Single P-channel MOSFET

ELM65103A-S

■General description

ELM65103A-S uses advanced trench technology to provide excellent Rds(on), low gate charge and low gate threshold voltage.

■Features

- Vds=-30V
- Id=-4.5A (Vgs=-10V)
- Rds(on) = 41mΩ (Vgs=-10V)
- Rds(on) = 60mΩ (Vgs=-4.5V)

■Maximum absolute ratings

Ta=25°C. Unless otherwise noted.

Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		Vds	-30	V	
Gate-source voltage		Vgs	±20	V	
Continuous drain current	Ta=25°C	Id	-4.5	A	
	Ta=70°C		-3.5		
Pulsed drain current		Idm	-20	A	1, 2
Power dissipation	Tc=25°C	Pd	1.38	W	3
	Tc=75°C		0.83		
Junction and storage temperature range		Tj, Tstg	-55 to +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.

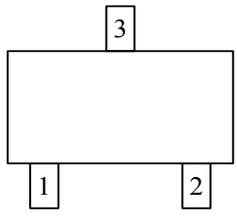
■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Thermal resistance, junction-to-ambient	Rθja	-	90	°C/W	

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

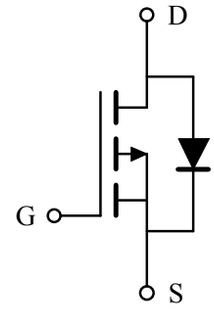
■Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit



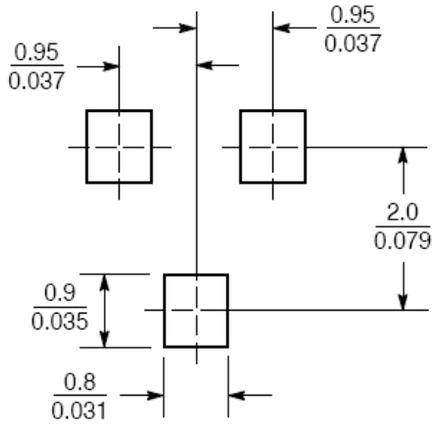
■Electrical characteristics

Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-30	-	-	V
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V	-	-	-1	μA
		Vds=-24V, Vgs=0V (Ta=125°C)	-	-	-10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V	-	-	±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.2	1.8	-2.2	V
Static drain-source on-resistance *	Rds(on)	Vgs=-10V, Id=-4.5A	-	41	50	mΩ
		Vgs=-4.5V, Id=-3.5A		60	70	
Forward transconductance *	Gfs	Vds=-10V, Id=-4.5A	-	4.3	-	S
Max. body-diode continuous current *	Is				-4.5	A
Pulsed body-diode current *	Ism		-	-	-18	A
Diode forward voltage *	Vsd	Is=-1A, Vgs=0V	-	-	-1.2	V
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-10V, f=1MHz	-	885	-	pF
Output capacitance	Coss		-	86	-	pF
Reverse transfer capacitance	Crss		-	81	-	pF
SWITCHING PARAMETERS						
Total gate charge *	Qg	Vgs=-10V, Vds=-15V Id=-4.5A	-	15	-	nC
Gate-source charge *	Qgs		-	3	-	nC
Gate-drain charge *	Qgd		-	7	-	nC
Turn-on delay time *	td(on)	Vgs=-10V, Vds=-15V Id=-1A, Rd=15Ω Rgen=6Ω	-	8	-	ns
Turn-on rise time *	tr		-	12	-	ns
Turn-off delay time *	td(off)		-	30	-	ns
Turn-off fall time *	tf		-	23	-	ns
Body diode reverse recovery time *	trr	If=-4.5A, dIf/dt=100A/μs	-	32.0		ns
Body diode reverse recovery charge *	Qrr		-	13.5	-	nC

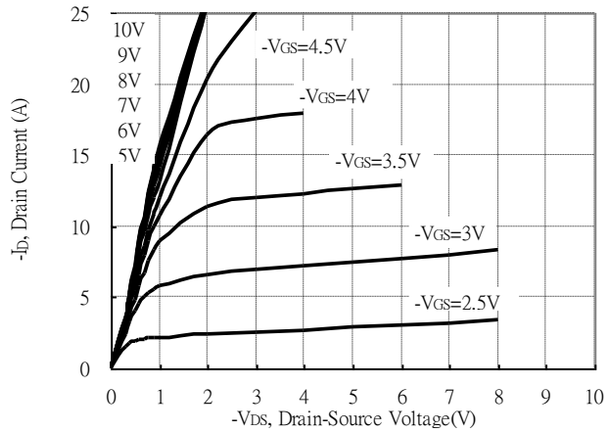
* Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%.

■Reference land pattern

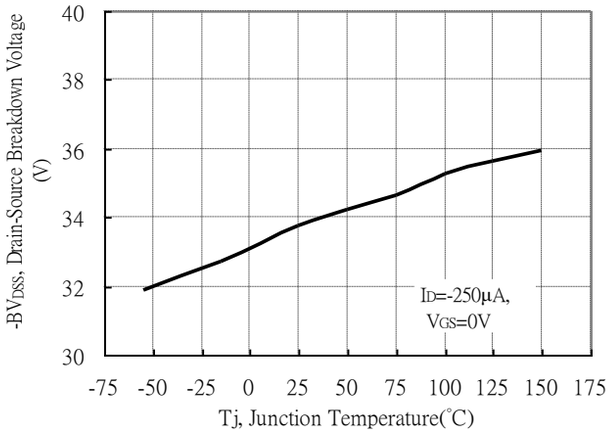


■Typical electrical and thermal characteristics

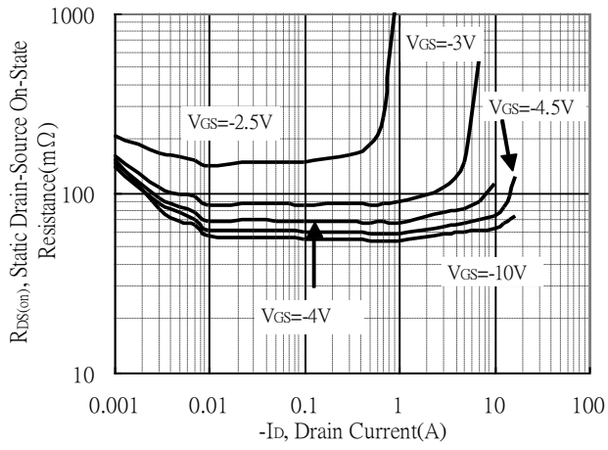
Typical Output Characteristics



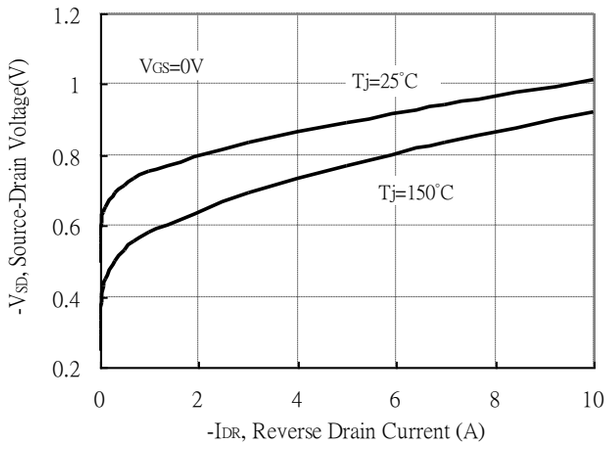
Brekdown Voltage vs Ambient Temperature



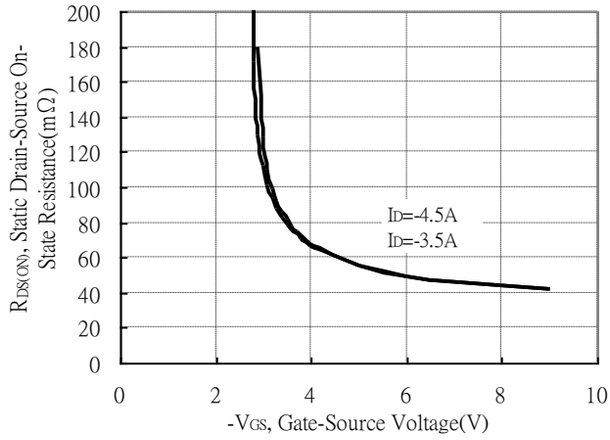
Static Drain-Source On-State resistance vs Drain Current



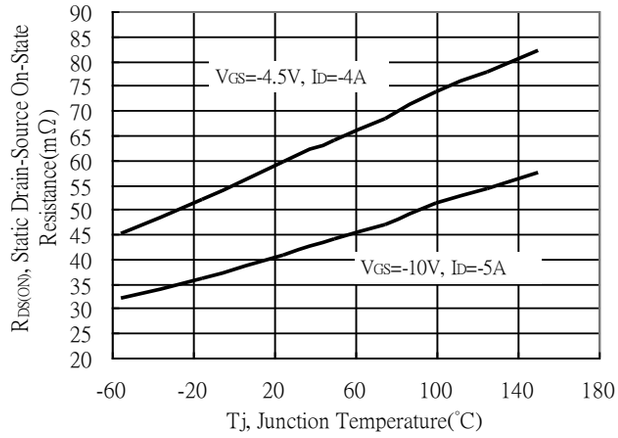
Reverse Drain Current vs Source-Drain Voltage



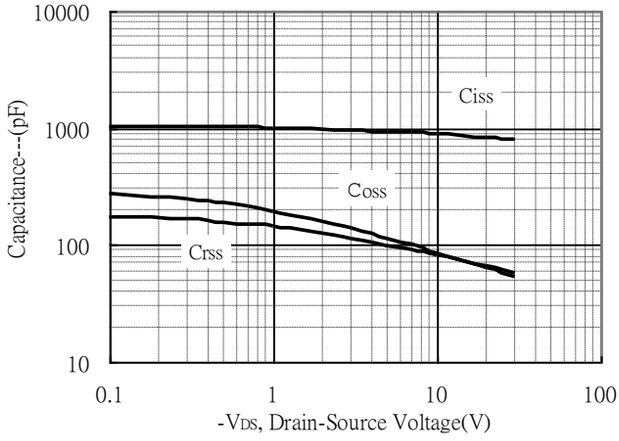
Static Drain-Source On-State Resistance vs Gate-Source Voltage



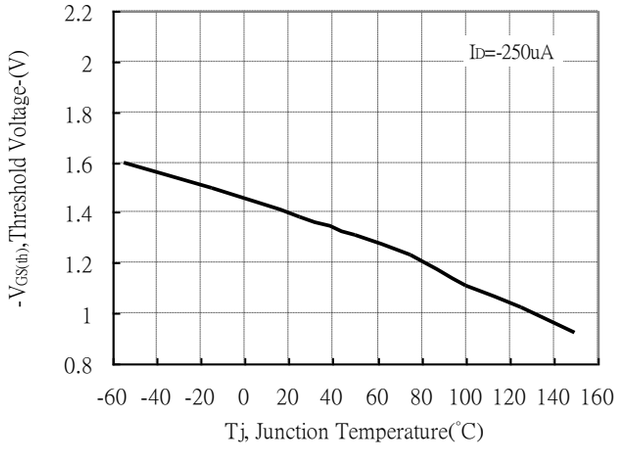
Drain-Source On-State Resistance vs Junction Tempearture



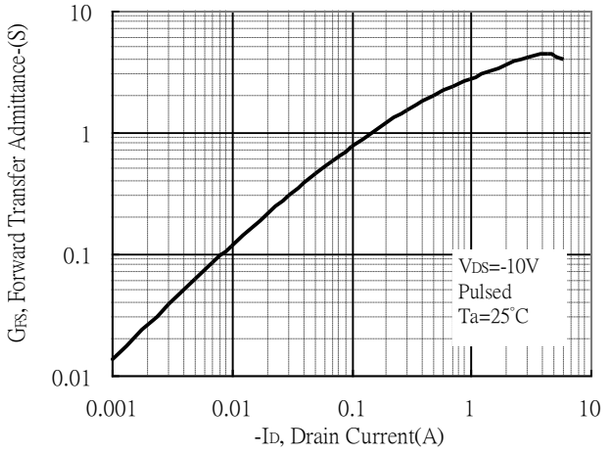
Capacitance vs Drain-to-Source Voltage



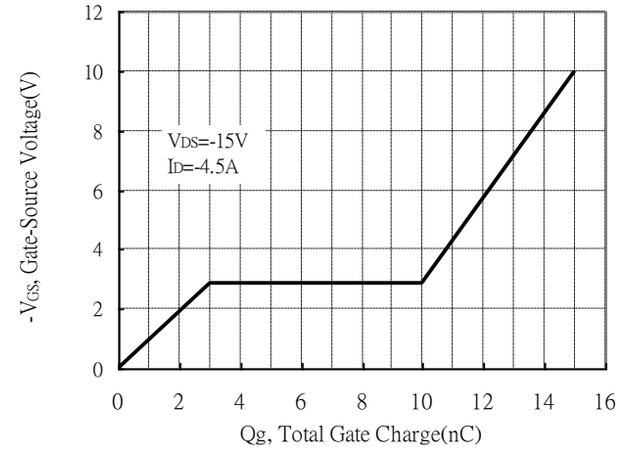
Threshold Voltage vs Junction Tempearture



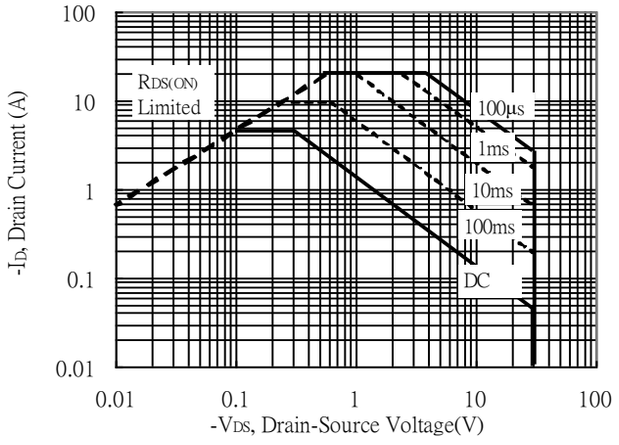
Forward Transfer Admittance vs Drain Current



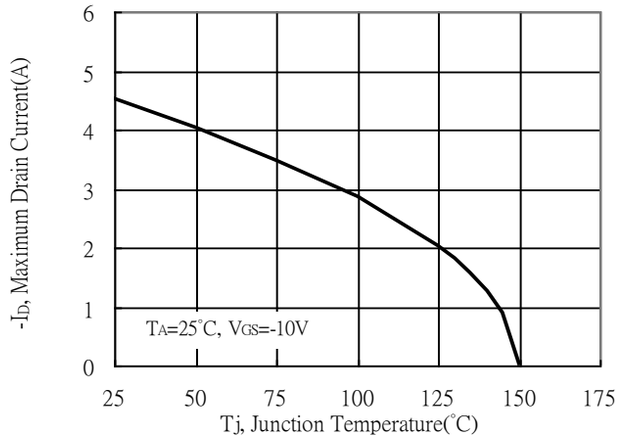
Gate Charge Characteristics



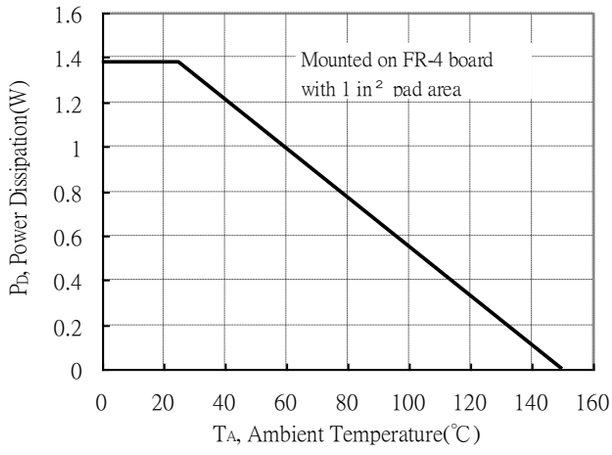
Maximum Safe Operating Area



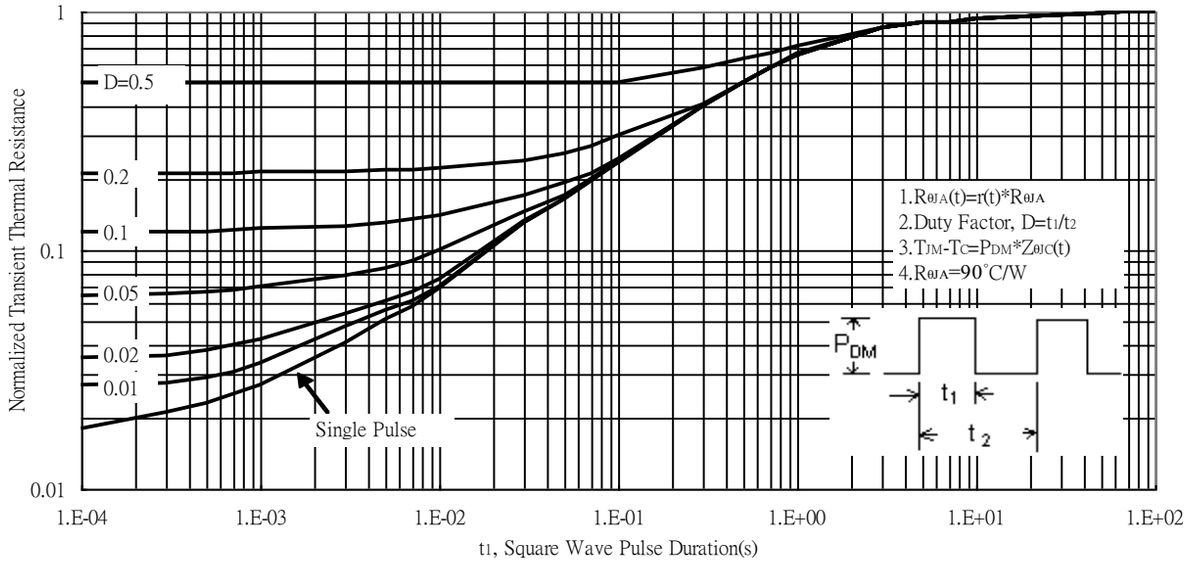
Maximum Drain Current vs JunctionTemperature



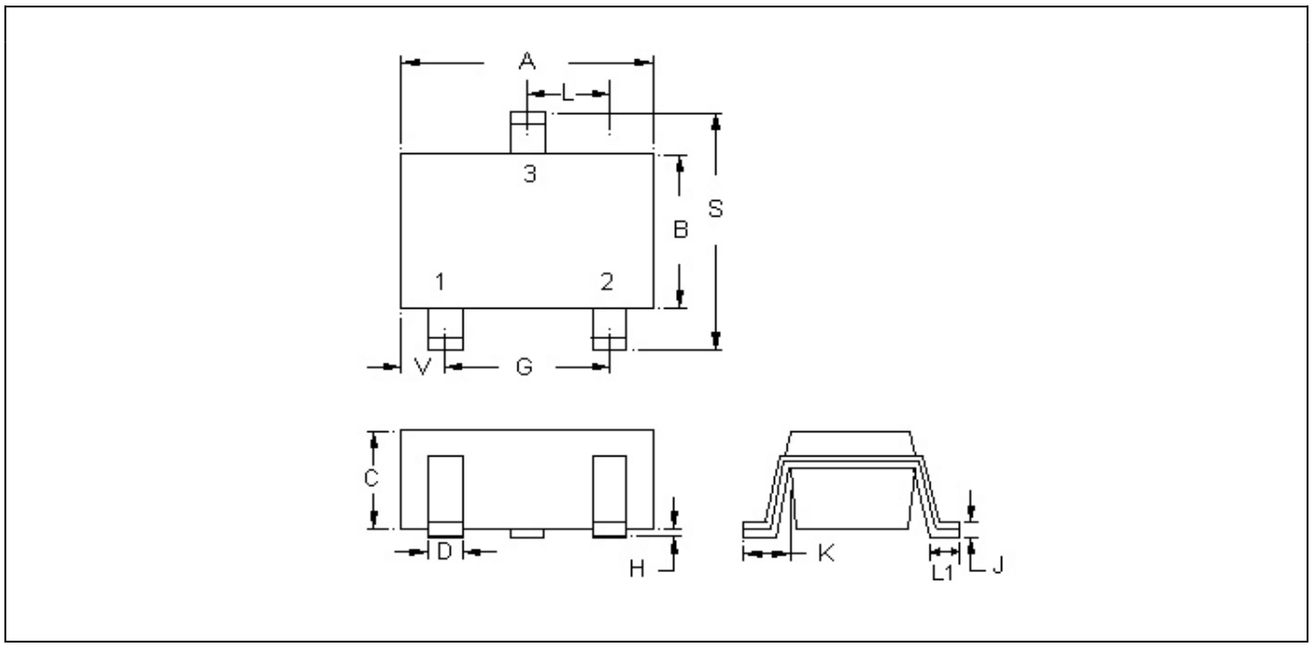
Power Derating Curve



Transient Thermal Response Curves



■SOT-23 dimension



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

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

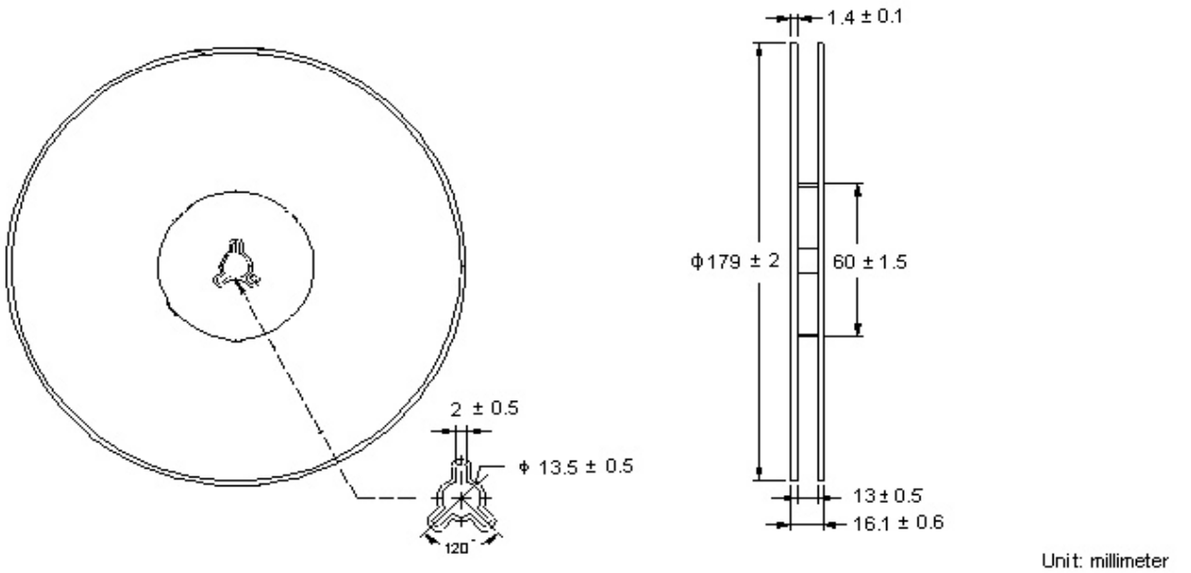
k

Material:

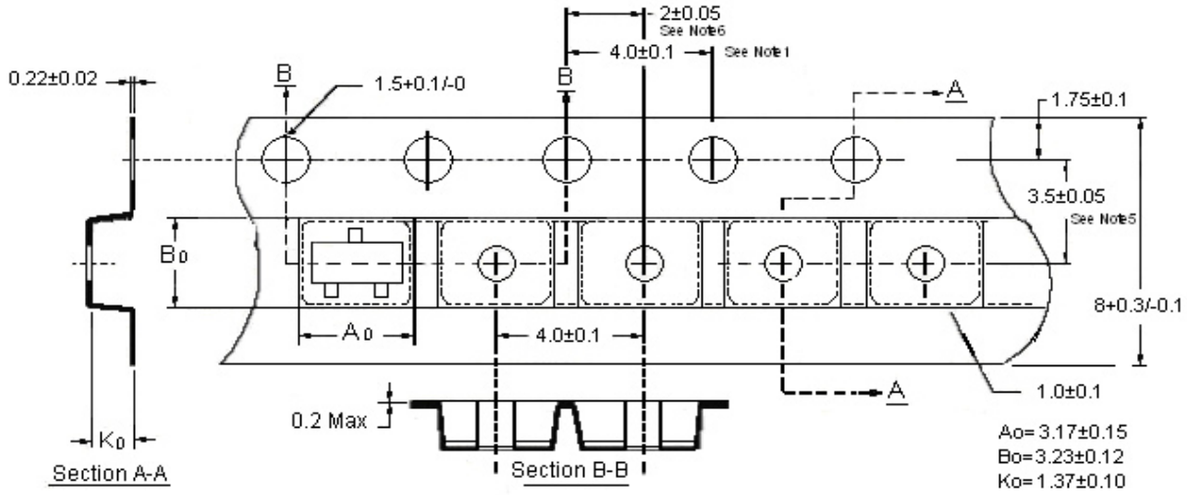
- Lead: Pure tin plated.
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0.

■Reel & carrier tape dimension

• Reel



• Carrier tape



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