

MS35C31

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

Description

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.

Features

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper lead frame TSOP-6 saves board space
- Fast switching speed
- High performance trench technology
- RoHS compliant package

Package type : TSOP-6

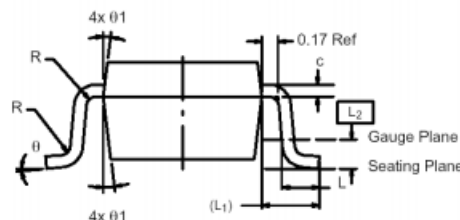
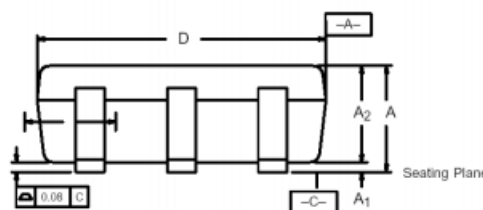
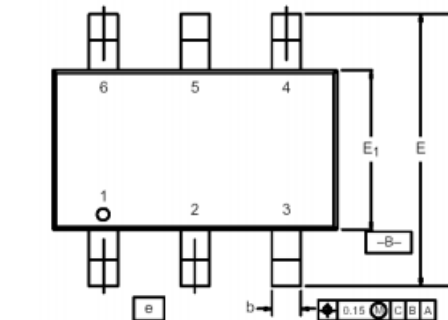
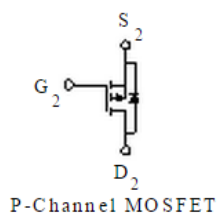
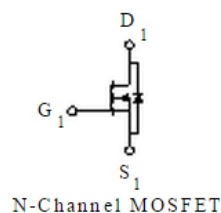
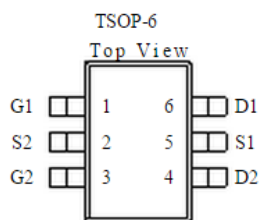
Packing & Order Information

3,000/Reel



**RoHS
COMPLIANT**

Graphic symbol



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
A	0.91	–	1.10	0.036	–	0.043
A₁	0.01	–	0.10	0.0004	–	0.004
A₂	0.84	–	1.00	0.033	0.038	0.039
b	0.30	0.32	0.45	0.012	0.013	0.018
c	0.10	0.15	0.20	0.004	0.006	0.008
D	2.95	3.05	3.10	0.116	0.120	0.122
E	2.70	2.85	2.98	0.106	0.112	0.117
E₁	1.55	1.65	1.70	0.061	0.065	0.067
e	1.00 BSC			0.0394 BSC		
L	0.35	–	0.50	0.014	–	0.020
L₁	0.60 Ref			0.024 Ref		
L₂	0.25 BSC			0.010 BSC		
R	0.10	–	–	0.004	–	–
θ	0°	4°	8°	0°	4°	8°
θ₁	7° Nom			7° Nom		

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Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

Symbol	Parameter	Nch Limit	Pch Limit	Unit
V _{DS}	Drain-Source Voltage	30	-26.5	V
V _{GS}	Gate-Source Voltage	±12	±12	V
I _D	Continuous Drain Current ^a (T _A =25°C)	3.7	-2.7	A
	Continuous Drain Current ^a (T _A =70°C)	2.9	-2.1	A
I _{DM}	Pulsed Drain Current ^b	8	-8	A
I _S	Continuous Source Current (Diode Conduction) ^a	1.05	-1.05	A
P _D	Power Dissipation ^a (T _A =25°C)	1.15		W
	Power Dissipation ^a (T _A =70°C)	0.7		W
T _J /T _{STG}	Operating Junction and Storage Temperature Range	-55 to +150		°C

Thermal Resistance Ratings

Symbol	Parameter	N-Channel		P-Channel		Units
		Typ	Max	Typ	Max	
R _{THJA}	Maximum Junction-to-Ambient ^a (t ≤ 10 sec)	93	110	93	110	°C/W
	Maximum Junction-to-Ambient ^a (Steady-State)	130	150	130	150	

Notes :

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

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Symbol	Parameter	Test Conditions	Ch	Min	Typ.	Max.	Units
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA V _{DS} = V _{GS} , I _D = -250μA	N P	0.6 -0.6			V
I _{GSS}	Gate-Body Leakage	V _{DS} = 0 V, V _{GS} = 12 V V _{DS} = 0 V, V _{GS} = -12 V	N P			100 -100	uA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 21 V, V _{GS} = 0 V	N			1	uA
		V _{DS} = -21 V, V _{GS} = 0 V	P			-1	
		V _{DS} = 21 V, V _{GS} = 0 V, T _J = 55°C	N			10	
		V _{DS} = -21 V, V _{GS} = 0 V, T _J = 55°C	P			-10	
I _{D(on)}	On-State Drain Current ^A	V _{DS} = 5 V, V _{GS} = 4.5 V V _{DS} = -5 V, V _{GS} = -4.5 V	N P	5 -5			A
r _{DS(on)}	Drain-Source On-Resistance ^A	V _{GS} = 4.5 V, I _D = 3.7 A	N			0.058	Ω
		V _{GS} = -4.5 V, I _D = 3.1 A	P			0.112	
		V _{GS} = 2.5 V, I _D = 2.7 A	N			0.08	
		V _{GS} = -2.5 V, I _D = -2.2 A	P			0.17	
g _{fs}	Forward Transconductance ^A	V _{DS} = 5 V, I _D = 3.7 A	N		10		S
		V _{DS} = -5 V, I _D = 3.1 A	P		5		
V _{SD}	Diode Forward Voltage	I _S = 1.05 A, V _{GS} = 0 V	N		0.80		S
		I _S = -1.05 A, V _{GS} = 0 V	P		-0.83		

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Dynamic ^b							
Symbol	Parameter	Test Conditions	Ch	Min	Typ.	Max.	Units
Q _g	Total Gate Charge	N-Channel	N		6.3		nC
			P		3.8		
Q _{gs}	Gate-Source Charge	V _{DS} = 15 V , I _D = 2.7 A , V _{GS} = 4.5 V P-Channel	N		0.9		nC
			P		0.6		
Q _{gd}	Gate-Drain Charge	V _{DS} = -15 V , I _D = -3.1 A , V _{GS} = -4.5 V	N		1.9		nC
			P		1.5		
t _{d(on)}	Turn-On Delay Time	N-Channel	N		5		ns
			P		5		
t _r	Rise Time	V _{DD} = 15 V , V _{GS} = 4.5 V , R _{GEN} = 15 Ω , I _D = 1 A P-Channel	N		12		ns
			P		15		
t _{d(off)}	Turn-Off Delay Time	V _{DD} = -15 V , V _{GS} = -4.5 V , R _{GEN} = 15 Ω , I _D = -1 A	N		13		ns
			P		20		
t _f	Fall Time		N		7		ns
			P		20		

Notes :

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

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Disclaimer

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