

P-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The **ME2301** is the P-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.

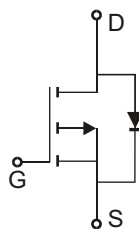
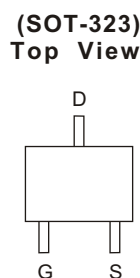
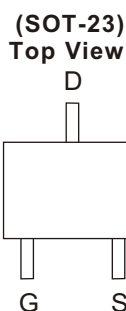
FEATURES

1. -20V/-2.8A, $R_{DS(ON)}=130m\Omega@V_{GS}=-4.5V$
2. -20V/-2.0A, $R_{DS(ON)}=190m\Omega@V_{GS}=-2.5V$
3. Super high density cell design for extremely low $R_{DS(ON)}$
4. Exceptional on-resistance and maximum DC current Capability
5. SOT-23 and SOT-323 package design

ORDER INFORMATION

Device	Package
ME2301T1	SOT-23
ME2301T3	SOT-323

PIN CONFIGURATION (SOT-23-3L)



PIN DESCRIPTION

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

Absolute Maximum Ratings (TA=25°C Unless Specified)

Parameter	Symbol	Typical	Units
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	± 12	V
Continuous Drain Current ($t_J=150^\circ C$)	I_D	$T_A=25^\circ C$	-2.5
		$T_A=70^\circ C$	-1.5
Pulsed Drain Current	I_{DM}	-10	A
Continuous Source Current (Diode Conduction)	I_S	-1.6	A
Power Dissipation	P_D	$T_A=25^\circ C$	1.25
		$T_A=70^\circ C$	0.8
Operating Junction Temperature	T_J	150	$^\circ C$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	100	$^\circ C/W$

P-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J = 25°C Unless Specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = -250 μA	-20			V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250 μA	-0.45		-1.5	
I _{GSS}	Gate Leakage Current	V _{DS} = 0V, V _{GS} = ±12V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 20V, V _{GS} = 0V			-1	μA
		V _{DS} = -20V, V _{GS} = 0V T _J = 55°C			-10	
I _{D(ON)}	On-State Drain Current	V _{DS} ≤ -5V, V _{GS} = -4.5V	-6			A
		V _{DS} ≤ -5V, V _{GS} = -2.5V	-3			
R _{DS(ON)}	Drain-Source On-Resistance	V _{GS} = -4.5V, I _D = -2.8A		0.105	0.13	Ω
		V _{GS} = -2.5V, I _D = -2.0A		0.145	0.19	
g _{FS}	Forward Transconductance	V _{DS} = -5V, I _D = -2.8A		6.5		S
V _{SD}	Diode Forward Voltage	I _S = -1.6A, V _{GS} = 0V		-0.8	-1.2	V
DYNAMIC PARAMETERS						
Q _g	Total Gate Charge	V _{DS} = -6V, V _{GS} = -4.5V, I _D = -2.8A		5.8	10	nC
Q _{gs}	Gate Source Charge			0.85		
Q _{gd}	Gate-Drain Charge			1.7		
C _{iss}	Input Capacitance	V _{DS} = -6V, V _{GS} = 0V, f = 1MHz		415		pF
C _{oss}	Output Capacitance			223		
C _{rss}	Reverse Transfer Capacitance			87		
T _{d(on)}	Turn-On Time	V _{DD} = -6V, R _L = 6Ω I _D = -1.0A, V _{GEN} = -4.5V R _G = 6Ω		13	25	nS
t _r				36	60	
T _{d(off)}	Turn-Off Time			42	70	
t _f				34	60	

P-Channel Enhancement Mode MOSFET

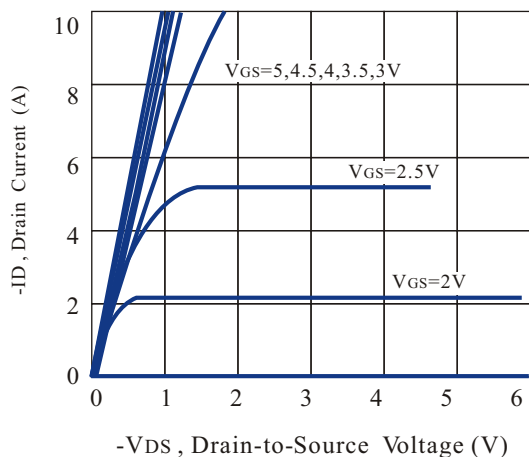


Figure 1. Output Characteristics

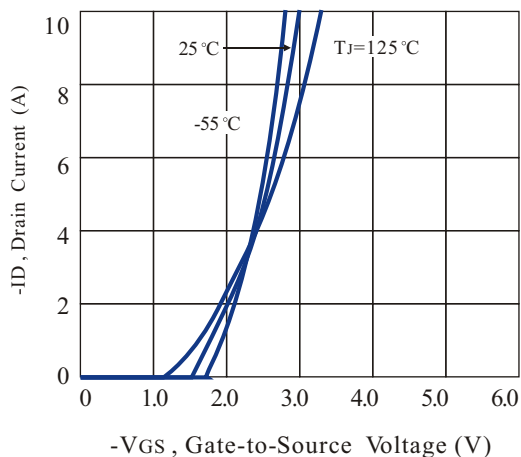


Figure 2. Transfer Characteristics

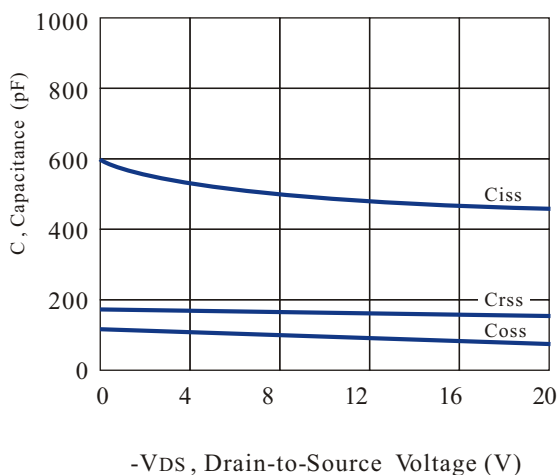


Figure 3. Capacitance

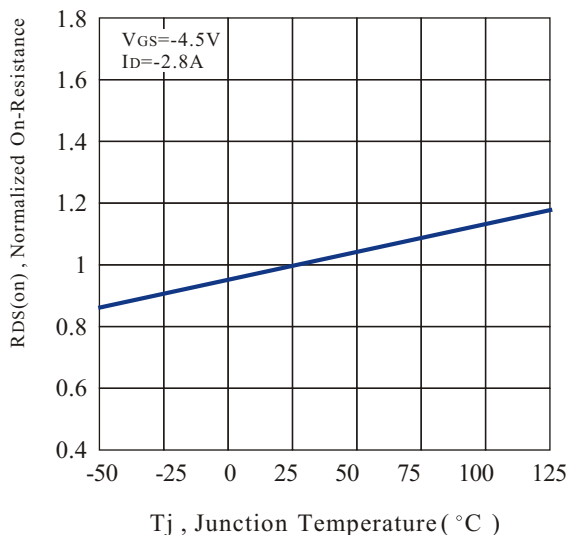


Figure 4. On-Resistance Variation with Temperature

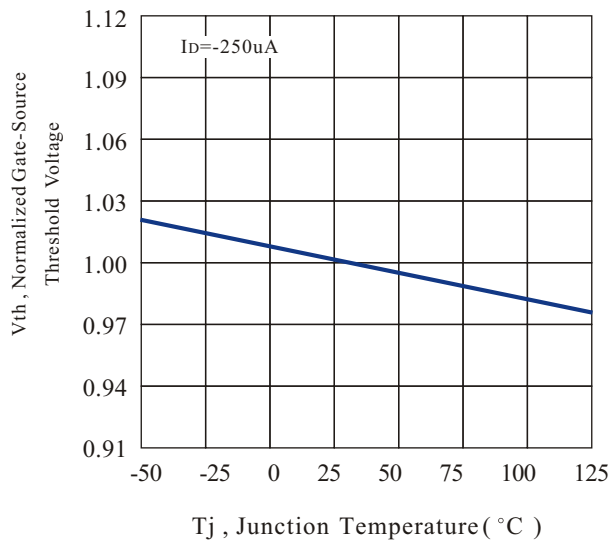


Figure 5. Gate Threshold Variation with Temperature

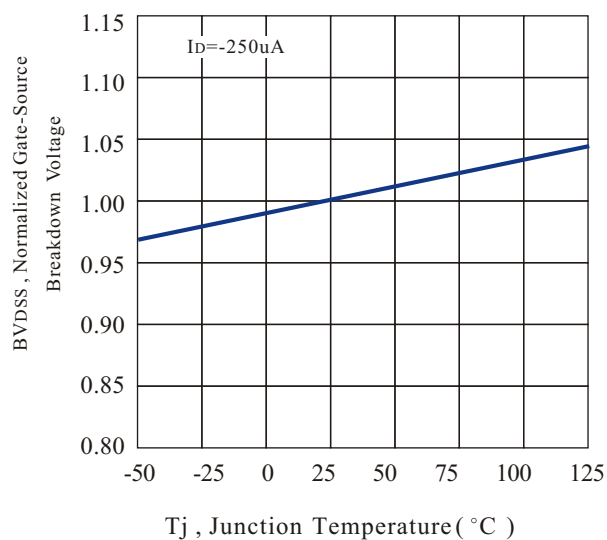
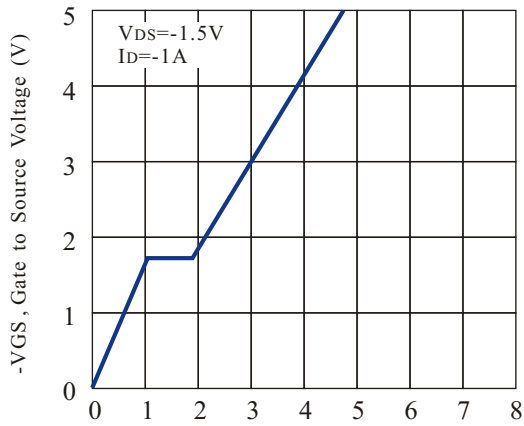


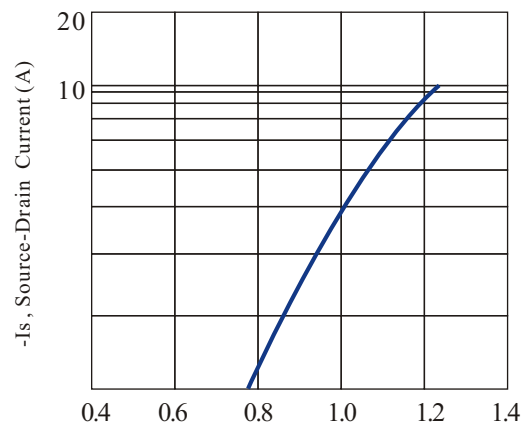
Figure 4. Breakdown Voltage with Temperature

P-Channel Enhancement Mode MOSFET



Q_g , Total Gate Charge (nC)

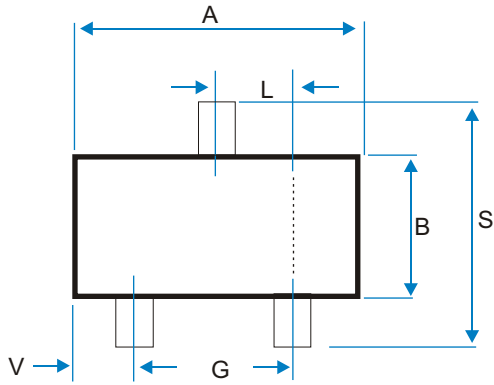
Figure 7. Gate Charge



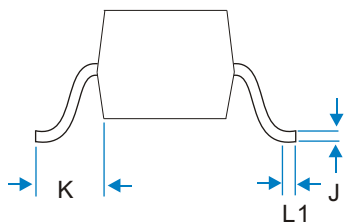
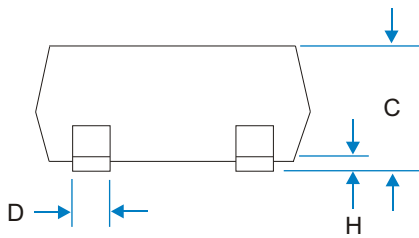
$-V_{SD}$, Body Diode Forward Voltage (V)

Figure 8. Body Diode Forward Voltage Variation with Source Current

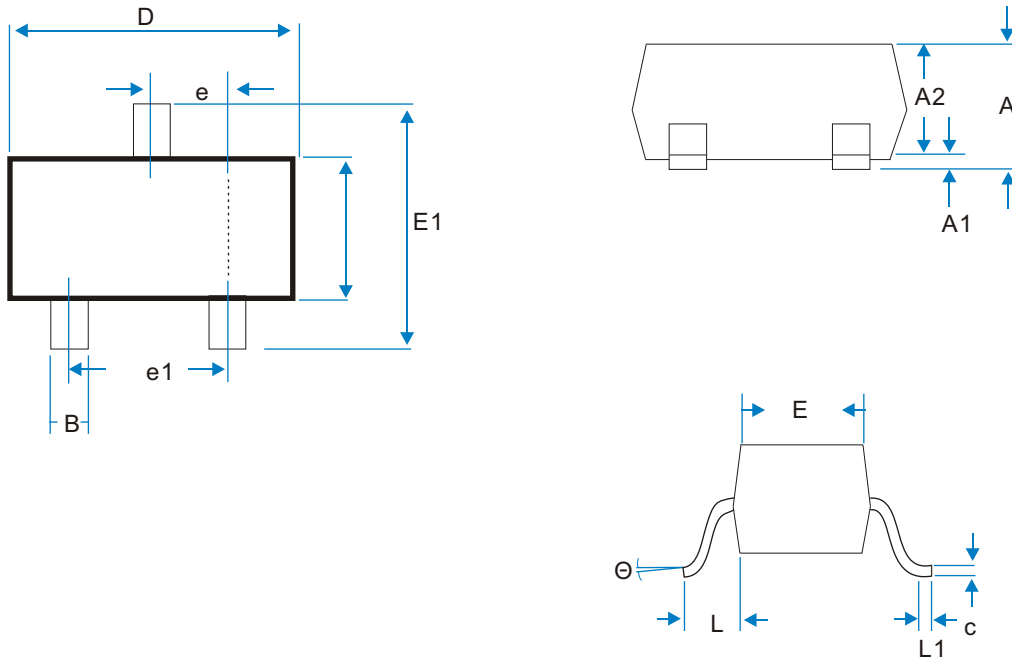
SOT-23 Package Outline



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



SOT-323 Package Outline



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
Θ	0°	8°	0°	8°

P-Channel Enhancement Mode MOSFET

Package Method of Tube

Suitable Package	Quantity of Per Tube
SOP8 / SOP8 (FD) / SOP8 (TS)	80 pcs / Tube
SOP14	50 pcs / Tube
SOP16 / SOP16 (BW)	50 pcs / Tube
SOP20 (30 mil)	40 pcs / Tube
SSOP16 / SSOP16 (LP) / SSOP8 (FD) / SSOP8 (TS)	80 pcs / Tube
SSOP20	50 pcs / Tube
SSOP20 (209 mil) (TS) / SSOP20 (150 mil)	70 pcs / Tube
SSOP24	50 pcs / Tube
SSOP28 / SSOP28 (FD)	50 pcs / Tube
TSSOP8	100 pcs / Tube
TSSOP16 / TSSOP16 (FD)	80 pcs / Tube
TSSOP20 / TSSOP20 (FD)	70 pcs / Tube
TSSOP24 / TSSOP24 (FD)	50 pcs / Tube
TSSOP28 / TSSOP28 (FD)	50 pcs / Tube
SOT-223	70 pcs / Tube
MSOP8 / MSOPS (FD)	80 pcs / Tube
MSOP10 / MSOP10 (FD)	80 pcs / Tube
TO-251 / 252	80 pcs / Tube
TO-220 /263	50 pcs / Tube

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

Reel / Stick Method of Reel Label

