Complementary MOSFET

ELM53326CWSA-N

■General Description

ELM53326CWSA-N uses advanced trench technology to provide excellent Rds(on) and low gate charge.

■Features

N-channel

- Vds=30V
- Id=12.0A
- Rds(on)=36mΩ(Vgs=10V)
- Rds(on)=46mΩ(Vgs=4.5V)

P-channel

- Vds=-30V
- Id=-8.0A
- Rds(on)=60mΩ(Vgs=-10V)
- Rds(on)=80mΩ(Vgs=-4.5V)

■Maximum Absolute Ratings

Ta=25°C. Unless otherwise noted.

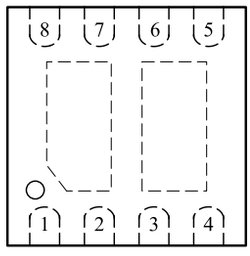
Parameter		Symbol	N-ch (Max.)	P-ch (Max.)	Unit
Drain-source voltage		Vds	30	-30	V
Gate-source voltage		Vgs	±20	±20	V
Continuous drain current(Tj=150°C)	Ta=25°C	Id	12	-8	A
	Ta=70°C		10	-6	
Pulsed drain current		Idm	50	-30	A
Power dissipation	Tc=25°C	Pd	2.0	1.8	W
	Tc=70°C		1.5	1.2	
Operating junction temperature		Tj	150	150	°C
Storage temperature range		Tstg	-55 to 150	-55 to 150	°C

■Thermal Characteristics

Parameter	Symbol	Device	Typ.	Max.	Unit
Thermal resistance junction-to-ambient	Rθja	N-ch		56.0	°C/W
Thermal resistance junction-to-ambient	Rθja	P-ch		62.5	°C/W

■Pin configuration

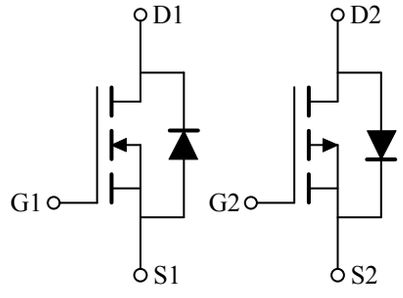
DFN8-3×3(TOP VIEW)



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

■Circuit

- N-ch
- P-ch

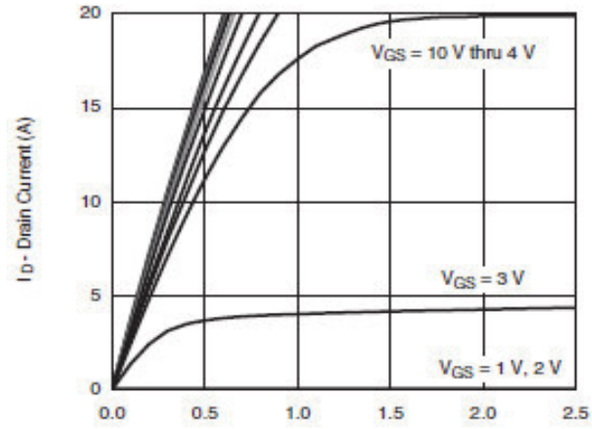


■Electrical Characteristics (N-ch)

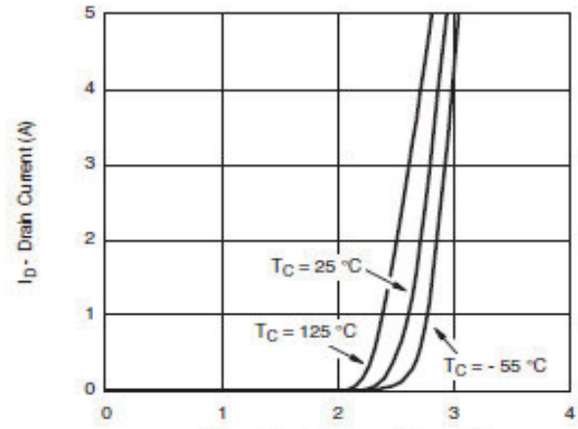
Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V		30			V
Zero gate voltage drain current	Idss	Vds=24V, Vgs=0V				1	μA
			Ta=85°C			30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA		1.3		2.1	V
On state drain current	Id(on)	Vgs=4.5V, Vds≥5V		10			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=12.0A			30	36	mΩ
		Vgs=4.5V, Id=10.0A			40	46	
Forward transconductance	Gfs	Vds=15V, Id=5.2A			13		S
Diode forward voltage	Vsd	Is=1.6A, Vgs=0V			0.8	1.3	V
Max.body-diode continuous current	Is					10	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=20V, f=1MHz			700		pF
Output capacitance	Coss				75		pF
Reverse transfer capacitance	Crss				45		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=20V, Id≡5.2A			8.0	12.0	nC
Gate-source charge	Qgs				1.6		nC
Gate-drain charge	Qgd				2.4		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=15V, Id≡1.0A RL=15.0Ω, Rgen=6.0Ω			8	12	ns
Turn-on rise time	tr				12	18	ns
Turn-off delay time	td(off)				28	40	ns
Turn-off fall time	tf				10	18	ns

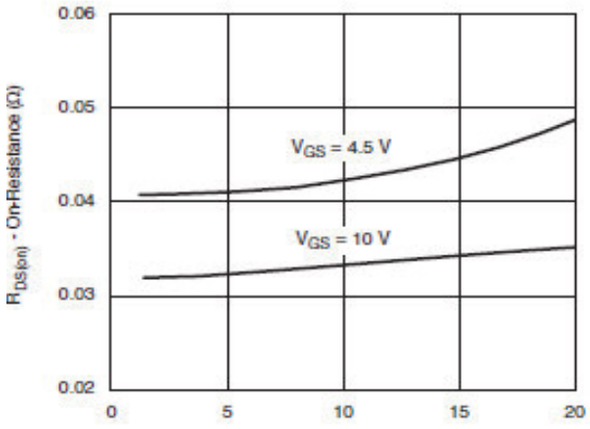
■Typical Electrical and Thermal Characteristics (N-ch)



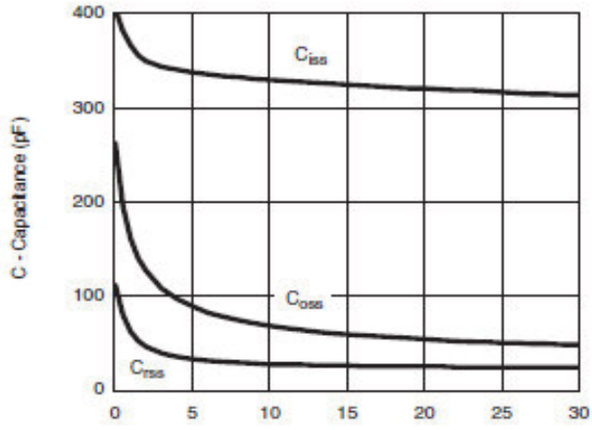
Output Characteristics



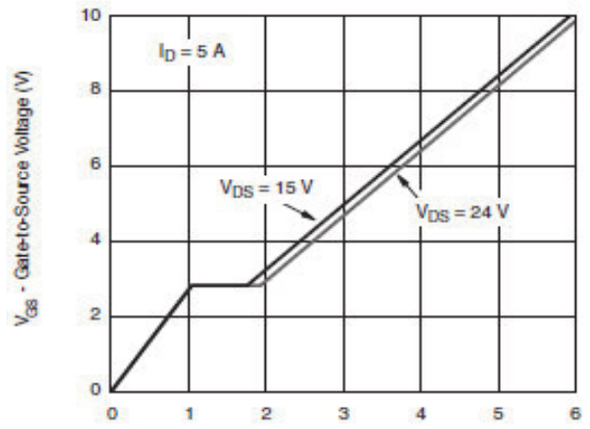
Transfer Characteristics



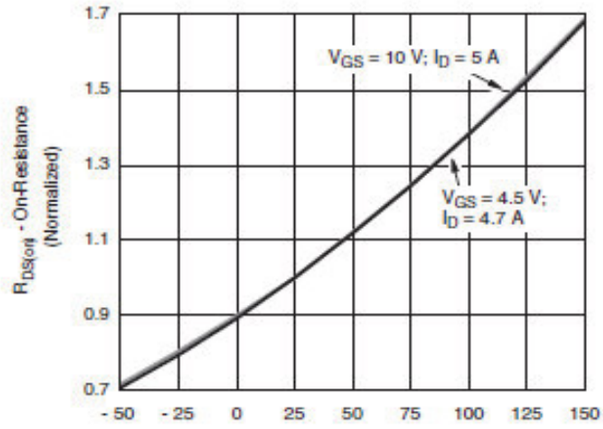
On-Resistance vs. Drain Current



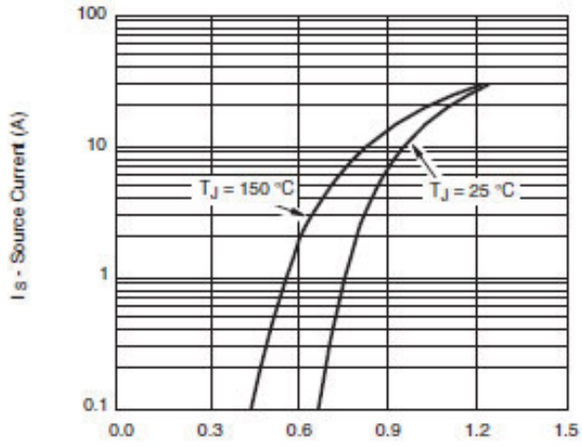
Capacitance



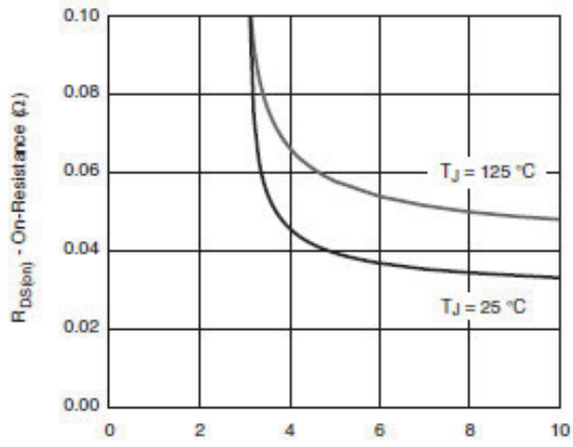
Gate Charge



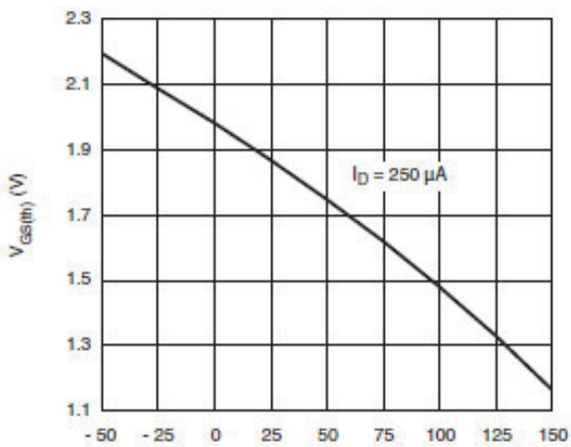
On-Resistance vs. Junction Temperature



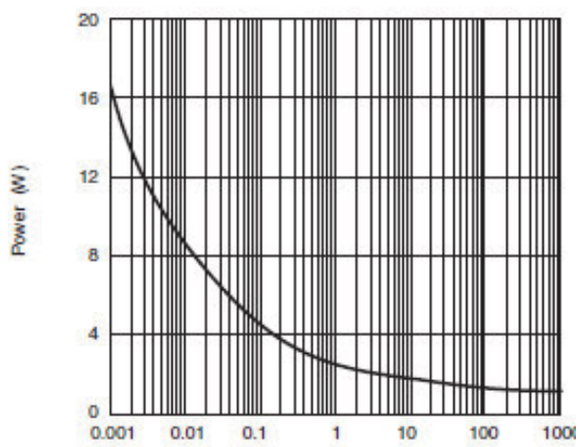
Source-Drain Diode Forward Voltage



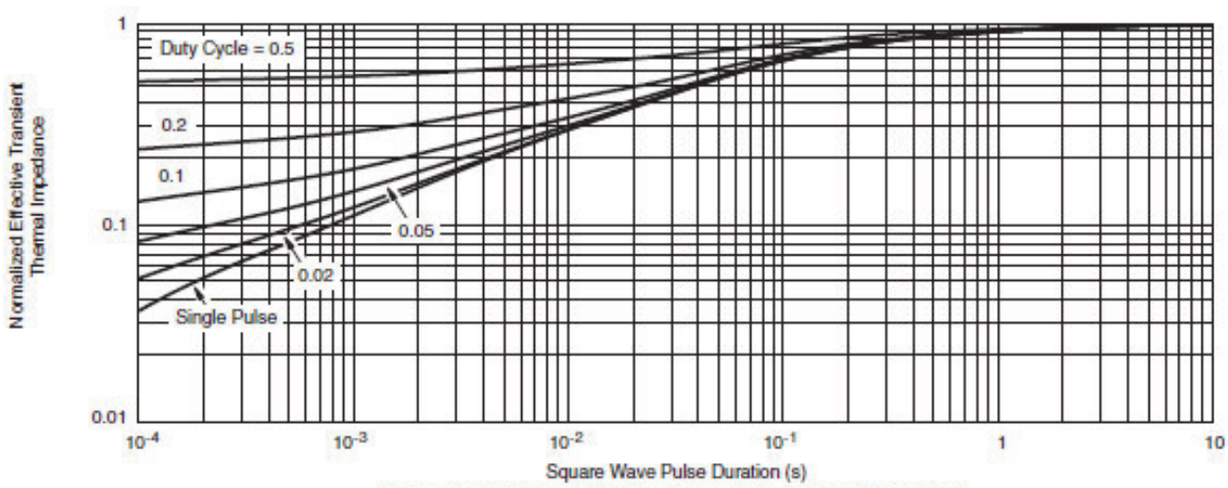
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Foot

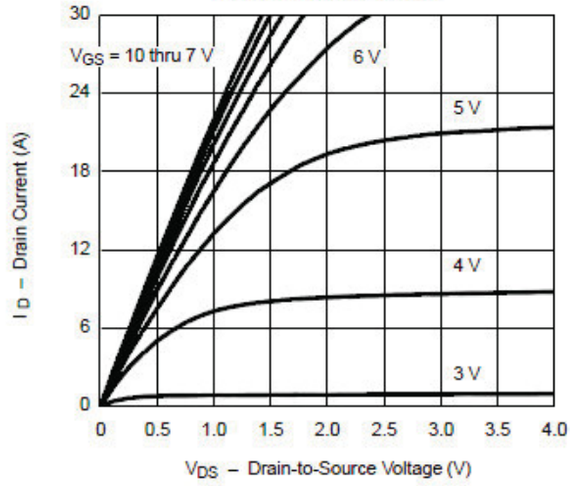
■Electrical Characteristics (P-ch)

Ta=25°C. Unless otherwise noted.

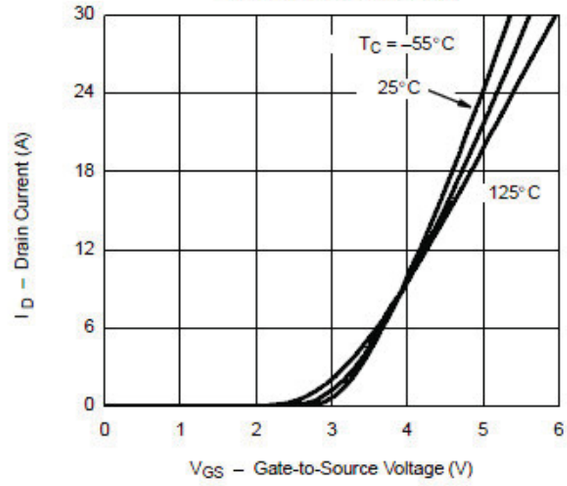
Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V		-30			V
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V				-1	μA
			Ta=85°C			-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA		-1.0		-2.0	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-5V		-25			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-8.0A			50	60	mΩ
		Vgs=-4.5V, Id=-6.0A			70	80	
Forward transconductance	Gfs	Vds=-10V, Id=-4.9A			10		S
Diode forward voltage	Vsd	Is=-1.7A, Vgs=0V			-0.8	-1.3	V
Max. body-diode continuous current	Is					-10	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz			500		pF
Output capacitance	Coss				100		pF
Reverse transfer capacitance	Crss				55		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=-10V, Vds=-15V Id≡-5.0A			10.0	18.0	nC
Gate-source charge	Qgs				1.6		nC
Gate-drain charge	Qgd				3.0		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V Id≡-1.0A, RL=15Ω Rgen=6Ω			8	18	ns
Turn-on rise time	tr				8	18	ns
Turn-off delay time	td(off)				25	50	ns
Turn-off fall time	tf				25	35	ns

■Typical Electrical and Thermal Characteristics (P-ch)

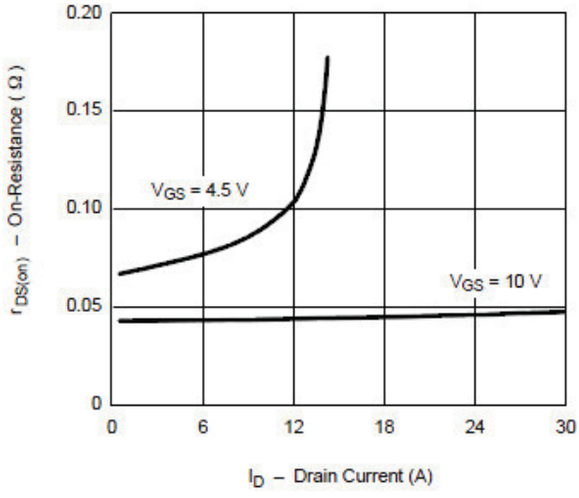
Output Characteristics



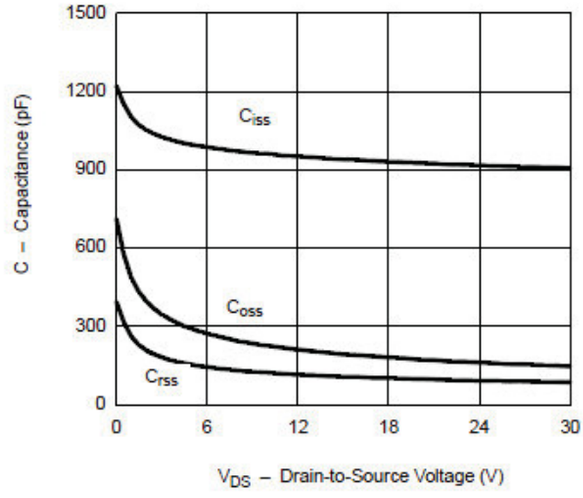
Transfer Characteristics



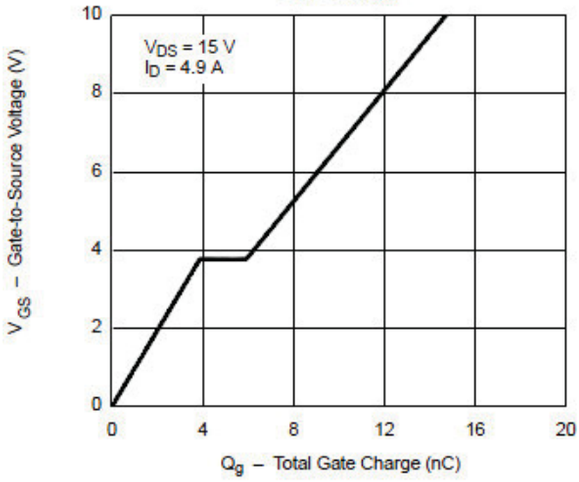
On-Resistance vs. Drain Current



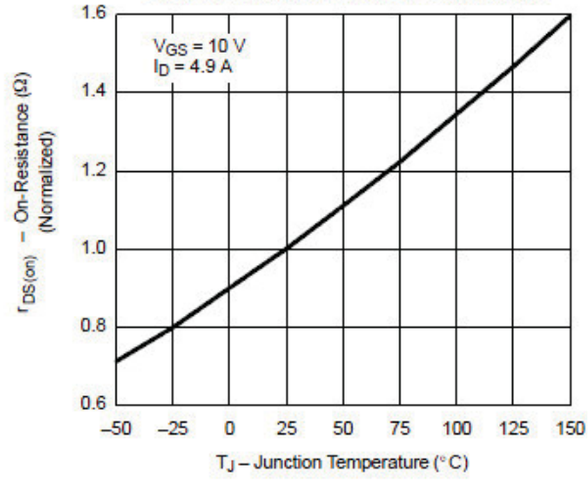
Capacitance



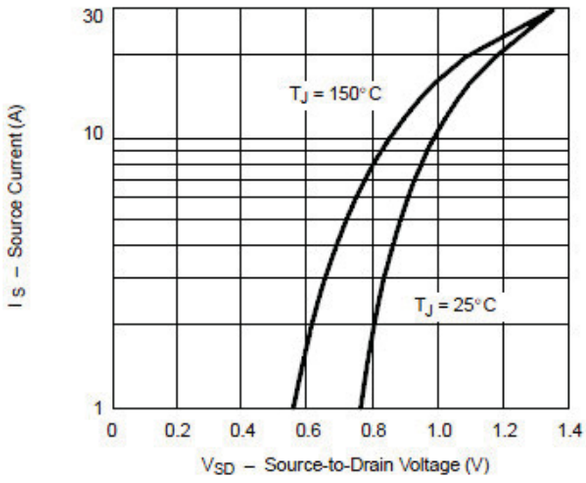
Gate Charge



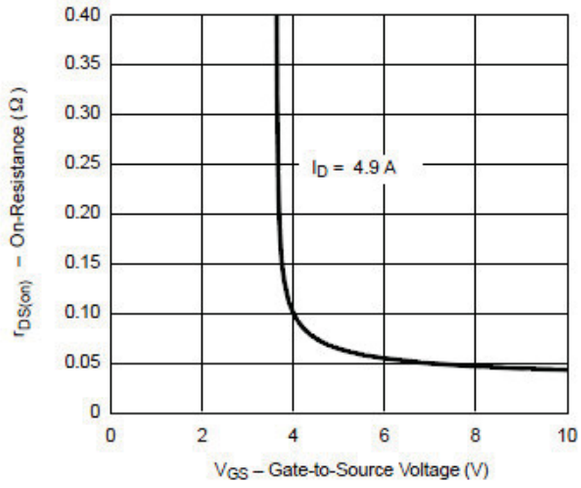
On-Resistance vs. Junction Temperature



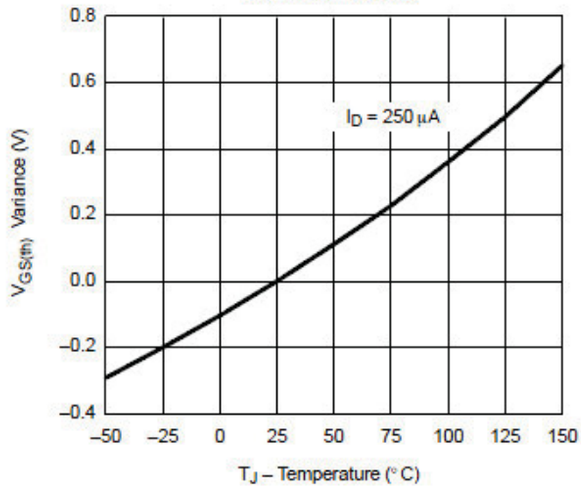
Source-Drain Diode Forward Voltage



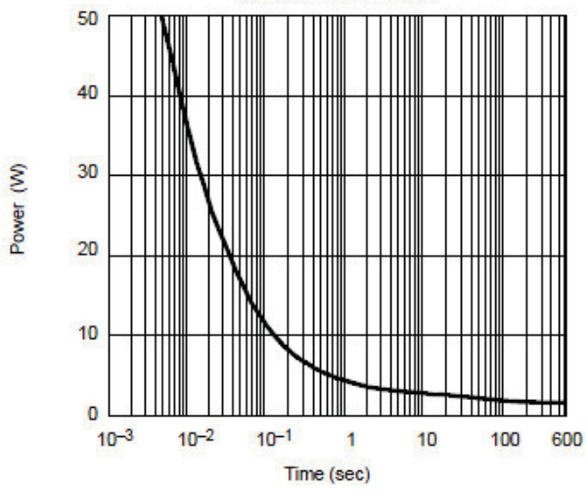
On-Resistance vs. Gate-to-Source Voltage



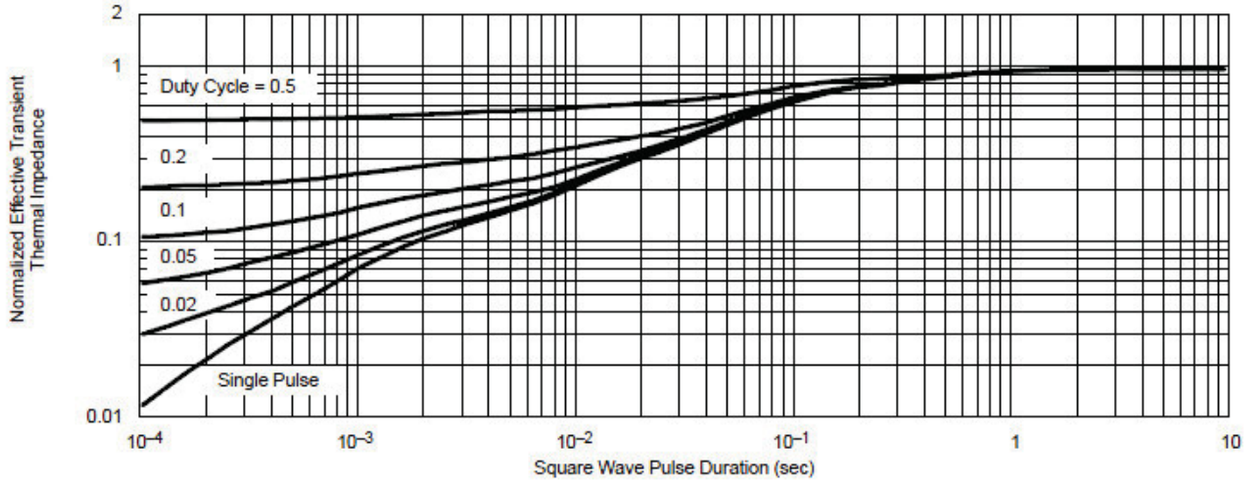
Threshold Voltage



Single Pulse Power

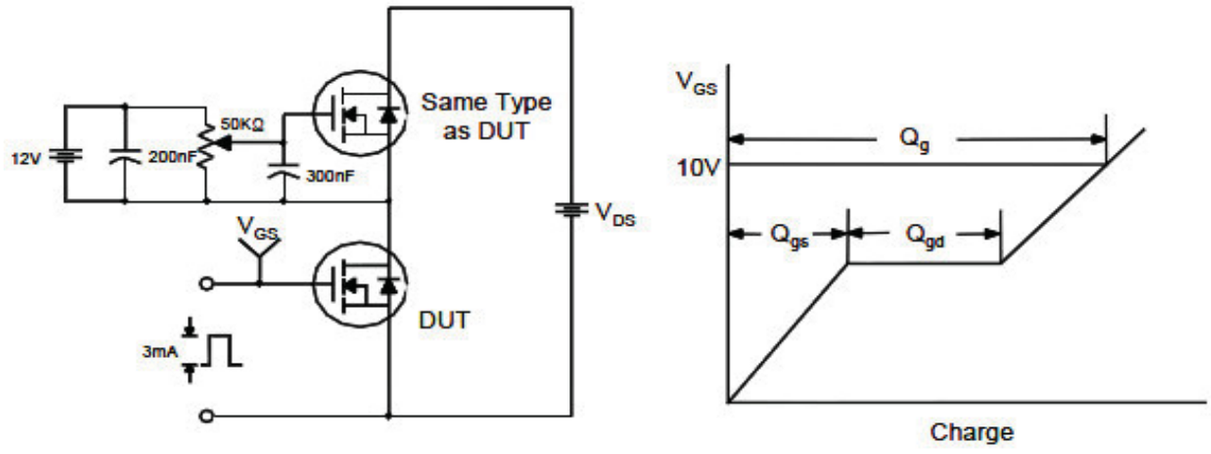


Normalized Thermal Transient Impedance, Junction-to-Foot

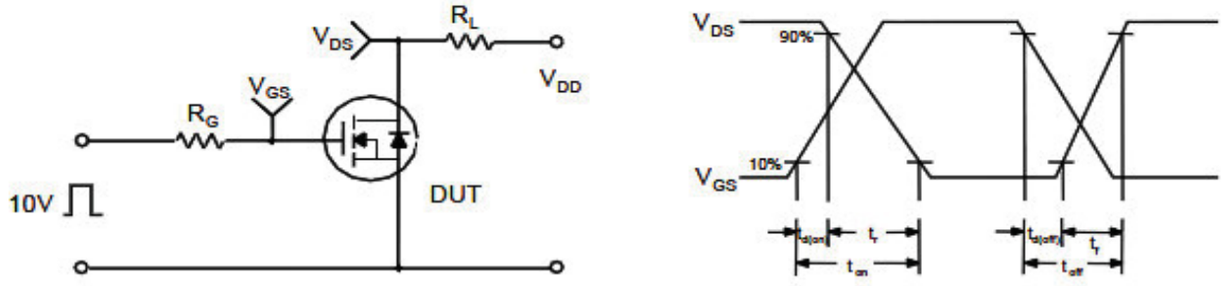


■Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms