

Complementary MOSFET

ELM54616CWSA-N

<http://www.elm-tech.com>

■General Description

ELM54616CWSA-N uses advanced trench technology to provide excellent Rds(on) and low gate charge.

■Features

- | | |
|--------------------------|---------------------------|
| N-channel | P-channel |
| • Vds=30V | • Vds=-30V |
| • Id=8.0A | • Id=-8.0A |
| • Rds(on)=18mΩ(Vgs=10V) | • Rds(on)=18mΩ(Vgs=-10V) |
| • Rds(on)=22mΩ(Vgs=4.5V) | • Rds(on)=22mΩ(Vgs=-4.5V) |

■Maximum Absolute Ratings

Ta=25°C. Unless otherwise noted.

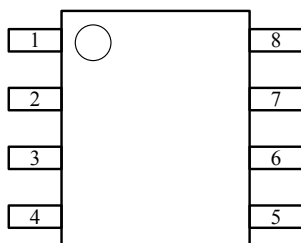
Parameter		Symbol	N-ch (Max.)	P-ch (Max.)	Unit
Drain-source voltage		Vds	30	-30	V
Gate-source voltage		Vgs	±20	±20	V
Continuous drain current(Tj=150°C)	Ta=25°C	Id	8.0	-8.0	A
	Ta=70°C		6.0	-6.0	
Pulsed drain current		Idm	25	-30	A
Power dissipation	Tc=25°C	Pd	2.8	2.8	W
	Tc=70°C		1.8	1.8	
Operating junction 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		62.5	°C/W
Thermal resistance junction-to-ambient	Rθja	P-ch		62.5	°C/W

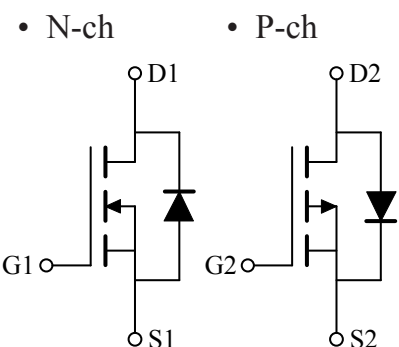
■Pin configuration

SOP-8(TOP VIEW)



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

■Circuit



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■Electrical Characteristics (N-ch)

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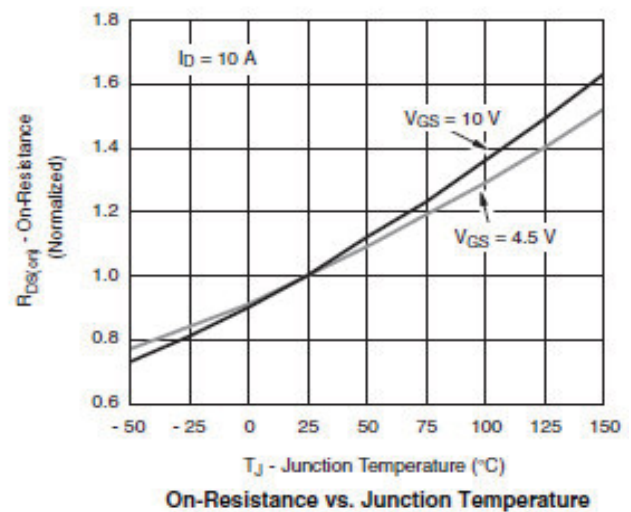
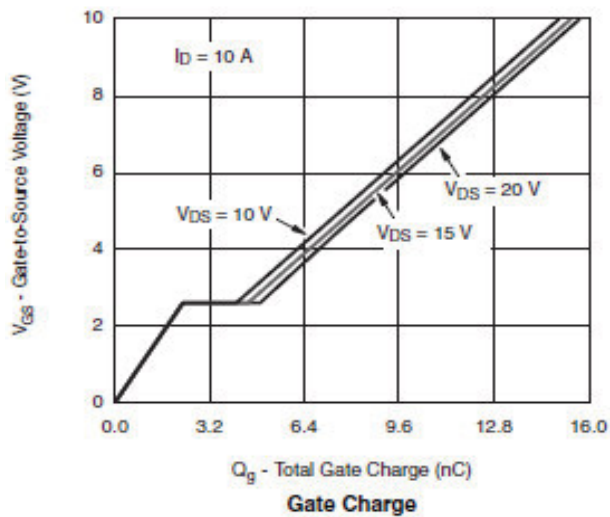
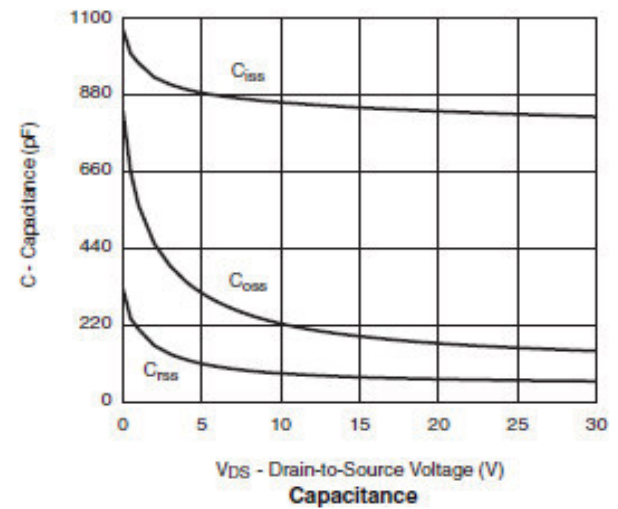
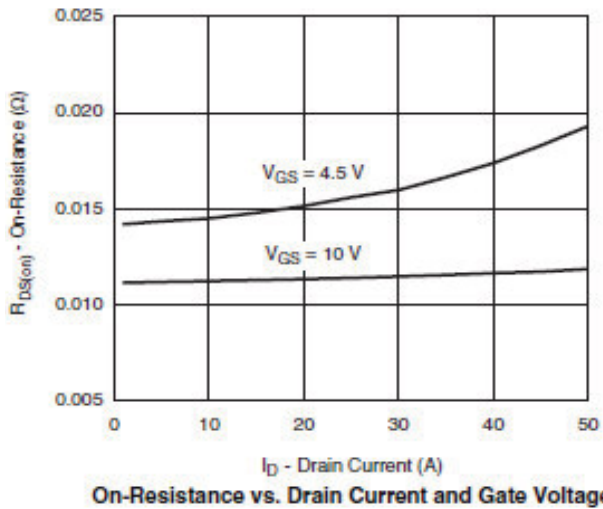
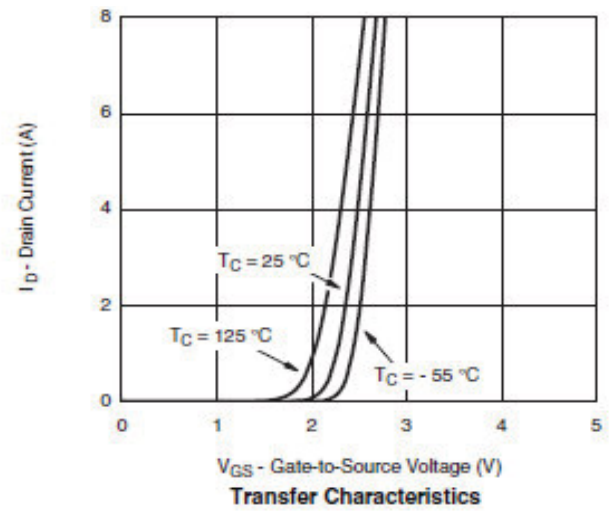
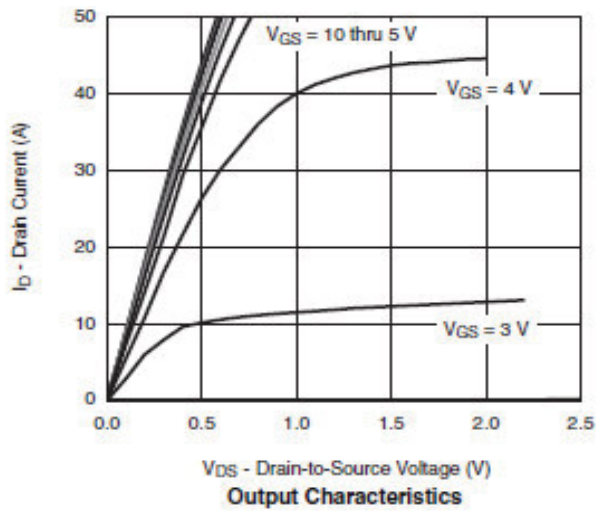
Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
STATIC PARAMETERS							
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V		30			V
Zero gate voltage drain current	Idss	Vds=30V, Vgs=0V				1	μA
			Ta=85°C				
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V				±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=250μA		0.5		1.8	V
On state drain current	Id(on)	Vgs=10V, Vds≥5V		15			A
Static drain-source on-resistance	Rds(on)	Vgs=10V, Id=8.0A			13	18	mΩ
		Vgs=4.5V, Id=6.0A			14	22	
Forward transconductance	Gfs	Vds=15V, Id=10A			24		S
Diode forward voltage	Vsd	Is=3.0A, Vgs=0V			0.8	1.3	V
Max.body-diode continuous current	Is					1.5	A
DYNAMIC PARAMETERS							
Input capacitance	Ciss	Vgs=0V, Vds=15V, f=1MHz			800		pF
Output capacitance	Coss				180		pF
Reverse transfer capacitance	Crss				70		pF
SWITCHING PARAMETERS							
Total gate charge	Qg	Vgs=4.5V, Vds=15V, Id≡10A			8.0	12.0	nC
Gate-source charge	Qgs				2.0		nC
Gate-drain charge	Qgd				2.3		nC
Turn-on delay time	td(on)	Vgs=10V, Vds=15V, Id≡10A RL=1.5Ω, Rgen=1.0Ω			8	15	ns
Turn-on rise time	tr				8	15	ns
Turn-off delay time	td(off)				16	28	ns
Turn-off fall time	tf				8	16	ns

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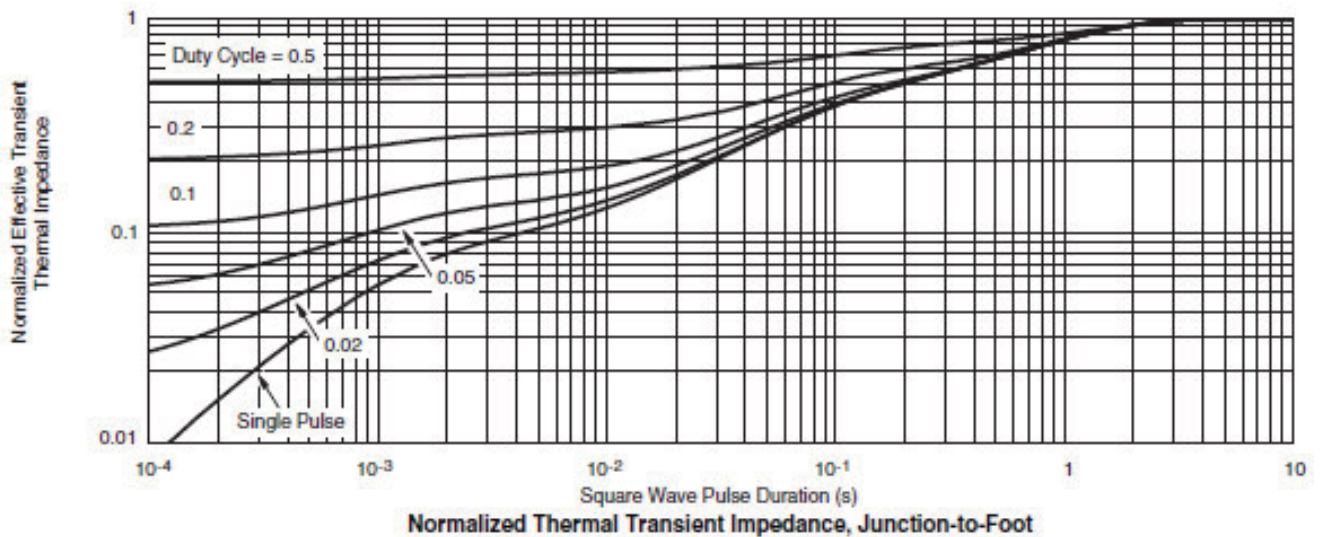
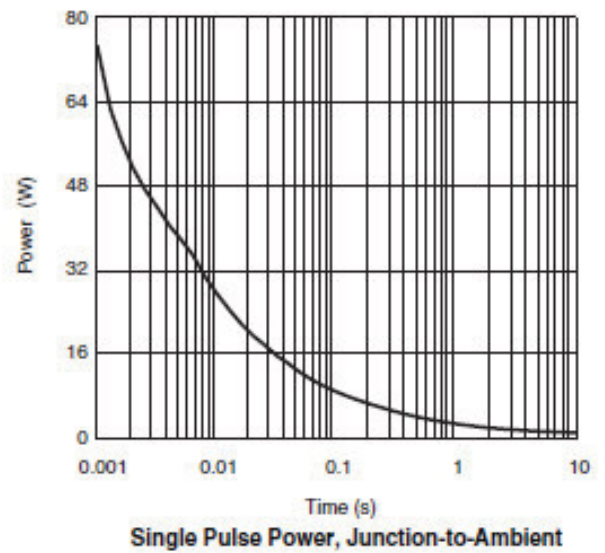
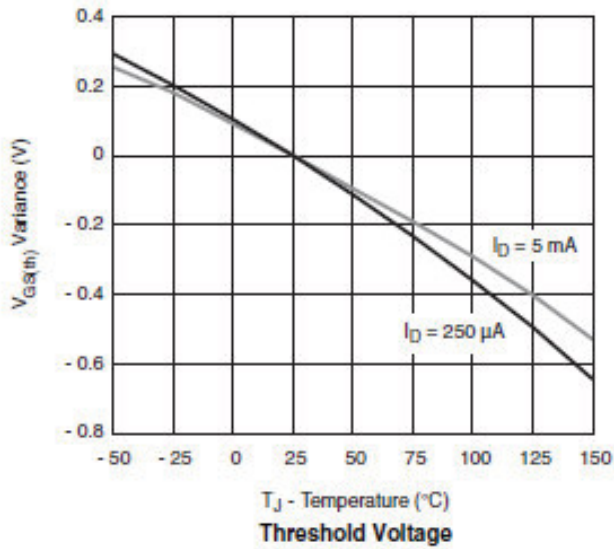
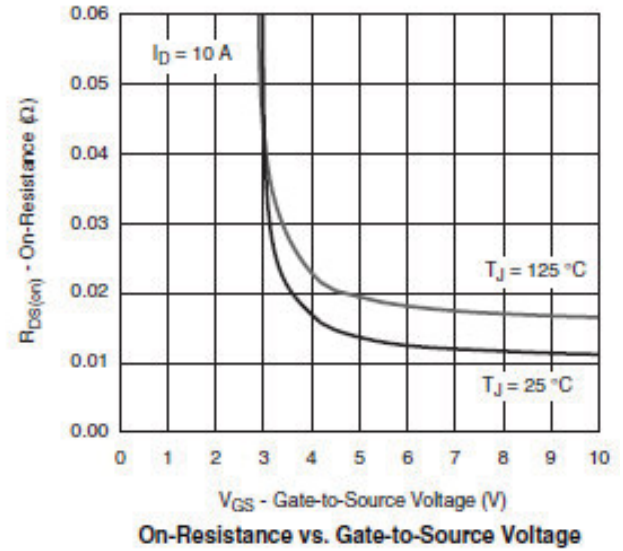
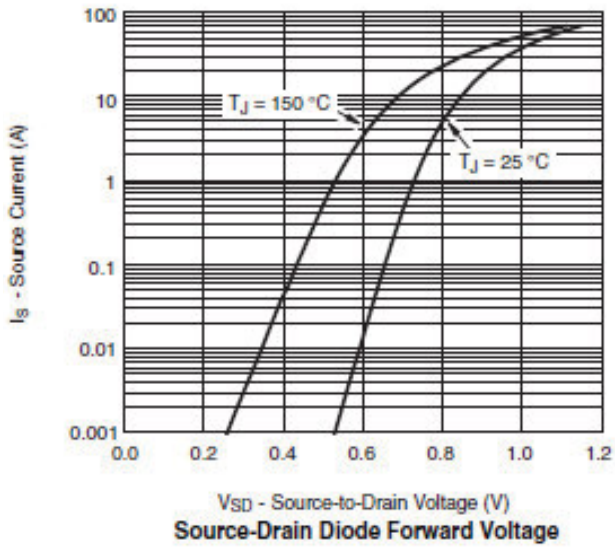
■ Typical Electrical and Thermal Characteristics (N-ch)



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■Electrical Characteristics (P-ch)

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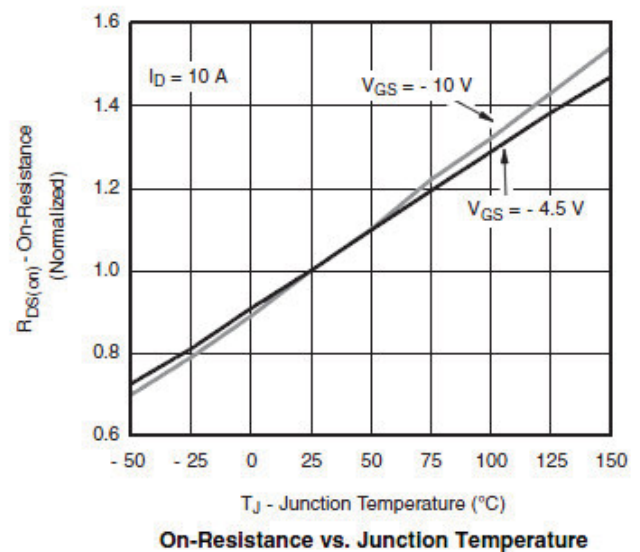
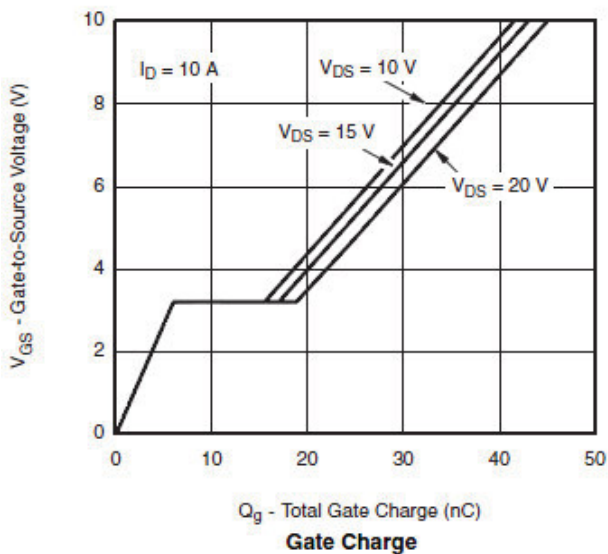
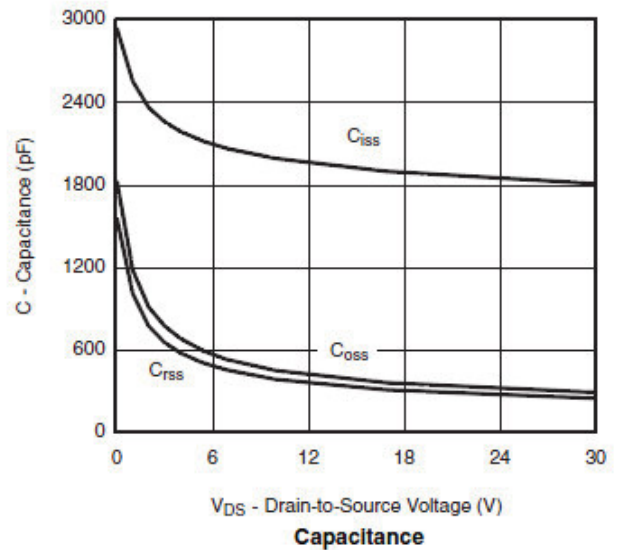
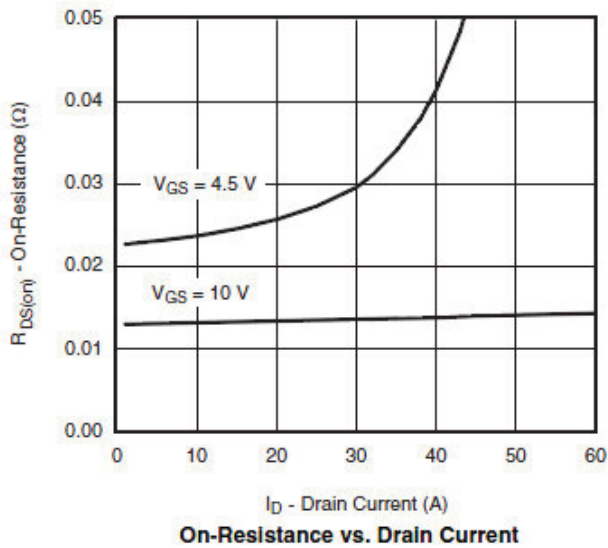
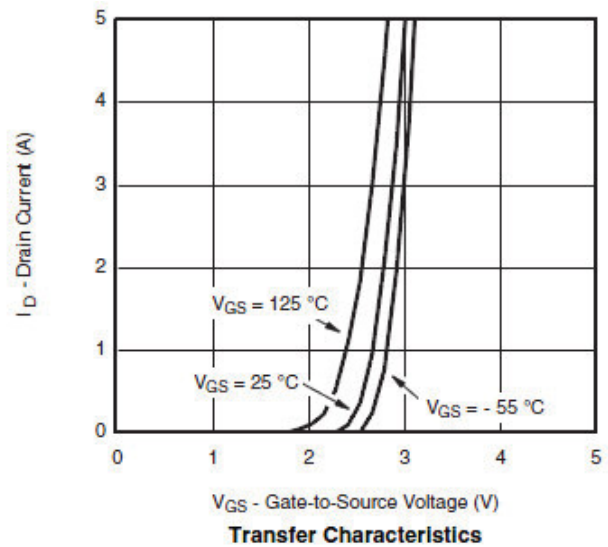
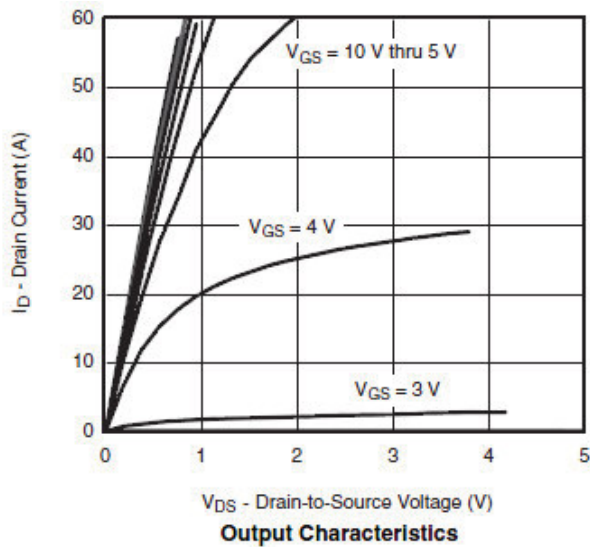
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-30			V
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V			-1	μA
		Ta=85°C			-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±25V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-2.0	V
On state drain current	Id(on)	Vgs=-10V, Vds≥-10V	-30			A
		Vgs=-4.5V, Vds≥-5V	-5			
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-8.0A		15	18	mΩ
		Vgs=-4.5V, Id=-6.0A		19	22	
Forward transconductance	Gfs	Vds=-10V, Id=-9.0A		22		S
Diode forward voltage	Vsd	Is=-2.3A, Vgs=0V		-0.7	-1.3	V
Max. body-diode continuous current	Is				-1.7	A
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-15V, f=1MHz		1600		pF
Output capacitance	Coss			350		pF
Reverse transfer capacitance	Crss			300		pF
SWITCHING PARAMETERS						
Total gate charge	Qg	Vgs=-4.5V, Vds=-15V Id=-6.0A		20	30	nC
Gate-source charge	Qgs			6		nC
Gate-drain charge	Qgd			10		nC
Turn-on delay time	td(on)	Vgs=-10V, Vds=-15V Id=-5.0A, RL=3Ω, Rgen=1Ω		10	20	ns
Turn-on rise time	tr			12	24	ns
Turn-off delay time	td(off)			30	45	ns
Turn-off fall time	tf			10	20	ns

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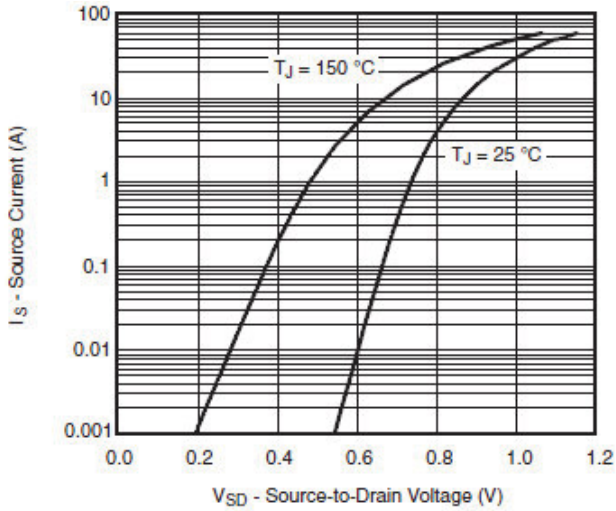
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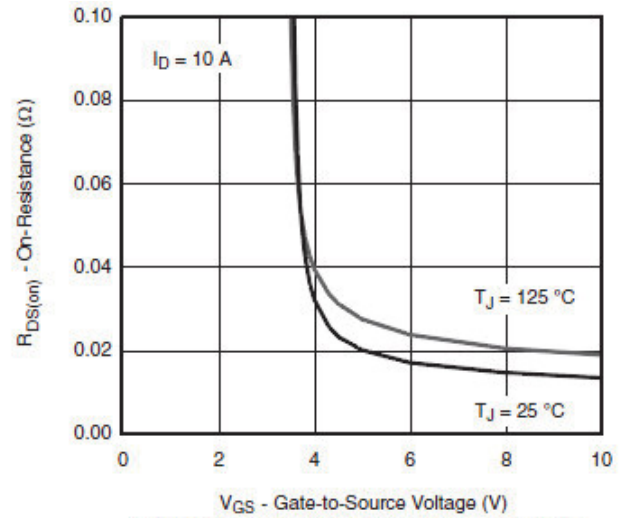
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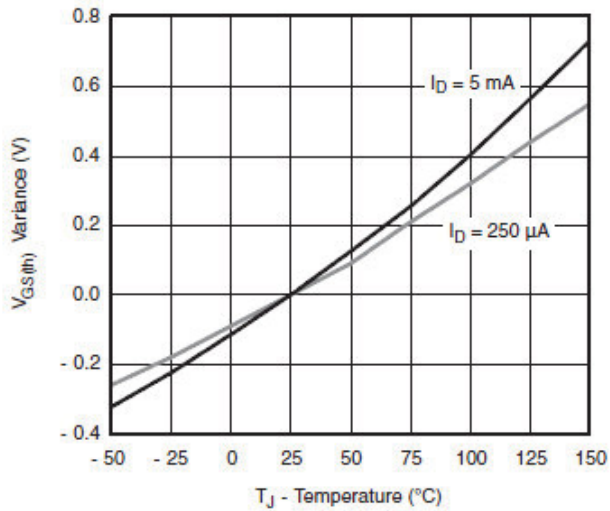
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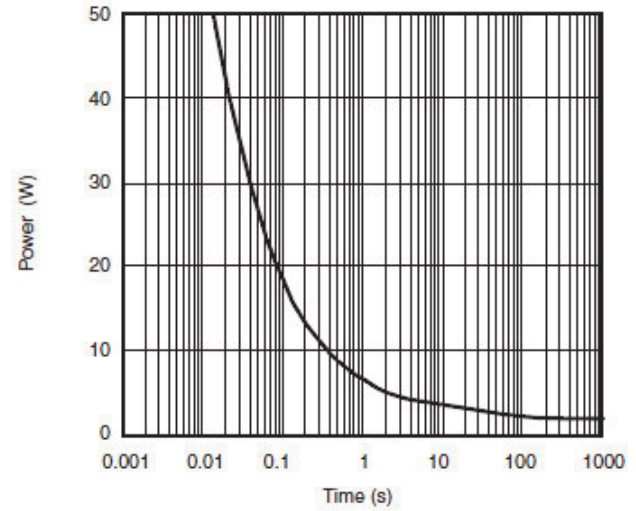
Source-Drain Diode Forward Voltage



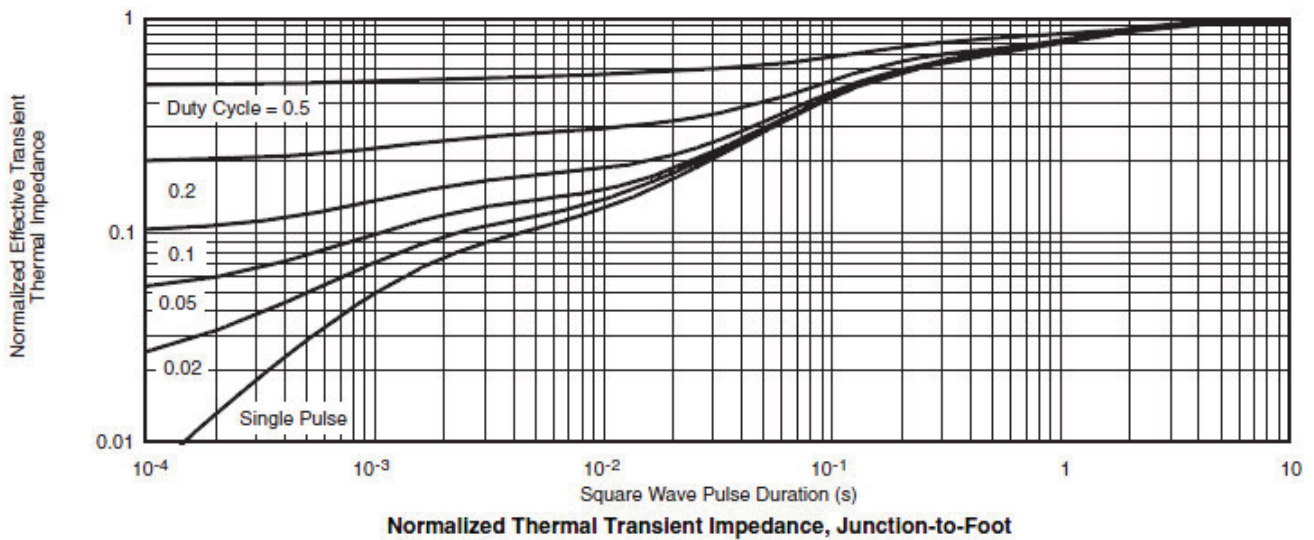
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

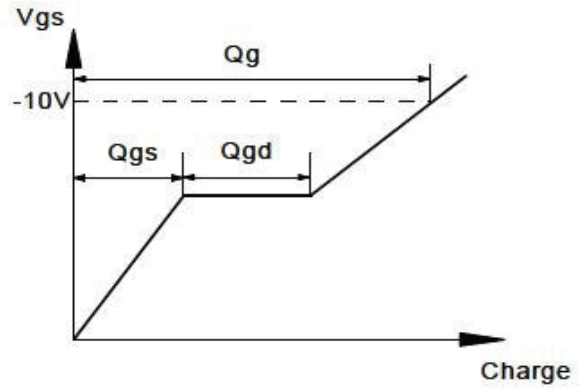
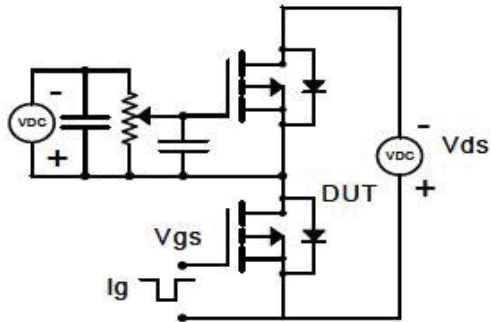
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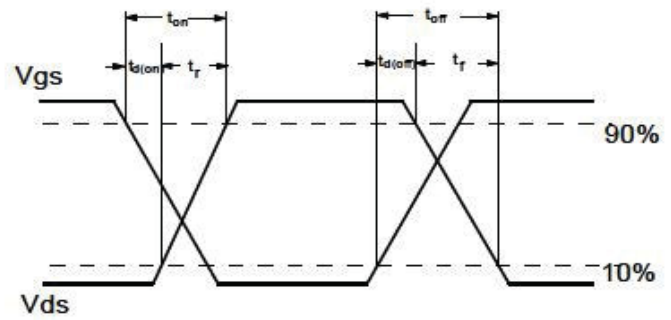
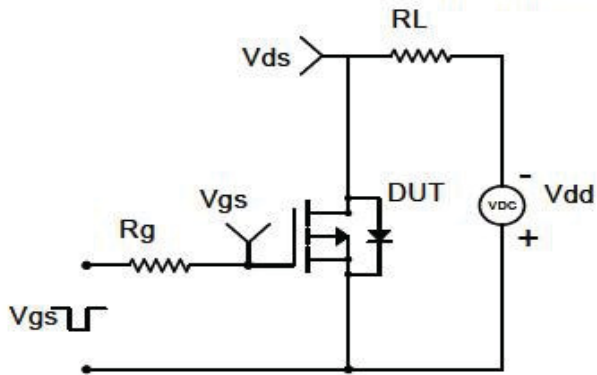
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

