Dual P-channel MOSFET

ELM56801EA-S

■General description

ELM56801EA-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate resistance.

■Features

- Vds=-20V
- Id=-3.2A, Rds(on)=100mΩ (Vgs=-4.5V)
- Id=-2.6A, Rds(on)=135mΩ (Vgs=-2.5V)
- Id=-1.5A, Rds(on)=190mΩ (Vgs=-1.8V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

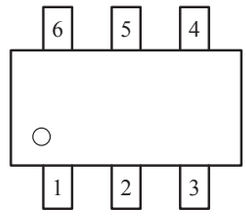
Parameter		Symbol	Limit	Unit
Drain-source voltage		Vds	-20	V
Gate-source voltage		Vgs	±12	V
Continuous drain current	Ta=25°C	Id	-3.2	A
	Ta=70°C		-2.6	
Pulsed drain current		Idm	-20	A
Power dissipation	Tc=25°C	Pd	2.0	W
	Tc=70°C		1.3	
Junction and storage temperature range		Tj, Tstg	-55 to 150	°C

■Thermal characteristics

Parameter		Symbol	Typ.	Max.	Unit
Maximum junction-to-ambient	Steady-state	Rθja		120	°C/W

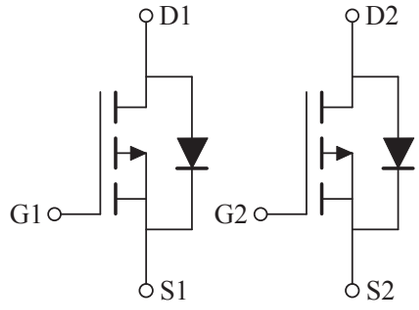
■Pin configuration

SOT-26(TOP VIEW)



Pin No.	Pin name
1	GATE1
2	SOURCE2
3	GATE2
4	DRAIN2
5	SOURCE1
6	DRAIN1

■Circuit

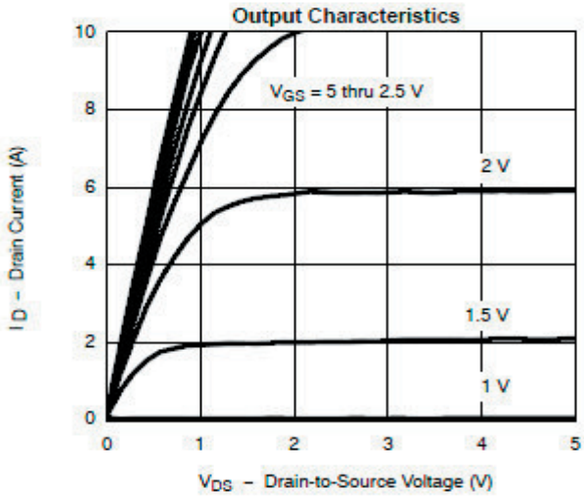


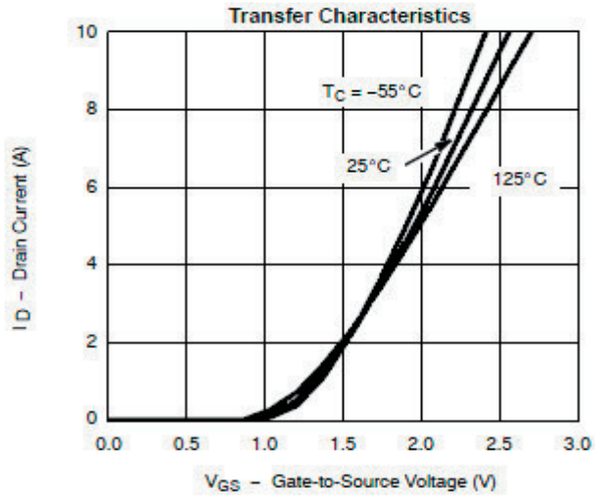
■Electrical characteristics

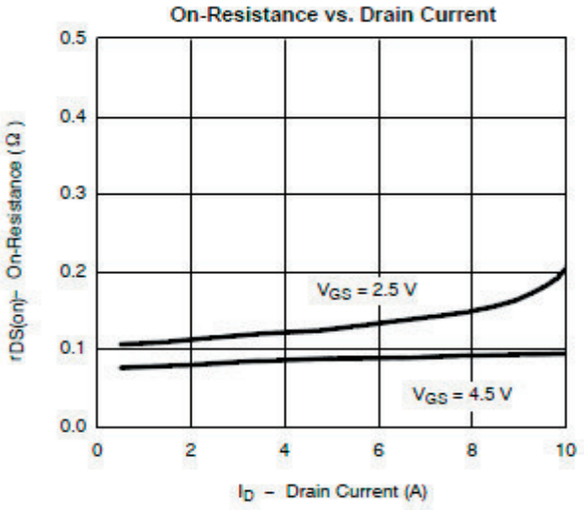
Ta=25°C. Unless otherwise noted.

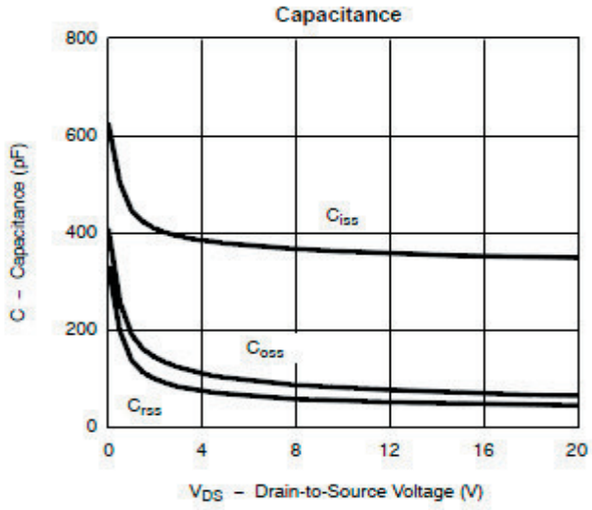
Parameter	Symbol	Condition		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V		-20			V
Zero gate voltage drain current	Idss	Vds=-16V, Vgs=0V				-1	μA
			Ta=85°C			-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±12V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA		-0.3		-0.7	V
On state drain current	Id(on)	Vgs=-4.5V, Vds=-5V		-6			A
		Vgs=-2.5V, Vds=-5V		-3			
Static drain-source on-resistance	Rds(on)	Vgs=-4.5V, Id=-3.2A			92	100	mΩ
		Vgs=-2.5V, Id=-2.6A			122	135	
		Vgs=-1.8V, Id=-1.5A			168	190	
Forward transconductance	Gfs	Vds=-5V, Id=-2.8A			6.5		S
Diode forward voltage	Vsd	Is=-1.25A, Vgs=0V			-0.75	-1.30	V
Max. body-diode continuous current	Is					-1.7	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-6V, f=1MHz			415		pF
Output capacitance	Coss				223		pF
Reverse transfer capacitance	Crss				87		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-4.5V, Vds=-6V Id=-2.8A			5.80	10.00	nC
Gate-source charge	Qgs				0.85		nC
Gate-drain charge	Qgd				1.70		nC
Turn-on delay time	td(on)	Vgs=-4.5V, Vds=-6V, Id=-1.0A RL=6Ω, Rgen=6Ω			13	25	ns
Turn-on rise time	tr				36	60	ns
Turn-off delay time	td(off)				42	70	ns
Turn-off fall time	tf				34	60	ns

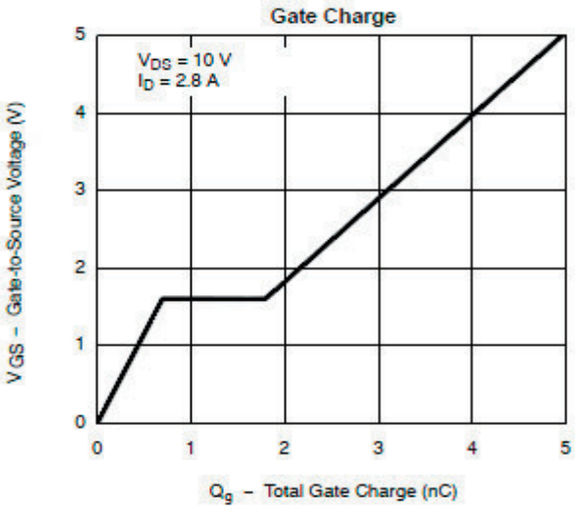
■Typical electrical and thermal characteristics

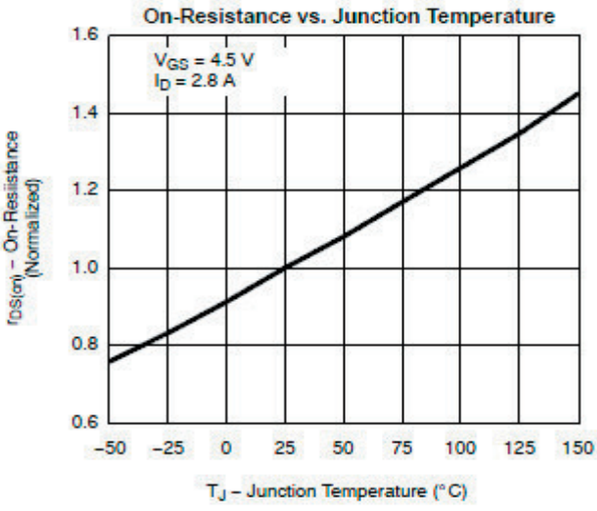


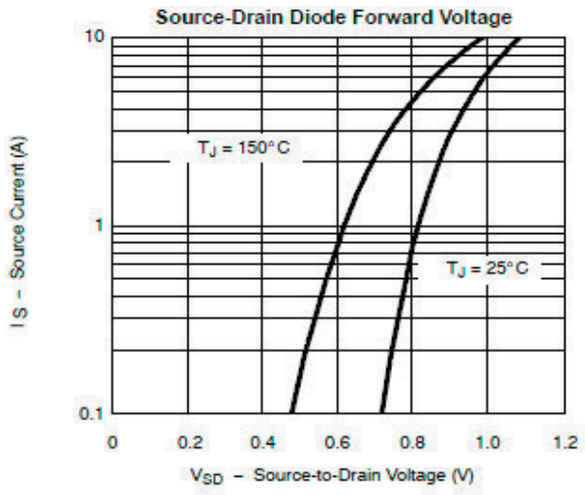


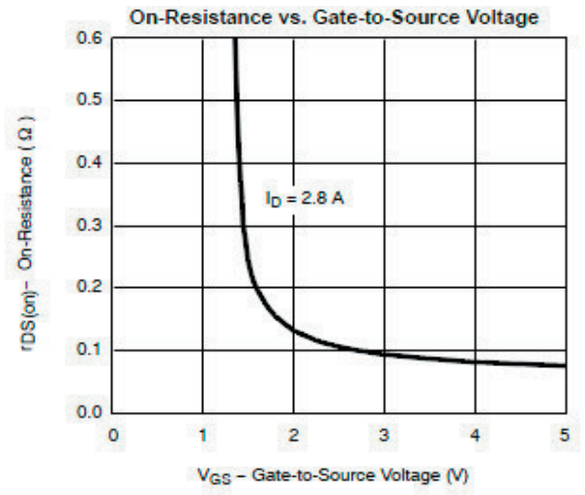


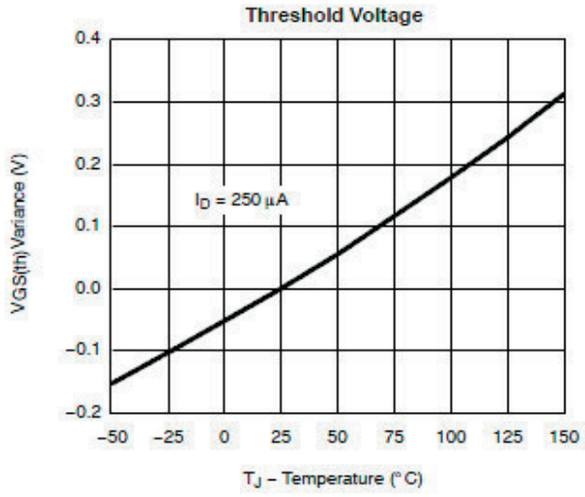


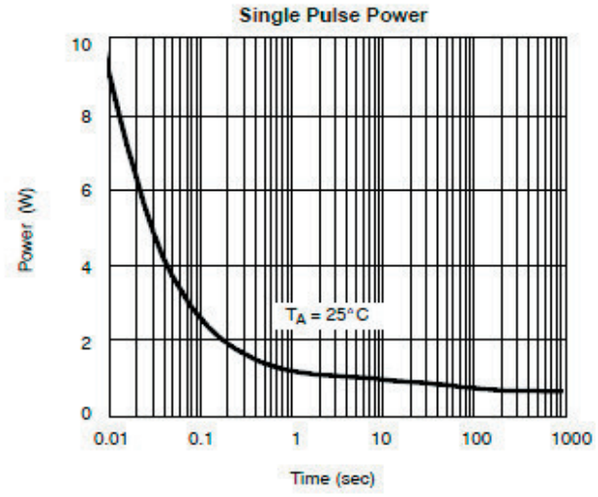


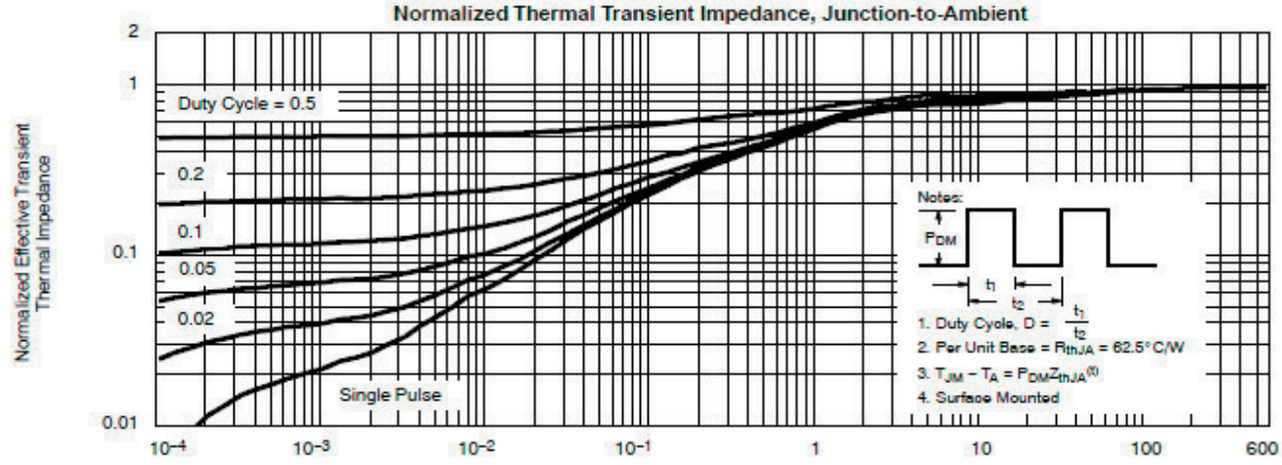



Source-Drain Diode Forward Voltage
T_J = 150°C
T_J = 25°C
I_S – Source Current (A)
V_{SD} – Source-to-Drain Voltage (V)


On-Resistance vs. Gate-to-Source Voltage
I_D = 2.8 A
$r_{DS(on)}$ – On-Resistance (Ω)
V_{GS} – Gate-to-Source Voltage (V)

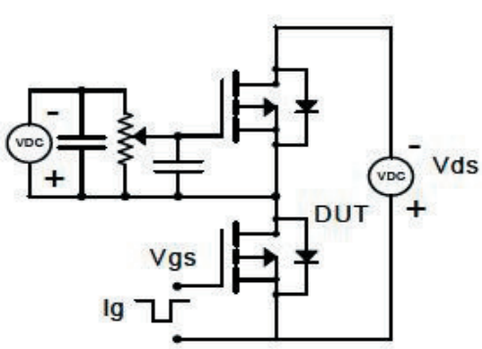

Threshold Voltage
I_D = 250 µA
$V_{GS(th)}$ Variance (V)
T_J – Temperature (°C)

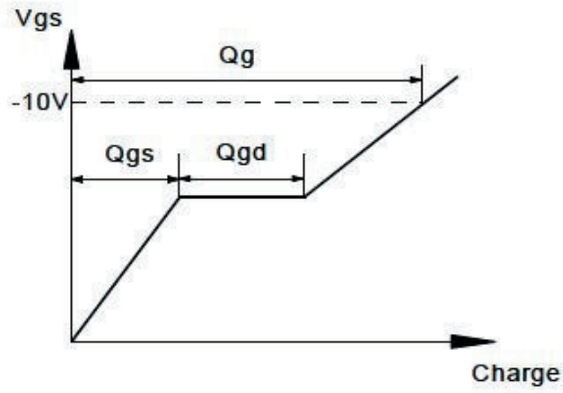

Single Pulse Power
T_A = 25°C
Power (W)
Time (sec)


Normalized Thermal Transient Impedance, Junction-to-Ambient
Duty Cycle = 0.5
0.2
0.1
0.05
0.02
Single Pulse
Notes:
1. Duty Cycle, D = t_1/t_2
2. Per Unit Base = R_{thJA} = 62.5°C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}(t)$
4. Surface Mounted
Normalized Effective Transient Thermal Impedance

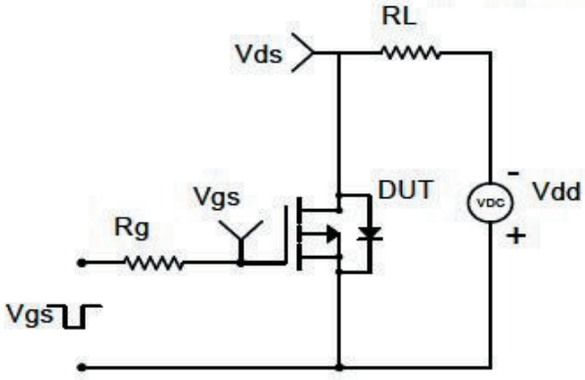
■Test circuit & waveform

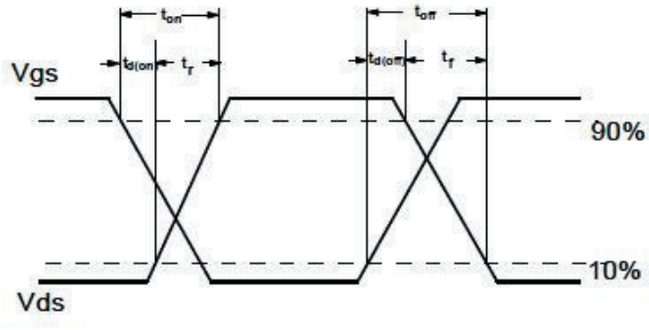
Gate Charge Test Circuit & Waveform





Resistive Switching Test Circuit & Waveforms





Diode Recovery Test Circuit & Waveforms