Single P-channel MOSFET

ELM51033EA-S

■General description

ELM51033EA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage. Internal ESD protection is included.

■Features

- Vds=-30V
- Id=-0.6A
- Rds(on) = 900mΩ (Vgs=-10V)
- Rds(on) = 1150mΩ (Vgs=-4.5V)
- Rds(on) = 1450mΩ (Vgs=-2.5V)
- ESD Protected

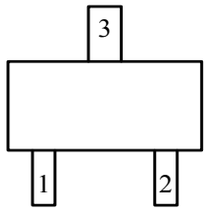
■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	-30	V
Gate-source voltage		Vgs	±12	V
Continuous drain current	Ta=25°C	Id	-0.6	A
	Ta=70°C		-0.2	
Pulsed drain current		Idm	-1.0	A
Power dissipation	Tc=25°C	Pd	0.27	W
	Tc=70°C		0.16	
Junction and storage temperature range		Tj, Tstg	- 55 to 150	°C

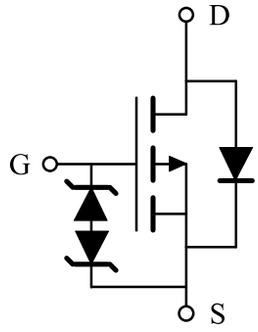
■Pin configuration

SOT-523(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit

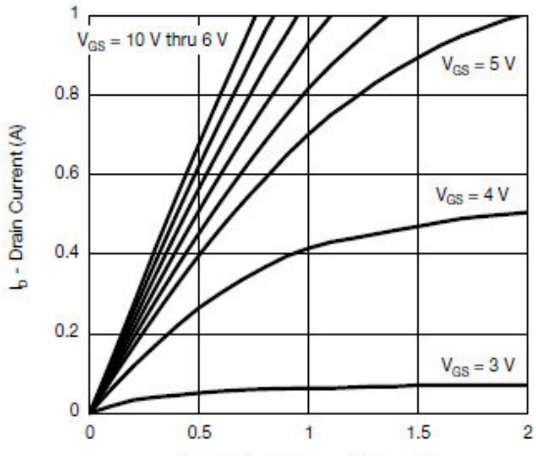


■Electrical characteristics

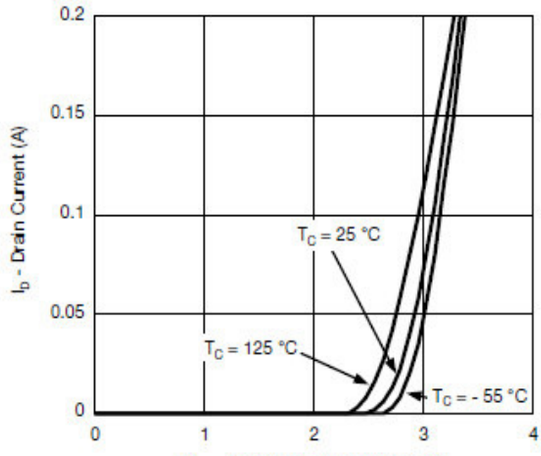
Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Vgs=0V, Id=-250μA	-30			V
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V			-1	μA
		Vds=-24V, Vgs=0V, Ta=85°C			-5	
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V			±5	mA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-0.7		-1.5	V
On state drain current	Id(on)	Vgs=-4.5V, Vds≥-5V	-0.5			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-0.6A		560	900	mΩ
		Vgs=-4.5V, Id=-0.3A		730	1150	
		Vgs=-2.5V, Id=-0.2A		1000	1450	
Forward transconductance	Gfs	Vds=-15V, Id=-0.5A		1		S
Diode forward voltage	Vsd	Is=-0.3A, Vgs=0V		-0.65	-1.20	V
Max. body-diode continuous current	Is				-0.3	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz		34		pF
Output capacitance	Coss			12		pF
Reverse transfer capacitance	Crss			8		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-4.5V, Vds=-15V Id≡-0.4A		0.8	1.3	nC
Gate-source charge	Qgs			0.4		nC
Gate-drain charge	Qgd			0.4		nC
Turn-on delay time	td(on)	Vgs=-4.5V, Vds=-15V RL=38Ω, Id≡-0.2A Rgen=1Ω		35	50	ns
Turn-on rise time	tr			20	30	ns
Turn-off delay time	td(off)			10	20	ns
Turn-off fall time	tf			10	20	ns

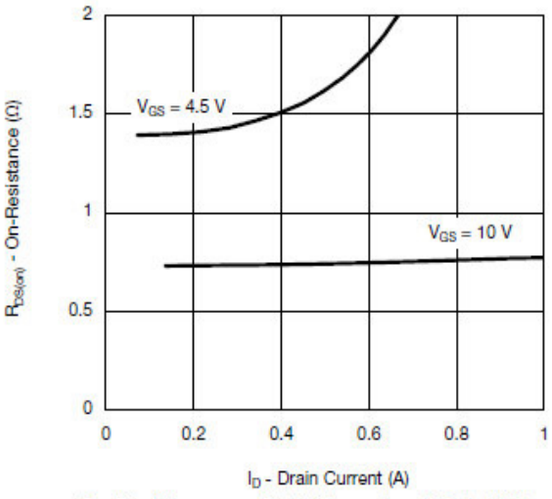
■Typical electrical and thermal characteristics



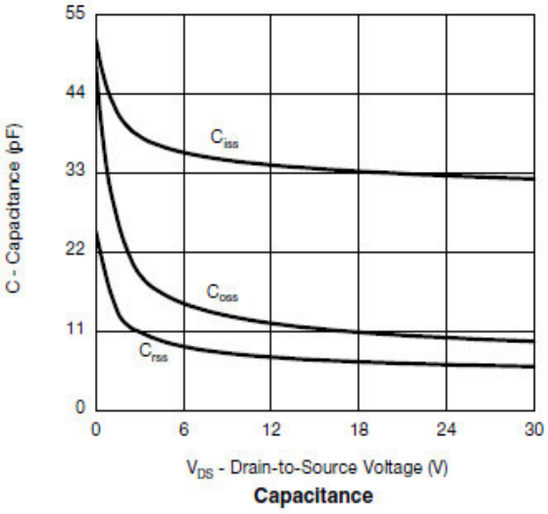
Output Characteristics



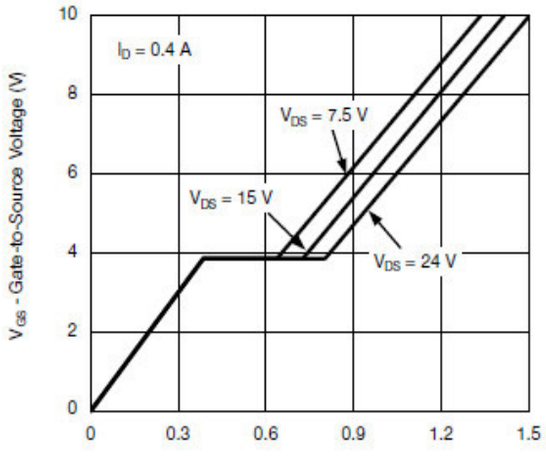
Transfer Characteristics



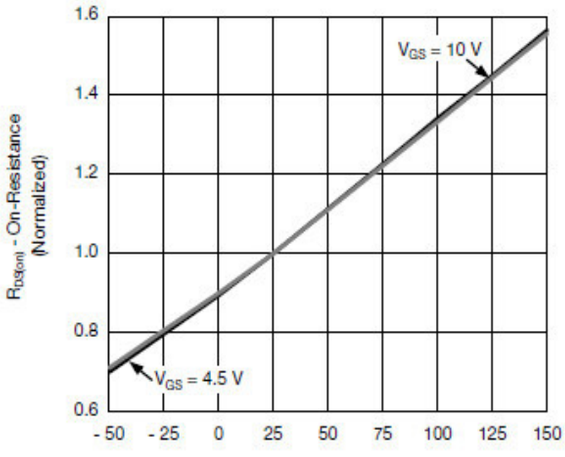
On-Resistance vs. Drain Current and Gate Voltage



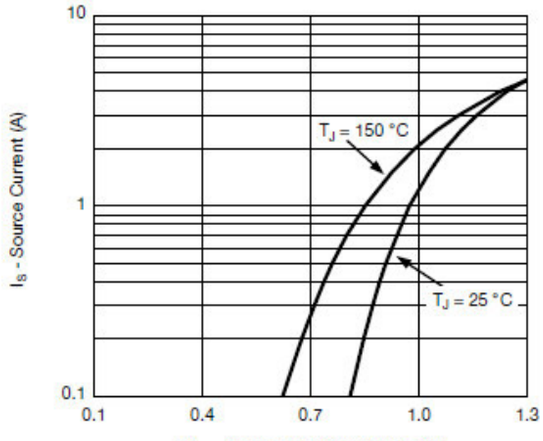
Capacitance



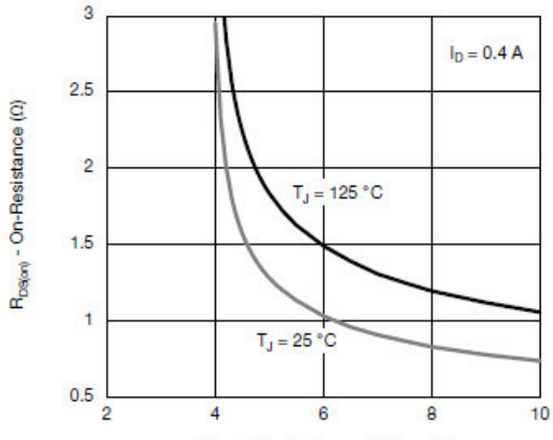
Gate Charge



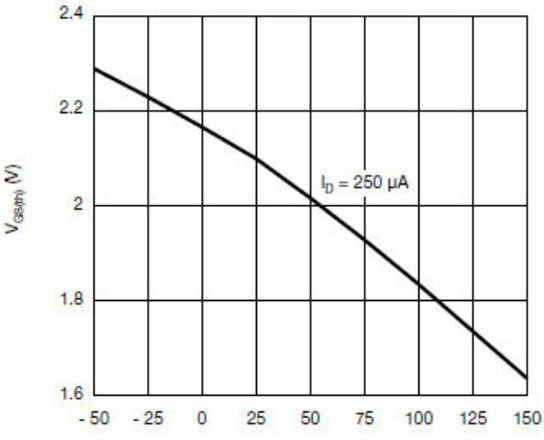
On-Resistance vs. Junction Temperature



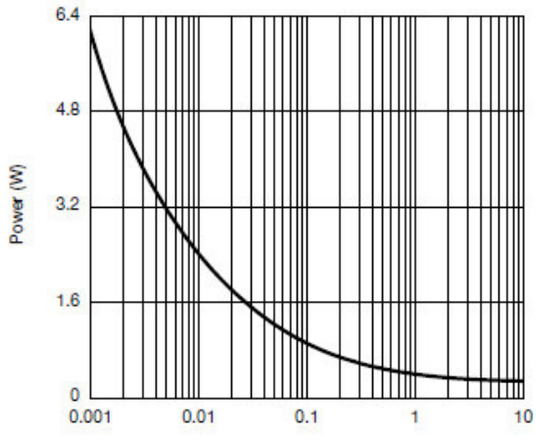
Source-Drain Diode Forward Voltage



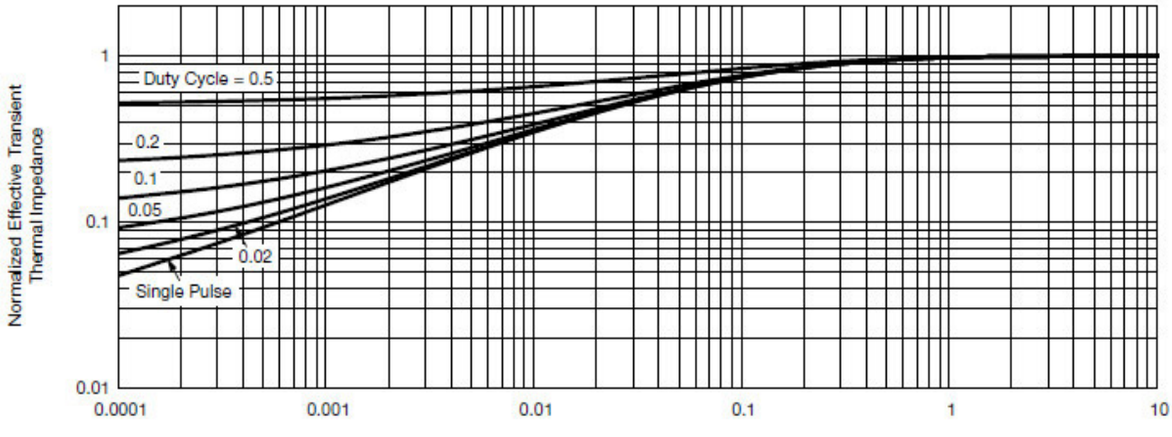
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



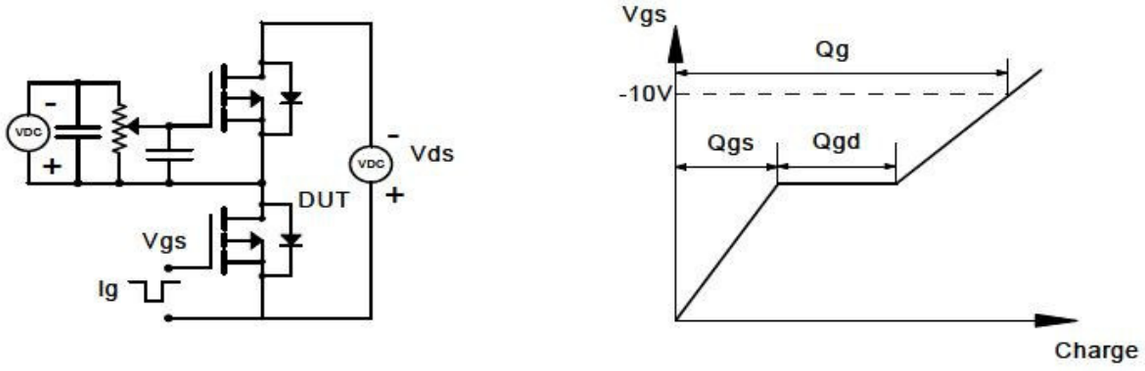
Single Pulse Power, Junction-to-Ambient



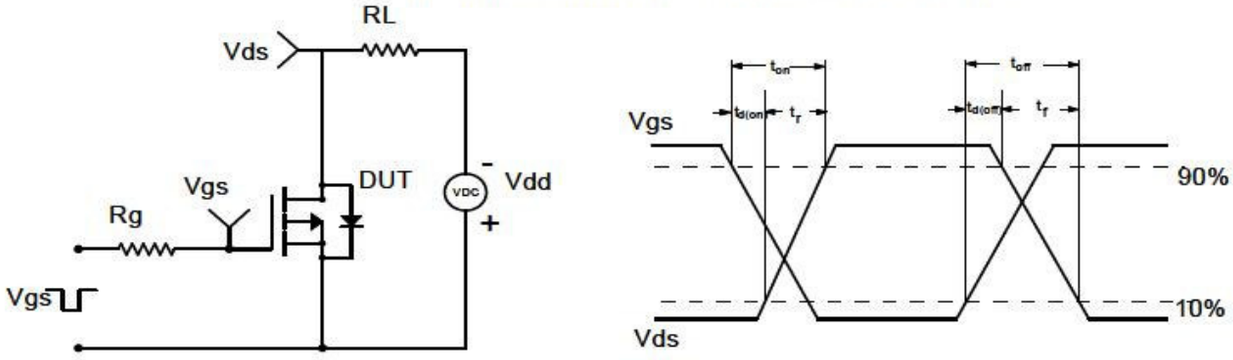
Normalized Thermal Transient Impedance, Junction-to-Foot

■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms