Single N-channel MOSFET

ELM4N7002EPA-S

■General description

ELM4N7002EPA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage. ESD protection is included.

■Features

- Vds=60V
- Id=600mA
- Rds(on) = 2.0Ω (Vgs=10V)
- Rds(on) = 3.0Ω (Vgs=4.5V)
- Rds(on) = 5.0Ω (Vgs=3.5V)
- ESD = 2KV HBM

■Maximum absolute ratings

Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		Vds	60	V	
Gate-source voltage		Vgs	±20	V	
Continuous drain current	Ta=25°C	Id	600	mA	
	Ta=100°C		380		
Pulsed drain current		Idm	1	A	1
Total power dissipation	Ta=25°C	Pd	0.35	W	
	Ta=100°C		0.14		
Storage temperature range		Tstg	-40 to 150	°C	
Operating junction temperature range		Tj	-40 to 150	°C	

■Thermal characteristics

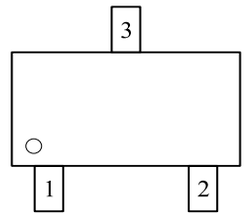
Parameter	Symbol	Typ.	Max.	Unit	Note
Thermal resistance junction-ambient	Rθja	--	350	°C/W	

NOTE :

1. Pulse width limited by maximum junction temperature.

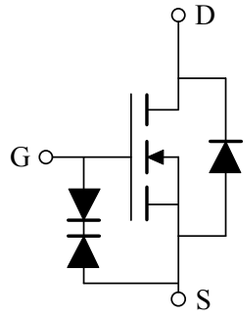
■Pin configuration

SOT-523(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	60	--	--	V	
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=200mA	--	1.6	2.0	Ω	1
		Vgs=4.5V, Id=100mA	--	1.7	3.0		
		Vgs=3.5V, Id=10mA	--	2.1	5.0		
Gate threshold voltage	Vgs(th)	Vgs=Vds, Id=250μA	1.0	1.5	2.5	V	
Drain-source leakage current	Idss	Vds=48V, Vgs=0V	--	--	1	μA	
		Vds=48V, Vgs=0V, Tj=125°C	--	--	30		
On state drain current	Id(on)	Vds=10V, Vgs=10V	1.0	--	--	A	1
Gate-source leakage current	Igss	Vgs=±20V, Vds=0V	--	--	±30	μA	
Forward transconductance	Gfs	Vds=20V, Id=200mA	--	3	--	S	1
Continuous source current	Is	Vgs=Vds=0V, Force current	--	--	300	mA	
Diode forward voltage	Vsd	Vgs=0V, If=200mA	--	--	1.2	V	1
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vds=25V, Vgs=0V, f=1MHz	--	42	--	pF	
Output capacitance	Coss		--	7	--	pF	
Reverse transfer capacitance	Crss		--	3	--	pF	
SWITCHING PARAMETERS							
Total gate charge	Qg	Vds=30V, Vgs=10V Id=200mA	--	1.8	--	nC	2
Gate-source charge	Qgs		--	0.9	--	nC	2
Gate-drain charge	Qgd		--	0.2	--	nC	2

NOTE :

1. Pulse test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
2. Independent of operating temperature.
3. Pulse width limited by maximum junction temperature.

■Typical characteristics

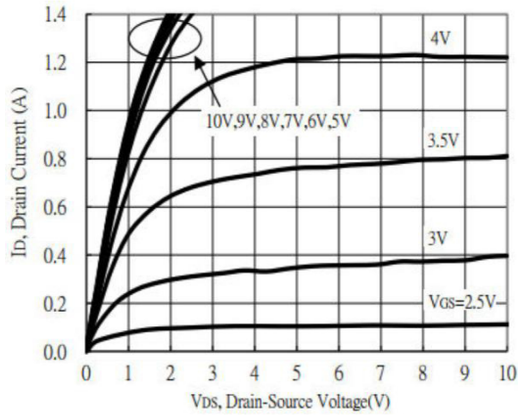


Fig.1 Typical Output Characteristics

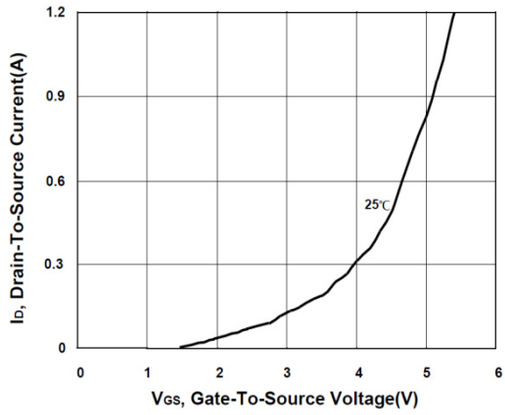


Fig.2 Transfer Characteristics

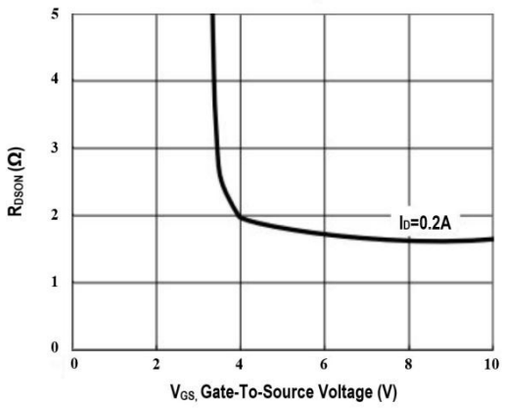


Fig.3 On-Resistance vs G-S Voltage

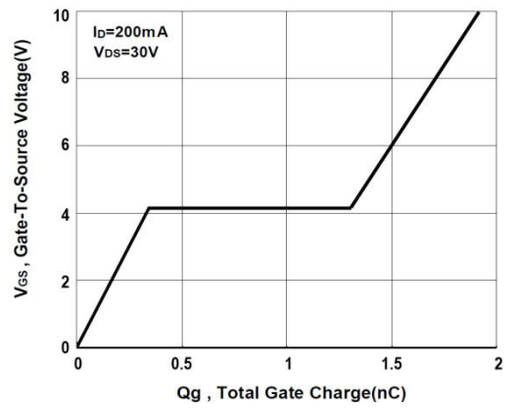


Fig.4 Gate-Charge Characteristics

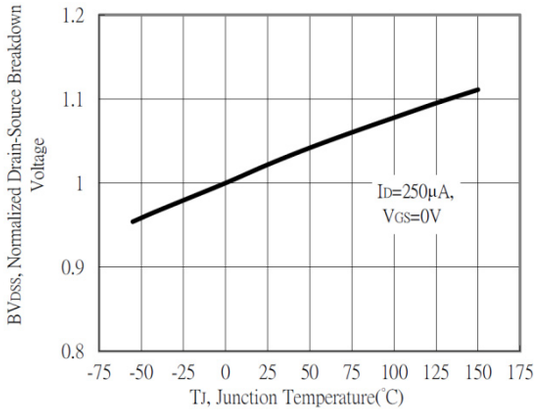


Fig.5 Breakdown Voltage vs T_J

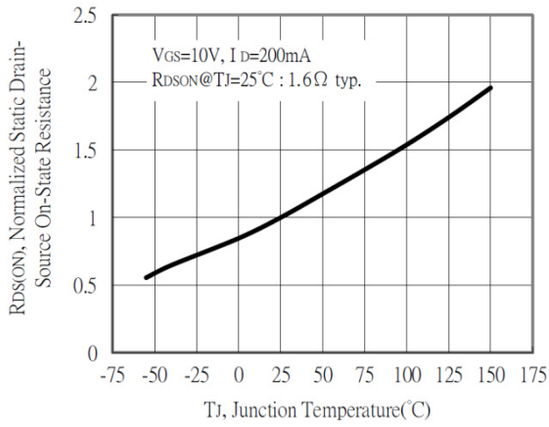


Fig.6 Normalized R_{DSON} vs T_J

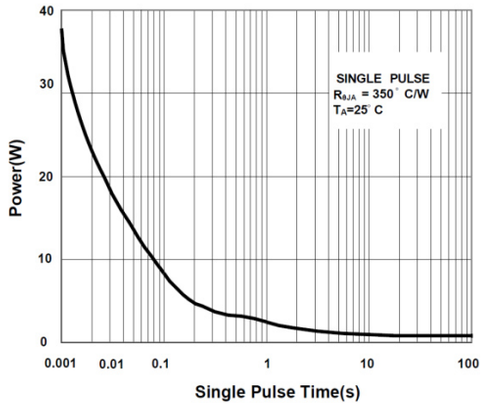


Fig.7 Single Pulse Max. Power Dissipation

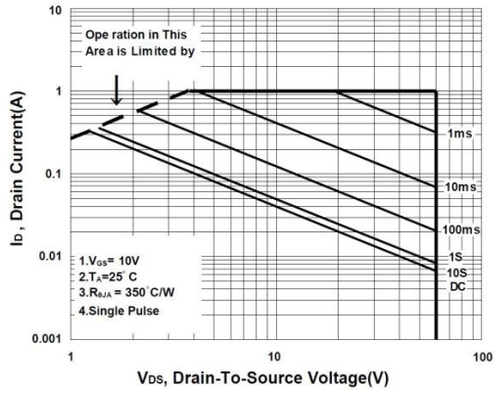


Fig.8 Safe Operating Area

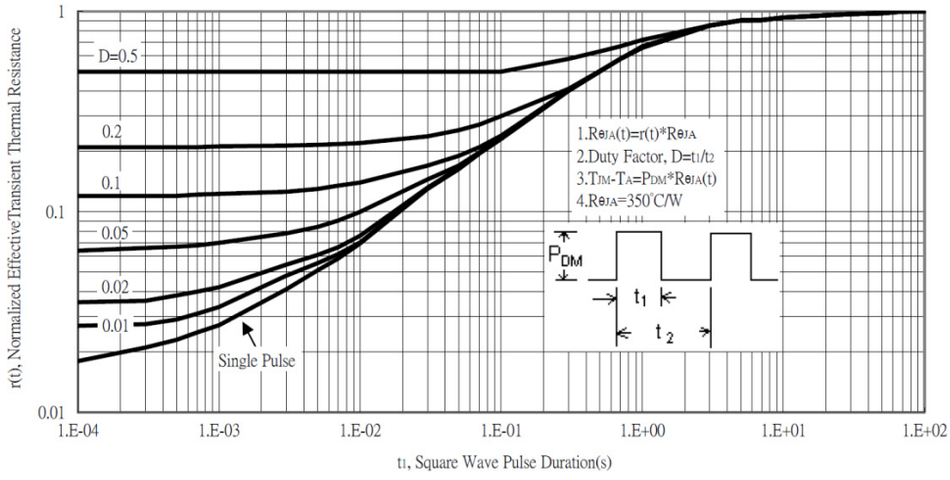
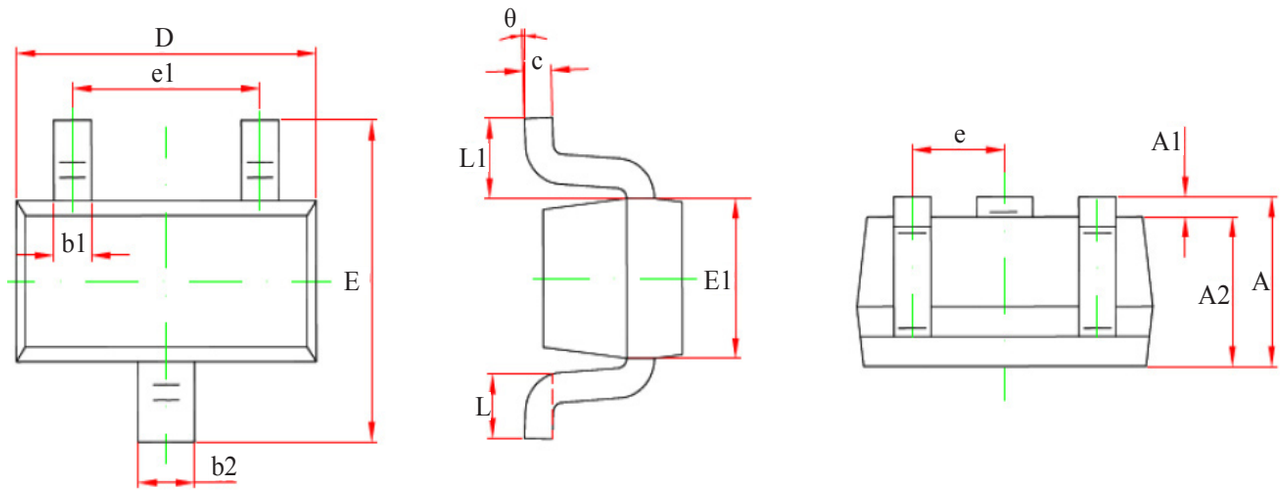


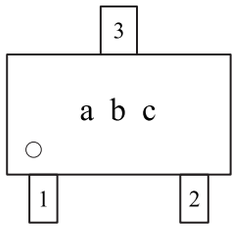
Fig.9 Normalized Maximum Transient Thermal Impedance

■SOT-523 dimension (3,000pcs/reel)



Symbols	Millimeters		Inches		Symbols	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.70	0.90	0.028	0.035	E	1.45	1.75	0.057	0.069
A1	0.00	0.10	0.000	0.004	E1	0.70	0.90	0.028	0.035
A2	0.70	0.80	0.028	0.031	e	0.50 Typ		0.020 Typ	
b1	0.15	0.25	0.006	0.010	e1	0.90	1.10	0.035	0.043
b2	0.25	0.35	0.010	0.014	L	0.26	0.46	0.010	0.018
c	0.10	0.20	0.004	0.008	L1	0.40 Ref		0.016 Ref	
D	1.50	1.70	0.059	0.067	θ	0°	8°	0°	8°

■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