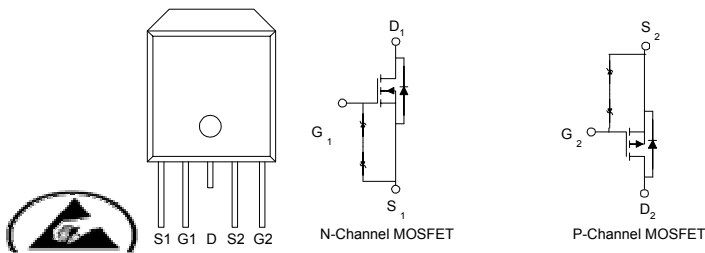


P & N-Channel 30-V (D-S) MOSFET

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.

- 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

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ m(Ω)	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



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}	± 20	± 20	
Continuous Drain Current ^a	$T_A = 25^\circ C$	I_D	36	-39	A
	$T_A = 70^\circ C$		30	-26	
Pulsed Drain Current ^b		I_{DM}	40	-40	
Continuous Source Current (Diode Conduction) ^a		I_S	30	-30	A
Power Dissipation ^a	$T_A = 25^\circ C$	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 ^a	$R_{\theta JA}$	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

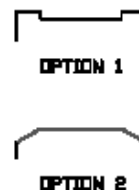
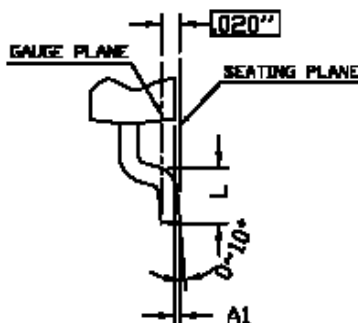
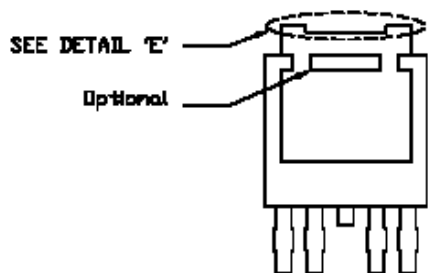
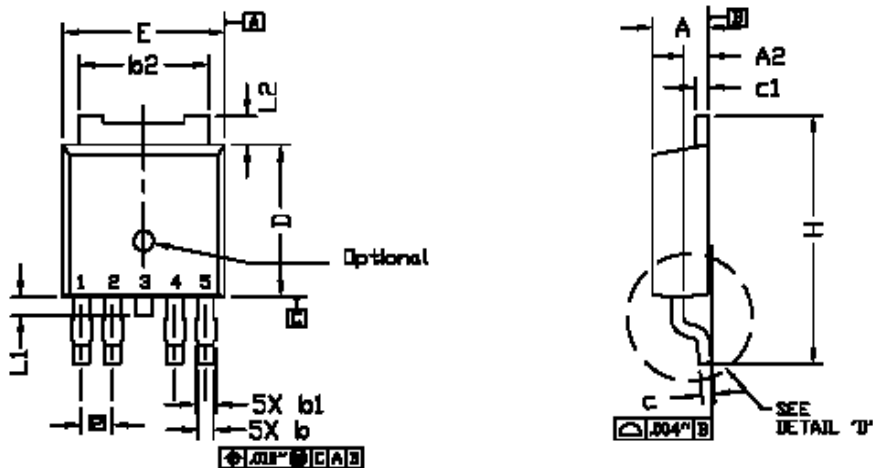
SPECIFICATIONS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Conditions	Limits				Unit
			Ch	Min	Typ	Max	
Static							
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250 \mu\text{A}$	N	0.6			V
		$V_{GS} = V_{DS}, I_D = -250 \mu\text{A}$	P	-0.6			
Gate-Body Leakage	I_{GSS}	$V_{GS} = -20 \text{ V}, V_{DS} = 0 \text{ V}$	P			± 100	nA
		$V_{GS} = 20 \text{ V}, V_{DS} = 0 \text{ V}$	N			± 100	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}$	P			-1	uA
		$V_{DS} = 24 \text{ V}, V_{GS} = 0 \text{ V}$	N			1	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	N	20			A
		$V_{DS} = -5 \text{ V}, V_{GS} = -10 \text{ V}$	P	-20			
Drain-Source On-Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 6.9 \text{ A}$	N			35	m Ω
		$V_{GS} = 4.5 \text{ V}, I_D = 6 \text{ A}$				45	
		$V_{GS} = -10 \text{ V}, I_D = -5.2 \text{ A}$	P			23	
		$V_{GS} = -4.5 \text{ V}, I_D = -4.2 \text{ A}$				33	
Forward Transconductance ^a	g_s	$V_{DS} = 15 \text{ V}, I_D = 6.9 \text{ A}$	N		25		S
		$V_{DS} = -15 \text{ V}, I_D = -5.2 \text{ A}$	P		10		
Dynamic							
Total Gate Charge	Q_g	N-Channel $V_{DS}=15\text{V}, V_{GS}=10\text{V}, I_D=6.9\text{A}$ P-Channel $V_{DS}=-15\text{V}, V_{GS}=-10\text{V}, I_D=-5.2\text{A}$	N		6.0		nC
			P		10		
Gate-Source Charge	Q_{gs}		N		1.0		
			P		2.4		
Gate-Drain Charge	Q_{gd}		N		1.5		
			P		3.9		
Turn-On Delay Time	$t_{d(on)}$	N-Chaneel $V_{DD}=15\text{V}, V_{GS}=10\text{V}, I_D=1\text{A}$, $R_{\theta EN}=6\Omega$ P-Channel $V_{DD}=-15\text{V}, V_{GS}=-10\text{V}, I_D=-1\text{A}$ $R_{\theta GEN}=6\Omega$	N		7.4		nS
			P		7.6		
Rise Time	t_r		N		4		
			P		6.8		
Turn-Off Delay Time	$t_{d(off)}$		N		22.2		
			P		33.6		
Fall-Time	t_f		N		3.6		
			P		23.2		

Notes

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

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TO252_4L PACKAGE OUTLINE



DETAIL 'D'

DETAIL 'E'

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).

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