Features

- **Channel 1**

  30V/48A,

  $R_{DS(ON)}$ = 8mΩ (typ.) @ V_{GS} = 10V

  $R_{DS(ON)}$ = 11mΩ (typ.) @ V_{GS} = 4.5V
- **Channel 2**

  30V/56A,

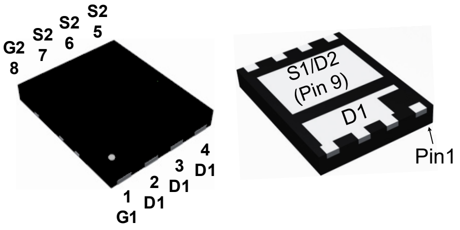
  $R_{DS(ON)}$ = 7 mΩ (typ.) @ V_{GS} = 10V

  $R_{DS(ON)}$ = 10mΩ (typ.) @ V_{GS} = 4.5V
- 100% UIS Tested
- Reliable and Rugged
- Lead Free Available (RoHS Compliant)

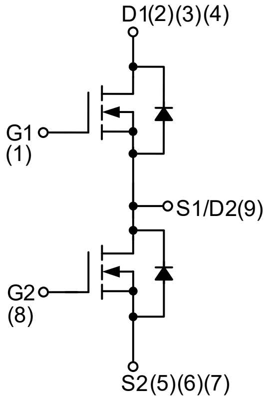
Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



DFN5x6D-8_EP2



N-Channel MOSFET

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

Symbol	Parameter		Channel 1	Channel 2	Unit
Common Ratings					
V_{DSS}	Drain-Source Voltage		30	30	V
V_{GSS}	Gate-Source Voltage		±20	±20	
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	48	56	A
I_D [a]	Continuous Drain Current	T_C=25°C	48	56	A
I_{DM} [b]	Pulse Drain Current Tested	T_C=25°C	144	172	A
P_D	Maximum Power Dissipation	T_C=25°C	20.8	23.6	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	6	5.3	°C/W
$R_{\theta JA}$ [c]	Thermal Resistance-Junction to Ambient	t ≤ 10s	54	66	°C/W
		Steady State [c]	96	108	
I_{AS} [d]	Avalanche Current, Single pulse	L=0.1mH	13.8	17.4	A
		L=0.5mH	7.8	9	
E_{AS} [d]	Avalanche Energy, Single pulse	L=0.1mH	9.5	15.1	mJ
		L=0.5mH	15.2	20.3	

Note a：Max. continuous current is limited by bonding wire.
Note b：Pulse width is limited by max. junction temperature.
Note c：Surface Mounted on 1in^2 pad area, t ≤10s.
Note d：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).

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

Symbol	Parameter	Test Conditions	Channel 1			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.35	1.8	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [e]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=14A	-	8	9.2	mΩ
		V_{GS}=4.5V, I_{DS}=10A	-	11	13.9	
Diode Characteristics						
V_{SD} [e]	Diode Forward Voltage	I_{SD}=1A, V_{GS}=0V	-	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_{DS}=14A, dI_{SD}/dt=100A/μs	-	17	-	ns
Q_{rr}	Reverse Recovery Charge		-	6	-	nC
Dynamic Characteristics [f]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	2	4	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	485	630	pF
C_{oss}	Output Capacitance		-	280	-	
C_{rss}	Reverse Transfer Capacitance		-	24	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	9.6	17.3	ns
t_r	Turn-on Rise Time		-	8.8	15.8	
$t_{d(OFF)}$	Turn-off Delay Time		-	17.6	32	
t_f	Turn-off Fall Time		-	10.8	19.4	
Gate Charge Characteristics [f]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=14A	-	8.3	10.8	nC
Q_{gs}	Gate-Source Charge		-	1.4	-	
Q_{gd}	Gate-Drain Charge		-	1.3	-	

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

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

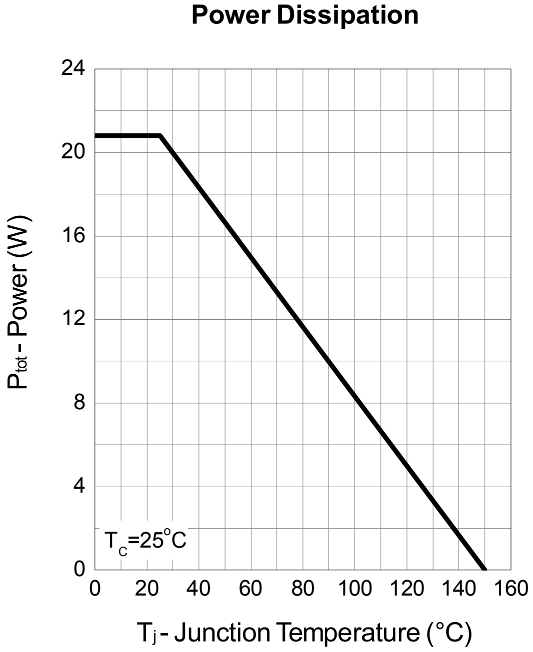
Electrical Characteristics (T_A = 25°C unless otherwise noted)

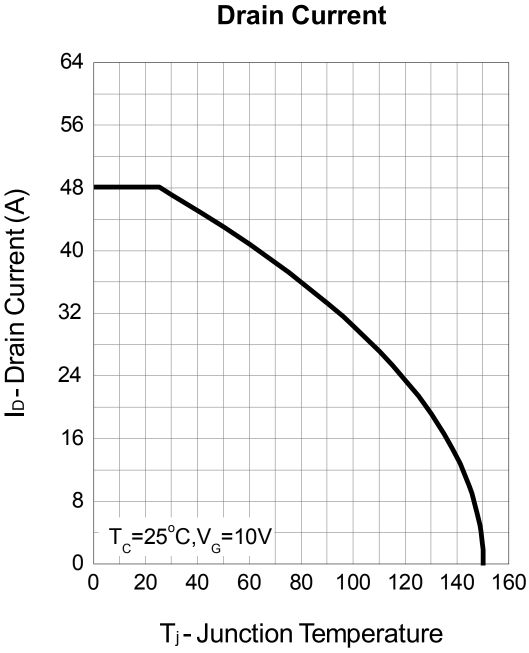
Symbol	Parameter	Test Conditions	Channel 2			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	mA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	1.35	1.8	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [e]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=15A	-	7	9.2	mΩ
		V_{GS}=4.5V, I_{DS}=10A	-	10	12.3	
Diode Characteristics						
V_{SD} [e]	Diode Forward Voltage	I_{SD}=1A, V_{GS}=0V	-	0.8	1.3	V
t_{rr}	Reverse Recovery Time	I_{DS}=15A, dI_{SD}/dt=100A/μs	-	20	-	ns
Q_{rr}	Reverse Recovery Charge		-	8	-	nC
Dynamic Characteristics [f]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1.3	2.6	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	615	800	pF
C_{oss}	Output Capacitance		-	340	-	
C_{rss}	Reverse Transfer Capacitance		-	100	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	10.7	19.3	ns
t_r	Turn-on Rise Time		-	9.6	17.3	
$t_{d(OFF)}$	Turn-off Delay Time		-	18.4	33.1	
t_f	Turn-off Fall Time		-	12.3	22.1	
Gate Charge Characteristics [f]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=15A	-	11.9	15.5	nC
Q_{gs}	Gate-Source Charge		-	1.4	-	
Q_{gd}	Gate-Drain Charge		-	3.5	-	

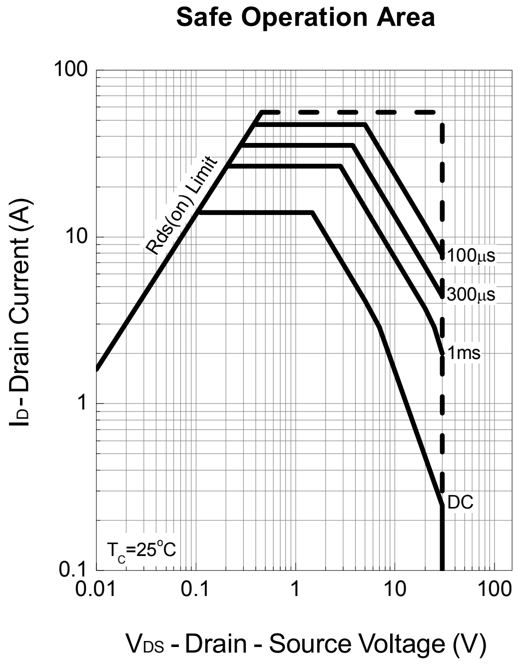
Note e：Pulse test; pulse width≤300μs, duty cycle≤2%.

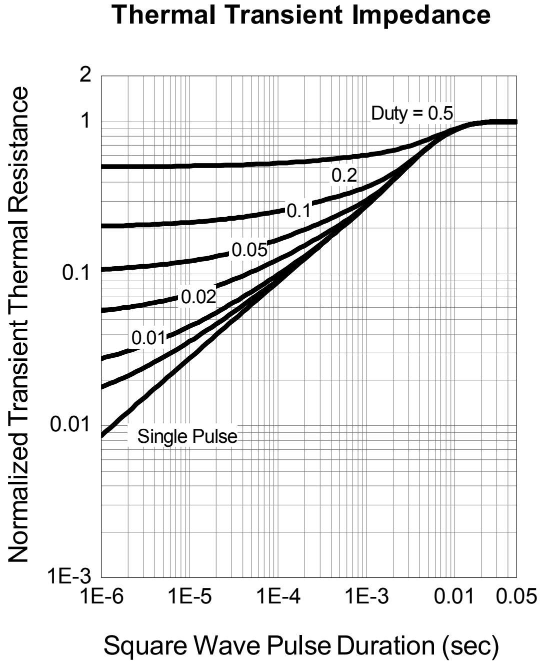
Note f：Guaranteed by design, not subject to production testing.

Channel 1 Typical Operating Characterist



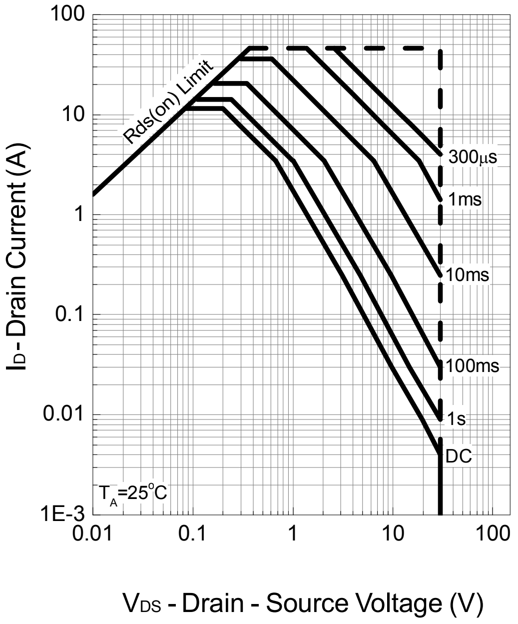




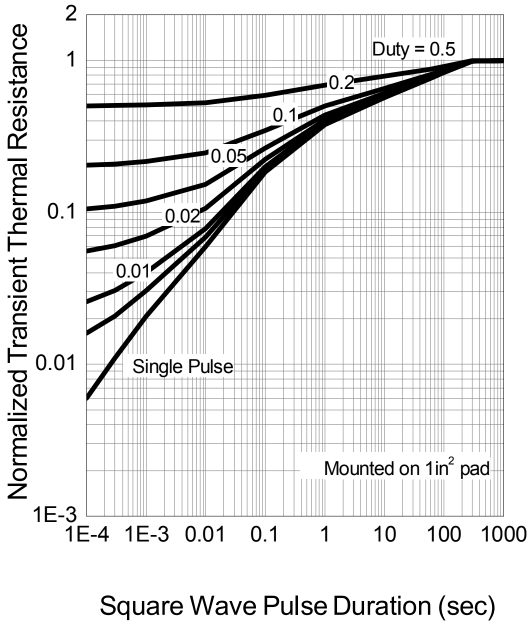


Channel 1 Typical Operating Characteristics (Cont.)

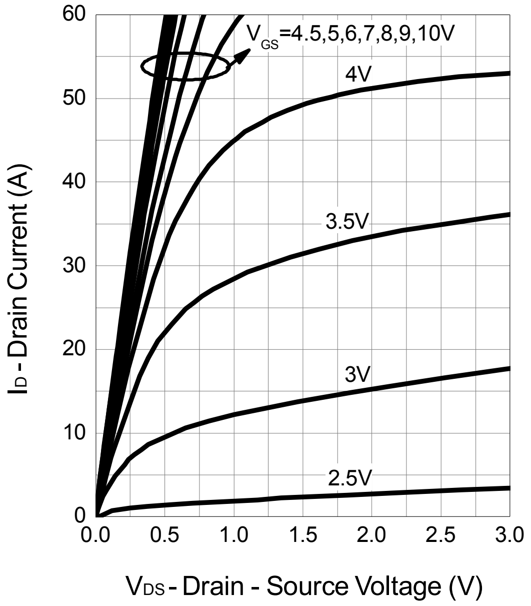
Safe Operation Area



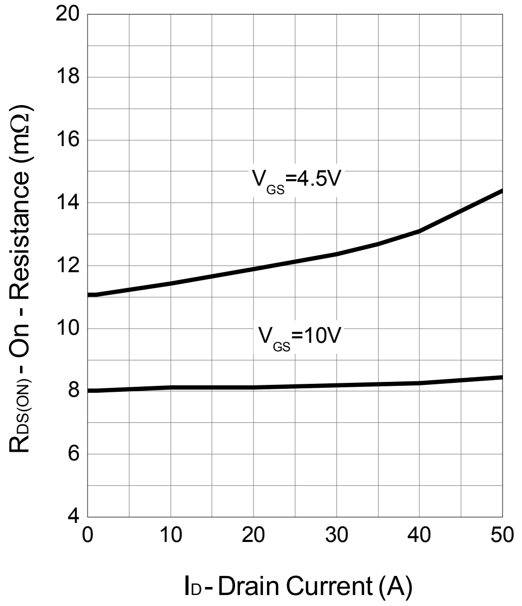
Thermal Transient Impedance



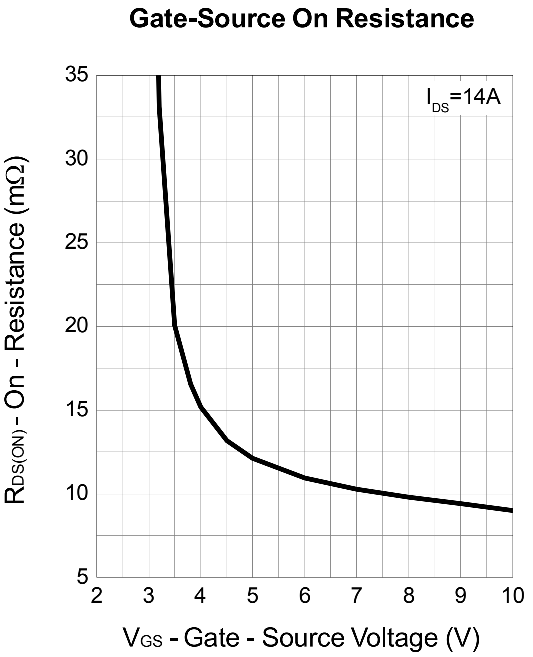
Output Characteristics

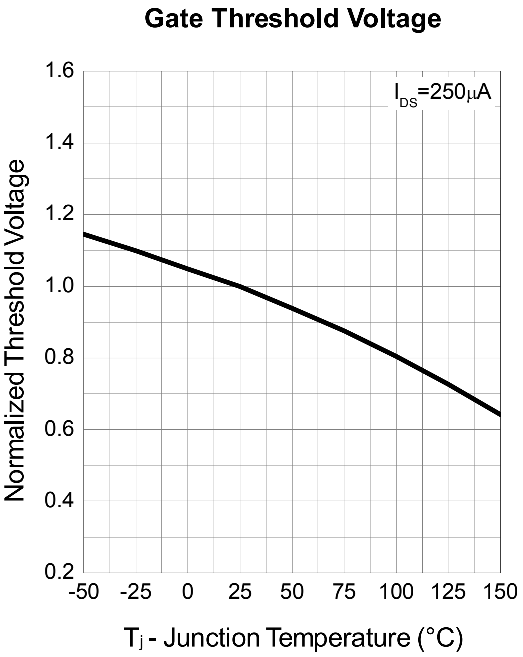


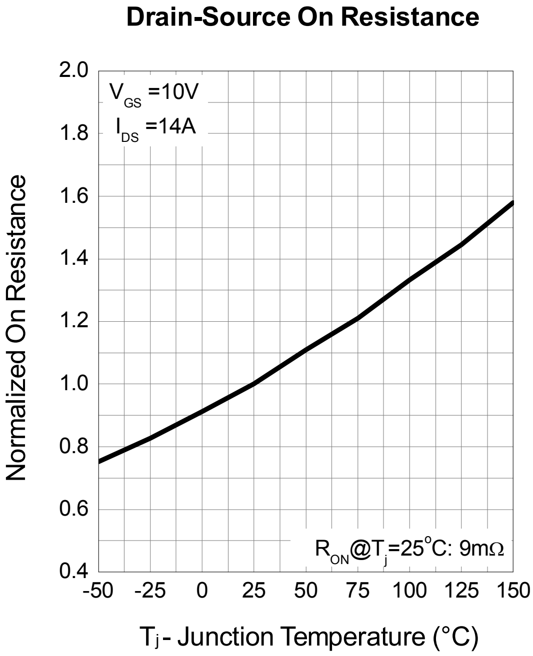
Drain-Source On Resistance

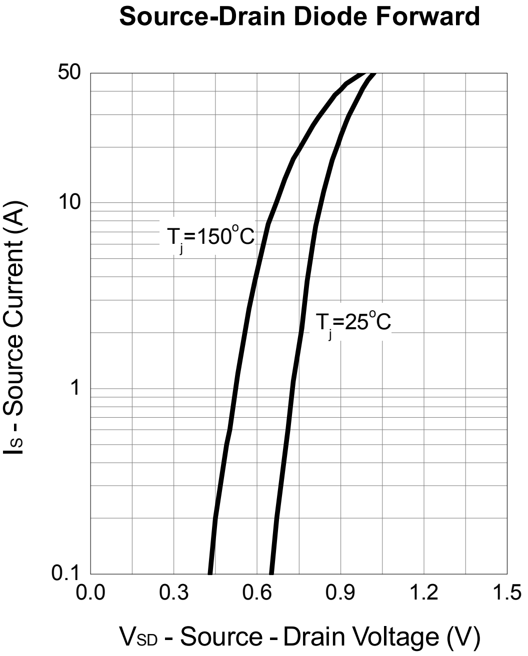


Channel 1 Typical Operating Characteristics (Cont.)

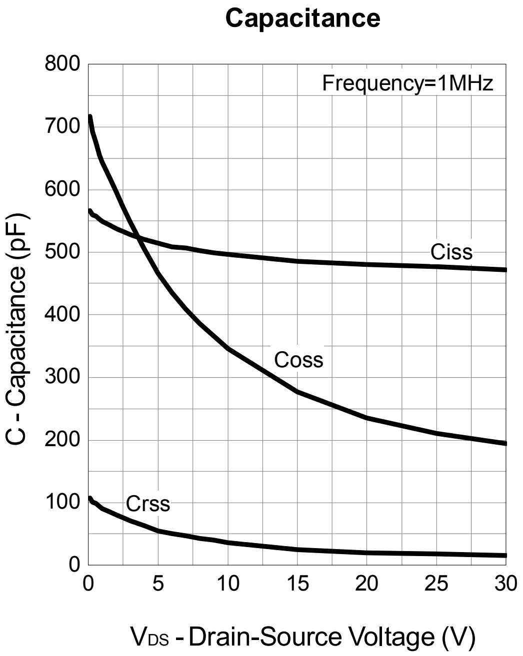


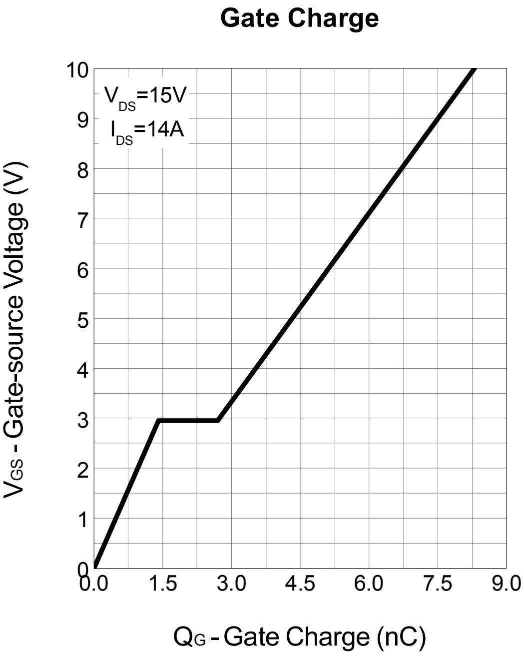


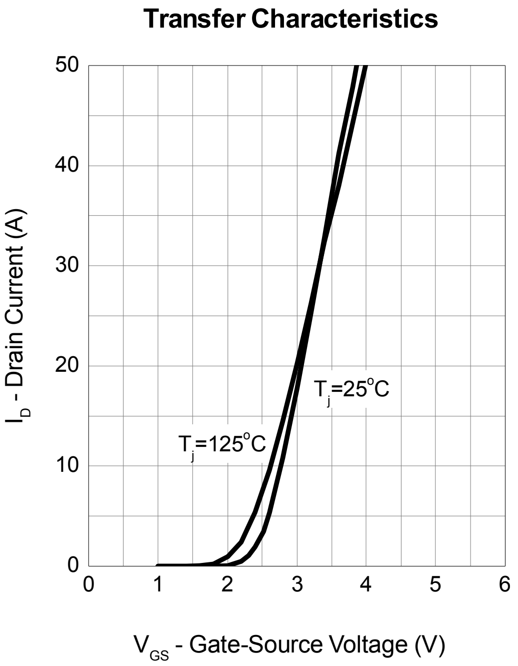




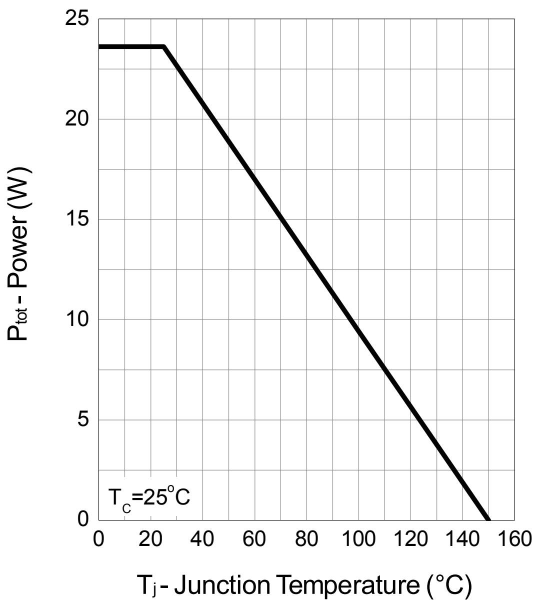
Channel 1 Typical Operating Characteristics (Cont.)

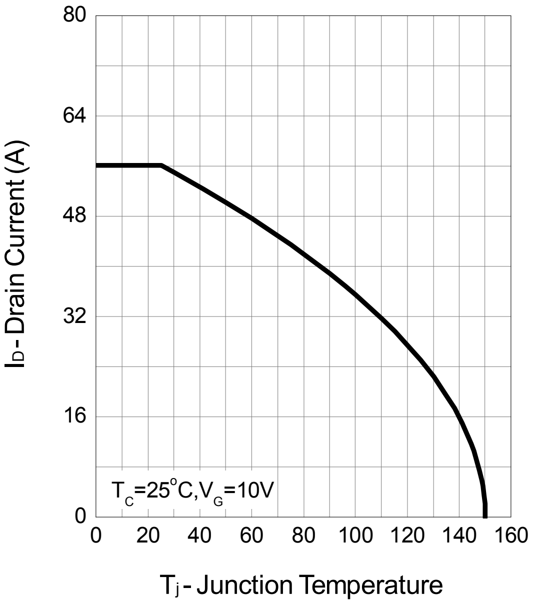


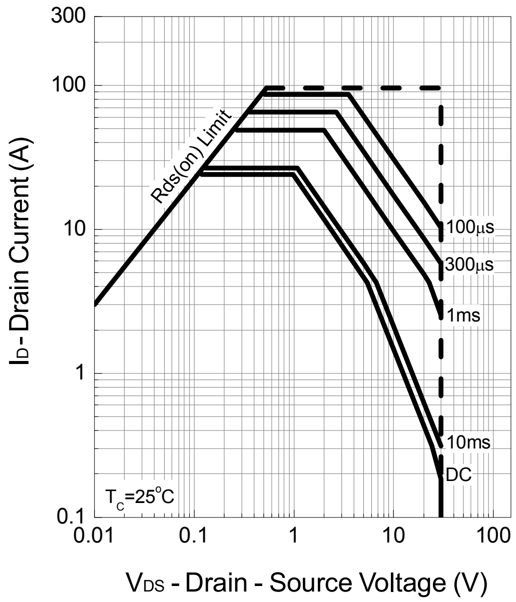


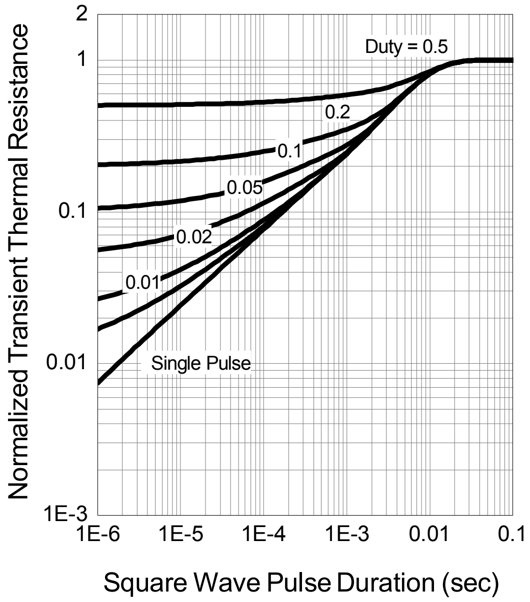


Channel 2 Typical Operating Characteristics

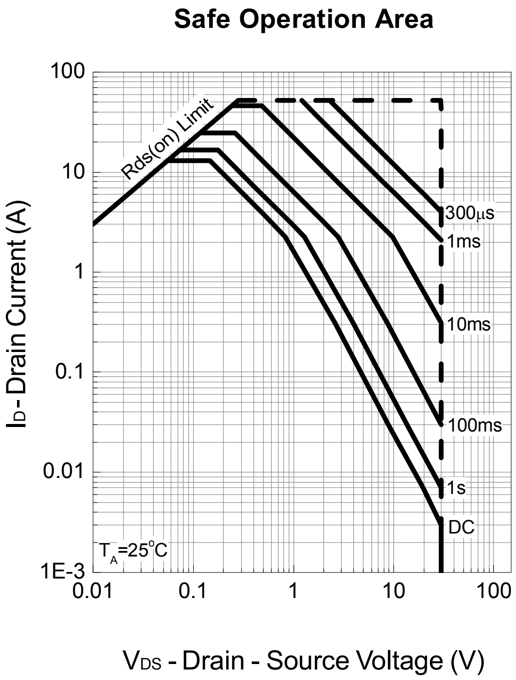

Power Dissipation

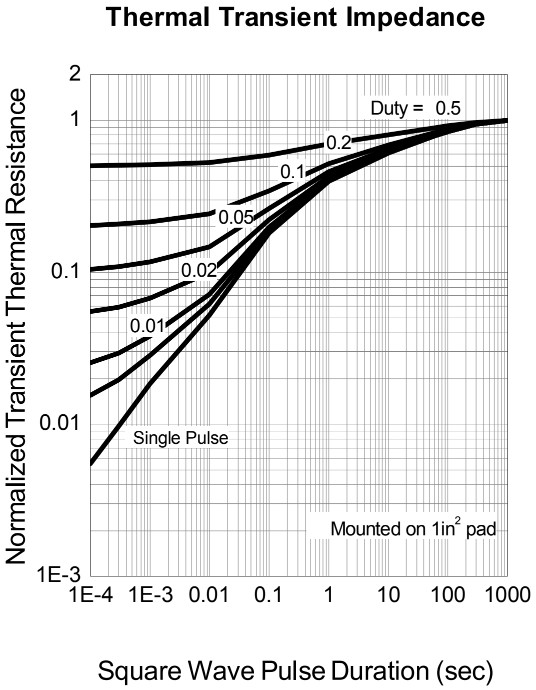

Drain Current

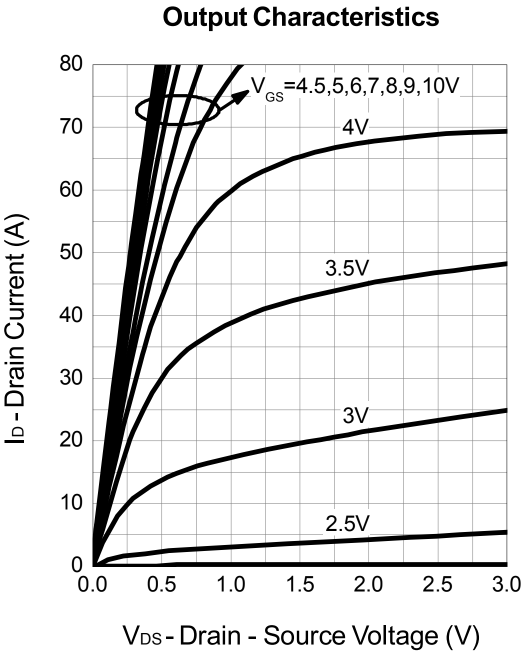

Safe Operation Area

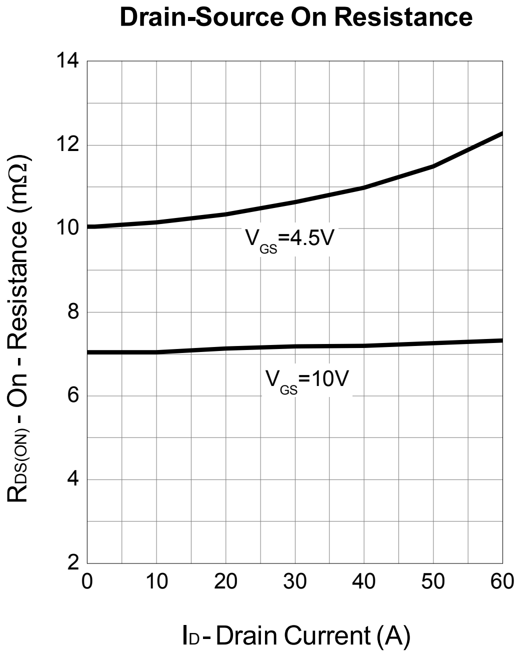

Thermal Transient Impedance

Channel 2 Typical Operating Characteristics (Cont.)

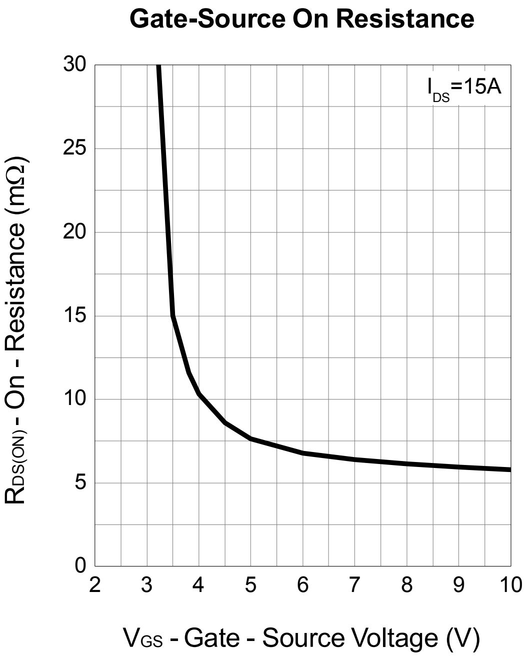


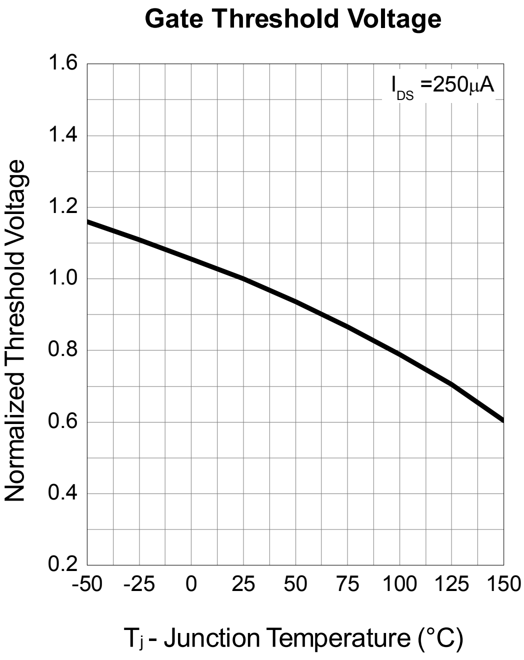


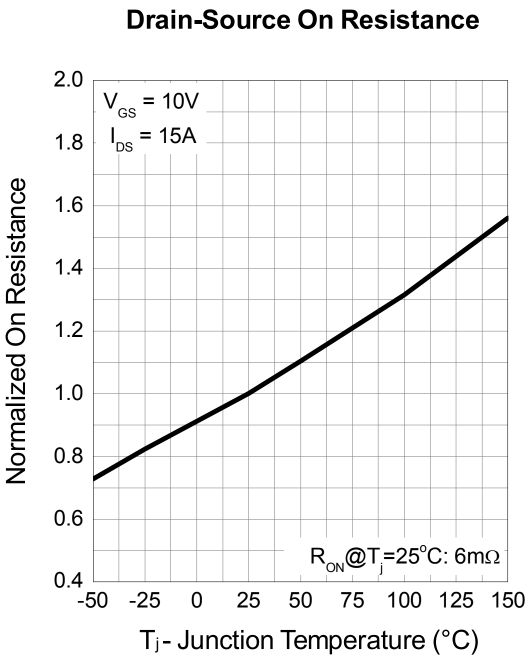


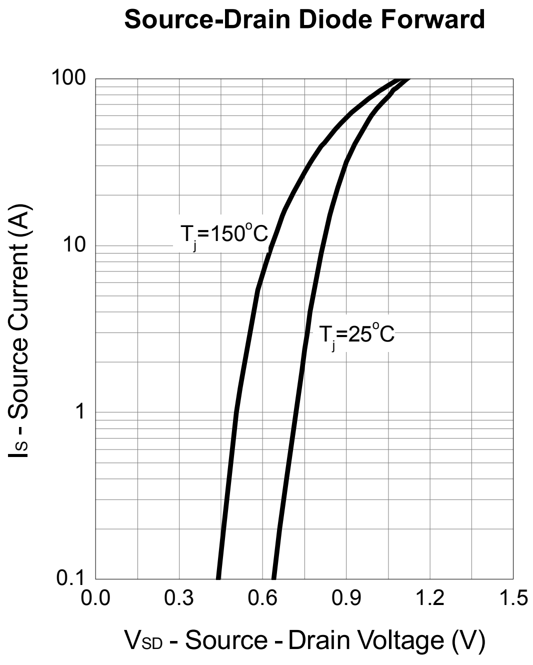


Channel 2 Typical Operating Characteristics (Cont.)

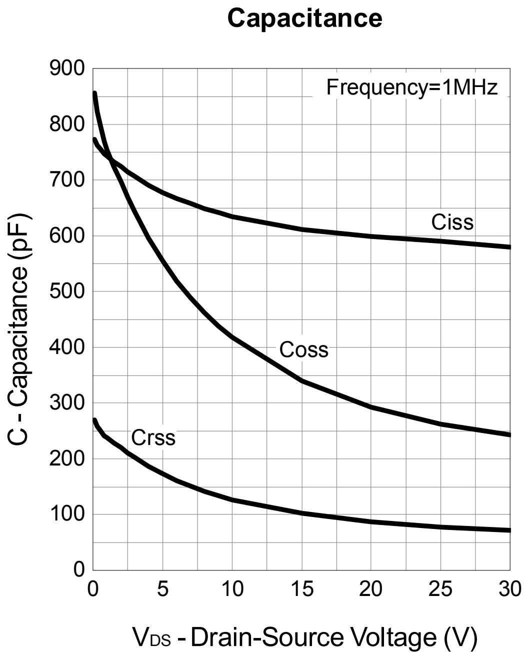


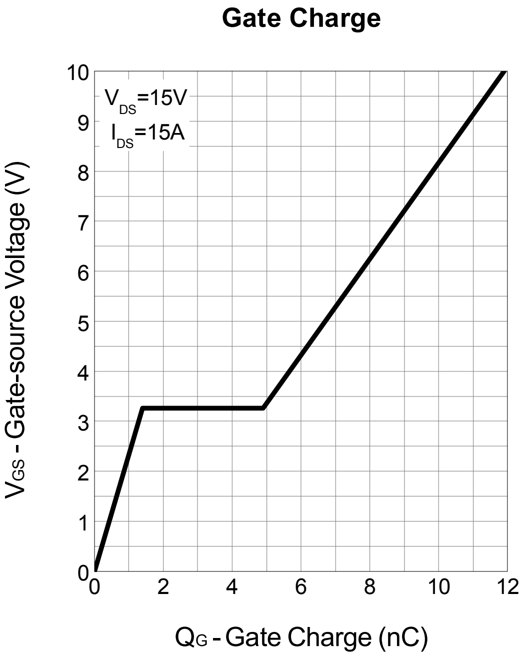


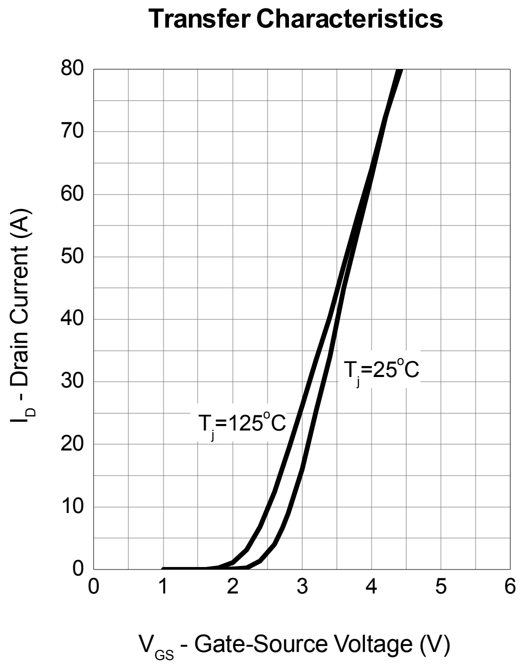




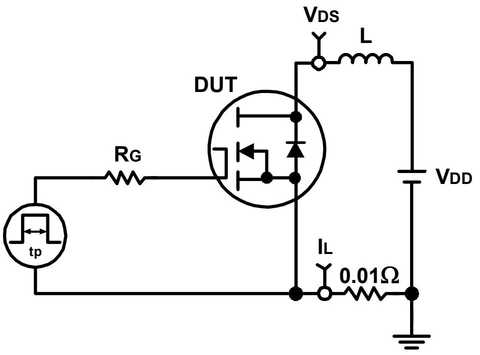
Channel 2 Typical Operating Characteristics (Cont.)

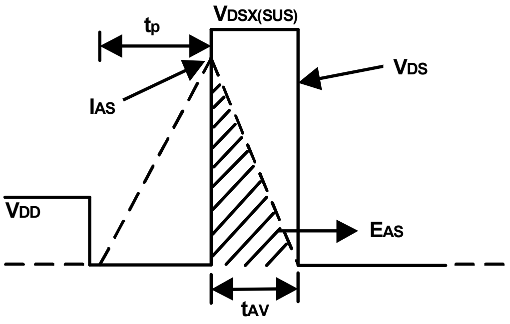




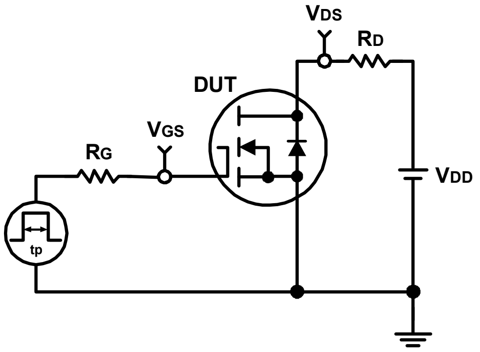


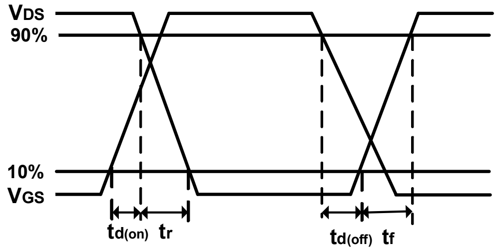
Avalanche Test Circuit and Waveforms

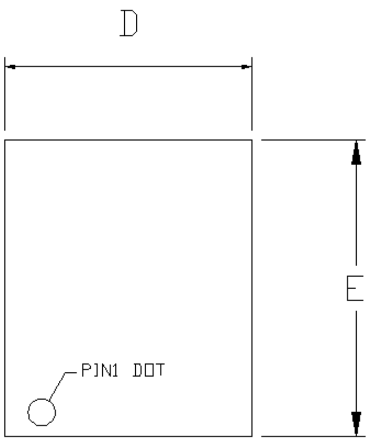




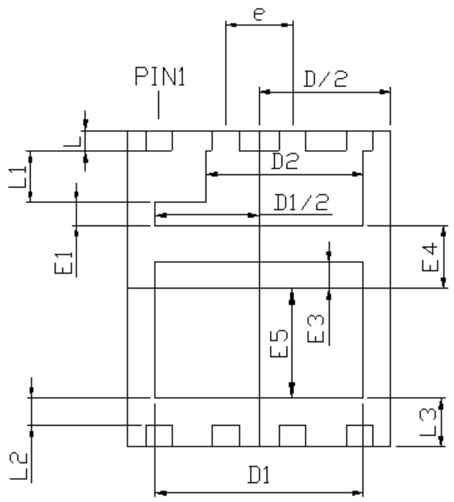
Switching Time Test Circuit and Waveforms



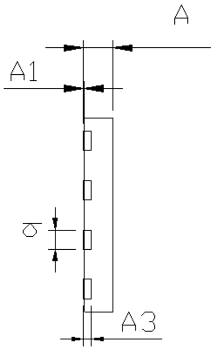




TOP VIEW



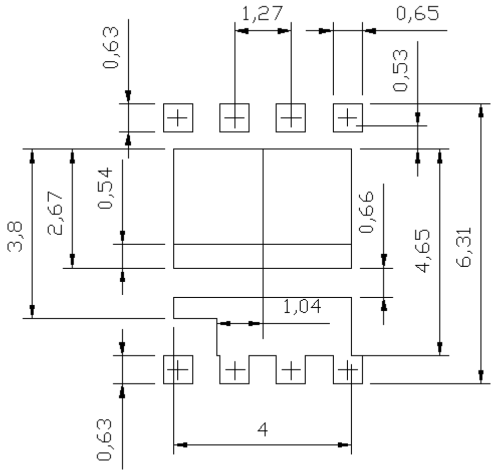
BOTTOM VIEW



SIDE VIEW

SYMBOLS	DFN5x6D-8_EP2			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	0.90	0.0276	0.0354
A1	0.00	0.05	0.000	0.002
A3	0.15	0.25	0.006	0.010
b	0.45	0.55	0.018	0.022
D	4.90	5.10	0.193	0.201
D1	3.80	4.05	0.078	0.088
D2	2.85	3.13	0.110	0.123
E	5.90	6.10	0.232	0.240
E1	0.28	0.58	0.011	0.023
E2	2.53	2.63	0.100	0.104
E3	0.35	0.60	0.014	0.024
E4	1.05	1.30	0.041	0.051
E5	1.93	2.18	0.076	0.086
e	1.27 BSC		0.050 BSC	
L	0.30	0.50	0.012	0.020
L1	0.92	1.02	0.036	0.040
L2	0.47	0.57	0.018	0.022
L3	0.87	0.97	0.034	0.038

RECOMMENDED LAND PATTERN



UNIT: mm