Single N-channel MOSFET

ELM57002KASA-S

■General description

ELM57002KASA-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=0.5A
- Rds(on) = 2.4Ω (Vgs=10V)
- Rds(on) = 3.0Ω (Vgs=4.5V)
- ESD Rating : 2KV

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

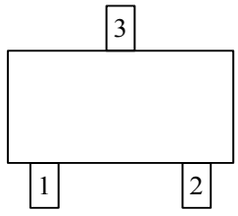
Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	60	V
Gate-source voltage		Vgs	±20	V
Continuous drain current(Tj=150°C)	Ta=25°C	Id	0.5	A
	Ta=70°C		0.3	
Pulsed drain current		Idm	0.65	A
Power dissipation	Tc=25°C	Pd	1.25	W
	Tc=70°C		0.80	
Operating junction temperature		Tj	150	°C
Storage temperature range		Tstg	- 55 to 150	°C

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	Rθja		120	°C/W

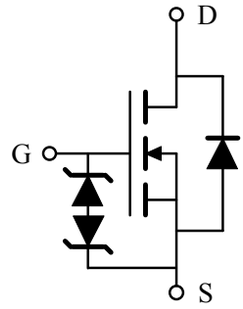
■Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit

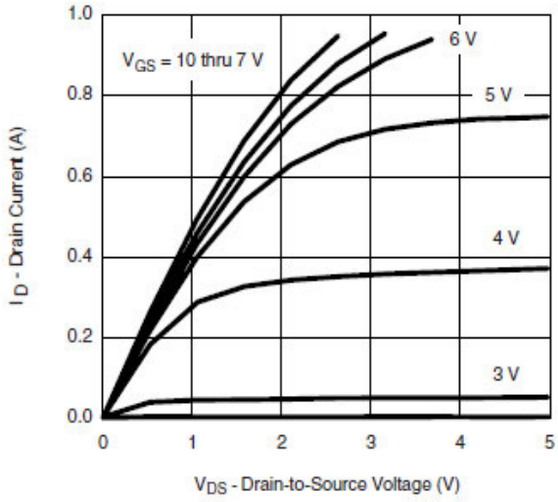


■Electrical characteristics

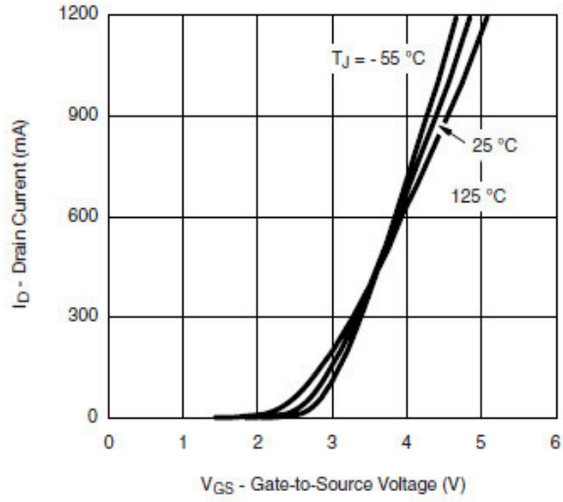
Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V		60			V
Zero gate voltage drain current	Idss	Vds=60V, Vgs=0V				1	μA
			Ta=85°C			10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V				3	μA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA		1.0		2.0	V
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=0.5A			1.2	2.4	Ω
		Vgs=4.5V, Id=0.3A			1.6	3.0	
Forward transconductance	Gfs	Vds=10V, Id=0.2A			0.2		S
Diode forward voltage	Vsd	Is=0.2A, Vgs=0V			0.75	1.40	V
Max. body-diode continuous current	Is					0.45	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=25V, f=1MHz			30		pF
Output capacitance	Coss				8		pF
Reverse transfer capacitance	Crss				5		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=10V Id≡0.25A			500		pC
Gate-source charge	Qgs				100		pC
Gate-drain charge	Qgd				150		pC
Turn-on delay time	td(on)	Vgs=4.5V, Vds=30V RL=150Ω, Id≡0.2A Rgen=10Ω			10	20	ns
Turn-on rise time	tr				35	50	ns
Turn-off delay time	td(off)				20	30	ns
Turn-off fall time	tf				40	60	ns

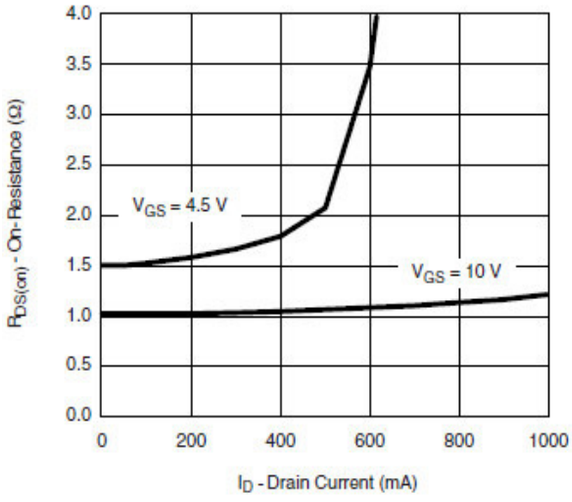
■Typical electrical and thermal characteristics



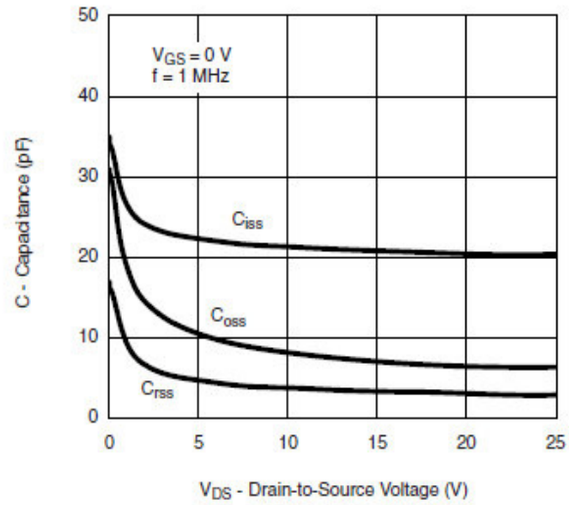
Output Characteristics



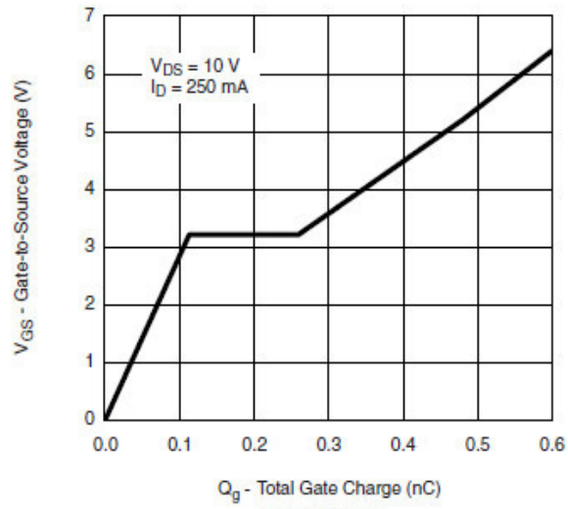
Transfer Characteristics



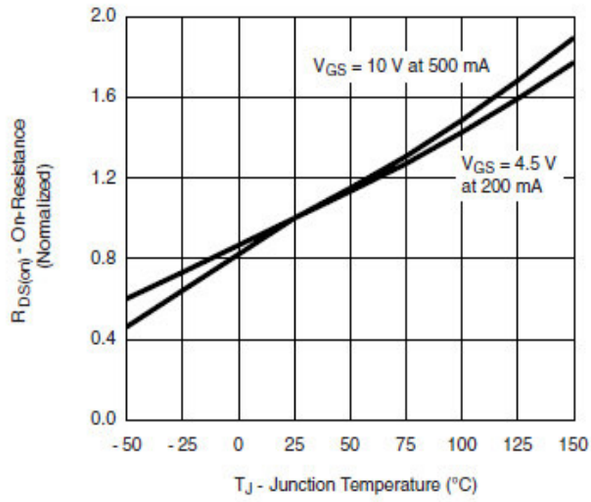
On-Resistance vs. Drain Current



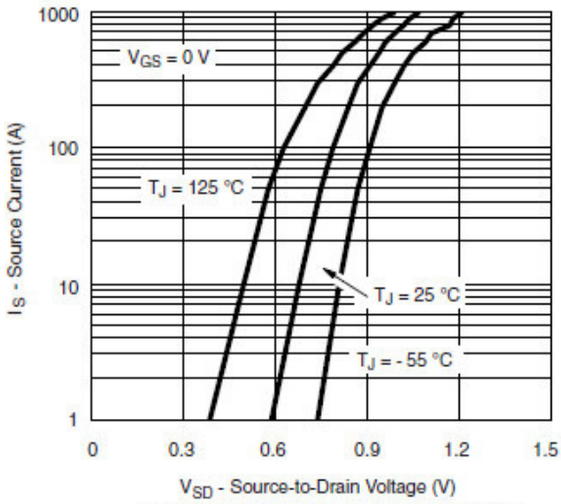
Capacitance



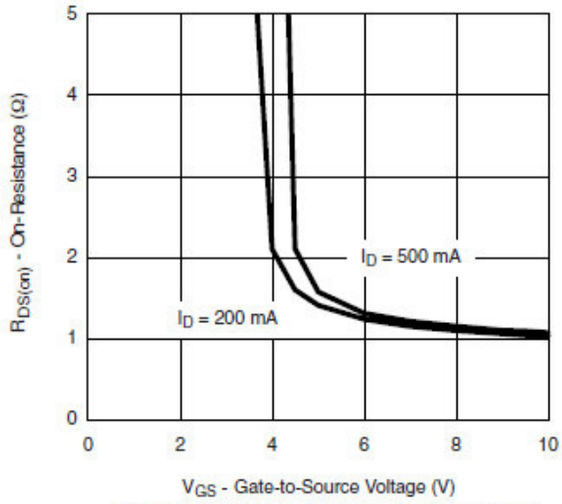
Gate Charge



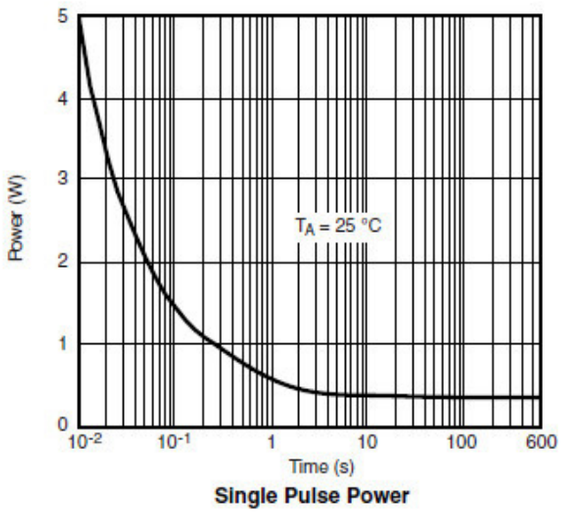
On-Resistance vs. Junction Temperature



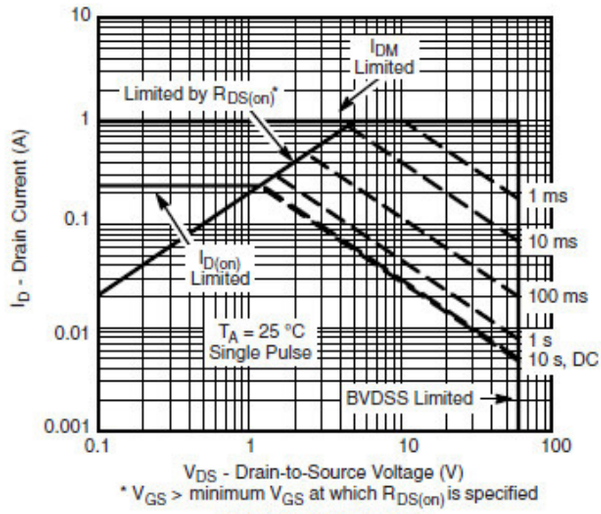
Source-Drain Diode Forward Voltage



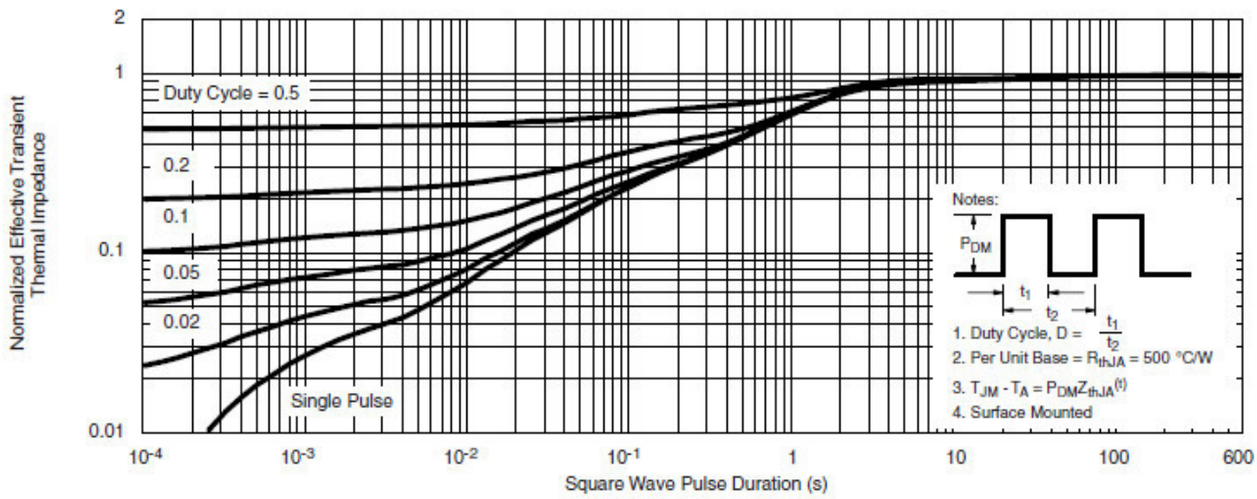
On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power



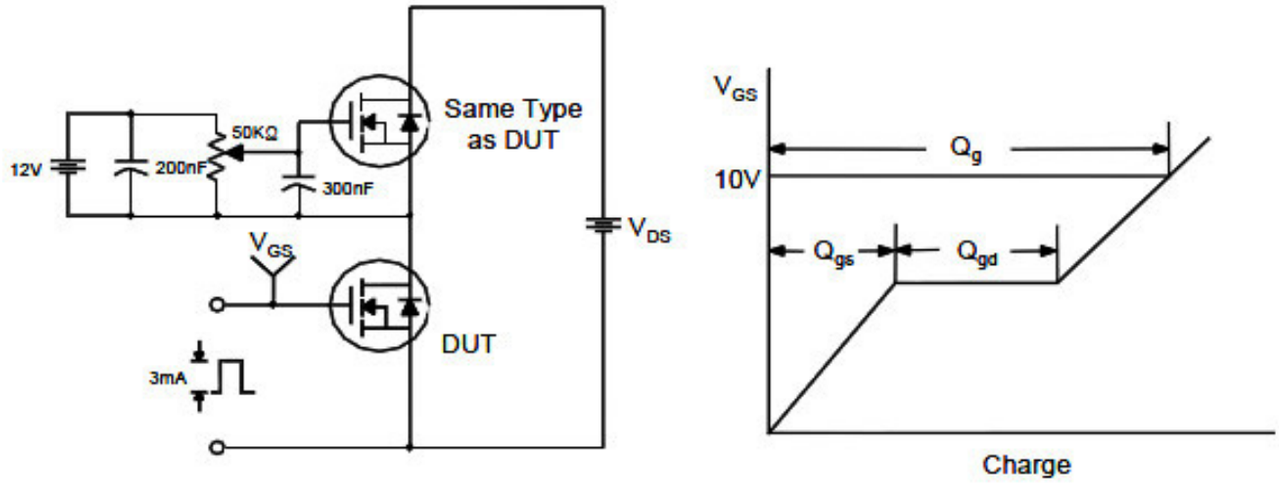
Safe Operating Area



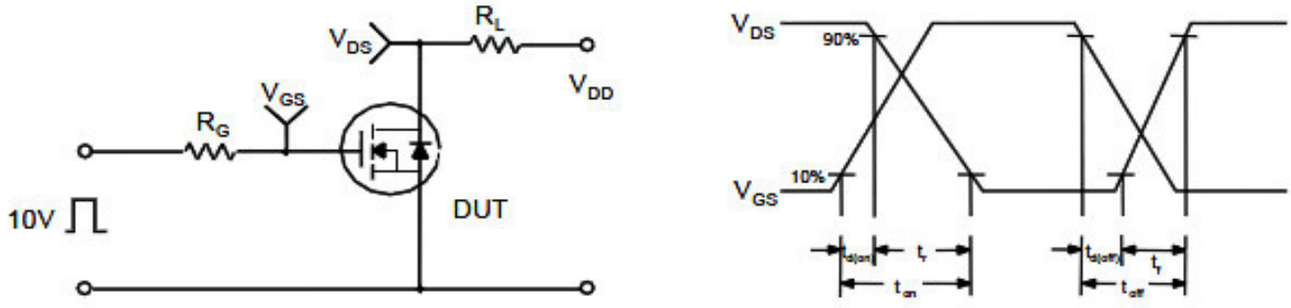
Normalized Thermal Transient Impedance, Junction-to-Ambient

■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms