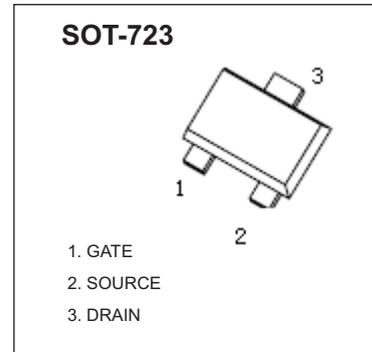


**HM2301BJR** P-Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-20V	500mΩ@-4.5V	-0.80A
	750mΩ@-2.5V	
	780mΩ (TYP)@-1.8V	



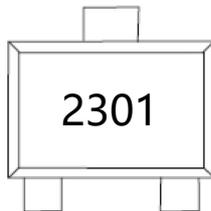
**FEATURE**

- Lead Free Product is Acquired
- Surface Mount Package
- P-Channel Switch with Low  $R_{DS(on)}$
- Operated at Low Logic Level Gate Drive

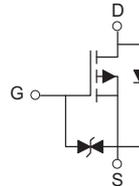
**APPLICATION**

- Load/Power Switching
- Interfacing, Logic Switching
- Battery Management for Ultra Small Portable Electronics

**MARKING**



**Equivalent Circuit**



**Maximum ratings ( $T_a=25^{\circ}C$  unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Typical Gate-Source Voltage	$V_{GS}$	±12	V
Continuous Drain Current (note 1)	$I_D$	-0.80	A
Pulsed Drain Current ( $t_p=10\mu s$ )	$I_{DM}$	-2.4	A
Power Dissipation (note 1)	$P_D$	150	mW
Thermal Resistance from Junction to Ambient (note 1)	$R_{\theta JA}$	833	$^{\circ}C/W$
Junction Temperature	$T_J$	150	$^{\circ}C$
Storage Temperature	$T_{STG}$	-55~+150	$^{\circ}C$
Lead Temperature for Soldering Purposes(1/8" from case for 10 s)	$T_L$	260	$^{\circ}C$

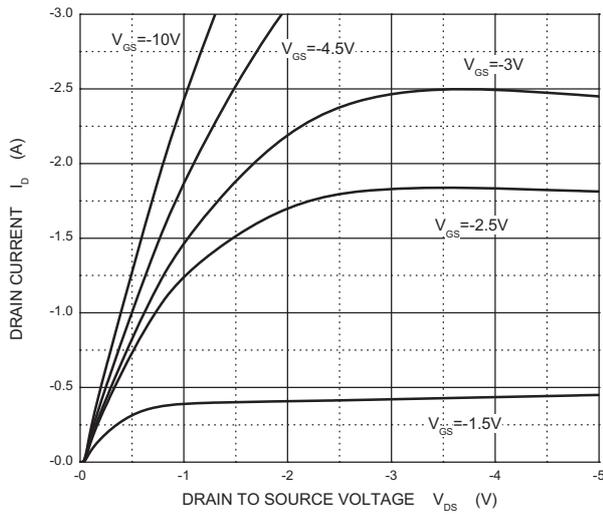
$T_a=25^\circ\text{C}$  unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>STATIC CHARACTERISTICS</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = -20V, V_{GS} = 0V$			-1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 10V, V_{DS} = 0V$			$\pm 20$	$\mu A$
Gate threshold voltage (note 2)	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1.0	V
Drain-source on-resistance (note 2)	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -1A$		410	500	$m\Omega$
		$V_{GS} = -2.5V, I_D = -0.8A$		575	750	$m\Omega$
		$V_{GS} = -1.8V, I_D = -0.5A$		780	1100	$m\Omega$
Forward transconductance (note 2)	$g_{FS}$	$V_{DS} = -10V, I_D = -0.54A$		1.2		S
Diode forward voltage	$V_{SD}$	$I_S = -0.5A, V_{GS} = 0V$			-1.2	V
<b>DYNAMIC CHARACTERISTICS (note 4)</b>						
Input capacitance	$C_{iss}$	$V_{DS} = -16V, V_{GS} = 0V, f = 1MHz$		113	170	pF
Output capacitance	$C_{oss}$			15	25	pF
Reverse transfer capacitance	$C_{rss}$			9	15	pF
<b>SWITCHING CHARACTERISTICS (note 4)</b>						
Turn-on delay time (note 3)	$t_{d(on)}$	$V_{GS} = -4.5V, V_{DS} = -10V,$ $I_D = -200mA, R_{GEN} = 10\Omega$		9		ns
Turn-on rise time (note 3)	$t_r$			5.8		ns
Turn-off delay time (note 3)	$t_{d(off)}$			32.7		ns
Turn-off fall time (note 3)	$t_f$			20.3		ns

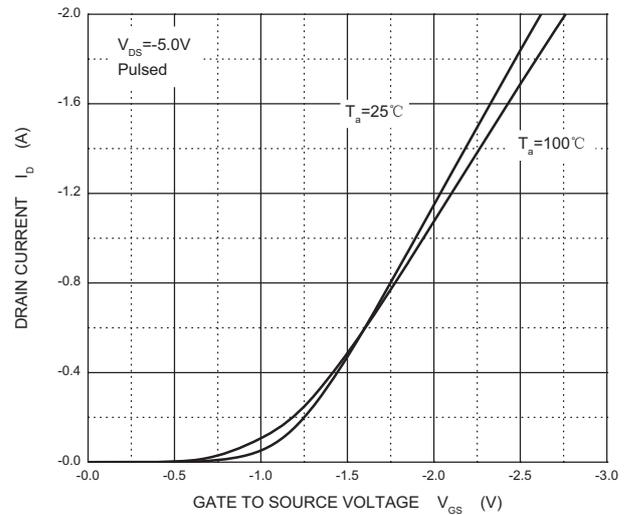
**Notes :**

1. Surface mounted on FR4 board using the minimum recommended pad size.
2. Pulse Test : Pulse Width=300 $\mu s$ , Duty Cycle=2%.
3. Switching characteristics are independent of operating junction temperatures.
4. Guaranteed by design, not subject to producing.

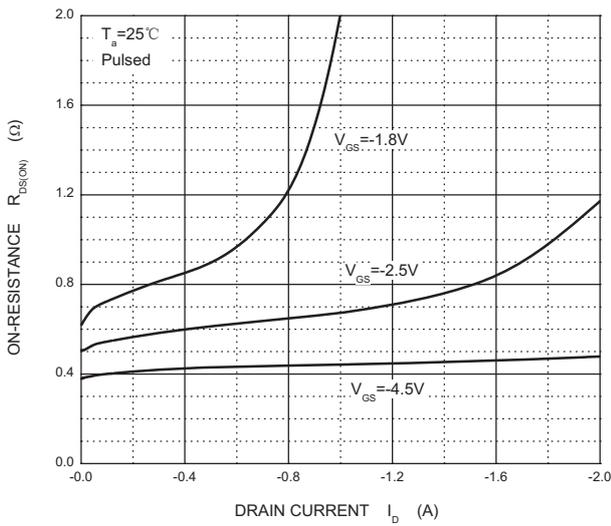
Output Characteristics



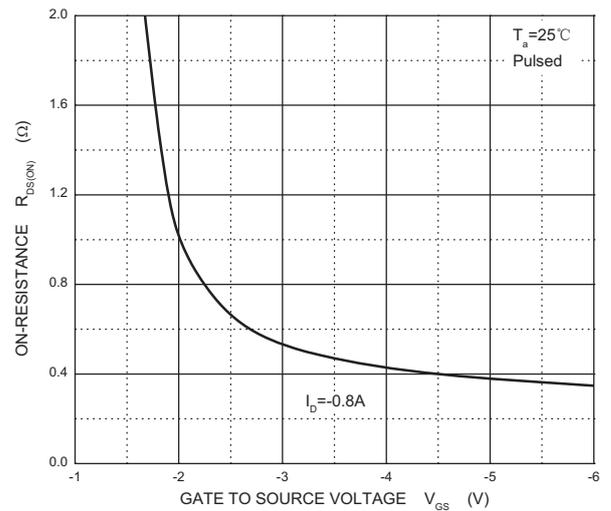
Transfer Characteristics



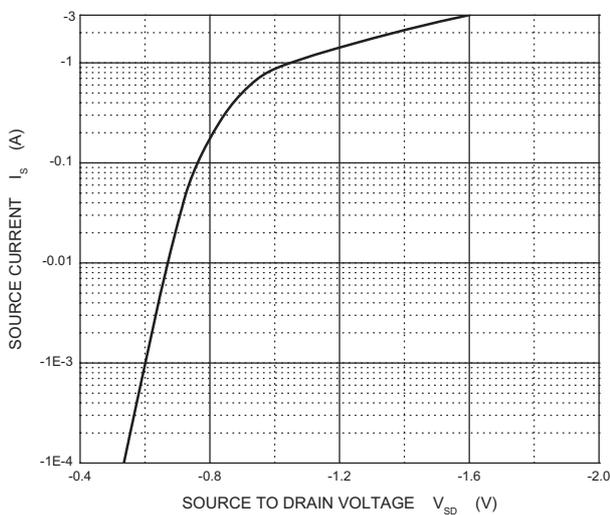
$R_{DS(ON)}$  —  $I_D$



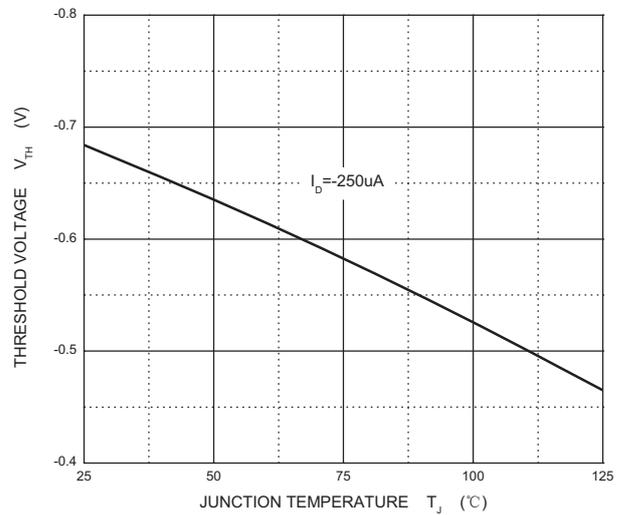
$R_{DS(ON)}$  —  $V_{GS}$

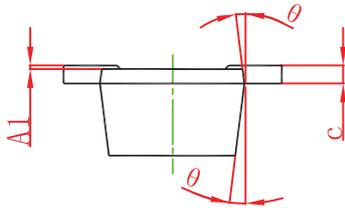
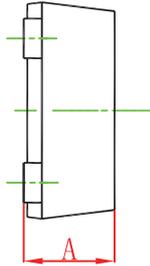
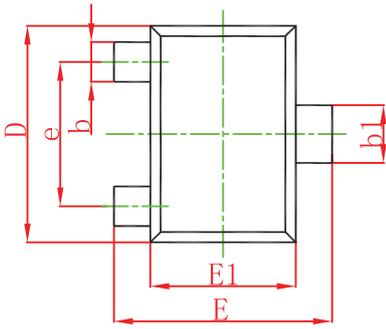


$I_S$  —  $V_{SD}$

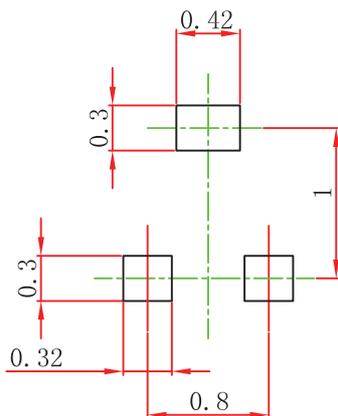


Threshold Voltage



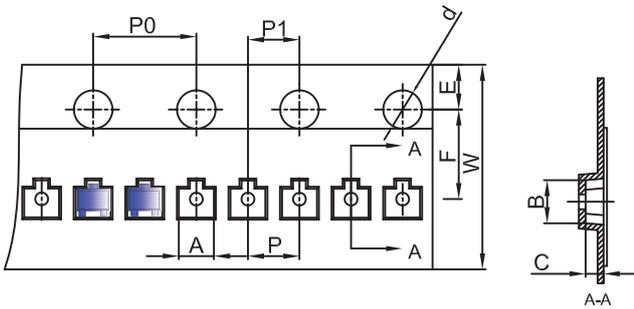


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.430	0.500	0.017	0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c	0.080	0.150	0.003	0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	



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

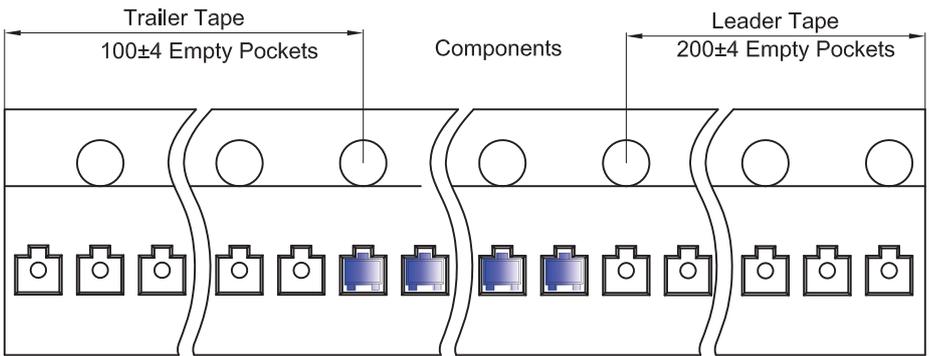
SOT-723 Embossed Carrier Tape



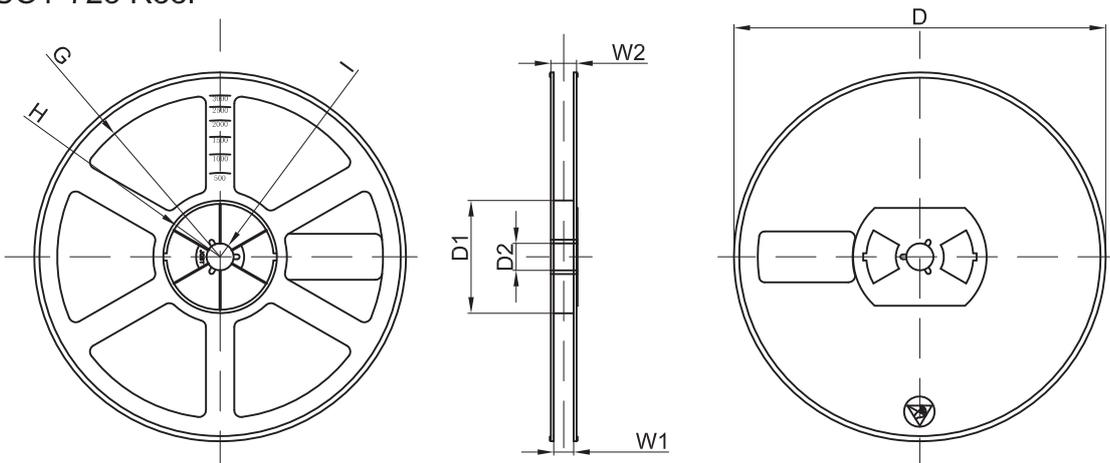
**Packaging Description:**  
 SOT-723 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 8,000 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-723	1.33	1.45	0.61	Ø1.50	1.75	3.50	4.00	2.00	2.00	8.00

SOT-723 Tape Leader and Trailer



SOT-723 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)
8000 pcs	7 inch	120,000 pcs	203×203×195	480,000 pcs	438×438×220	