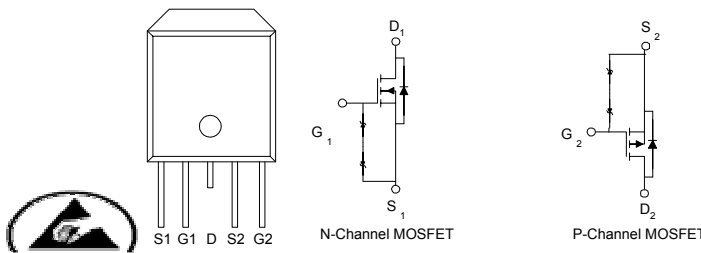


### P & N-Channel 30-V (D-S) MOSFET

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.

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ m( $\Omega$ )	$I_D$ (A)
30	45 @ $V_{GS} = 4.5V$	29
	35 @ $V_{GS} = 10V$	36
-30	33 @ $V_{GS} = -4.5V$	-32
	23 @ $V_{GS} = -10V$	39

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



ESD Protected  
2000V

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ C$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	N-Channel	P-Channel	Units
Drain-Source Voltage		$V_{DS}$	30	-30	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	$\pm 20$	
Continuous Drain Current <sup>a</sup>	$T_A = 25^\circ C$	$I_D$	36	-39	A
	$T_A = 70^\circ C$		30	-26	
Pulsed Drain Current <sup>b</sup>		$I_{DM}$	40	-40	
Continuous Source Current (Diode Conduction) <sup>a</sup>		$I_S$	30	-30	A
Power Dissipation <sup>a</sup>	$T_A = 25^\circ C$	$P_D$	50	50	W
Operating Junction and Storage Temperature Range		$T_j, T_{stg}$	-55 to 175		$^\circ C$

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Maximum	Units
Maximum Junction-to-Ambient <sup>a</sup>	$R_{\theta JA}$	50	$^\circ C/W$
Maximum Junction-to-Case	$R_{\theta JC}$	3.0	$^\circ C/W$

Notes

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

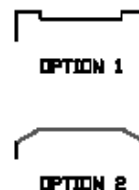
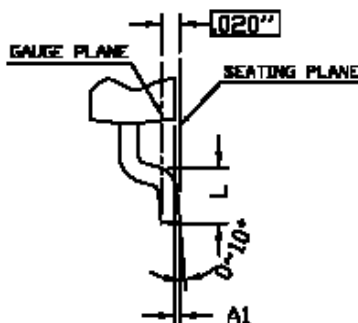
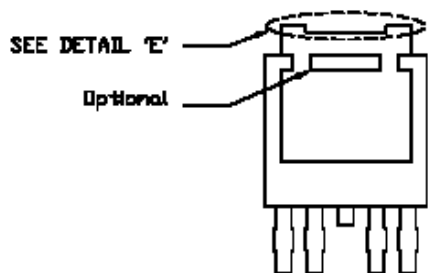
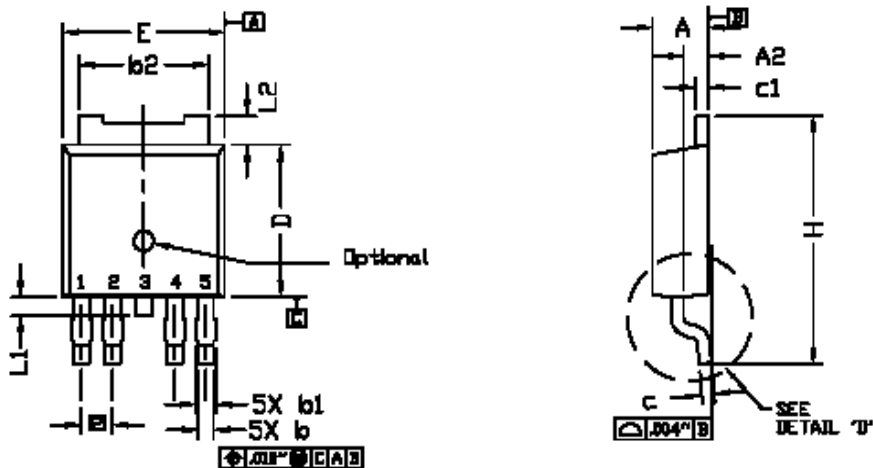
SPECIFICATIONS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Conditions	Limits				Unit
			Ch	Min	Typ	Max	
<b>Static</b>							
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250 uA	N	0.6			V
		V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250 uA	P	-0.6			
Gate-Body Leakage	I <sub>CSS</sub>	V <sub>GS</sub> = -20 V, V <sub>DS</sub> = 0 V	P			±100	nA
		V <sub>GS</sub> = 20 V, V <sub>DS</sub> = 0 V	N			±100	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -24 V, V <sub>GS</sub> = 0 V	P			-1	uA
		V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V	N			1	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	N	20			A
		V <sub>DS</sub> = -5 V, V <sub>GS</sub> = -10 V	P	-20			
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 6.9 A	N			35	mΩ
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 6 A				45	
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5.2 A	P			23	
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -4.2 A				33	
Forward Transconductance <sup>a</sup>	g <sub>s</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 6.9 A	N		25		S
		V <sub>DS</sub> = -15 V, I <sub>D</sub> = -5.2 A	P		10		
<b>Dynamic</b>							
Total Gate Charge	Q <sub>g</sub>	N-Channel V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =6.9A P-Channel V <sub>DS</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-5.2A	N		6.0		nC
			P		10		
Gate-Source Charge	Q <sub>gs</sub>		N		1.0		
			P		2.4		
Gate-Drain Charge	Q <sub>gd</sub>		N		1.5		
			P		3.9		
Turn-On Delay Time	t <sub>d(on)</sub>	N-Chaneel V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =1A , R <sub>GEN</sub> =6Ω P-Channel V <sub>DD</sub> =-15V, V <sub>GS</sub> =-10V, I <sub>D</sub> =-1A R <sub>GEN</sub> =6Ω	N		7.4		nS
			P		7.6		
Rise Time	t <sub>r</sub>		N		4		
			P		6.8		
Turn-Off Delay Time	t <sub>d(off)</sub>		N		22.2		
			P		33.6		
Fall-Time	t <sub>f</sub>		N		3.6		
			P		23.2		

Notes

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

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TO252\_4L PACKAGE OUTLINE



DETAIL 'D'

DETAIL 'E'

SYMBOL	DIMENSION IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	2.184	2.288	2.388	0.086	0.090	0.094
A1	0.000	—	0.127	0.000	—	0.005
A2	0.889	—	1.143	0.035	—	0.045
b	0.508	—	0.711	0.020	—	0.028
b1	0.584	—	0.787	0.023	—	0.031
b2	4.953	—	5.461	0.195	—	0.215
c	0.457	0.508	0.610	0.018	0.020	0.024
c1	0.457	—	0.610	0.018	—	0.024
D	5.969	6.096	6.223	0.235	0.240	0.245
E	6.350	6.604	6.731	0.250	0.260	0.265
e	1.270 BSC.			0.050 BSC.		
H	9.398	—	10.414	0.370	—	0.410
L	1.270	—	2.032	0.050	—	0.080
L1	—	—	1.016	—	—	0.040
L2	0.889	—	1.270	0.035	—	0.050

NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS. MOLD FLASH SHOULD BE LESS THAN 6 MIL.
2. DIMENSION L IS MEASURED IN GAUGE PLANE.
3. TOLERANCE 0.10 mm UNLESS OTHERWISE SPECIFIED.
4. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
5. REFER TO JEDEC TO-252 (AD).