

Dual N-channel MOSFET

ELM14828AA-N

■ General description

ELM14828AA-N uses advanced trench technology to provide excellent $R_{ds(on)}$ and low gate charge.

■ Features

- $V_{ds}=60V$
- $I_d=4.5A$ ($V_{gs}=10V$)
- $R_{ds(on)} < 56m\Omega$ ($V_{gs}=10V$)
- $R_{ds(on)} < 77m\Omega$ ($V_{gs}=4.5V$)

■ Maximum absolute ratings

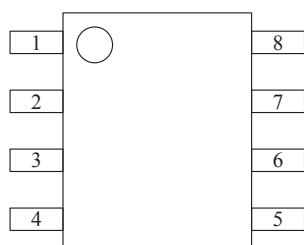
Parameter	Symbol	Limit	Unit	Note	
Drain-source voltage	V_{ds}	60	V		
Gate-source voltage	V_{gs}	± 20	V		
Continuous drain current	I_d	$T_a=25^\circ C$	4.5	A	1
		$T_a=70^\circ C$	3.6		
Pulsed drain current	I_{dm}	20	A	2	
Power dissipation	P_d	$T_a=25^\circ C$	2.00	W	
		$T_a=70^\circ C$	1.28		
Junction 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	60.0	$^\circ C/W$	3

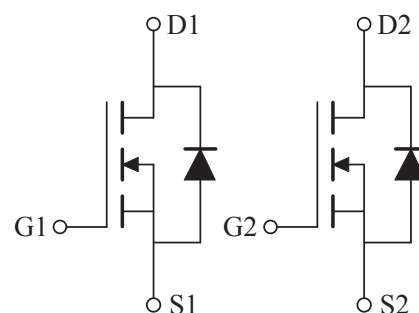
■ Pin configuration

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

Ta=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BV _{dss}	I _d =250μA, V _{gs} =0V	60			V	
Zero gate voltage drain current	I _{dss}	V _{ds} =60V V _{gs} =0V			1	μA	
		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 =250μA	1.0	2.1	3.0	V	
On state drain current	I _{d(on)}	V _{gs} =10V, V _{ds} =5V	20			A	
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =10V I _d =4.5A		46	56	mΩ	
		T _j =125°C		80	100		
		V _{gs} =4.5V, I _d =3A		64	77	mΩ	
Forward transconductance	G _{fs}	V _{ds} =5V, I _d =4.5A		11		S	
Diode forward voltage	V _{sd}	I _s =1A, V _{gs} =0V		0.74	1.00	V	
Max. body-diode continuous current	I _s				3	A	
Pulsed body diode current	I _{sm}				20	A	2
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}			450	540	pF	
Output capacitance	C _{oss}	V _{gs} =0V, V _{ds} =30V, f=1MHz		60		pF	
Reverse transfer capacitance	C _{rss}			25		pF	
Gate resistance	R _g	V _{gs} =0V, V _{ds} =0V, f=1MHz	1.30	1.65	2.00	Ω	
SWITCHING PARAMETERS							
Total gate charge (10V)	Q _g			8.5	10.5	nC	
Total gate charge (4.5V)	Q _g	V _{gs} =10V, V _{ds} =30V		4.3	5.5	nC	
Gate-source charge	Q _{gs}	I _d =4.5A		1.6		nC	
Gate-drain charge	Q _{gd}			2.2		nC	
Turn-on delay time	t _{d(on)}			4.7		ns	
Turn-on rise time	t _r	V _{gs} =10V, V _{ds} =30V		2.3		ns	
Turn-off delay time	t _{d(off)}	R _l =6.7Ω, R _{gen} =3Ω		15.7		ns	
Turn-off fall time	t _f			1.9		ns	
Body diode reverse recovery time	t _{rr}	I _f =4.5A, dI/dt=100A/μs		27.5	35.0	ns	
Body diode reverse recovery charge	Q _{rr}	I _f =4.5A, dI/dt=100A/μs		32.0		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 Ta=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 Ta=25°C. The SOA curve provides a single pulse rating.

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■ Typical electrical and thermal characteristics

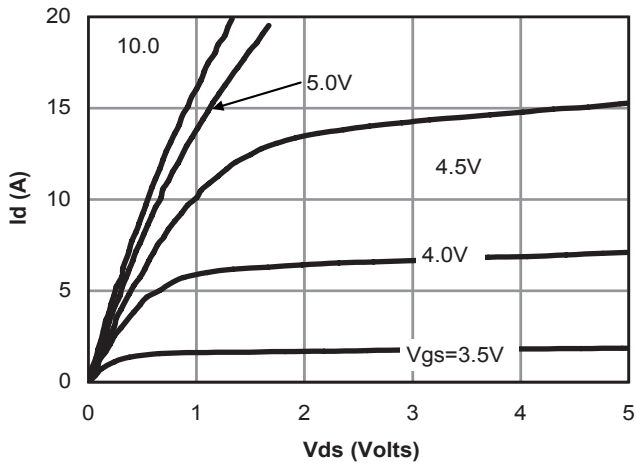


Fig 1: On-Region Characteristics

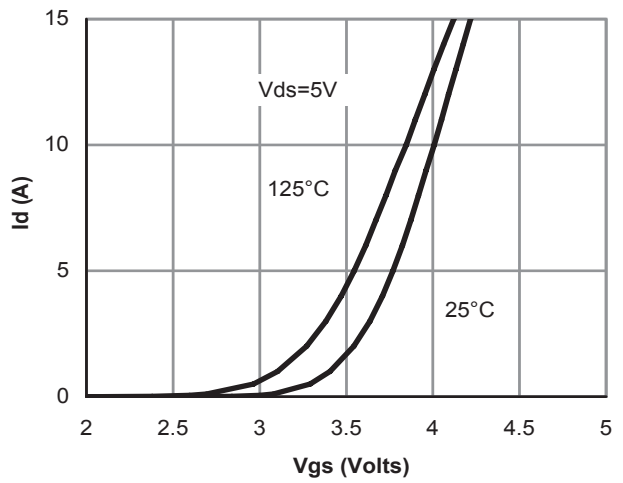


Figure 2: Transfer Characteristics

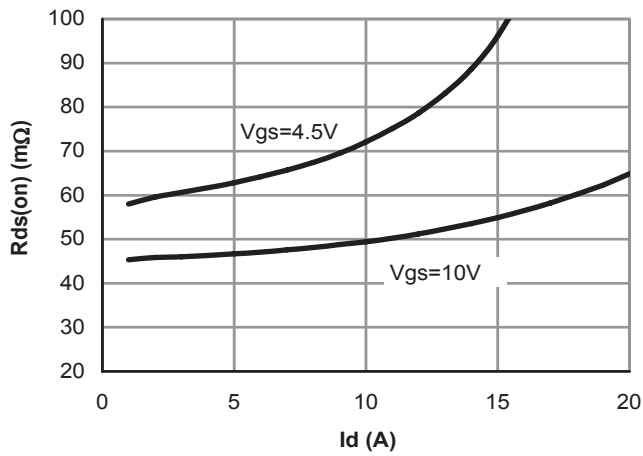


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

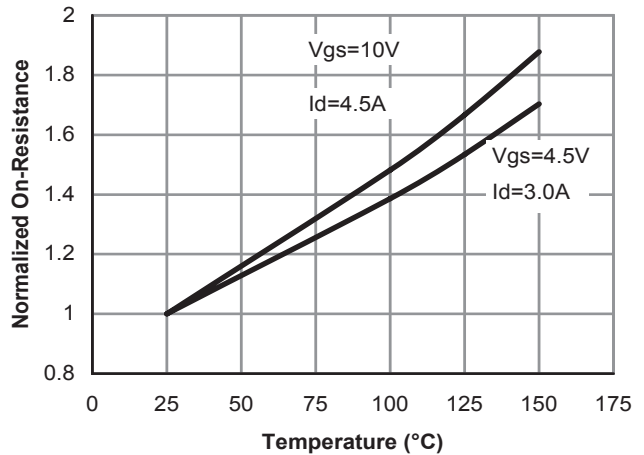


Figure 4: On-Resistance vs. Junction Temperature

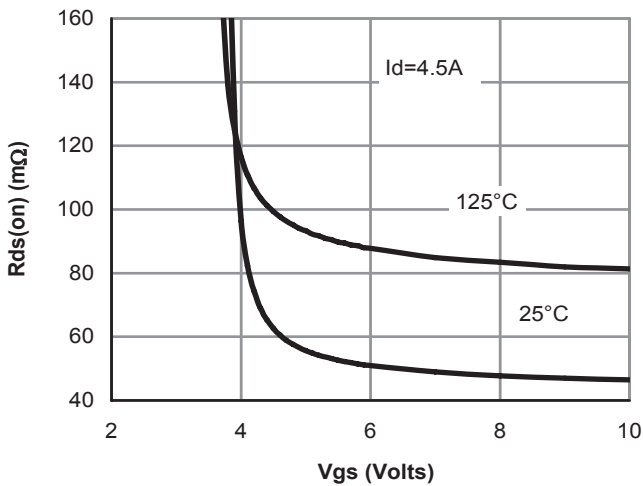


Figure 5: On-Resistance vs. Gate-Source Voltage

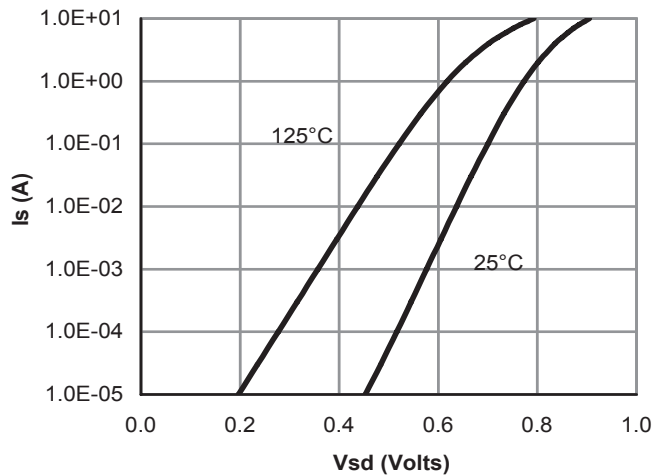


Figure 6: Body-Diode Characteristics

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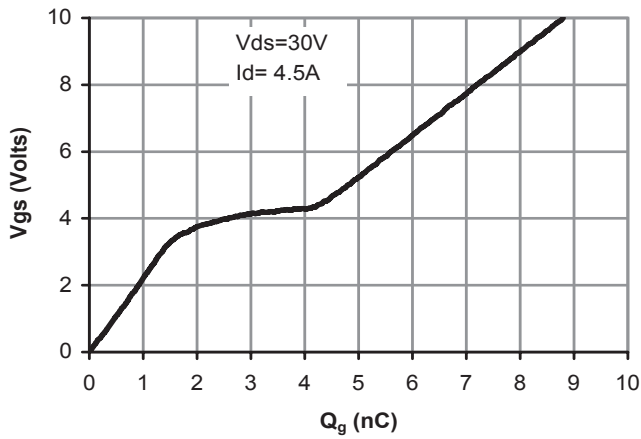


Figure 7: Gate-Charge Characteristics

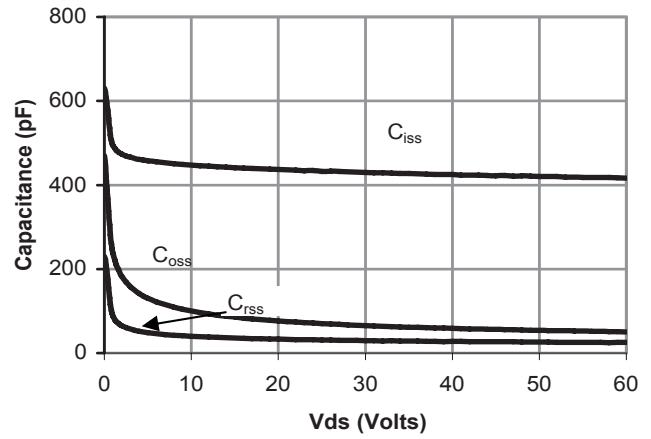


Figure 8: Capacitance Characteristics

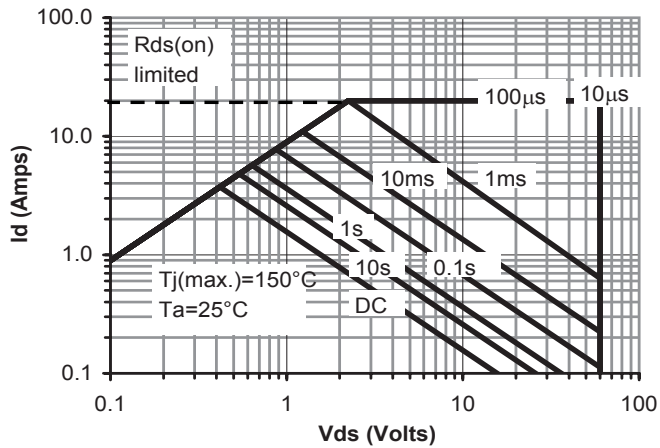


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

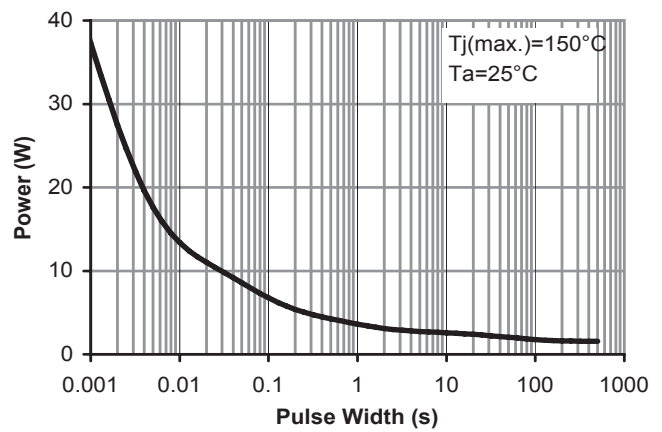


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

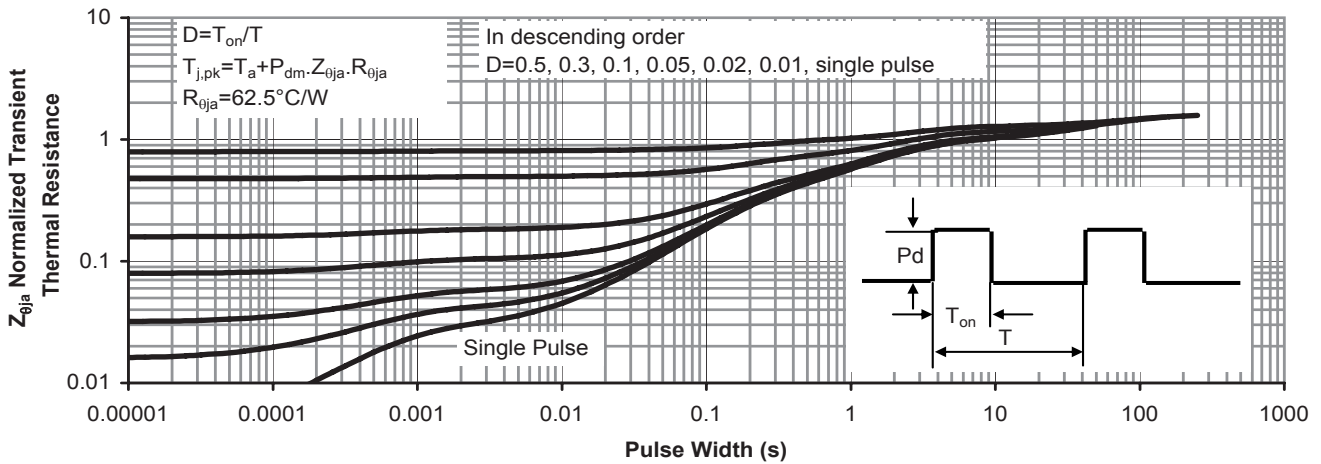


Figure 11: Normalized Maximum Transient Thermal Impedance