

Dual N-channel MOSFET

ELM14822AA-N

General description

ELM14822AA-N uses advanced trench technology to provide excellent $R_{ds(on)}$ and low gate charge.

Features

- $V_{ds}=30V$
- $I_d=8.5A$ ($V_{gs}=10V$)
- $R_{ds(on)} < 16m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 26m\Omega$ ($V_{gs}=4.5V$)

Maximum absolute ratings

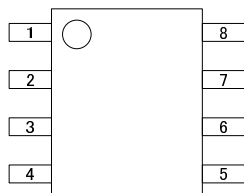
Parameter	Symbol	Limit	Unit	Note
Drain-source voltage	V_{ds}	30	V	
Gate-source voltage	V_{gs}	± 20	V	
Continuous drain current	I_d	8.5	A	1
		6.6		
Pulsed drain current	I_{dm}	30	A	2
Power dissipation	P_d	2.00	W	
		1.28		
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	$^{\circ}C$	

Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-ambient	$t \leq 10s$	$R\theta_{ja}$	48.0	62.5	$^{\circ}C/W$	1
Maximum junction-to-ambient	Steady-state		74.0	110.0	$^{\circ}C/W$	
Maximum junction-to-lead	Steady-state	$R\theta_{jl}$	35.0	40.0	$^{\circ}C/W$	3

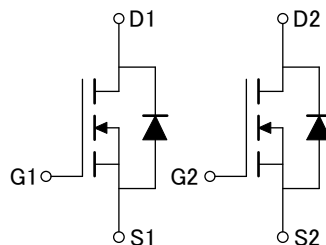
Pin configuration

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



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Electrical characteristics

T_a=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BV _{dss}	I _d =250 μA, V _{gs} =0V	30			V
Zero gate voltage drain current	I _{dss}	V _{ds} =24V			1	μA
		V _{gs} =0V		T _j =55°C	5	
Gate-body leakage current	I _{gss}	V _{ds} =0V, V _{gs} =±20V			100	nA
Gate threshold voltage	V _{gs(th)}	V _{ds} =V _{gs} , I _d =250 μA	1.0	1.8	3.0	V
On state drain current	I _{d(on)}	V _{gs} =10V, V _{ds} =5V	30			A
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V		13.4	16.0	mΩ
		I _d =8.5A	T _j =125°C	20.0	25.0	
		V _{gs} =4.5V, I _d =6A		21.0	26.0	mΩ
Forward transconductance	G _{fs}	V _{ds} =5V, I _d =8.5A		23		S
Diode forward voltage	V _{sd}	I _s =1A, V _{gs} =0V		0.76	1.00	V
Max. body-diode continuous current	I _s				3	A
DYNAMIC PARAMETERS						
Input capacitance	C _{iss}			1040	1250	pF
Output capacitance	C _{oss}	V _{gs} =0V, V _{ds} =15V, f=1MHz		180		pF
Reverse transfer capacitance	C _{rss}			110		pF
Gate resistance	R _g	V _{gs} =0V, V _{ds} =0V, f=1MHz		0.70	0.85	Ω
SWITCHING PARAMETERS						
Total gate charge (10V)	Q _g	V _{gs} =10V, V _{ds} =15V, I _d =8.5A		19.20	23.00	nC
Total gate charge (4.5V)	Q _g			9.36	11.20	nC
Gate-source charge	Q _{gs}			2.60		nC
Gate-drain charge	Q _{gd}			4.20		nC
Turn-on delay time	t _{d(on)}			5.2	7.5	ns
Turn-on rise time	t _r	V _{gs} =10V, V _{ds} =15V		4.4	6.5	ns
Turn-off delay time	t _{d(off)}	R _l =1.8 Ω, R _{gen} =3 Ω		17.3	25.0	ns
Turn-off fall time	t _f			3.3	5.0	ns
Body diode reverse recovery time	t _{rr}	I _f =8.5A, dI/dt=100A/μs		16.7	21.0	ns
Body diode reverse recovery charge	Q _{rr}	I _f =8.5A, dI/dt=100A/μs		6.7	10.0	nC

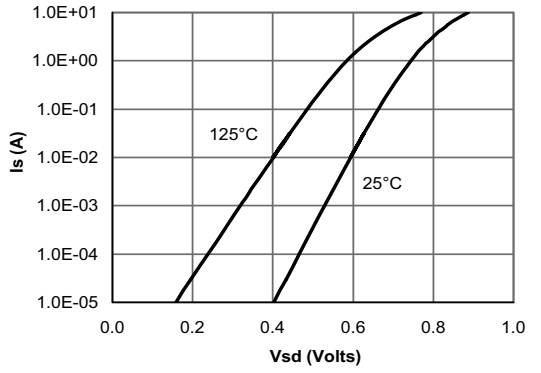
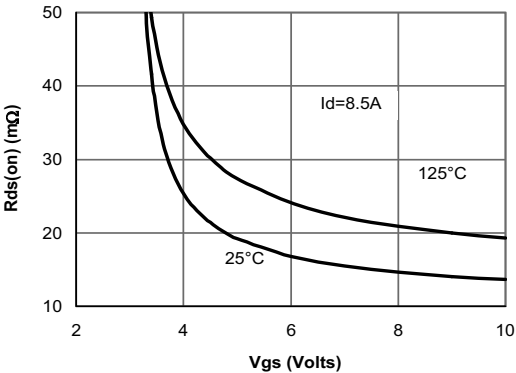
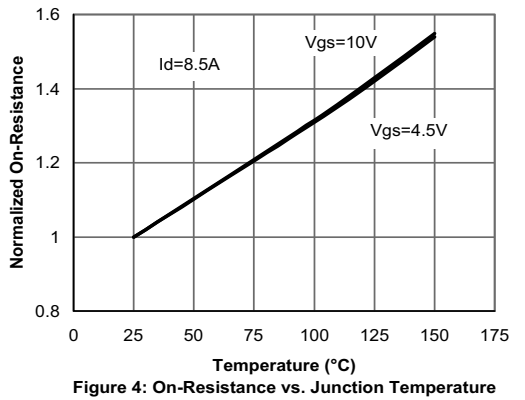
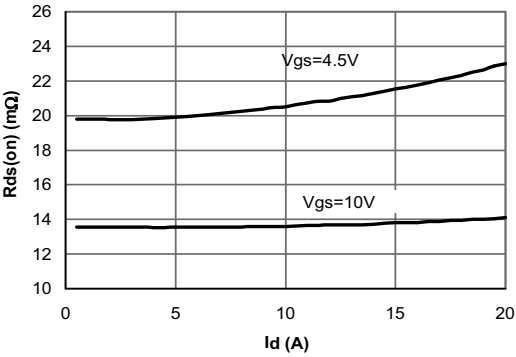
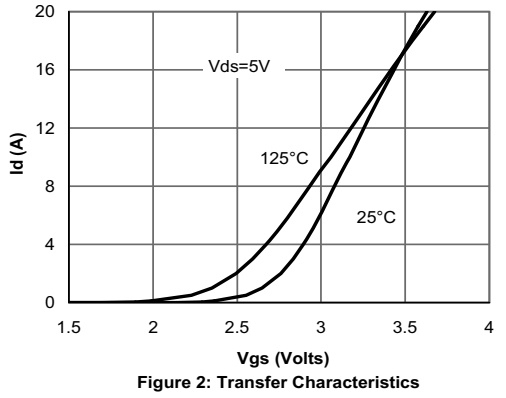
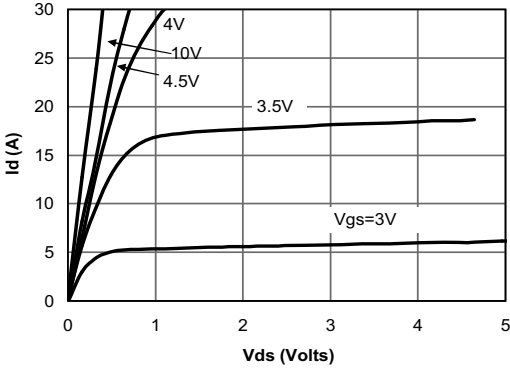
NOTE :

1. The value of R_{θja} is measured with the device mounted on 1in² FR-4 board of 2oz. Copper, in still air environment with T_a=25°C. The value in any given applications depends on the user's specific board design, The current rating is based on the t ≤ 10s thermal resistance rating.
2. Repetitive rating, pulse width limited by junction temperature.
3. The R_{θja} is the sum of the thermal impedance from junction to lead R_{θjl} and lead to ambient.
4. The static characteristics in Figures 1 to 6 are obtained using 80μs pulses, duty cycle 0.5%max.
5. These tests are performed with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_a=25°C. The SOA curve provides a single pulse rating.

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Typical electrical and thermal characteristics



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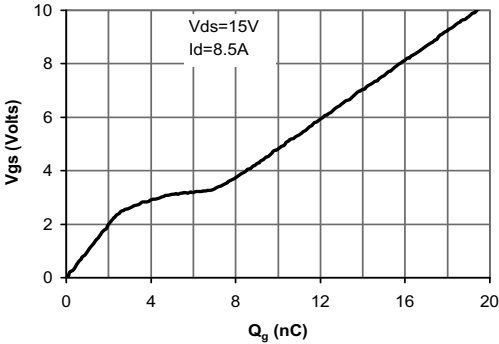


Figure 7: Gate-Charge Characteristics

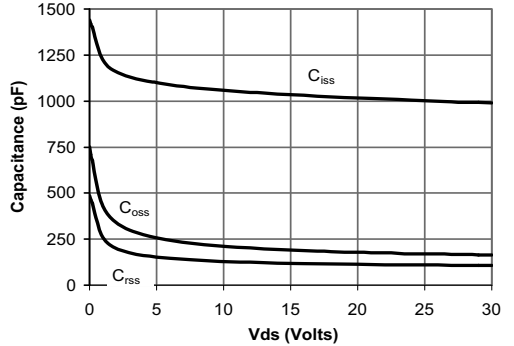


Figure 8: Capacitance Characteristics

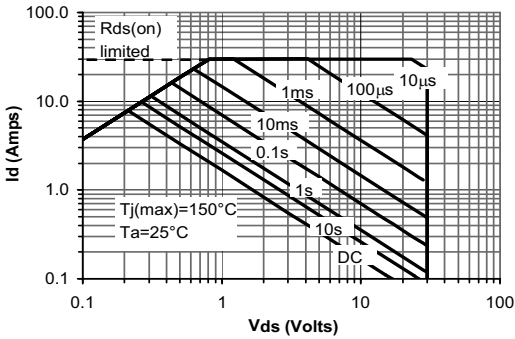


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

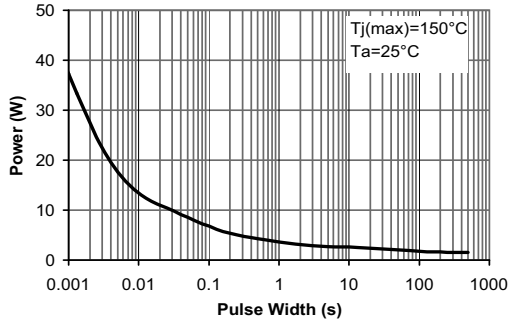


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

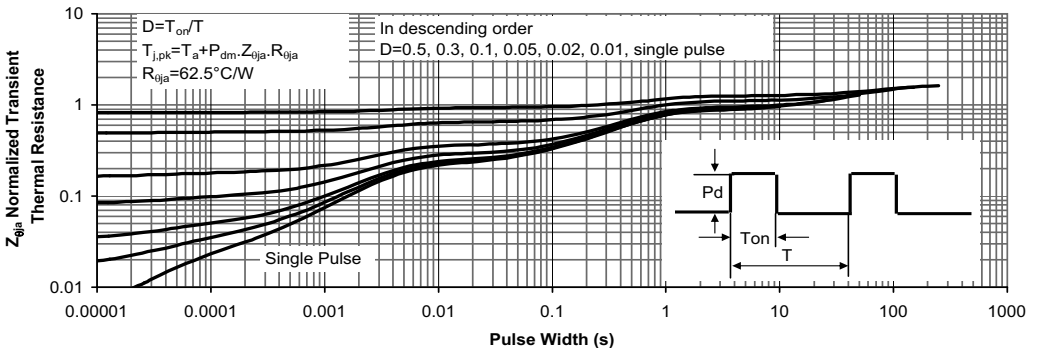


Figure 11: Normalized Maximum Transient Thermal Impedance