

Complementary MOSFET

ELM544539A-N

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

■General Description

ELM544539A-N uses advanced trench technology to provide excellent $R_{ds(on)}$ and low gate charge.

■Features

- N-channel
 $V_{ds}=30V$, $I_d=5.0A$, $R_{ds(on)}=36m\Omega$ ($V_{gs}=10V$)
 $V_{ds}=30V$, $I_d=4.7A$, $R_{ds(on)}=46m\Omega$ ($V_{gs}=4.5V$)
- P-channel
 $V_{ds}=-30V$, $I_d=-5.4A$, $R_{ds(on)}=62m\Omega$ ($V_{gs}=-10V$)
 $V_{ds}=-30V$, $I_d=-4.2A$, $R_{ds(on)}=90m\Omega$ ($V_{gs}=-4.5V$)

■Maximum Absolute Ratings

$T_a=25^\circ C$. Unless otherwise noted.

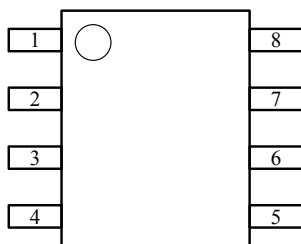
Parameter		Symbol	N-ch (Max.)	P-ch (Max.)	Unit
Drain-source voltage		V_{ds}	30	-30	V
Gate-source voltage		V_{gs}	± 20	± 20	V
Continuous drain current	$T_a=25^\circ C$	I_d	5.4	-5.4	A
	$T_a=70^\circ C$		4.0	-4.2	
Pulsed drain current		I_{dm}	20	-30	A
Power dissipation	$T_c=25^\circ C$	P_d	2.8	2.8	W
	$T_c=70^\circ C$		1.8	1.8	
Junction and storage temperature range		T_j, T_{stg}	-55 to 150	-55 to 150	$^\circ C$

■Thermal Characteristics

Parameter		Symbol	Device	Typ.	Max.	Unit
Maximum junction-to-ambient	Steady-state	$R_{\theta ja}$	N-ch		62.5	$^\circ C/W$
Maximum junction-to-ambient	Steady-state	$R_{\theta ja}$	P-ch		62.5	$^\circ C/W$

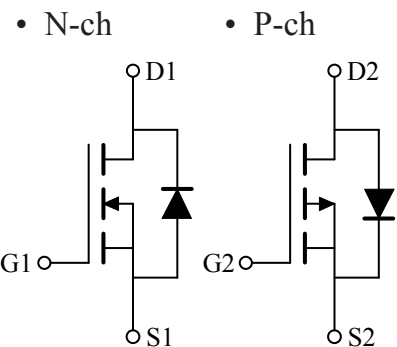
■Pin configuration

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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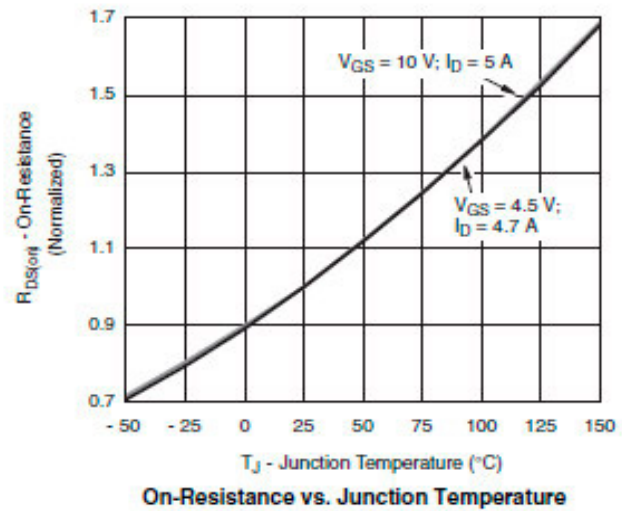
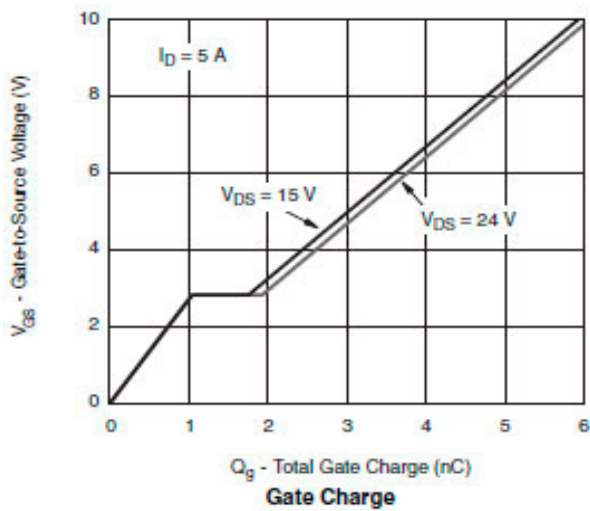
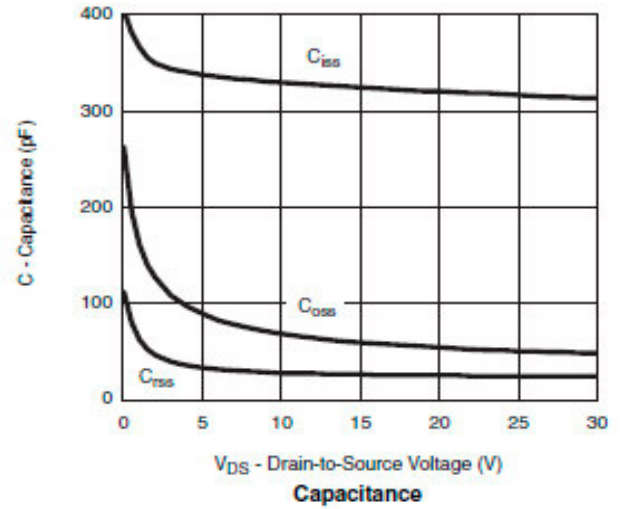
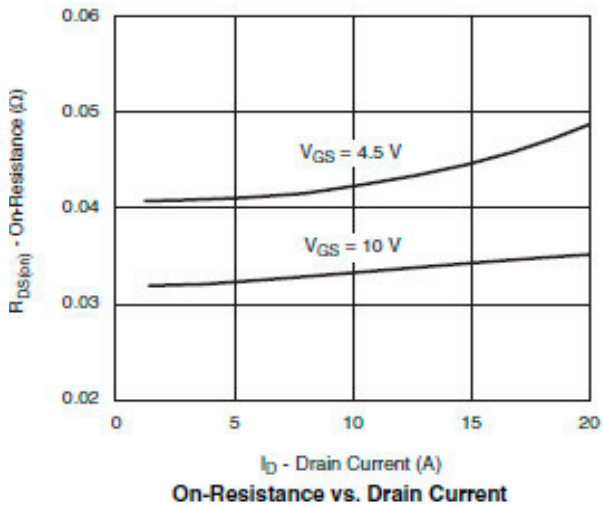
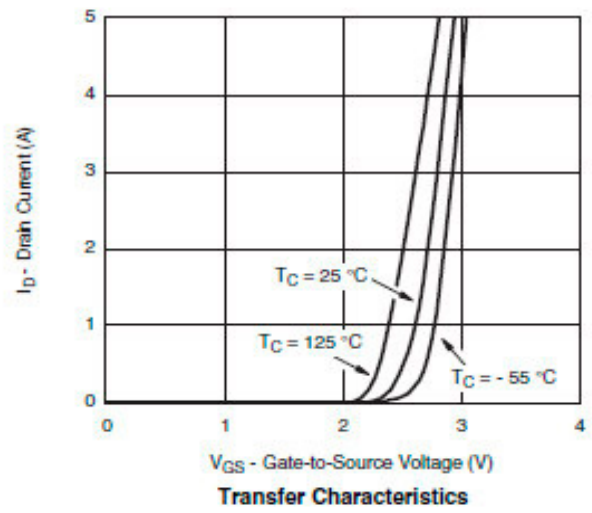
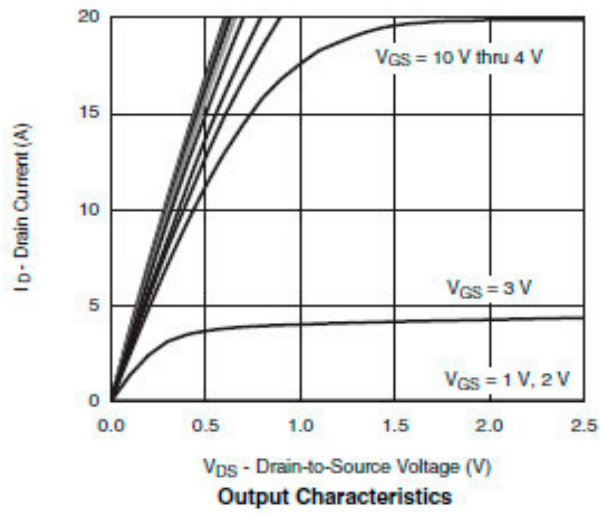
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=250μA, Vgs=0V	30			V
Zero gate voltage drain current	Idss	Vds=24V, Vgs=0V			1	μA
		Ta=85°C			30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, 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=5.0A		30	36	mΩ
		Vgs=4.5V, Id=4.7A		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				1.5	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=15Ω, Rgen=6Ω		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

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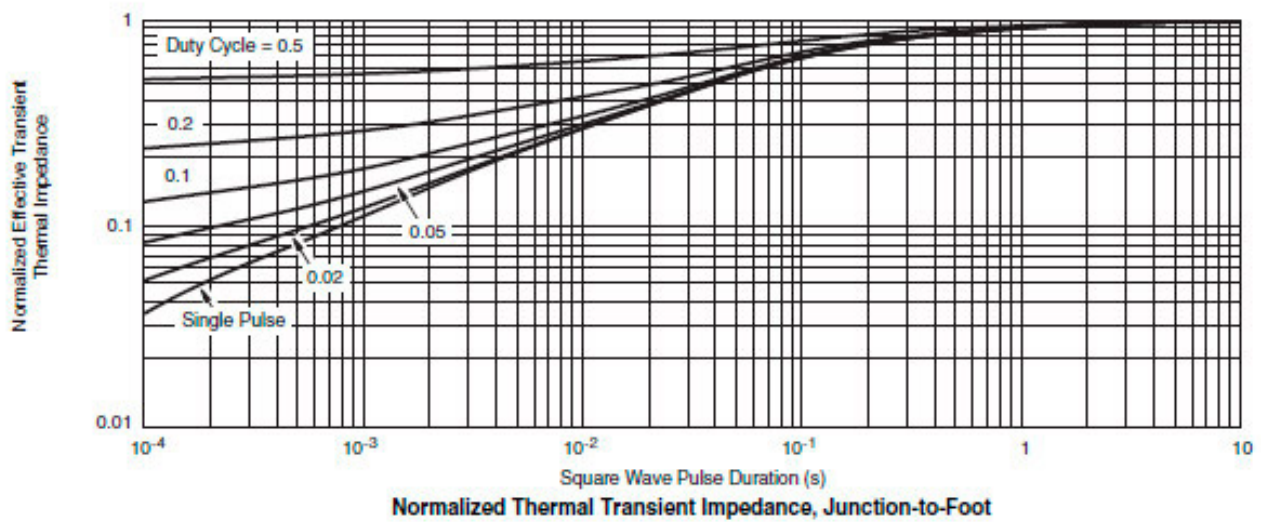
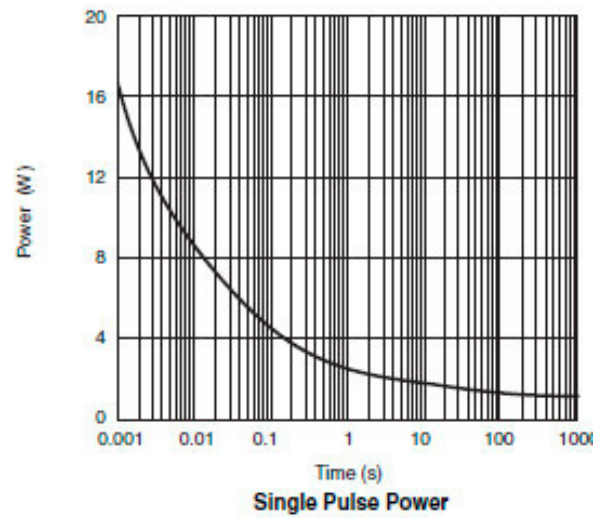
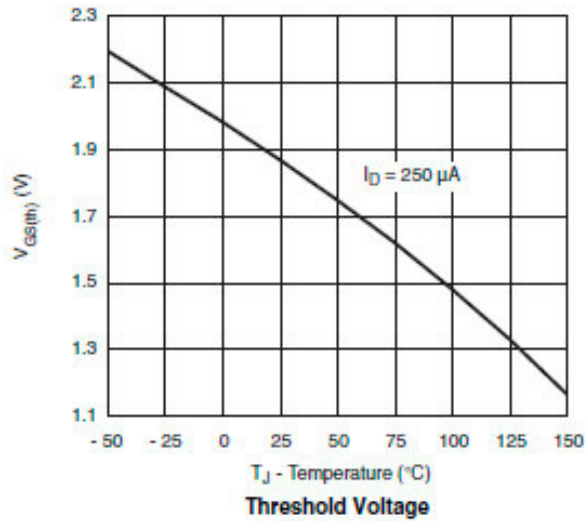
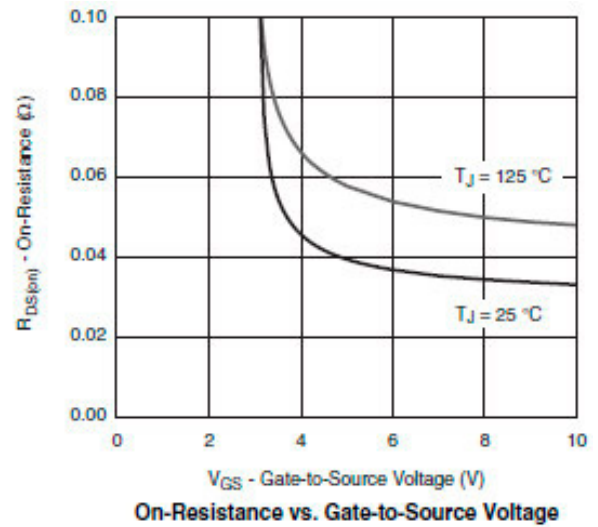
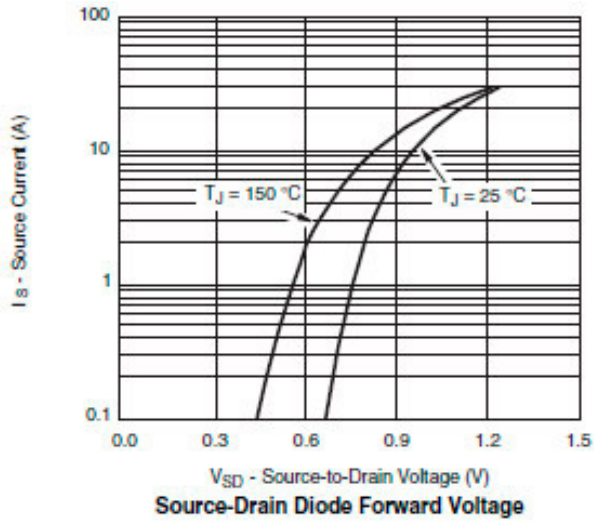
■ Typical Electrical and Thermal Characteristics (N-ch)



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■Electrical Characteristics (P-ch)

Ta=25°C. Unless otherwise noted.

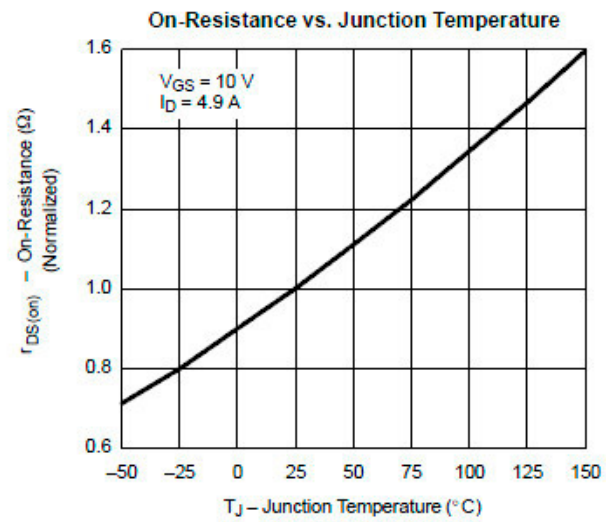
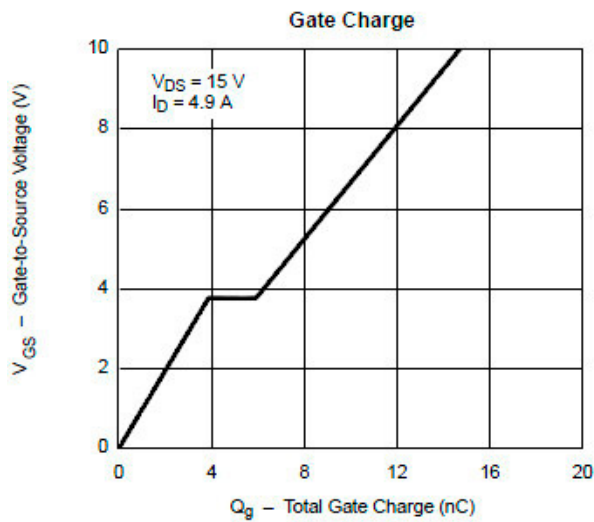
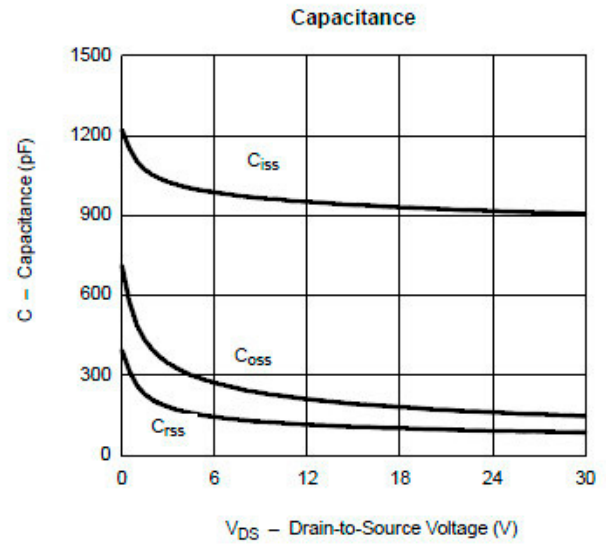
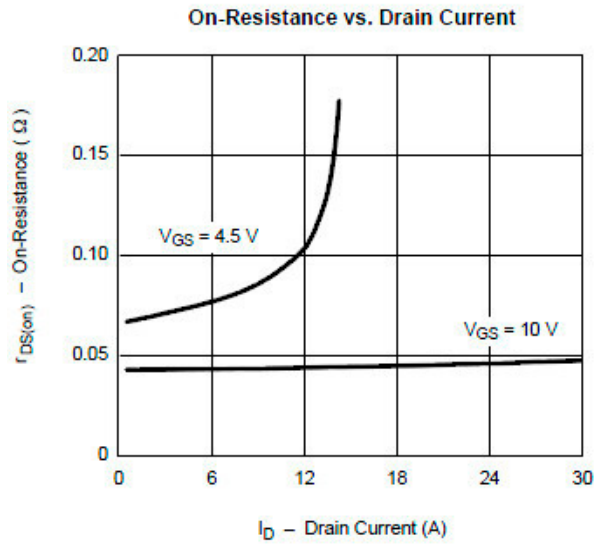
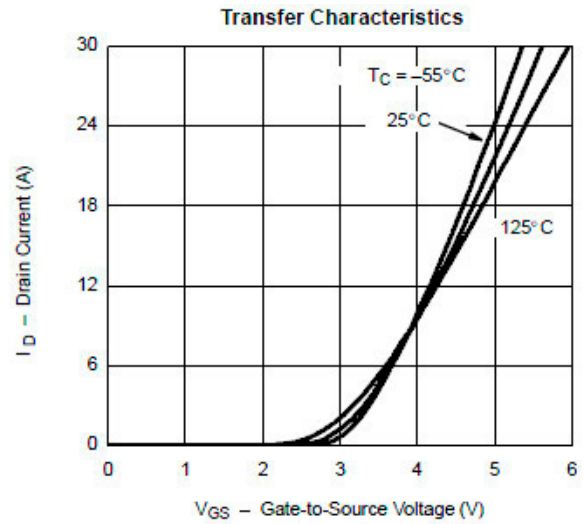
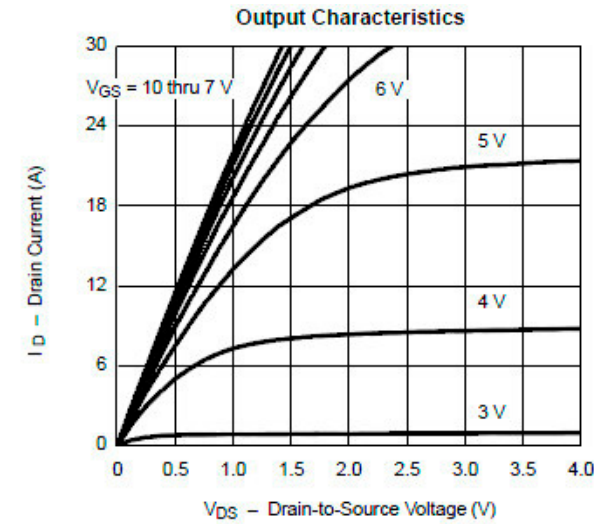
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Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V			-1	μA
		Ta=85°C			-30	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V			±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0		-2.5	V
On state drain current	Id(on)	Vgs=-10V, Vds=-5V	-25			A
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-5.4A		52	62	mΩ
		Vgs=-4.5V, Id=-4.2A		70	90	
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				-1.7	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

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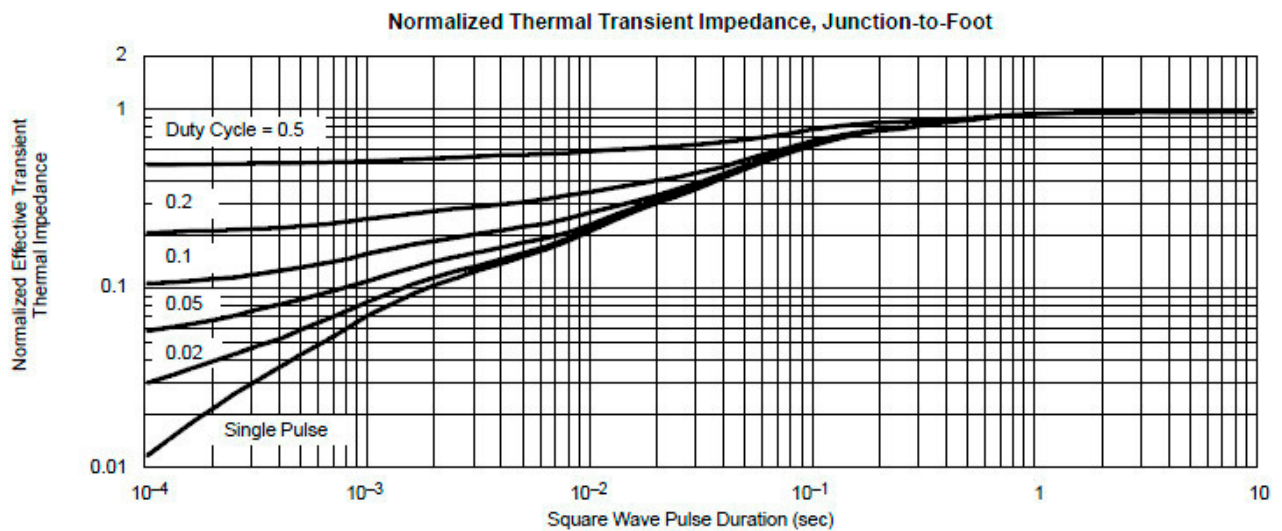
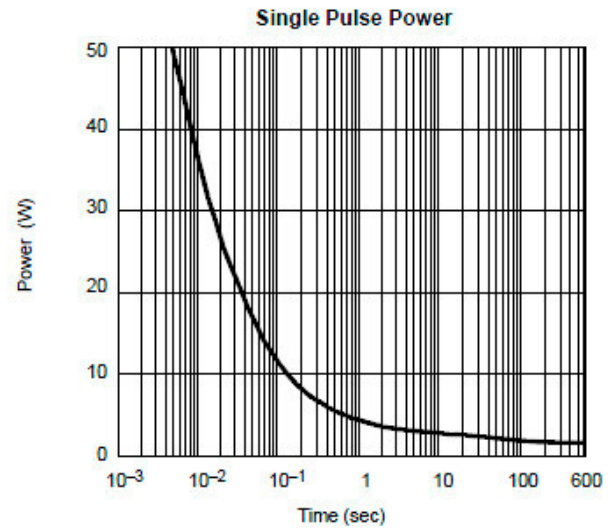
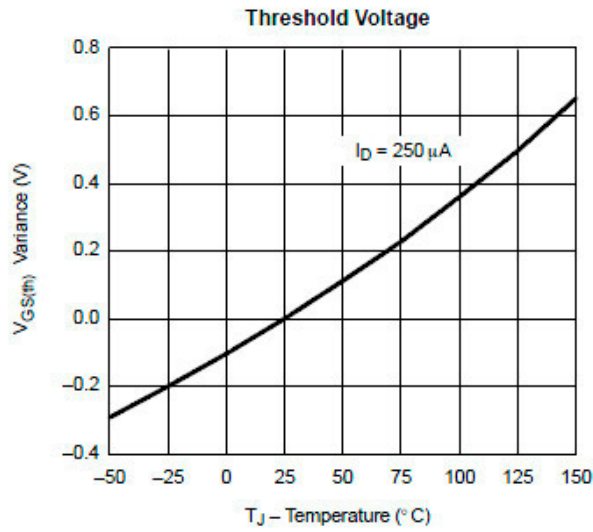
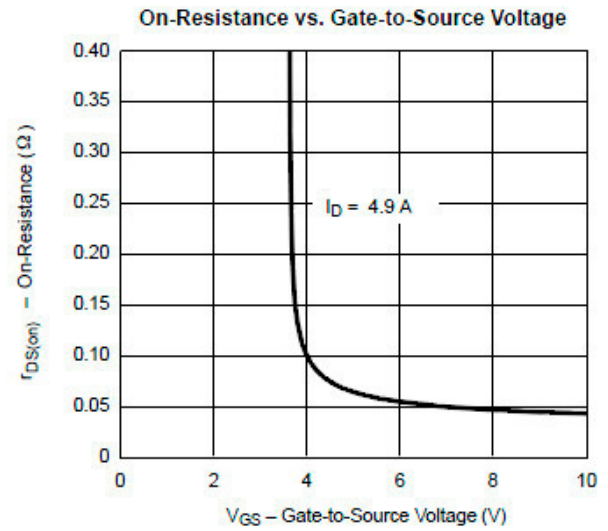
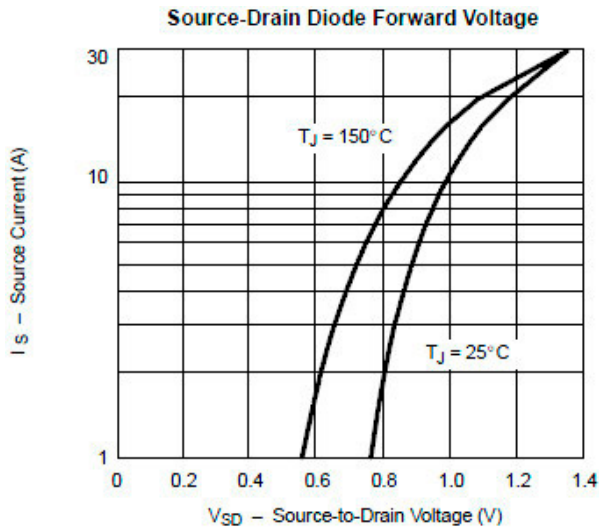
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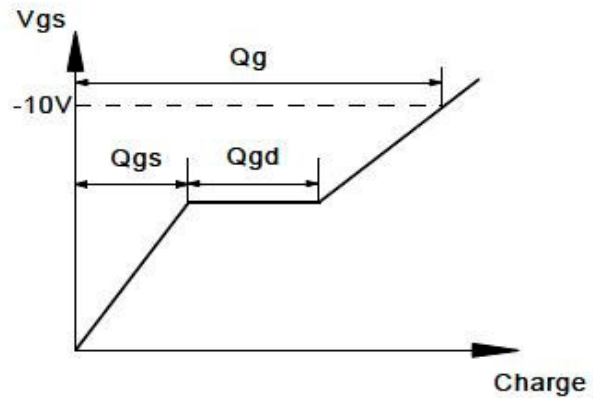
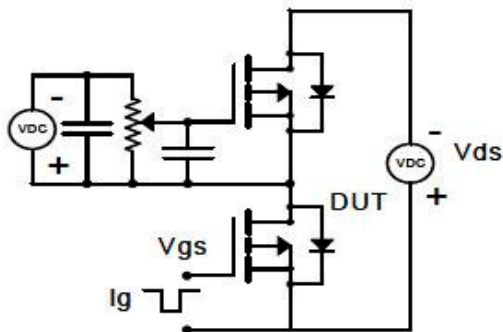
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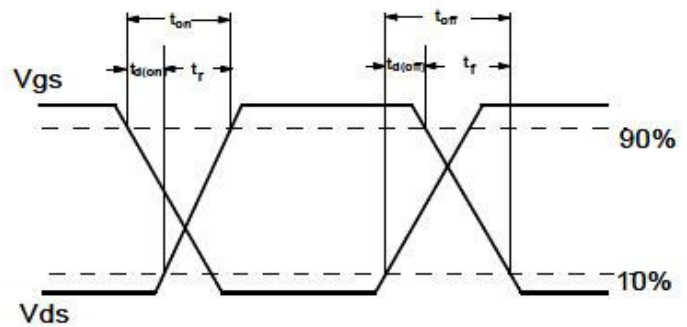
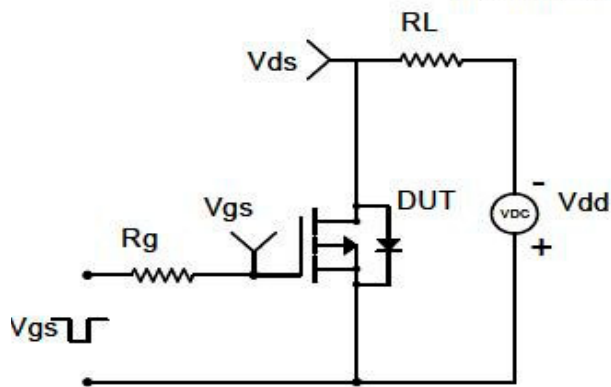
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■ Test circuit and waveform

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

