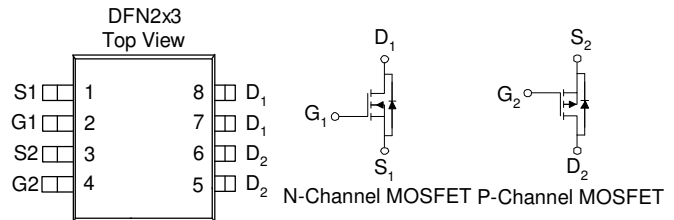


**N & P-Channel 20-V (D-S) MOSFET**

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $r_{DS(on)}$  and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

- Low  $r_{DS(on)}$  provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe DFN2X3 saves board space
- Fast switching speed
- High performance trench technology

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
20	0.058 @ $V_{GS} = 4.5V$	5
	0.077 @ $V_{GS} = 2.5V$	4.3
-20	0.064 @ $V_{GS} = -4.5V$	-4.7
	0.085 @ $V_{GS} = -2.5V$	-4.1



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)				
Parameter	Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage	$V_{DS}$	20	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	$\pm 8$	
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A=25^\circ C$	5	A
		$T_A=70^\circ C$	4.1	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	8	-8	
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	4.5	-4.5	A
Power Dissipation <sup>a</sup>	$P_D$	$T_A=25^\circ C$	2.1	W
		$T_A=70^\circ C$	1.3	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ C$

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Maximum	Units	
Maximum Junction-to-Ambient <sup>a</sup>	$t \leq 10$ sec	62.5	$^\circ C/W$	
	Steady State	80	$^\circ C/W$	

Notes

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

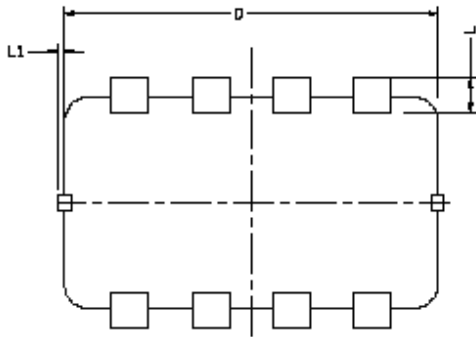
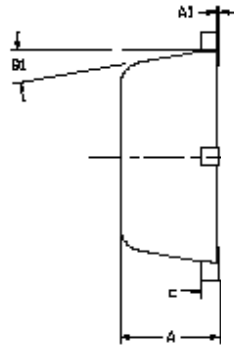
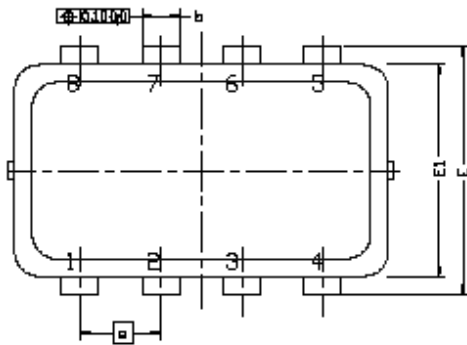
SPECIFICATIONS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Conditions	Limits				Unit
			Ch	Min	Typ	Max	
<b>Static</b>							
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 uA	N	1			V
		V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250 uA	P	-1			
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = 8 V	N			100	μA
		V <sub>DS</sub> = 0 V, V <sub>GS</sub> = -8 V	P			-100	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V	N			1	μA
		V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V	P			-1	
		V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C	N			10	μA
		V <sub>DS</sub> = -16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C	P			-10	
On-State Drain Current <sup>A</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 4.5 V	N	5			A
		V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -4.5 V	P	-5			
Drain-Source On-Resistance <sup>A</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 1 A	N			0.058	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = 1 A	P			0.077	
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1 A	N			0.064	
		V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -1 A	P			0.085	
Forward Transconductance <sup>A</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5 V, I <sub>D</sub> = 1 A	N		10		S
		V <sub>DS</sub> = -5 V, I <sub>D</sub> = 1 A	P		5		
Diode Forward Voltage <sup>A</sup>	V <sub>SD</sub>	I <sub>S</sub> = 1 A, V <sub>GS</sub> = 0 V	N		0.80		S
		I <sub>S</sub> = -1 A, V <sub>GS</sub> = 0 V	P		-0.83		
<b>Dynamic<sup>b</sup></b>							
Total Gate Charge	Q <sub>g</sub>	N-Channel V <sub>DS</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A P-Channel V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1A	N		2		nC
Gate-Source Charge	Q <sub>gs</sub>		P		7		
Gate-Drain Charge	Q <sub>gd</sub>		N		0.4		
Turn-On Delay Time	t <sub>d(on)</sub>	N-Chanceel V <sub>DD</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A , R <sub>GEN</sub> =15Ω, P-Channel V <sub>DD</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-1A R <sub>GEN</sub> =15Ω	N		0.7		nS
			P		2		
Rise Time	t <sub>r</sub>		N		6		
			P		10		
Turn-Off Delay Time	t <sub>d(off)</sub>		N		9		
			P		1		
Fall-Time	t <sub>f</sub>	N		5			
		P		11			
			N		16		
			P		12		

Notes

- a. Pulse test: PW <= 300us duty cycle <= 2%.
- b. Guaranteed by design, not subject to production testing.

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# Package Information



DIM.	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.700	0.80	0.900	0.0276	0.0315	0.0354
A1	0.00	---	0.03	0.000	---	0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.08	0.152	0.25	0.003	0.006	0.010
D	3.00 BSC			0.118 BSC		
E	2.00 BSC			0.079 BSC		
E1	1.70 BSC			0.067 BSC		
e	0.65 BSC			0.026 BSC		
L	0.20	0.275	0.400	0.008	0.011	0.0157
L1	0	---	0.100	0	---	0.004
Ø	0°	10°	12°	0°	10°	12°