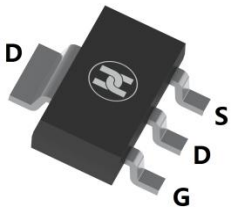
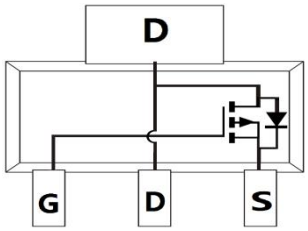
P-CHANNEL HIGH VOLTAGE MOSFET

FEATURES

- V_{DS}=-100V,$R_{DS(ON)}$≤150mΩ@V_{GS}=-10V,I_D=-3.7A
- Fast Switching Speed
- Low On-Resistance
- For Power Management Functions and DC-DC Converters
- For Motor Control, Relay and Solenoid Driving
- Surface Mount device



SOT-223



MECHANICAL DATA

- Case: SOT-223
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.112 grams (approximate)

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-source voltage		V_{DS}	-100	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current	V_{GS}=-10V, T_A=25°C(2)	I_D	-3.7	A
	V_{GS}=-10V, T_A=70°C(2)		-3.0	A
	V_{GS}=-10V, T_A=25°C(1)		-2.6	A
Pulsed drain current(3)		I_{DM}	-16.5	A
Continuous Source Current (Body Diode)(2)		I_S	-5.3	A
Pulsed Source Current (Body Diode)(3)		I_{SM}	-16.5	A
Power dissipation(1)		P_D	2	W
Power dissipation(2)			3.9	W
Thermal Resistance, Junction to Ambient (1)		$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Ambient (2)			32	°C/W
Thermal Resistance, Junction to Lead(4)		$R_{\theta JL}$	7.65	°C/W
Operating and Storage temperature		T_J,T_{STG}	-55 ~+150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-Source breakdown voltage	$V_{(BR)DSS}$	-100			V	V_{GS}=0V, I_D=-250μA
Zero gate voltage drain current	I_{DSS}			-1	μA	V_{DS}=-100V,V_{GS}=0V
Gate-body leakage current	I_{GSS}			±100	nA	V_{DS}=0V, V_{GS}=±20V
Gate-threshold voltage	$V_{GS(th)}$	-2.0		-4.0	V	V_{DS}=V_{GS}, I_D=-250μA
Drain-source on-resistance(5)	$R_{DS(ON)}$			0.15	Ω	V_{GS}=-10V, I_D=-2.8A
				0.19	Ω	V_{GS}=-6V, I_D=-2.4A
Forward Trans-conductance (5,6)	g_{fs}		6		S	V_{DS}=-15V, I_D=-2.8A
Diode Forward Voltage (5)	V_{SD}		-0.85	-0.95	V	I_S=-3.5A,V_{GS}=0V,T_J=25°C
Reverse Recovery Time(6)	t_{rr}		49		nS	I_F=-2.8A,di/dt=100A/μs, T_J=25°C
Reverse Recovery Charge(6)	Q_{rr}		107		nC	
Input capacitance (6)	C_{iss}		1055		pF	V_{DS}=-50V, V_{GS}=0V, f=1MHz
Output capacitance(6)	C_{oss}		90		pF	
Reverse transfer capacitance(6,7)	C_{rss}		76		pF	
Total Gate Charge(6,7)	Q_g		26.9		nC	V_{DS}=-50V,V_{GS}=-10V,I_D=-2.8A
Gate-Source Charge(6,7)	Q_{gs}		3.9		nC	
Gate-Drain Charge(6,7)	Q_{gd}		10.2		nC	
Turn-on delay time(6,7)	$t_{d(on)}$		4.6		nS	V_{DD}=-50V,I_D=-1A,V_{GS}=-10V, R_G=6.0Ω
Turn-on rise time(6,7)	t_r		6.8		nS	
Turn-off delay time(6,7)	$t_{d(off)}$		33.9		nS	
Turn-off fall time(6,7)	t_f		17.9		nS	

Notes: 1. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the deviceis measured when operating in a steady-state condition.
2. Same as Note 1, except the device is measured at t ≤10 seconds.
3. Same as Note 1, except the device is pulsed with D = 0.02 and pulse width 300μs. The pulse current is limited by the maximum junction temperature.
4.Thermal resistance from junction to solder-point (at the end of the drain lead).
5. Measured under pulsed conditions. Pulse width≤300μs; duty cycle≤2%
6. For design aid only, not subject to production testing.
7. Switching characteristics are independent of operating junction temperatures

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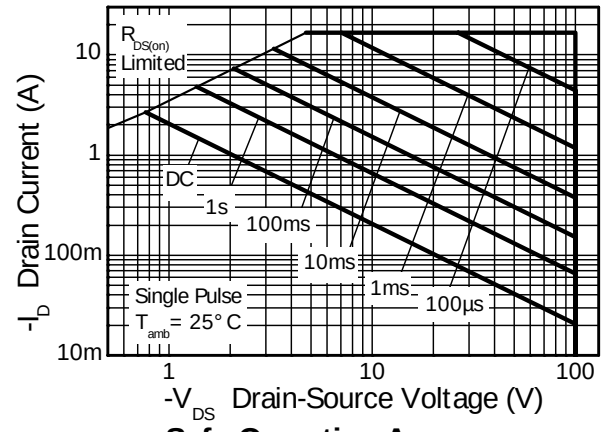
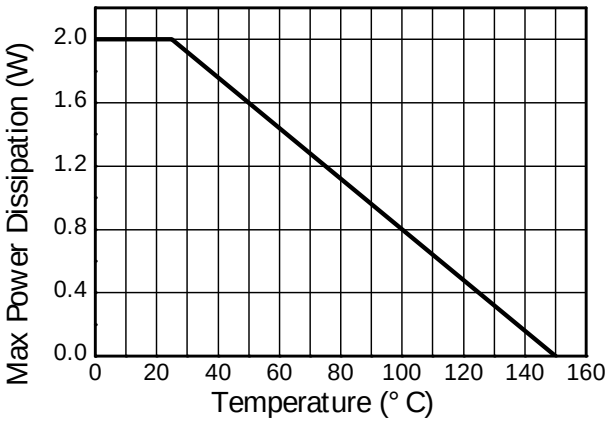
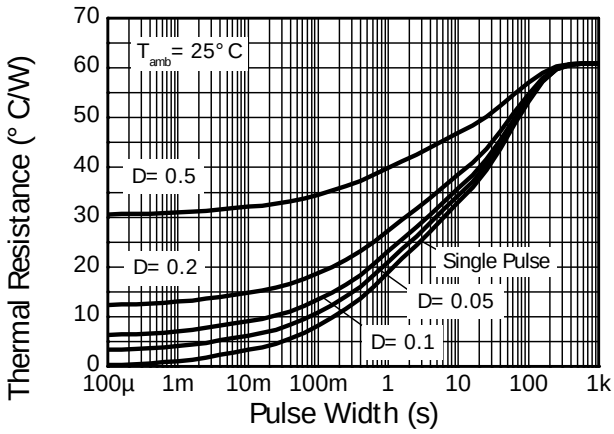
Typical Characteristics



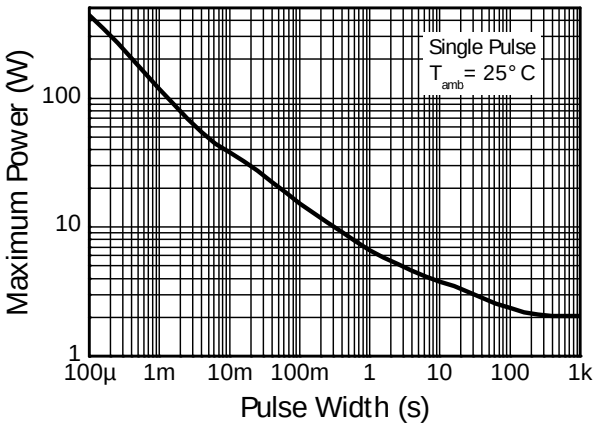
Safe Operating Area



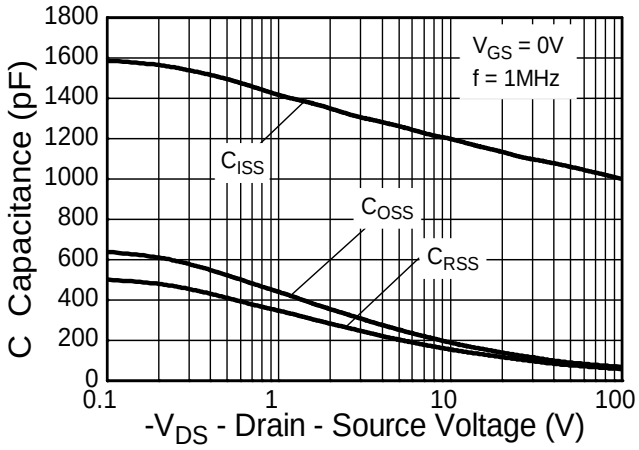
Derating Curve



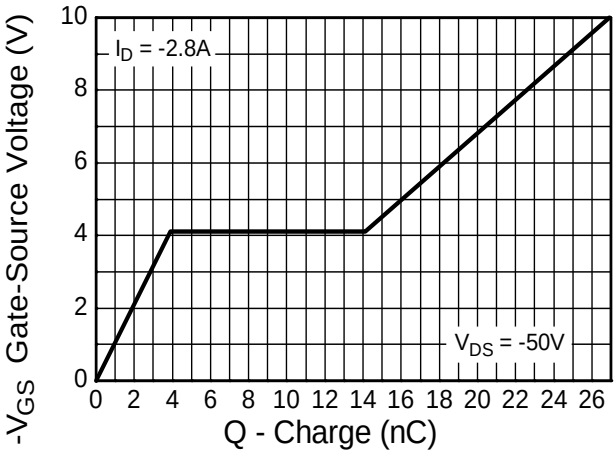
Transient Thermal Impedance



Pulse Power Dissipation



Capacitance v Drain-Source Voltage



Gate-Source Voltage v Gate Charge

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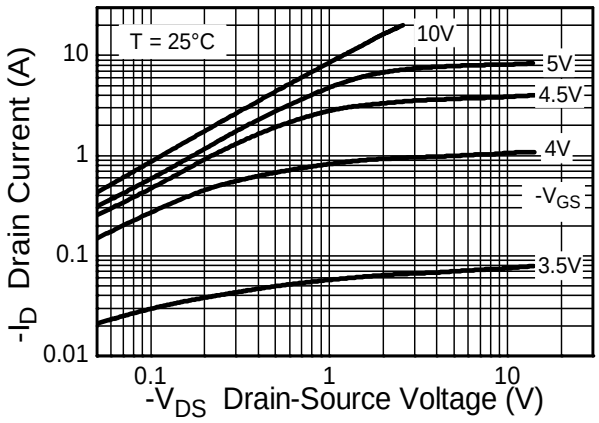
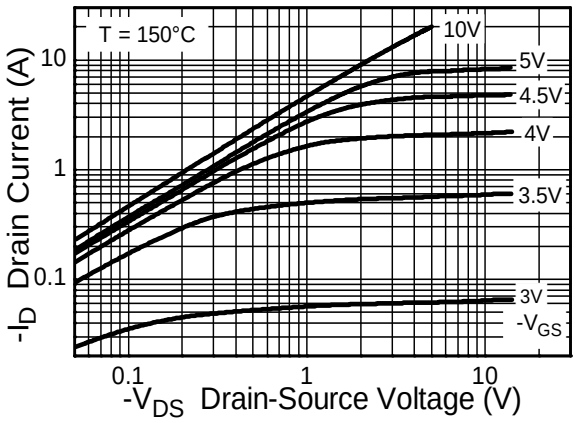
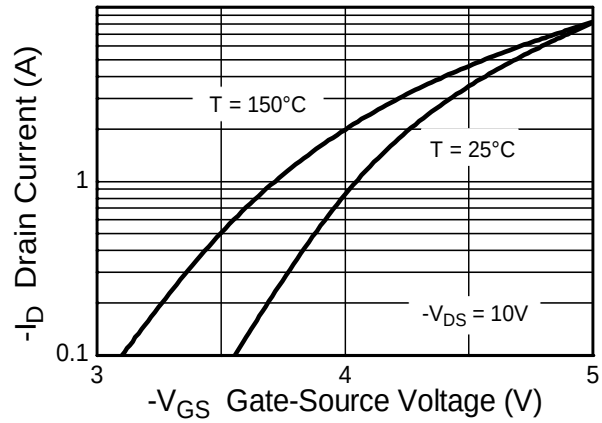


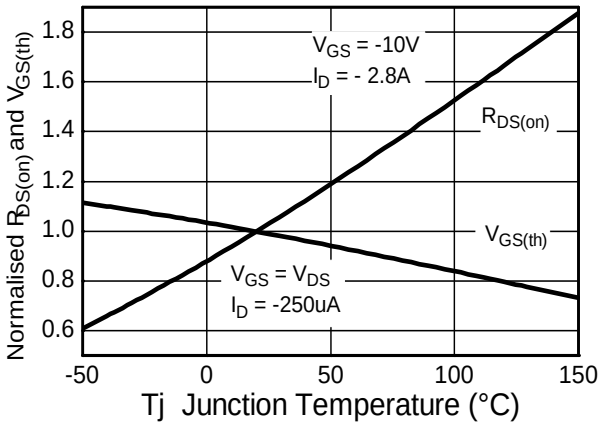
Output Characteristics



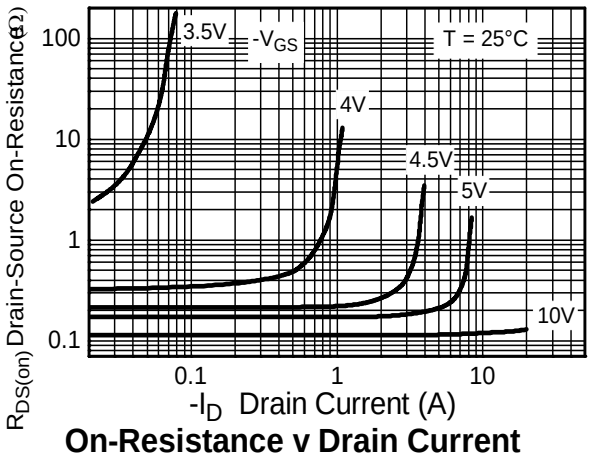
Output Characteristics



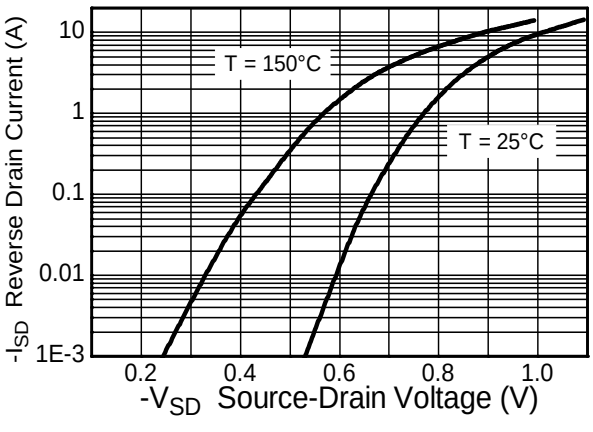
Typical Transfer Characteristics



Normalised Curves v Temperature



On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

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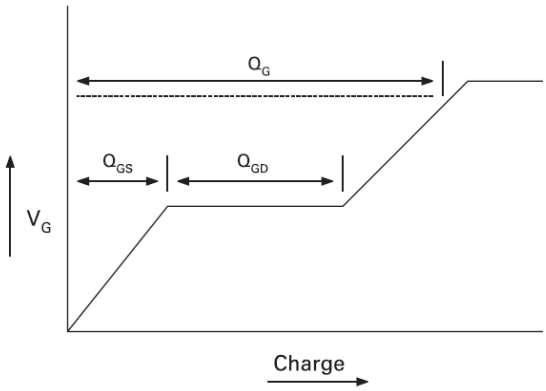
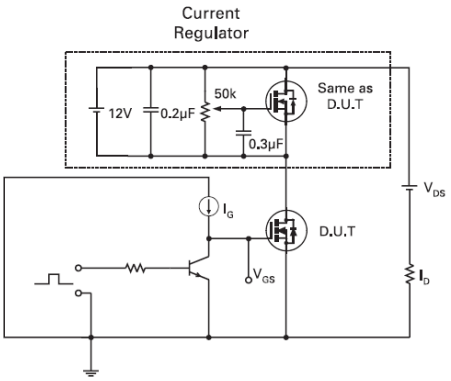
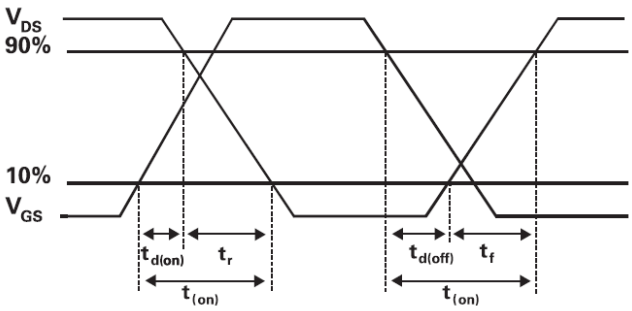
Test Circuits



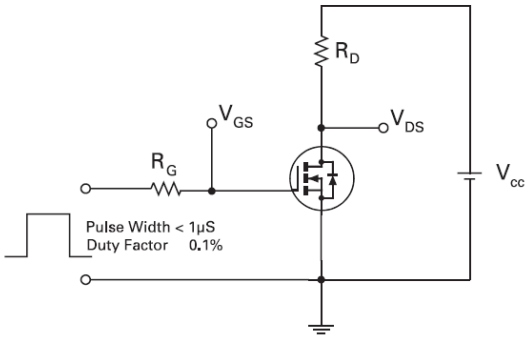
Basic Gate Charge Waveform



Gate Charge Test Circuit



Switching Time Waveforms



Switching Time Test Circuit

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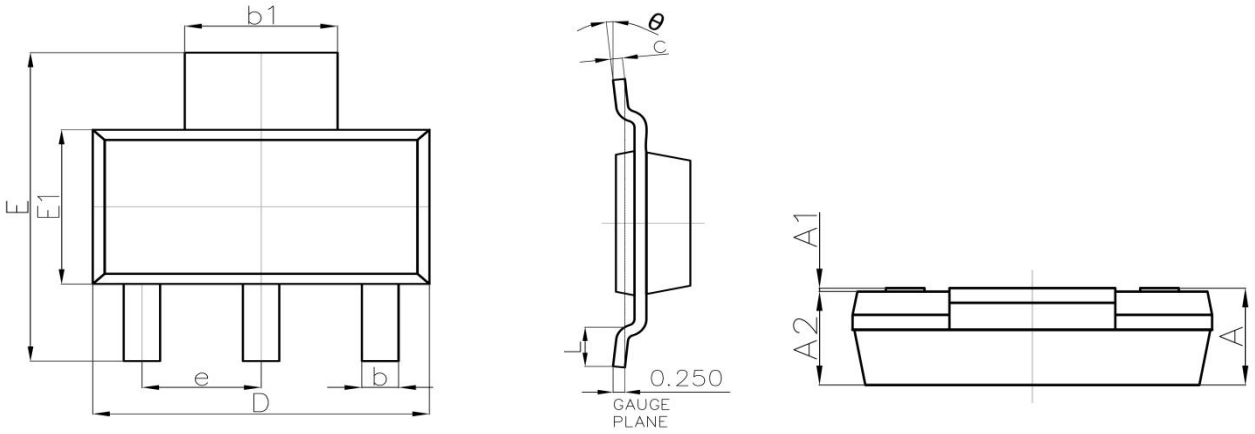
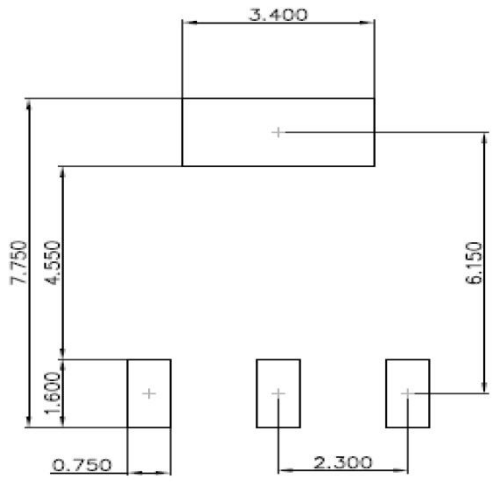
SOT-223 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	——	1.800	------	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	------	0.030	------
θ	0°	10°	0°	10°

SOT-223 Suggested Pad Layout



Note:

1.Controlling dimension: in millimeters

2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

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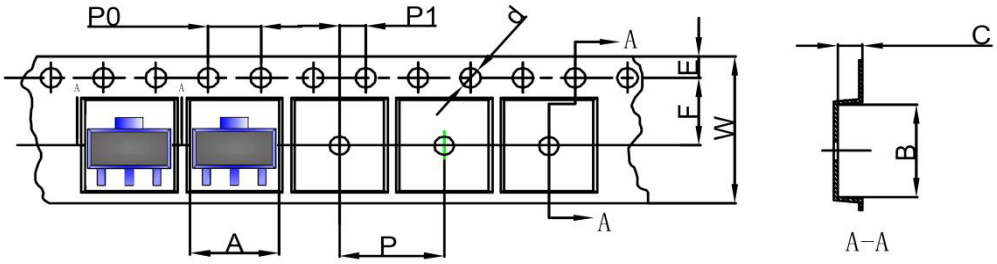
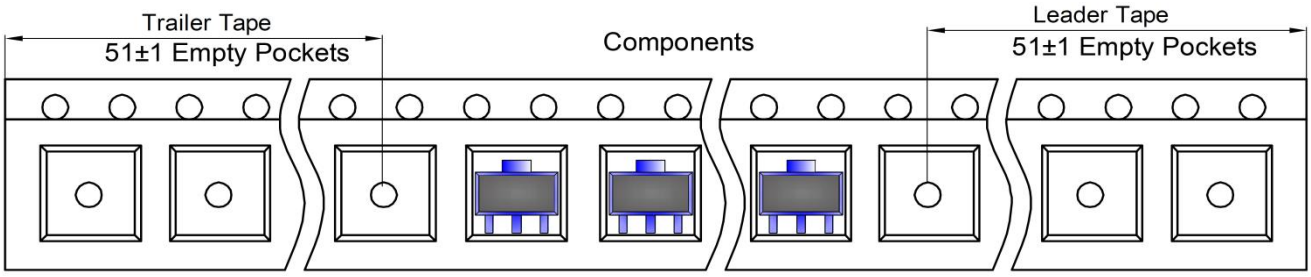
SOT-223 Tape and Reel

SOT-223 Embossed Carrier Tape

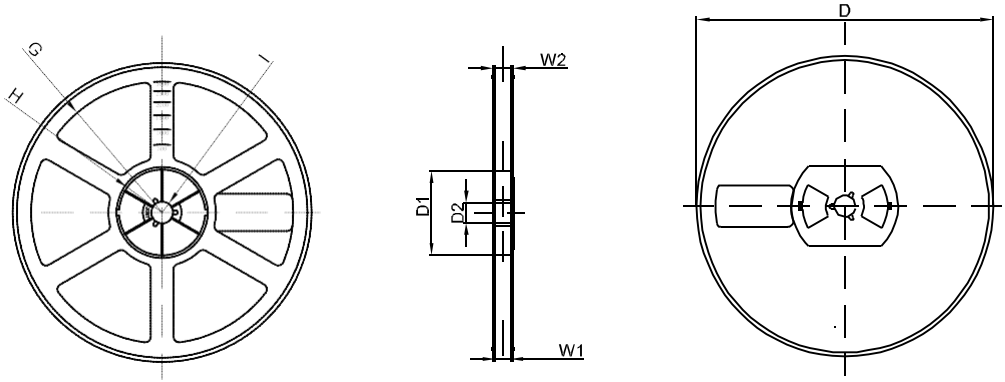


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOT-223	6.765	7.335	1.88	Ø1.50	1.75	5.50	4.00	4.00	2.00	12.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SOT-223 Tape Leader and Trailer



SOT-223 Reel



	DIMENSIONS ARE IN MILLIMETER							
REEL OPTION	D	D1	D2	G	H	I	W1	W2
13” DIA	Ø330.00	100.00	13.00	R151.00	R56.00	R6.50	12.40	17.60
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1