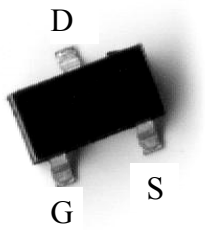
20V N-Channel Enhancement Mode MOSFET

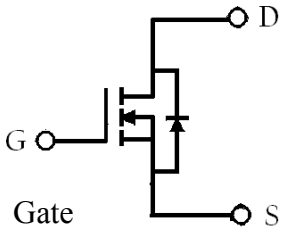
SOT-23



Features:

- Simple drive requirement
- Small package outline
- Capable of 2.5V gate drive
- Pb-free lead plating and halogen-free package

BV_{DSS}	20V
I_D@V_{GS}=4.5V, T_A=25°C	3.6A
R_{DSON}@V_{GS}=4.5V, I_D=3.6A	29mΩ(typ.)
R_{DSON}@V_{GS}=2.5V, I_D=3.1A	39mΩ(typ.)



G：Gate
S：Source
D：Drain

Ordering Information

Device	Package	Shipping
K2300	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}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current @V_{GS}=4.5V, T_A=25°C (Note 3)	I_D	3.6	A
Continuous Drain Current @V_{GS}=4.5V, T_A=70°C (Note 3)		2.9	A
Pulsed Drain Current (Notes 1, 2)	I_{DM}	10	A
Maximum Power Dissipation@ T_A=25℃	P_D	1.38 (Note 3)	W
Linear Derating Factor		0.01	W/°C
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, t≤5s; 270°C/W when mounted on minimum copper pad.

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient, max	$R_{\theta JA}$	90	°C/W
Thermal Resistance, Junction-to-Case, max	$R_{\theta JC}$	80	°C/W

Note : Surface mounted on 1 in² copper pad of FR-4 board, t≤5s; 270°C/W when mounted on minimum copper pad.

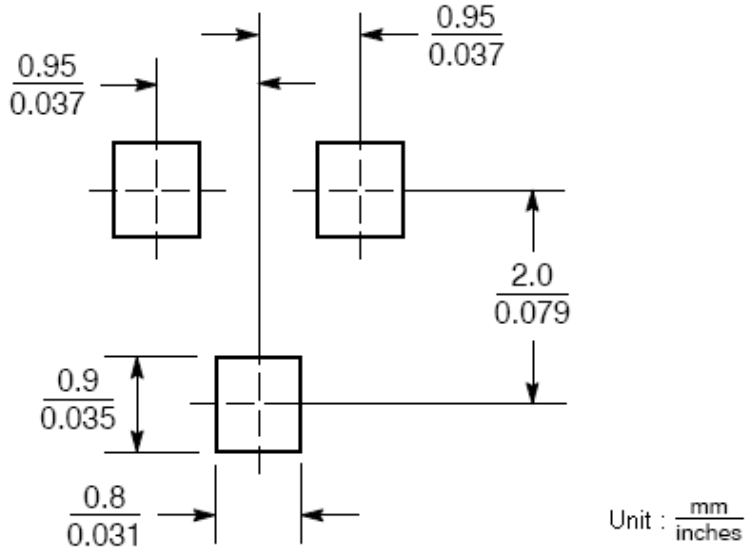
Electrical Characteristics (Tj=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.1	-	V/°C	Reference to 25°C, I_D=1mA
$V_{GS(th)}$	0.5	0.7	1.2	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±12V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=20V, V_{GS}=0
	-	-	10	μA	V_{DS}=20V, V_{GS}=0 (Tj=70°C)
*$R_{DS(ON)}$	-	29	55	mΩ	I_D=3.6A, V_{GS}=4.5V
	-	39	70		I_D=3.1A, V_{GS}=2.5V
*G_{FS}	-	7.5	-	S	V_{DS}=5V, I_D=3.6A
Dynamic					
Ciss	-	440	-	pF	V_{DS}=10V, V_{GS}=0, f=1MHz
Coss	-	61	-		
Crss	-	59	-		
$t_{d(ON)}$	-	4.5	-	ns	V_{DS}=10V, I_D=3.6A, V_{GS}=5V R_G=6Ω , R_D=2.8Ω
t_r	-	7.4	-		
$t_{d(OFF)}$	-	19	-		
t_f	-	7.2	-		

Qg	-	4.4	-	nC	V_{DS}=10V, I_D=3.6A, V_{GS}=4.5V
Qgs	-	0.7	-		
Qgd	-	1.7	-		
Source-Drain Diode					
*V_{SD}	-	0.8	1.2	V	V_{GS}=0V, I_S=1.6A
I_S	-	-	1	A	V_D=V_G=0V, V_S=1.2V
I_{SM}	-	-	10		

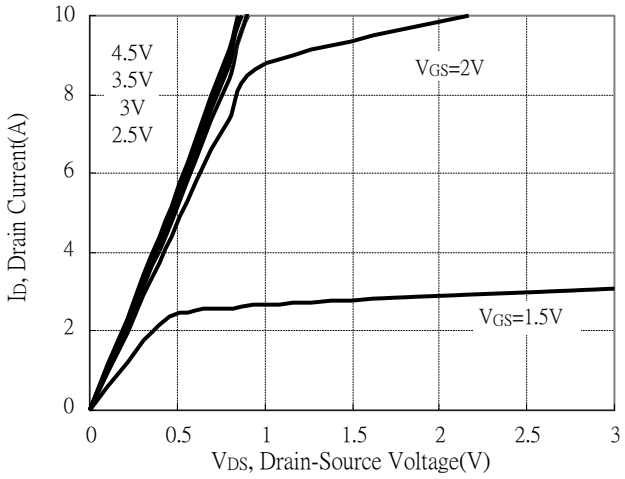
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Recommended Soldering Footprint

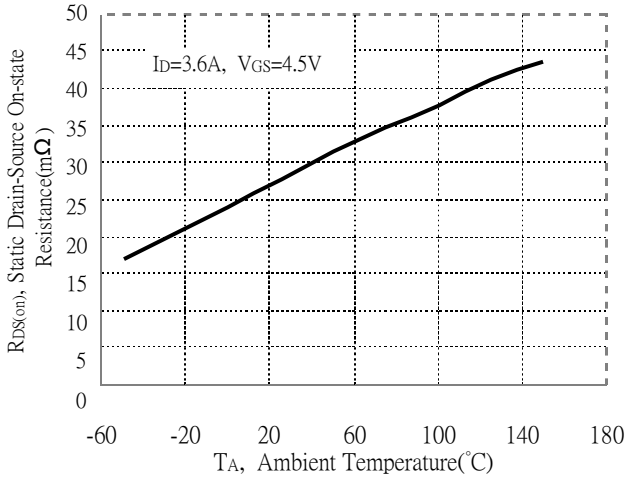


Typical Characteristics

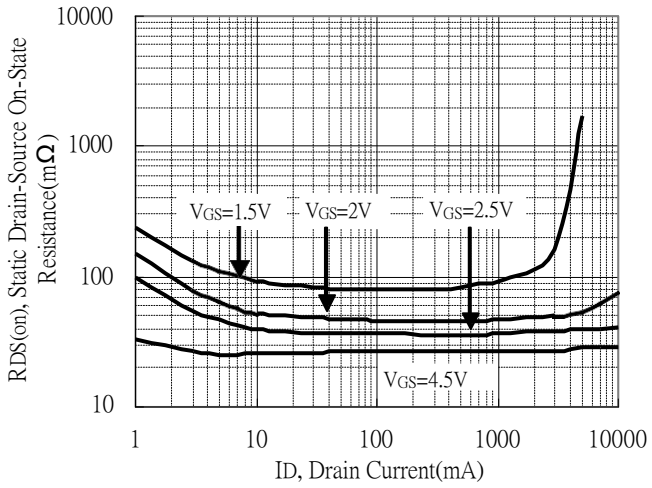
Typical Output Characteristics



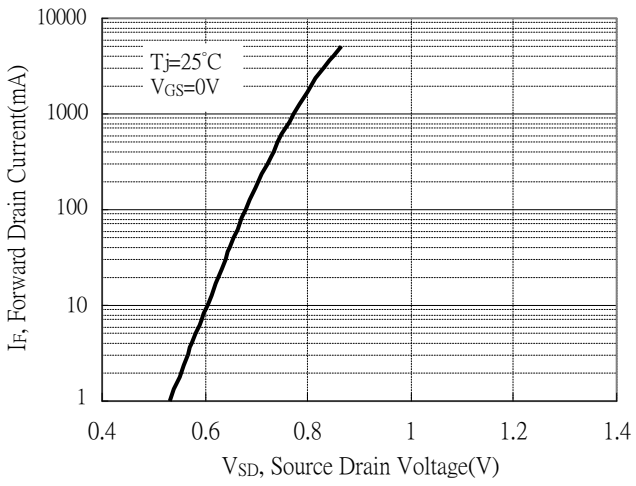
Static Drain-Source On-resistance vs Ambient Temperature



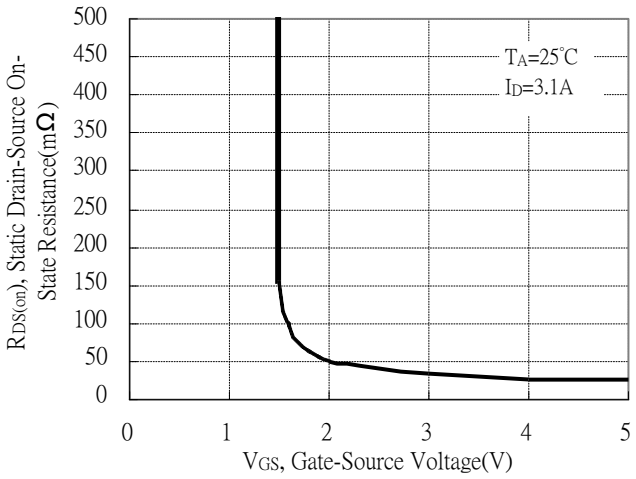
Static Drain-Source On-State resistance vs Drain Current



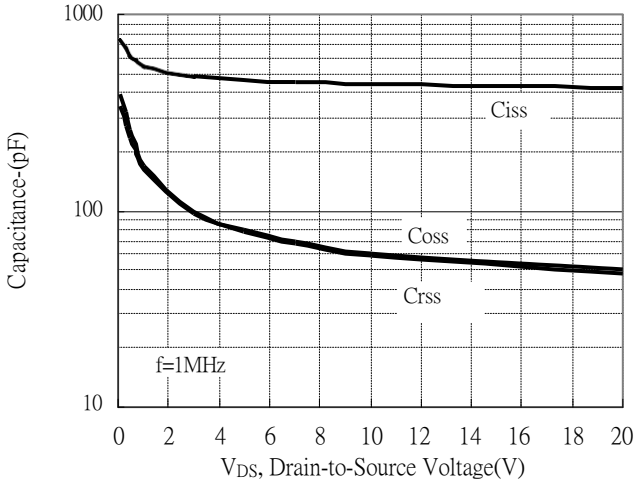
Forward Drain Current vs Source-Drain Voltage



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

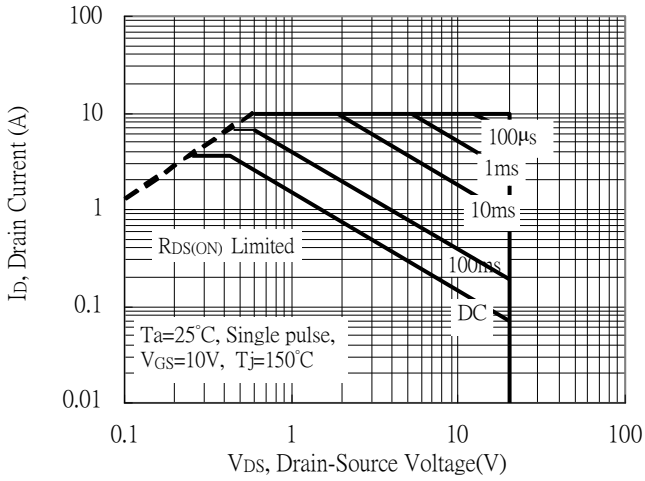


Capacitance vs Reverse Voltage

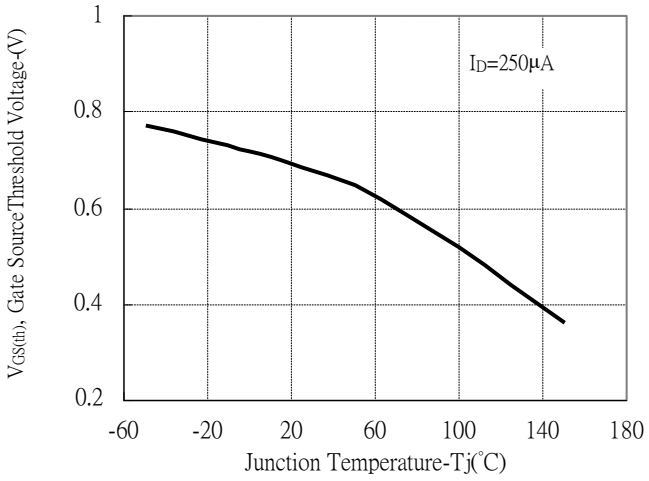


Typical Characteristics(Cont.)

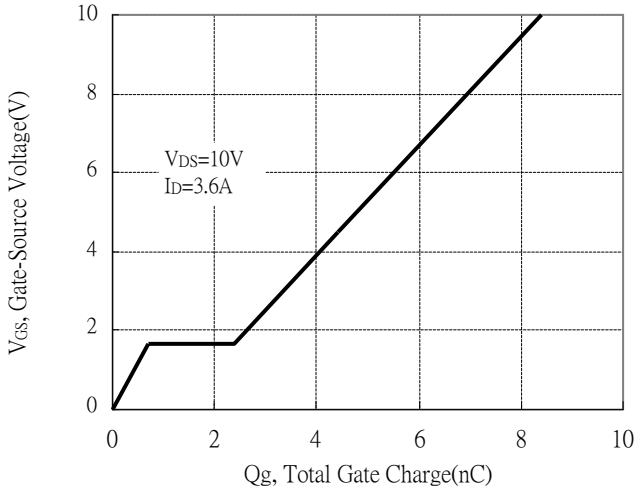
Maximum Safe Operating Area



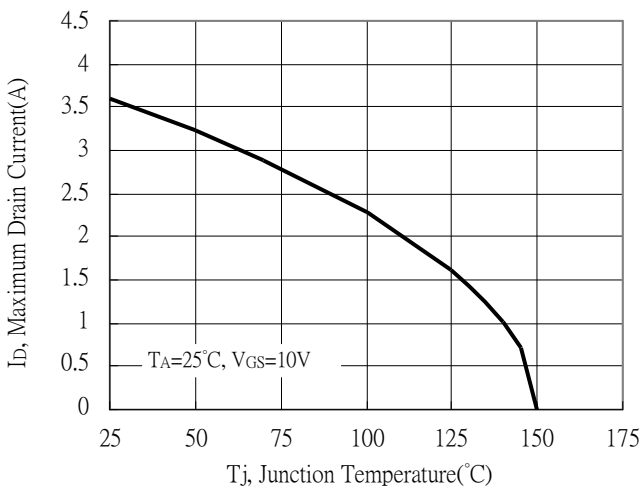
Gate Threshold Voltage vs Ambient Temperature



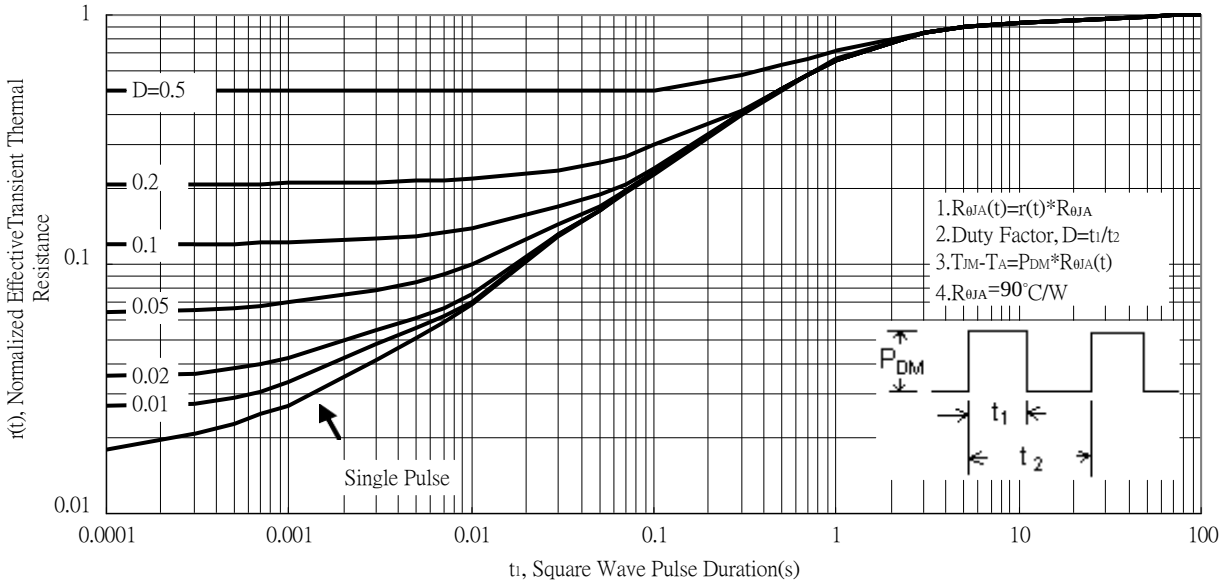
Gate Charge Characteristics



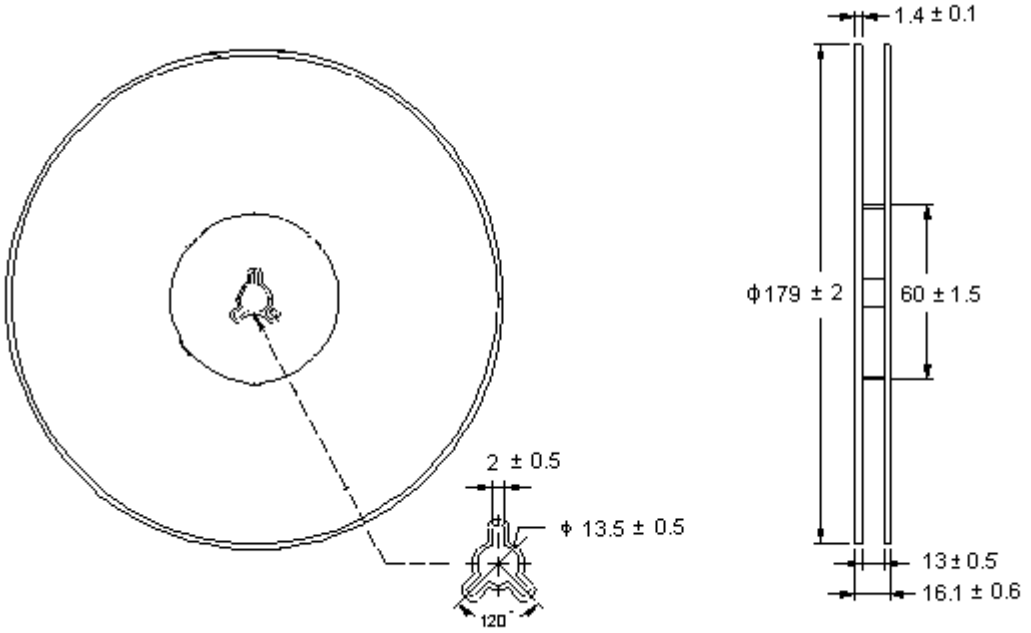
Maximum Drain Current vs Junction Temperature



Transient Thermal Response Curves

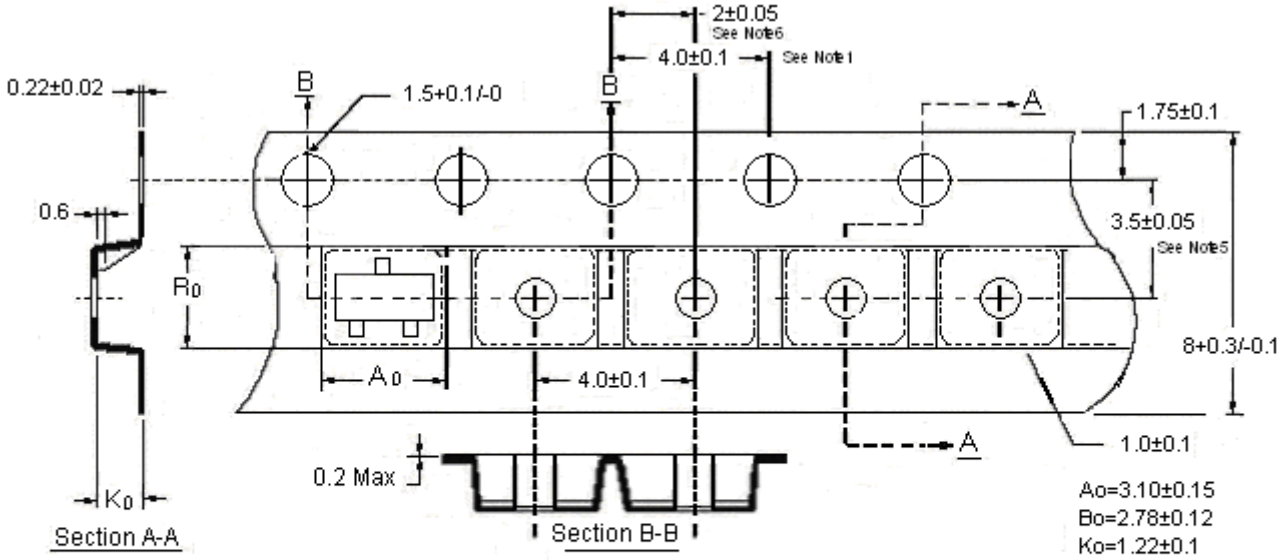


Reel Dimension



Unit: millimeter

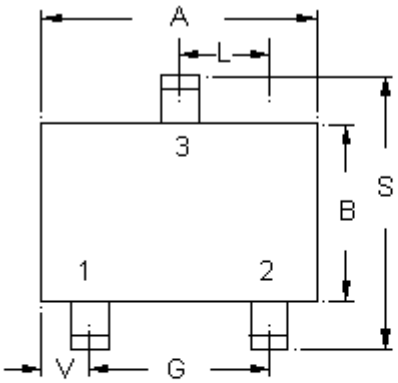
Carrier Tape Dimension

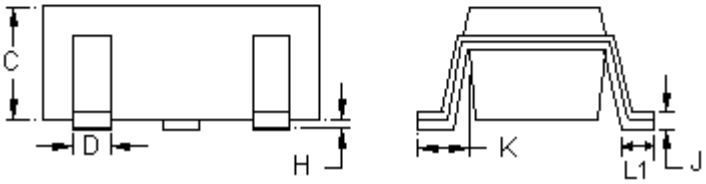


Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.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

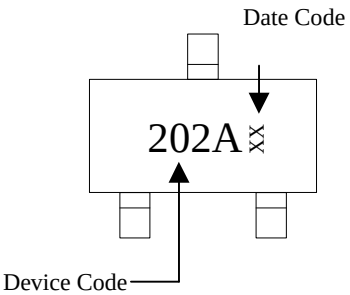
Unit : millimeter

SOT-23 Dimension





Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package
Package Code: N3

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

*: Typical

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