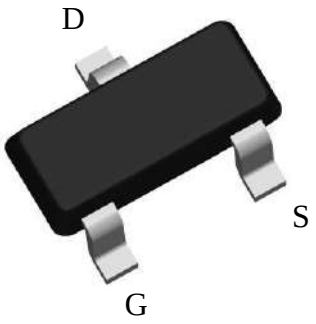
P-Channel Enhancement Mode MOSFET

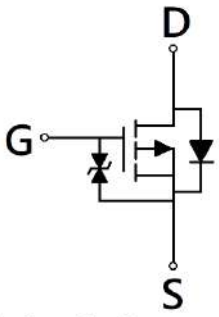
Features:

- Low On Resistance
- Low Gate Charge
- Fast Switching Characteristic
- ESD protected gate

SOT-23



BV_{DSS}	-60V
I_D@V_{GS}=-10V, T_A=25°C	-2A
$R_{DS(ON)}$ typ.@V_{GS}=-10V, I_D=-2A	145mΩ
$R_{DS(ON)}$ typ.@V_{GS}=-4.5V, I_D=-1A	210mΩ



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KWD170P06K	SOT-23 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (T_A=25°C)

Parameter			Symbol	Limits	Unit
Drain-Source Voltage			V_{DS}	-60	V
Gate-Source Voltage			V_{GS}	±20	
Continuous Drain Current @ V_{GS}=-10V, T_A=25°C		*a	I_D	-2	A
Continuous Drain Current @ V_{GS}=-10V, T_A=70°C		*a		-1.6	
Pulsed Drain Current		*b	I_{DM}	-8	
Continuous Body Diode Forward Current @ T_A=25°C		*a	I_S	-1	
Total Power Dissipation	T_A=25°C	*a	P_D	1.4	W
	T_A=70°C	*a		0.9	
Operating Junction and Storage Temperature Range			T_J, T_{stg}	-55~+150	°C

Thermal Data

Parameter		Symbol	Steady State	Unit
Thermal Resistance, Junction-to-ambient	*a	$R_{\theta JA}$	90	°C/W

Note:

*a. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR -4 board with 2 oz. copper, in a still air environment with T_A=25℃. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

*b. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃. Ratings are based on low frequency and low duty cycles to keep initial T_J=25℃.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-60	-	-	V	V_{GS}=0V, I_D=-250μA
$V_{GS(th)}$	-1	-	-2.5		V_{DS}=V_{GS}, I_D=-250μA
G_{FS}	-	3.2	-	S	V_{DS}=-10V, I_D=-2A
I_{GSS}	-	-	±10	μA	V_{GS}=±16V, V_{DS}=0V
I_{DSS}	-	-	-1		V_{DS}=-48V, V_{GS}=0V
$R_{DS(ON)}$	-	145	190	mΩ	V_{GS}=-10V, I_D=-2A
	-	210	290		V_{GS}=-4.5V, I_D=-1A
Dynamic					
Ciss	-	337	-	pF	V_{DS}=-30V, V_{GS}=0V, f=1MHz
Coss	-	36	-		
Crss	-	9	-		
Qg *1, 2	-	6.9	-	nC	V_{DS}=-30V, I_D=-2A, V_{GS}=-10V
Qgs *1, 2	-	0.9	-		
Qgd *1, 2	-	1.8	-		
$t_{d(ON)}$ *1, 2	-	40	-	ns	V_{DS}=-30V, I_D=-1A, V_{GS}=-10V, R_{GS}=6Ω
tr *1, 2	-	59	-		
$t_{d(OFF)}$ *1, 2	-	156	-		
t_f *1, 2	-	259	-		
Source-Drain Diode					
V_{SD} *1	-	-0.86	-1.2	V	I_S=-2A, V_{GS}=0V
trr	-	10	-	ns	I_F=-2A, dI_F/dt=100A/μs
Qrr	-	5.2	-	nC	

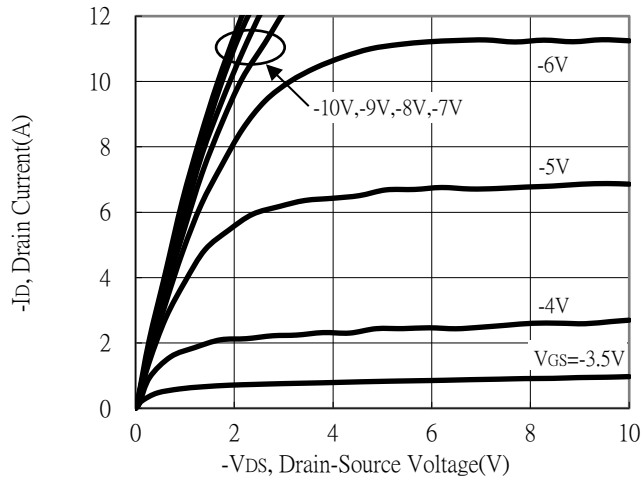
Note:

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

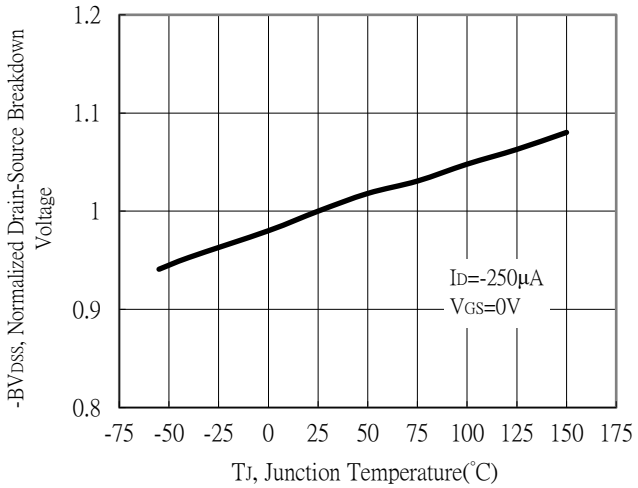
*2. Independent of operating temperature

Typical Characteristics

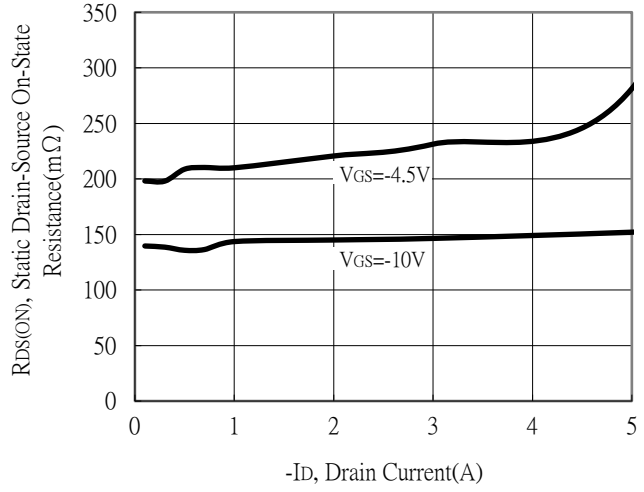
Typical Output Characteristics



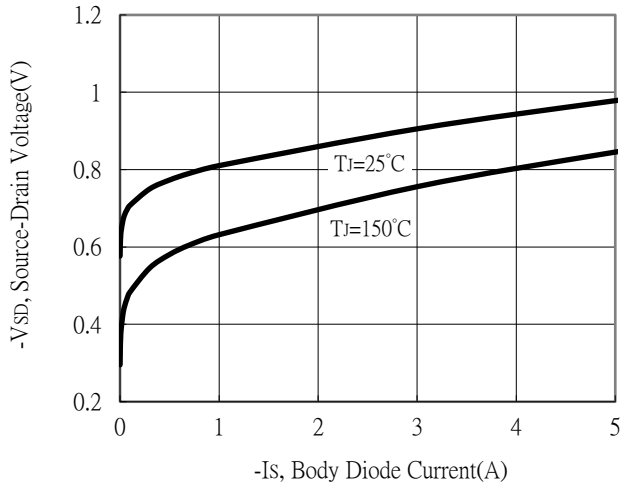
Breakdown Voltage vs Ambient Temperature



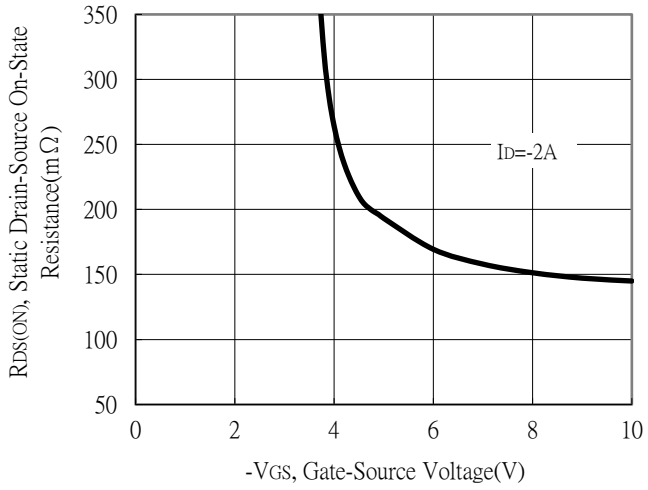
Static Drain-Source On-State resistance vs Drain Current



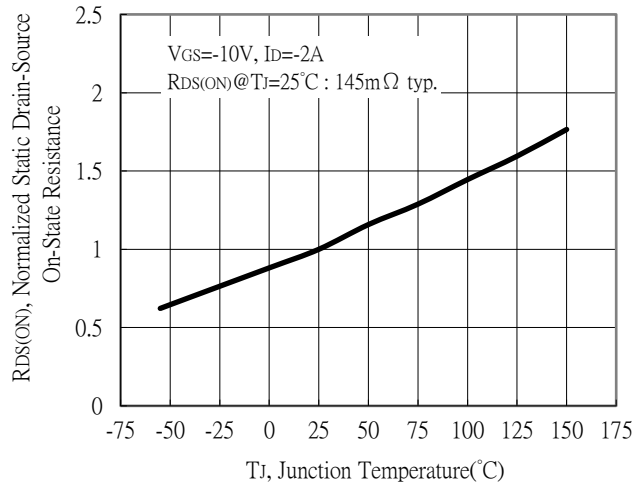
Body Diode Current vs Source-Drain Voltage



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

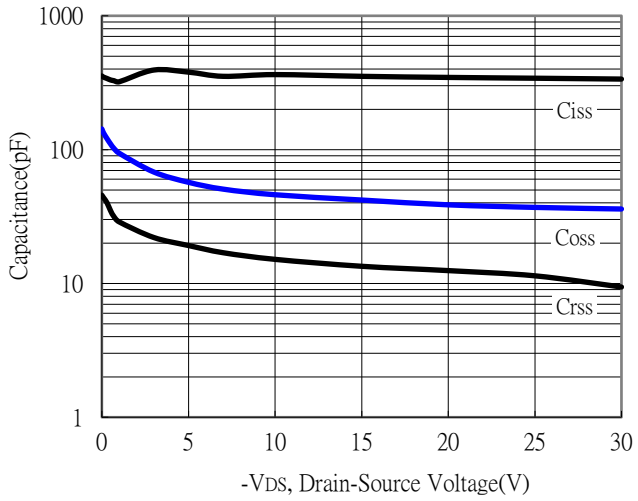


Drain-Source On-State Resistance vs Junction Temperature

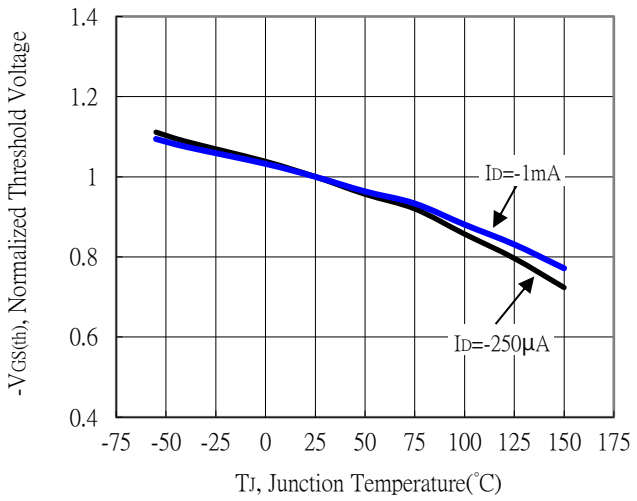


Typical Characteristics (Cont.)

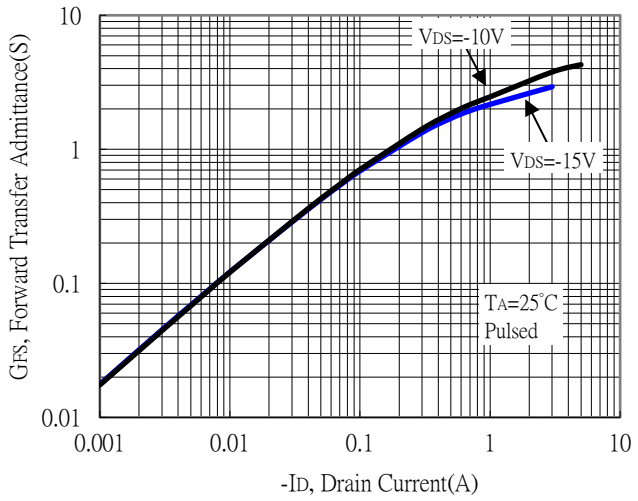
Capacitance vs Drain-to-Source Voltage



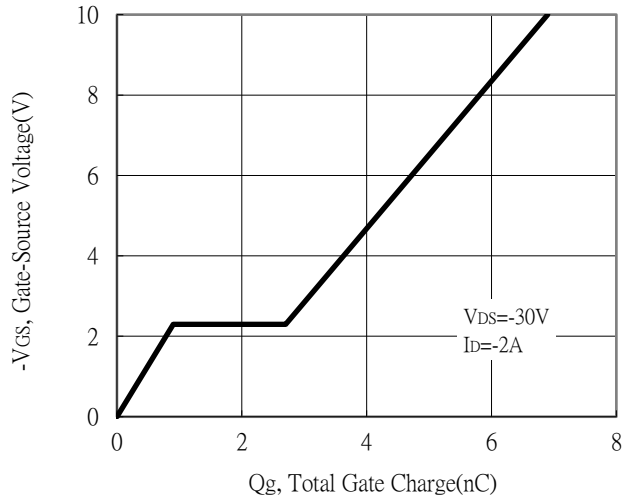
Threshold Voltage vs Junction Temperature



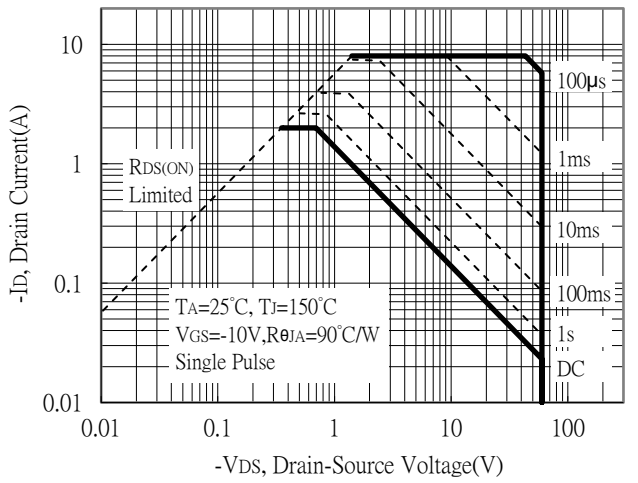
Forward Transfer Admittance vs Drain Current



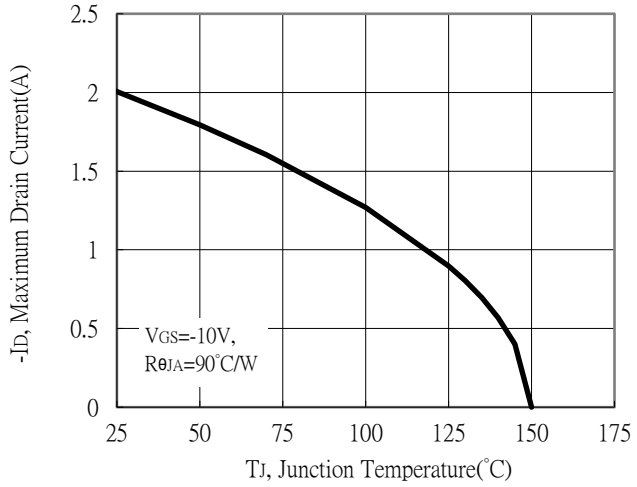
Gate Charge Characteristics



Maximum Safe Operating Area

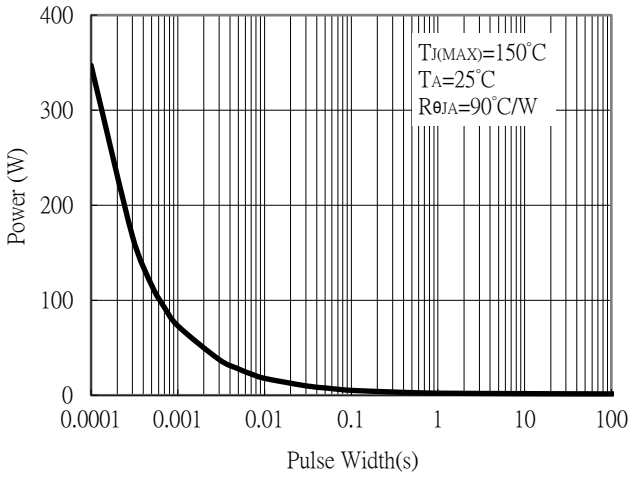


Maximum Drain Current vs Junction Temperature

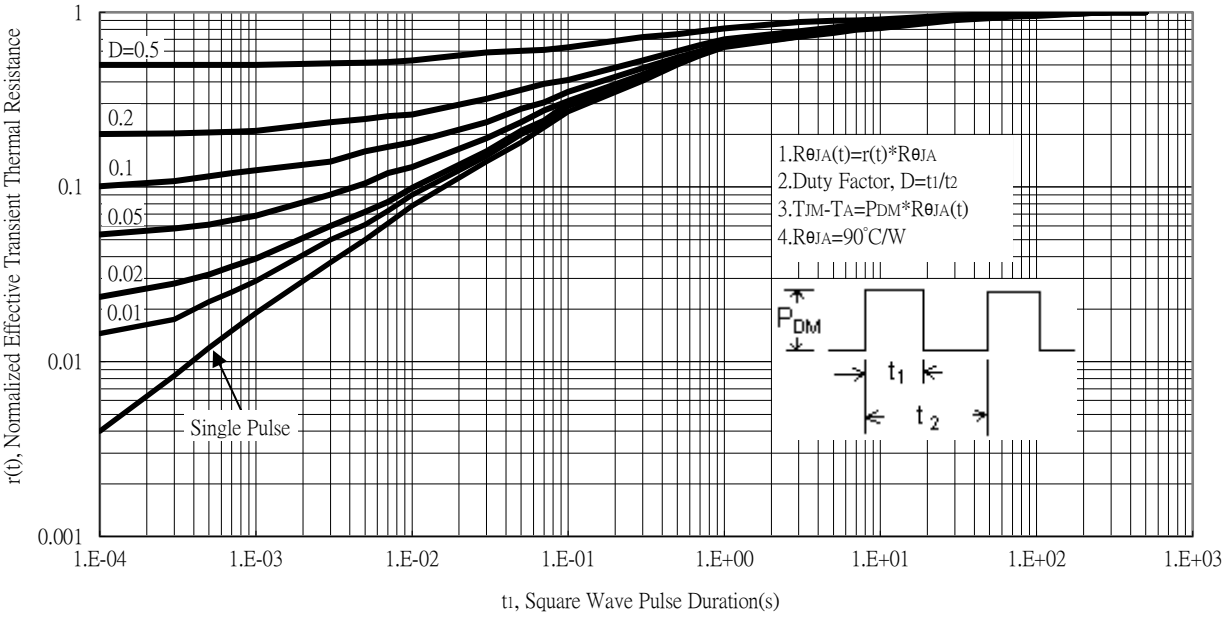


Typical Characteristics (Cont.)

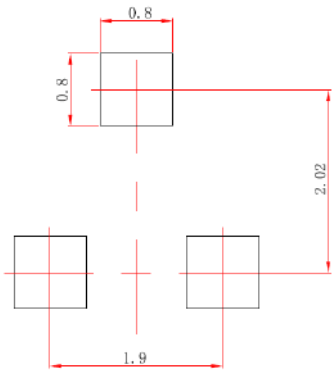
Single Pulse Power Rating, Junction to Ambient



Transient Thermal Response Curves

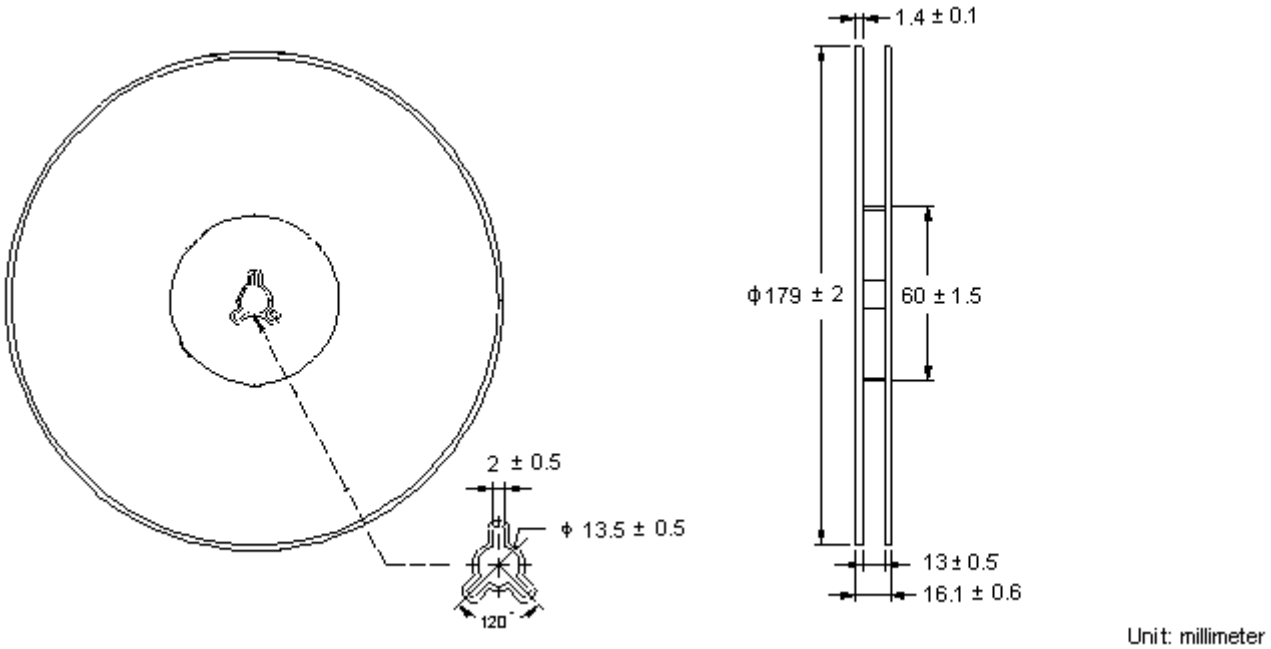


Recommended Soldering Footprint



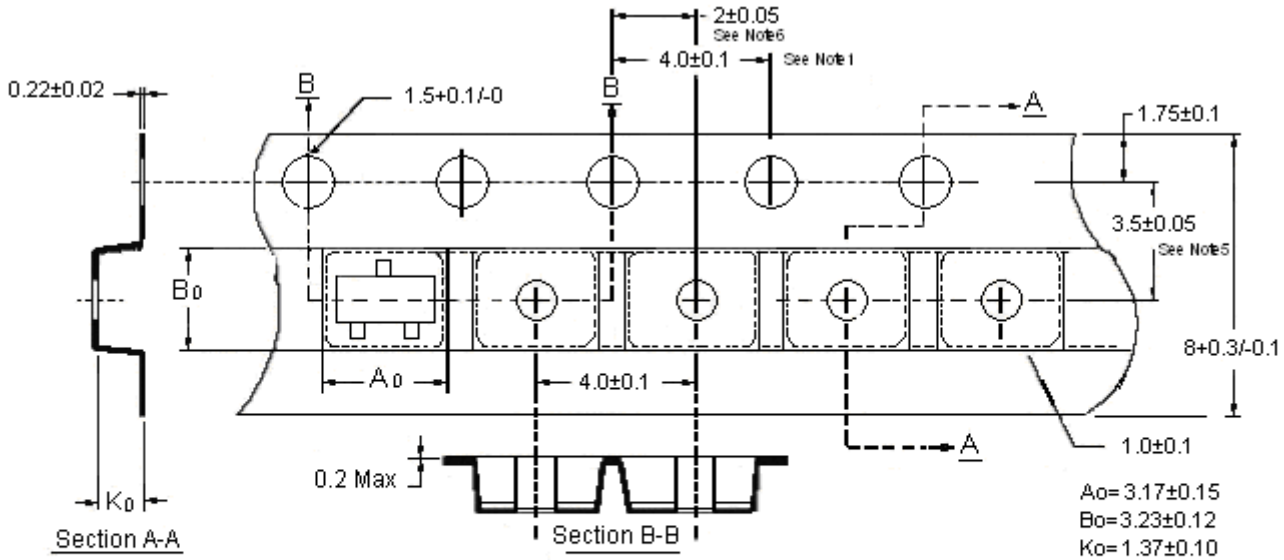
Unit:mm

Reel Dimension



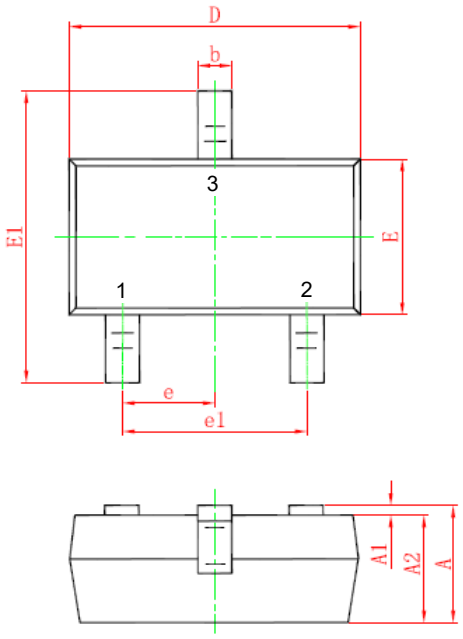
Unit: millimeter

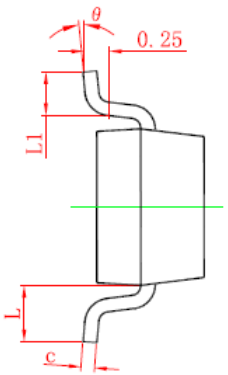
Carrier Tape Dimension



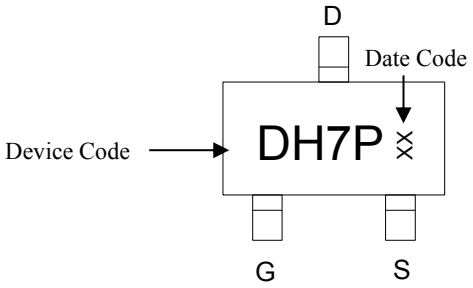
Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.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

Unit : millimeter





Marking:



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

Date Code: Year+Month
Year: 3→2003, 4→2004
Month: 1→1, 2→2, • • •
9→9, A→10, B→11, C→12

3-Lead SOT-23 Plastic
Surface Mounted Package

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.035	0.045	0.900	1.150	E1	0.089	0.100	2.250	2.550
A1	0.000	0.004	0.000	0.100	e	0.037 TYP.		0.950 TYP.	
A2	0.035	0.041	0.900	1.050	e1	0.071	0.079	1.800	2.000
b	0.012	0.020	0.300	0.500	L	0.022 REF.		0.550 REF.	
c	0.003	0.006	0.080	0.150	L1	0.012	0.020	0.300	0.500
D	0.110	0.118	2.800	3.000	θ	0°	8°	0°	8°
E	0.047	0.055	1.200	1.400					