

**RoHS Compliant Product**  
**A suffix of "-C" specifies halogen and lead-free**

## DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell Density trench process to provide low  $R_{DS(on)}$  and to assure minimal power loss and heat dissipation.

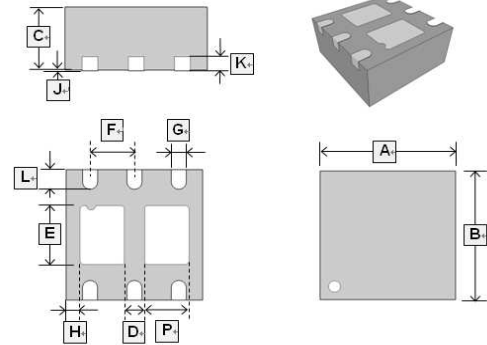
## FEATURES

- Low  $R_{DS(on)}$  provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe DFN2X2\_6L saves board space.
- Fast switching speed.
- High performance trench technology.

## APPLICATION

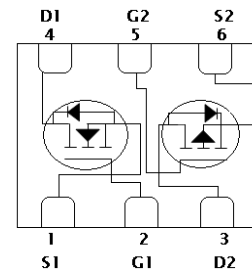
DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

### DFN2x2-6L



REF.	Millimeter			REF.	Millimeter		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	2.00 BSC.			G	0.23	0.30	0.38
B	2.00 BSC.			H	0.65BSC		
C	0.675	0.75	0.80	J	0	-	0.05
D	0.25	0.30	0.35	K	0.15	0.20	0.25
E	0.81	0.86	0.91	L	0.25	0.30	0.35
F	0.65BSC			P	0.60	0.65	0.70

### TOP VIEW



## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings		Unit	
		N-Channel	P-Channel		
Drain-Source Voltage	$V_{DS}$	20	-20	V	
Gate-Source Voltage	$V_{GS}$	$\pm 8$	$\pm 8$	V	
Continuous Drain Current <sup>1</sup>	$I_D$	$T_A=25^\circ\text{C}$	4.5	-4.5	A
		$T_A=70^\circ\text{C}$	4.5	-4.5	
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	8	-8	A	
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	4.5	-4.5	A	
Power Dissipation <sup>1</sup>	$P_D$	$T_A=25^\circ\text{C}$	6.5		W
		$T_A=70^\circ\text{C}$	5		
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 ~ +150		$^\circ\text{C}$	
Thermal Resistance Rating					
Parameter	Symbol	Typ	Max	Unit	
Maximum Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	$t \leq 5 \text{ sec}$	52	65	$^\circ\text{C} / \text{W}$
		Steady State	12.5	16	

Notes:

1. Surface Mounted on 1" x 1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-Threshold Voltage	N-Ch	$V_{GS(th)}$	1	-	-	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
	P-Ch		-1	-	-		$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$
Gate-Body Leakage Current	N-Ch	$I_{GSS}$	-	-	100	uA	$V_{DS}=0, V_{GS}=8\text{V}$
	P-Ch		-	-	-100		$V_{DS}=0, V_{GS}=-8\text{V}$
Zero Gate Voltage Drain Current	N-Ch	$I_{DSS}$	-	-	1	uA	$V_{DS}=16\text{V}, V_{GS}=0$
	P-Ch		-	-	-1		$V_{DS}=-16\text{V}, V_{GS}=0$
	N-Ch		-	-	10		$V_{DS}=16\text{V}, V_{GS}=0, T_J=55^\circ\text{C}$
	P-Ch		-	-	-10		$V_{DS}=-16\text{V}, V_{GS}=0, T_J=55^\circ\text{C}$
On-State Drain Current <sup>1</sup>	N-Ch	$I_{D(on)}$	5	-	-	A	$V_{DS}=5\text{V}, V_{GS}=4.5\text{V}$
	P-Ch		-5	-	-		$V_{DS}=-5\text{V}, V_{GS}=-4.5\text{V}$
Drain-Source On-Resistance <sup>1</sup>	N-Ch	$R_{DS(ON)}$	-	-	58	m $\Omega$	$V_{GS}=4.5\text{V}, I_D=1\text{A}$
	P-Ch		-	-	112		$V_{GS}=-4.5\text{V}, I_D=1\text{A}$
	N-Ch		-	-	82		$V_{GS}=2.5\text{V}, I_D=1\text{A}$
	P-Ch		-	-	172		$V_{GS}=-2.5\text{V}, I_D=-1\text{A}$
Forward Transconductance <sup>1</sup>	N-Ch	$g_{fs}$	-	10	-	S	$V_{DS}=5\text{V}, I_D=1\text{A}$
	P-Ch		-	5	-		$V_{DS}=-5\text{V}, I_D=1\text{A}$
Diode Forward Voltage <sup>1</sup>	N-Ch	$V_{SD}$	-	0.80	-	S	$I_S=1.05\text{A}, V_{GS}=0$
	P-Ch		-	-0.83	-		$I_S=-1.05\text{A}, V_{GS}=0$
<b>Dynamic <sup>2</sup></b>							
Total Gate Charge	N-Ch	$Q_g$	-	7.5	-	nC	N-Channel $V_{DS}=15\text{V}, V_{GS}=4.5\text{V}, I_D=2.7\text{A}$
	P-Ch		-	3.8	-		
Gate-Source Charge	N-Ch	$Q_{gs}$	-	0.6	-	nC	P-Channel $V_{DS}=-15\text{V}, V_{GS}=-4.5\text{V}, I_D=-3.1\text{A}$
	P-Ch		-	0.6	-		
Gate-Drain Charge	N-Ch	$Q_{gd}$	-	1.0	-	nC	P-Channel $V_{DS}=-15\text{V}, V_{GS}=-4.5\text{V}, I_D=-3.1\text{A}$
	P-Ch		-	1.5	-		
Turn-on Delay Time	N-Ch	$T_{d(on)}$	-	5	-	nS	N-Channel $V_{DD}=15\text{V}, R_{GEN}=15\Omega, V_{GS}=4.5\text{V}, I_D=1\text{A}$
	P-Ch		-	5	-		
Rise Time	N-Ch	$T_r$	-	12	-	nS	P-Channel $V_{DD}=-15\text{V}, R_{GEN}=15\Omega, V_{GS}=-4.5\text{V}, I_D=-1\text{A}$
	P-Ch		-	15	-		
Turn-off Delay Time	N-Ch	$T_{d(off)}$	-	13	-	nS	P-Channel $V_{DD}=-15\text{V}, R_{GEN}=15\Omega, V_{GS}=-4.5\text{V}, I_D=-1\text{A}$
	P-Ch		-	20	-		
Fall Time	N-Ch	$T_f$	-	7	-	nS	P-Channel $V_{DD}=-15\text{V}, R_{GEN}=15\Omega, V_{GS}=-4.5\text{V}, I_D=-1\text{A}$
	P-Ch		-	20	-		

Notes:

1. Pulse test:  $PW \leq 300\mu\text{s}$  duty cycle  $\leq 2\%$ .
2. Guaranteed by design, not subject to production testing.