

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Extremely low threshold voltage

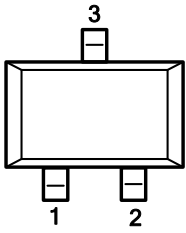
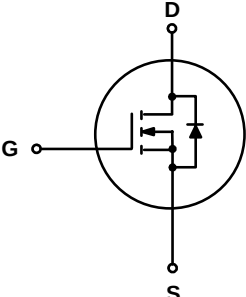
1.2 Applications

- ☒ Portable appliances

1.3 Quick reference

- ☒ $BV \geq 20\text{ V}$
- ☒ $P_{\text{tot}} \leq 1\text{ W}$
- ☒ $I_D \leq 4.4\text{ A}$
- ☒ $R_{\text{DS(ON)}} \leq 35\text{ m}\Omega @ V_{\text{GS}} = 4.5\text{ V}$
- ☒ $R_{\text{DS(ON)}} \leq 48\text{ m}\Omega @ V_{\text{GS}} = 2.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View SOT23	
2	Source(S)		
3	Drain(D)		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	20	-	V
V_{GS}	Gate-Source Voltage	$T_A = 25\text{ }^{\circ}\text{C}$	-	± 12	V
I_D^*	Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 4.5\text{ V}$	-	4.4	A
$I_{DM}^{*,**}$	Pulsed Drain Current	$T_A = 25\text{ }^{\circ}\text{C}, V_{GS} = 4.5\text{ V}$	-	17.6	A
P_{tot}^*	Total Power Dissipation	$T_A = 25\text{ }^{\circ}\text{C}$	-	1	W
T_{stg}	Storage Temperature		- 55	150	$^{\circ}\text{C}$
T_J	Junction Temperature		-	150	$^{\circ}\text{C}$
I_S^*	Diode Forward Current	$T_A = 25\text{ }^{\circ}\text{C}$	-	4.4	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD} = 20\text{ V}, L = 1.0\text{ mH}$	-	12	mJ
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	125	$^{\circ}\text{C} / \text{W}$

Notes :

- * Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$
- ** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

4. Marking Information

Product Name	Marking
KJ2302S	2302

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJ2302S	SOT23			3000	

Note: KUAJIJEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C)

6. Electrical Characteristics ($T_A = 25\text{ }^{\circ}\text{C}$ Unless Otherwise Noted)

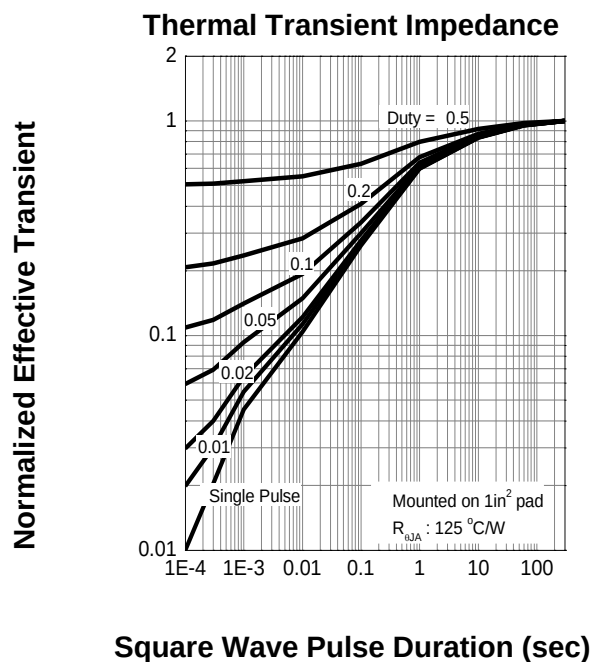
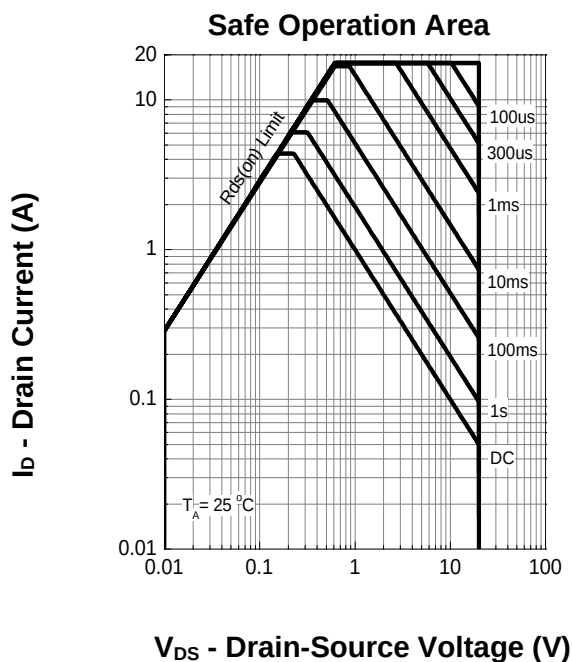
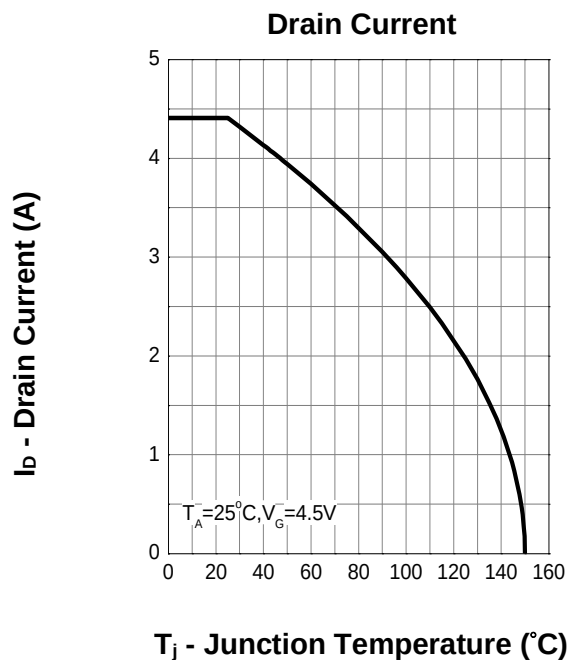
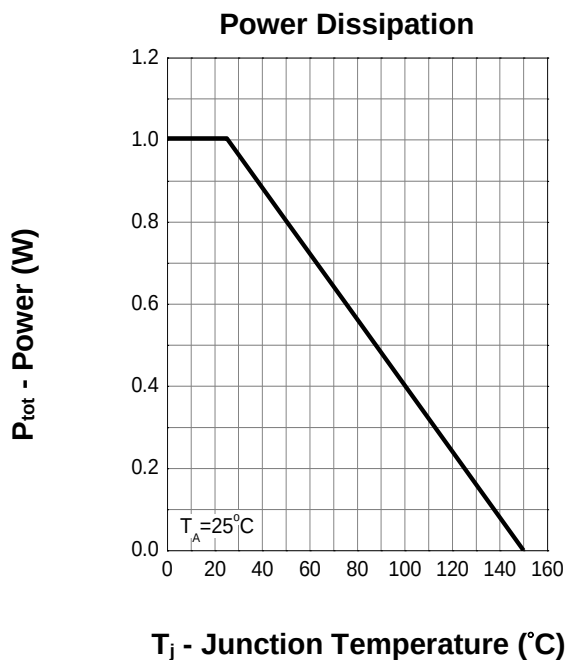
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = 250 μA	20	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	0.5	-	1	V
I _{DSS}	Drain Leakage Current	V _{DS} = 16 V, V _{GS} = 0 V	-	-	1	μA
		T _J = 85 °C	-	-	30	μA
I _{GSS}	Gate Leakage Current	V _{GS} = ± 12 V, V _{DS} = 0 V	-	-	± 100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} = 4.5 V, I _{DS} = 3 A	-	28	35	m Ω
		V _{GS} = 2.5 V, I _{DS} = 2 A	-	37	48	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 3 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} = 3 A, dI _{SD} / dt = 100 A / μs	-	9.4	-	nS
Q _{rr}	Reverse Recovery Charge		-	2.8	-	nC
Dynamic Characteristics ^b						
C _{iSS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 10 V Frequency = 1 MHz	-	278	-	pF
C _{oSS}	Output Capacitance		-	52	-	
C _{rSS}	Reverse Transfer Capacitance		-	46	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 10 V, V _{GEN} = 4.5 V, R _G = 4.5 Ω, R _L = 3.3 Ω, I _{DS} = 3 A	-	3.9	-	nS
t _r	Turn-on Rise Time		-	28	-	
t _{d(off)}	Turn-off Delay Time		-	16	-	
t _f	Turn-off Fall Time		-	23	-	
Q _g	Total Gate Charge	V _{GS} = 4.5 V, V _{DS} = 10 V, I _{DS} = 3 A	-	4	-	nC
Q _{gs}	Gate-Source Charge		-	1	-	
Q _{gd}	Gate-Drain Charge		-	1.2	-	

Notes :

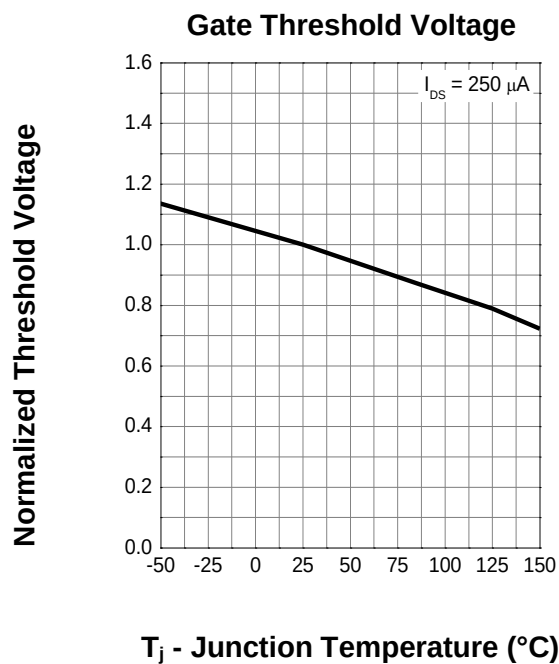
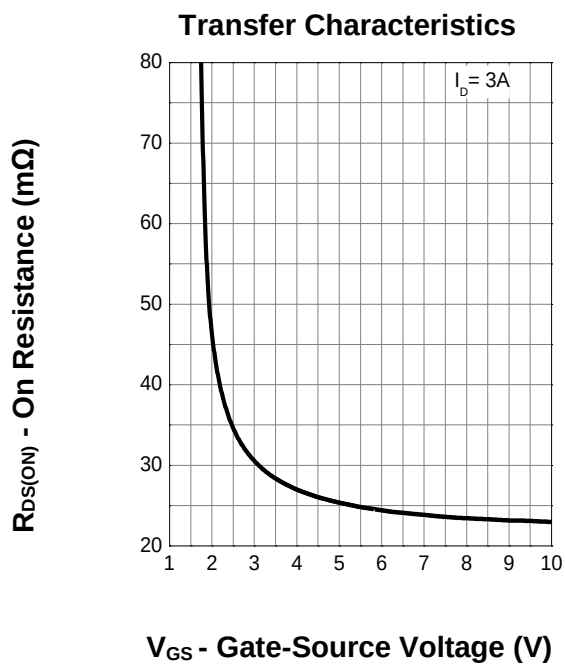
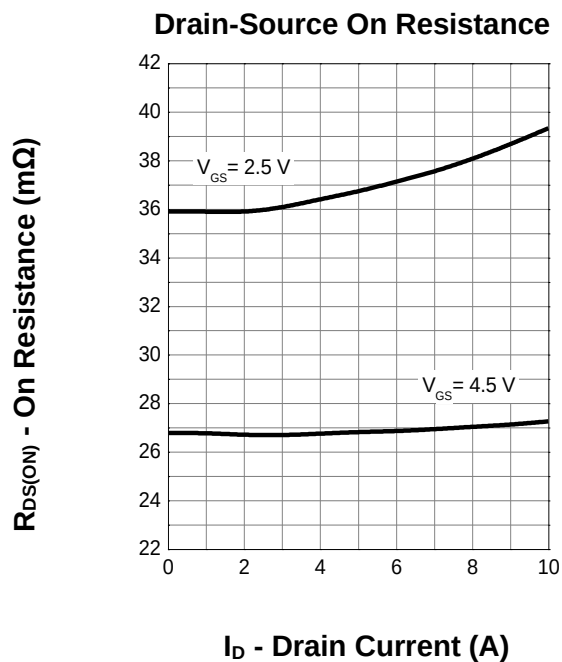
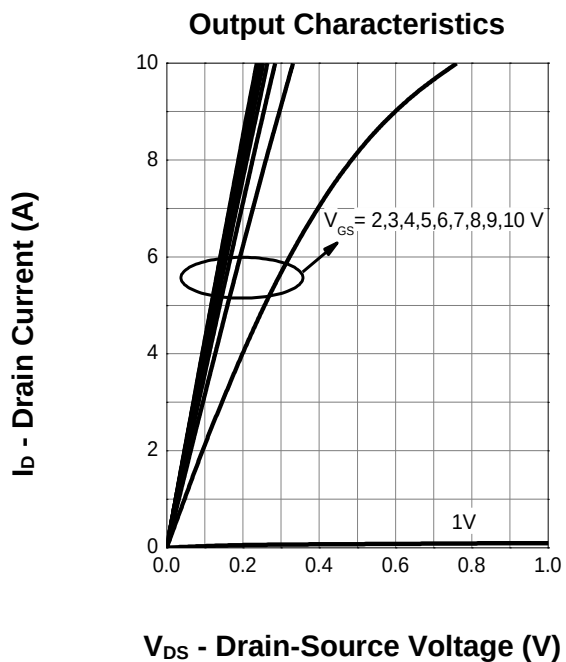
a : Pulse test ; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$

b : Guaranteed by design, not subject to production testing

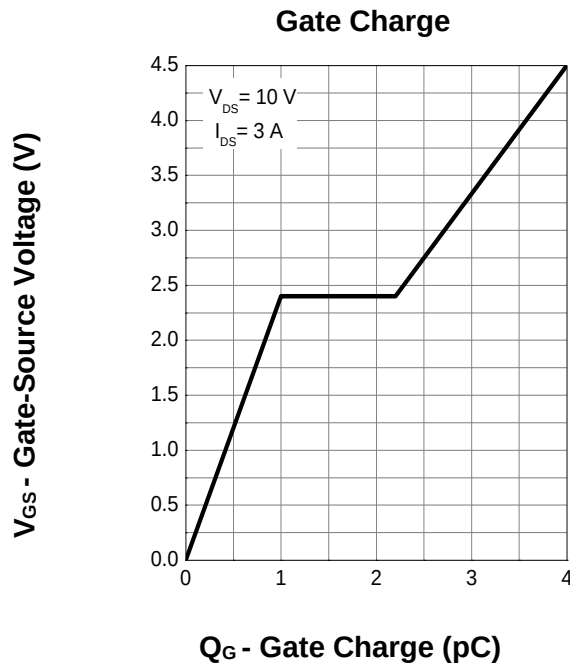
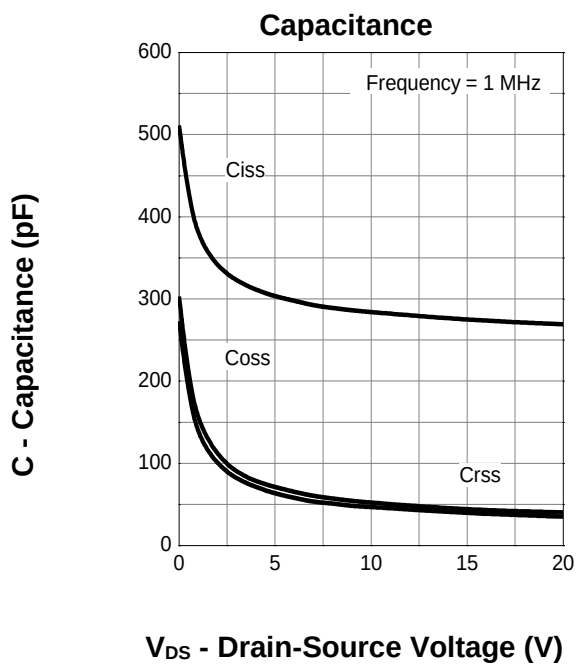
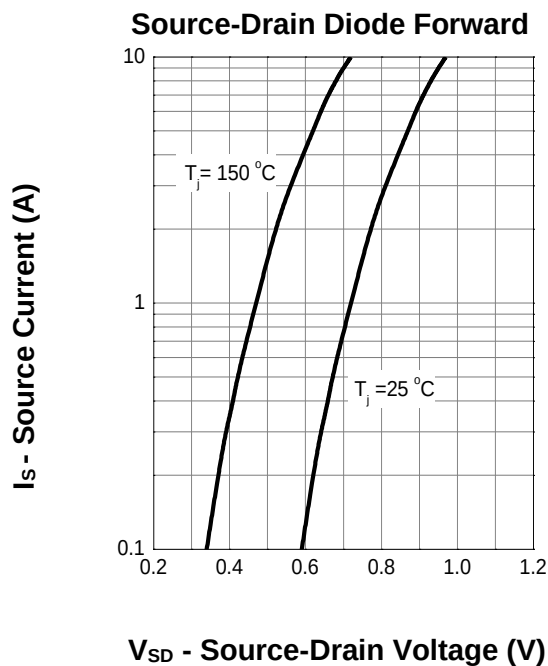
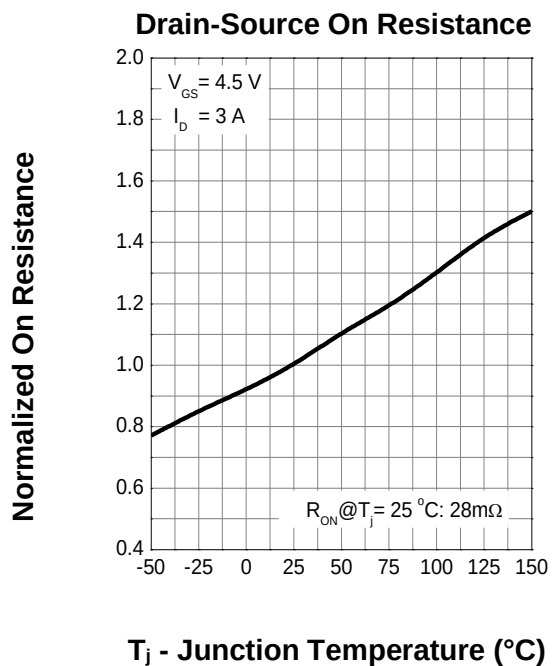
7. Typical Characteristics



7. Typical Characteristics (cont.)

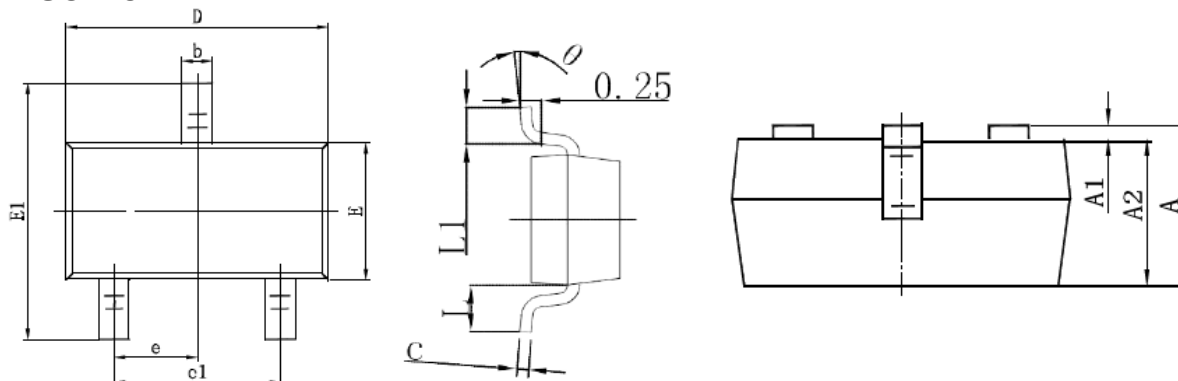


7. Typical Characteristics (cont.)



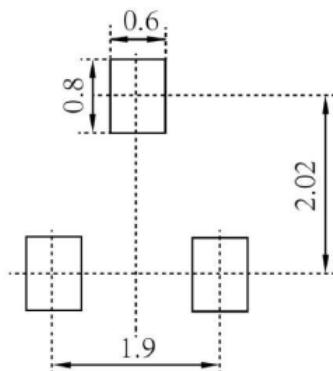
8. Package Dimensions

SOT23



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	0.950 BSC	
e1	1.800	2.000
L	0.550 REF	
L1	0.300	0.500
θ	0°	8°

SOT-23 Suggested Pad Layout

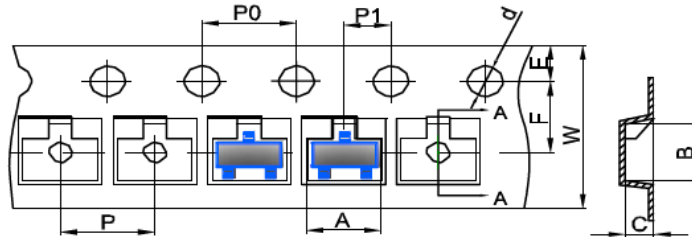


Note:

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

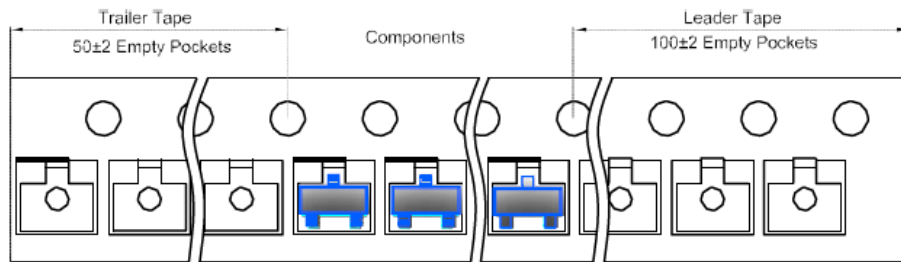
9. SOT-23 Tape and Reel

SOT-23 Embossed Carrier Tape

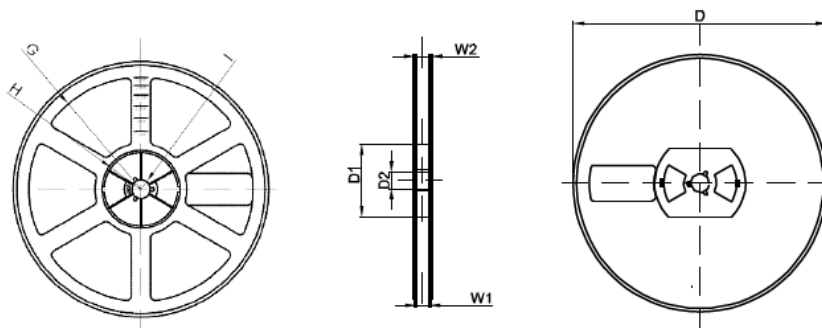


DIMENSIONS ARE IN MILLIMETER										
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SOT-23 Tape Leader and Trailer



SOT-23 Reel



DIMENSIONS ARE IN MILLIMETER								
REEL OPTION	D	D1	D2	G	H	I	W1	W2
7" DIA	Ø178	54.40	13.00	R78	R25.60	R6.50	9.50	12.30
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1