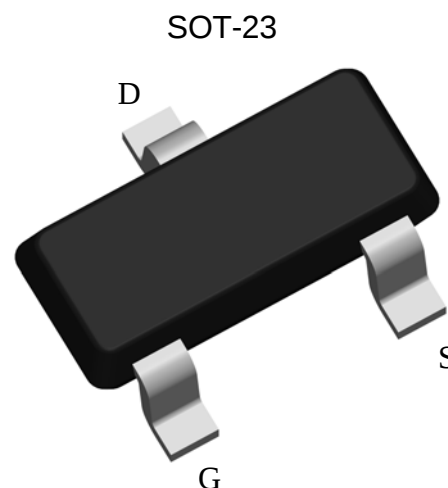


-20V P-Channel Enhancement Mode MOSFET

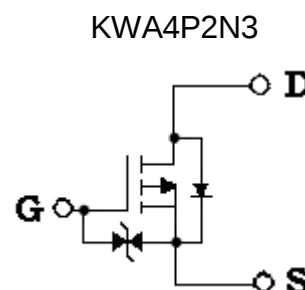
Features:

- For load switch application only
- Compact and low profile SOT-23 package
- Advanced trench process technology
- High density cell design for ultra low on resistance
- ESD protected gate
- Pb-free lead plating package

Outline



Symbol



G : Gate
S : Source
D : Drain

BV_{DSS}	-20V
$I_D @ V_{GS}=-4.5V, T_A=25^{\circ}C$	-4.3A
$R_{DS(on)} @ V_{GS}=-4.5V, I_D=-4A$	37.5m Ω (typ)
$R_{DS(on)} @ V_{GS}=-2.5V, I_D=-4A$	52.4m Ω (typ)
$R_{DS(on)} @ V_{GS}=-1.8V, I_D=-2A$	76.6m Ω (typ)

Ordering Information

Device	Package	Shipping
KWA4P2N3	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}	±8	
Continuous Drain Current @ T _A =25°C, V _{GS} =-4.5V (Note 4)	I _D	-4.3	A
Continuous Drain Current @ T _A =70°C, V _{GS} =-4.5V (Note 4)		-3.4	
Pulsed Drain Current (Notes 1, 2)	I _{DM}	-30	
ESD susceptibility (Note 3)	V _{ESD}	1500	V
Maximum Power Dissipation (Note 4)	P _D	1.25	W
Linear Derating Factor		0.01	W/°C
Operating Junction and Storage Temperature Range	T _j ; T _{stg}	-55~+150	°C

- Note : 1. Pulse width limited by maximum junction temperature.
 2. Pulse width ≤ 300μs, duty cycle ≤ 2%.
 3. Human body model, 1.5kΩ in series with 100pF
 4. Surface mounted on 1 in² copper pad of FR-4 board; 270°C/W when mounted on minimum copper pad

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient(PCB mounted)	R _{θJA}	100	°C/W

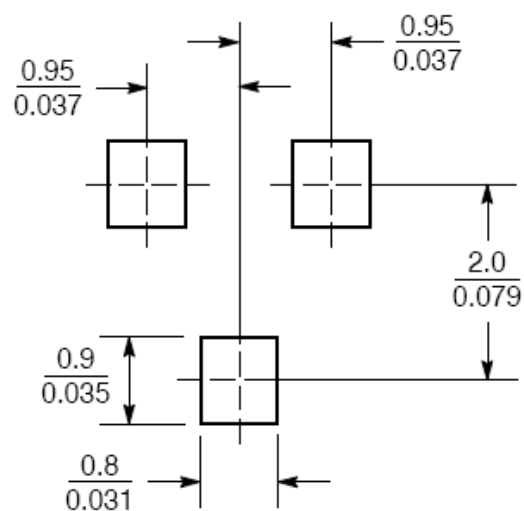
Note : Surface mounted on 1 in² copper pad of FR-4 board; 270°C/W when mounted on minimum copper pad

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-20	-	-	V	V _{GS} =0V, I _D =-250μA
ΔBV _{DSS} /ΔT _j	-	0.01	-	V/°C	Reference to 25°C, I _D =-250μA
V _{GS(th)}	-0.5	-	-1.0	V	V _{DS} =V _{GS} , I _D =-250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±8V, V _{DS} =0V
I _{DSS}	-	-	-1		V _{DS} =-16V, V _{GS} =0V
	-	-	-10		V _{DS} =-16V, V _{GS} =0V (T _j =70°C)
*R _{DS(ON)}	-	37.5	50	mΩ	I _D =-4A, V _{GS} =-4.5V
	-	52.4	75		I _D =-4A, V _{GS} =-2.5V
	-	76.6	155		I _D =-2A, V _{GS} =-1.8V
*G _{FS}	-	8.4	-	S	V _{DS} =-10V, I _D =-4A
Source-Drain Diode					
*V _{SD}	-	-0.79	-1	V	V _{GS} =0V, I _S =-1A
T _{rr}	-	8.6	-	ns	V _{GS} =0V, I _F =-4A, dI _F /dt=100A/μs
Q _{rr}	-	3.1	-	nC	

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

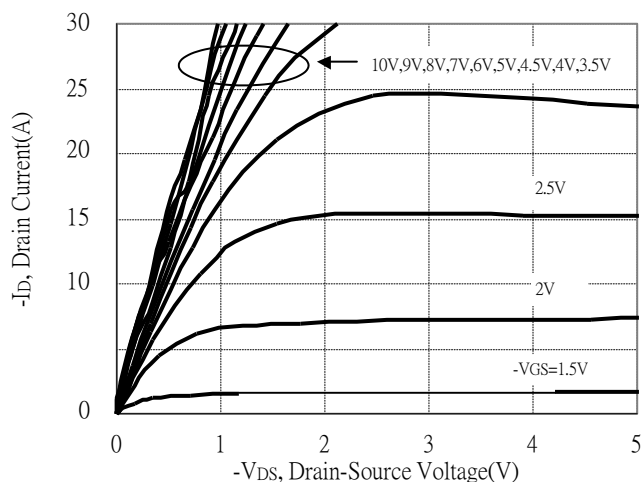
Recommended Soldering Footprint



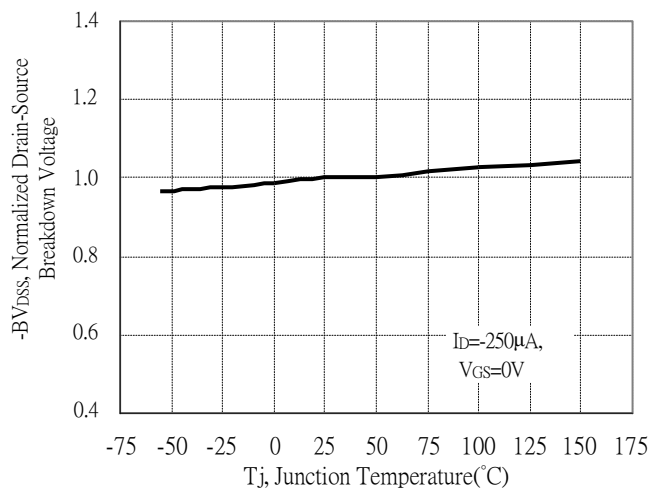
Unit : $\frac{\text{mm}}{\text{inches}}$

Typical Characteristics

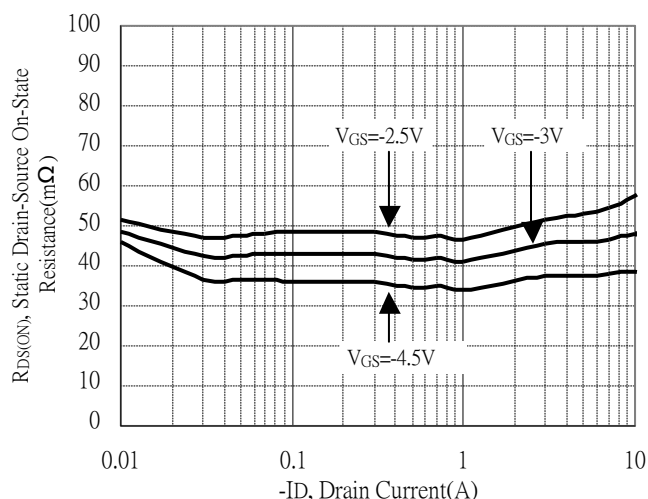
Typical Output Characteristics



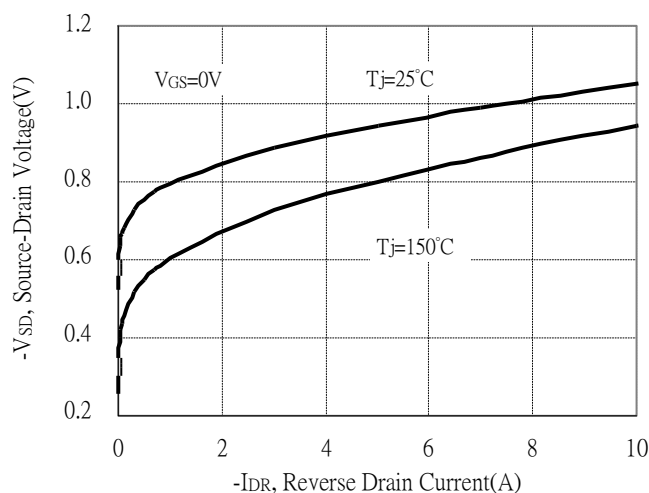
Breakdown Voltage vs Ambient Temperature



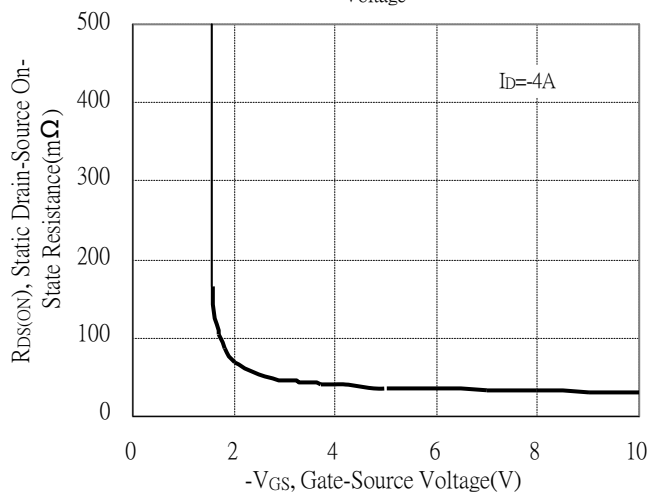
Static Drain-Source On-State resistance vs Drain Current



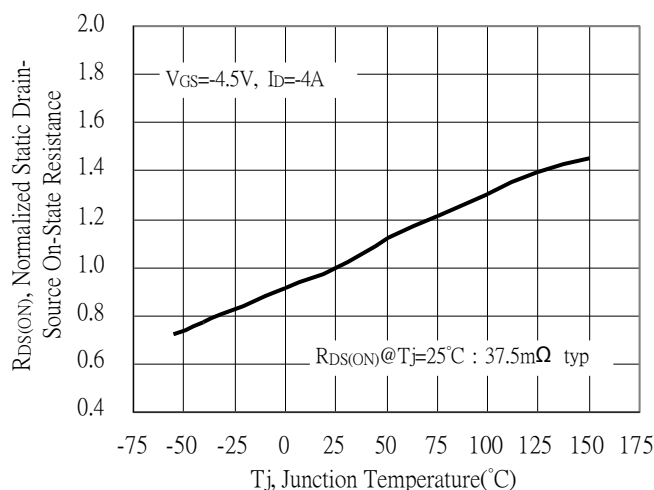
Reverse Drain Current vs Source-Drain Voltage



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

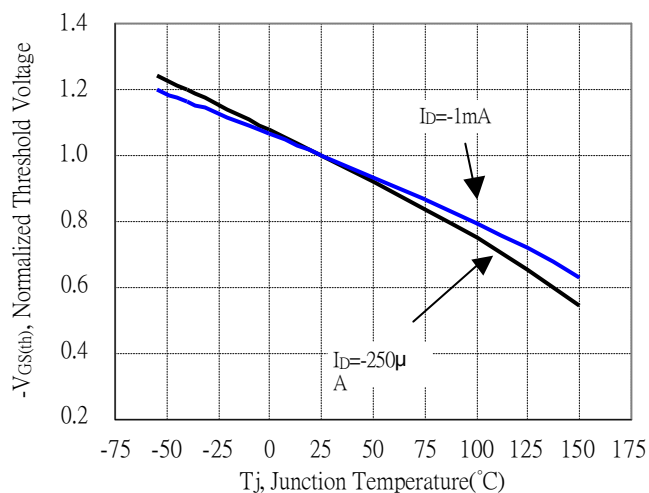


Drain-Source On-State Resistance vs Junction Temperature

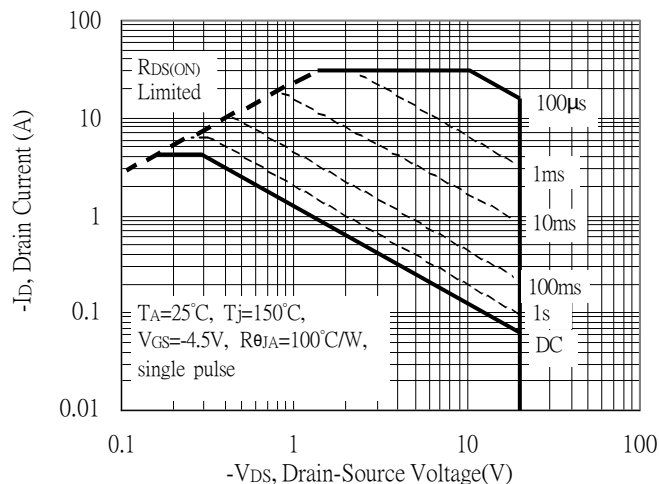


Typical Characteristics(Cont.)

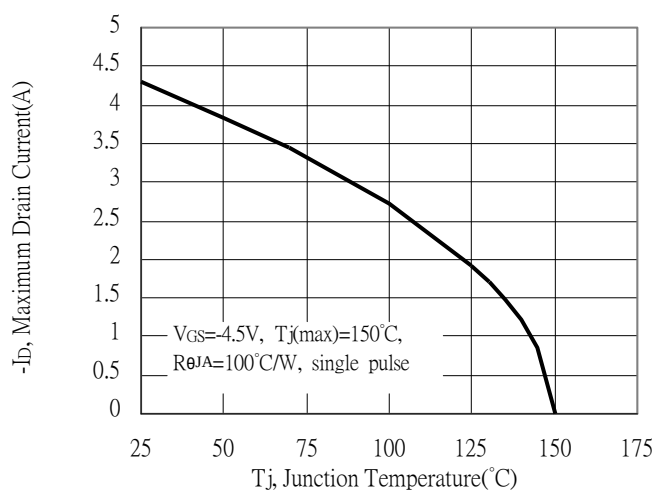
Threshold Voltage vs Junction Temperature



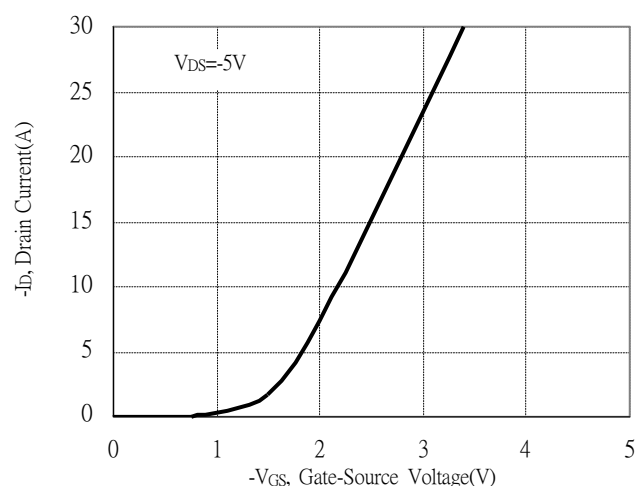
Maximum Safe Operating Area



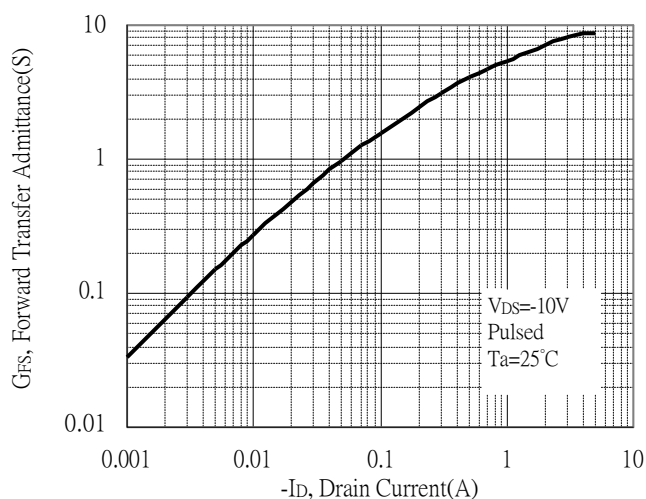
Maximum Drain Current vs Junction Temperature



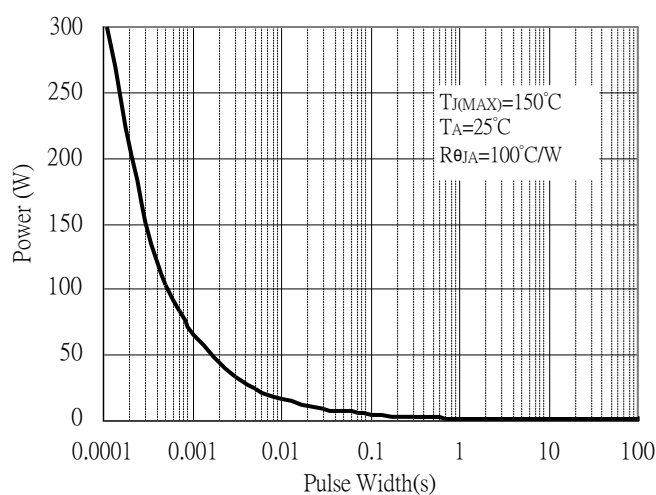
Typical Transfer Characteristics



Forward Transfer Admittance vs Drain Current

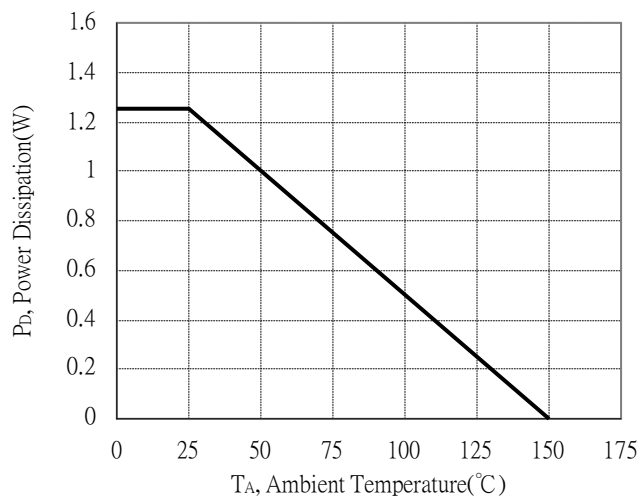


Single Pulse Power Rating, Junction to Case

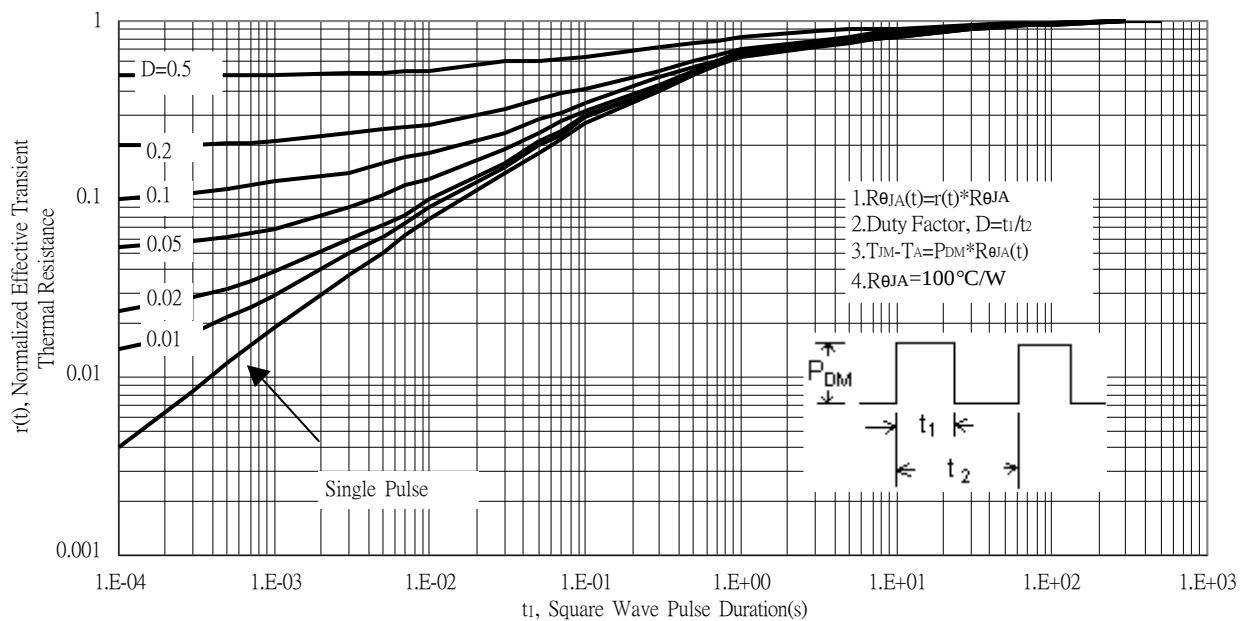


Typical Characteristics(Cont.)

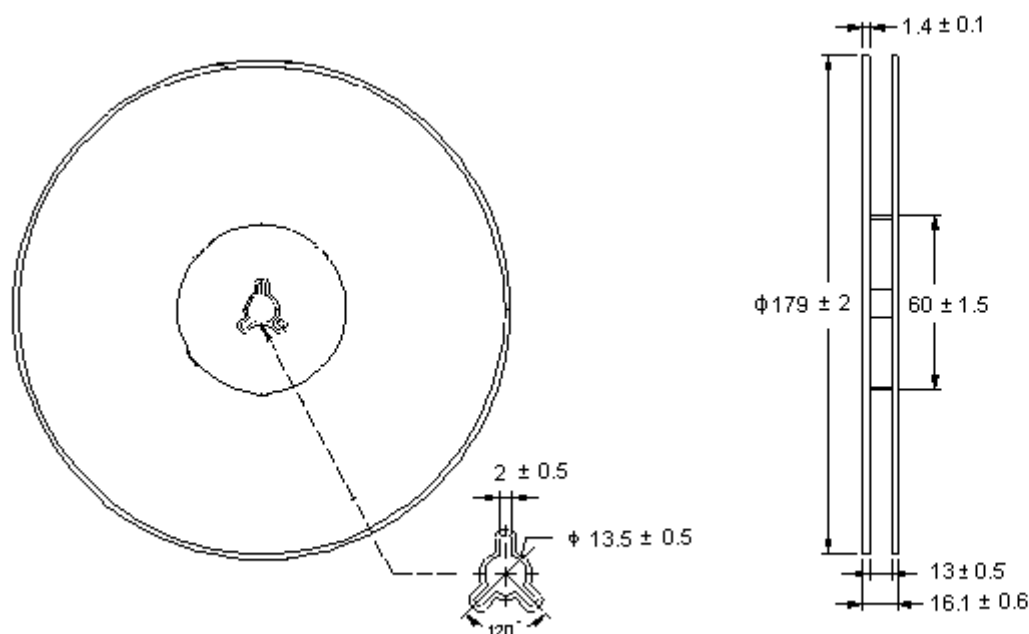
Power Derating Curve



Transient Thermal Response Curves

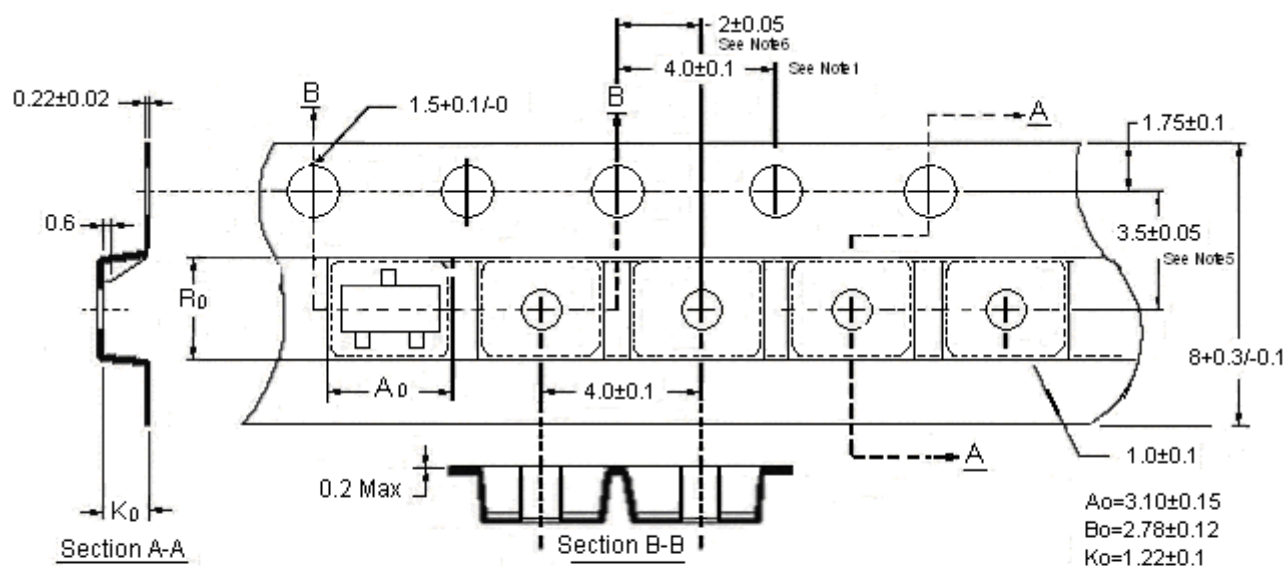


Reel Dimension



Unit: millimeter

Carrier Tape Dimension

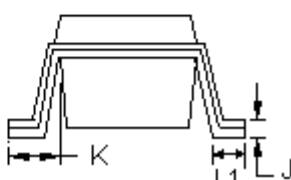
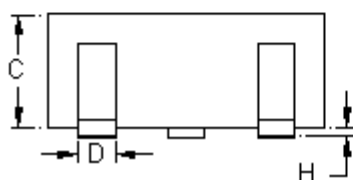
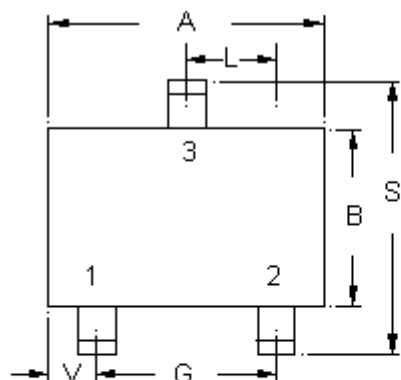


Notes:

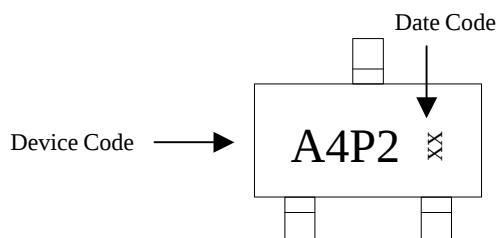
1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
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
 Package Code: N3

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