

## N-Channel Enhancement Mode MOSFET

### GENERAL DESCRIPTION

The **ME2306** is the N-Channel logic enhancement mode power field effect transistors, using high cell density, DMOS trench technology.

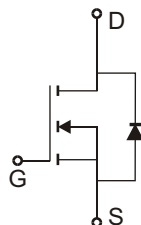
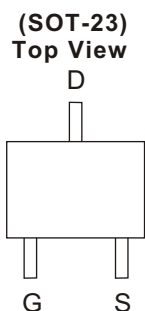
This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone, notebook computer power management and other battery powered circuits, and low in-line power loss that are needed in a very small outline surface mount package.

### FEATURES

1. 30V/4A,  $R_{DS(ON)}=37m\Omega@V_{GS}=10V$
2. 30V/3.5A,  $R_{DS(ON)}=49m\Omega@V_{GS}=4.5V$
3. Super high density cell design for extremely low  $R_{DS(ON)}$
4. Exceptional on-resistance and maximum DC current capability

### PIN CONFIGURATION (SOT-23)



### PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

### Absolute Maximum Ratings (TA=25°C Unless Otherwise Noted)

Parameter		Symbol	5 secs	Steady State	Units
Drain-Source Voltage		$V_{DS}$	30		V
Gate-Source Voltage		$V_{GS}$	±20		V
Continuous Drain Current ( $t_j=150^\circ\text{C}$ ) <sup>ab</sup>	TA=25°C	$I_D$	4.0	3.16	A
	TA=70°C		3.5	2.7	
Pulsed Drain Current		$I_{DM}$	20		A
Continuous Source Current (Diode Conduction) <sup>ab</sup>		$I_S$	1.04	0.62	A
Power Dissipation <sup>ab</sup>	TA=25°C	$P_D$	1.25	0.75	W
	TA=70°C		0.8	0.48	
Operating Junction Temperature		$T_J$	-55 to 150		°C

### Thermal Resistance Ratings

Parameter	Symbol	Limits		Units
		Typ	Max	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	80	100	°C/W
		Steady-State	130	
Maximum Junction-to-Foot(Drain)	$R_{thJF}$	60	75	°C/W

Notes

a. Surface Mounted on FR4 Board,  $t \leq 5$  sec.

b. Pulse width limited by maximum junction temperature.

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### Electrical Characteristics (T<sub>J</sub> = 25°C Unless Specified)

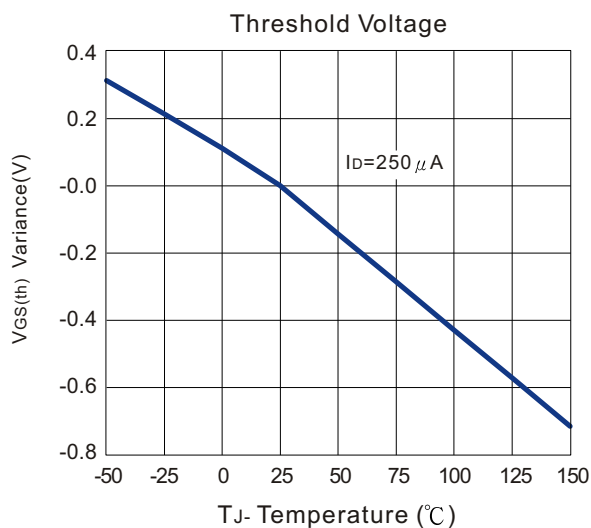
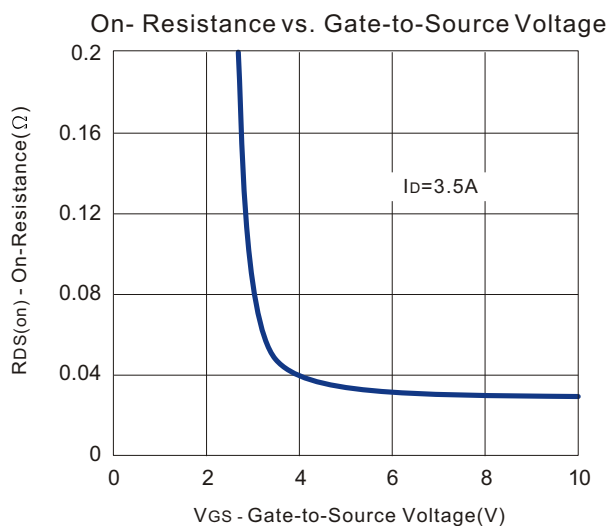
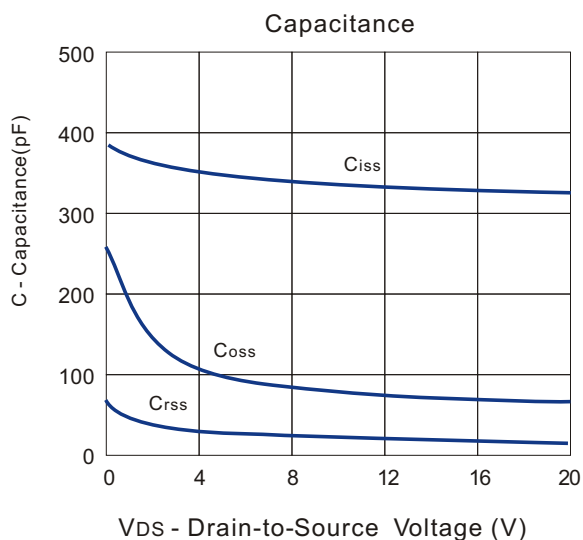
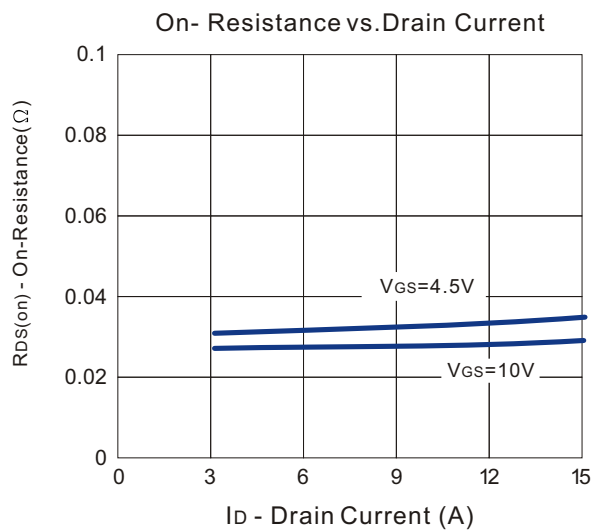
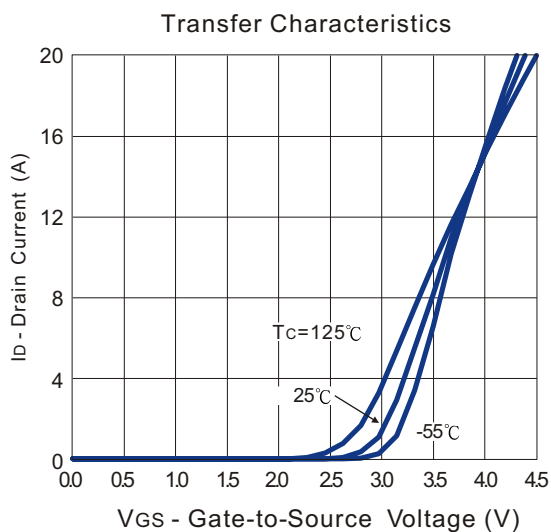
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 10 μA	30			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1.0	1.21	3.0	
I <sub>GSS</sub>	Gate-Body Leakage	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			0.5	μA
		V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V T <sub>J</sub> = 55°C			10	
I <sub>D(ON)</sub>	On-State Drain Current <sup>a</sup>	V <sub>DS</sub> ≥ 4.5V, V <sub>GS</sub> = 10V	6			A
R <sub>DS(ON)</sub>	Drain-Source On-Resistance <sup>a</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 4.0A		28	37	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3.5A		36	49	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> = 1.25A, V <sub>GS</sub> = 0V		0.8	1.2	V
<b>DYNAMIC PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 2.5A		10.6	15	nC
Q <sub>gs</sub>	Gate Source Charge			3.2		
Q <sub>gd</sub>	Gate-Drain Charge			1		
R <sub>g</sub>	Gate Resistance	f = 1.0MHz		0.72		Ω
t <sub>d(on)</sub>	Turn-On Time	V <sub>DD</sub> = 15V, R <sub>L</sub> = 15Ω I <sub>D</sub> = 1A, V <sub>GEN</sub> = 10V R <sub>G</sub> = 6Ω		7.4	15	nS
t <sub>r</sub>				13.2	20	
t <sub>d(off)</sub>	Turn-Off Time			21.6	31	
t <sub>f</sub>				3.5	9	

Notes

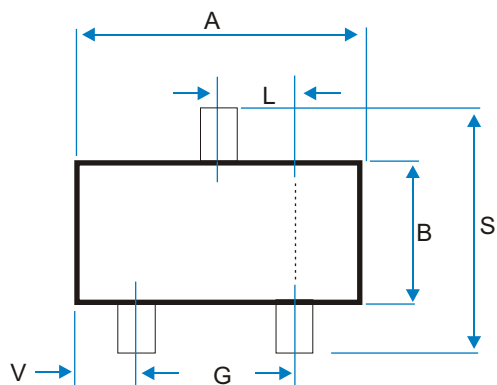
a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.

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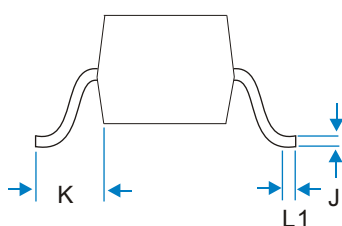
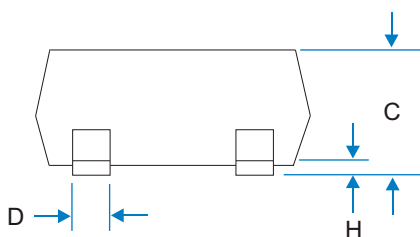
### Typical Characteristics (T<sub>J</sub> = 25°C Noted)



### SOT-23 Package Outline



DIM	MILLIMETERS	
	MIN	MAX
A	2.80	3.1
B	1.20	1.7
C	0.89	1.3
D	0.37	0.50
G	1.78	2.04
H	0.013	0.15
J	0.085	0.2
K	0.45	0.7
L	0.89	1.02
S	2.10	3
V	0.45	0.60
L1	0.2	0.6



**Package Method of Taping**

Reel Model	Package	Quality of Reel	Front Blank	Back Blank	Blank Cover
SOT-2X	SOT-23 SOT-25/26/28 SOT26W	3000	20	50	200
SC82	SC82	3000	20	50	200
SOT-89	SOT-89	1000	25	25	75
SOT-223	SOT-223	2500	25	25	75
SOP	SOP8	2500	25	25	75
TSSOP	TSSOP24	2000	25	25	75
TO-252	TO-252	2500	35	35	75
TO-263	TO-263	1000	35	35	75