Single P-channel MOSFET

ELM4P2611FCA-S

■General description

ELM4P2611FCA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

■特長

- Vds=-20V
- Id=-4.9A (Vgs=-4.5V)
- Rds(on) = 45mΩ (Vgs=-4.5V)
- Rds(on) = 60mΩ (Vgs=-2.5V)
- Rds(on) = 85mΩ (Vgs=-1.8V)

■Maximum absolute ratings

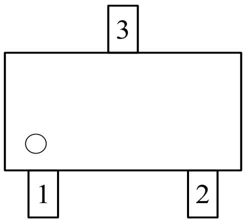
Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		Vds	-20	V	
Gate-source voltage		Vgs	±12	V	
Continuous drain current (Vgs=-4.5V)	Ta=25°C	Id	-4.9	A	1
	Ta=70°C		-3.9		
Pulsed drain current		Idm	-14	A	2
Power dissipation	Ta=25°C	Pd	1.31	W	3
	Ta=70°C		0.84		
Storage temperature range		Tstg	- 55 to +150	°C	
Operating junction temperature range		Tj	- 55 to +150	°C	

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Thermal resistance junction-to-ambient	Rθja	-	120	°C/W	1
Thermal resistance junction-to-ambient (t ≤ 10s)		-	95	°C/W	

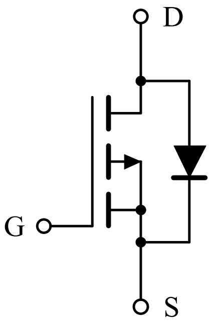
■Pin configuration

SOT-23S(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit



■Electrical characteristics

Tj=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit	Note
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-20	-	-	V	
Static drain-source on-resistance	Rds(on)	Vgs=-4.5V, Id=-4.9A	-	40	45	mΩ	2
		Vgs=-2.5V, Id=-3.4A	-	50	60		
		Vgs=-1.8V, Id=-2.0A	-	65	85		
Gate threshold voltage	Vgs(th)	Vgs=Vds, Id=-250μA	-0.4	-	-1.0	V	
Zero gate voltage drain current	Idss	Vds=-16V, Vgs=0V	-	-	-1	μA	
		Vds=-16V, Vgs=0V, Tj=55°C	-	-	-5		
Gate-body leakage current	Igss	Vgs=±12V, Vds=0V	-	-	±100	nA	
Forward transconductance	Gfs	Vds=-5V, Id=-3A	-	12.8	-	S	
Continuous source current	Is	Vgs=Vds=0V, Force Current	-	-	-4.9	A	1, 4
Diode forward voltage	Vsd	Vgs=0V, Is=-1A	-	-	-1	V	2
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vds=-15V, Vgs=0V f=1MHz	-	857	1200	pF	
Output capacitance	Coss		-	114	160	pF	
Reverse transfer capacitance	Crss		-	108	151	pF	
SWITCHING PARAMETERS							
Total gate charge (-4.5V)	Qg	Vds=-15V, Vgs=-4.5V Id=-3A	-	10.20	14.30	nC	
Gate-source charge	Qgs		-	1.89	2.60	nC	
Gate-drain charge	Qgd		-	3.10	4.30	nC	
Turn-on delay time	td(on)	Vds=-10V, Vgs=-4.5V Rgen=3.3Ω, Id=-3A	-	5.6	11.2	ns	
Turn-on rise time	tr		-	40.8	73.0	ns	
Turn-off delay time	td(off)		-	33.6	67.0	ns	
Turn-off fall time	tf		-	18.0	36.0	ns	
Reverse recovery time	trr	If=-3A, di/dt=100A/μs	-	21.8	-	nS	
Reverse recovery charge	Qrr		-	6.9	-	nC	

NOTE :

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width ≤ 300μs and duty cycle ≤ 2%.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as Id and Idm, in real applications, should be limited by total power dissipation.

■Typical electrical and thermal characteristics

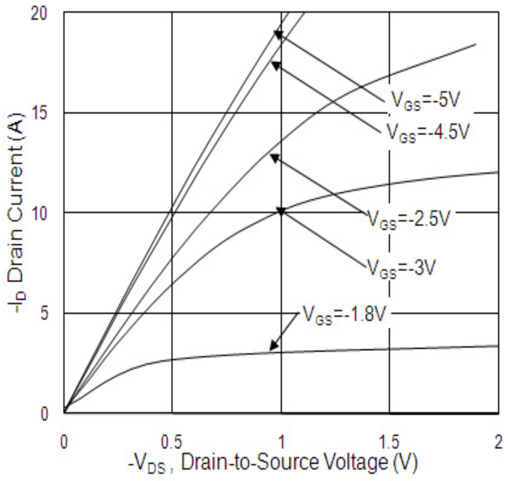


Fig.1 Typical Output Characteristics

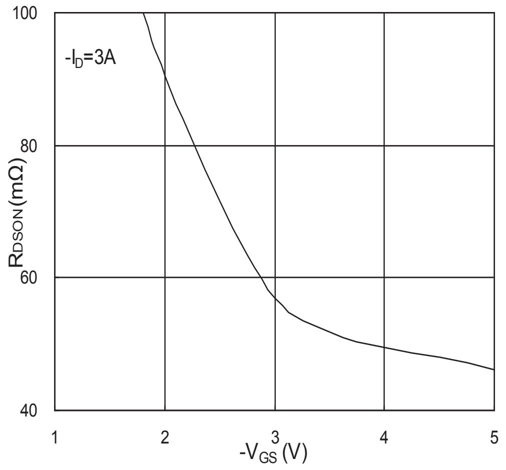


Fig.2 On-Resistance vs. G-S Voltage

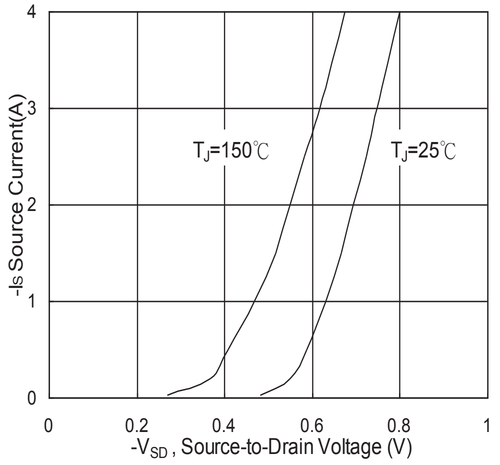


Fig.3 Source Drain Forward Characteristics

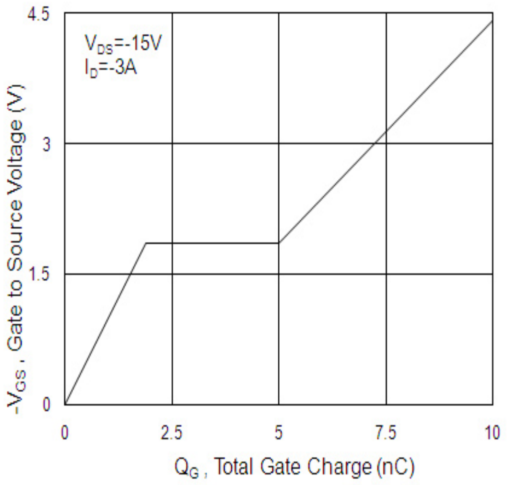


Fig.4 Gate-charge Characteristics

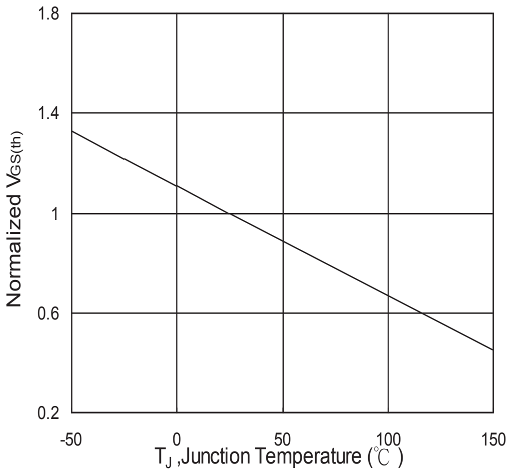


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

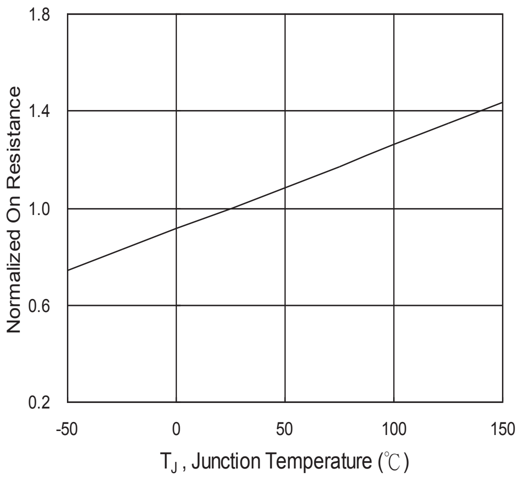


Fig.6 Normalized R_{DSON} vs. T_J

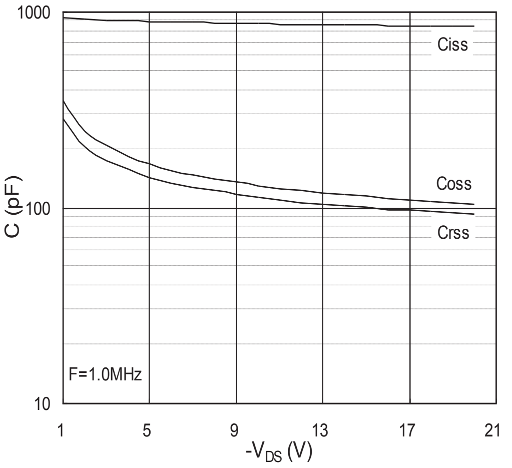


Fig.7 Capacitance

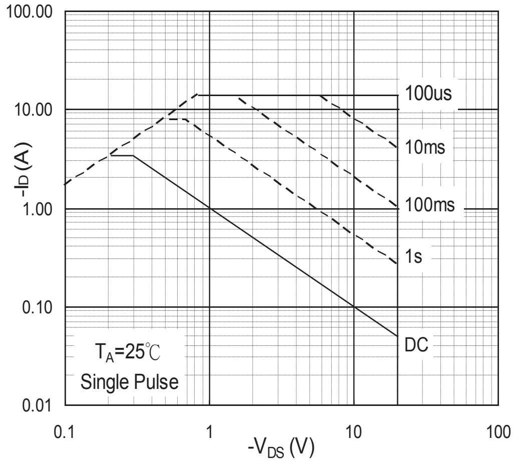


Fig.8 Safe Operating Area

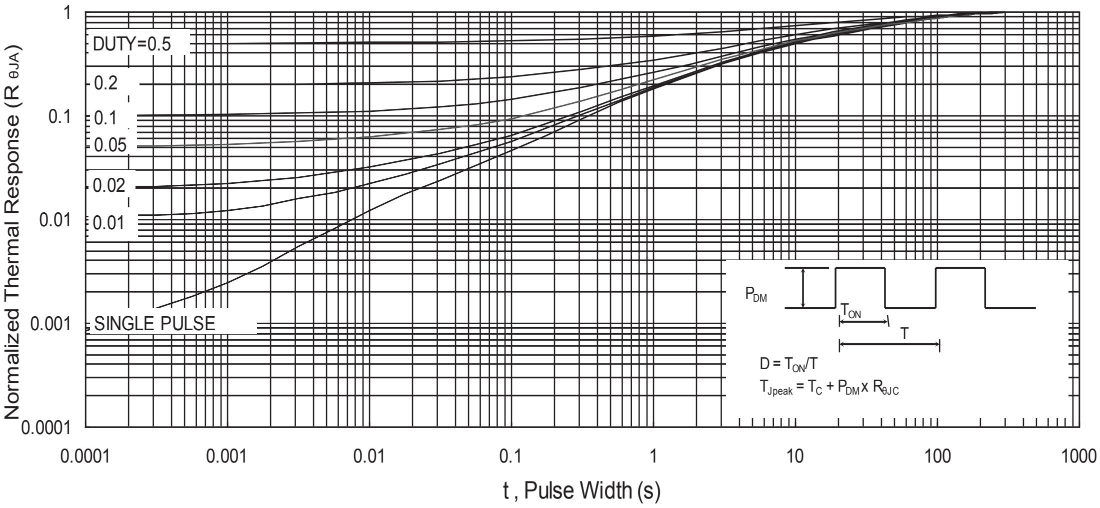


Fig.9 Normalized Maximum Transient Thermal Impedance

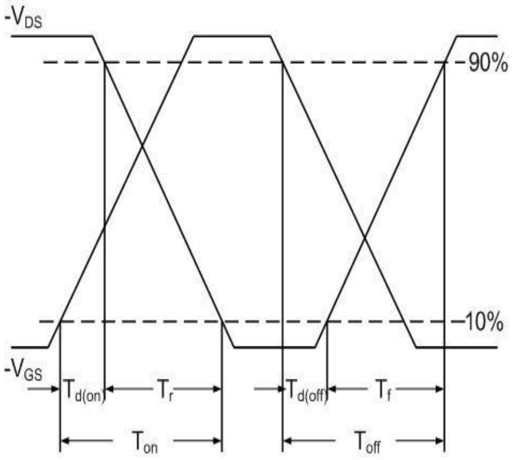


Fig.10 Switching Time Waveform

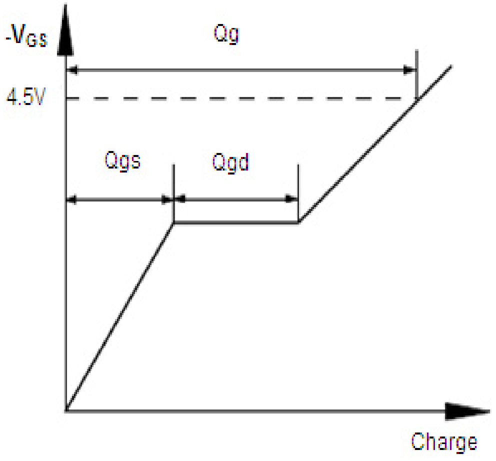
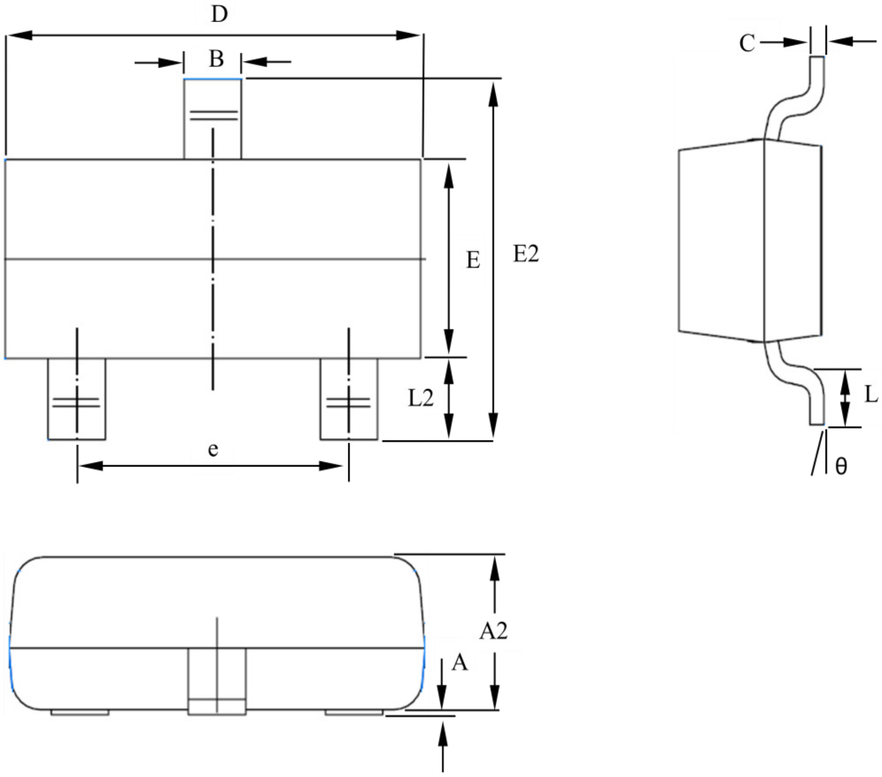


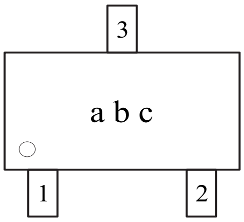
Fig.11 Gate Charge Waveform

■SOT–23S dimension (3,000pcs/reel)



Symbols	Millimeters		Inches		Symbols	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.00	0.10	0.000	0.004	E2	2.25	2.55	0.089	0.100
A2	0.90	1.10	0.035	0.041	L	0.30	0.50	0.012	0.020
B	0.30	0.50	0.012	0.020	L2	0.50	0.60	0.020	0.024
C	0.08	0.15	0.003	0.006	θ	0°	8°	0°	8°
D	2.80	3.00	0.110	0.118	e	1.80	2.00	0.071	0.079
E	1.20	1.40	0.047	0.055					

■Marking



Symbols	Content
a	Product code
b	Yearly code：ex 2019=9, 2020=A, 2021=B, 2022=C...
c	Sequence：1 to 9, A to Z