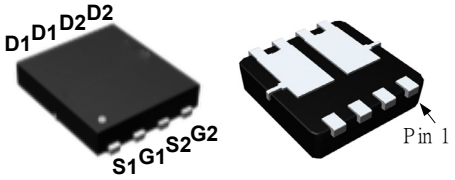
Features

- N Channel : 100V/18A,
  $R_{DS(ON)}$=50mΩ(typ.)@V_{GS}=10V
  $R_{DS(ON)}$=60mΩ(typ.)@V_{GS}=4.5V
- P Channel : -100V/-12A,
  $R_{DS(ON)}$=80mΩ(typ.)@V_{GS}=-10V
  $R_{DS(ON)}$=95mΩ(typ.)@V_{GS}=-4.5V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- Moisture Sensitivity Level MSL1 (per JEDEC J-STD-020D)

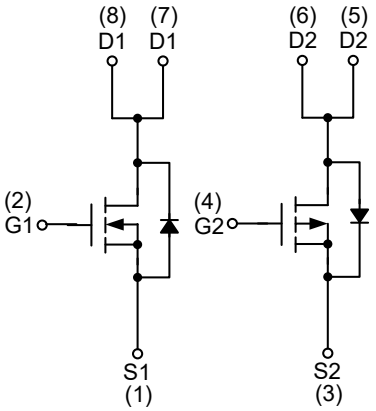
Applications

- DC Motor Control.

Pin Description



DFN5x6C-8_EP2



N-Channel MOSFET P-Channel MOSFET

Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter		N Channel	P Channel	Unit
Common Ratings					
V_{DSS}	Drain-Source Voltage		100	-100	V
V_{GSS}	Gate-Source Voltage		±20	±20	
T_J	Maximum Junction Temperature		175		°C
T_{STG}	Storage Temperature Range		-55 to 175		
I_S	Diode Continuous Forward Current	T_C=25°C	18	-12	A
I_D	Continuous Drain Current	T_C=25°C	18	-12	A
		T_C=100°C	7.2	-4.8	
I_{DM} [a]	Pulse Drain Current Tested	T_C=25°C	54	-36	A
P_D	Maximum Power Dissipation	T_C=25°C	37.5		W
		T_C=100°C	18.75		
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	4		°C/W
I_D	Continuous Drain Current	T_A=25°C	5.7	-2.9	A
		T_A=70°C	4.8	-2.5	
P_D	Maximum Power Dissipation	T_A=25°C	2		W
		T_A=70°C	1.4		
$R_{\theta JA}$ [b]	Thermal Resistance-Junction to Ambient	Steady State	75		°C/W
I_{AS} [c]	Avalanche Current, Single pulse	L=0.5mH	12	-14	A
E_{AS} [c]	Avalanche Energy, Single pulse	L=0.5mH	36	49	mJ

Note a : Pulse width limited by maximum junction temperature.
Note b : Surface Mounted on 1in^2 pad area.
Note c : UIS tested and pulse width limited by maximum junction temperature (initial temperature T_j=25°C).

N Channel Electrical Characteristics (T_A = 25°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	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.5	2	3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [d]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=10A	-	50	55	mΩ
		V_{GS}=4.5V, I_{DS}=6A	-	60	65	
Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	I_{SD}=5A, V_{GS}=0V	-	0.8	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD}=5A, dI_{SD}/dt=100A/μs	-	34	-	ns
Q_{rr}	Reverse Recovery Charge		-	38	-	nC
Dynamic Characteristics [e]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,f=1MHz	-	1.5	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Frequency=1.0MHz	-	800	1040	pF
C_{oss}	Output Capacitance		-	120	-	
C_{rss}	Reverse Transfer Capacitance		-	24	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=30V, R_L=30Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	11	20	ns
t_r	Turn-on Rise Time		-	6	11	
$t_{d(OFF)}$	Turn-off Delay Time		-	23	41	
t_f	Turn-off Fall Time		-	21	38	
Gate Charge Characteristics [e]						
Q_g	Total Gate Charge	V_{DS}=50V, V_{GS}=4.5V, I_{DS}=10A	-	6.9	-	nC
Q_g	Total Gate Charge	V_{DS}=50V, V_{GS}=10V, I_{DS}=10A	-	13.8	19.3	
Q_{gs}	Gate-Source Charge		-	2.4	-	
Q_{gd}	Gate-Drain Charge		-	2.9	-	

Note d：Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note e：Guaranteed by design, not subject to production testing.

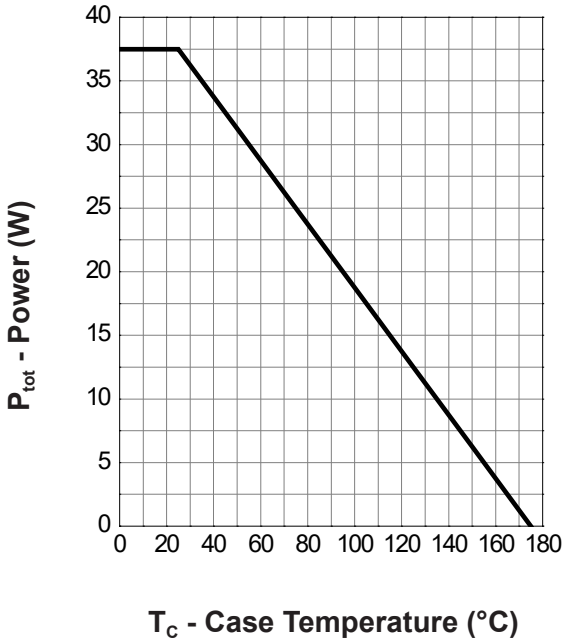
P Channel Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	P Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-80V, V_{GS}=0V	-	-	-1	μA
		T_J=85°C	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	-1.5	-2	-3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [d]	Drain-Source On-state Resistance	V_{GS}=-10V, I_{DS}=-5A	-	80	100	mΩ
		V_{GS}=-4.5V, I_{DS}=-3A	-	95	125	
Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	I_{SD}=-1A, V_{GS}=0V	-	-0.7	-1	V
t_{rr}	Reverse Recovery Time	I_{SD}=-2.5A, dI_{SD}/dt=100A/μs	-	31	-	ns
Q_{rr}	Reverse Recovery Charge		-	35	-	nC
Dynamic Characteristics [e]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,f=1MHz	-	8.5	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-50V, Frequency=1.0MHz	-	1400	1820	pF
C_{oss}	Output Capacitance		-	80	-	
C_{rss}	Reverse Transfer Capacitance		-	52	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-30V, R_L=-30Ω, I_{DS}=-1A, V_{GEN}=-10V, R_G=6Ω	-	11	20	ns
t_r	Turn-on Rise Time		-	9	16	
$t_{d(OFF)}$	Turn-off Delay Time		-	84	151	
t_f	Turn-off Fall Time		-	40	72	
Gate Charge Characteristics [e]						
Q_g	Total Gate Charge	V_{DS}=-50V, V_{GS}=-4.5V, I_{DS}=-5A	-	14.2	-	nC
Q_g	Total Gate Charge	V_{DS}=-50V, V_{GS}=-10V, I_{DS}=-3A	-	29.2	40.9	
Q_{gs}	Gate-Source Charge		-	4.1	-	
Q_{gd}	Gate-Drain Charge		-	6.1	-	

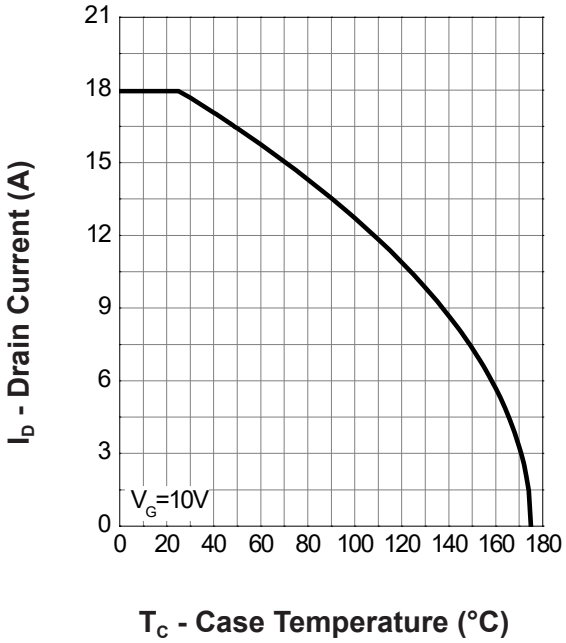
Note d：Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note e：Guaranteed by design, not subject to production testing.

N Channel Typical Operating Characteristics

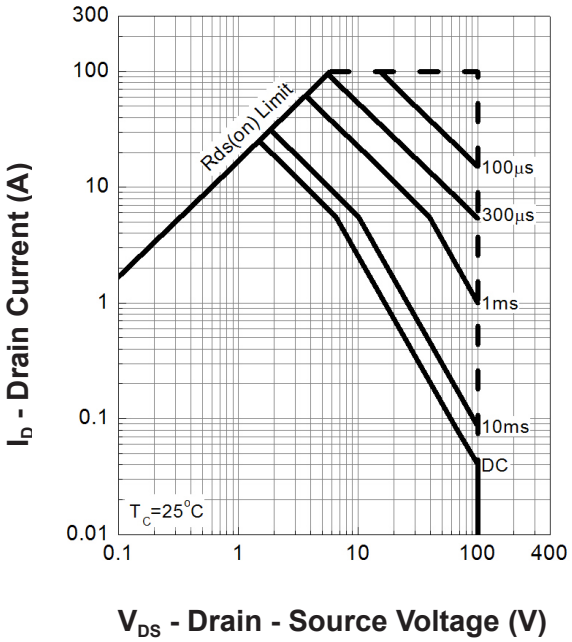
Power Dissipation



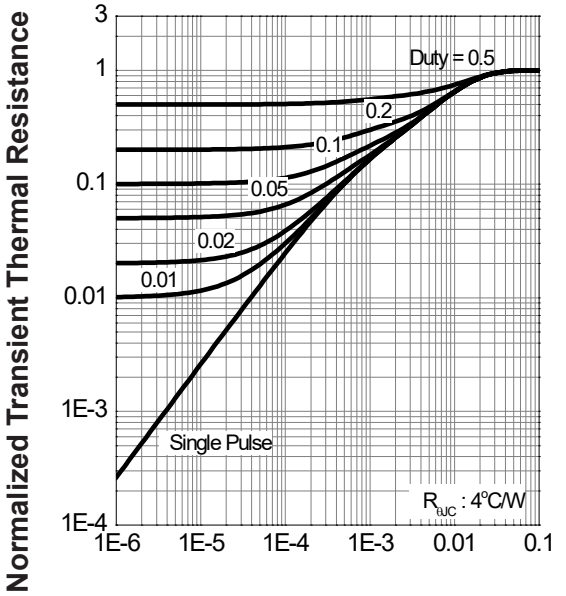
Drain Current



Safe Operation Area

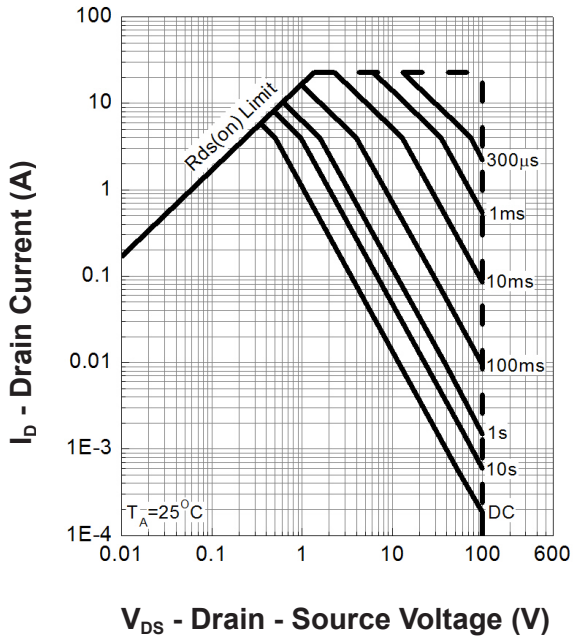


Thermal Transient Impedance

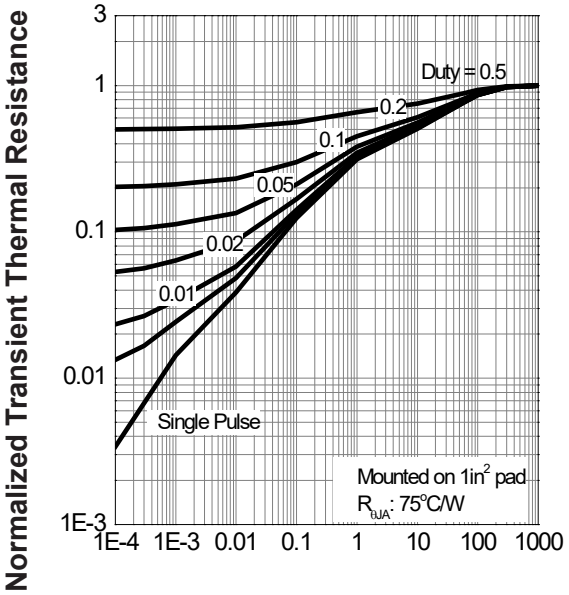


N Channel Typical Operating Characteristics(Cont.)

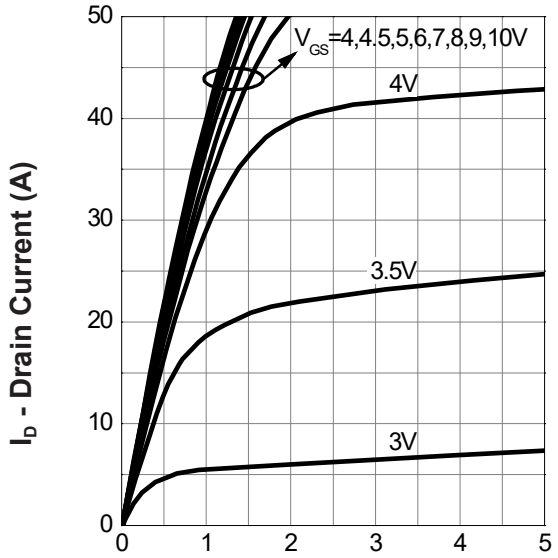
Safe Operation Area



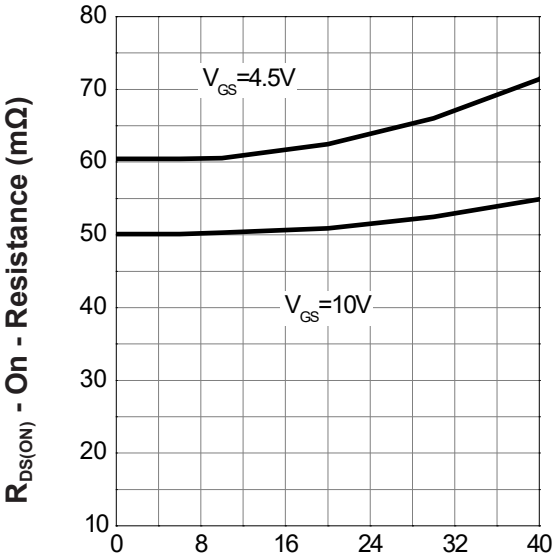
Thermal Transient Impedance



Output Characteristics

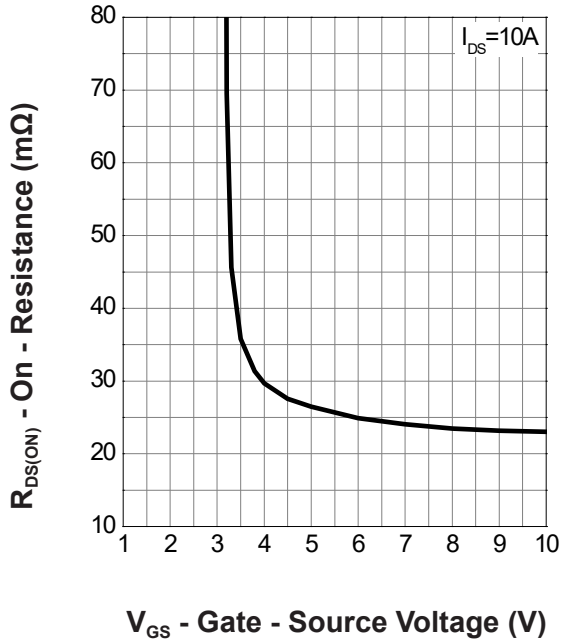


Drain-Source On Resistance

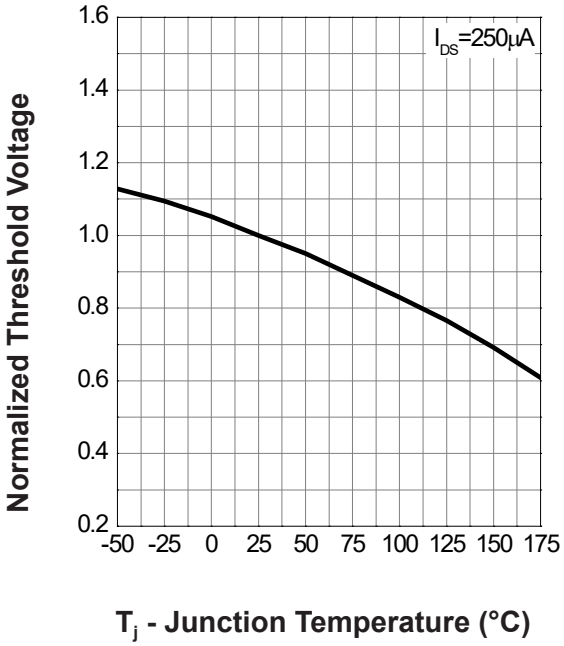


N Channel Typical Operating Characteristics(Cont.)

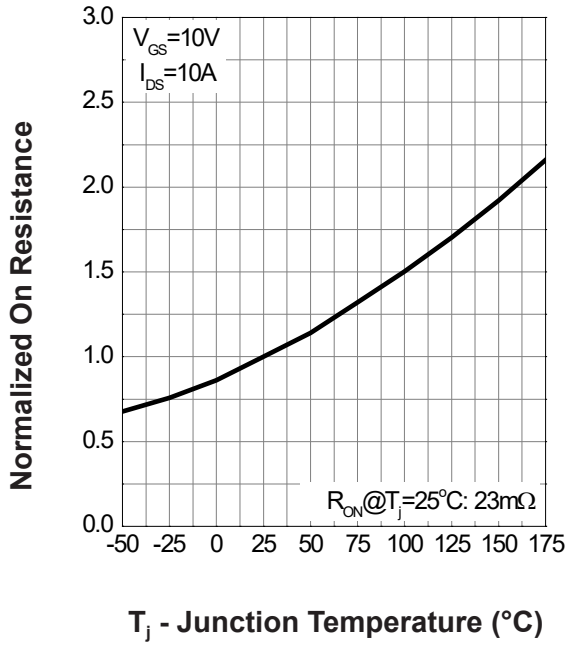
Gate-Source On Resistance



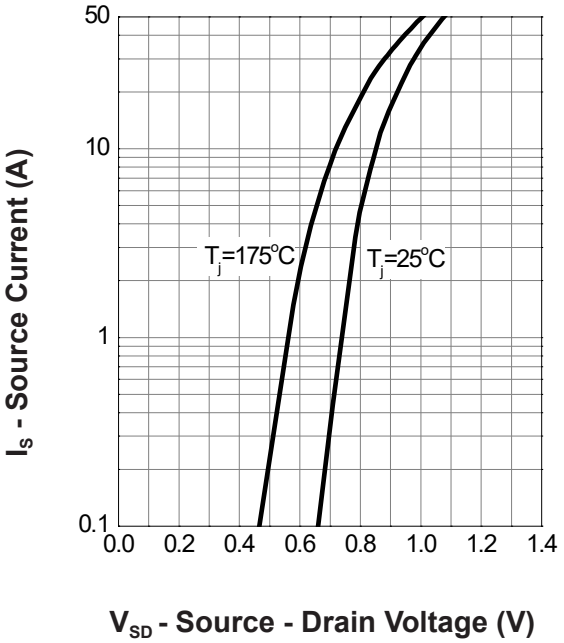
Gate Threshold Voltage



Drain-Source On Resistance

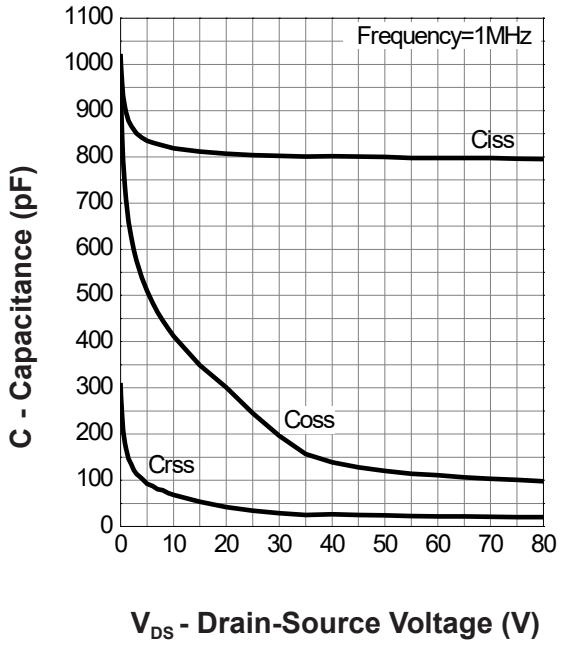


Source-Drain Diode Forward

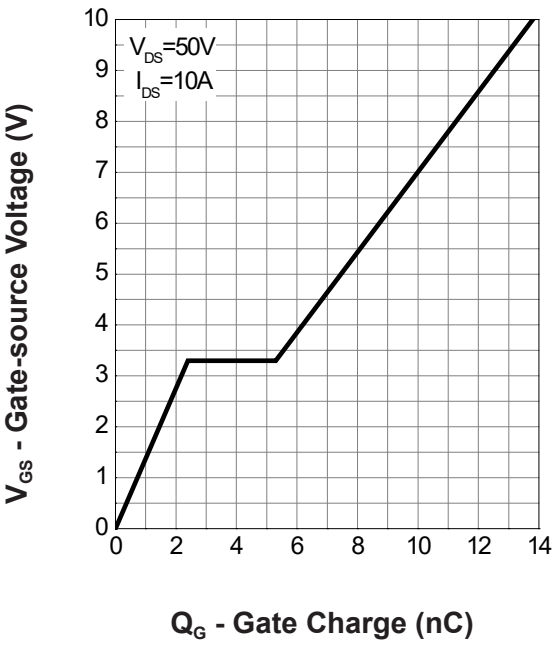


N Channel Typical Operating Characteristics(Cont.)

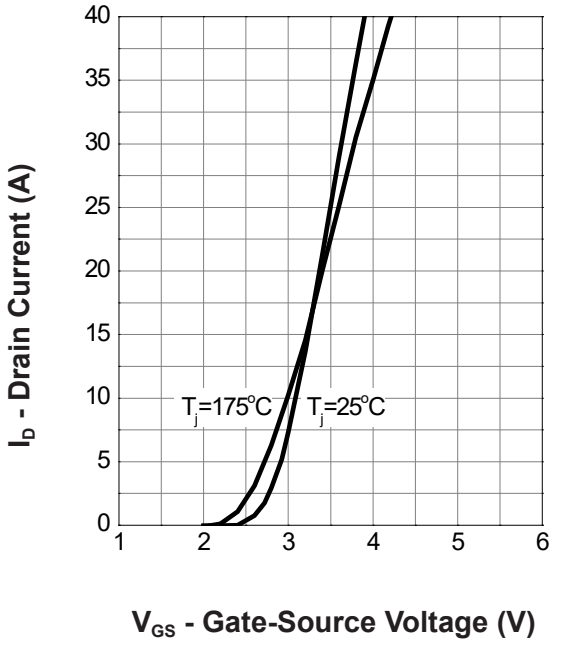
Capacitance



Gate Charge

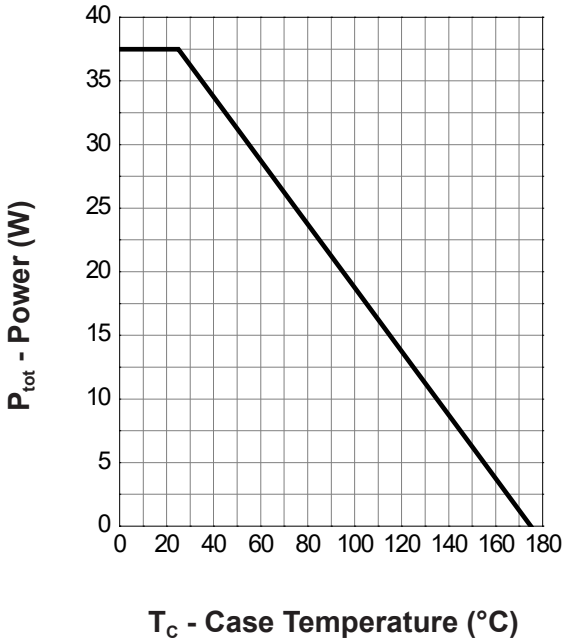


Transfer Characteristics

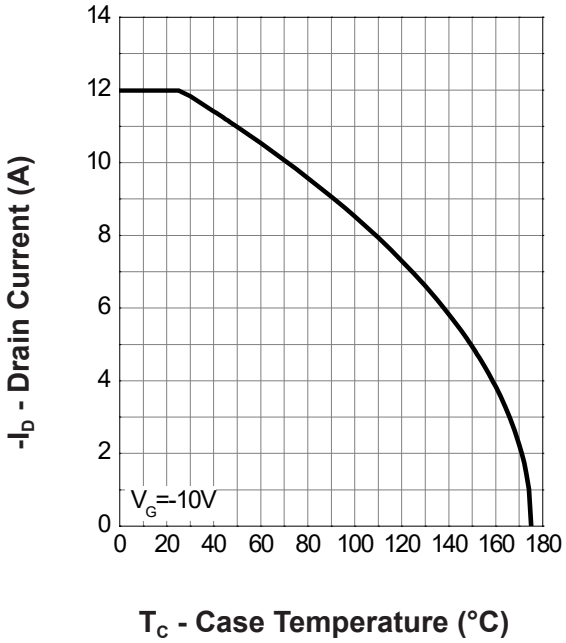


P Channel Typical Operating Characteristics

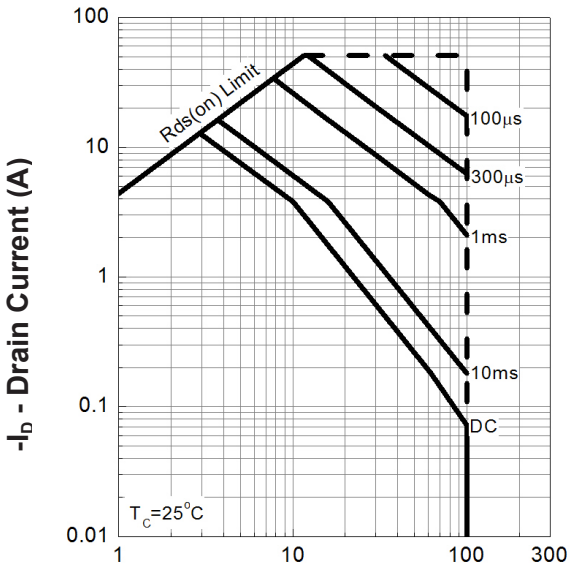
Power Dissipation



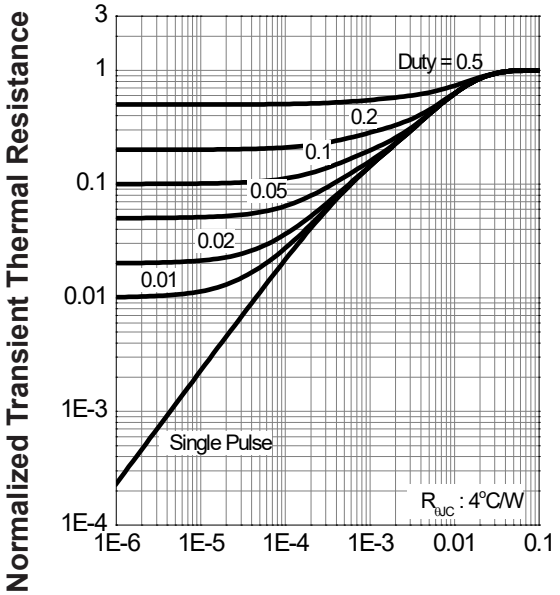
Drain Current



Safe Operation Area

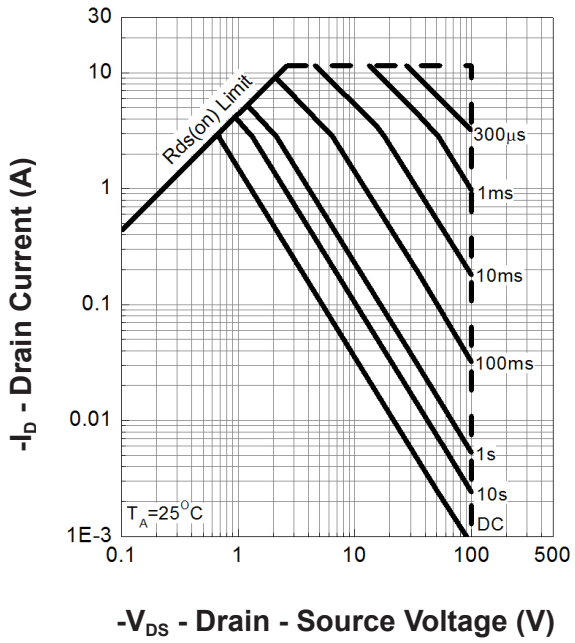


Thermal Transient Impedance

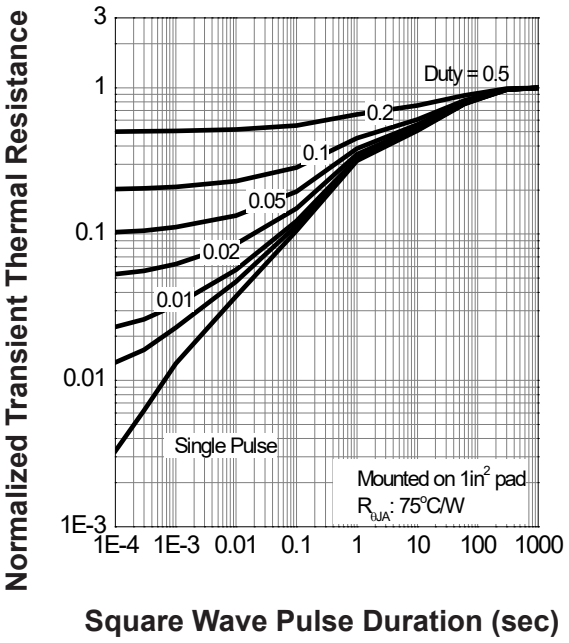


P Channel Typical Operating Characteristics(Cont.)

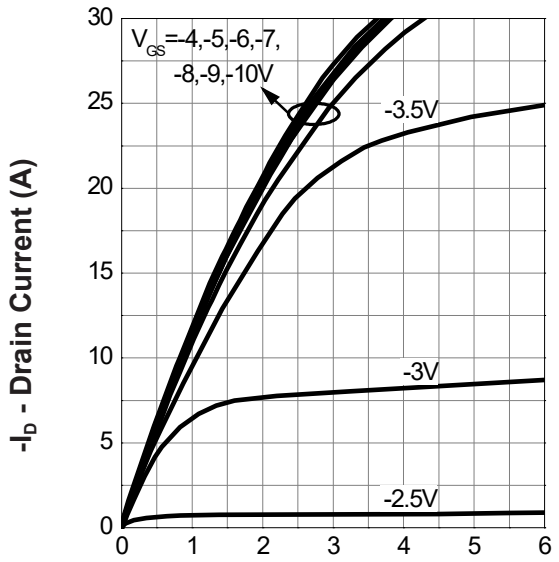
Safe Operation Area



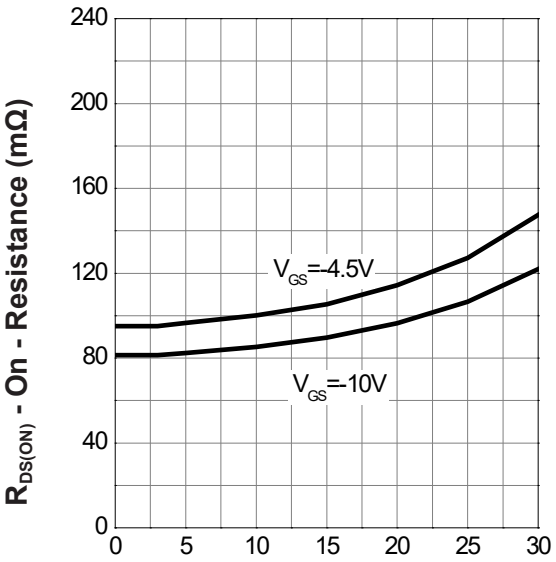
Thermal Transient Impedance



Output Characteristics

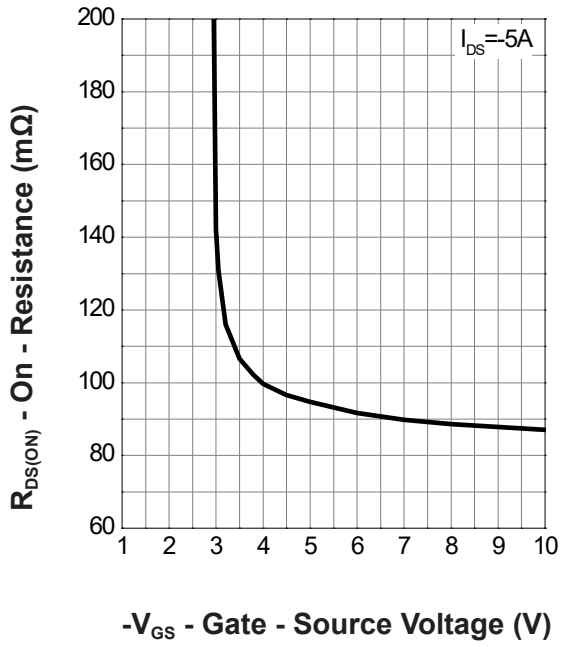


Drain-Source On Resistance

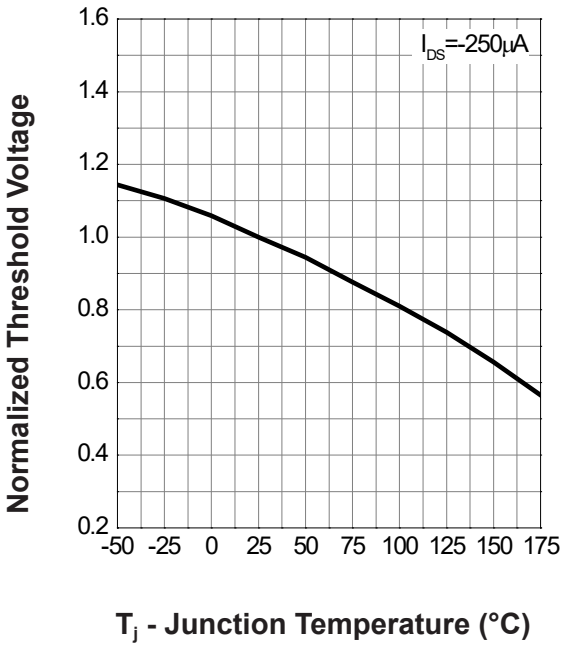


P Channel Typical Operating Characteristics(Cont.)

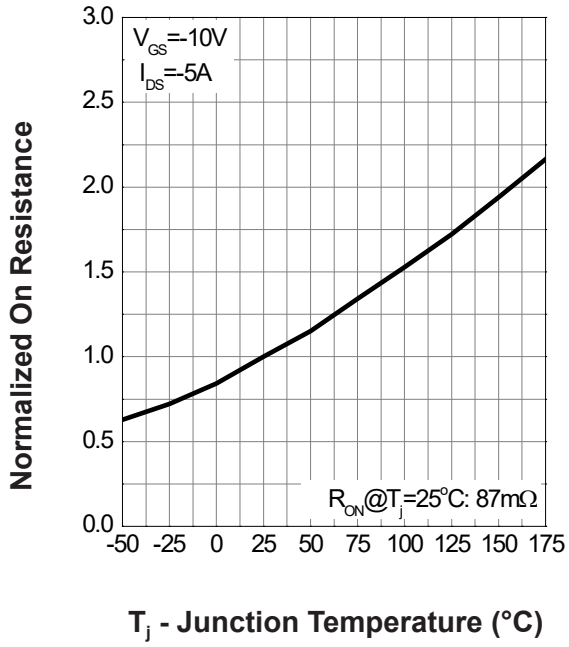
Gate-Source On Resistance



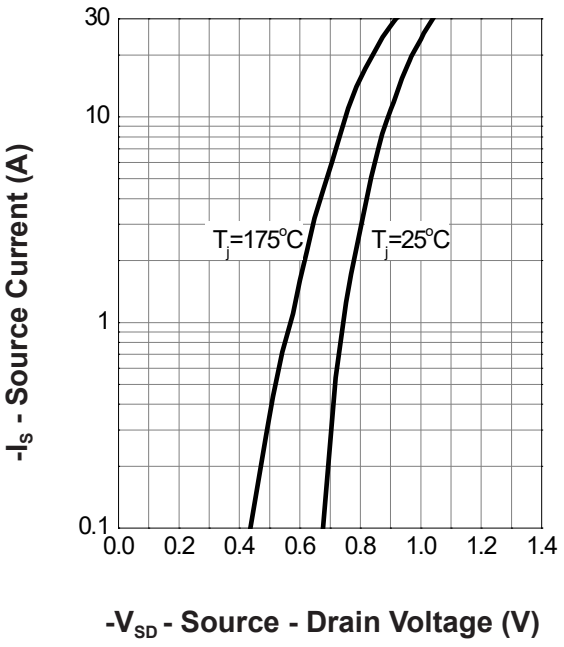
Gate Threshold Voltage



Drain-Source On Resistance

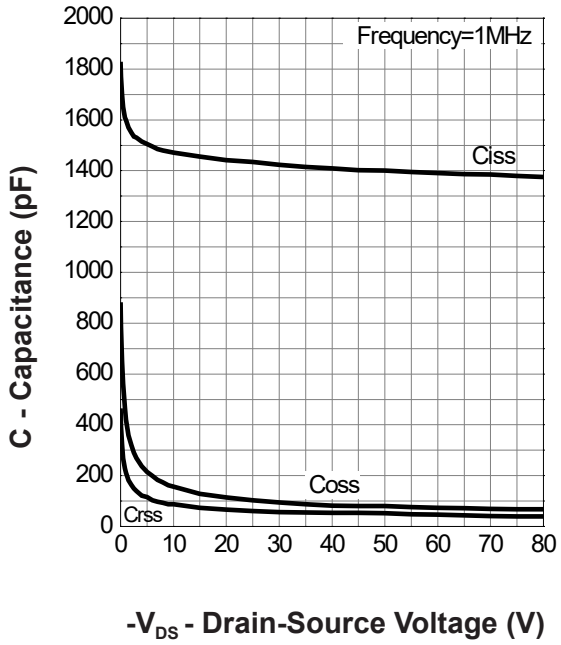


Source-Drain Diode Forward

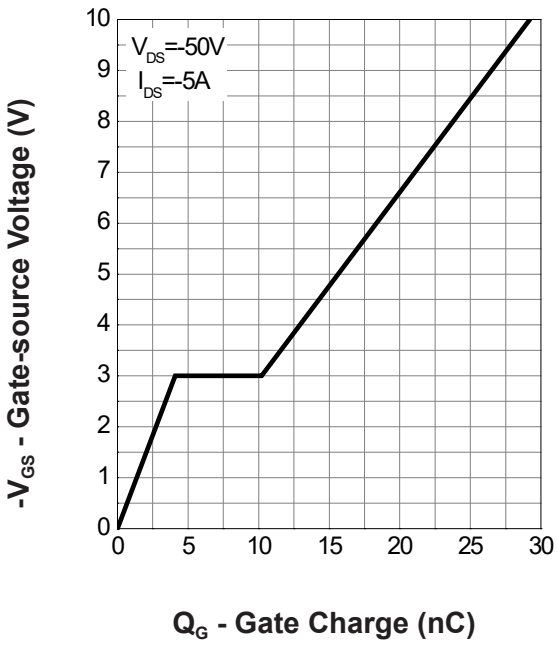


P Channel Typical Operating Characteristics(Cont.)

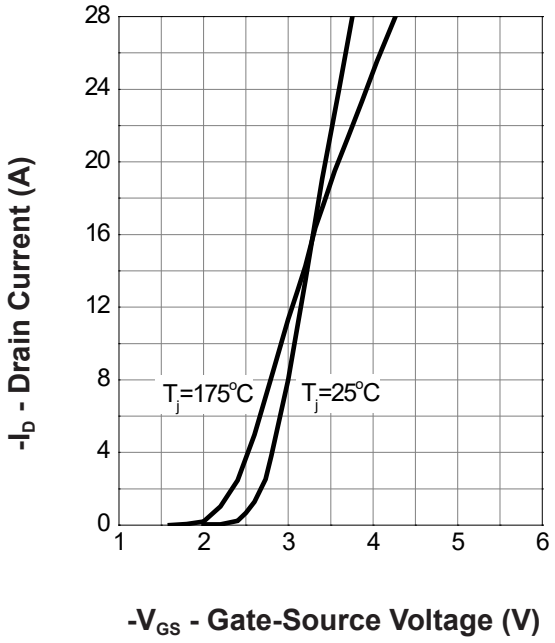
Capacitance



Gate Charge

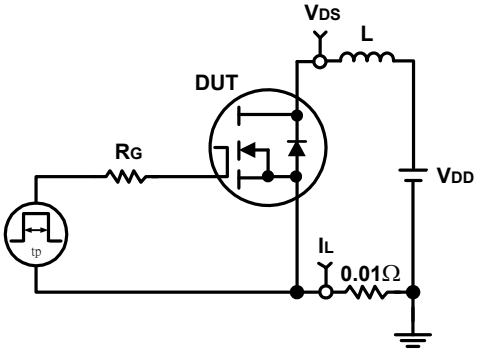


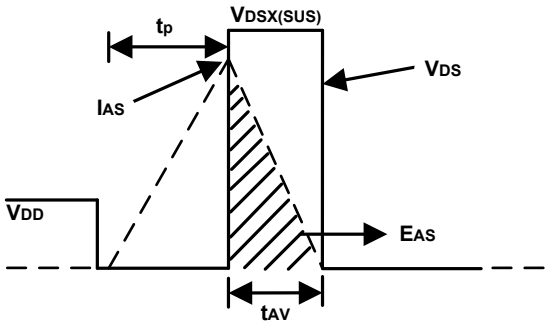
Transfer Characteristics



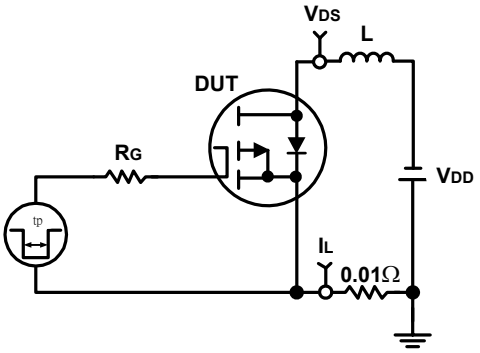
Avalanche Test Circuit and Waveforms

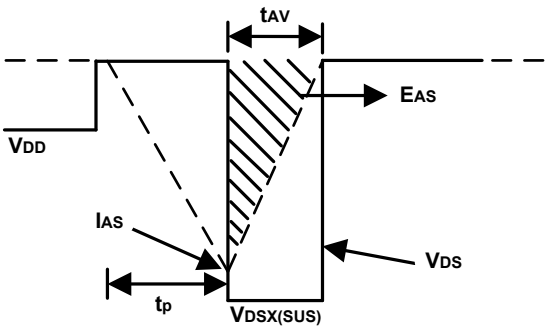
N Channel





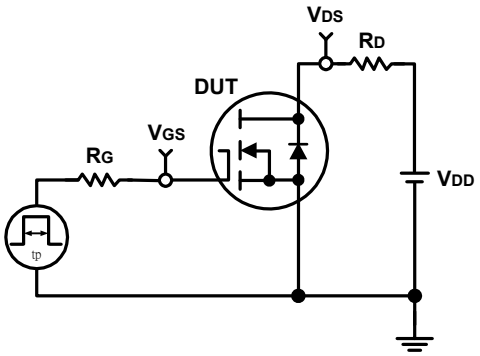
P Channel

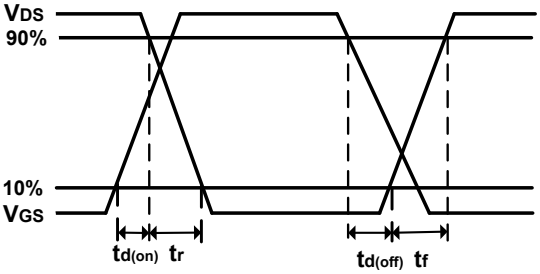




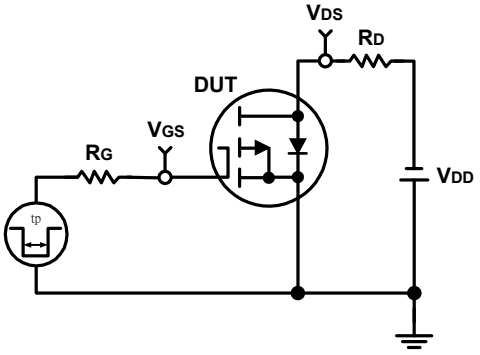
Switching Time Test Circuit and Waveforms

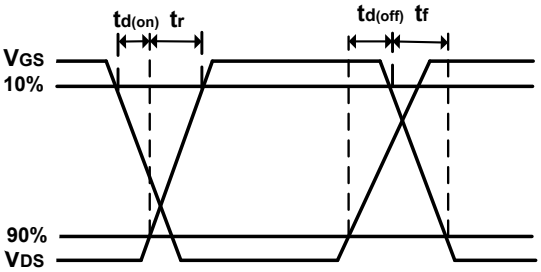
N Channel





P Channel





DFN5×6 OUTLINE