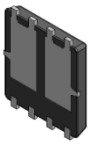
P & N-Channel 40-V (D-S) MOSFET

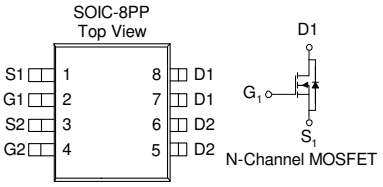
These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $r_{DS(on)}$ and to ensure minimal power loss and heat dissipation. Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, cellular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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ m(Ω)	I_D (A)
40	46 @ V_{GS} = 4.5V	7.2
	36 @ V_{GS} = 10V	8.1
-40	55 @ V_{GS} = -4.5V	-6.6
	39 @ V_{GS} = -10V	-7.8

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper leadframe DFN5x6 saves board space
- Fast switching speed
- High performance trench technology



Pb-free
RoHS COMPLIANT
HALOGEN FREE



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C UNLESS OTHERWISE NOTED)					
Parameter		Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage		V_{DS}	40	-40	V
Gate-Source Voltage		V_{GS}	20	-20	
Continuous Drain Current[a]	T_A=25°C	I_D	8.1	-7.8	A
	T_A=70°C		6.6	-6.4	
Pulsed Drain Current[b]		I_{DM}	±20	±20	
Continuous Source Current (Diode Conduction)[a]		I_S	2.9	-2.9	A
Power Dissipation[a]	T_A=25°C	P_D	3.5	3.5	W
	T_A=70°C		2.2	2.2	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	-55 to 150	°C

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Maximum	Units
Maximum Junction-to-Ambient[a]	t <= 10 sec	$R_{\theta JA}$	35	°C/W
	Steady State		85	°C/W

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

b. Pulse width limited by maximum junction temperature

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

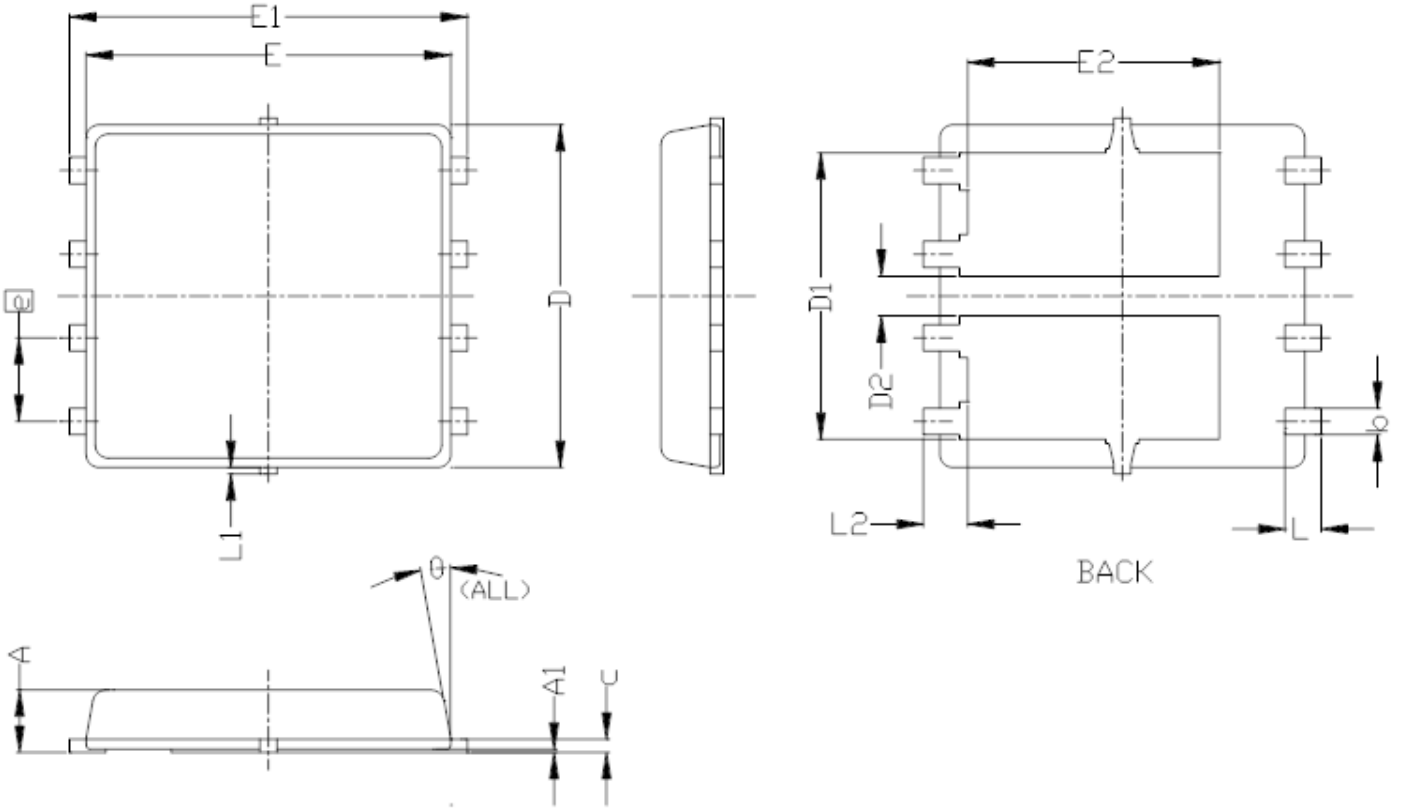
Parameter	Symbol	Test Conditions	Limits Ch	Min	Typ	Max	Unit
Static							
Gate-Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250 uA	N	1			V
		V_{GS} = V_{DS}, I_D = -250 uA	P	-1			
Gate-Body Leakage	I_{GSS}	V_{GS} = -20 V, V_{DS} = 0 V	P			±100	nA
		V_{GS} = 20 V, V_{DS} = 0 V	N			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -32 V, V_{GS} = 0 V	P			-1	uA
		V_{DS} = 32 V, V_{GS} = 0 V	N			1	
On-State Drain Current[A]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	N	20			A
		V_{DS} = -5 V, V_{GS} = -10 V	P	-20			
Drain-Source On-Resistance[A]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 1 A	N			36	mΩ
		V_{GS} = 4.5 V, I_D = 1 A				46	
		V_{GS} = -10 V, I_D = -1 A	P			39	
		V_{GS} = -4.5 V, I_D = -1 A				59	
Forward Tranconductance[A]	g_{fs}	V_{DS} = 15 V, I_D = 1 A	N		40		S
		V_{DS} = -15 V, I_D = -1 A	P		31		
Dynamic							
Total Gate Charge	Q_g	N-Channel V_{DS}=15V, V_{GS}=4.5V, I_D=1A P-Channel V_{DS}=-15V, V_{GS}=-4.5V, I_D=-1A	N		10		nC
			P		10		
Gate-Source Charge	Q_{gs}		N		3		
			P		4		
Gate-Drain Charge	Q_{gd}		N		3		
			P		5		
Turn-On Delay Time	$t_{d(on)}$	N-Chaneel V_{DD}=15V, V_{GS}=10V, I_D=1A , R_{GEN}=25Ω, P-Channel V_{DD}=-15V, V_{GS}=-10V, I_D=-1A R_{GEN}=15Ω	N		3		nS
			P		3		
Rise Time	t_r		N		3		
			P		3		
Turn-Off Delay Time	$t_{d(off)}$		N		30		
			P		40		
Fall-Time	t_f		N		10		
			P		10		

Notes

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

Package Information



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	——	0.05	0.000	——	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.20 BSC			0.205 BSC		
D1	4.35 BSC			0.171 BSC		
E	5.55 BSC			0.219 BSC		
E1	6.05 BSC			0.238 BSC		
E2	3.625 BSC			0.143 BSC		
E3	1.275 BSC			0.050 BSC		
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	——	0.15	0	——	0.006
L2	0.68 REF			0.027 REF		
θ	0°	——	10°	0°	——	10°