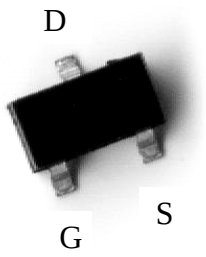
P-Channel Enhancement Mode MOSFET

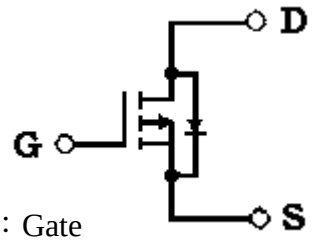
SOT-23



Features:

- Low gate charge
- Compact and low profile SOT-23 package
- Advanced trench process technology
- High density cell design for ultra low on resistance
- Pb-free lead plating and halogen-free package

BV_{DSS}		-30V
I_D @T_A=25°C , V_{GS}=-10V		-4.5A
$R_{DSON(TYP)}$	V_{GS}=-10V, I_D=-4.5A	41mΩ
	V_{GS}=-4.5V, I_D=-3.5A	60mΩ



G：Gate
S：Source
D：Drain

Ordering Information

Device	Package	Shipping
KNP5103	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @T_A=25°C , V_{GS}=-10V		I_D	-4.5	A
Continuous Drain Current @T_A=70°C , V_{GS}=-10V			-3.5	
Pulsed Drain Current @V_{GS}=10V (Notes 1, 2)		I_{DM}	-20	
ESD susceptibility		V_{ESD}	600 (Note 4)	V
Maximum Power Dissipation (Note 3)	T_A=25°C	P_D	1.38	W
	T_A=75°C		0.83	W
Operating Junction and Storage Temperature		Tj, Tstg	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width≤ 300μs, duty cycle≤2%.
3. Surface mounted on 1 in² copper pad of FR-4 board.
4. Human body model, 1.5kΩ in series with 100pF

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient	Rth,ja	90	°C/W

Note : Surface mounted on 1 in² copper pad of FR-4 board, 270°C/W when mounted on minimum copper pad.

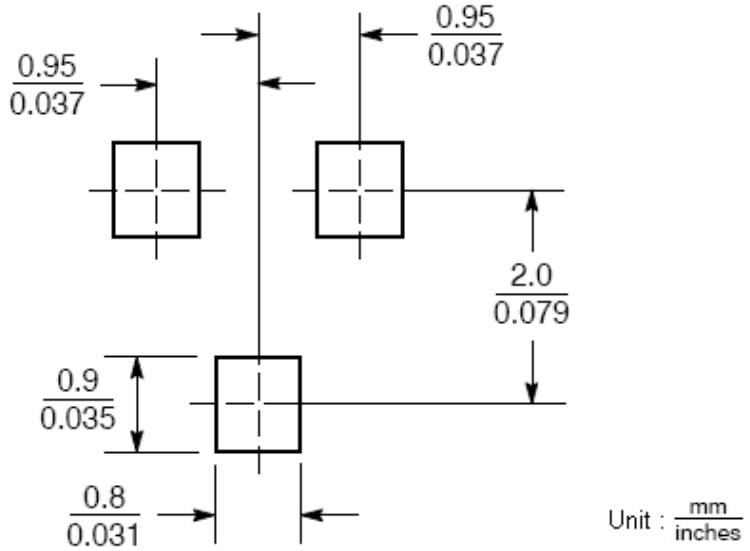
Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-30	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-1.0	-	-2.5		V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS}=-24V, V_{GS}=0V
I_{DSS}	-	-	-10		V_{DS}=-24V, V_{GS}=0V, Tj=125°C
*$R_{DS(ON)}$	-	41	50	mΩ	I_D=-4.5A, V_{GS}=-10V
	-	60	70		I_D=-3.5A, V_{GS}=-4.5V
*G_{FS}	-	4.3	-	S	V_{DS}=-10V, I_D=-4.5A
Dynamic					
Ciss	-	885	-	pF	V_{DS}=-10V, V_{GS}=0V, f=1MHz
Coss	-	86	-		
Crss	-	81	-		
*$t_{d(ON)}$	-	8	-	ns	V_{DS}=-15V, I_D=-1A, V_{GS}=-10V, R_D=15Ω , R_G=6Ω
*t_r	-	12	-		
*$t_{d(OFF)}$	-	30	-		
*t_f	-	23	-		

*Qg	-	15	-	nC	V_{DS}=-15V, I_D=-4.5A, V_{GS}=-10V
*Qgs	-	3	-		
*Qgd	-	7	-		
Source-Drain Diode					
*I_S	-	-	-4.5	A	
*I_{SM}	-	-	-18		
*V_{SD}	-	-	-1.2	V	V_{GS}=0V, I_S=-1A
*trr	-	32	-	ns	I_F=-4.5A, dI_F/dt=100A/μs
*Qrr	-	13.5	-	nC	

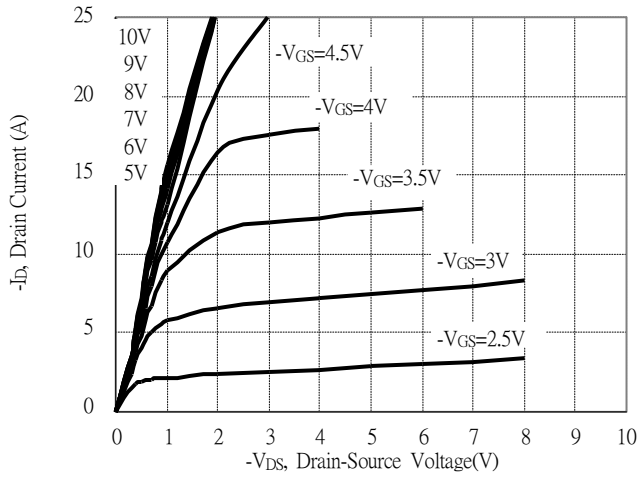
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

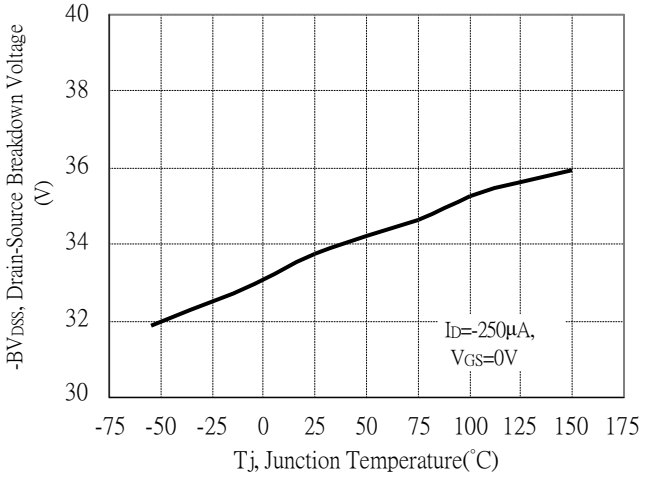


Typical Characteristics

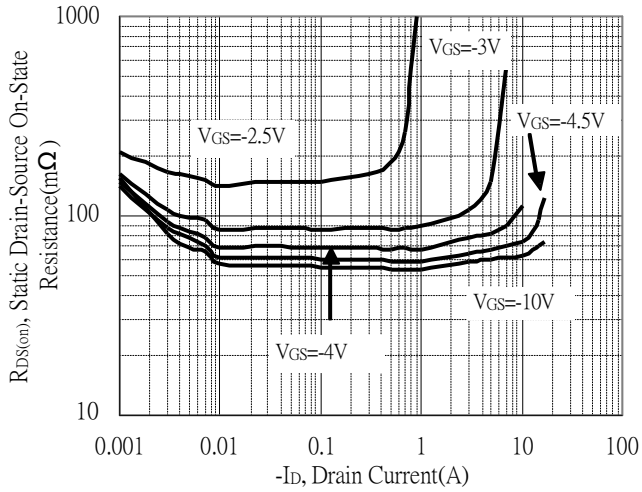
Typical Output Characteristics



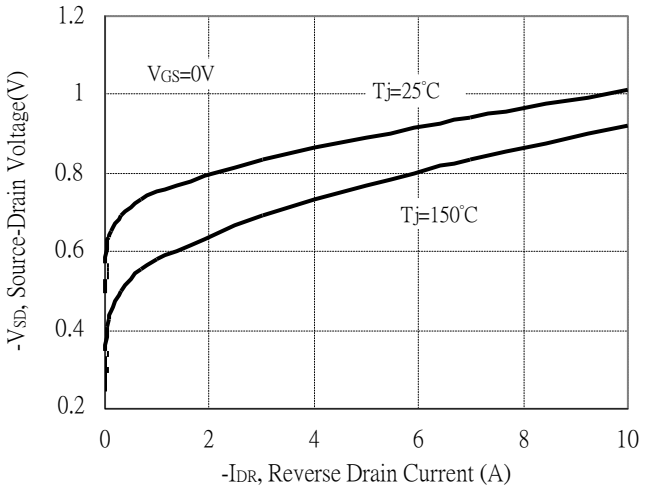
Brekdown Voltage vs Ambient Temperature



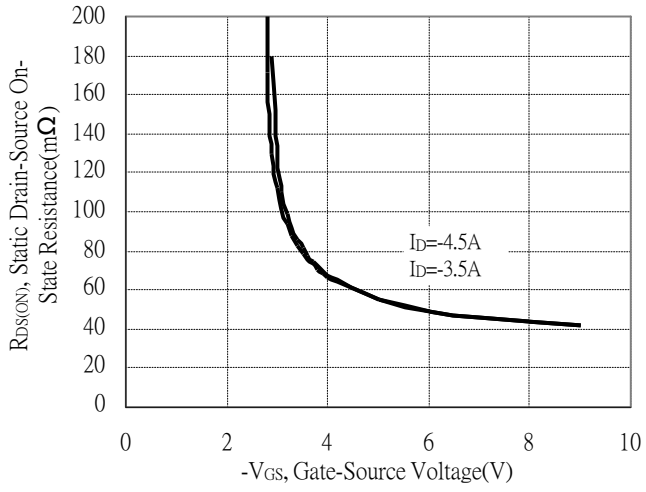
Static Drain-Source On-State resistance vs Drain Current



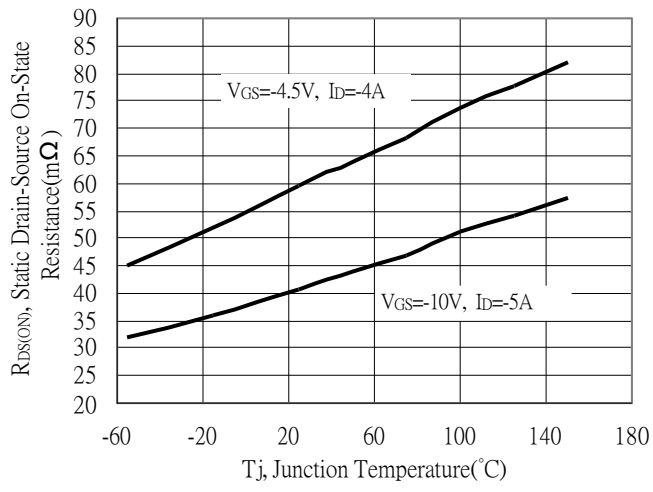
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

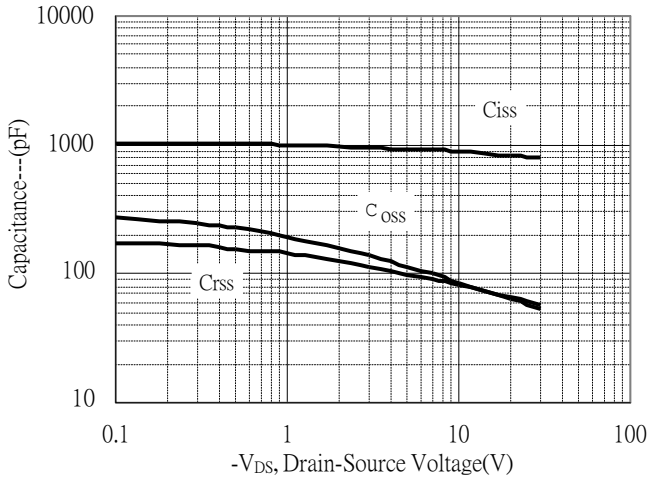


Drain-Source On-State Resistance vs Junction Tempearture

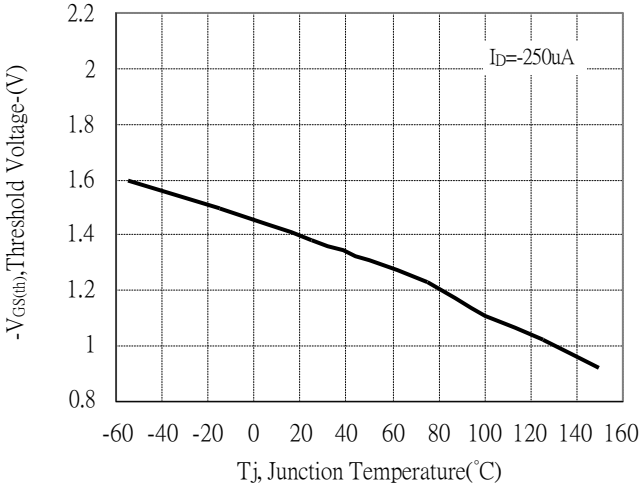


Typical Characteristics(Cont.)

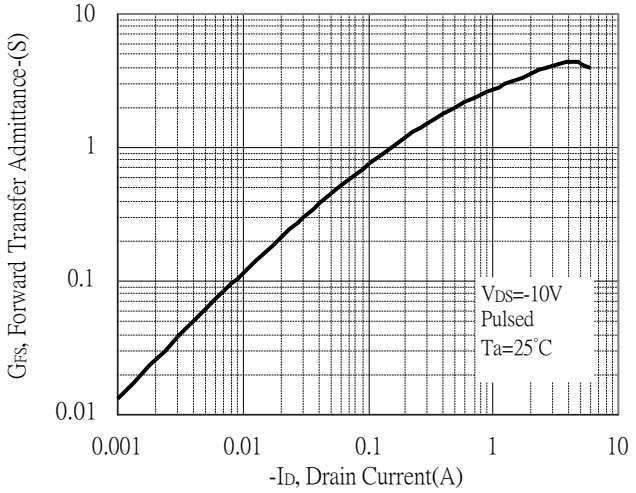
Capacitance vs Drain-to-Source Voltage



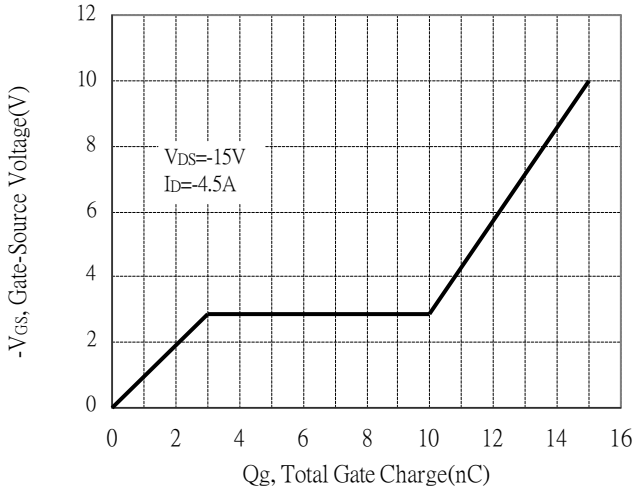
Threshold Voltage vs Junction Tempearture



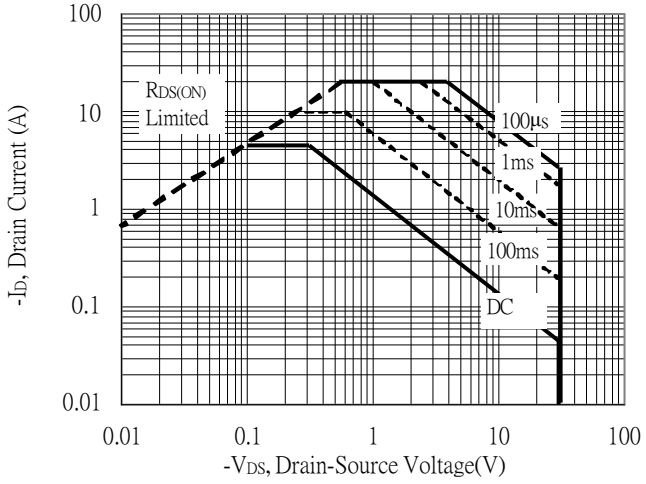
Forward Transfer Admittance vs Drain Current



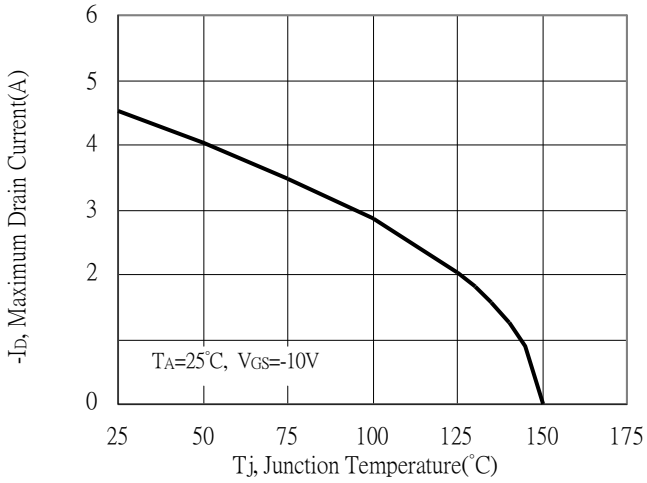
Gate Charge Characteristics



Maximum Safe Operating Area

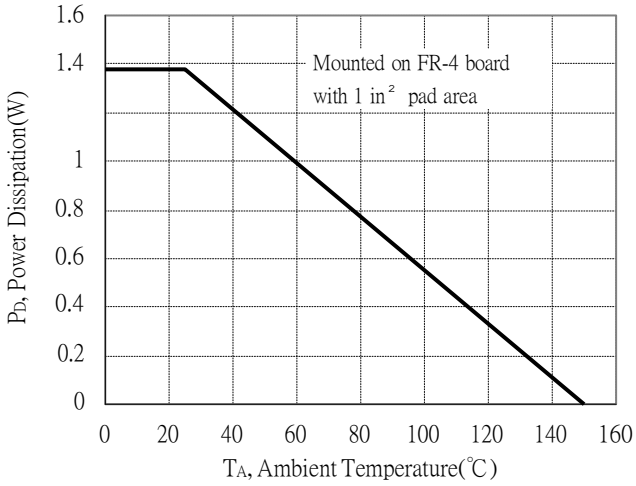


Maximum Drain Current vs JunctionTemperature

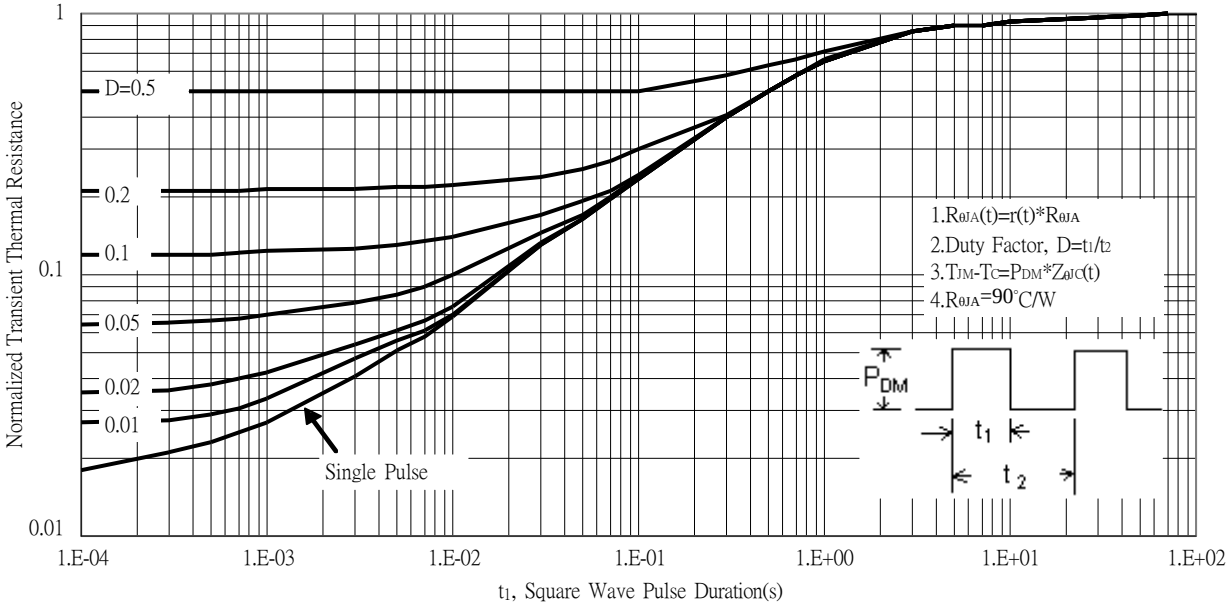


Typical Characteristics(Cont.)

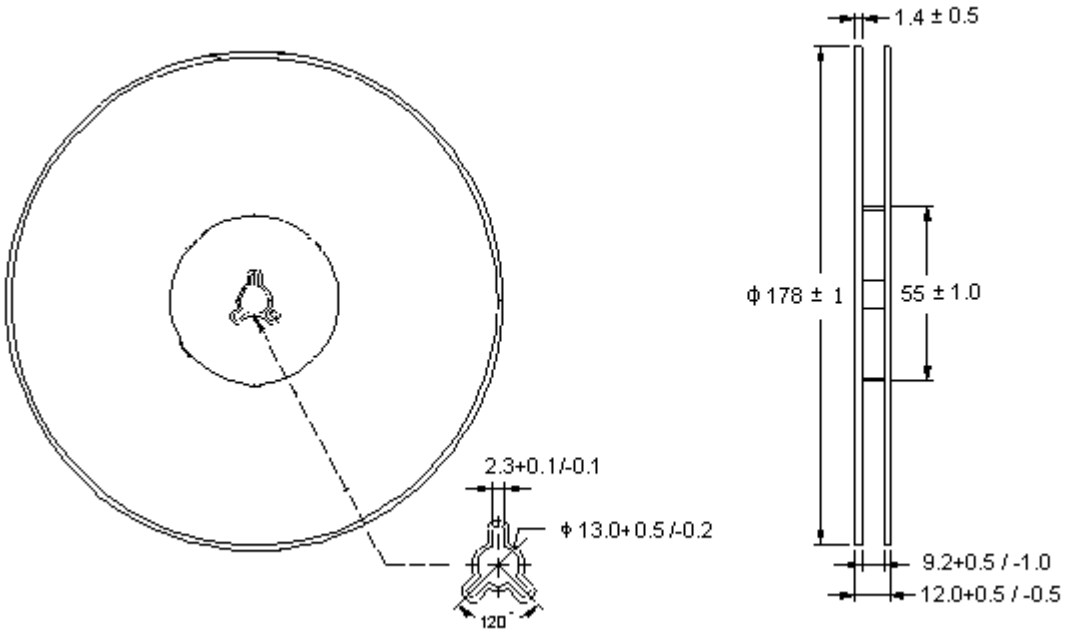
Power Derating Curve



Transient Thermal Response Curves

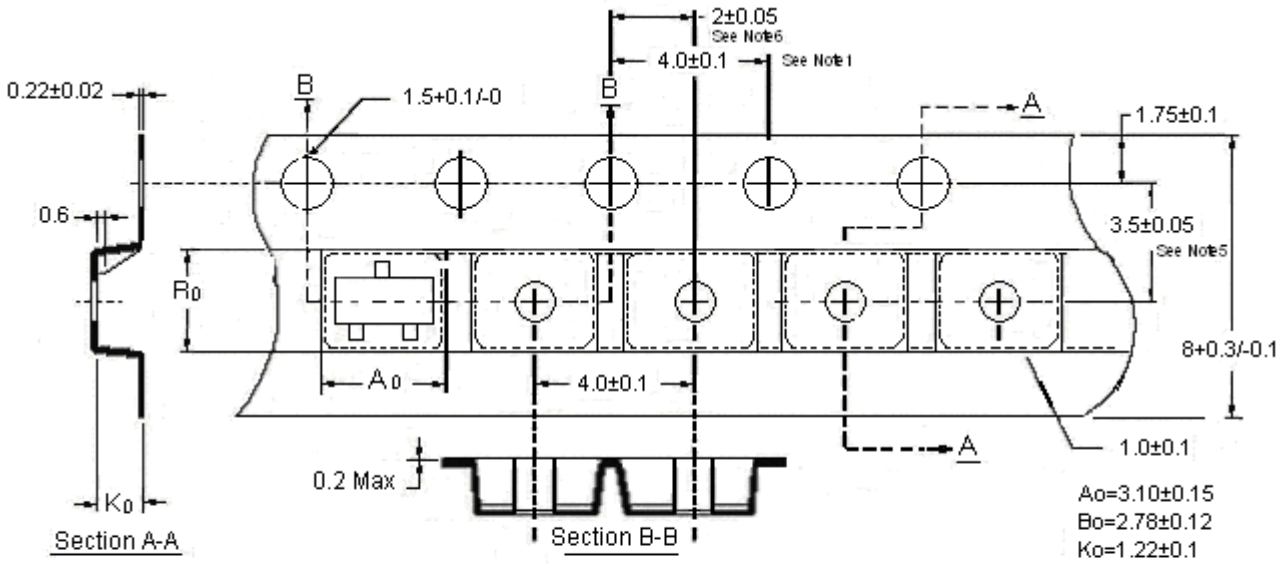


Reel Dimension



Unit: millimeter

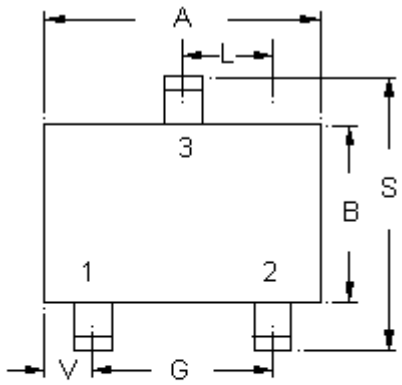
Carrier Tape Dimension

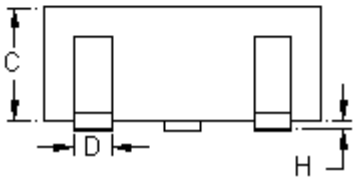


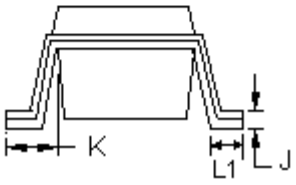
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

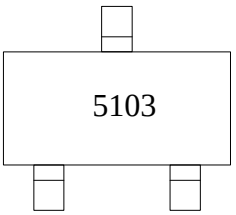
SOT-23 Dimension







Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package

Style: Pin 1.Gate 2.Source 3.Drain

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0032	0.0079	0.08	0.20
B	0.0472	0.0669	1.20	1.70	K	0.0118	0.0266	0.30	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1161	2.10	2.95
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10	L1	0.0118	0.0197	0.30	0.50