

Single N-channel MOSFET

ELM36402EA-S

General description

ELM36402EA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate resistance.

Features

- $V_{ds}=20V$
- $I_d=6.5A$
- $R_{ds(on)} < 24m\Omega$ ($V_{gs}=4.5V$)
- $R_{ds(on)} < 35m\Omega$ ($V_{gs}=2.5V$)

Maximum absolute ratings

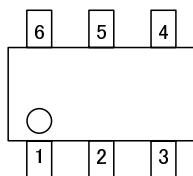
Parameter	Symbol	Limit	Unit	Note
Gate-source voltage	V_{gs}	± 12	V	
Continuous drain current	I_d	6.5	A	
		4.5		
Pulsed drain current	I_{dm}	20	A	3
Power dissipation	P_d	1.6	W	
		1.2		
Junction and storage temperature range	T_j, T_{stg}	-55 to 150	$^{\circ}C$	

Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit	Note
Maximum junction-to-case	Steady-state	$R\theta_{jc}$		30	$^{\circ}C/W$	
Maximum junction-to-ambient	Steady-state	$R\theta_{ja}$		78	$^{\circ}C/W$	

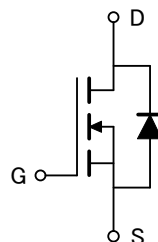
Pin configuration

SOT-26 (TOP VIEW)



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

Circuit



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■ Electrical characteristics

T_a=25°C

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BV _{dss}	I _d =250 μA, V _{gs} =0V	20			V	
Zero gate voltage drain current	I _{dss}	V _{ds} =16V, V _{gs} =0V			1	μA	
		V _{ds} =16V, V _{gs} =0V, T _j =125°C			10		
Gate-body leakage current	I _{gss}	V _{ds} =0V, V _{gs} =±12V			±100	nA	
Gate threshold voltage	V _{gs(th)}	V _{ds} =V _{gs} , I _d =250 μA	0.45	0.75	1.20	V	
On state drain current	I _{d(on)}	V _{gs} =4.5V, V _{ds} =5V	10			A	1
Static drain-source on-resistance	R _{ds(on)}	V _{gs} =4.5V, I _d =6.5A		20	24	mΩ	1
		V _{gs} =2.5V, I _d =5A		25	35	mΩ	
Forward transconductance	G _{fs}	V _{ds} =5V, I _d =6.5A		7.2		S	1
Diode forward voltage	V _{sd}	I _f =I _s , V _{gs} =0V			1.2	V	1
Max. body-diode continuous current	I _s				1.3	A	
DYNAMIC PARAMETERS							
Input capacitance	C _{iss}	V _{gs} =0V, V _{ds} =10V, f=1MHz		1125		pF	
Output capacitance	C _{oss}			290		pF	
Reverse transfer capacitance	C _{rss}			145		pF	
SWITCHING PARAMETERS							
Total gate charge	Q _g	V _{gs} =4.5V, V _{ds} =5V, I _d =6.5A		10.5	16.0	nC	2
Gate-source charge	Q _{gs}			1.5		nC	2
Gate-drain charge	Q _{gd}			2.2		nC	2
Turn-on delay time	t _{d(on)}	V _{gs} =4.5V, V _{ds} =10V, I _d ≅1A R _{gen} =6 Ω		9	18	ns	2
Turn-on rise time	t _r			13	24	ns	2
Turn-off delay time	t _{d(off)}			26	42	ns	2
Turn-off fall time	t _f			11	20	ns	2

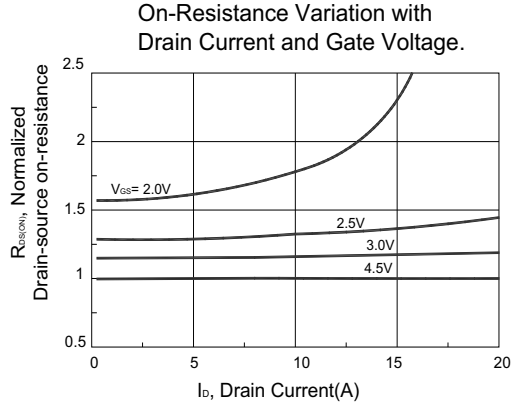
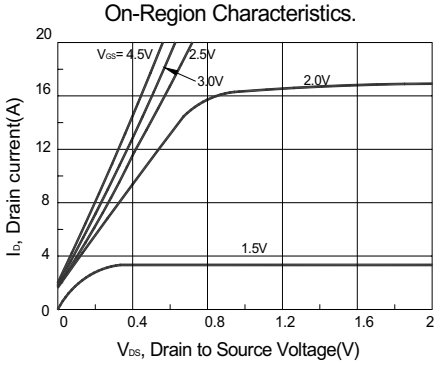
NOTE :

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

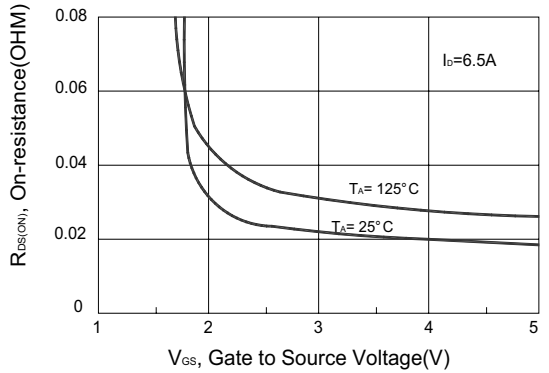
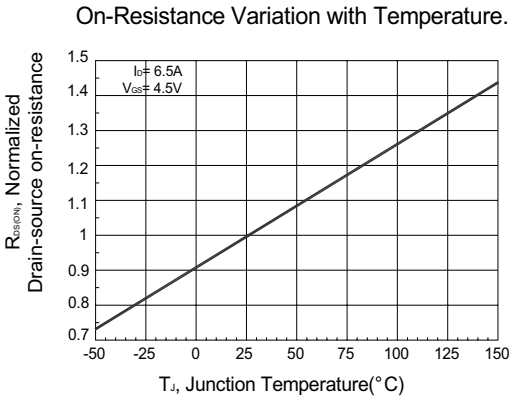
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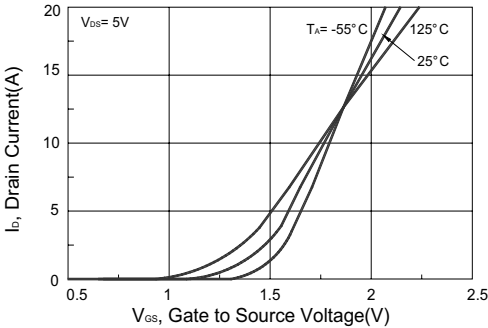
Typical electrical and thermal characteristics



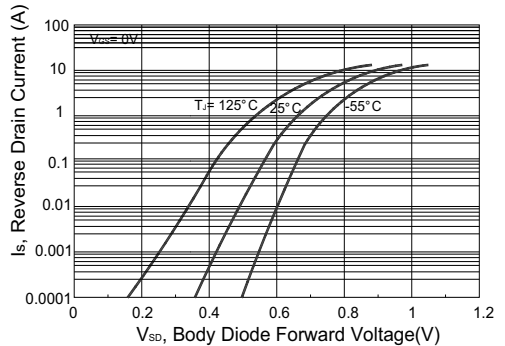
On-Resistance Variation with Gate-to-Source Voltage.



Transfer Characteristics.



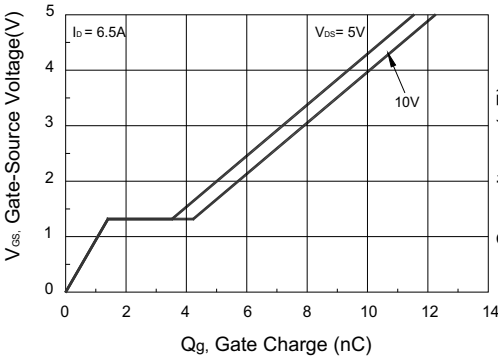
Body Diode Forward Voltage Variation with Source Current and Temperature.



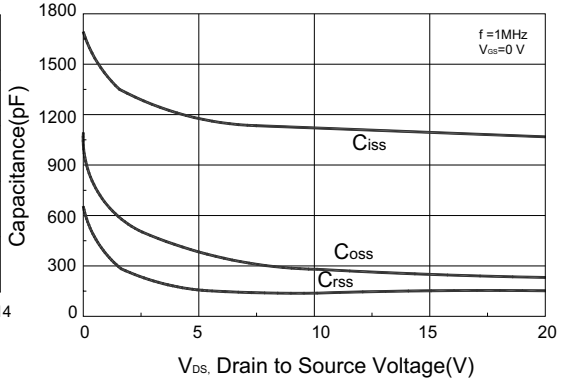
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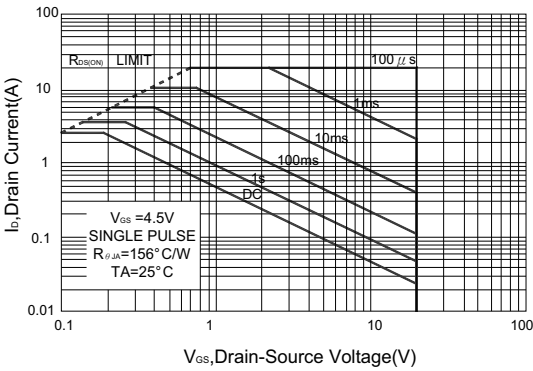
Gate-Charge Characteristics



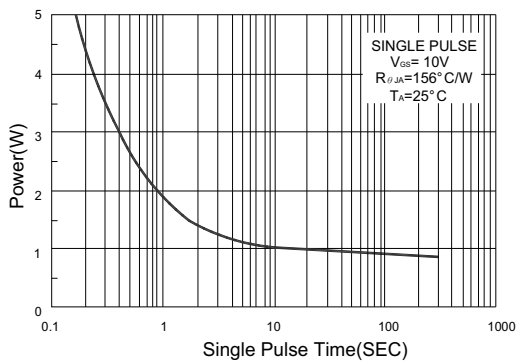
Capacitance Characteristics



Maximum Safe Operating Area.



Single Pulse Maximum Power Dissipation.



Transient Thermal Response Curve.

