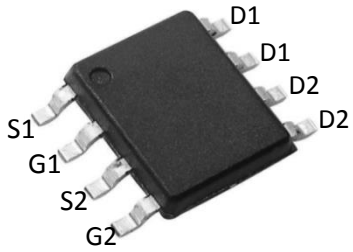
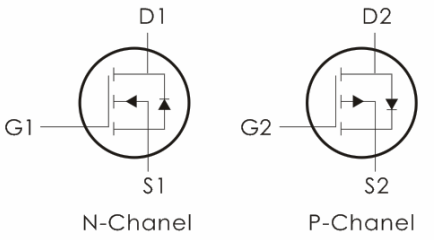
Description：

This N-Chanel and P-Channel MOSFET use advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. This device may be used to form a level shifted high side switch, and for a host of other application.





Features：

N-Channel: V_{DS}=40V,I_D=8 A,$R_{DS(ON)}$<19mΩ @V_{GS}=10V

P-Channel: V_{DS}=-40V,I_D=-7 A,$R_{DS(ON)}$<35mΩ @V_{GS}=-10V

1) High Power and current handing capability.
2) Lead free product is acquired.
3) Surface Mount Package.

Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	40	-40	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D	Drain Current-Continuous	8	-7	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed[1]	40	-30	
P_D	Power Dissipation	2	2	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	-55 to +150	℃

Thermal Characteristics：

Channel	Symbol	Parameter	Max	Units
N	$R_{\theta JA}$	Thermal Resistance,Junction to Ambient[2]	62.5	℃/W
P	$R_{\theta JA}$	Thermal Resistance,Junction to Ambient[2]	62.5	

N-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
ON/Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=40V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics [3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	1.5	2	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=8A	---	14	19	mΩ
		V_{GS}=4.5V,I_D=4A	---	19	35	
G_{FS}	Forward Transconductance	V_{DS}=5 V, I_D=8A	33	---	---	S
Dynamic Characteristics [4]						
C_{iss}	Input Capacitance	V_{DS}=20V, V_{GS}=0V, f=1MHz	---	415	---	pF
C_{oss}	Output Capacitance		---	112	---	
C_{rss}	Reverse Transfer Capacitance		---	11	---	
Switching Characteristics [4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=20V, R_L=2.5Ω V_{GS}=10V,R_{GEN}=3Ω	---	4	---	ns
t_r	Rise Time		---	3	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	15	---	ns
t_f	Fall Time		---	2	---	ns
Q_g	Total Gate Charge	V_{DS}=20V,I_D=8A, V_{GS}=10V	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	3.2	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	3.1	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[3]	V_{GS}=0V,I_S=8A	---	0.8	1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Characteristics: (T_C=25℃ unless otherwise noted)

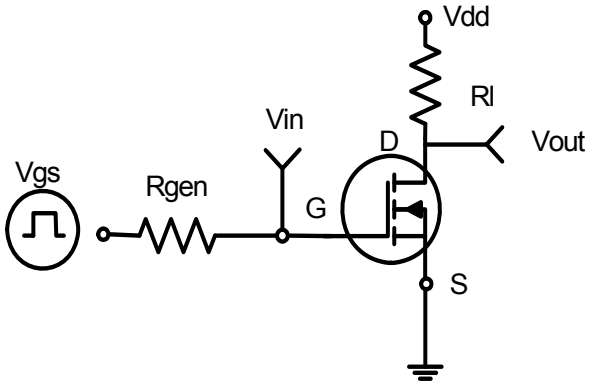


Figure 1:Switching Test Circuit

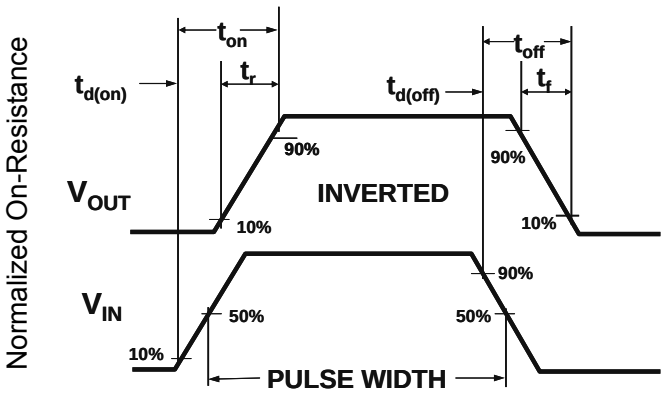
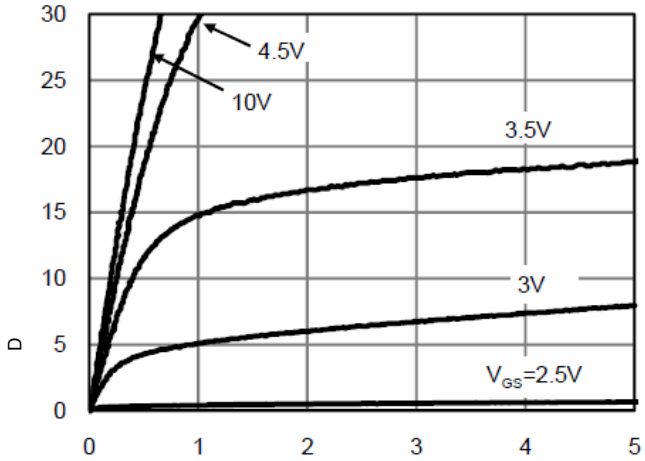
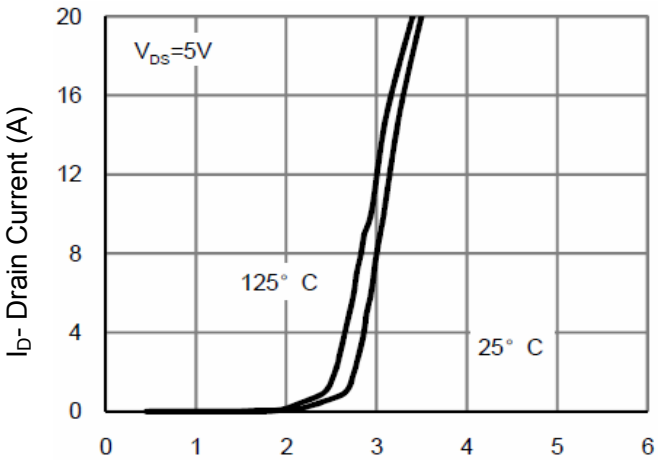


Figure 2:Switching Waveforms



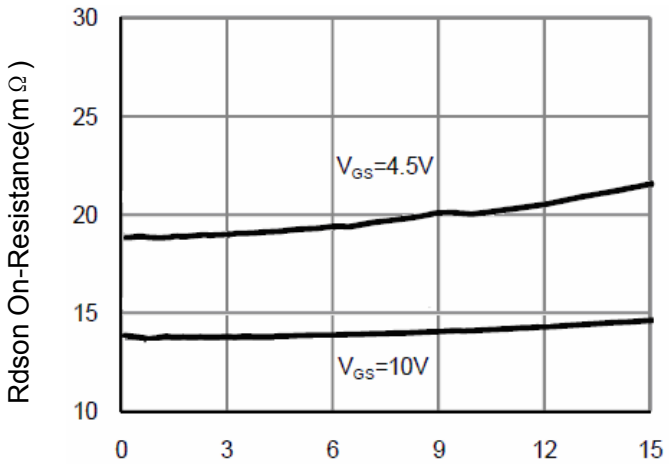
Vds Drain-Source Voltage (V)

Figure 3 Output Characteristics



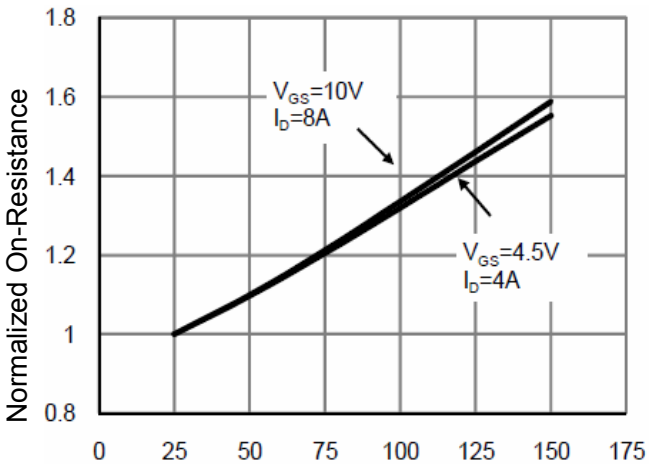
Vgs Gate-Source Voltage (V)

Figure 4 Transfer Characteristics



I_D- Drain Current (A)

Figure 5 Drain-Source On-Resistance



T_J-Junction Temperature(℃)

Figure 6 Drain-Source On-Resistance

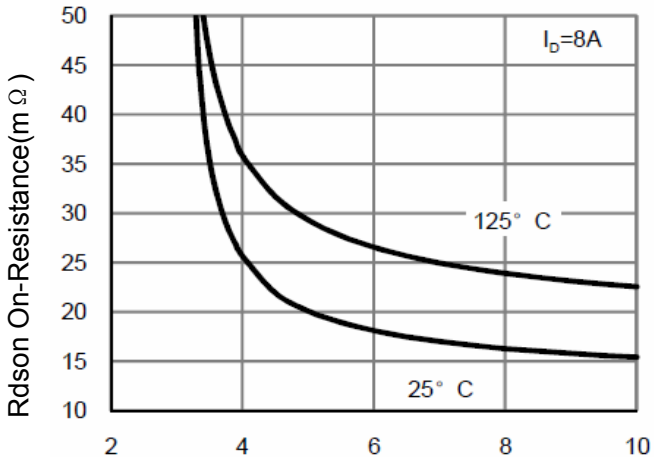


Figure7 Rdson vs Vgs

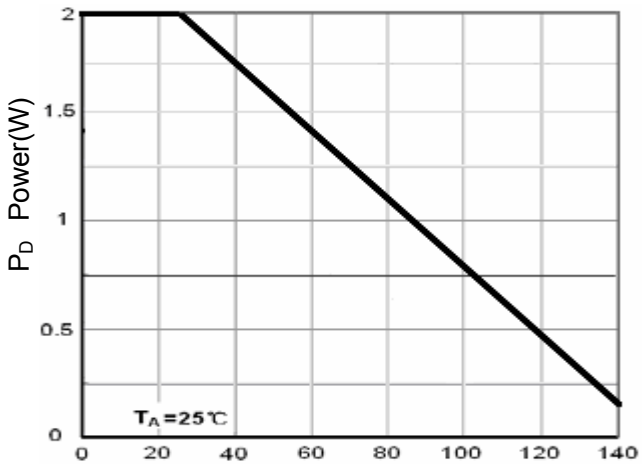


Figure 8 Power Dissipation

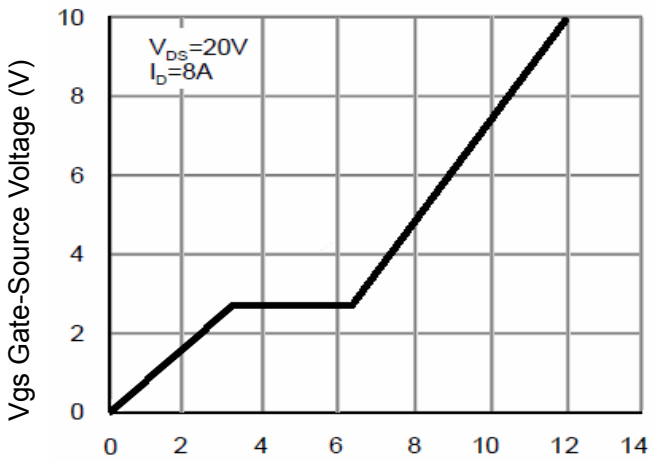


Figure 9 Gate Charge

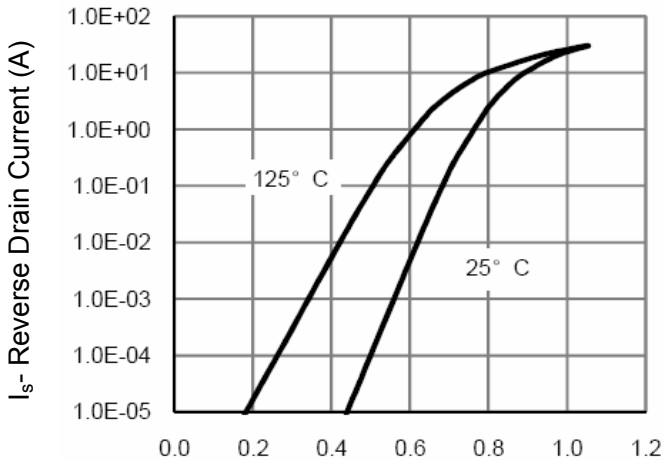


Figure 10 Source- Drain Diode Forward

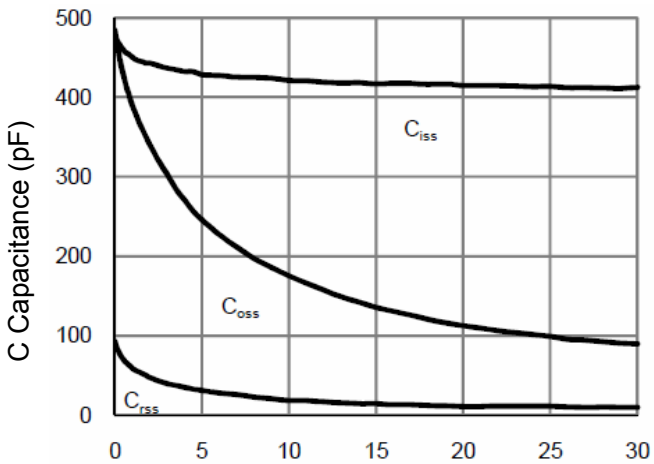


Figure 11 Capacitance vs Vds

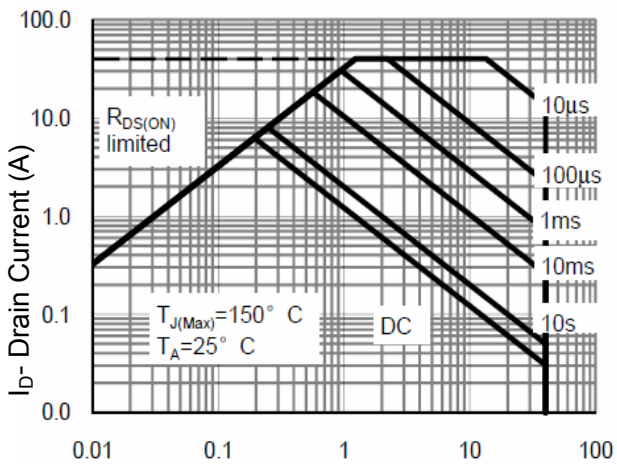


Figure 12 Safe Operation Area

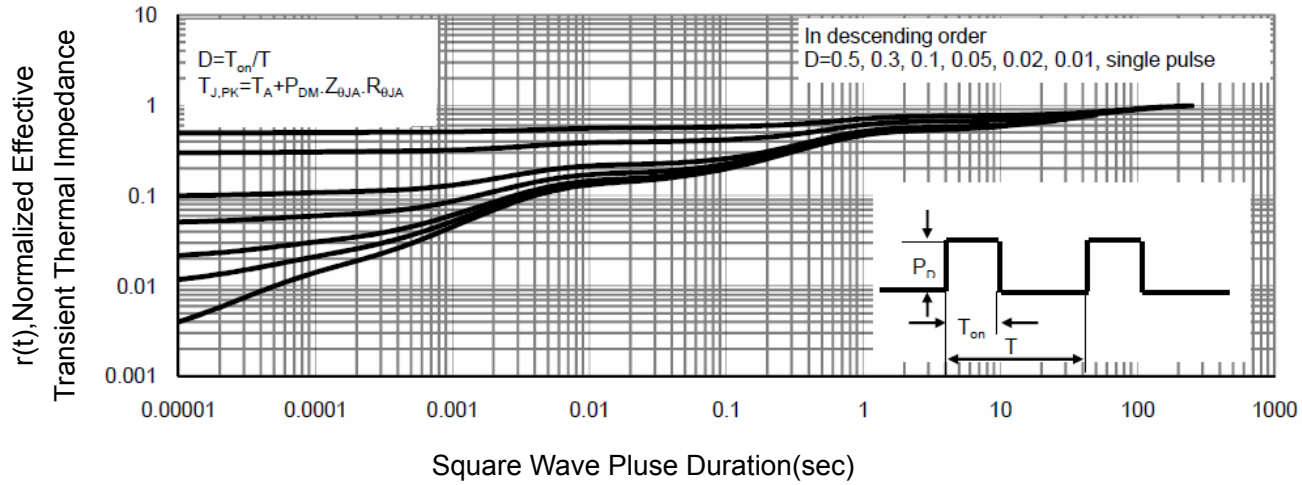


Figure 13 Normalized Maximum Transient Thermal Impedance

P-Channel Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
ON/Off States						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=-250μA	-40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-40V	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics[3]						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=-250μA	-1	-1.5	-2	V
$R_{DS(ON)}$	Drain-Source On Resistance[2]	V_{GS}=-10V,I_D=-4A	---	29	35	mΩ
G_{FS}	Forward Transconductance	V_{DS}=-10V, I_D=-3A	20	▪▪▪	--	S
Dynamic Characteristics [4]						
C_{iss}	Input Capacitance	V_{DS}=-20V,V_{GS}=0V, F=1.0MHz	---	520	---	pF
C_{oss}	Output Capacitance		---	100	---	
C_{rss}	Reverse Transfer Capacitance		---	65	---	
Switching Characteristics [4]						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=-20V, R_L=2.3Ω V_{GS}=-10V,R_{GEN}=6Ω	---	7.5	---	ns
t_r	Rise Time		---	5.5	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	1□	---	ns
t_f	Fall Time		---	7	---	ns
Q_g	Total Gate Charge	V_{DS}=-20V,I_D=-8A V_{GS}=-10V	---	13	---	nC
Q_{gs}	Gate-Source Charge		---	3.8	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	3.1	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage[3]	V_{GS}=0V,I_S=-10A	---	--	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Characteristics: (T_C=25℃ unless otherwise noted)

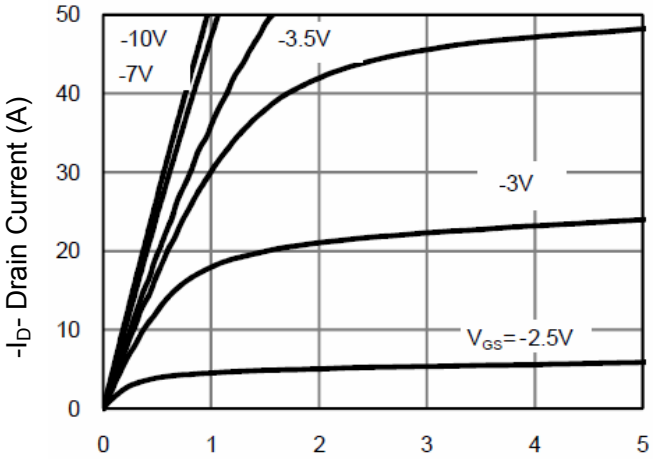


Figure 1 Output Characteristics

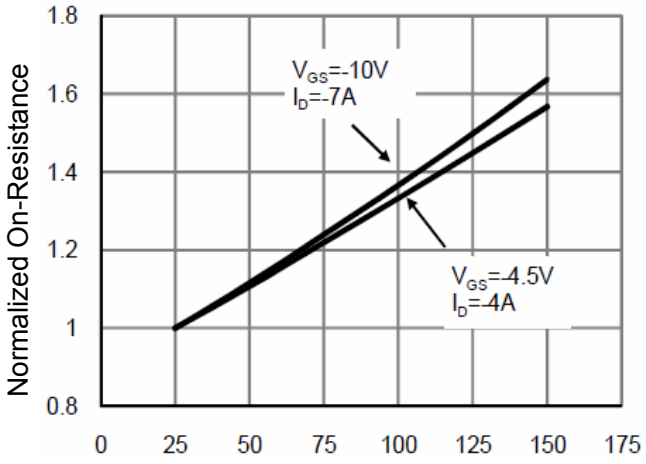


Figure 4 Rdson-Junction Temperature

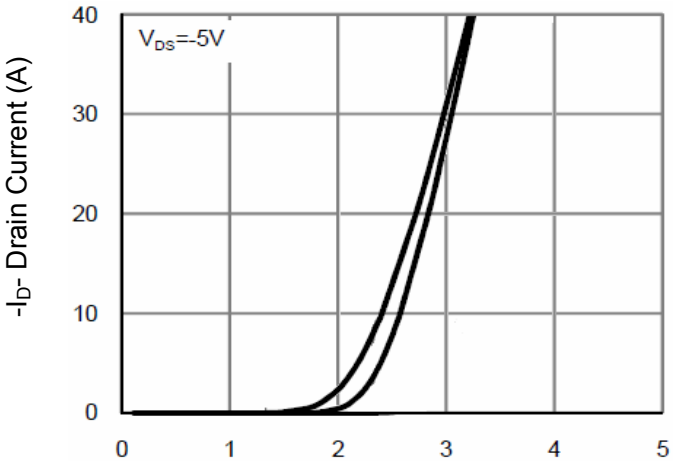


Figure 2 Transfer Characteristics

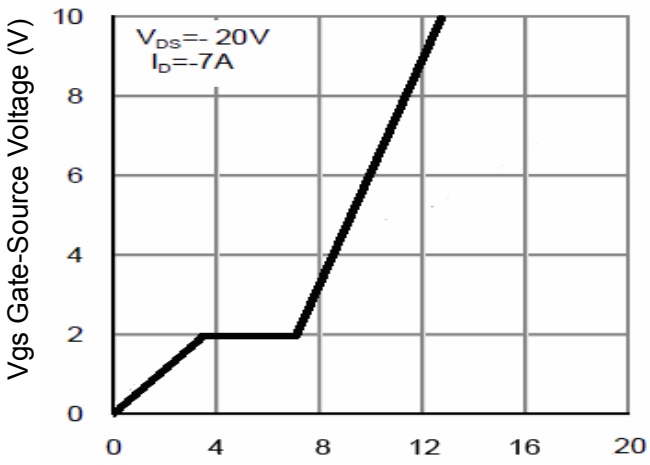


Figure 5 Gate Charge

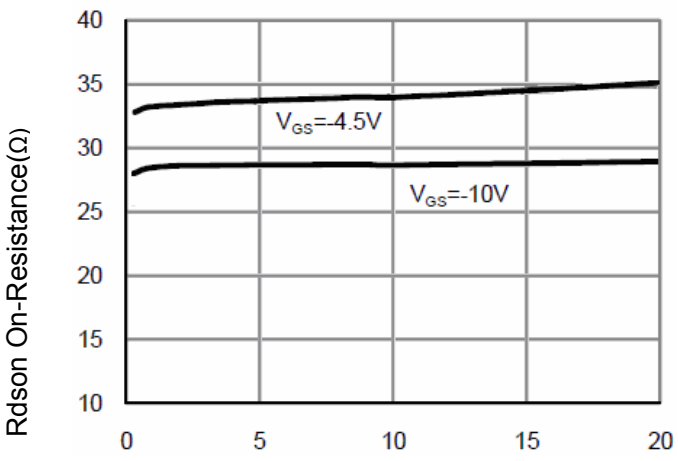


Figure 3 Rdson- Drain Current

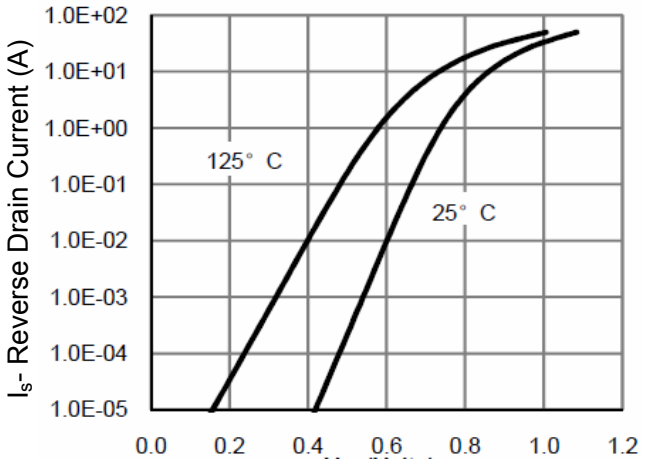


Figure 6 Source- Drain Diode Forward

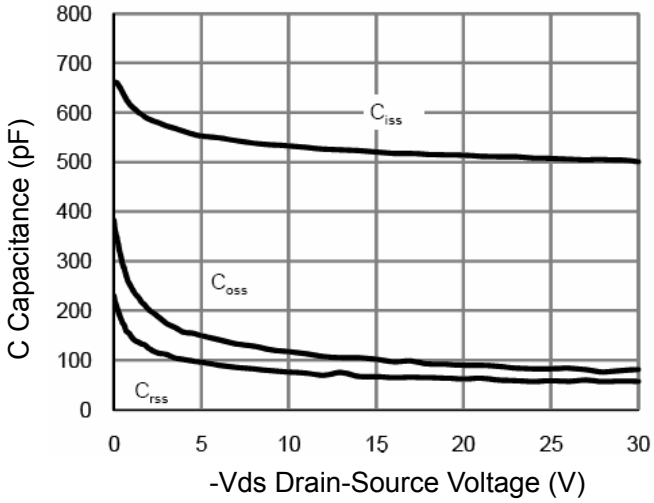


Figure 7 Capacitance vs Vds

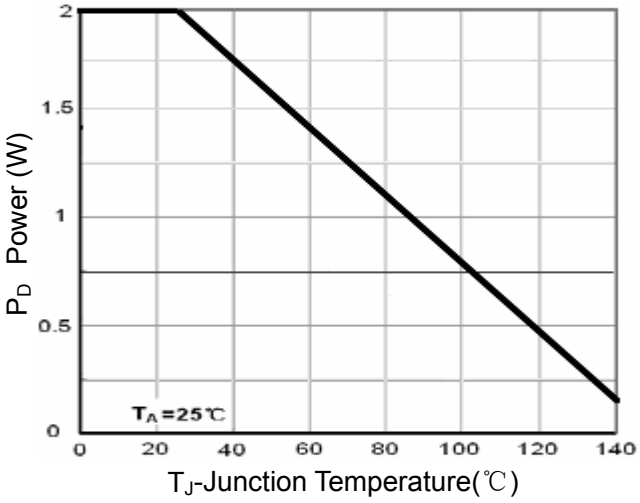


Figure 9 Power Dissipation

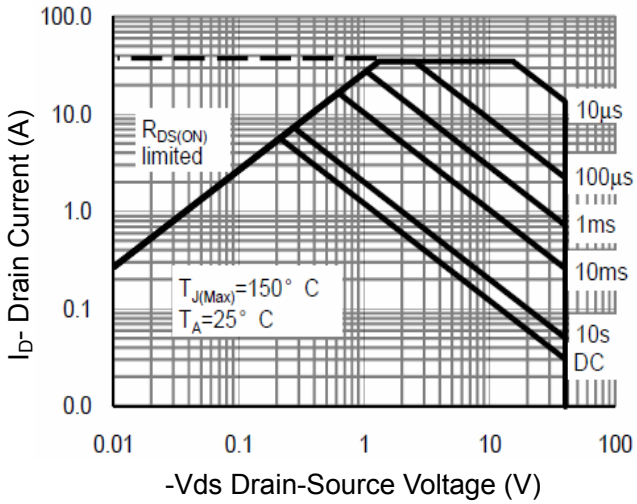


Figure 8 Safe Operation Area

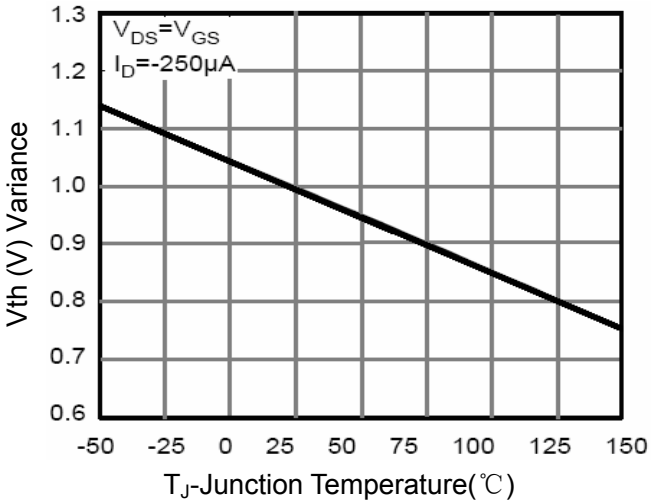


Figure 10 $V_{GS(th)}$ vs Junction Temperature

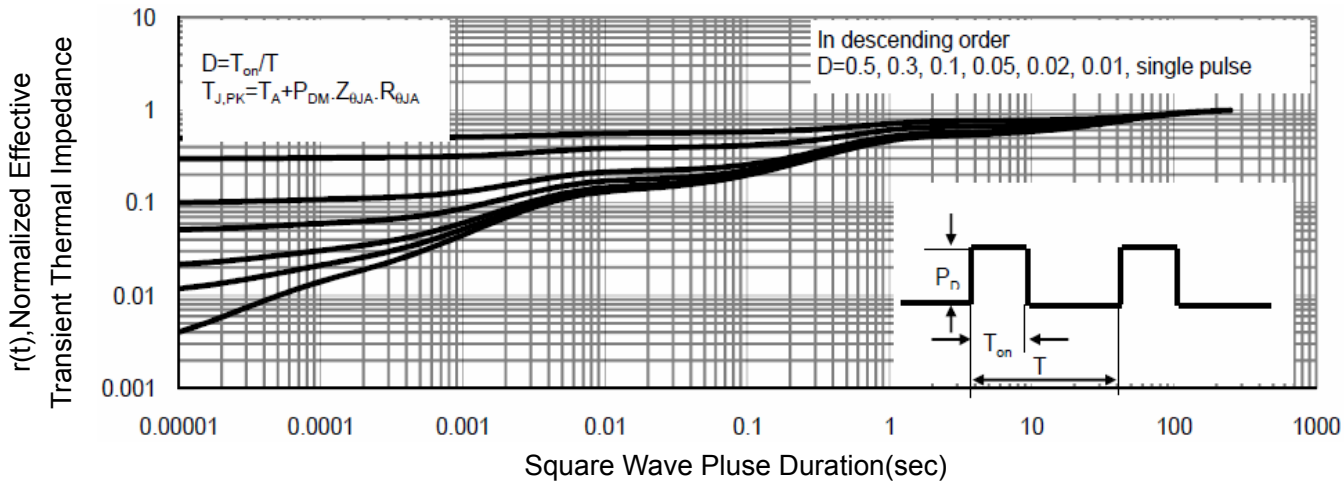


Figure 11 Normalized Maximum Transient Thermal Impedance