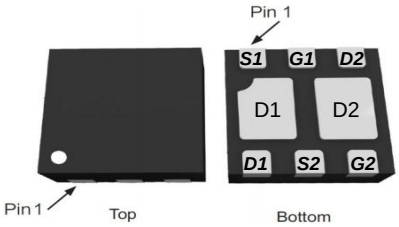
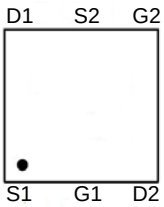
Features

- N-Channel: 18V, 6A
  $R_{DS(ON)}$ Typ= 13mΩ @ V_{GS} = 4.5V
  $R_{DS(ON)}$ Typ= 16mΩ @ V_{GS} = 2.5V
- P-Channel: -18V, -6A
  $R_{DS(ON)}$ Typ= 25mΩ @ V_{GS} = -4.5V
  $R_{DS(ON)}$ Typ= 32mΩ @ V_{GS} = -2.5V
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free

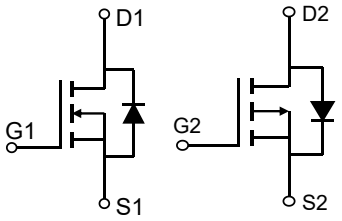


DFN 2x2 Package



Applications

- Battery Protection
- Load Switch
- Power Management



n-channel **p-channel**

Absolute Maximum Ratings (@ T_J = 25°C unless otherwise specified)

Symbol	Parameter		N-Channel Value	P-Channel Value	Units
V_{DS}	Drain-to-Source Voltage		18	-18	V
V_{GS}	Gate-to-Source Voltage		±12	±12	V
I_D	Continuous Drain Current	T_A = 25°C	6	-6	A
		T_A = 100°C	3.6	-3.6	
I_{DM}	Pulsed Drain Current (1)		24	-24	A
P_D	Power Dissipation	T_A = 25°C	2.1	2.5	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(2)		60	50	°C/W
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150		°C

N-Channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = 250μA, V_{GS} = 0V	18	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V	-	-	1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	0.5	0.75	1.1	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = 4.5V, I_D = 3A	-	13	16	mΩ
		V_{GS} = 2.5V, I_D = 2A	-	16	21	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz	-	671	-	pF
C_{oss}	Output Capacitance		-	90	-	pF
C_{rss}	Reverse Transfer Capacitance		-	76	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to 4.5V, V_{DS} = 10V, I_D = 2A	-	6	-	nC
Q_{gs}	Gate Source Charge		-	1	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = 4.5V, V_{DD} = 10V, I_D= 2A, R_{GEN} = 3Ω	-	4	-	ns
t_r	Turn-On Rise Time		-	13	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	65	-	ns
t_f	Turn-Off Fall Time		-	33	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	6	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	24	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 4A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F = 5A, di/dt = 100A/us	-	23	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	17	-	nC

P-Channel Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	I_D = -250μA, V_{GS} = 0V	-18	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -20V, V_{GS} = 0V	-	-	-1.0	μA
I_{GSS}	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±12V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	-0.3	-0.55	-1.0	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance(3)	V_{GS} = -4.5V, I_D = -3A	-	25	29	mΩ
		V_{GS} = -2.5V, I_D = -2A	-	32	34	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = -10V, f = 1MHz	-	677	-	pF
C_{oss}	Output Capacitance		-	96	-	pF
C_{rss}	Reverse Transfer Capacitance		-	81	-	pF
Q_g	Total Gate Charge	V_{GS} = 0 to -4.5V, V_{DS} = -10V, I_D = -3A	-	4.3	-	nC
Q_{gs}	Gate Source Charge		-	0.8	-	nC
Q_{gd}	Gate Drain("Miller") Charge		-	1.1	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On DelayTime	V_{GS} = -4.5V, V_{DD} = -10V, I_D= -3A, R_{GEN} = 3Ω	-	12	-	ns
t_r	Turn-On Rise Time		-	54	-	ns
$t_{d(off)}$	Turn-Off DelayTime		-	15	-	ns
t_f	Turn-Off Fall Time		-	9	-	ns
Drain-Source Diode Characteristics and Max Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-6	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-24	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = -5A	-	-	-1.2	V
trr	Body Diode Reverse Recovery Time	I_F = -3.8A, di/dt = 100A/us	-	4	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	24.5	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. $R_{\theta JA}$ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

Test Circuit

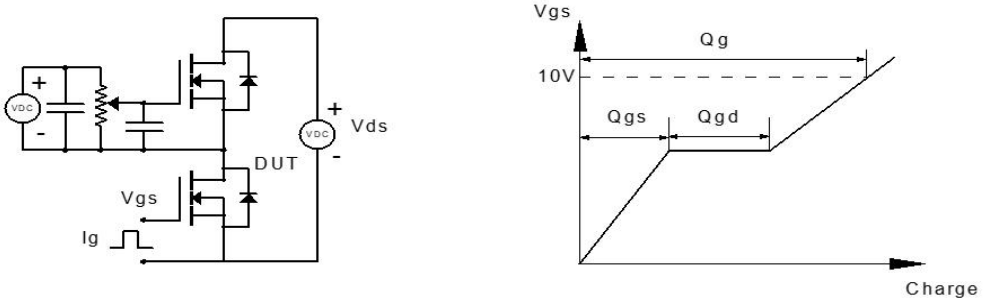


Figure 1: Gate Charge Test Circuit & Waveform

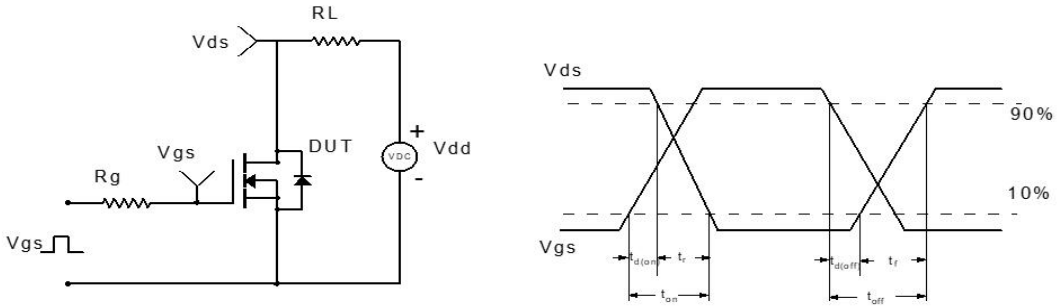


Figure 2: Resistive Switching Test Circuit & Waveform

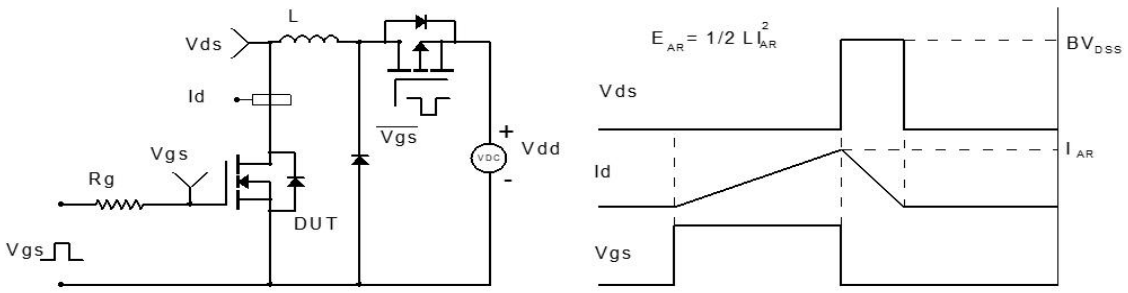


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

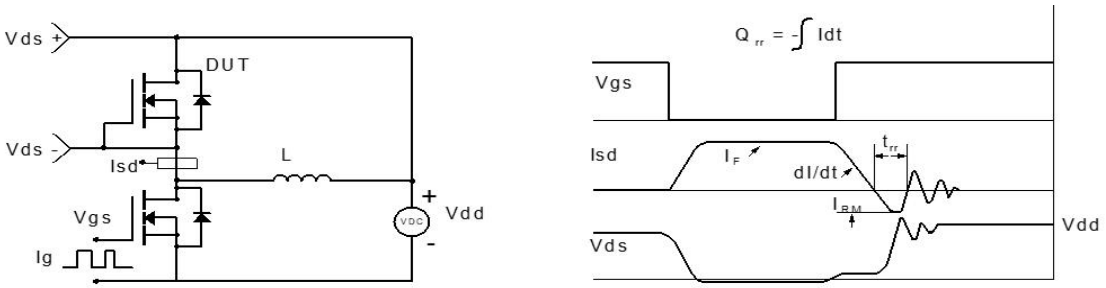
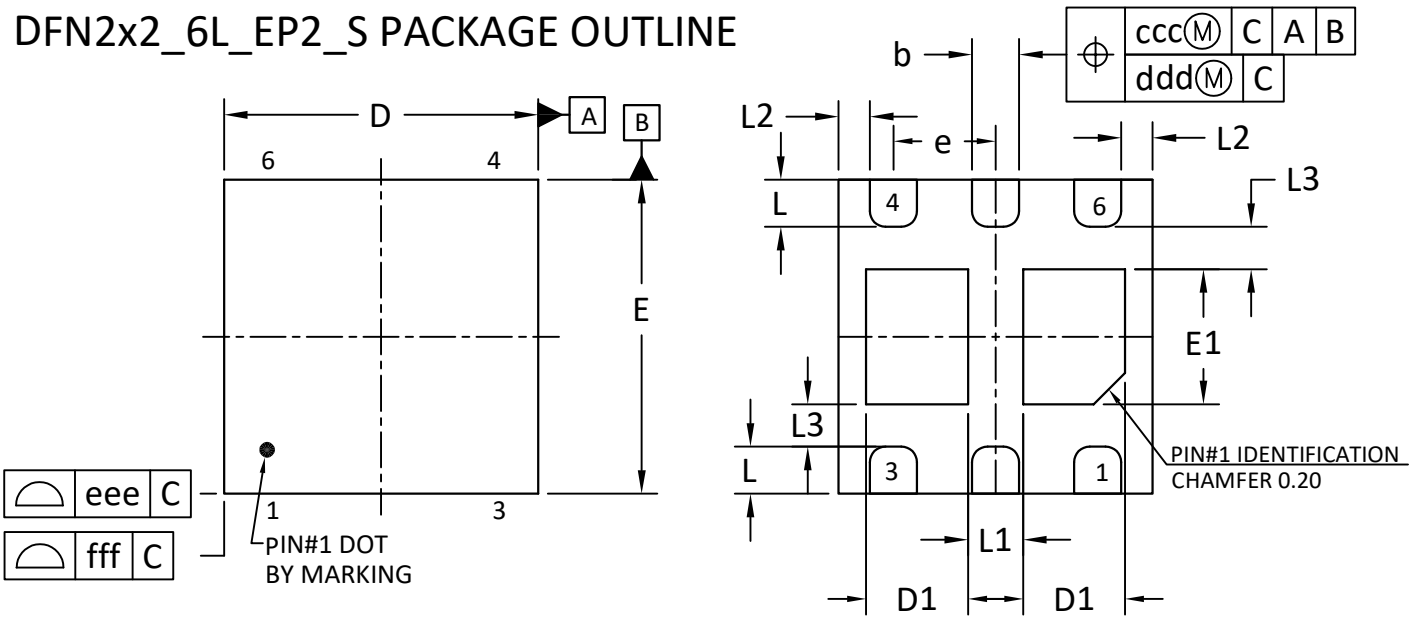


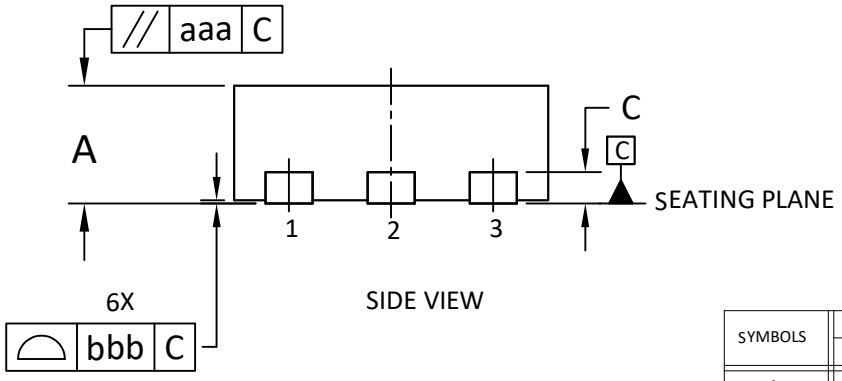
Figure 4: Diode Recovery Test Circuit & Waveform

DFN2x2_6L_EP2_S PACKAGE OUTLINE



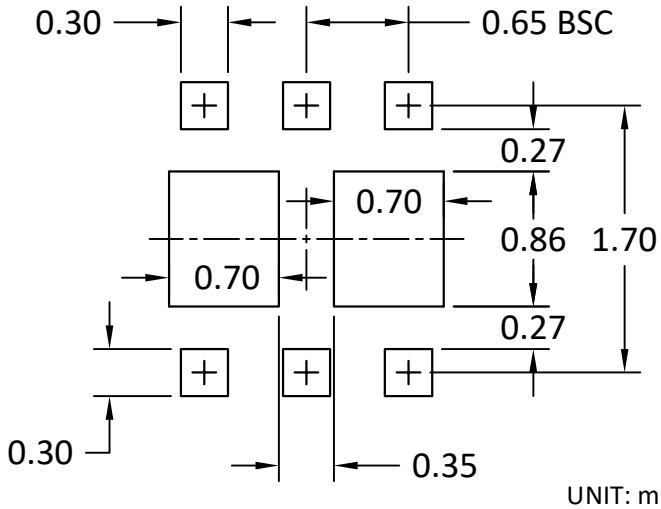
TOP VIEW

BOTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.60	0.65	0.70	0.023	0.026	0.028
b	0.30	0.35	0.40	0.012	0.014	0.016
c		0.20 Ref.			0.008 Ref.	
D	1.90	2.00	2.10	0.075	0.079	0.083
D1	0.600	0.650	0.700	0.023	0.026	0.028
E	1.90	2.00	2.10	0.075	0.079	0.083
E1	0.75	0.80	0.85	0.030	0.031	0.033
e		0.65 BSC			0.026 BSC	
L	0.25	0.30	0.35	0.010	0.012	0.014
L1	0.320	0.350	0.380	0.013	0.014	0.015
L2	0.170	0.200	0.230	0.007	0.008	0.009
L3	0.240	0.270	0.300	0.009	0.011	0.012
aaa	---	0.100	---	---	0.004	---
bbb	---	0.080	---	---	0.003	---
ccc	---	0.100	---	---	0.004	---
ddd	---	0.050	---	---	0.002	---
eee	---	0.150	---	---	0.006	---
fff	---	0.150	---	---	0.006	---

NOTE
1. CONTROLLING DIMENSION IS MILLIMETER.
   CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
2. THIS PACKAGE WAS QUALIFIED USING IR REFLOW PROCESS (JEDEC STANDARD). FOR USAGE IN OTHER SOLDERING PROCESSES, PLEASE CONTACT LOCAL AOS REPRESENTATIVES.