

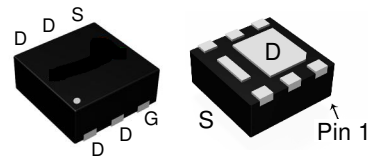
Features

- -20V/-9A,
 $R_{DS(ON)} = 9\text{ m}\Omega(\text{typ.}) @ V_{GS} = -4.5\text{V}$
 $R_{DS(ON)} = 12\text{ m}\Omega(\text{typ.}) @ V_{GS} = -2.5\text{V}$
 $R_{DS(ON)} = 20\text{ m}\Omega(\text{typ.}) @ V_{GS} = -1.8\text{V}$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

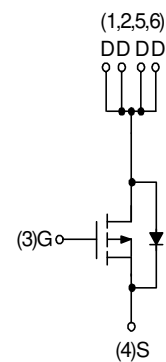
Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Pin Description



DFN2x2-6



P-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		± 12	
I_D^a	Continuous Drain Current ($V_{GS} = -4.5\text{V}$)	$T_A = 25^{\circ}\text{C}$	-9	A
		$T_A = 70^{\circ}\text{C}$	-6.75	
I_{DM}^a	Pulsed Drain Current ($V_{GS} = -4.5\text{V}$)		-27	
I_S^a	Diode Continuous Forward Current		-9	
T_J	Maximum Junction Temperature		150	$^{\circ}\text{C}$
I_{AS}^b	Avalanche Current, Single pulse	$L = 0.1\text{mH}$	-18	A
E_{AS}^b	Avalanche Energy, Single pulse	$L = 0.1\text{mH}$	16	mJ
T_{STG}	Storage Temperature Range		-55 to 150	$^{\circ}\text{C}$
P_D^a	Maximum Power Dissipation	$T_A = 25^{\circ}\text{C}$	2.5	W
		$T_A = 70^{\circ}\text{C}$	1.6	
$R_{\theta JA}^a$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	50	$^{\circ}\text{C/W}$
		Steady State	80	

Note * : Package limited.

Note a : Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$.

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

Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

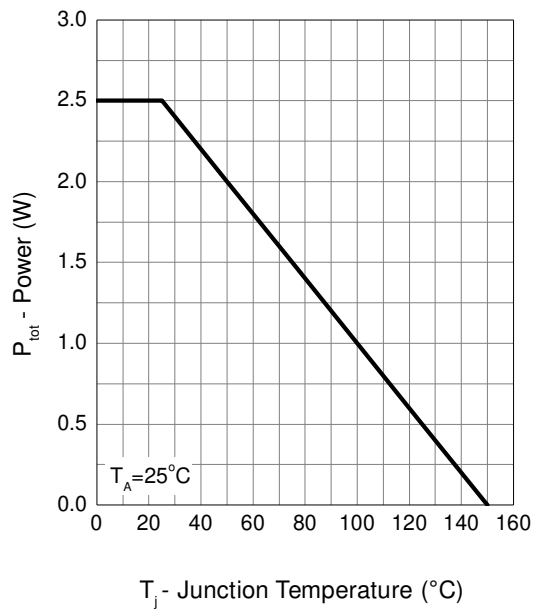
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V T _J =85°C	-	-	-1 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-	-1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-9.9A	-	9	12	mΩ
		V _{GS} =-2.5V, I _{DS} =-6.3A	-	12	15	
		V _{GS} =-1.8V, I _{DS} =-2A	-	20	25	
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1	V
t _{rr} ^d	Reverse Recovery Time	I _{SD} =-9.9A, dI _{SD} /dt=100A/μs	-	34	-	ns
Q _{rr} ^d	Reverse Recovery Charge		-	15	-	nC
Dynamic Characteristics ^d						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz	-	1608	-	pF
C _{oss}	Output Capacitance		-	294	-	
C _{rss}	Reverse Transfer Capacitance		-	257	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =10Ω, I _{DS} =-1A, V _{GEN} =-4.5V, R _G =6Ω	-	8	-	ns
t _r	Turn-on Rise Time		-	13	-	
t _{d(OFF)}	Turn-off Delay Time		-	25	-	
t _f	Turn-off Fall Time		-	170	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =-10V, V _{GS} =-4.5V, I _{DS} =-9.9A	-	20	-	nC
Q _{gs}	Gate-Source Charge		-	0.8	-	
Q _{gd}	Gate-Drain Charge		-	7.6	-	

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

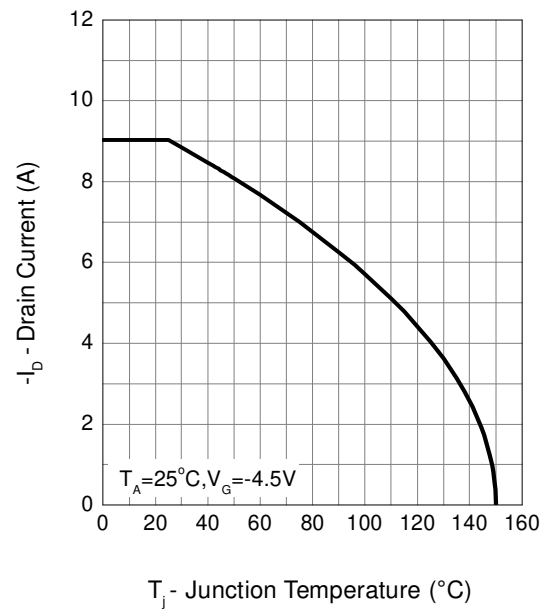
Note d : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

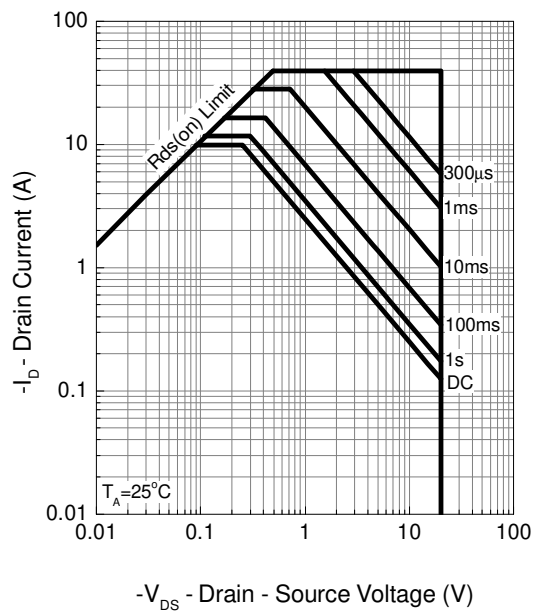
Power Dissipation



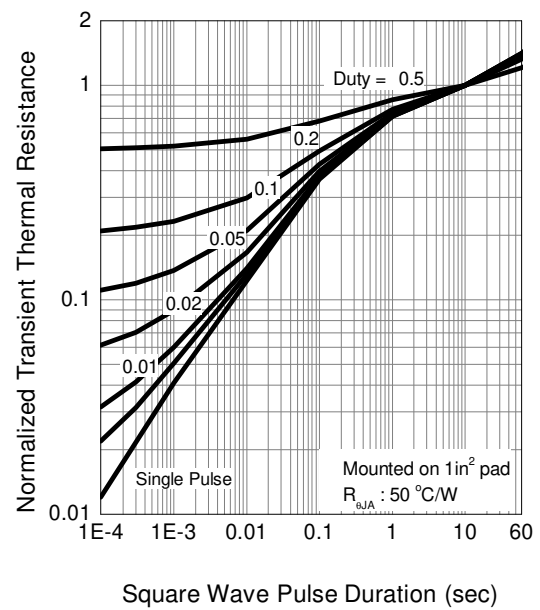
Drain Current



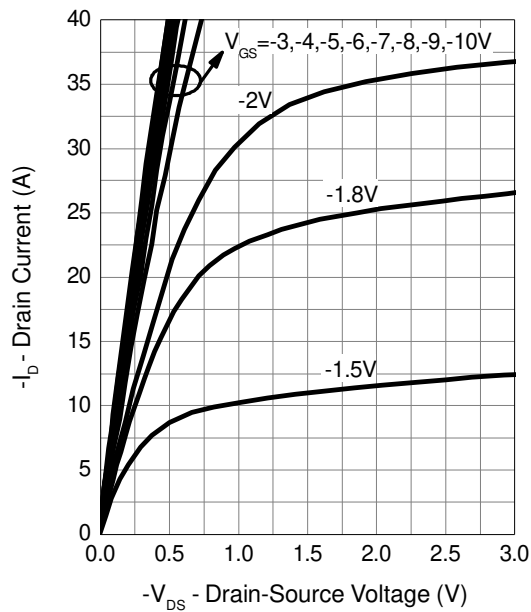
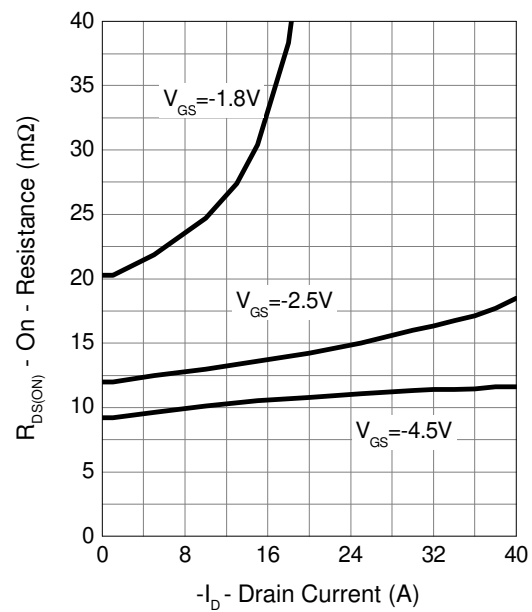
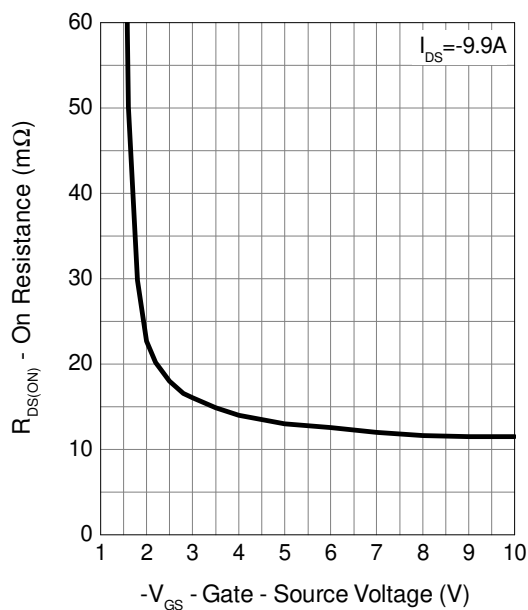
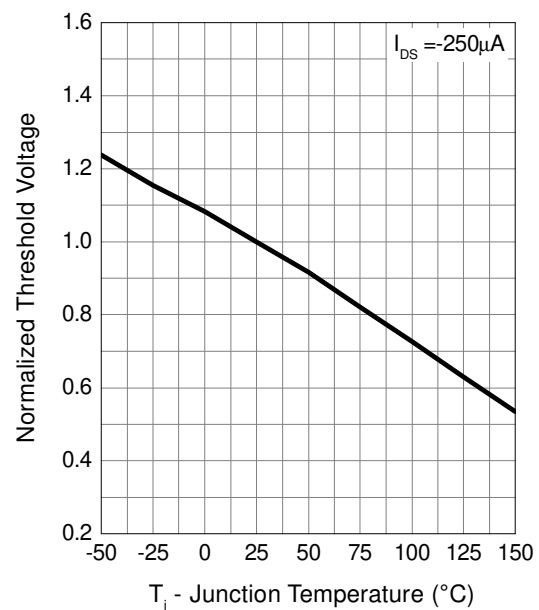
Safe Operation Area



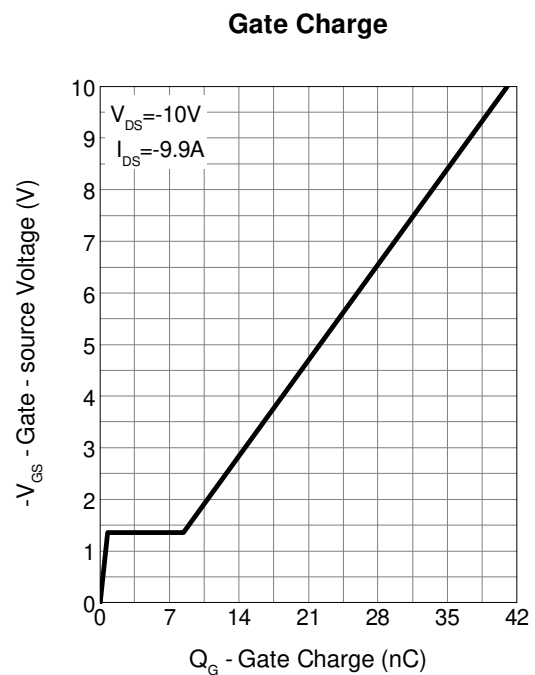
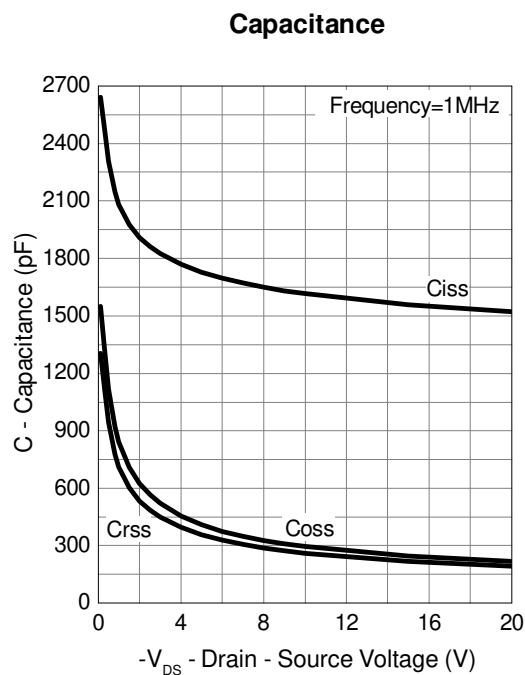
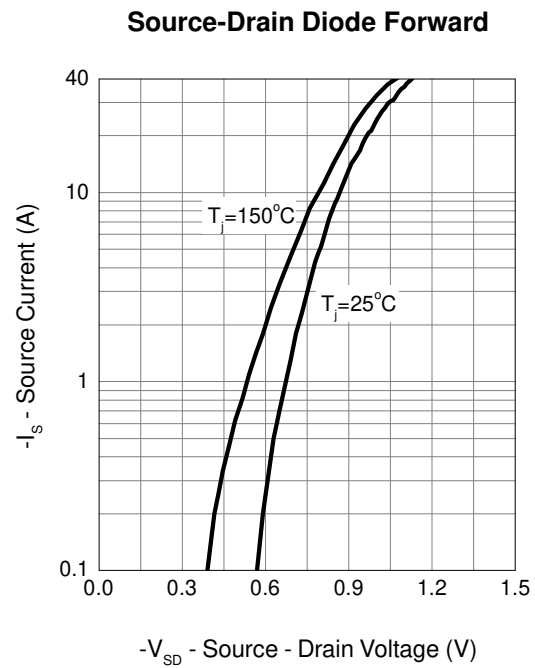
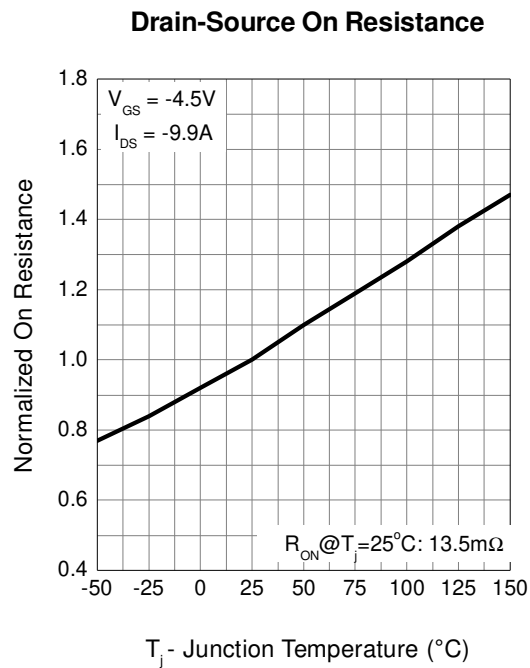
Thermal Transient Impedance



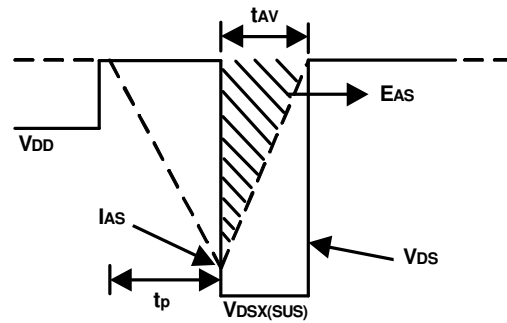
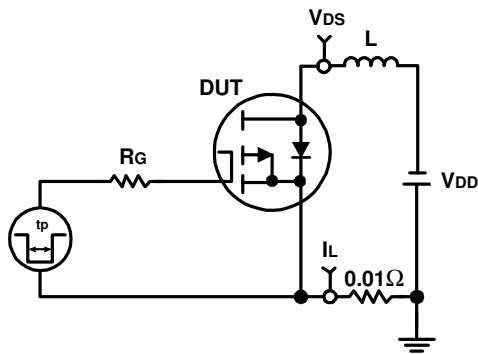
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


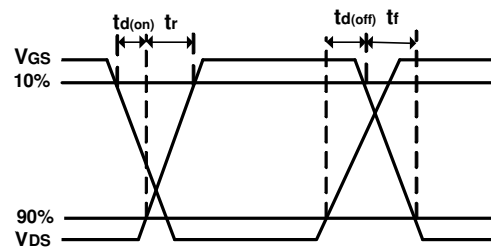
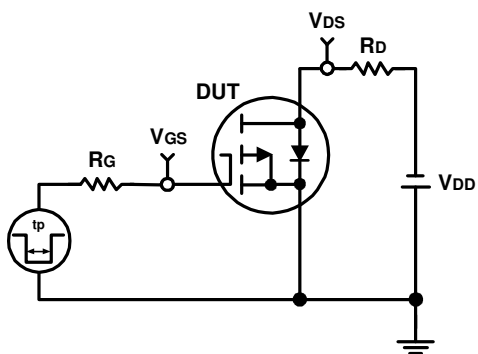
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

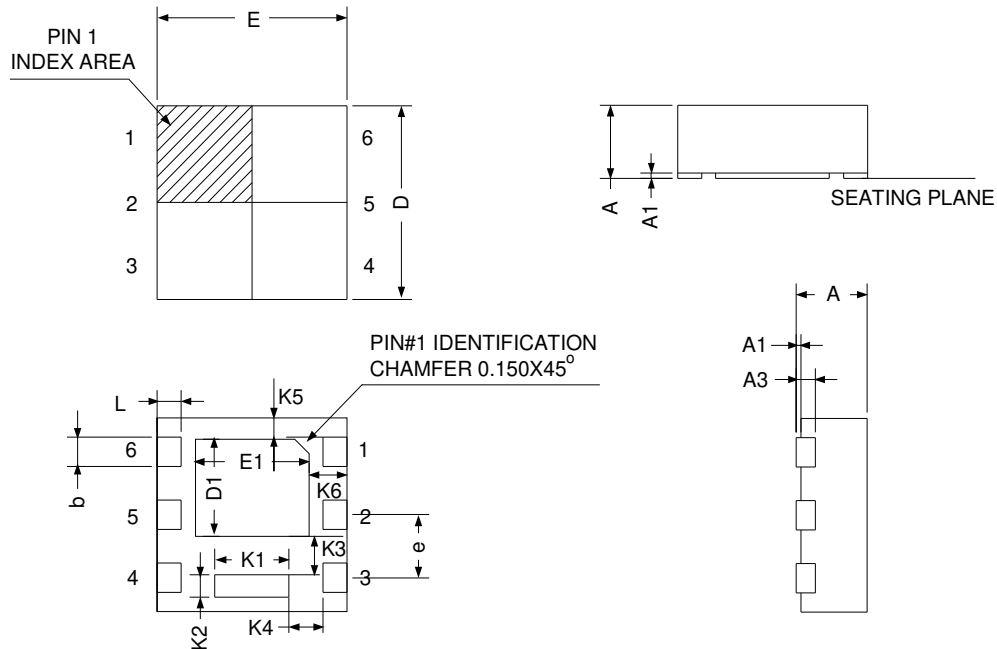


Switching Time Test Circuit and Waveforms



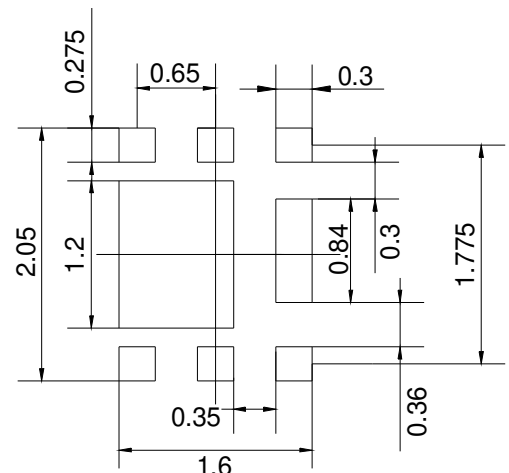
Package Information

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
E	1.90	2.10	0.075	0.083
D1	0.90	1.10	0.035	0.043
E1	0.90	1.10	0.035	0.043
e	0.65 BSC		0.026 BSC	
L	0.20	0.30	0.008	0.012
K1	0.65	0.85	0.026	0.033
K2	0.20	-	0.008	-
K3	0.20	-	0.008	-
K4	0.32	-	0.013	-
K5	0.20	0.26	0.008	0.010
K6	0.45	0.55	0.018	0.022

RECOMMENDED LAND PATTERN



UNIT: mm