



HY2301

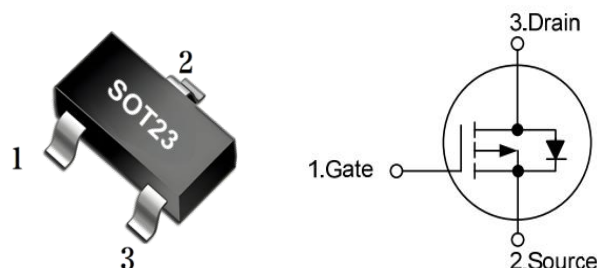
POWER MOSFET

-3.0A, -20V P-CHANNEL ENHANCEMENT MODE POWER MOSFET

■ DESCRIPTION

The HY2301 is P-channel enhancement mode power MOSFET, designed in serried ranks. With fast switching speed, low on-resistance, favorable stabilization.

Used in commercial and industrial surface mount applications and suited for low voltage applications such as DC/DC converters.



■ MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

(Rating at 25°C ambient temperature unless otherwise specified.)

PARAMETER		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	± 8	V
Continuous Drain Current	Continuous	I_D	-3.0	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	-8.4	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	20.5	mJ
Total Power Dissipation	SOT-23	P_D	0.6	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by maximum junction temperature.

3. L=16mH, IAS=-1.6A, VDD= -20V, RG=25Ω, Starting TJ=25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	SOT-23	θ_{JA}	208	°C/W

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.



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■ ELECTRICAL CHARACTERISTICS (1)

($T_j=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-20			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-16V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±8V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =-250uA	-0.45			V
Static Drain-Source On-State Resistance (Note 1)	R _{DS(ON)}	V _{GS} =-6.0V, I _D =-1.5A		67	100	mΩ
		V _{GS} =-4.5V, I _D =-1.0A	47	69	70	mΩ
		V _{GS} =-2.5V, I _D =-1.0A		89	100	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-10V f=1.0MHz		255		pF
Output Capacitance	C _{OSS}			66		pF
Reverse Transfer Capacitance	C _{RSS}			56		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note 1)	Q _G	V _{DS} =-16V, V _{GS} =-10V, I _D =-3.0A, I _D =-1mA		12		nC
Gate-Source Charge	Q _{GS}			1		nC
Gate-Drain Charge	Q _{GD}			2		nC
Turn-ON Delay Time (Note 1)	t _{D(ON)}	V _{DS} =-10V, V _{GS} =-10V, I _D =-3.0A, R _G =6Ω		3		ns
Turn-ON Rise Time	t _r			15		ns
Turn-OFF Delay Time	t _{D(OFF)}			15		ns
Turn-OFF Fall Time	t _f			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				-1.6	A
Maximum Body-Diode Pulsed Current	I _{SM}				-8.4	A
Drain-Source Diode Forward Voltage (Note 1)	V _{SD}	V _{GS} =0V, I _S =-1.6A		-0.8	-1.2	V

Notes: 1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

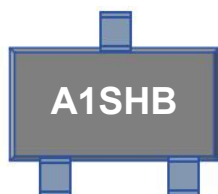


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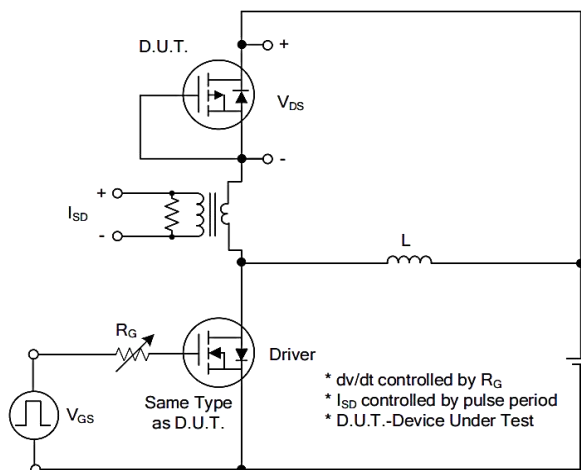
POWER MOSFET

MARKING

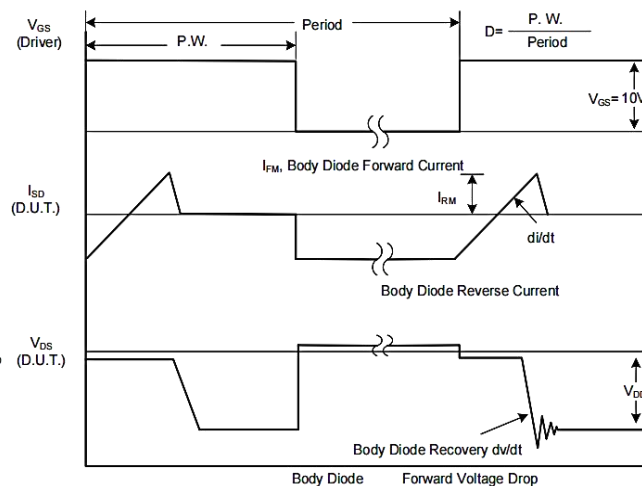
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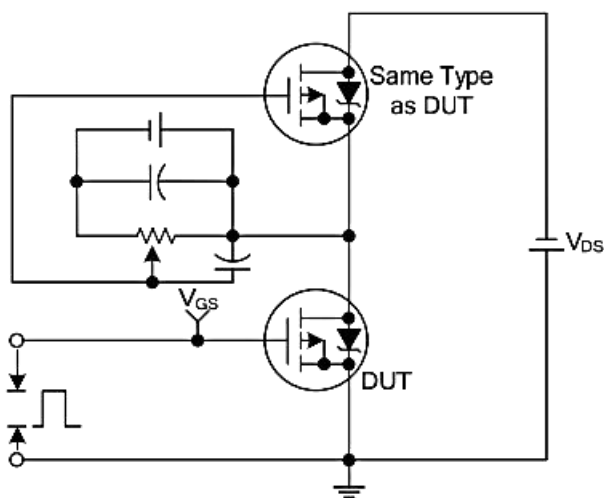
TEST CIRCUITS AND WAVEFORMS (1)



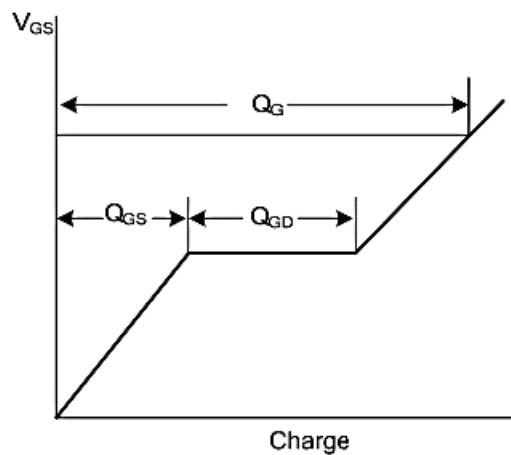
Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Waveforms



Gate Charge Test Circuit



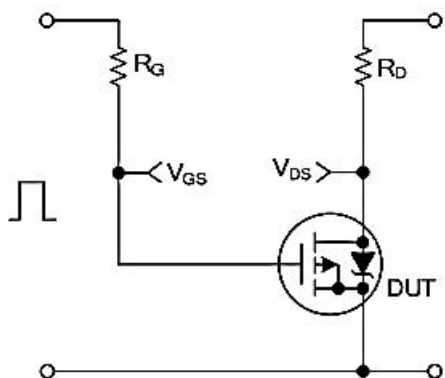
Gate Charge Waveforms



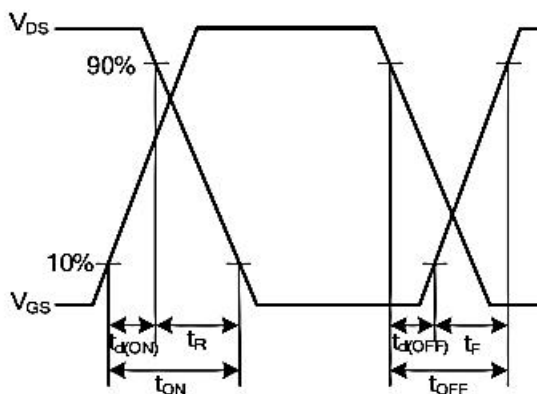
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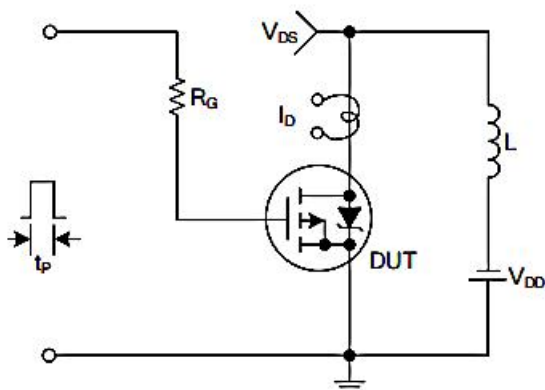
■ TEST CIRCUITS AND WAVEFORMS (2)



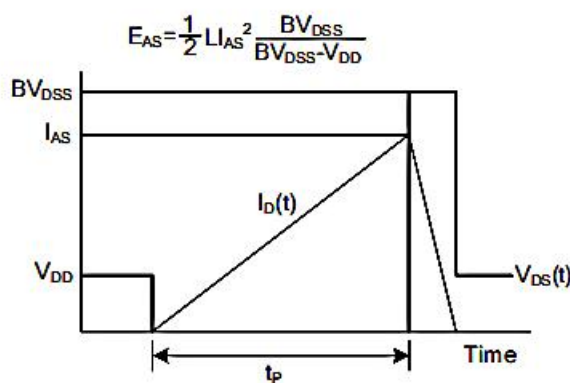
Resistive Switching Test Circuit



Resistive Switching Waveforms

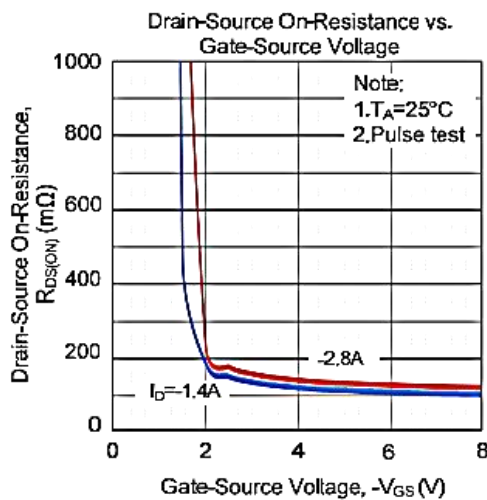
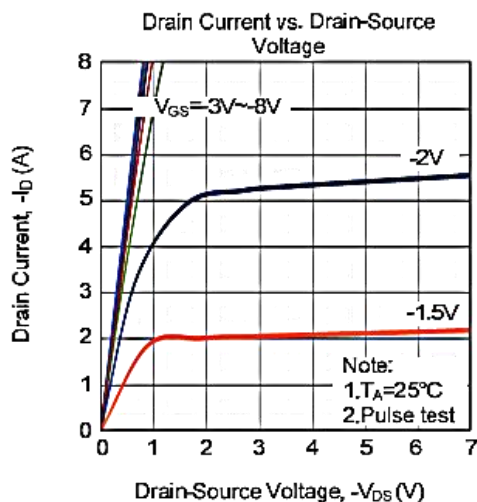


Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS (1)

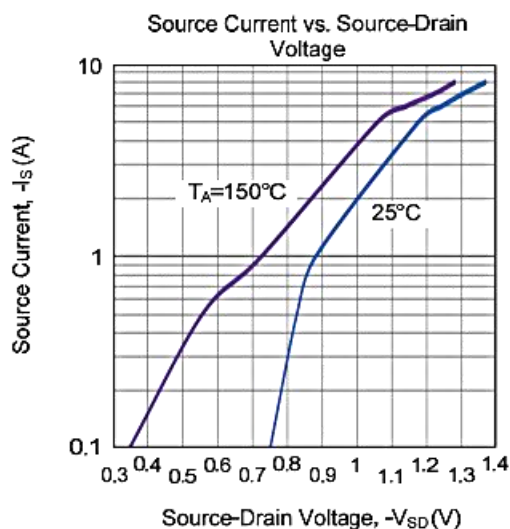
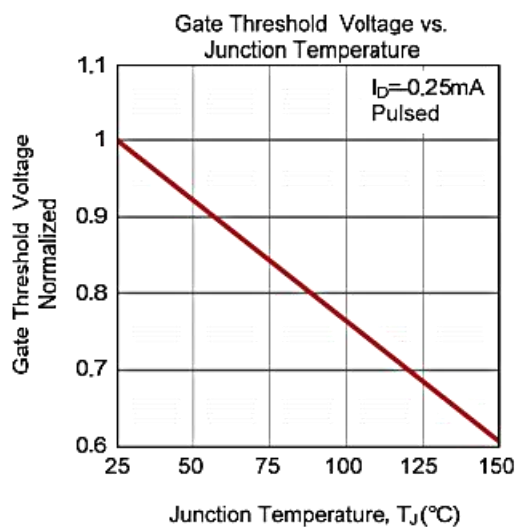
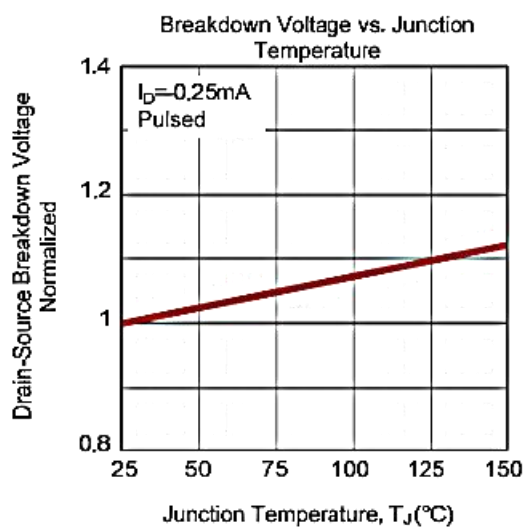
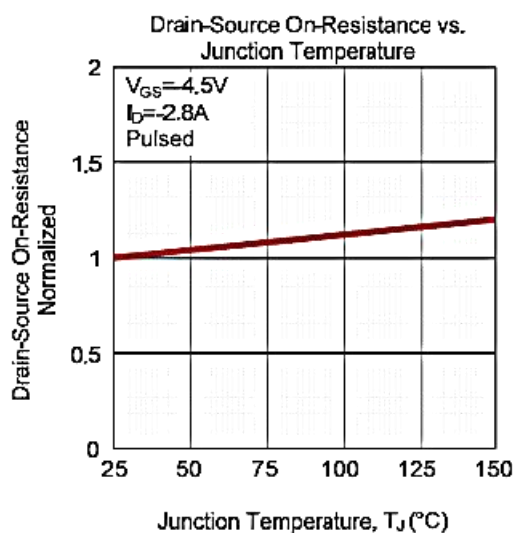
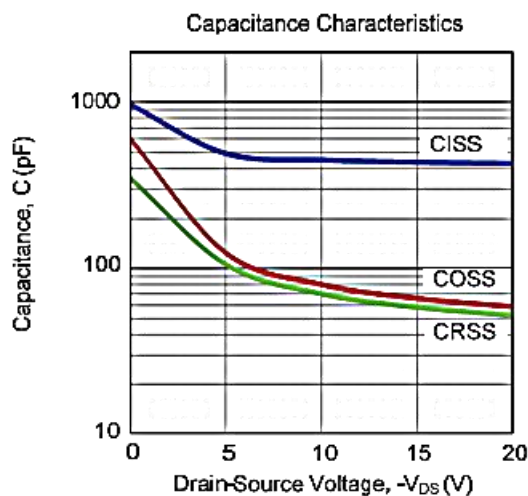
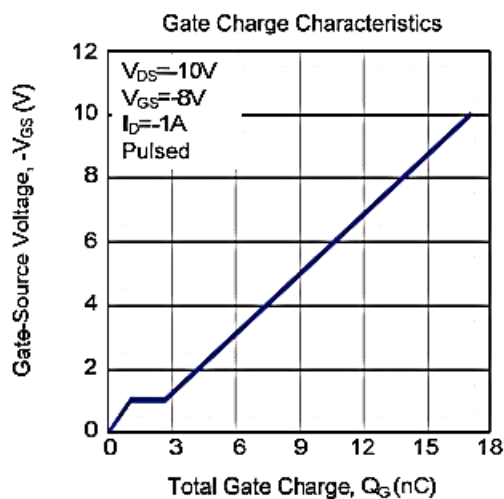




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■ TYPICAL CHARACTERISTICS (2)

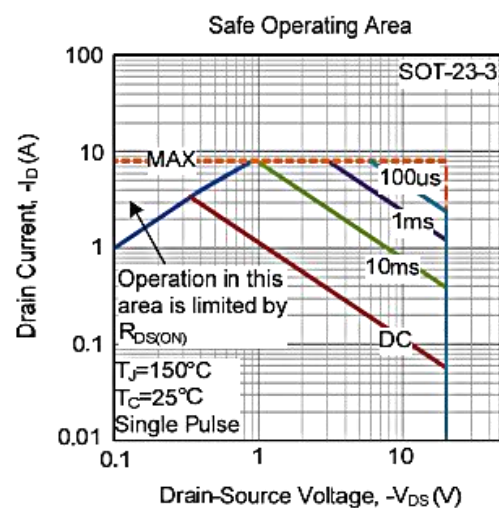
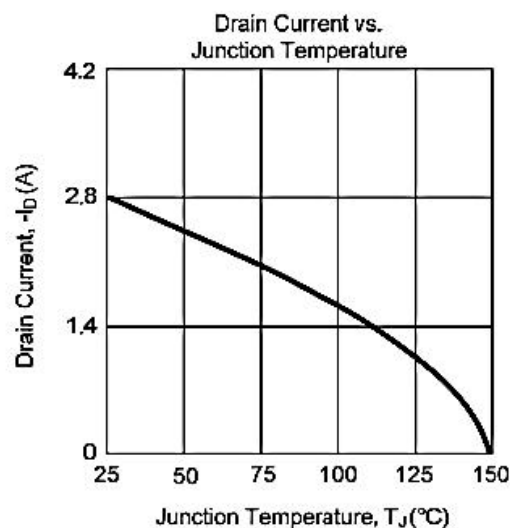
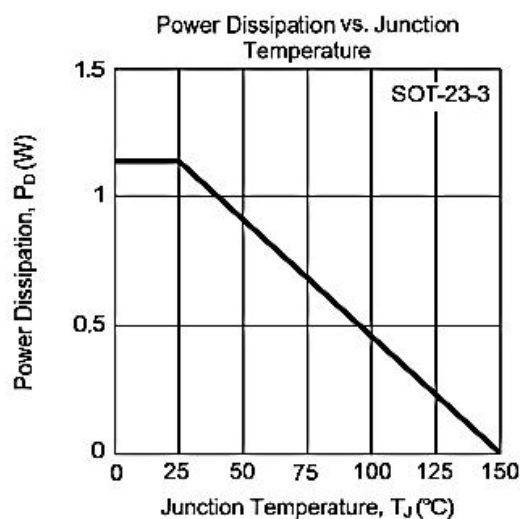
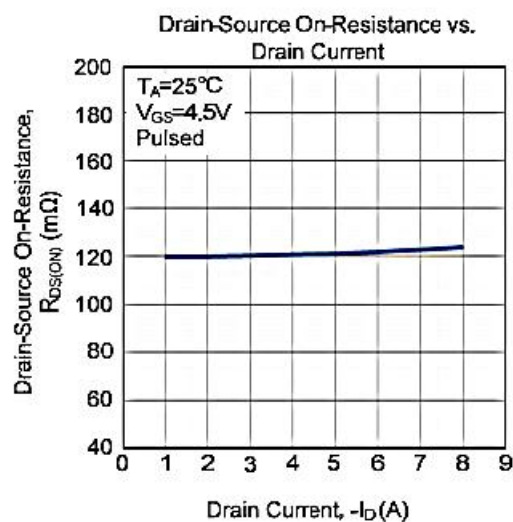
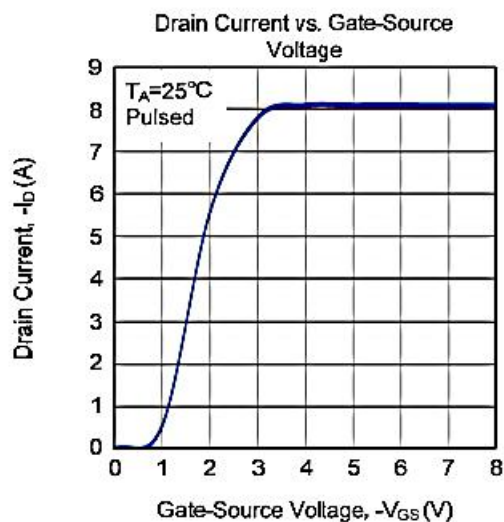




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■ TYPICAL CHARACTERISTICS (3)

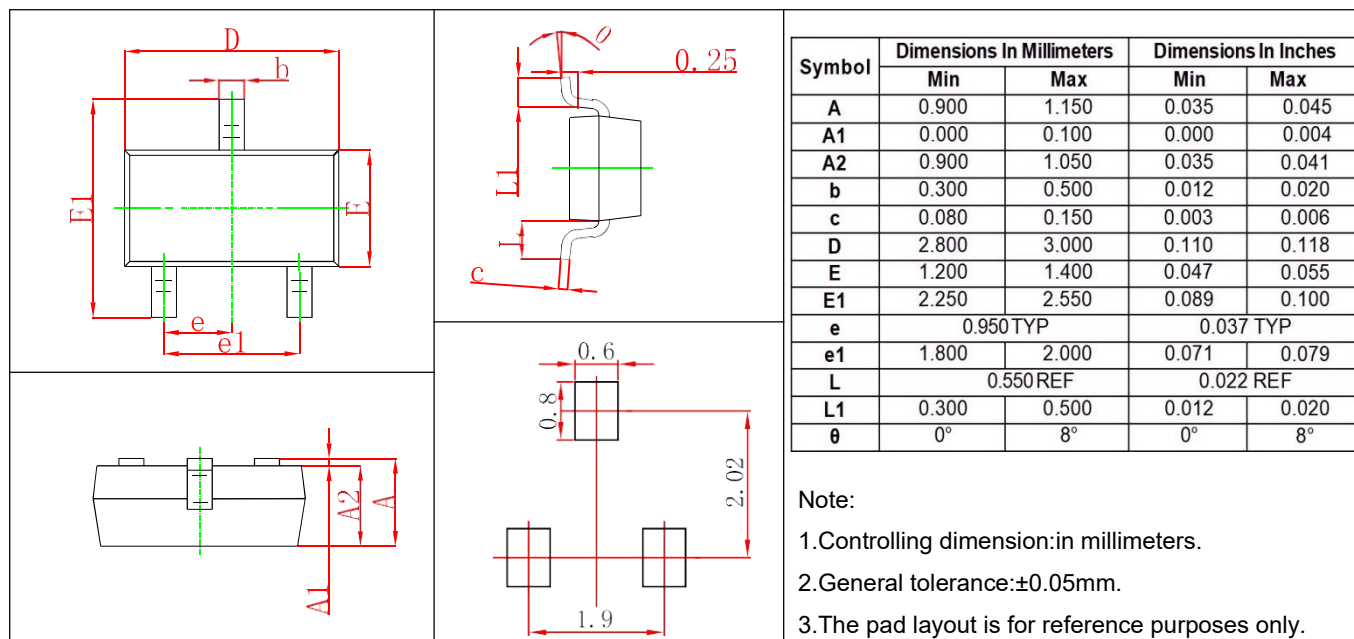




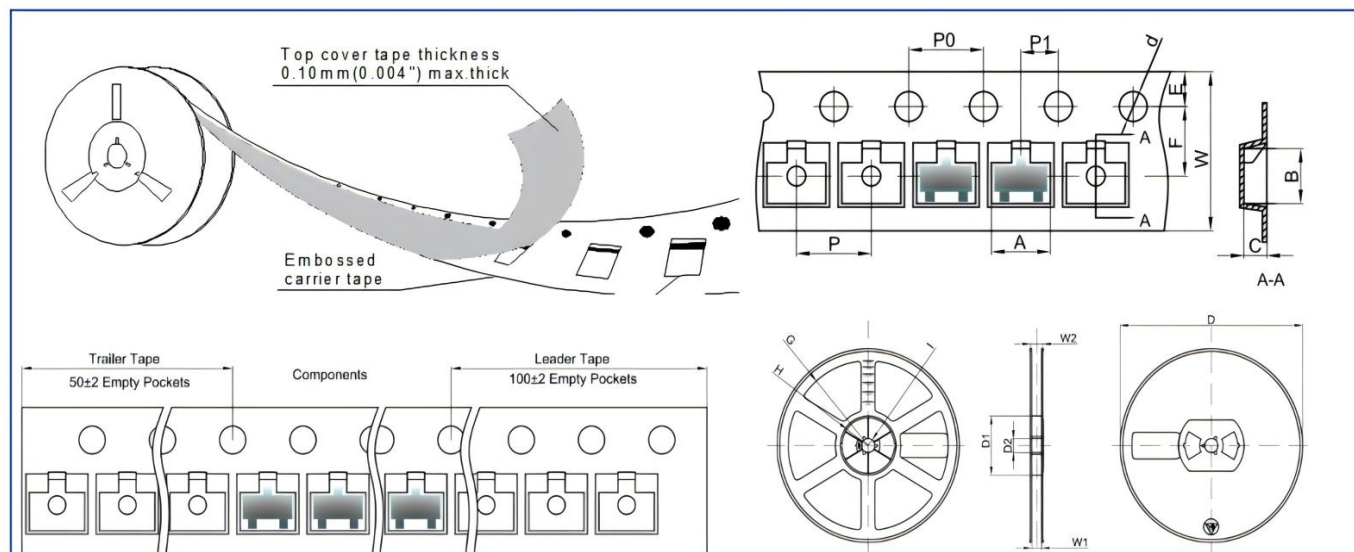
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■ SOT23 PACKAGE OUTLINE DIMENSIONS



■ REEL PACKING



Dimensions are in millimeter

PKG TYPE	A	B	C	d	E	F	Po	P	P1	W
SOT-23	3.15	2.77	1.22	Φ1.50	1.75	3.50	4.00	4.00	2.00	8.00
Reel Option	D	D1	D2	G	H	I	W1	W2	Q.TY PER REEL	
7" Dia	Φ178.0	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30	3000PCS	
13" Dia	Φ330.0	/	13.00	/	/	R6.50	9.50	12.30	10000PCS	