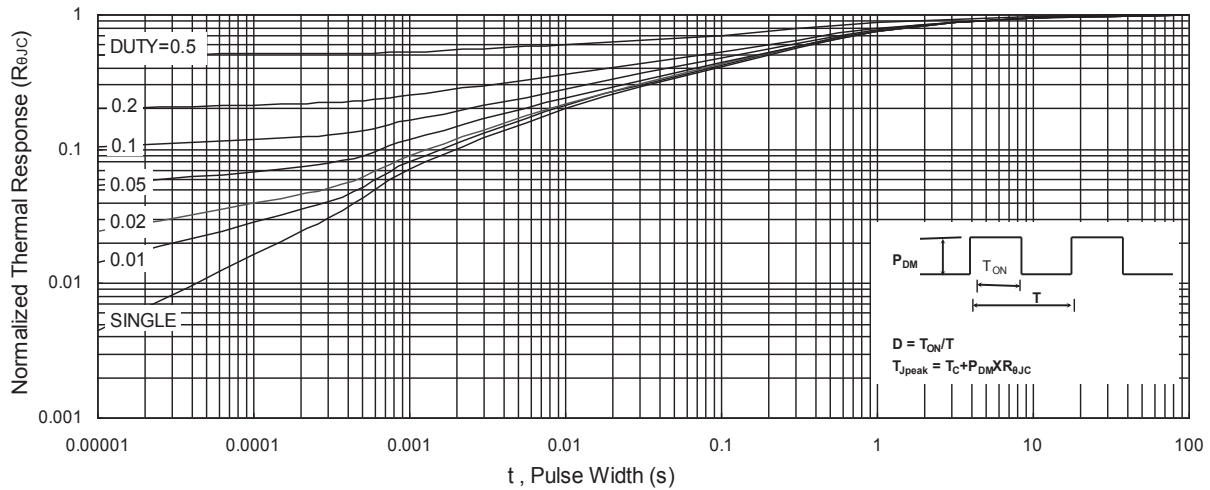


Fig.9 Normalized Maximum Transient Thermal Impedance

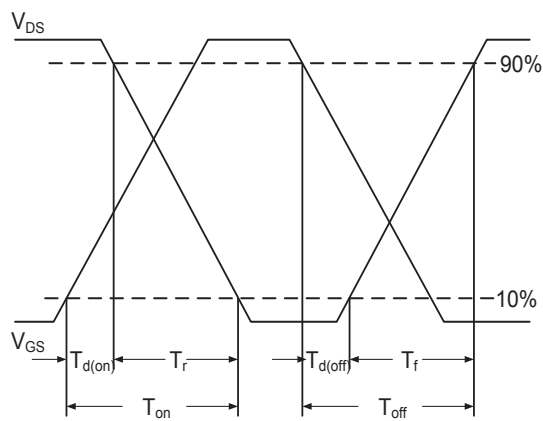


Fig.10 Switching Time Waveform

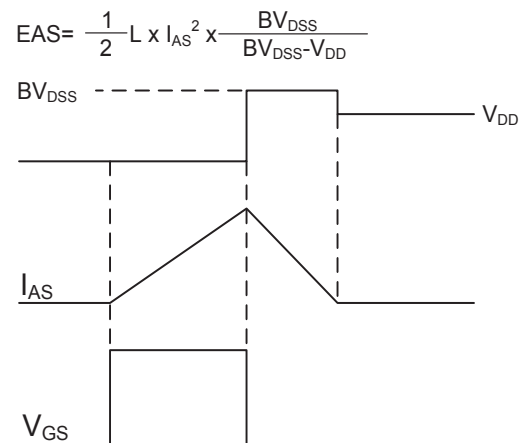


Fig.11 Unclamped Inductive Switching Waveform

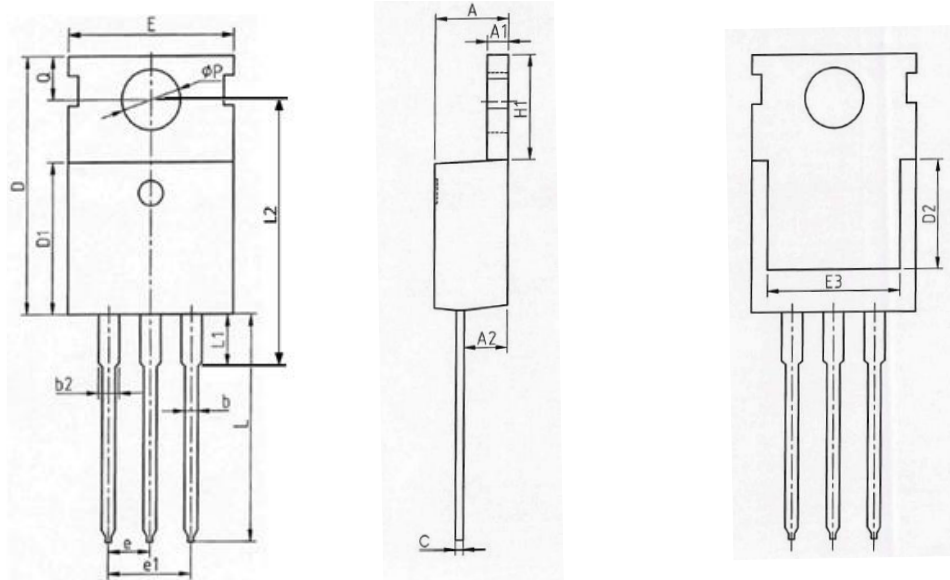
Single N-channel MOSFET

ELM4N18N20FTA-T

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

TO-220 dimension (50pcs/tube)

SEE DETAIL "A"



Detail "A"

	Top	Bottom		Top	Bottom
Option 1			Option 3		
Option 2					

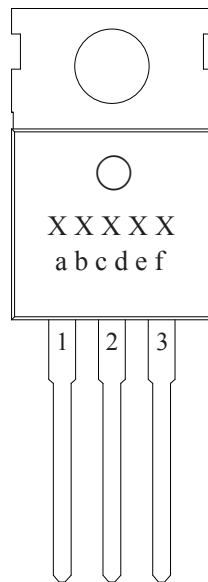
Sym.	Millimeters		Inches		Sym.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	3.56	4.83	0.140	0.190	E3	6.22	8.89	0.245	0.350
A1	0.51	1.40	0.020	0.055	e	2.54 BSC		0.100 BSC	
A2	2.03	2.92	0.080	0.115	e1	5.08 BSC		0.200 BSC	
b	0.38	1.02	0.015	0.040	H1	5.84	6.86	0.230	0.270
b2	1.14	1.78	0.045	0.070	L	12.27	14.73	0.483	0.580
c	0.36	0.61	0.014	0.024	L1	2.47	4.06	0.097	0.160
D	14.22	16.51	0.560	0.650	L2	0.00	16.70	0.000	0.657
D1	8.38	9.65	0.330	0.380	Q	2.54	3.05	0.100	0.120
D2	5.30	--	0.209	--	ØP	3.40	3.89	0.134	0.153
E	9.65	10.67	0.380	0.420					

Single N-channel MOSFET

ELM4N18N20FTA-T

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

■ Marking



Symbols	Content
xxxxx	Product code
a	Yearly code : 2019=K, 2020=L, 2021=M ...
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)