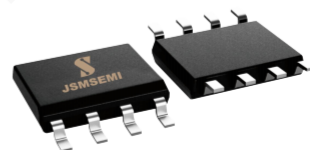


Features

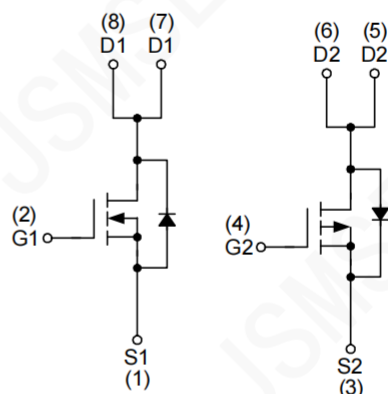
- **N Channel**
40V/6.5A,
 $R_{DS(ON)} = 26m\Omega \text{ (max.) @ } V_{GS} = 10V$
 $R_{DS(ON)} = 31m\Omega \text{ (max.) @ } V_{GS} = 4.5V$
- **P Channel**
-40V/-5.0A,
 $R_{DS(ON)} = 72m\Omega \text{ (max.) @ } V_{GS} = -10V$
 $R_{DS(ON)} = 92m\Omega \text{ (max.) @ } V_{GS} = -4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

Applications

- Synchronous Rectification
- Motor Control
- Fan Pre-driver H-bridge



Top View of SOP-8



N-Channel MOSFET P-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	N Channel	P Channel	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage	40	-40	V
V_{GSS}	Gate-Source Voltage	± 20	± 20	V
T_J	Maximum Junction Temperature	150		$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150		$^\circ\text{C}$
I_S	Diode Continuous Forward Current	2	-2	A
I_{DP}	Pulse Drain Current Tested	$V_{GS}=10V(N), V_{GS}=-10V(P)$		A
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	6.5	A
		$T_A=70^\circ\text{C}$	6	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	2	W
		$T_A=70^\circ\text{C}$	1.3	
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State	50	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	$t \leq 10s$	62.5	$^\circ\text{C/W}$
		Steady State ^b	110	
I_{AS}^a	Avalanche Current, Single pulse	$L=0.5mH$	10	A
E_{AS}^a	Avalanche Energy, Single pulse	$L=0.5mH$	25	mJ

Note a : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J=25^\circ\text{C}$).

Note b : Surface Mounted on $1in^2$ pad area, $t=999sec$.

N Channel Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	N Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.5	2.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =5A	-	25	35	mΩ
		V _{GS} =4.5V, I _{DS} =3A	-	30	45	
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =6A, dI _{SD} /dt=100A/μs	-	13	-	ns
Q _{rr}	Reverse Recovery Charge		-	8.7	-	nC
Dynamic Characteristics ^d						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	815	-	pF
C _{oss}	Output Capacitance		-	95	-	
C _{rss}	Reverse Transfer Capacitance		-	60	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	7.8	-	ns
t _r	Turn-on Rise Time		-	6.9	-	
t _{d(OFF)}	Turn-off Delay Time		-	22.4	-	
t _f	Turn-off Fall Time		-	4.8	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =6A	-	15.7	22	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =6A	-	7.5	10.5	
Q _{gth}	Threshold Gate Charge		-	1.85	-	
Q _{gs}	Gate-Source Charge		-	3.24	-	
Q _{gd}	Gate-Drain Charge		-	2.75	-	

Note c : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note d : Guaranteed by design, not subject to production testing.

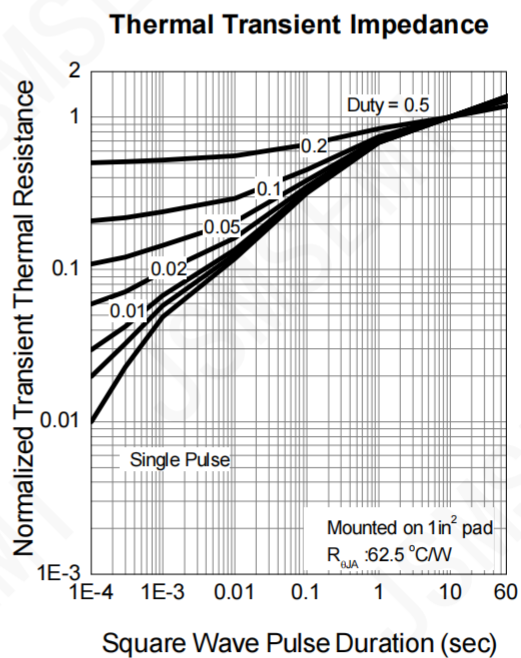
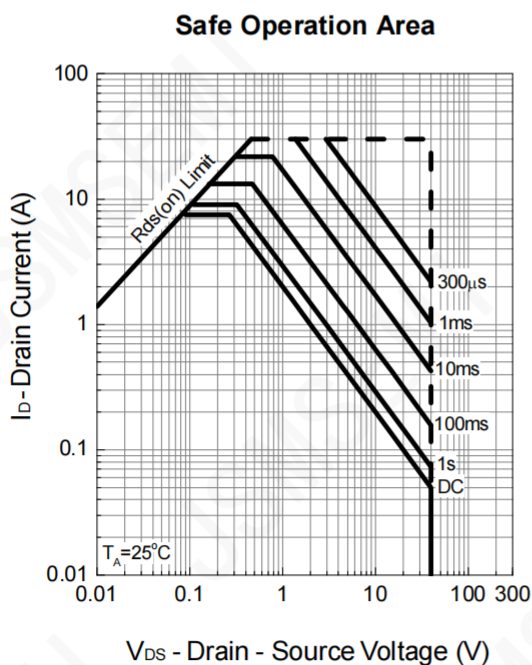
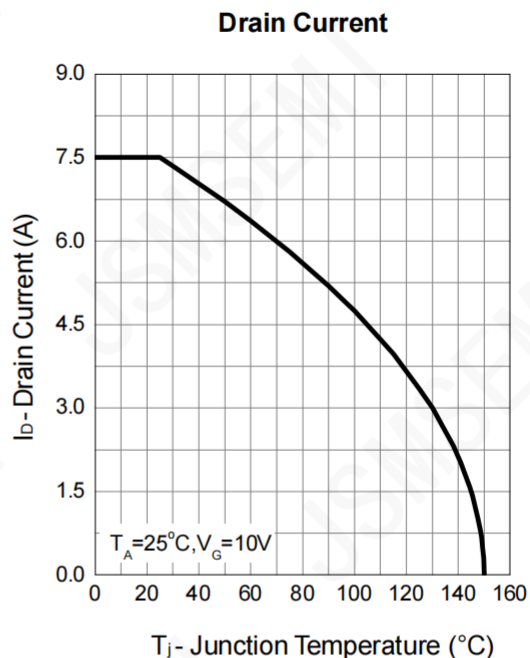
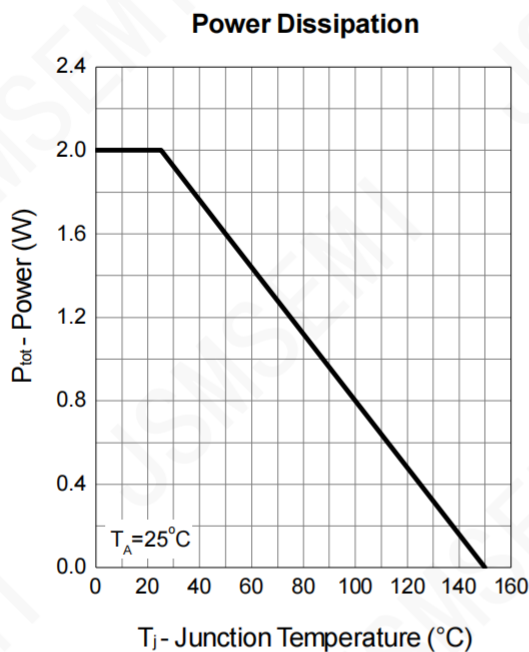
P Channel Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	P Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-32V, V _{GS} =0V	-	-	-1	μA
		T _J =85°C	-	-	-30	mA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1.0	-1.65	-2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =-10V, I _{DS} =-5.0A	-	72	88	mΩ
		V _{GS} =-4.5V, I _{DS} =-3.5A	-	92	110	
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.75	-1	V
t _{rr}	Reverse Recovery Time	I _{DS} =-5.5A,	-	15	-	ns
Q _{rr}	Reverse Recovery Charge	di _{SD} /dt=100A/μs	-	8	-	nC
Dynamic Characteristics ^d						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-20V, Frequency=1.0MHz	-	668	-	pF
C _{oss}	Output Capacitance		-	98	-	
C _{rss}	Reverse Transfer Capacitance		-	72	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-20V, R _L =20Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	8.7	-	ns
t _r	Turn-on Rise Time		-	7	-	
t _{d(OFF)}	Turn-off Delay Time		-	31	-	
t _f	Turn-off Fall Time		-	17	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =-20V, V _{GS} =-10V, I _{DS} =-5.5A	-	15	-	nC
Q _g	Total Gate Charge	V _{DS} =-20V, V _{GS} =-4.5V, I _{DS} =-5.5A	-	7.5	-	
Q _{gth}	Threshold Gate Charge		-	1.4	-	
Q _{gs}	Gate-Source Charge		-	2.4	-	
Q _{gd}	Gate-Drain Charge		-	3.5	-	

Note c : Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

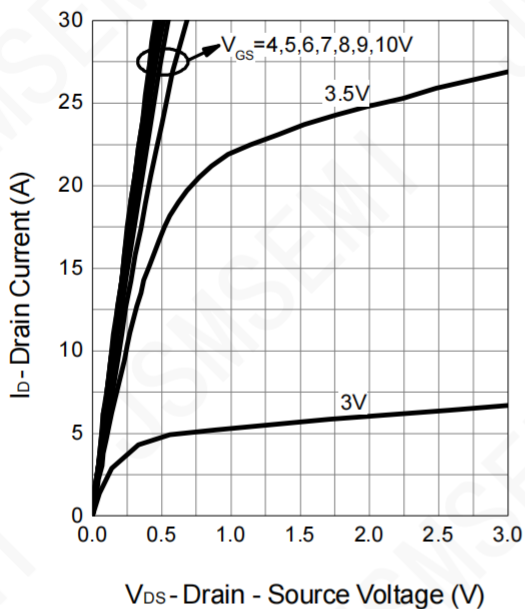
Note d : Guaranteed by design, not subject to production testing.

N Channel Typical Operating Characteristics

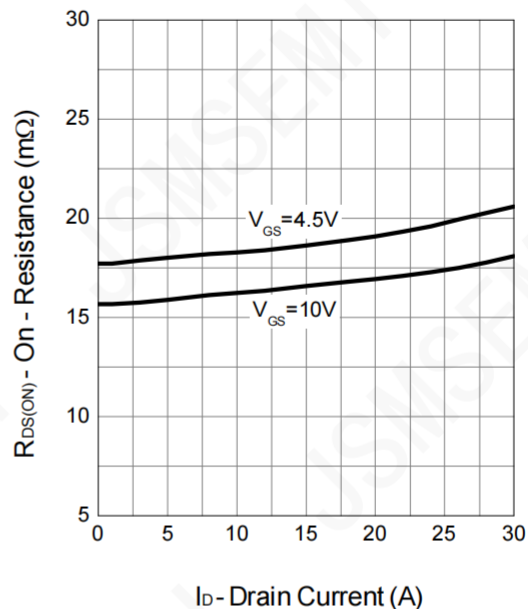


N Channel Typical Operating Characteristics (Cont.)

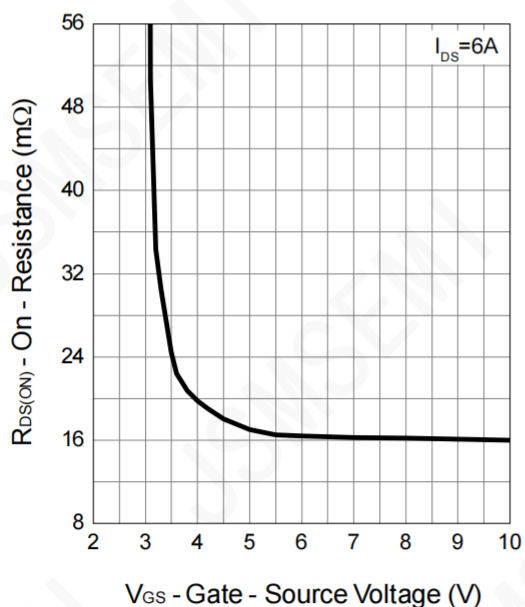
Output Characteristics



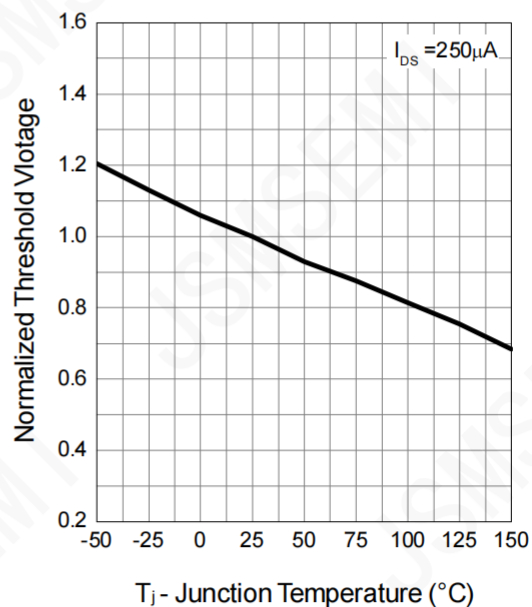
Drain-Source On Resistance



Gate-Source On Resistance

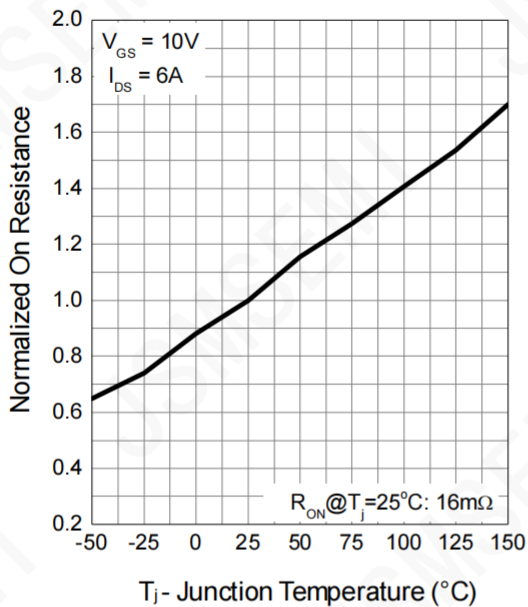


Gate Threshold Voltage

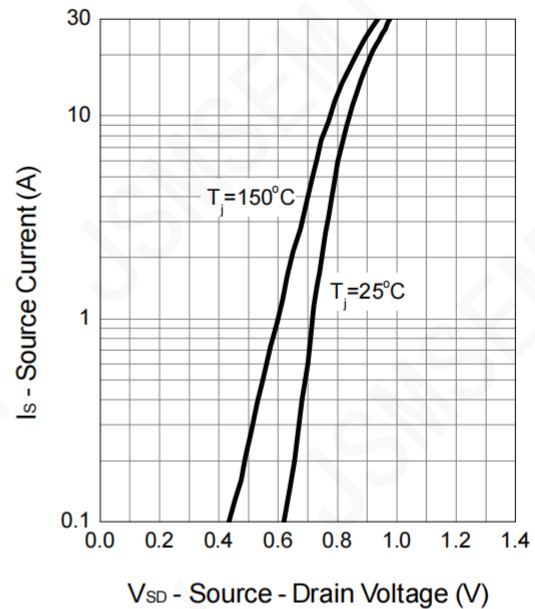


N Channel Typical Operating Characteristics (Cont.)

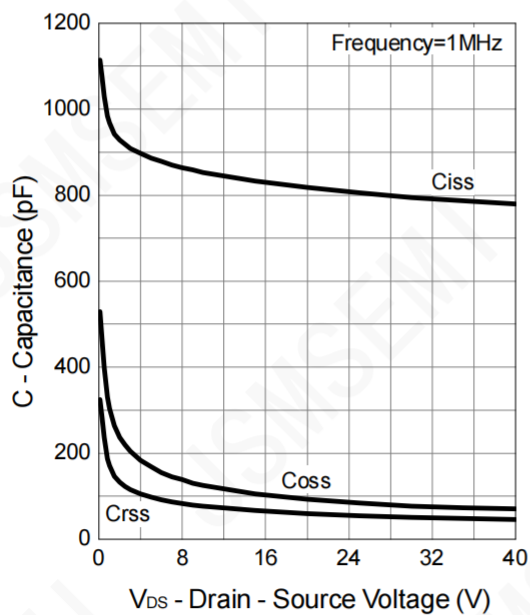
Drain-Source On Resistance



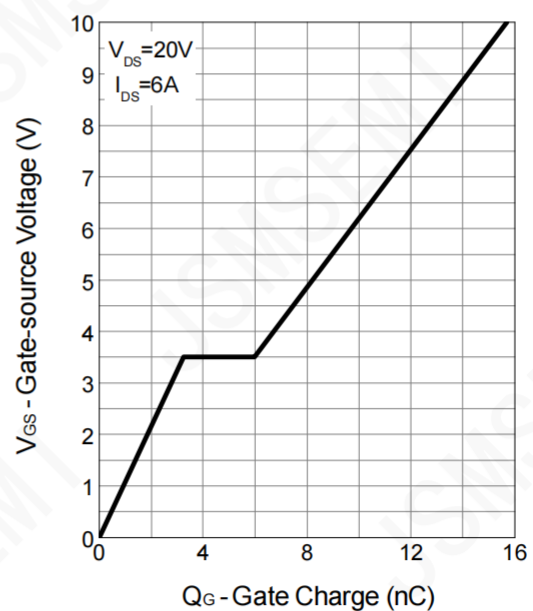
Source-Drain Diode Forward



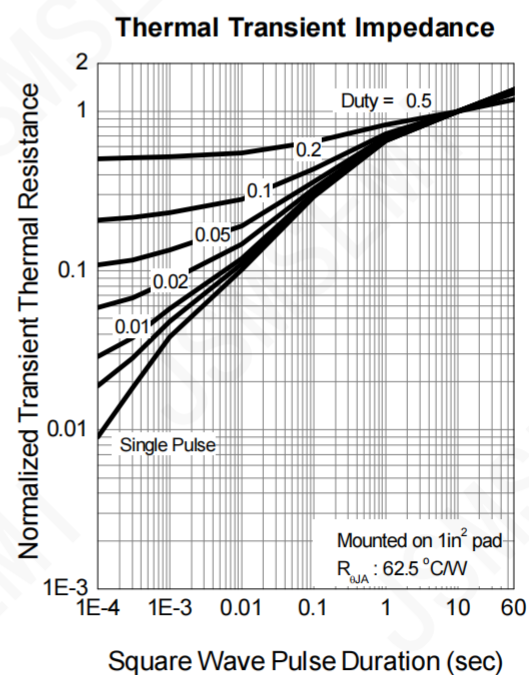
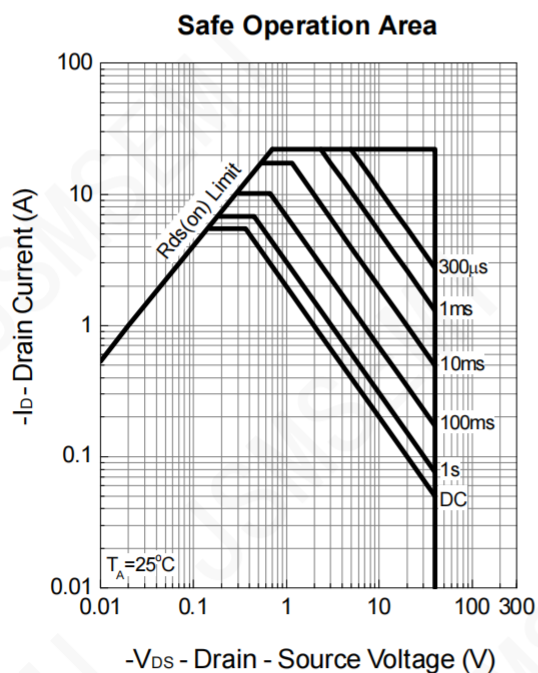
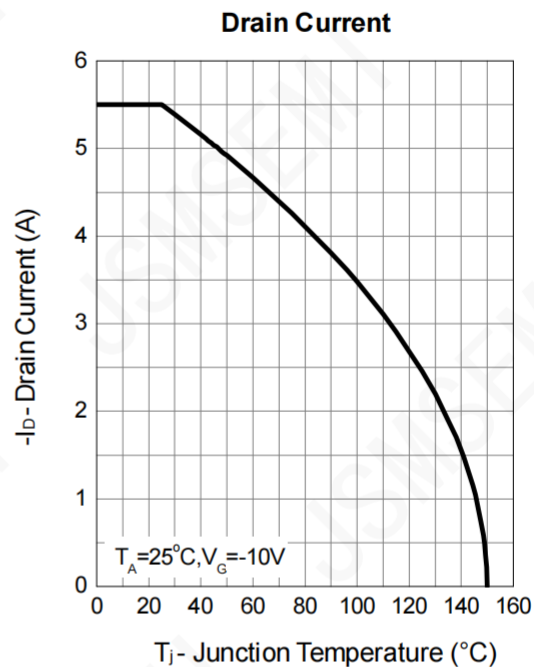
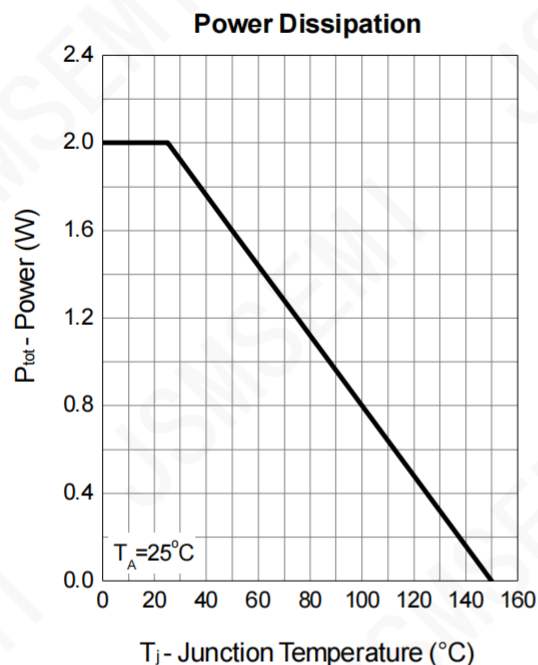
Capacitance



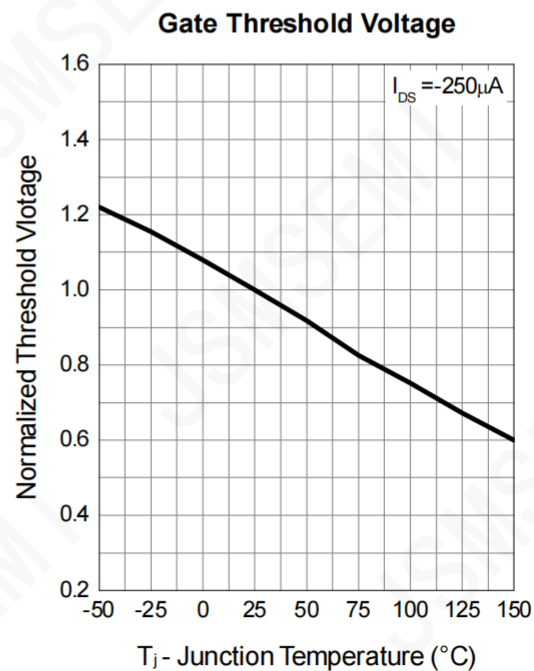
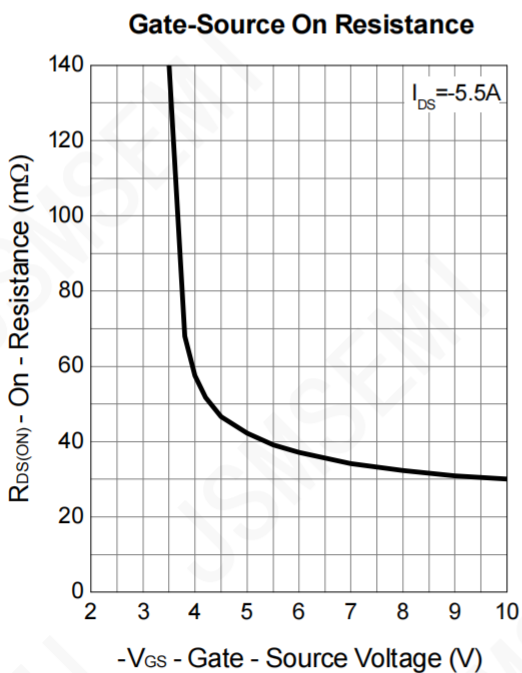
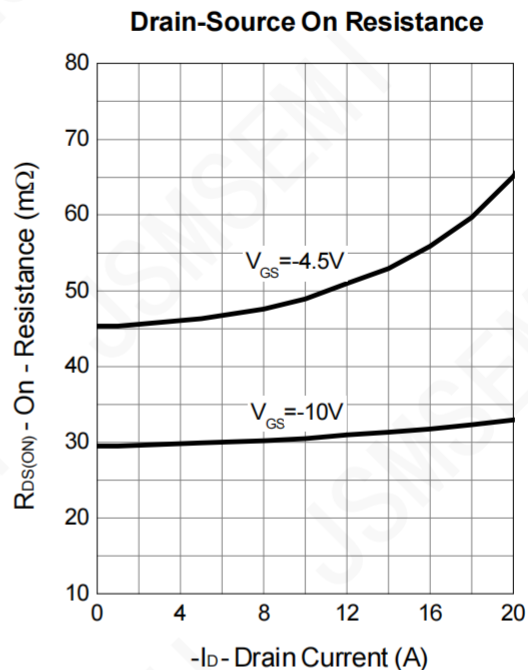
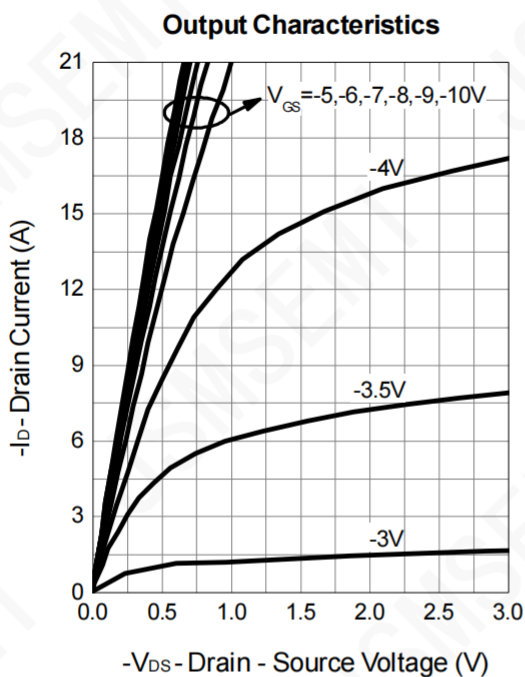
Gate Charge



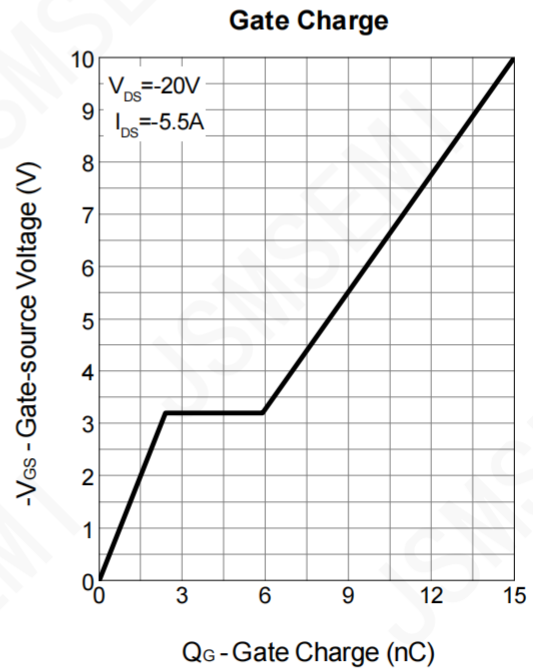
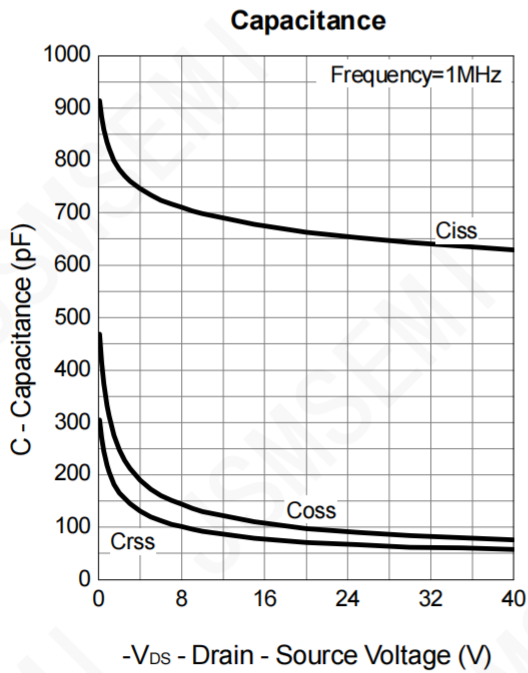
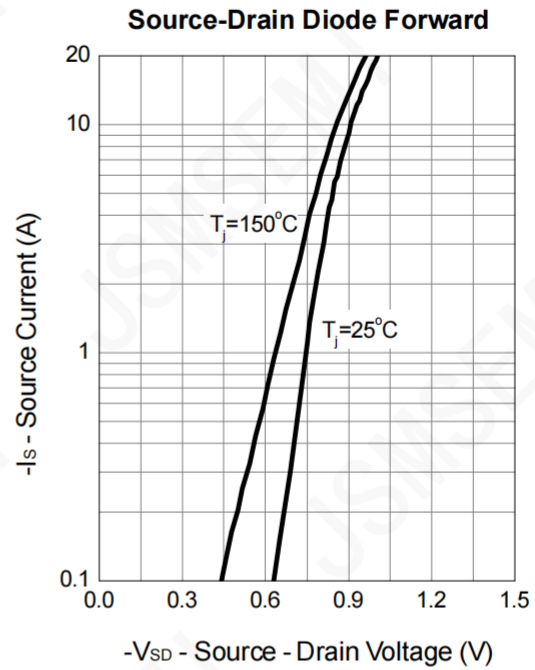
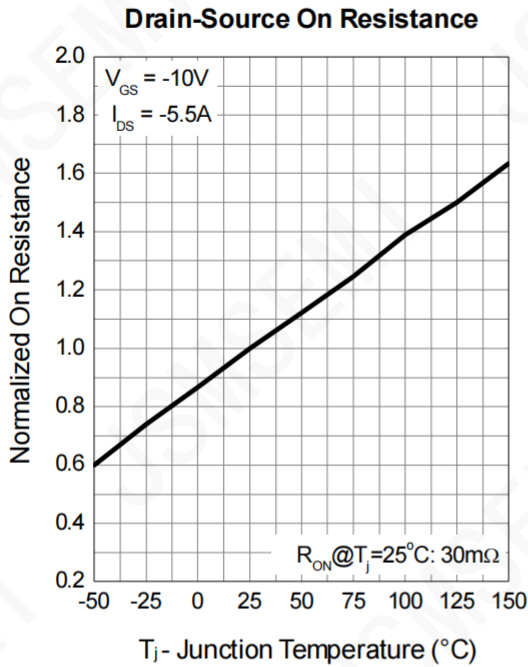
P Channel Typical Operating Characteristics



P Channel Typical Operating Characteristics (Cont.)

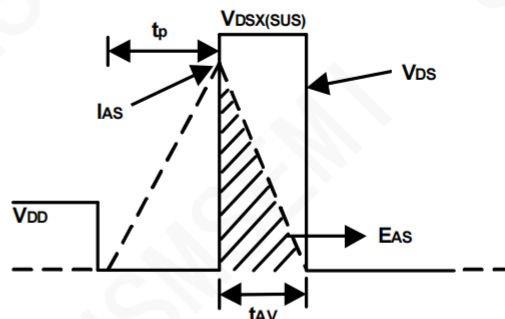
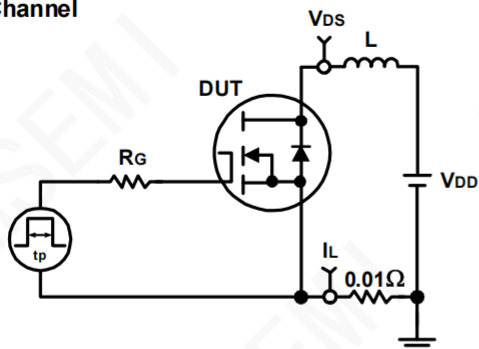


P Channel Typical Operating Characteristics (Cont.)

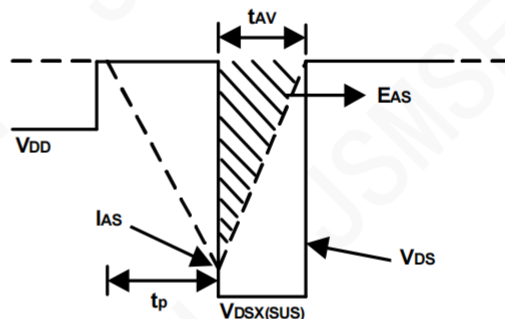
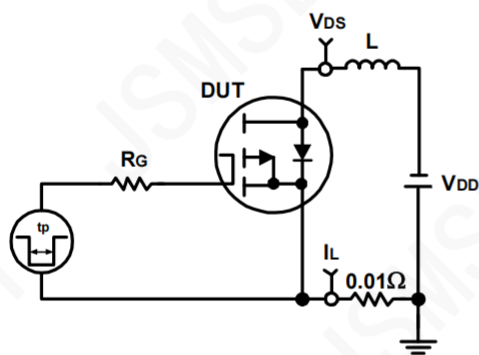


Avalanche Test Circuit and Waveforms

N Channel

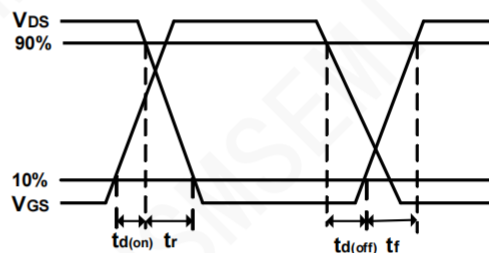
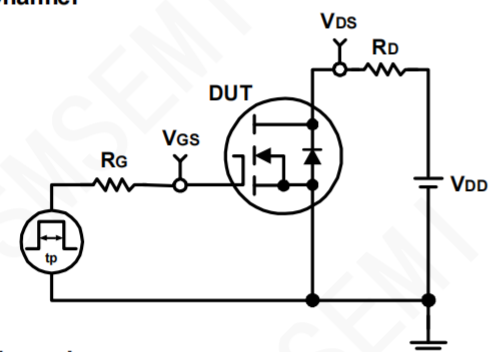


P Channel



Switching Time Test Circuit and Waveforms

N Channel



P Channel

