

GENERAL DESCRIPTION

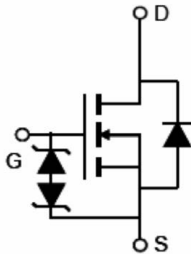
The HM2302D is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

APPLICATIONS

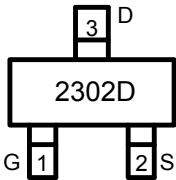
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch

FEATURES

- $R_{DS(ON)} = 270\text{ m}\Omega$  @  $V_{GS} = 4.5\text{V}$
- $R_{DS(ON)} = 330\text{ m}\Omega$  @  $V_{GS} = 2.5\text{V}$
- $R_{DS(ON)} = 450\text{ m}\Omega$  @  $V_{GS} = 1.8\text{V}$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding



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Marking and pin Assignment



SOT-23 top view

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

Parameter	Symbol	Maximum Ratings	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±8	V

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Gate-Source Voltage	V <sub>GS</sub>	±8	V

### Electrical Characteristics (Tj =25°C Unless Otherwise Specified)

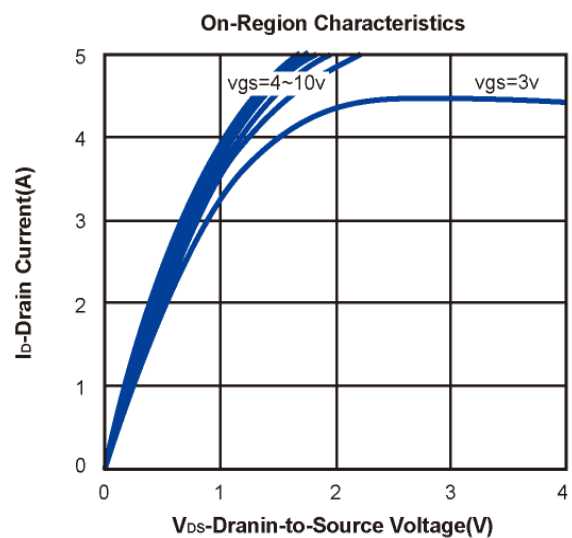
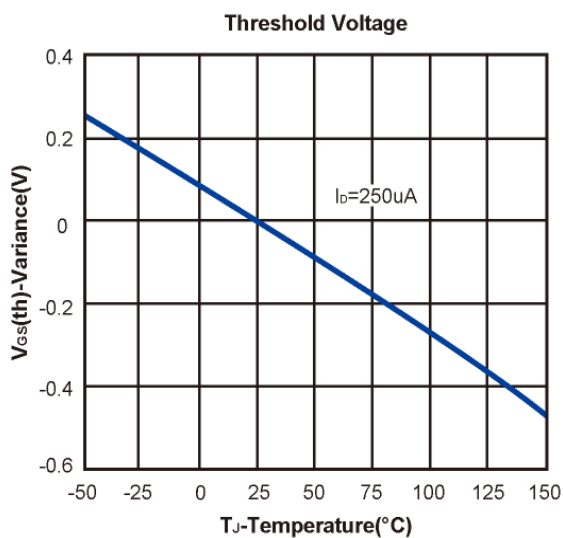
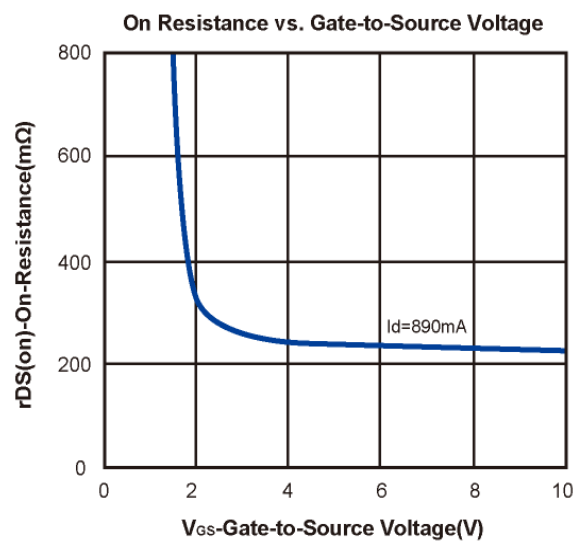
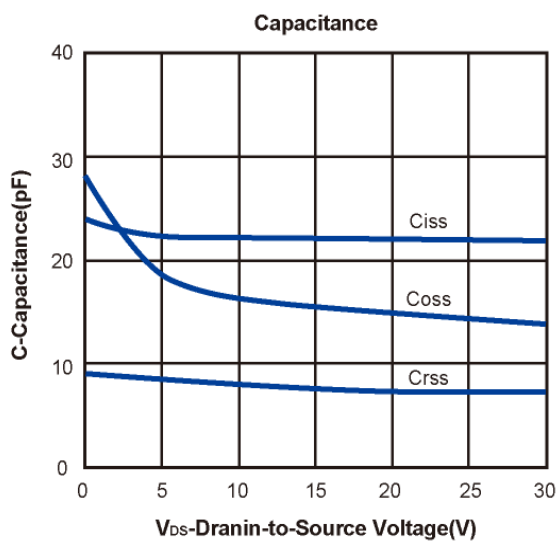
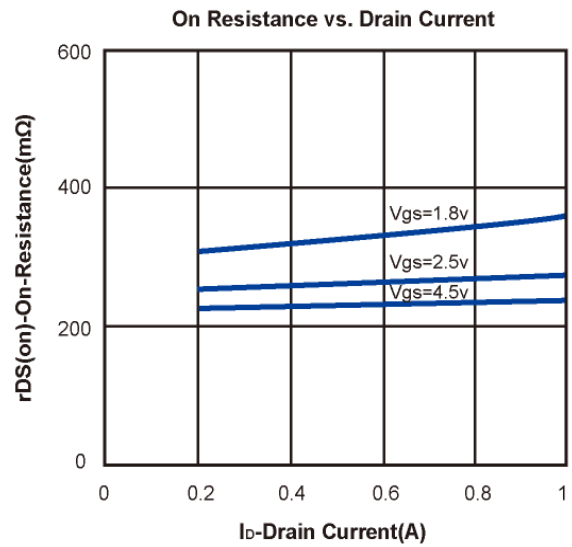
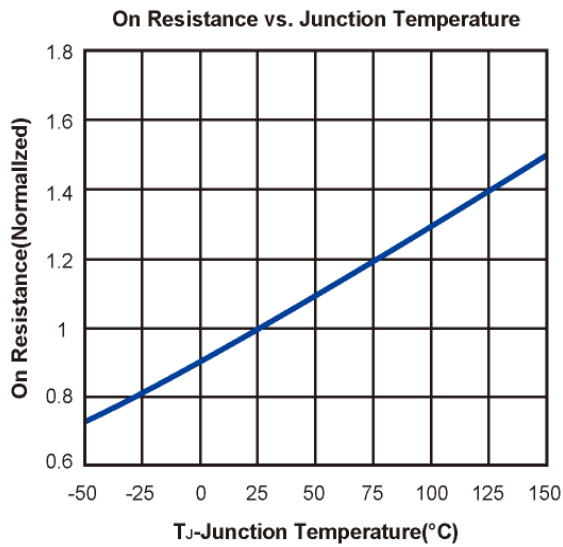
Symbol	Parameter	Limit	Min	Typ	Max	Unit
<b>STATIC</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250 $\mu$ A	20			V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 $\mu$ A	0.45		1.2	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±10	$\mu$ A
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V			1	$\mu$ A
R <sub>DS(ON)</sub>	Drain-Source On-Resistance <sup>a</sup>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =890mA		220	270	m $\Omega$
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =780mA		260	330	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =700mA		330	450	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> =350mA, V <sub>GS</sub> =0V		0.75	1.2	V
<b>DYNAMIC</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHZ		21		pF
C <sub>OSS</sub>	Output Capacitance			15		
C <sub>rss</sub>	Reverse Transfer Capacitance			8		
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =25V, V <sub>GS</sub> =10V, I <sub>D</sub> =0.22A		6.7		nC
Q <sub>gs</sub>	Gate-Source Charge			1.2		
Q <sub>gd</sub>	Gate-Drain Charge			0.9		
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =10V, R <sub>L</sub> =3 $\Omega$ V <sub>GEN</sub> =10V, R <sub>G</sub> =10 $\Omega$		120		ns
t <sub>r</sub>	Turn-On Rise Time			317		
t <sub>d(off)</sub>	Turn-Off Delay Time			748		
t <sub>f</sub>	Turn-Off Fall Time			716		

Notes: a. Based on epoxy or solder paste and bond wire Cu wire 1mil×1(S), Cu wire 1mil×1(G) on each die of SOT-523 package.

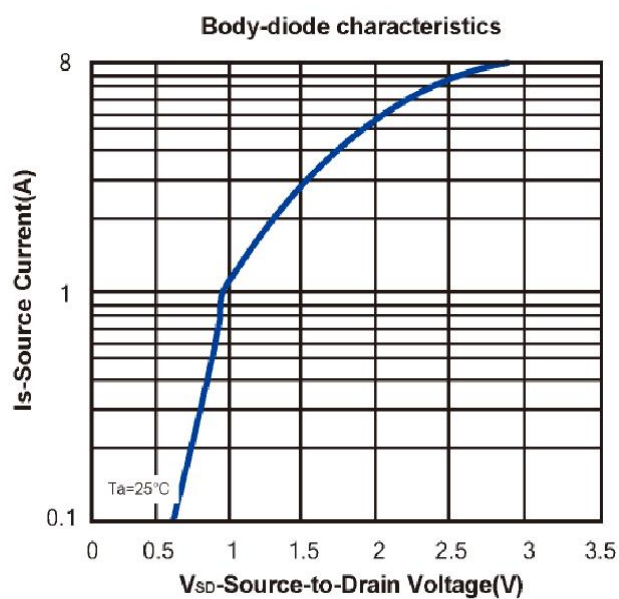
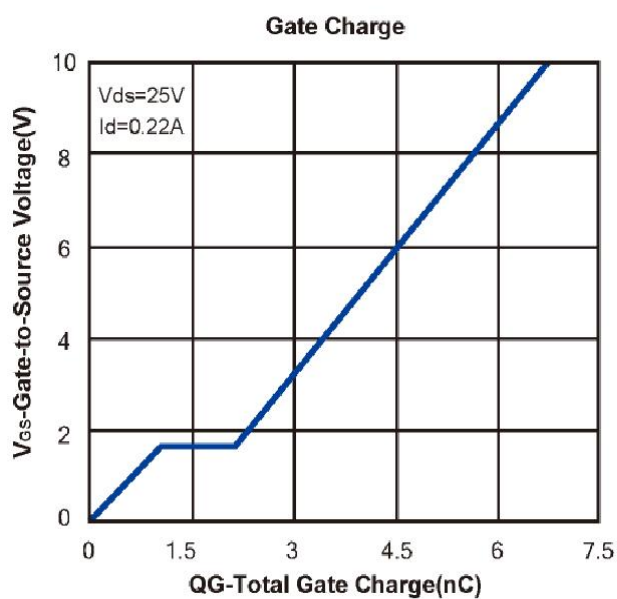
b. Pulse test; pulse width  $\leq$  300us, duty cycle  $\leq$  2%.

c. Force mos reserves the right to improve product design, functions and reliability without notice.

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

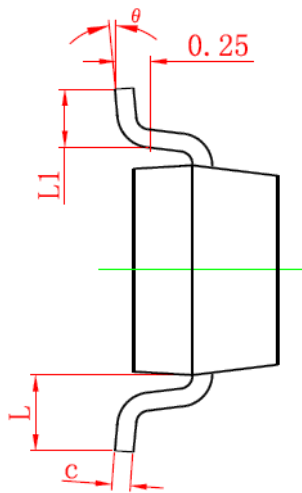
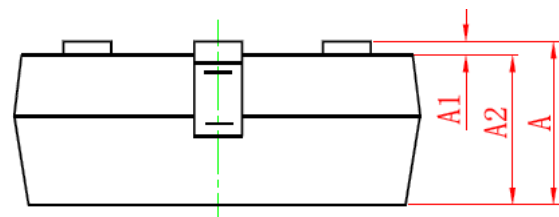
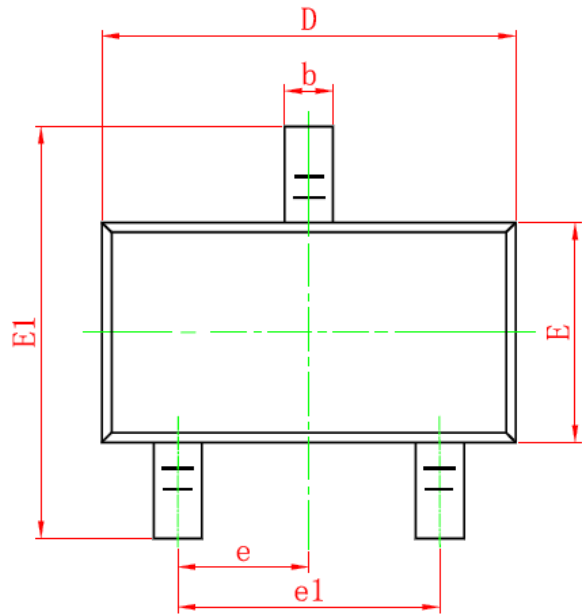


# Typical Characteristics (TJ =25°C Noted)



SOT-23 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

NOTES

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.