Dual P-channel MOSFET

ELM14803AB-N

■General description

ELM14803AB-N uses advanced trench technology to provide excellent Rds(on) and low gate charge.

■Features

- Vds=-30V
- Id=-5A (Vgs=-10V)
- Rds(on) < 46mΩ (Vgs=-10V)
- Rds(on) < 74mΩ (Vgs=-4.5V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

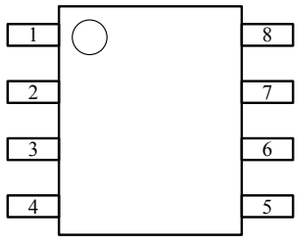
Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		Vds	-30	V	
Gate-source voltage		Vgs	±20	V	
Continuous drain current	Ta=25°C	Id	-5	A	
	Ta=70°C		-4		
Pulsed drain current		Idm	-30	A	3
Avalanche current		Ias, Iar	17	A	3
Avalanche energy	L=0.1mH	Eas, Ear	14	mJ	3
Power dissipation	Tc=25°C	Pd	2.0	W	2
	Tc=70°C		1.3		
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C	

■Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Thermal resistance junction-to-ambient	t≤10s	Rθja	48.0	62.5	°C/W	1
Thermal resistance junction-to-ambient	Steady-state		74.0	110.0	°C/W	1, 4
Thermal resistance junction-to-lead	Steady-state	Rθjl	35.0	40.0	°C/W	

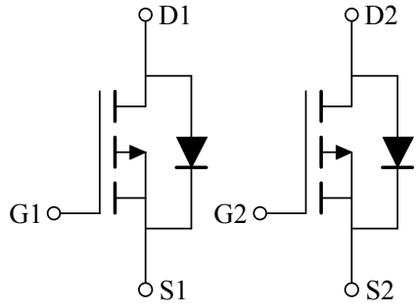
■Pin configuration

SOP-8(TOP VIEW)



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

■Circuit



■Electrical characteristics

Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V		-30			V
Zero gate voltage drain current	Idss	Vds=-30V, Vgs=0V				-1	μA
			Ta=55°C			-5	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA		-1.5	-2.0	-2.5	V
On state drain current	Id(on)	Vgs=-10V, Vds=-5V		-30			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-5A			32	46	mΩ
			Ta=125°C		48	68	
		Vgs=-4.5V, Id=-4A			51	74	
Forward transconductance	Gfs	Vds=-5V, Id=-5A			13		S
Diode forward voltage	Vsd	Is=-1A, Vgs=0V			-0.7	-1.0	V
Max. body-diode continuous current	Is					-2.5	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz			520		pF
Output capacitance	Coss				100		pF
Reverse transfer capacitance	Crss				65		pF
Gate resistance	Rg	Vgs=0V, Vds=0V, f=1MHz		3.5	7.5	11.5	Ω
SWITCHING PARAMETERS							
Total gate charge (10V)	Qg	Vgs=-10V, Vds=-15V Id=-5A			9.2	11.0	nC
Total gate charge (4.5V)	Qg				4.6	6.0	nC
Gate-source charge	Qgs				1.6		nC
Gate-drain charge	Qgd				2.2		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V RL=3Ω, Rgen=3Ω			7.5		ns
Turn-on rise time	tr				5.5		ns
Turn-off delay time	td(off)				19.0		ns
Turn-off fall time	tf				7.0		ns
Body diode reverse recovery time	trr	If=-5A, dIf/dt=100A/μs			11.0		ns
Body diode reverse recovery charge	Qrr	If=-5A, dIf/dt=100A/μs			5.3		nC

NOTE :

1. The value of Rθja is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with Ta=25°C. The value in any given application depends on the user's specific board design.
2. The power dissipation Pd is based on Tj(max)=150°C, using ≤ 10s junction-to-ambient thermal resistance.
3. Repetitive rating, pulse width limited by junction temperature Tj(max)=150°C. Ratings are based on low frequency and duty cycles to keep initial Tj=25°C.
4. The Rθja is the sum of the thermal impedence from junction to lead Rθjal and lead to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.
6. These curves are based on the junction-to-ambient thermal impedence which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of Tj(max)=150°C. The SOA curve provides a single pulse rating.

■Typical electrical and thermal characteristics

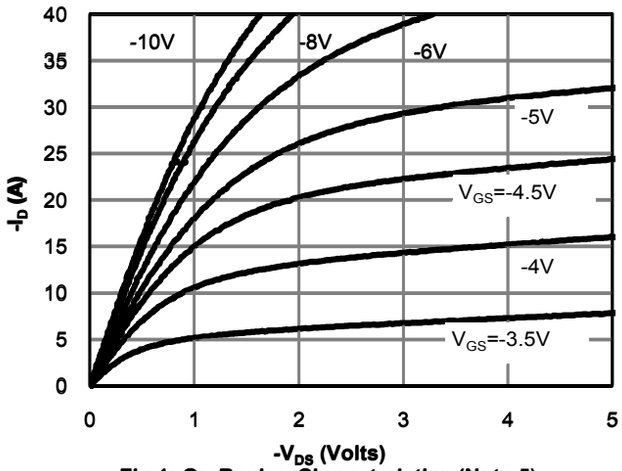


Fig 1: On-Region Characteristics (Note 5)

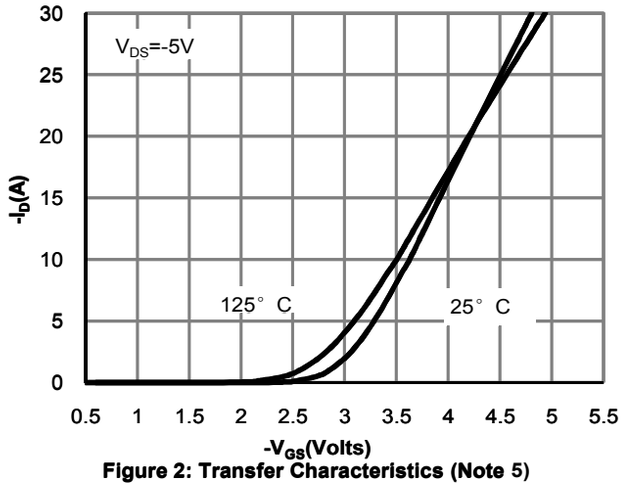


Figure 2: Transfer Characteristics (Note 5)

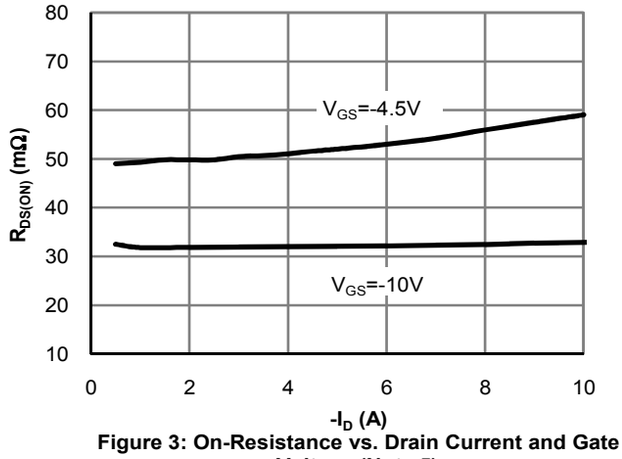


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note 5)

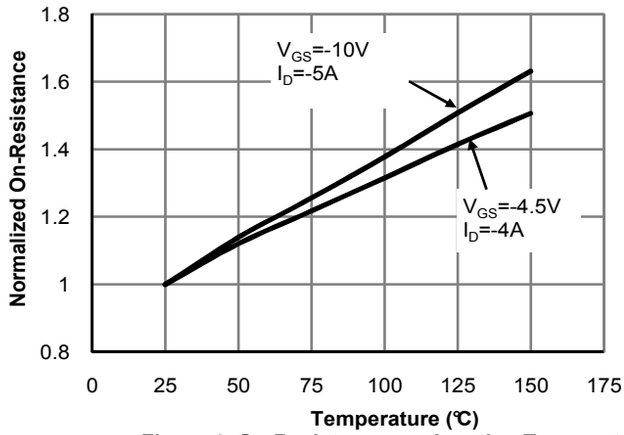


Figure 4: On-Resistance vs. Junction Temperature (Note 5)

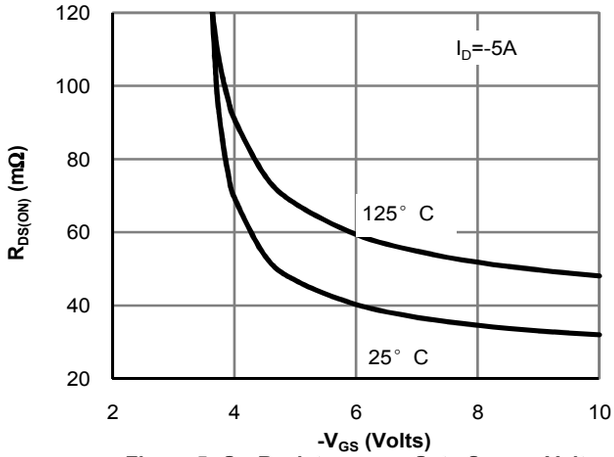


Figure 5: On-Resistance vs. Gate-Source Voltage (Note 5)

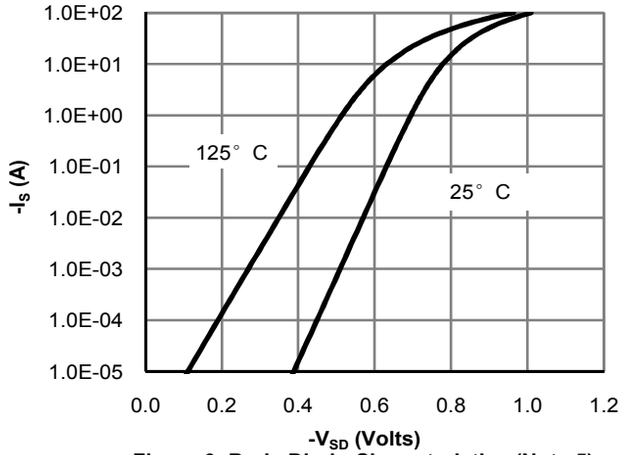


Figure 6: Body-Diode Characteristics (Note 5)

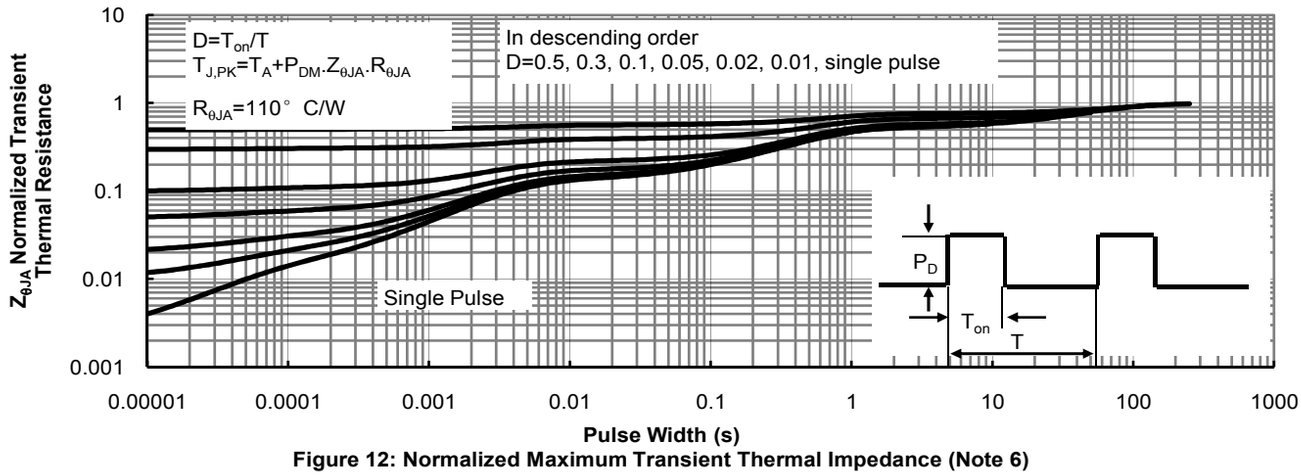


Figure 12: Normalized Maximum Transient Thermal Impedance (Note 6)

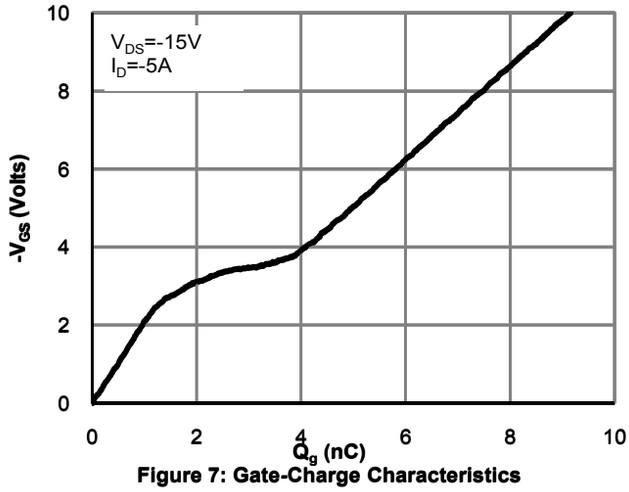


Figure 7: Gate-Charge Characteristics

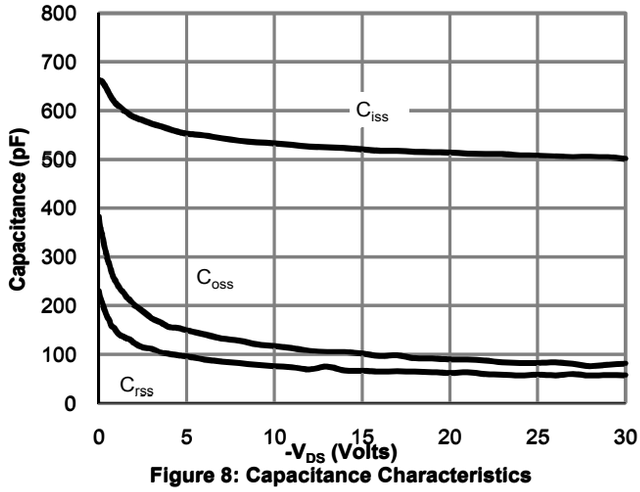


Figure 8: Capacitance Characteristics

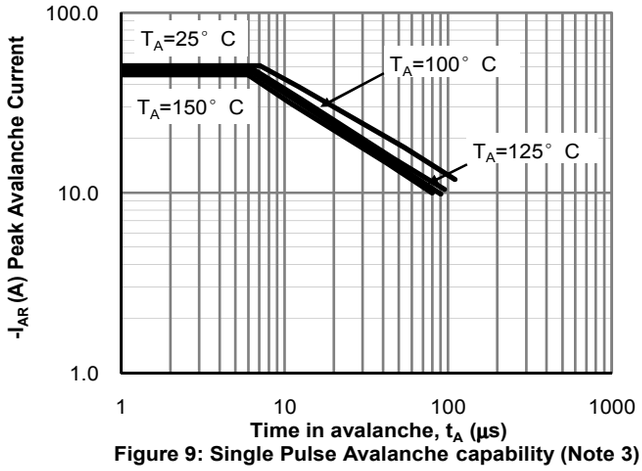


Figure 9: Single Pulse Avalanche capability (Note 3)

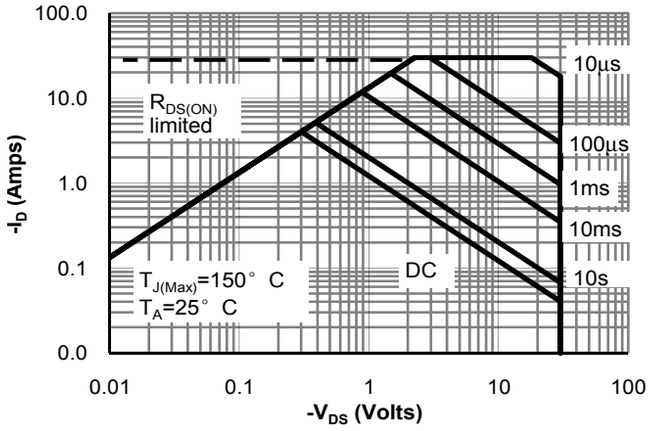


Figure 10: Maximum Forward Biased Safe Operating Area (Note 6)

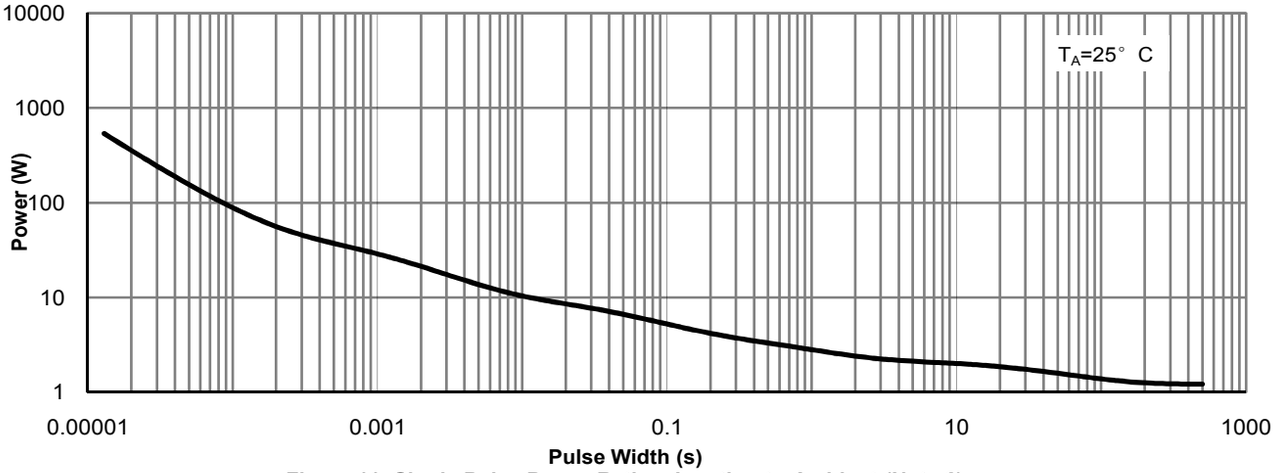
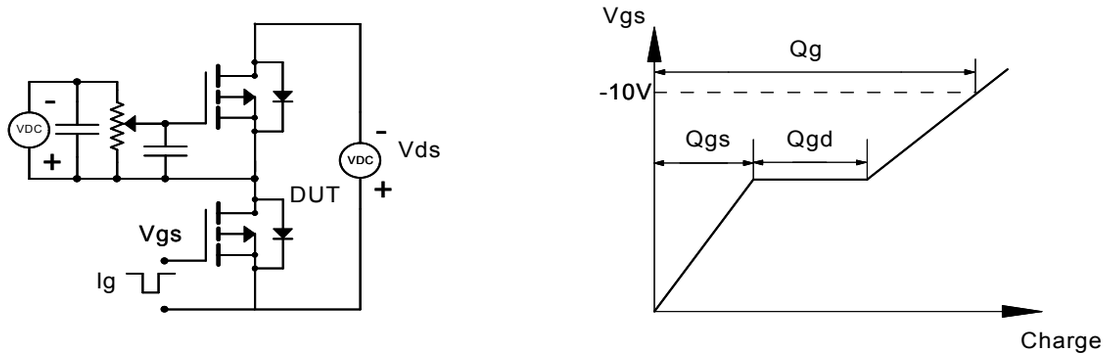


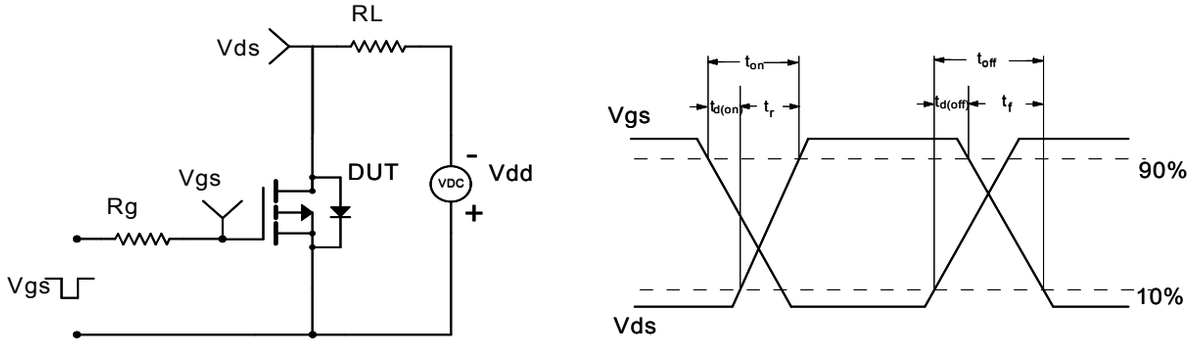
Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note 6)

■Test circuit & waveform

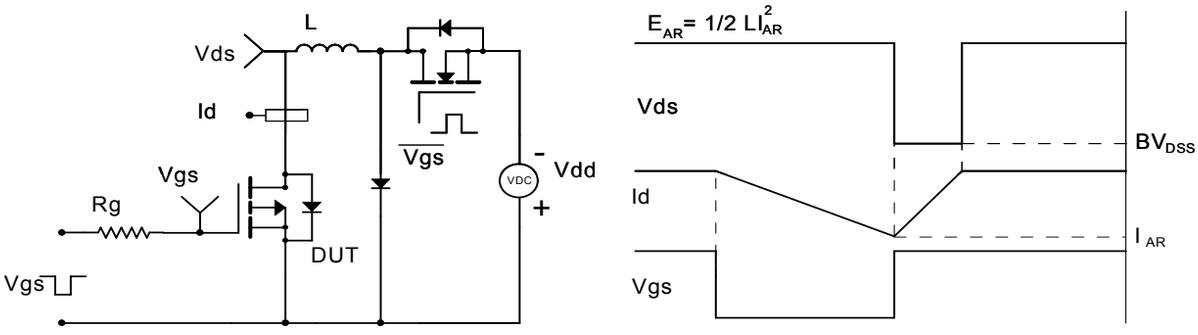
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms