N-Channel and P-Channel Enhancement Mode Power MOSFET

Features

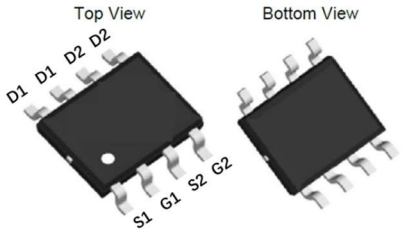
- N-Channel: 60V, 5A
  $R_{DS(ON)}$< 28 mΩ@ V_{GS} = 10V
  $R_{DS(ON)}$ <31 mΩ@ V_{GS} = 4.5V
- P-Channel: -60V, -3.1A
  $R_{DS(ON)}$< 62 mΩ@ V_{GS} = -10V
  $R_{DS(ON)}$ < 72mΩ @ V_{GS} = -4.5V

General Features

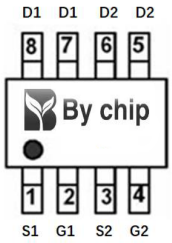
- Advanced Trench Technology
- Provide Excellent RDS(ON) and Low Gate Charge
- Lead Free and Green Available

100% UIS TESTED!
100% ΔVds TESTED!

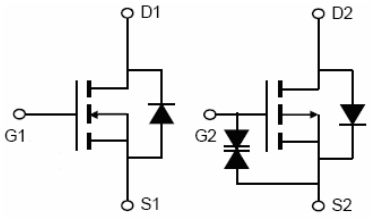
RoHS



SOP-8 Dual



Pin Assignment



Schematic diagram

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted				
Parameter	**Symbol**	**NMOS**	**PMOS**	**Unit**
Drain-Source Voltage	V_{DS}	60	-60	V
Continuous Drain Current	I_D	5	-3.1	A
Pulsed Drain Current (note1)	I_{DM}	20	-12.4	A
Gate-Source Voltage	V_{GS}	±20	±20	V
Power Dissipation	P_D	2.5	1.9	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	-55 To 150	ºC

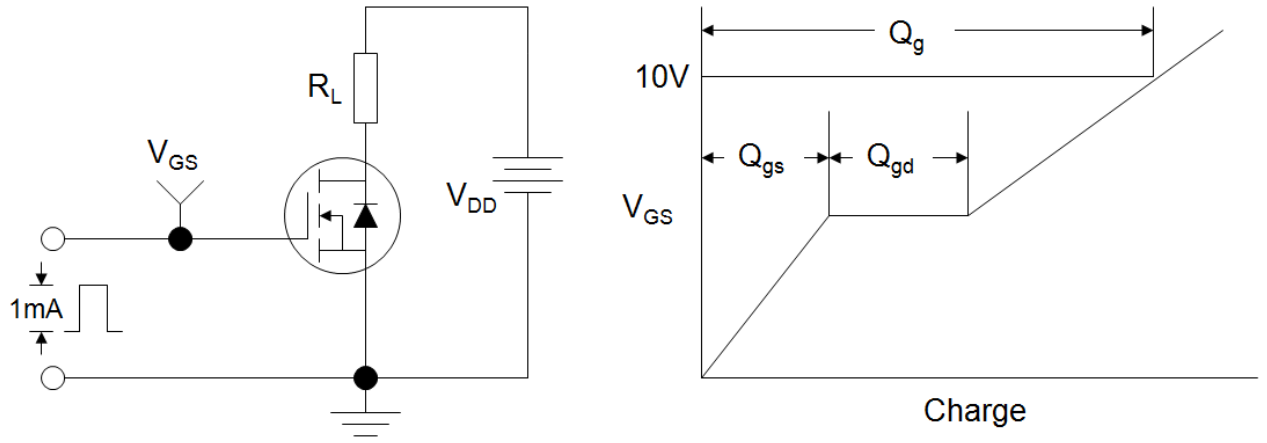
Thermal Resistance				
Parameter	**Symbol**	**NMOS**	**PMOS**	**Unit**
Thermal Resistance, Junction-to-Ambient	R_{thJA}	50	65	ºC/W

NMOS Specifications T_J = 25ºC, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0		2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 4.3A	--		28	mΩ
		V_{GS} = 4.5V, I_D = 3.9A	--		31	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=4.3A	--	9.6	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1.0MHz	--	1336	--	pF
Output Capacitance	C_{oss}		--	56	--	
Reverse Transfer Capacitance	C_{rss}		--	52	--	
Total Gate Charge	Q_g	V_{DS} = 30V, I_D = 5A, V_{GS} = 10V	--	22	--	nC
Gate-Source Charge	Q_{gs}		--	3.3	--	
Gate-Drain Charge	Q_{gd}		--	5.2	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 30V, I_D = 5A, R_G = 3Ω	--	5.2	--	ns
Turn-on Rise Time	t_r		--	3	--	
Turn-off Delay Time	$t_{d(off)}$		--	17	--	
Turn-off Fall Time	t_f		--	2.5	--	
Drain-Source Body Diode Characteristics						
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 1.7A, V_{GS} = 0V	--	--	1.2	V
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	5	A

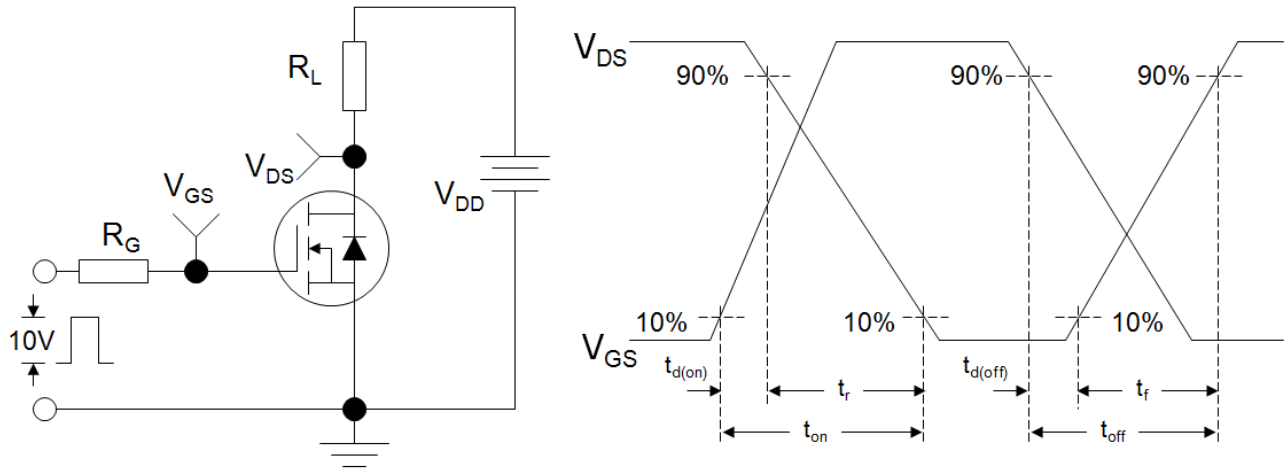
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G

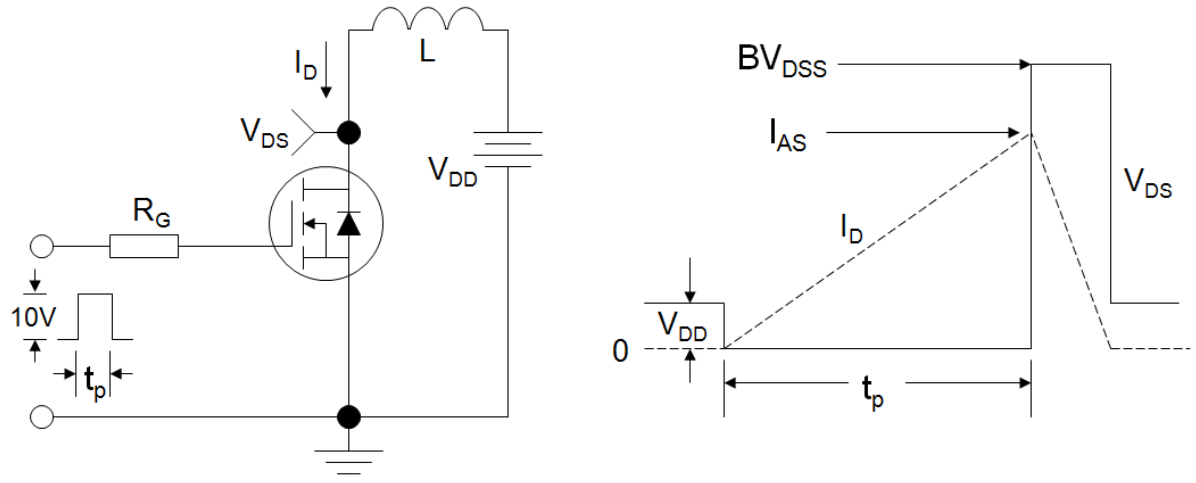
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



NMOS Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

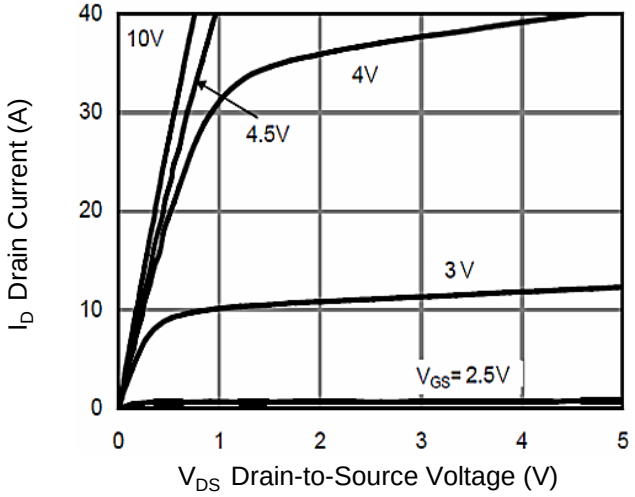


Figure 2. Transfer Characteristics

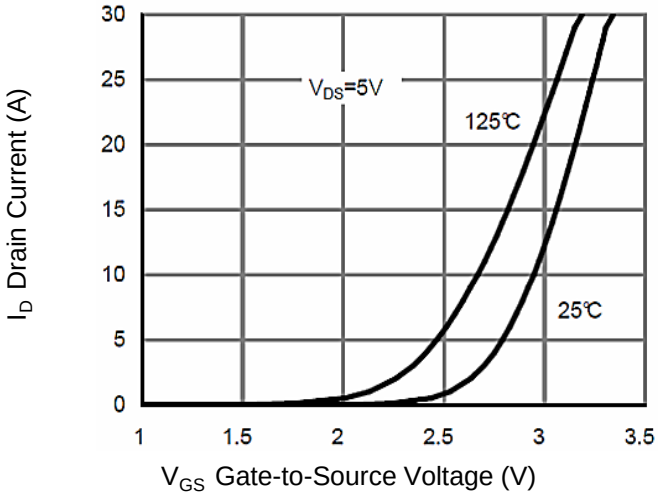


Figure 3.Drain-Source On-Resistance

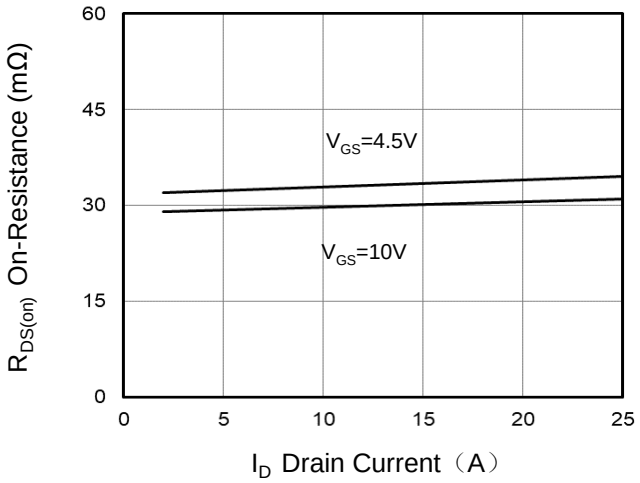


Figure 4. Gate Charge

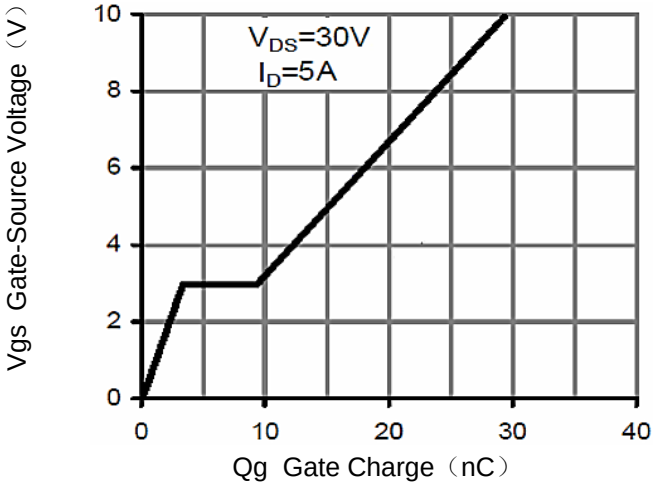


Figure 5. Capacitance

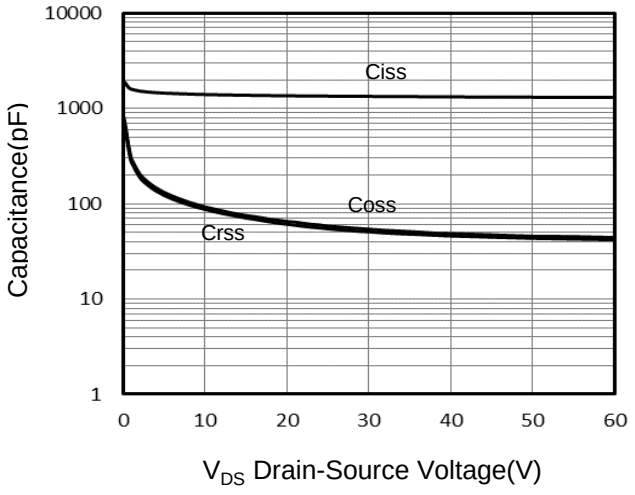
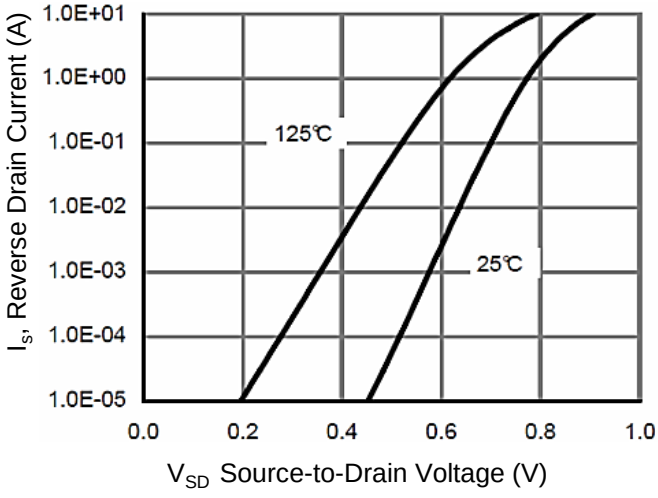


Figure 6. Source-Drain Diode Forward



NMOS Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

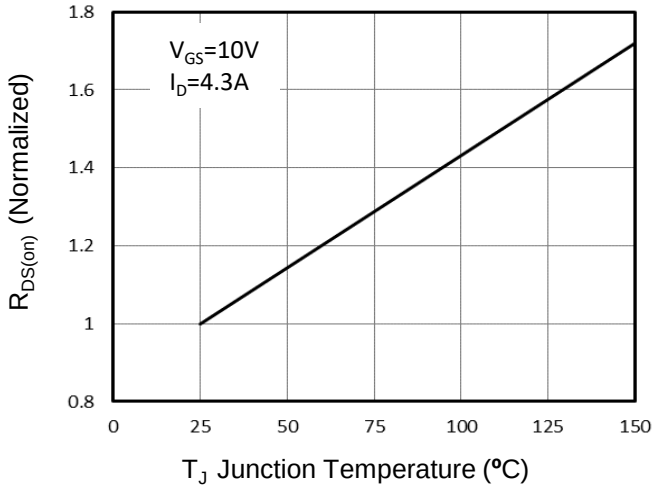


Figure 8. Safe Operation Area

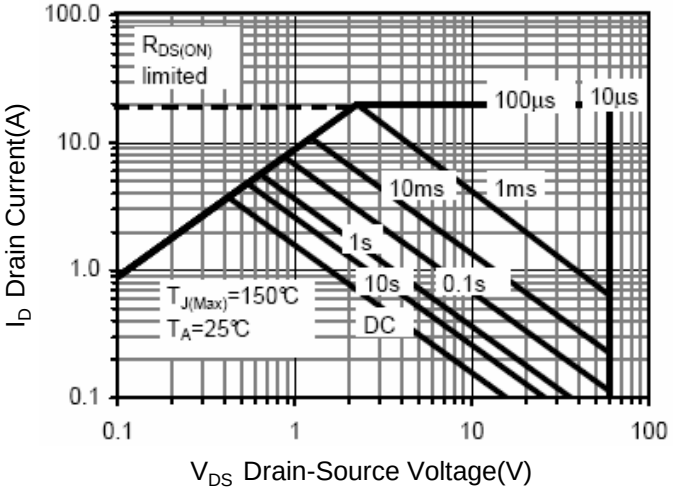
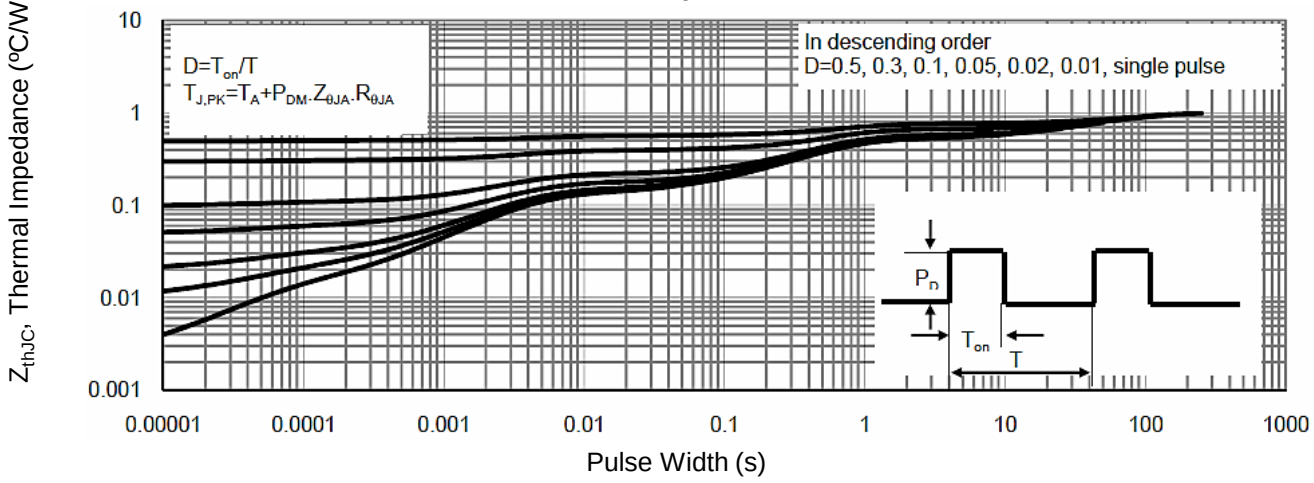


Figure 9. Normalized Maximum Transient Thermal Impedance

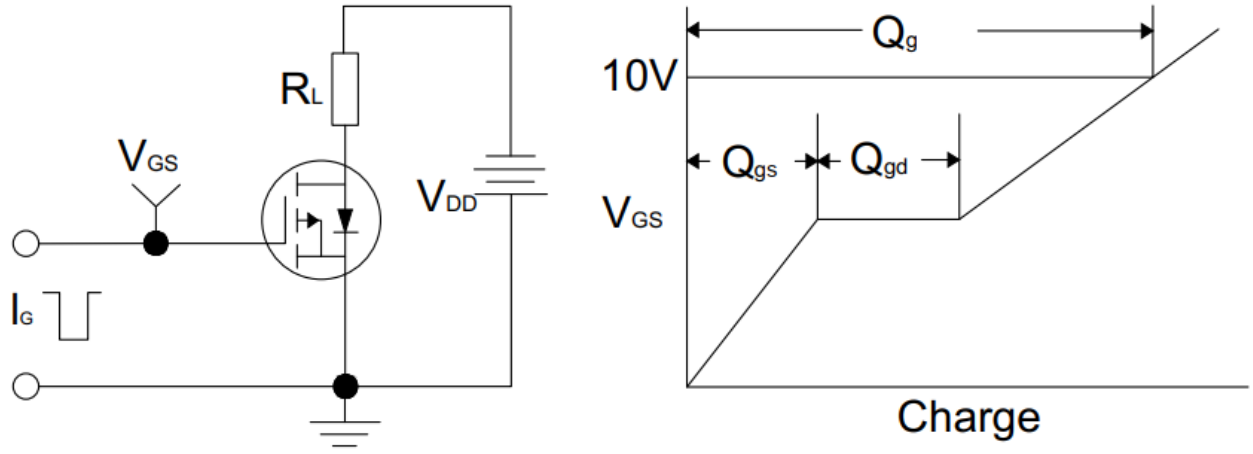


PMOS Specifications T_J = 25ºC, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -60V, V_{GS} = 0V, T_J = 25ºC	--	--	-1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.0		-2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V, I_D = -3.1A	--		62	mΩ
		V_{GS} = -4.5V, I_D = -0.2A	--		72	
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-3.1A	--	6.6	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -30V, f = 1.0MHz	--	1454	--	pF
Output Capacitance	C_{oss}		--	62	--	
Reverse Transfer Capacitance	C_{rss}		--	58	--	
Total Gate Charge	Q_g	V_{DD} = -30V, I_D = -3A, V_{GS} = -10V	--	37	--	nC
Gate-Source Charge	Q_{gs}		--	4.5	--	
Gate-Drain Charge	Q_{gd}		--	10.5	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = -30V, I_D = -3A, R_G = 3Ω	--	8	--	ns
Turn-on Rise Time	t_r		--	4	--	
Turn-off Delay Time	$t_{d(off)}$		--	32	--	
Turn-off Fall Time	t_f		--	7	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	-3.1	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = -2A, V_{GS} = 0V	--	--	-1.2	V

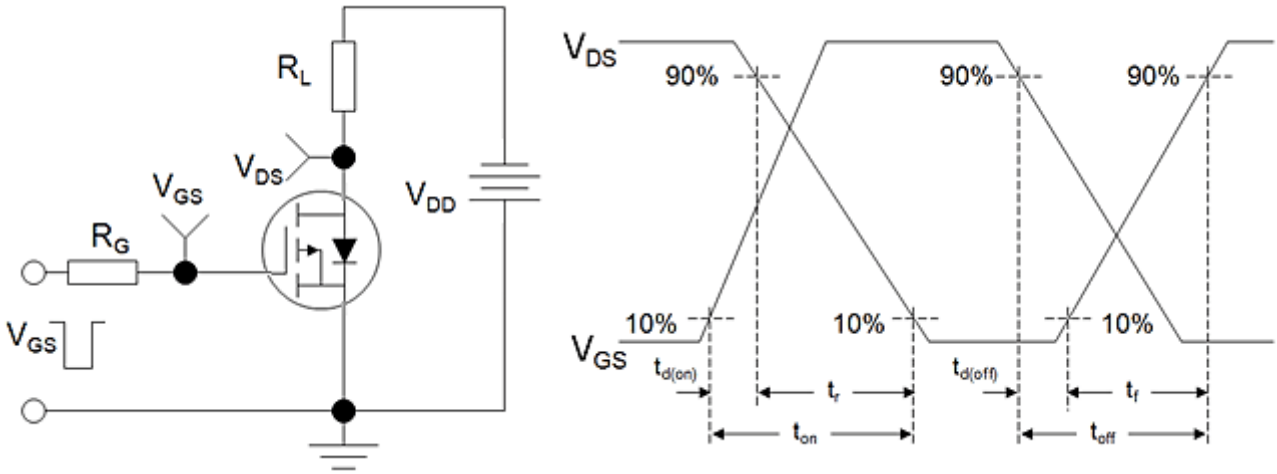
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G

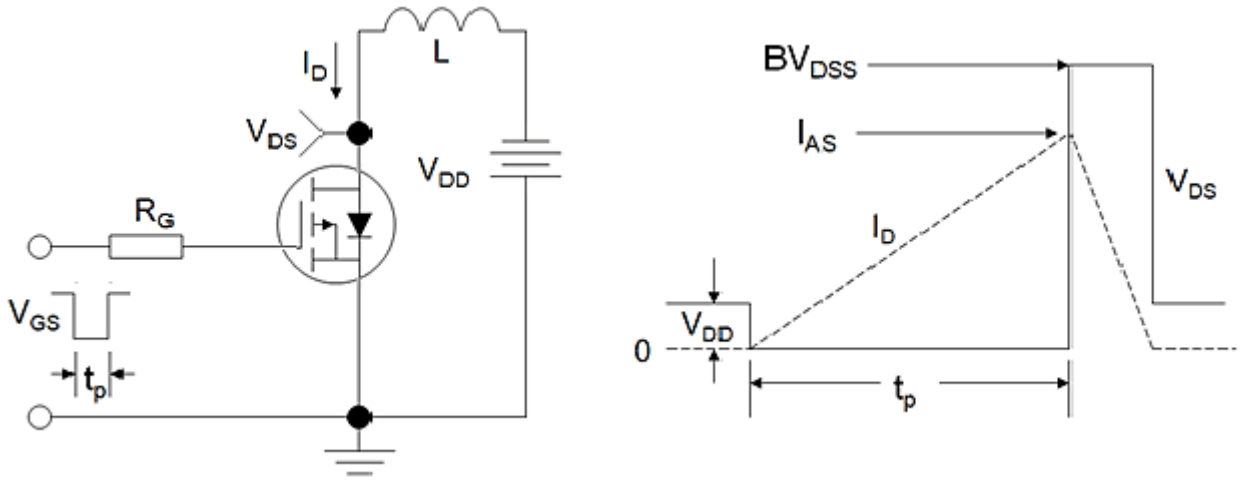
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



PMOS Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

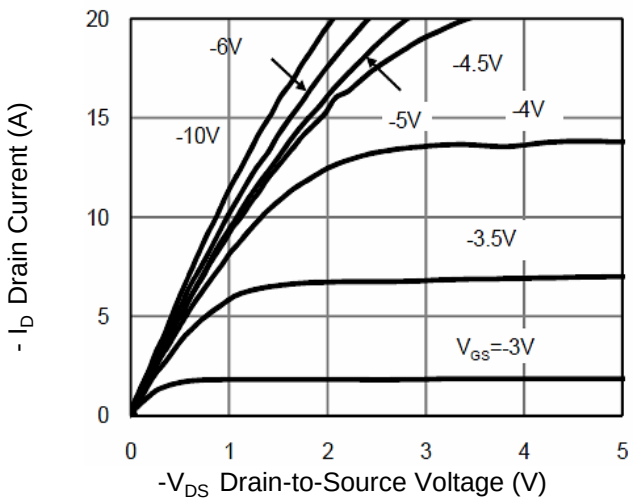


Figure 2. Transfer Characteristics

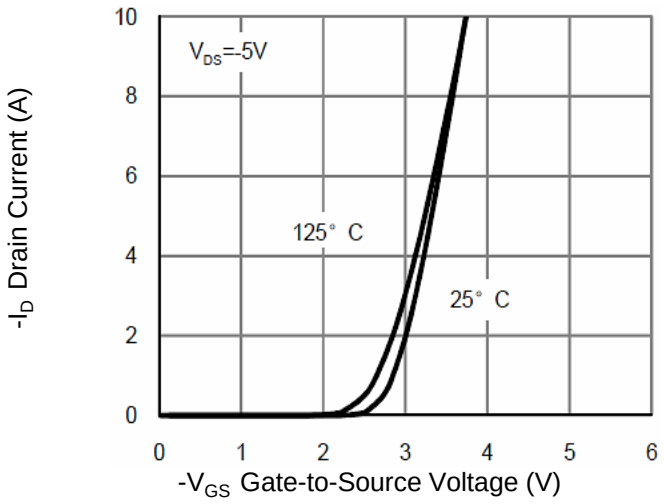


Figure 3.Rdson-Drain Current

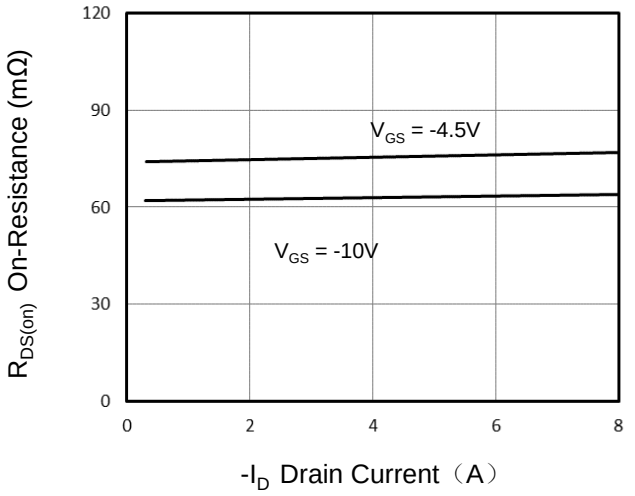


Figure 4. Gate Charge

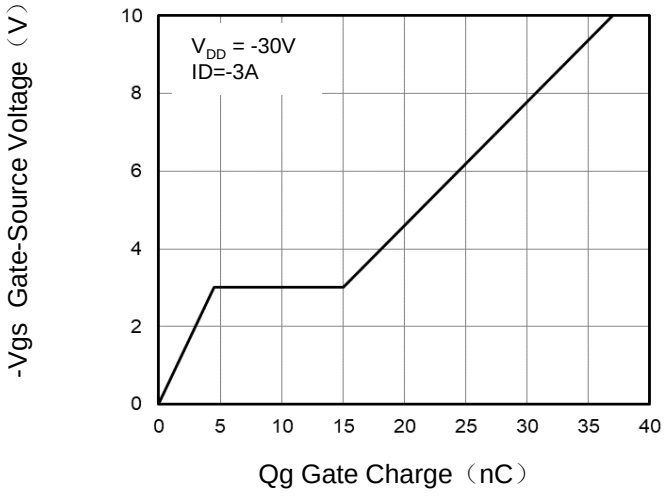


Figure 5. Capacitance

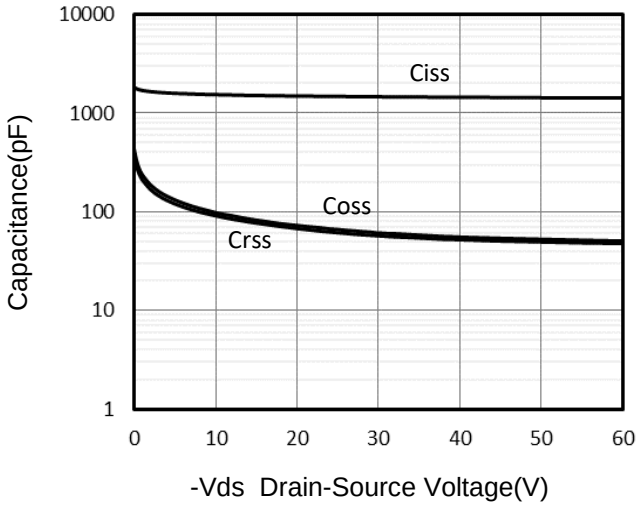
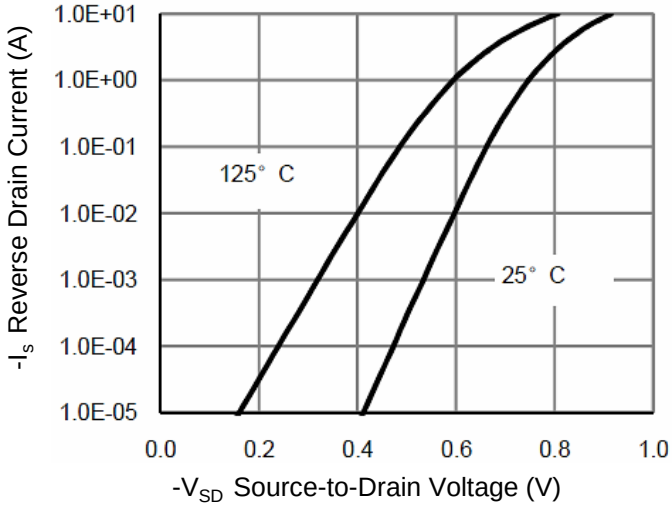


Figure 6. Source-Drain Diode Forward



PMOS Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

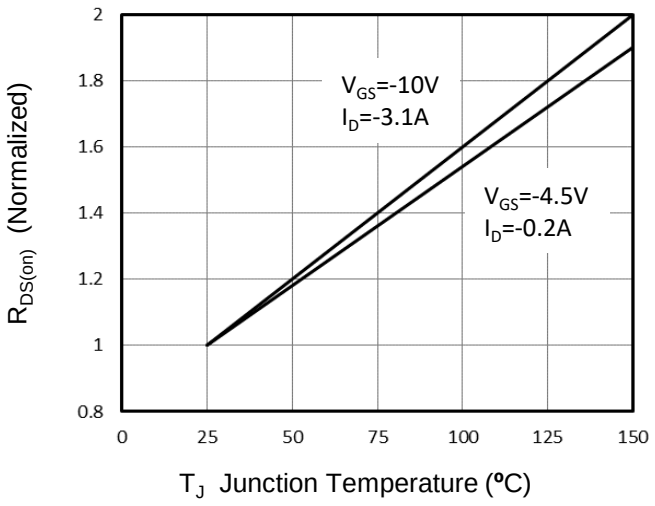


Figure 8. Safe Operation Area

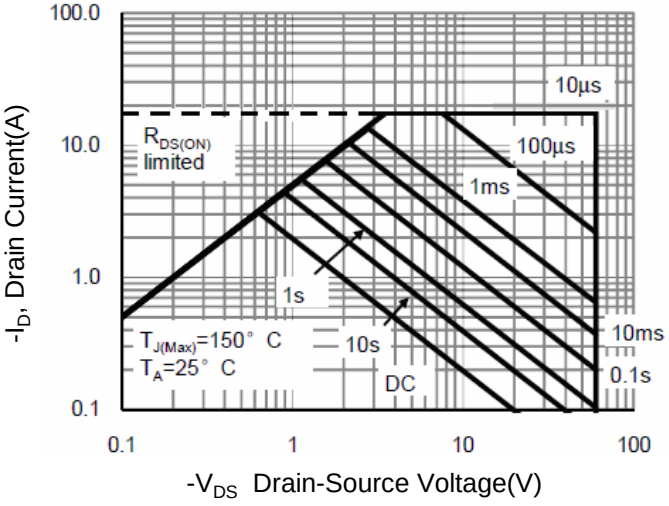


Figure 9. Normalized Maximum Transient Thermal Impedance

