

## MS 34N34

### Dual N-Channel 20-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.

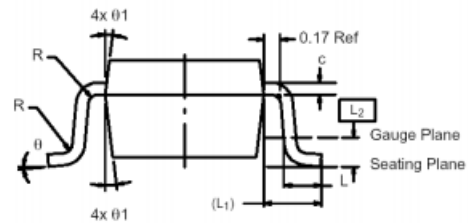
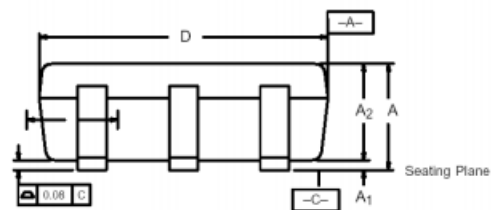
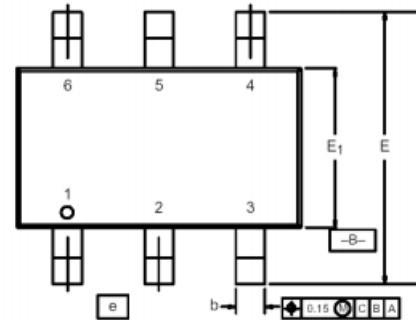
#### Features

- 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

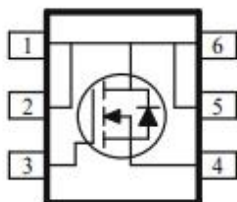
#### Packing & Order Information

3,000/Reel



**RoHS  
COMPLIANT**

Graphic symbol



Dim	MILLIMETERS			INCHES		
	Min	Nom	Max	Min	Nom	Max
<b>A</b>	0.91	–	1.10	0.036	–	0.043
<b>A<sub>1</sub></b>	0.01	–	0.10	0.0004	–	0.004
<b>A<sub>2</sub></b>	0.84	–	1.00	0.033	0.038	0.039
<b>b</b>	0.30	0.32	0.45	0.012	0.013	0.018
<b>c</b>	0.10	0.15	0.20	0.004	0.006	0.008
<b>D</b>	2.95	3.05	3.10	0.116	0.120	0.122
<b>E</b>	2.70	2.85	2.98	0.106	0.112	0.117
<b>E<sub>1</sub></b>	1.55	1.65	1.70	0.061	0.065	0.067
<b>e</b>	1.00 BSC			0.0394 BSC		
<b>L</b>	0.35	–	0.50	0.014	–	0.020
<b>L<sub>1</sub></b>	0.60 Ref			0.024 Ref		
<b>L<sub>2</sub></b>	0.25 BSC			0.010 BSC		
<b>R</b>	0.10	–	–	0.004	–	–
<b>θ</b>	0°	4°	8°	0°	4°	8°
<b>θ<sub>1</sub></b>	7° Nom			7° Nom		

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

Symbol	Parameter	Value	Unit
V <sub>DS</sub>	Drain-Source Voltage	30	V
V <sub>GS</sub>	Gate-Source Voltage	±12	V
I <sub>D</sub>	Continuous Drain Current <sup>a</sup> (T <sub>A</sub> =25°C)	6.0	A
	Continuous Drain Current <sup>a</sup> (T <sub>A</sub> =70°C)	4.6	A
I <sub>DM</sub>	Pulsed Drain Current <sup>b</sup>	±20	A
I <sub>S</sub>	Continuous Source Current (Diode Conduction) <sup>a</sup>	1.6	A
P <sub>D</sub>	Power Dissipation <sup>a</sup> (T <sub>A</sub> =25°C)	2.0	W
	Power Dissipation <sup>a</sup> (T <sub>A</sub> =70°C)	1.3	W
T <sub>J</sub> /T <sub>STG</sub>	Operating Junction and Storage Temperature	-55 to +150	°C

#### Thermal Resistance Ratings

Symbol	Parameter	Maximum	Units
R <sub>THJA</sub>	Maximum Junction-to-Ambient <sup>a</sup> (t ≤ 5 sec)	62.5	°C/W
	Maximum Junction-to-Ambient <sup>a</sup> (Steady-State)	110	

Notes :

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

#### Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V <sub>GS(th)</sub>	Gate-Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	0.7		15	V
I <sub>GSS</sub>	Gate-Body Leakage	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±8 V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V V <sub>DS</sub> = 24 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55°C			1 10	uA
I <sub>D(on)</sub>	On-State Drain Current <sup>A</sup>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 4.5 V	10			A
R <sub>DSON</sub>	Drain-Source On-Resistance <sup>A</sup>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 6.0 A V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 5.0 A			32 44	mΩ
g <sub>fs</sub>	Forward Transconductance <sup>A</sup>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 4.0 A		11.3		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> = 1.6 A, V <sub>GS</sub> = 0 V		0.75		V

#### Dynamic<sup>b</sup>

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units	
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> = 10 V, R <sub>L</sub> = 15 Ω, V <sub>GEN</sub> = 4.5 V, I <sub>D</sub> = 5 A		8		ns	
t <sub>r</sub>	Rise Time			24		ns	
t <sub>d(off)</sub>	Turn-Off Delay Time				35		ns
t <sub>f</sub>	Fall Time				10		ns

## MS34N34

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Dynamic <sup>b</sup>						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$Q_g$	Total Gate Charge	$V_{DS} = 10\text{ V}$ , $I_D = 4.0\text{ A}$ , $V_{GS} = 4.5\text{ V}$		60		nC
$Q_{gs}$	Gate-Source Charge			1.0		nC
$Q_{gd}$	Gate-Drain Charge			1.5		nC

Notes:

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

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#### Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

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