

Single N-channel MOSFET

ELM3D0804A-S

■ General description

ELM3D0804A-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

■ Features

- $V_{ds}=40V$
- $I_d=30A$
- $R_{ds(on)} < 8.0m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 22.0m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

$T_a=25^\circ C$. Unless otherwise noted.

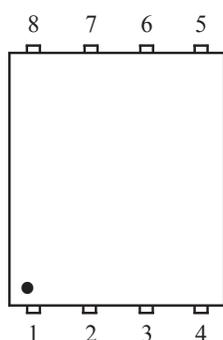
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	V_{ds}	40	V	
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	$T_a=25^\circ C$	19	A
		$T_a=70^\circ C$	15	
Pulsed drain current	I_{dm}	150	A	3
Avalanche current	I_{as}	51	A	
Avalanche energy	E_{as}	130	mJ	
Power dissipation	P_d	$T_c=25^\circ C$	2.5	W
		$T_c=70^\circ C$	1.6	
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	$^\circ C$	

■ Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	$R_{\theta jc}$		2	$^\circ C/W$	
Maximum junction-to-ambient	$R_{\theta ja}$		50	$^\circ C/W$	

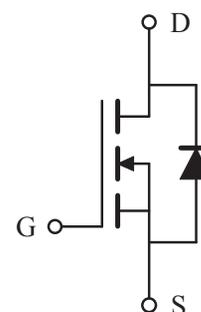
■ Pin configuration

PDFN-5×6(TOP VIEW)



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

■ Circuit



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note	
STATIC PARAMETERS								
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	40			V		
Zero gate voltage drain current	Idss	Vds=32V, Vgs=0V			1	μA		
		Vds=30V, Vgs=0V, Ta=55°C			10			
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA		
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA	1.5	2.0	3.0	V		
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=20A		6.5	8.0	mΩ	1	
		Vgs=4.5V, Id=20A		14.0	22.0			
Forward transconductance	Gfs	Vds=15V, Id=20A		40		S	1	
Diode forward voltage	Vsd	If=20A, Vgs=0V			1.3	V	1	
Max. body-diode continuous current	Is				14	A		
DYNAMIC PARAMETERS								
Input capacitance	Ciss	Vgs=0V, Vds=20V, f=1MHz		2370		pF		
Output capacitance	Coss			388		pF		
Reverse transfer capacitance	Crss			249		pF		
Gate resistance	Rg	Vgs=0V, Vds=0V, f=1MHz		1		Ω		
SWITCHING PARAMETERS								
Total gate charge (Vgs=10V)	Qg	Vds=20V, Vgs=10V, Id=20A		44		nC	2	
Total gate charge (Vgs=4.5V)				20		nC	2	
Gate-source charge	Qgs			11		nC	2	
Gate-drain charge	Qgd			10		nC	2	
Turn-on delay time	td(on)			19		ns	2	
Turn-on rise time	tr		Vds=20V, RL=1Ω, Id=20A,		18		ns	2
Turn-off delay time	td(off)		Vgs=10V, Rgen=6Ω		58		ns	2
Turn-off fall time	tf			20		ns	2	
Body diode reverse recovery time	trr	If=20A, dIf/dt=100A/μs		32		ns		
Body diode reverse recovery charge	Qrr			19		nC		

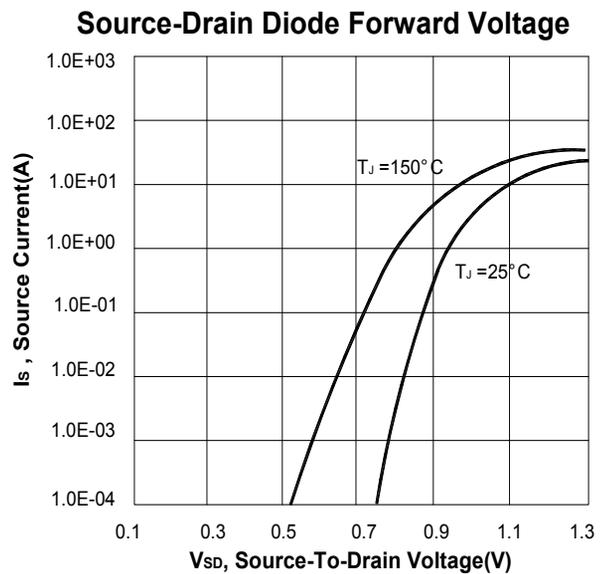
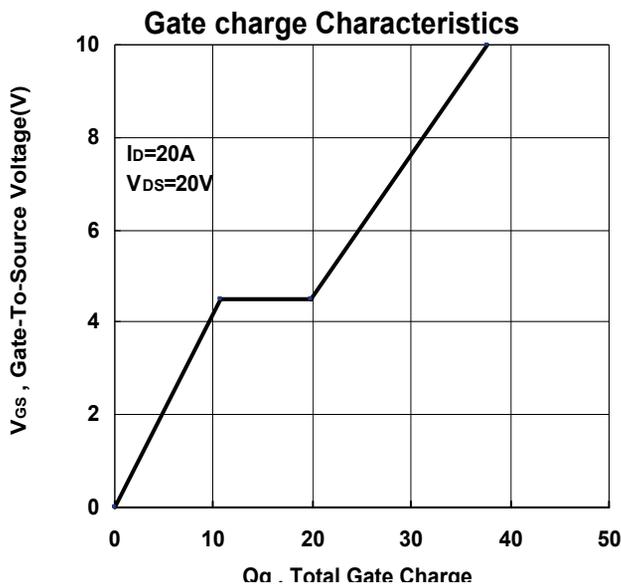
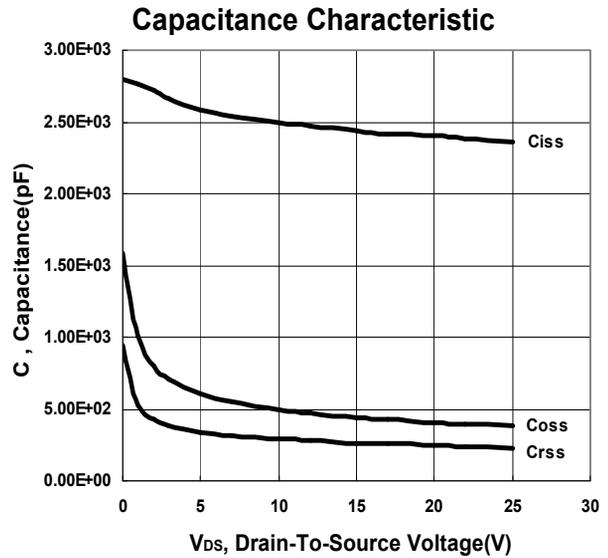
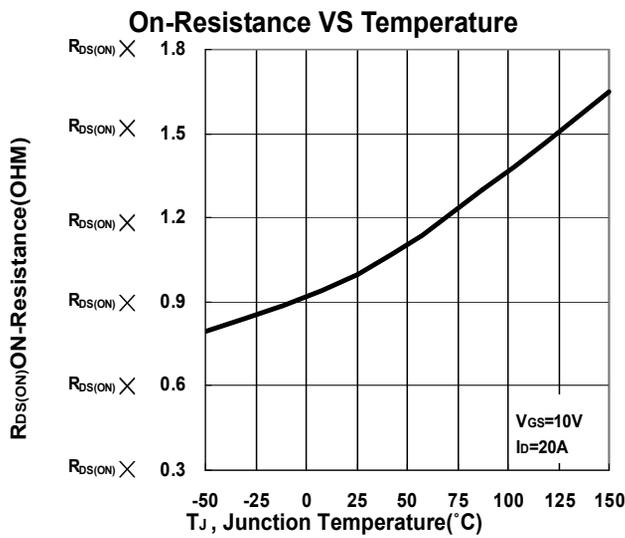
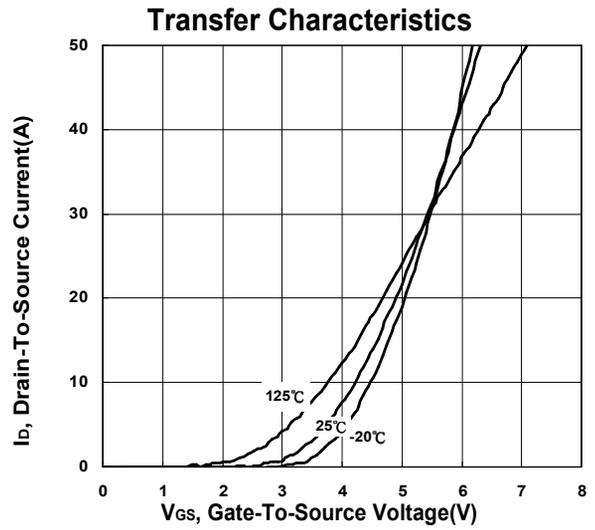
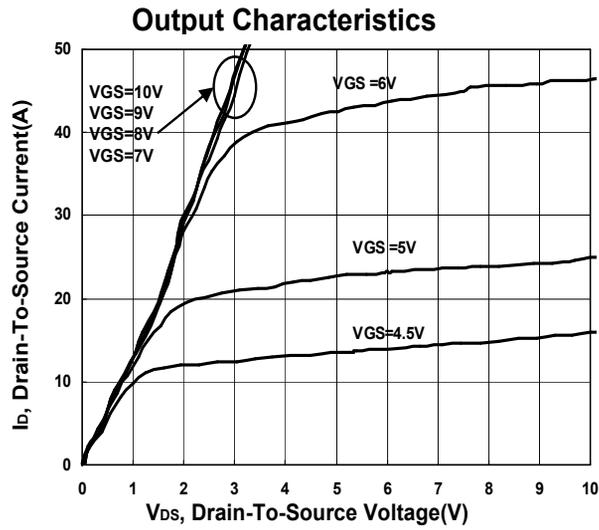
NOTE :

1. Pulse test : Pulsed width ≤ 300μsec and Duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulsed width limited by maximum junction temperature.

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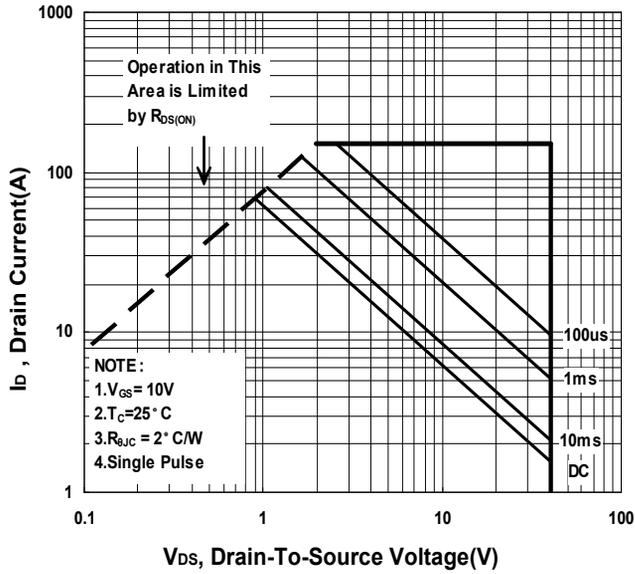
■ Typical electrical and thermal characteristics



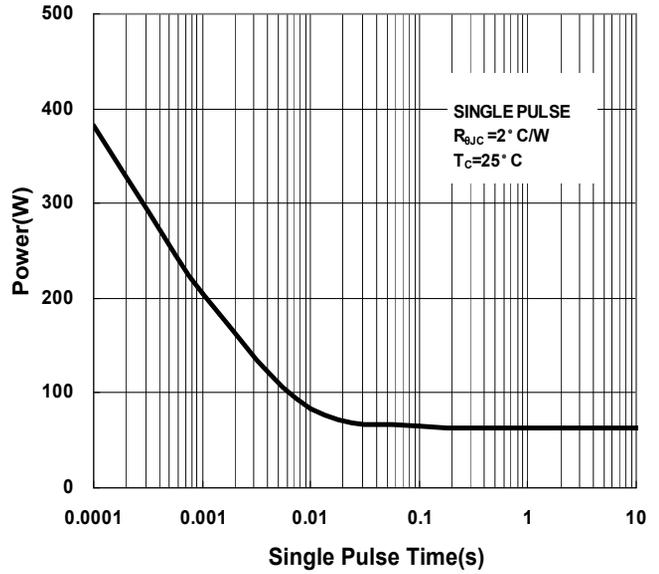
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Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

