

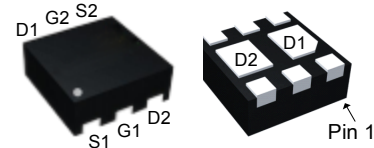
Features

- **N-Channel**
20V/13A,
 $R_{DS(ON)} = 20m\Omega(\text{typ.}) @ V_{GS}=4.5V$
 $R_{DS(ON)} = 25m\Omega(\text{typ.}) @ V_{GS}=2.5V$
- **P-Channel**
-20V/-10A,
 $R_{DS(ON)} = 48m\Omega(\text{typ.}) @ V_{GS}=-4.5V$
 $R_{DS(ON)} = 66m\Omega(\text{typ.}) @ V_{GS}=-2.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

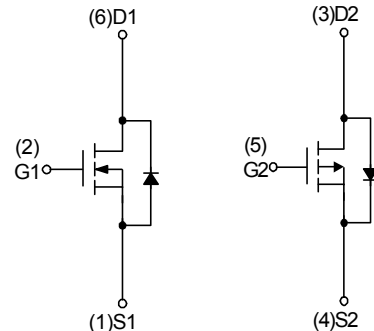
Applications

- Load Switch.
- Networking.

Pin Description



DFN2x2C-6_EP2



N-Channel

P-Channel

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Symbol	Parameter		N Channel	P Channel	Unit
Common Ratings					
V _{DSS}	Drain-Source Voltage		20	-20	V
V _{GSS}	Gate-Source Voltage		±12	±12	
T _J	Maximum Junction Temperature		150		°C
T _{STG}	Storage Temperature Range		-55 to 150		
I _S	Diode Continuous Forward Current	T _C =25°C	13	-10	A
I _D	Continuous Drain Current	T _C =25°C	13	-10	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	39	-30	
P _D	Power Dissipation	T _C =25°C	16	17	W
		T _C =70°C	9	10	
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	t ≤ 10s	85		°C/W
		Steady State	135		
I _{AS} ^c	Avalanche Current, Single pulse	L=0.5mH	6	-6	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.5mH	9	9	mJ

Note a : Pulse width is limited by max. junction temperature.

Note b : Surface mounted on 1in² pad area, steady state t = 999s.

Note c : UIS tested and pulse width limited by maximum junction temperature 150°C (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	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.5	0.7	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =4.5A	-	20	24	mΩ
		V _{GS} =2.5V, I _{DS} =3.5A	-	25	32	
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} =4.5A, dI _{SD} /dt=100A/μs	-	12.8	-	ns
Q _{rr}	Reverse Recovery Charge		-	3.8	-	nC
Dynamic Characteristics ^e						
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.2	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	275	358	pF
C _{oss}	Output Capacitance		-	61	-	
C _{rss}	Reverse Transfer Capacitance		-	52	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	2.4	-	ns
t _r	Turn-on Rise Time		-	13	-	
t _{d(OFF)}	Turn-off Delay Time		-	15.5	-	
t _f	Turn-off Fall Time		-	3	-	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =4.5A	-	4.2	6.3	nC
Q _{gs}	Gate-Source Charge		-	0.3	-	
Q _{gd}	Gate-Drain Charge		-	1.7	-	

Note d Pulse test; pulse width≤300μs, duty cycle≤2%.

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

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

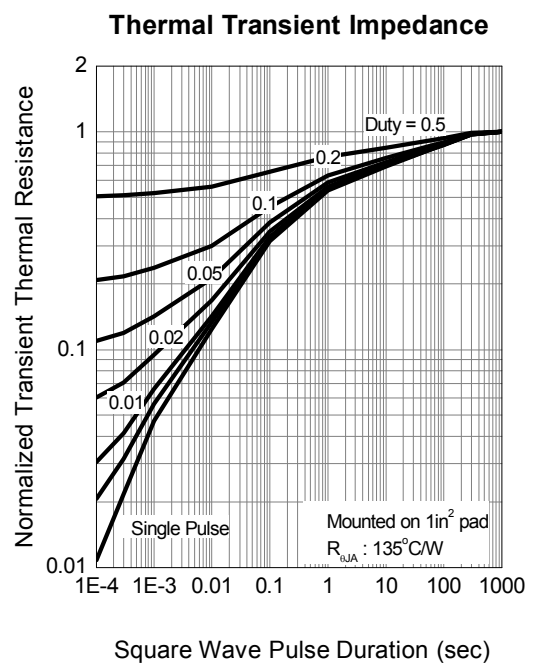
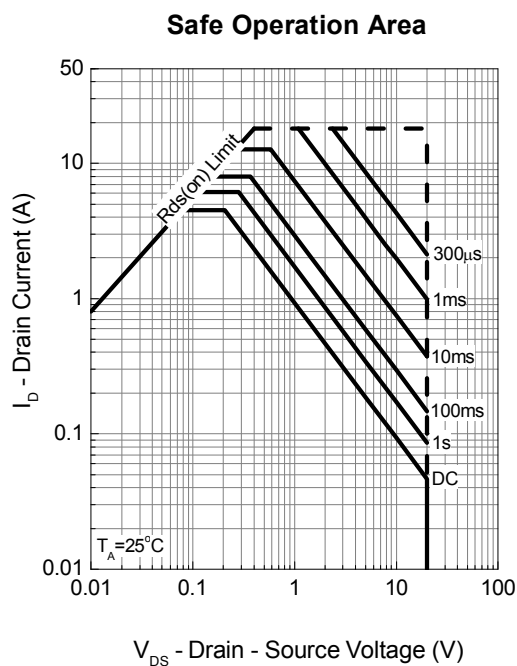
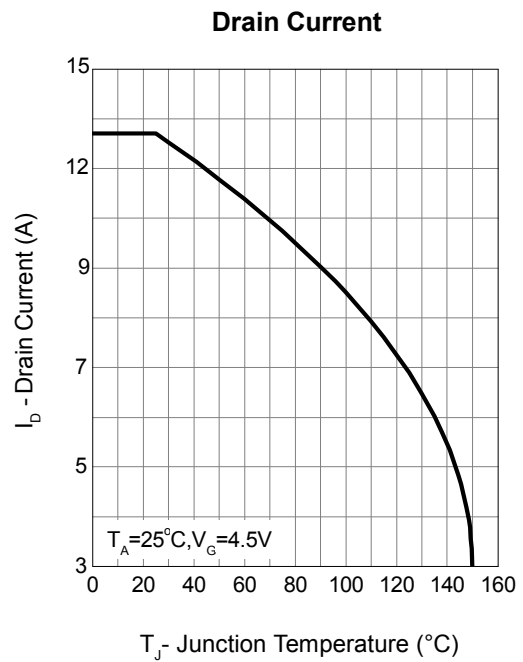
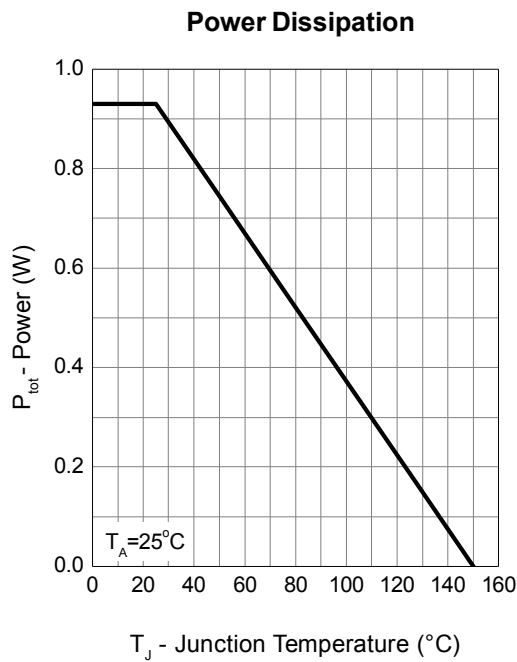
Symbol	Parameter	Test Conditions	P Channel			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V	-	-	-1	μA
		T _J =85°C	-	-	-30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-0.7	-1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±10V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-2.5A	-	48	56	mΩ
		V _{GS} =-2.5V, I _{DS} =-2A	-	66	78	
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.8	-1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =-2.5A, dI _{SD} /dt=100A/μs	-	22	-	ns
Q _{rr}	Reverse Recovery Charge		-	6	-	nC
Dynamic Characteristics ^e						
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	10.8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz	-	365	-	pF
C _{oss}	Output Capacitance		-	75	-	
C _{rss}	Reverse Transfer Capacitance		-	60	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω	-	6	-	ns
t _r	Turn-on Rise Time		-	14.4	-	
t _{d(OFF)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	24	-	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-2.5A	-	4.6	-	nC
Q _{gs}	Gate-Source Charge		-	0.5	-	
Q _{gd}	Gate-Drain Charge		-	1.9	-	

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

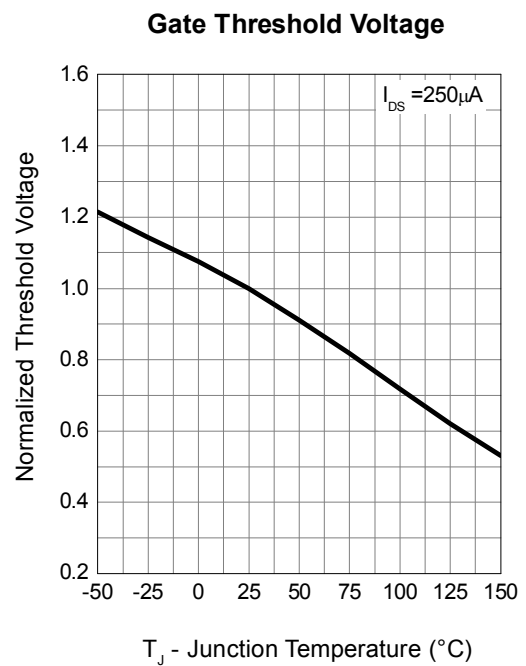
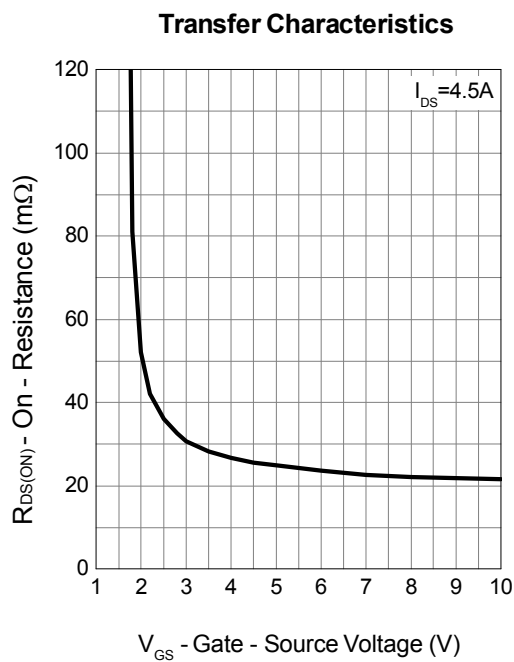
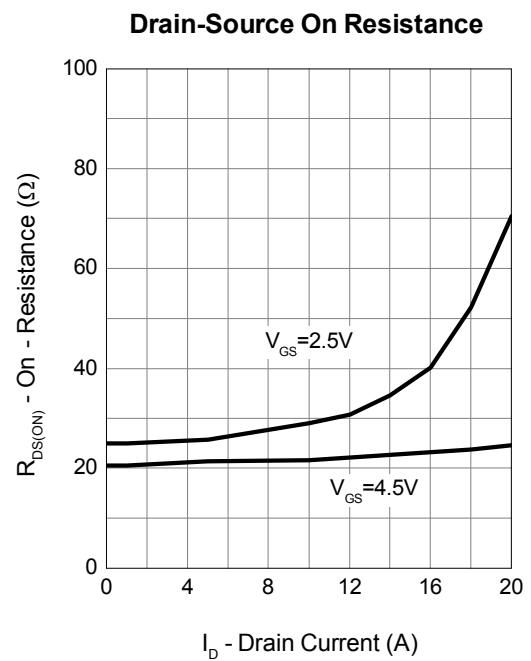
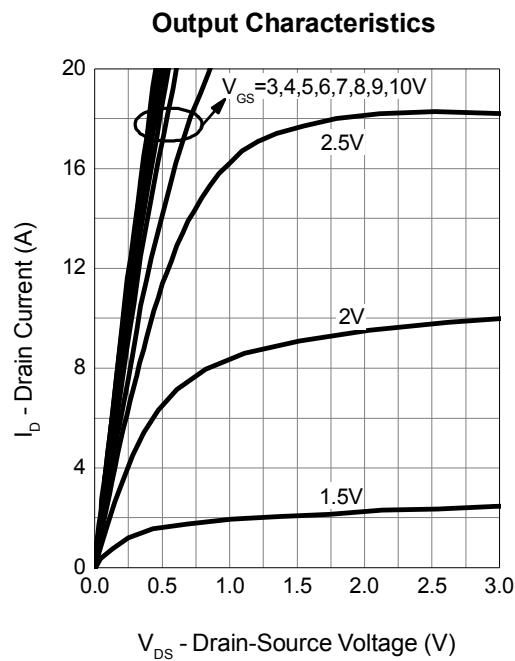
Note e : Guaranteed by design, not subject to production testing.

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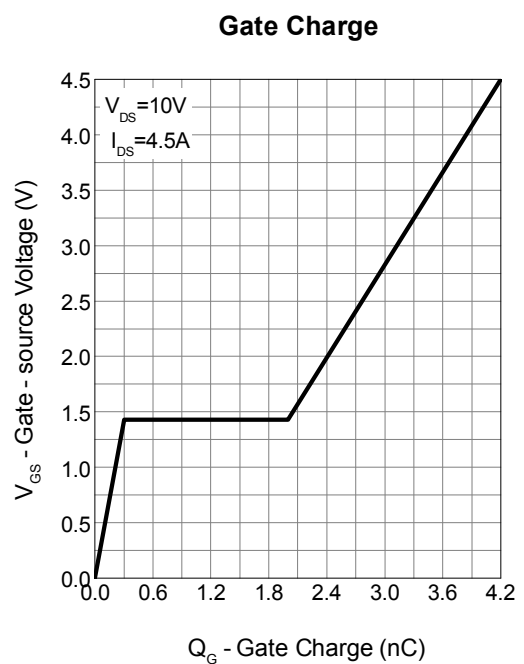
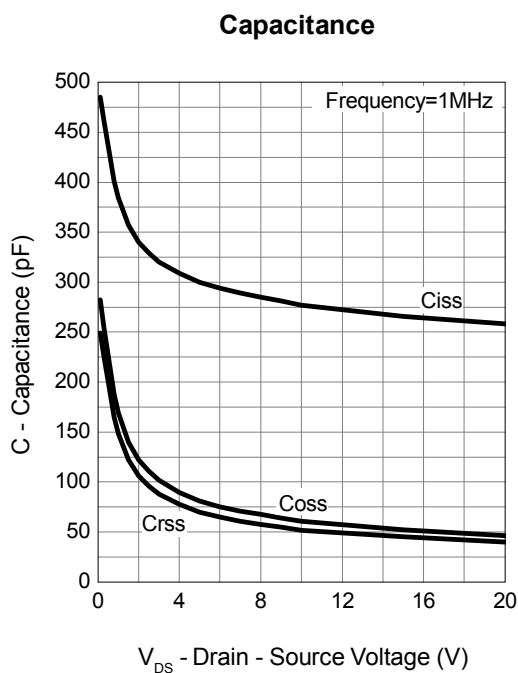
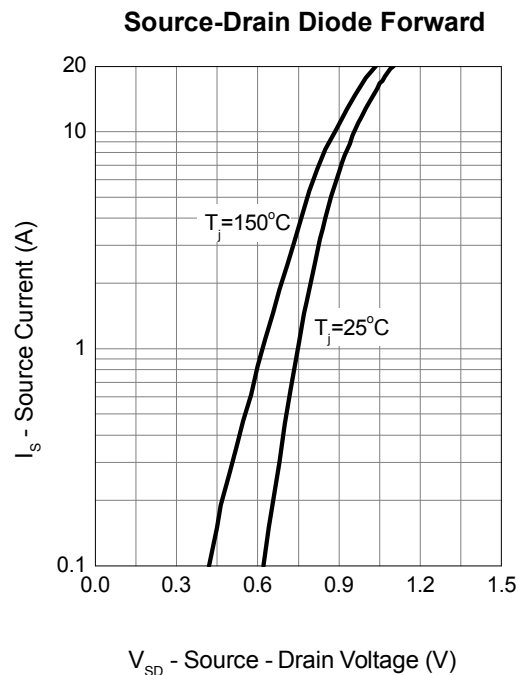
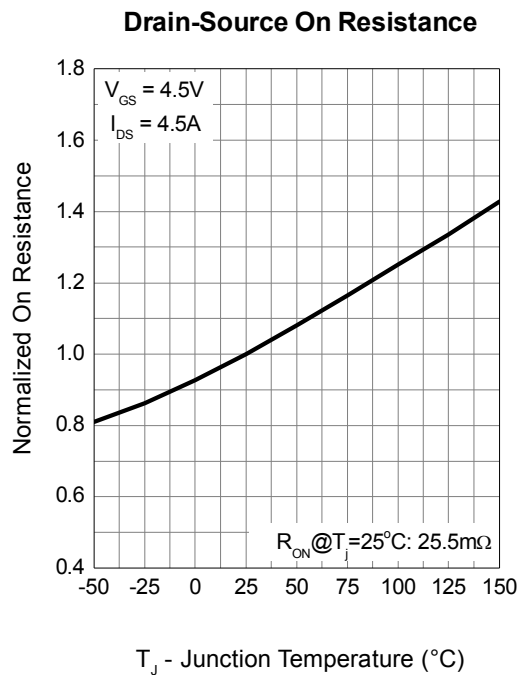
N Channel Typical Operating Characteristics



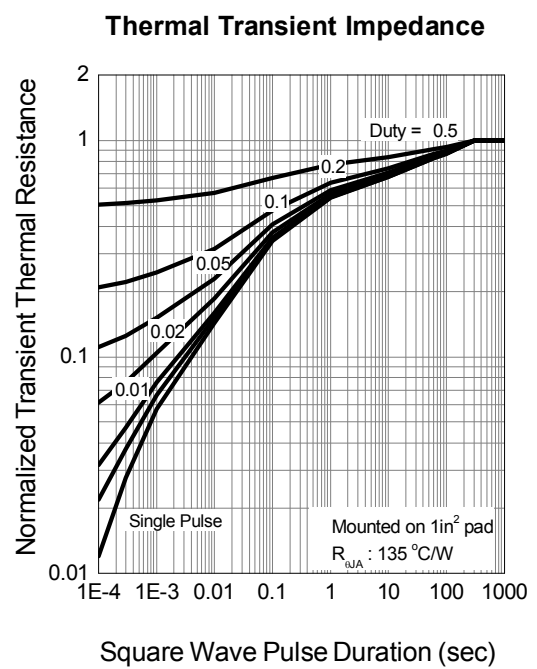
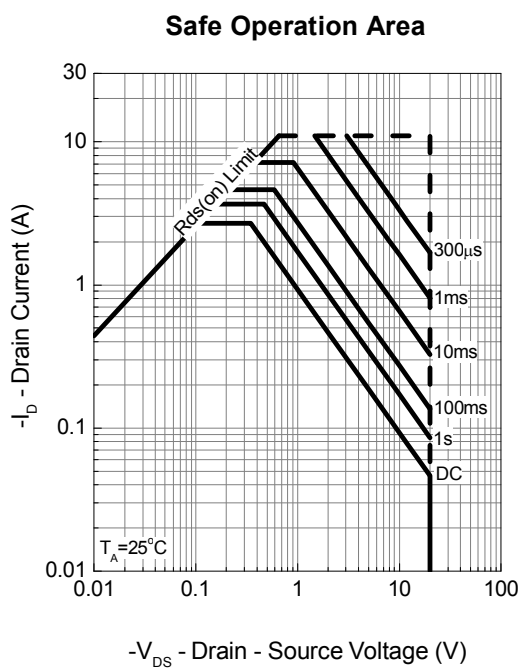
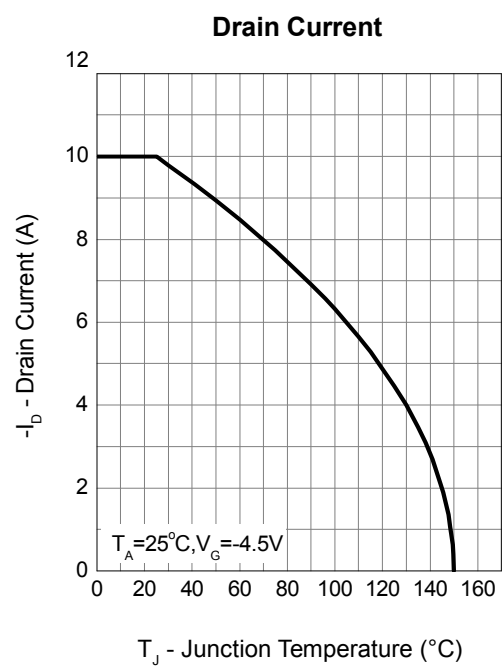
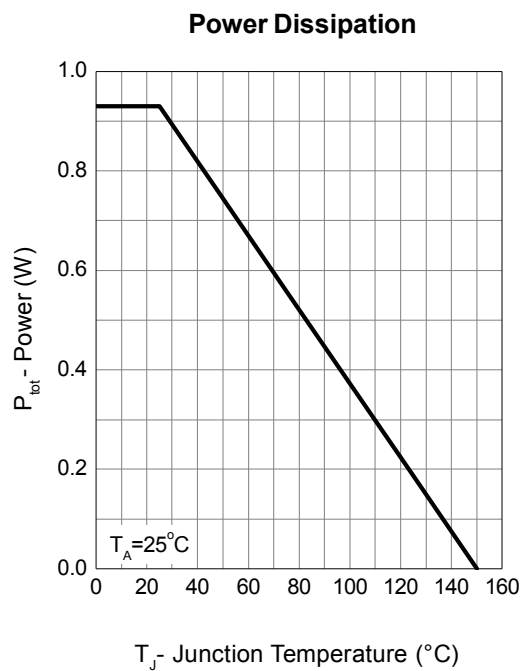
N Channel Typical Operating Characteristics (Cont.)



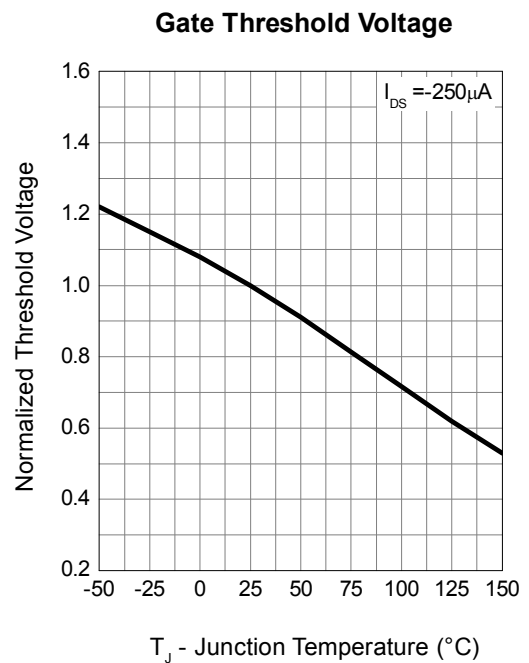
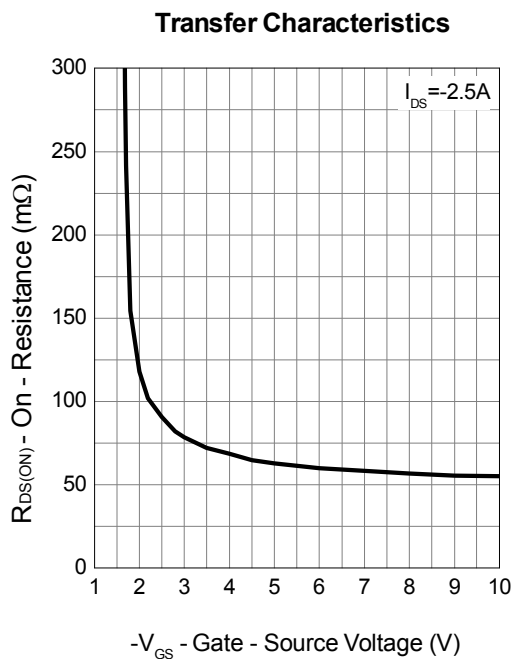
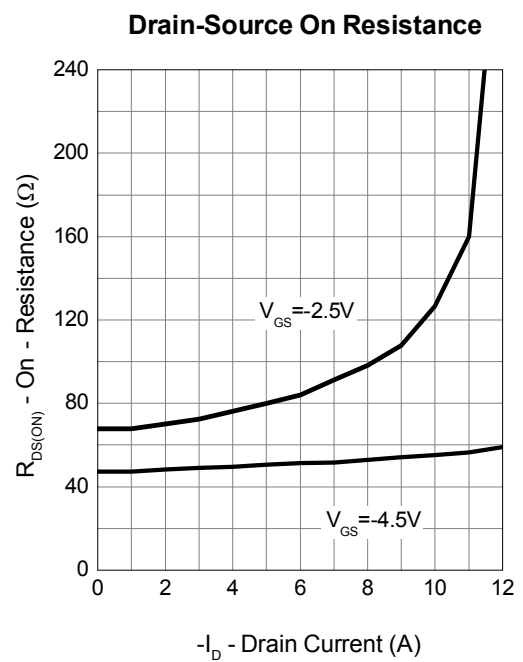
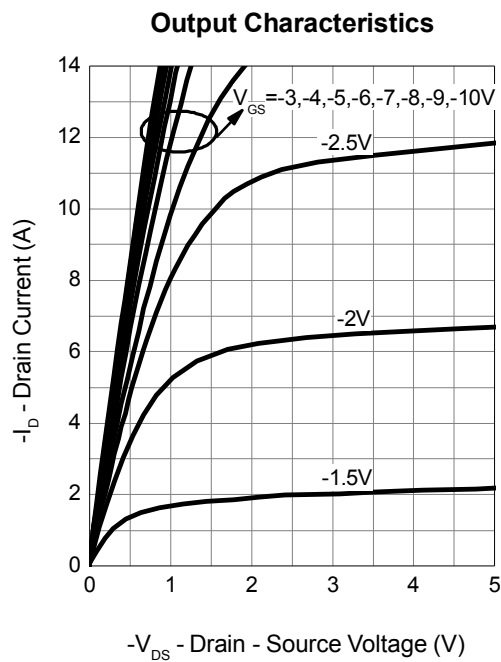
N Channel Typical Operating Characteristics (Cont.)



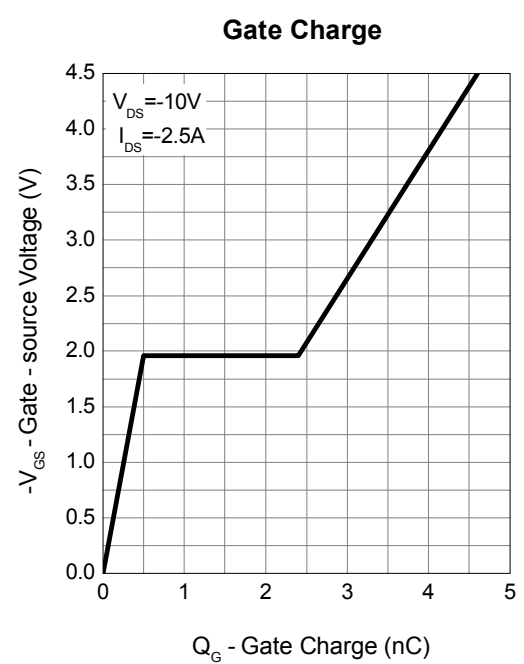
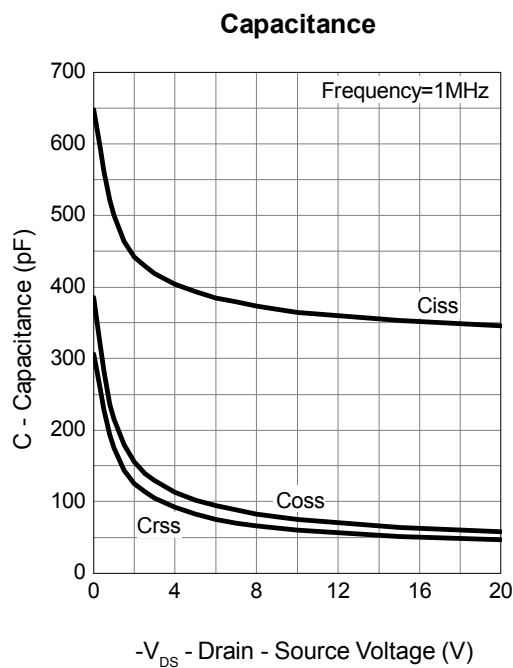
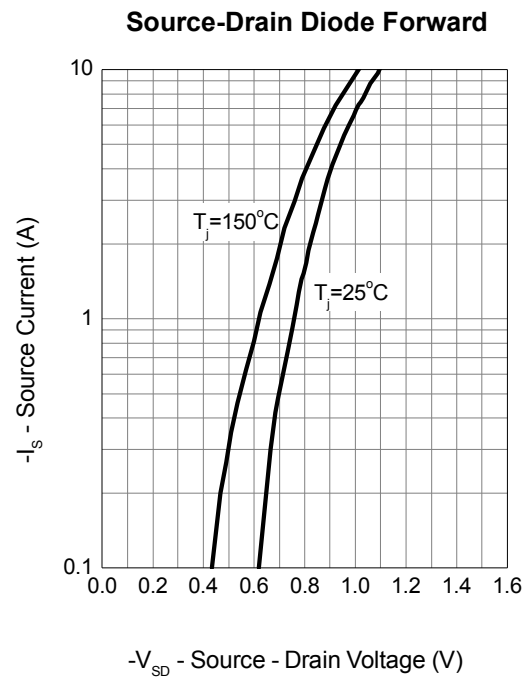
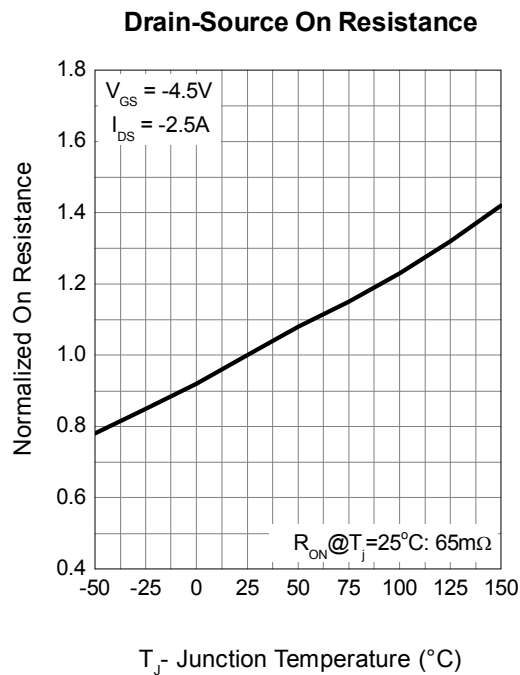
P Channel Typical Operating Characteristics



P Channel Typical Operating Characteristics (Cont.)

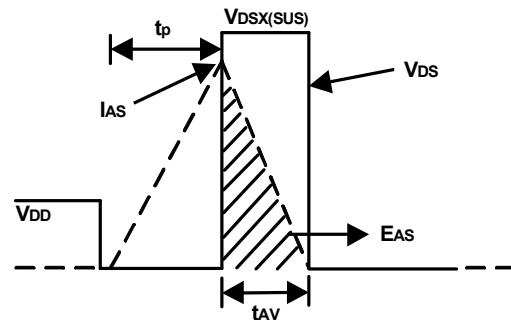
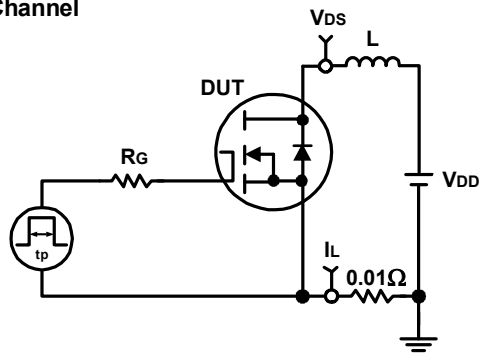


P Channel Typical Operating Characteristics (Cont.)

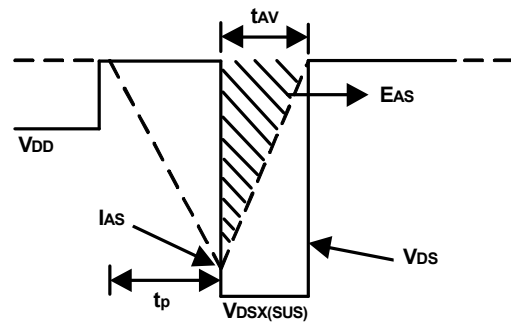
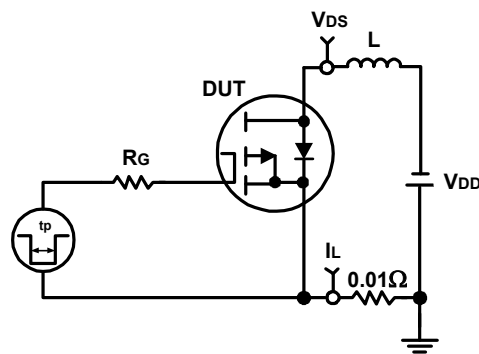


Avalanche Test Circuit and Waveforms

N Channel

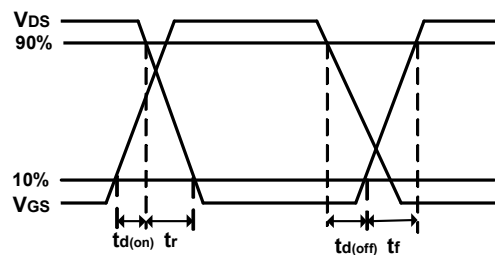
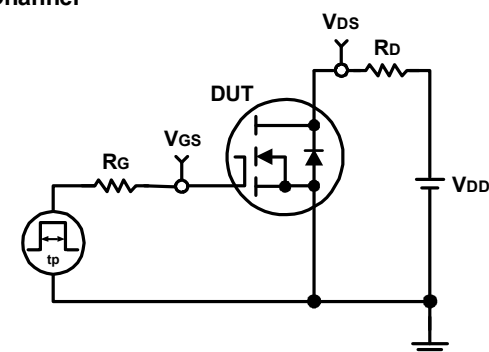


P Channel

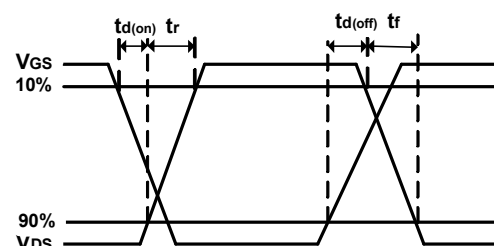
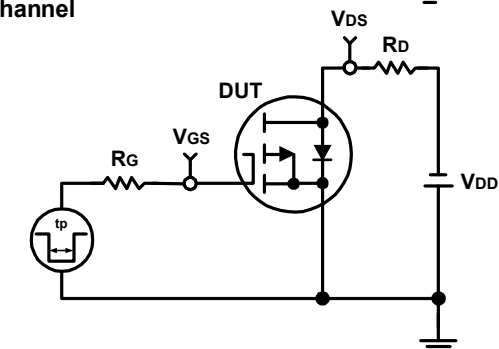


Switching Time Test Circuit and Waveforms

N Channel

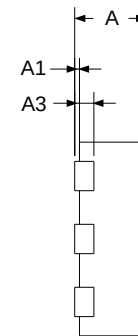
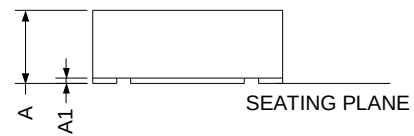
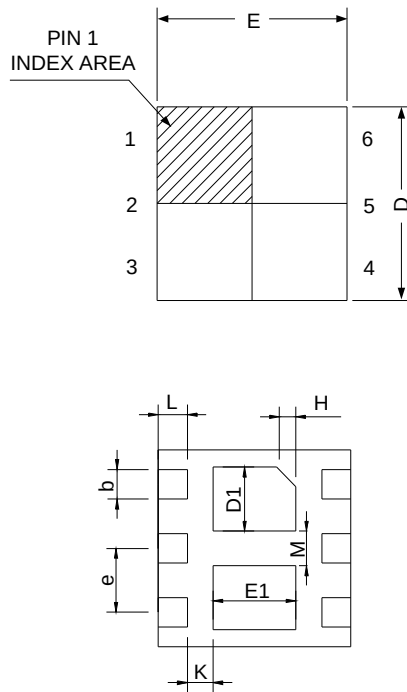


P Channel



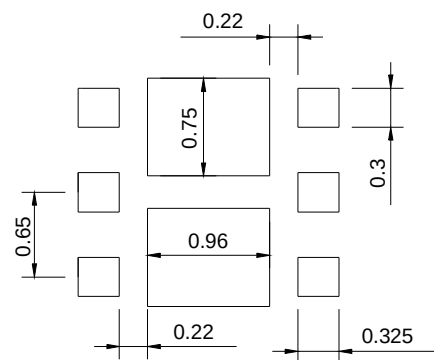
Package Information

DFN2x2-6



SYMBOL	DFN2x2-6			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	0.80	0.028	0.031
A1	0.00	0.05	0.000	0.002
A3	0.200 REF		0.008 REF	
b	0.25	0.35	0.010	0.014
D	1.90	2.10	0.075	0.083
D1	0.55	0.75	0.022	0.030
E	1.90	2.10	0.075	0.083
E1	0.76	0.96	0.030	0.038
e	0.65 BSC		0.026 BSC	
H	0.20 BSC		0.008 BSC	
K	0.17	0.37	0.007	0.015
L	0.25	0.35	0.010	0.014
M	0.25	0.45	0.010	0.018

RECOMMENDED LAND PATTERN



UNIT: mm