

### GENERAL DESCRIPTION

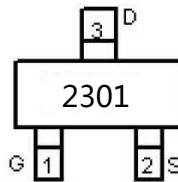
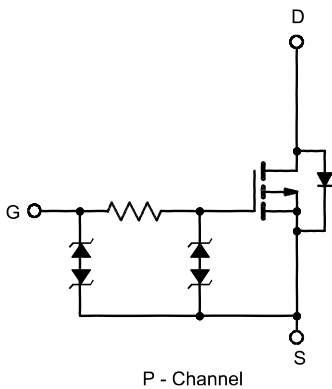
The HM2301BSR is the P-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance.

### APPLICATIONS

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

### FEATURES

- $R_{DS(ON)} = 0.48\Omega @ V_{GS} = -4.5V$
- $R_{DS(ON)} = 0.67\Omega @ V_{GS} = -2.5V$
- $R_{DS(ON)} = 0.95\Omega @ V_{GS} = -1.8V$
- $R_{DS(ON)} = 2.20\Omega @ V_{GS} = -1.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding



Marking and pin Assignment



SOT-523 top view

### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

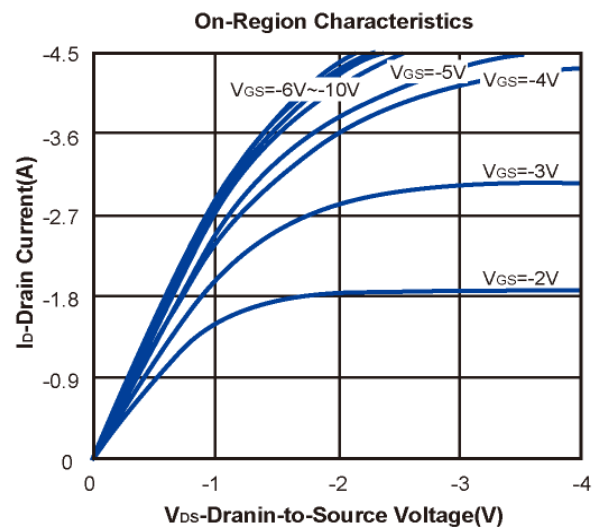
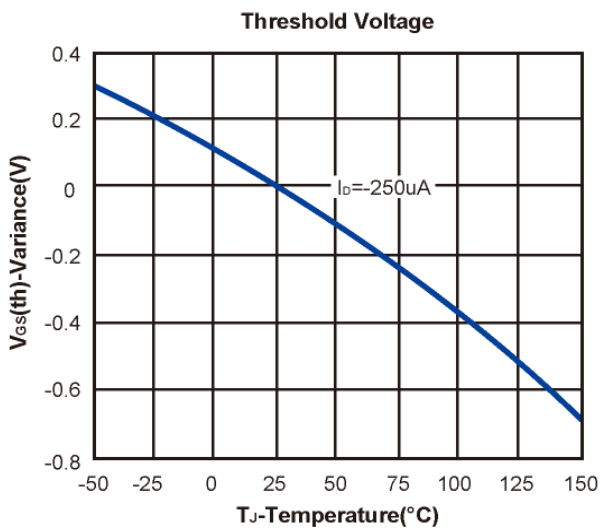
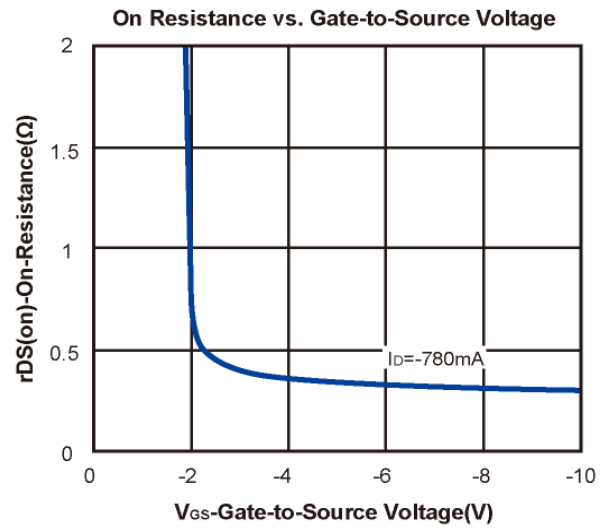
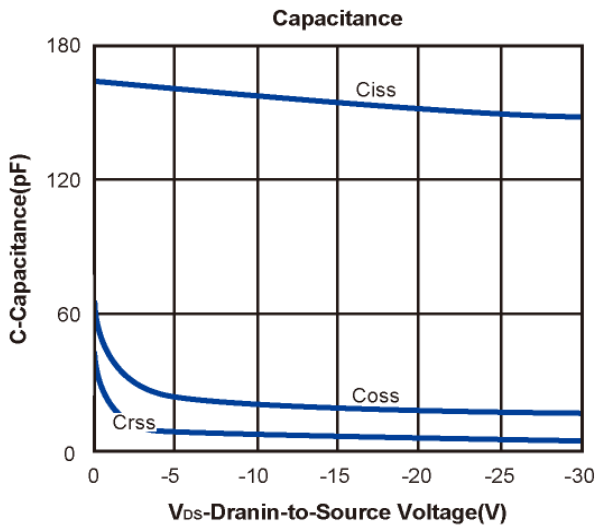
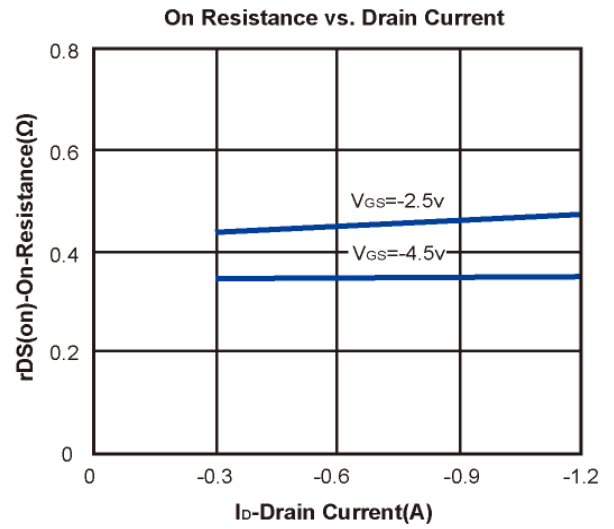
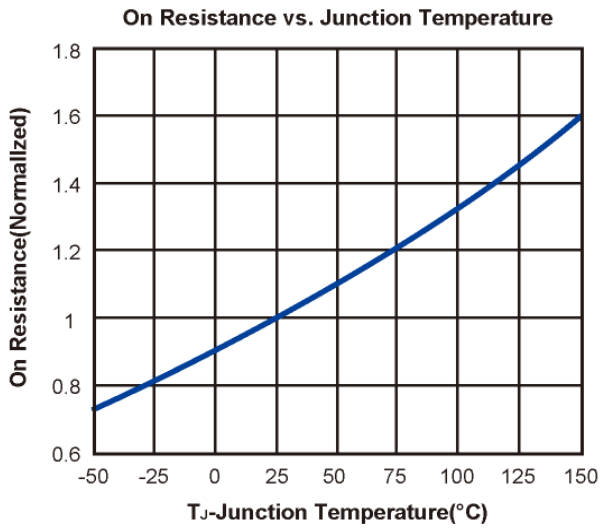
Parameter	Symbol	Maximum Ratings	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 6$	V

**Electrical Characteristics** ( $T_J = 25^\circ\text{C}$  Unless Otherwise Specified)

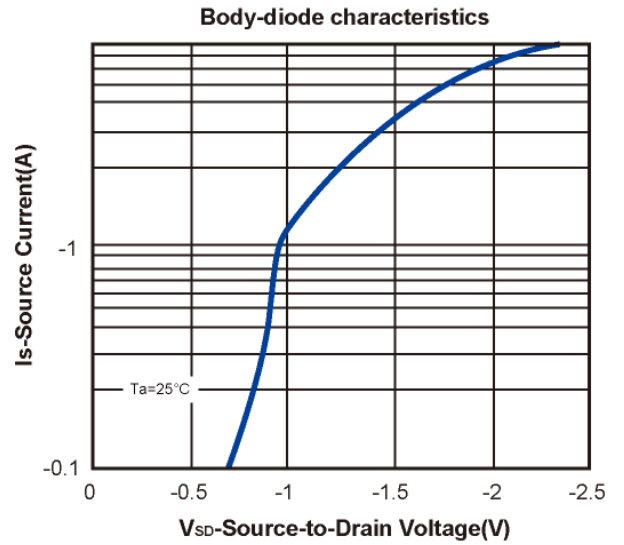
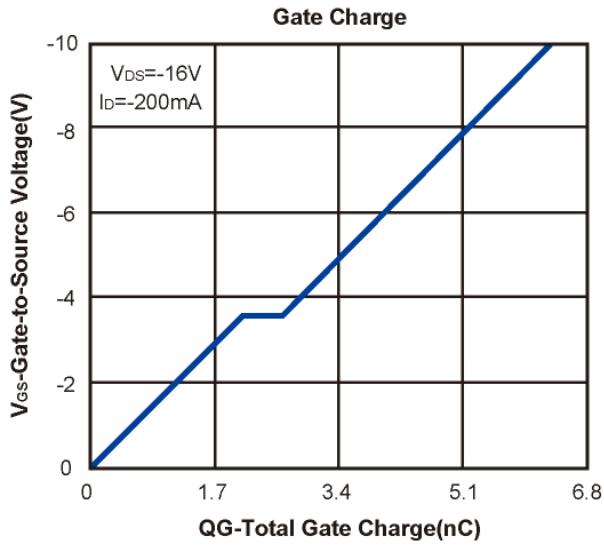
Symbol	Parameter	Limit	Min	Typ	Max	Unit
<b>STATIC</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45		-1.2	V
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 4.5V$			$\pm 10$	$\mu A$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-16V, V_{GS}=0V$			-1	$\mu A$
$R_{DS(on)}$	Drain-Source On-Resistance <sup>a</sup>	$V_{GS}=-4.5V, I_D=-780mA$		0.35	0.48	$\Omega$
		$V_{GS}=-2.5V, I_D=-660mA$		0.44	0.67	
		$V_{GS}=-1.8V, I_D=-100mA$		0.55	0.95	
		$V_{GS}=-1.5V, I_D=-100mA$		0.78	2.20	
$V_{SD}$	Diode Forward Voltage	$I_S=-350mA, V_{GS}=0V$		-0.8	-1.2	V
<b>DYNAMIC</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-16V, V_{GS}=0V, f=1MHz$		152		$\mu F$
$C_{oss}$	Output Capacitance			18.5		
$C_{rss}$	Reverse Transfer Capacitance			6		
$Q_g$	Total Gate Charge	$V_{DS}=-16V, V_{GS}=-4.5V, I_D=-200mA$		2.8		nC
$Q_{gs}$	Gate-Source Charge			2.1		
$Q_{gd}$	Gate-Drain Charge			0.5		
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10V, R_L=50\Omega$ $V_{GEN}=-5V, R_G=10\Omega$ $I_D=-200mA$		51.3		ns
$t_r$	Turn-On Rise Time			24.2		
$t_{d(off)}$	Turn-Off Delay Time			246		
$t_f$	Turn-Off Fall Time			81.2		

- Notes: a. Based on Eutectic 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  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .  
 c. H&M SEMI reserves the right to improve product design, functions and reliability without notice.

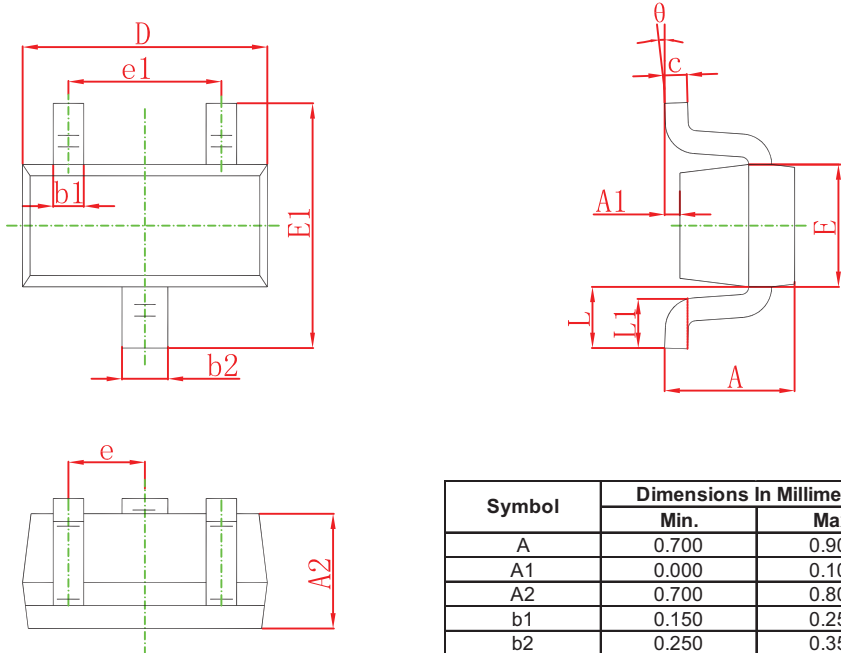
**Typical Characteristics (T<sub>J</sub> =25°C Noted)**



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

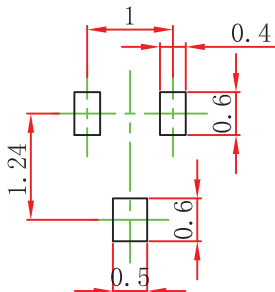


**SOT-523 Package Outline Dimensions**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

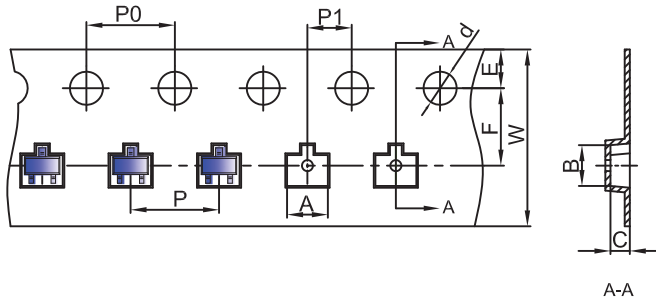
**SOT-523 Suggested Pad Layout**



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.

### SOT-523 Tape and Reel

#### SOT-523 Embossed Carrier Tape

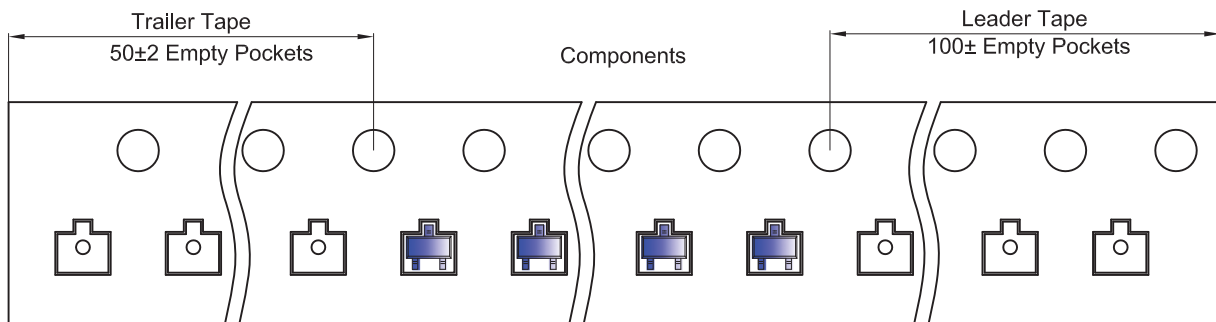


#### Packaging Description:

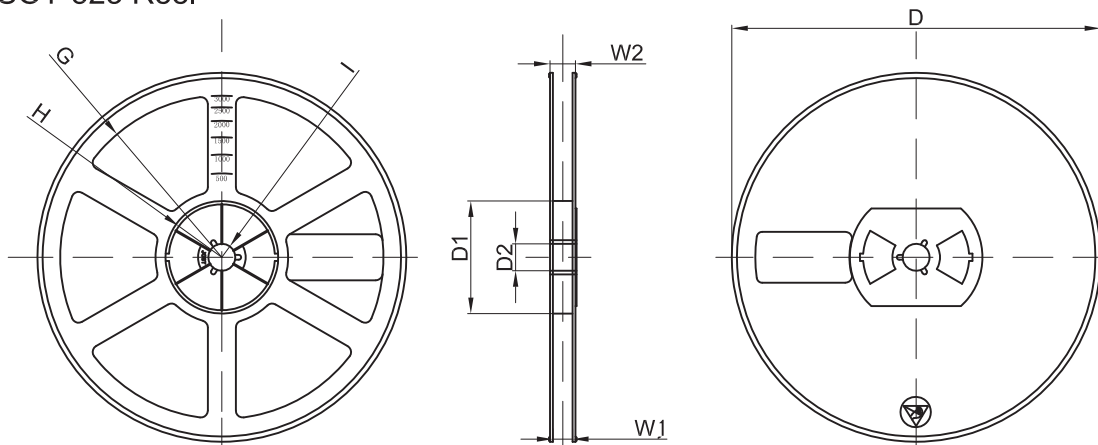
SOT-523 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-523	1.85	1.85	0.875	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

#### SOT-523 Tape Leader and Trailer



#### SOT-523 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	