

EST7610BI

3-Channel PC Power Supply Supervisors



Description

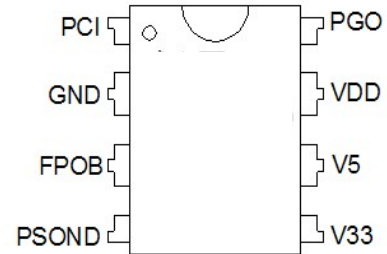
The EST7610BI is a PC switching power supply monitor with minimum external components. It provides protection circuits, power-good output (PGO), fault protection output (FPOB) and on/off control (PSONB).

The over-voltage protection (OVP) monitors 3.3V, 5V and 12V (12V supplies voltage detects via VDD pin). The under-voltage protection (UVP) monitors 3.3V and 5V. When an OV or UV condition is detected, the fault protection output (FPOB) is latched high and the power good output (PGO) go low. PSONB from low to high resets the latch. When OV, UV and PGI are all right, the power good output (PGO) will be issue. A built-in 4ms delay and 38ms debounce for PSONB turn off FPOB.

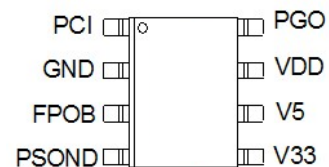
Features

- Over-voltage protection (OVP) for 3.3V, 5V and 12V supplies
- The Under Voltage Protection for 3.3V and 5V
- Both of fault protection output and power good output are open drain output stage
- 75ms delay for SPS short circuit protect
- 38ms PSONB input signal de-bounce
- 55us for OVP noise immunity de-bounce.
- 73us for internal noise immunity de-bounce
- 300ms power good delay time for PGO
- 3.5ms time delay between PGO and FPOB when PSONB turn off

Pin Assignments



DIP-8L

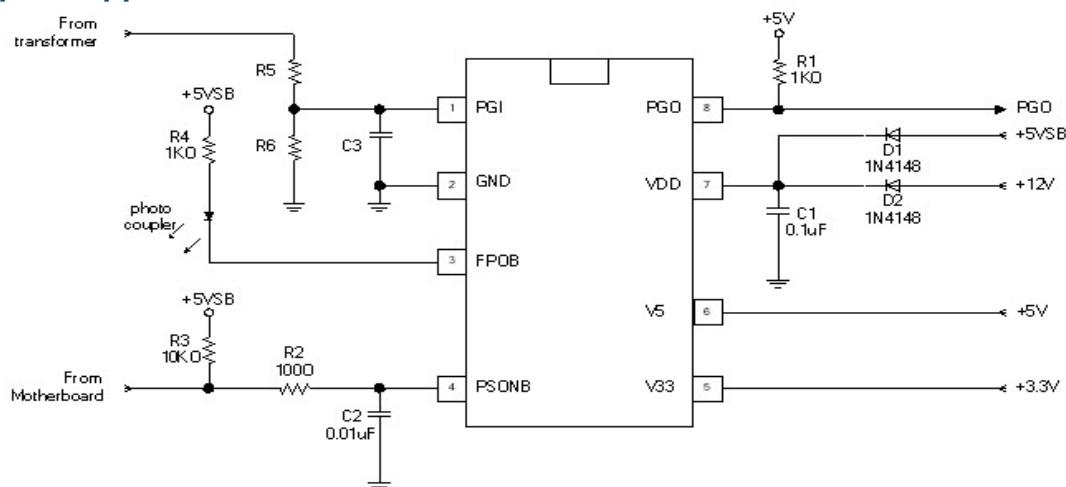


SOP-8L

Ordering Information

Order Number	Package Type	Packing	Top Marking
EST7610BI	DIP-8 (RoHS)	Tube	EST.7610BI
EST7610BIS	SOP-8 (RoHS)	Tube	EST.7610BIS
EST7610BISR	SOP-8 (RoHS)	Tape & Reel	EST.7610BIS

Typical Application Circuit



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Pin Description

Pin	Symbol	Function
1	PGI	AC power good input pin.
2	GND	Power supply ground.
3	FPOB	Open drain output of the fault protection.
4	PSONB	ON/OFF control input pin.
5	V33	3.3V input pin for OVP and UVP.
6	V5	5V input pin for OVP and UVP.
7	VDD	Power supply. 12V input pin for OVP.
8	PGO	Open drain output of power good signal.

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Storage Temperature (Tstg)	---	-40 to 140	°C
Operating Temperature (Topr)	---	-25 to 125	°C
Junction Temperature (Tj)	---	150	°C
Supply Voltage (VCC)	VCC	-0.3 to 18	V
Input Voltage Range (VI)	PGI, PSON, VS5, VS33	-0.3 to 16	V
Output Voltage Range (VO)	FPOB	-0.5 to 16	V
	PGO	-0.5 to 16	V
Power Dissipation	PD	800	mW
Thermal Resistance	θ_{JA}	85	°C/W

Stress beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC Electrical Characteristics (VCC =12V, Ta=25)

Input Power Supply:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	VCC	3.6	12	16	V	
Supply Current	Icc			1.0	mA	VPSON = 0V
Reset Threshold Voltage	VIH	2.8	3.0	3.2	V	HIGH → LOW *1

*1 Hysteresis voltage included

Over-Voltage function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Over-Voltage Threshold	OVT _{VS33}	3.7	3.9	4.1	V	
	OVT _{VS5}	5.7	5.95	6.2	V	
	OVT _{VS12}	12.9	13.4	13.9	V	For VCC

Under-Voltage function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Under-Voltage Threshold	UVT _{VS33}	2.0	2.2	2.4	V	
	UVT _{VS5}	3.3	3.5	3.7	V	

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PSONB, Analog Input function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Voltage		1.80			V	LOW→HIGH
Threshold Voltage				1.2	V	HIGH→LOW
Input pull up current			100		uA	

PGI, Analog Input:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Voltage of PGI		0.9	0.95	1.0	V	Enable/Disable UVP
		1.16	1.2	1.24	V	Enable/Disable PGO

FPOB, Open Drain Output:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Leakage Current	ILKG			5	uA	VFPOB=5V
Low Level Output Voltage	VOL			0.4	V	ISINK=10mA

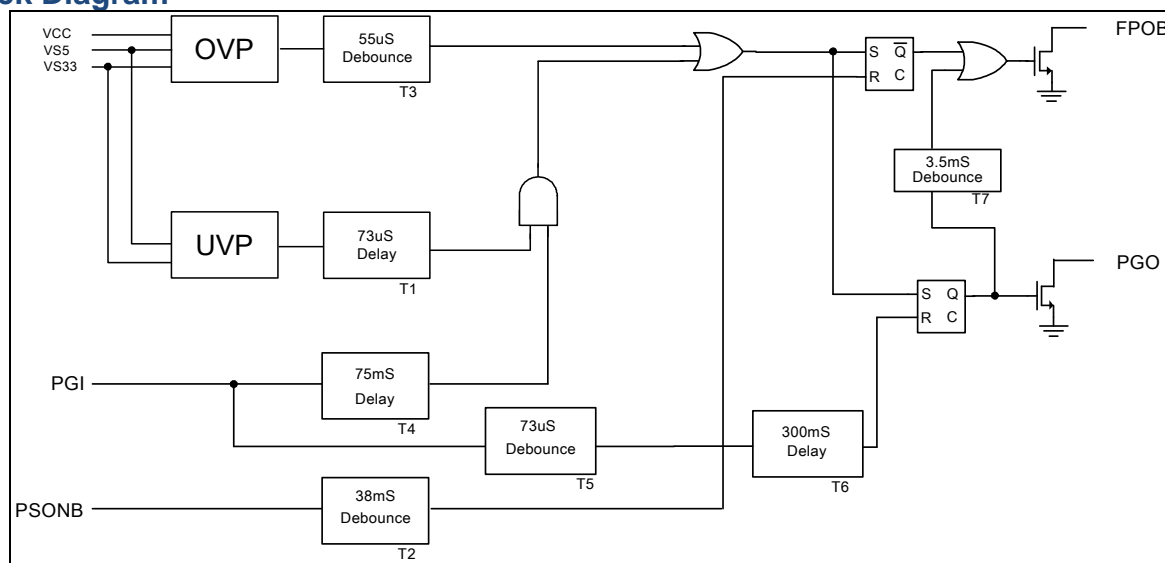
PGO, Open Drain Output:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Leakage Current	ILKG			5	uA	VPGO=5V
Low Level Output Voltage	VOL			0.3	V	ISINK=10mA

AC Electrical Characteristics (Vcc=12V, Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Under voltage protection delay time	T1	47	73	100	uS	
PSON De-bounce time	T2	24	38	52	mS	
Over voltage protection delay time	T3	35	55	75	uS	
PGI OC/UV mask time	T4	49	75	100	mS	PGI > 0.95V (TYP)
PGO De-bounce time	T5	47	73	100	uS	
PGI to PGO delay time	T6	200	300	400	mS	
PGO to FPOB delay time	T7	2	3.5	5	mS	

Block Diagram



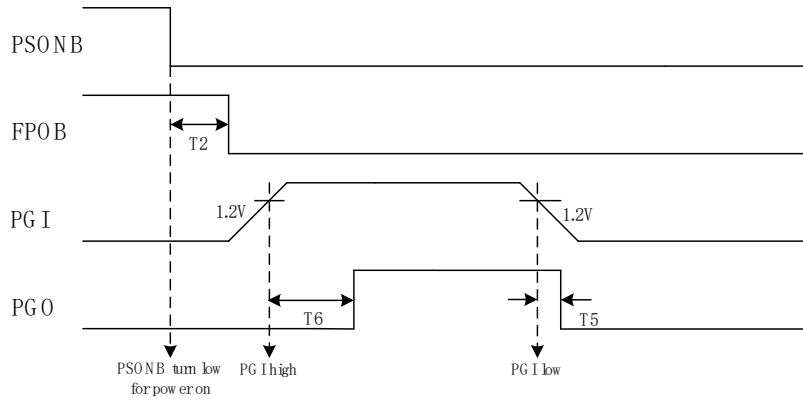
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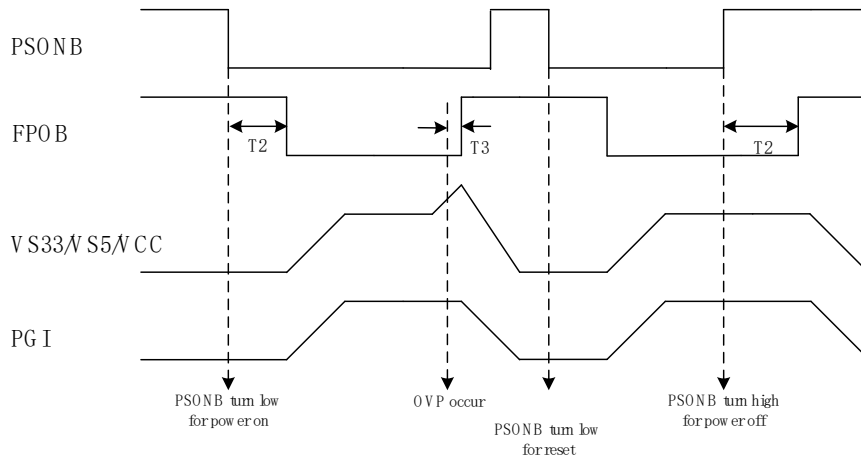


Time Chart

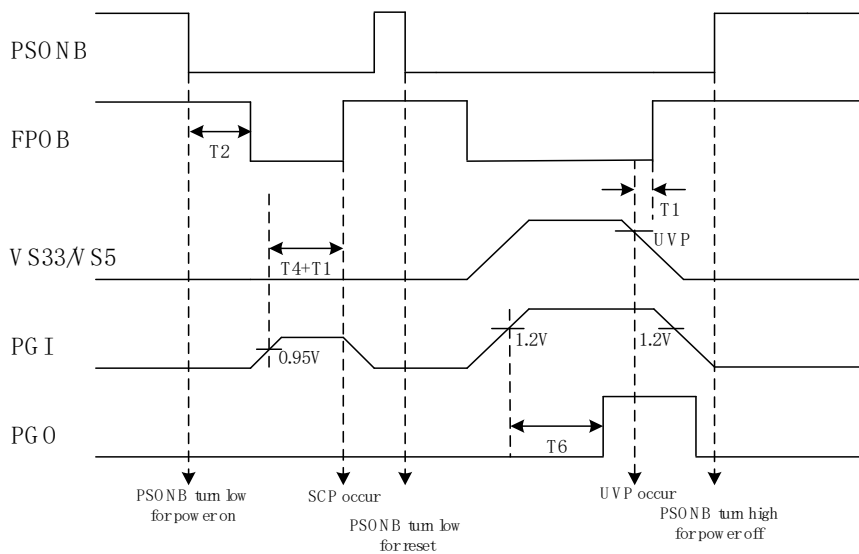
PG I Timing



OVP Timing



SCP & UVP Timing



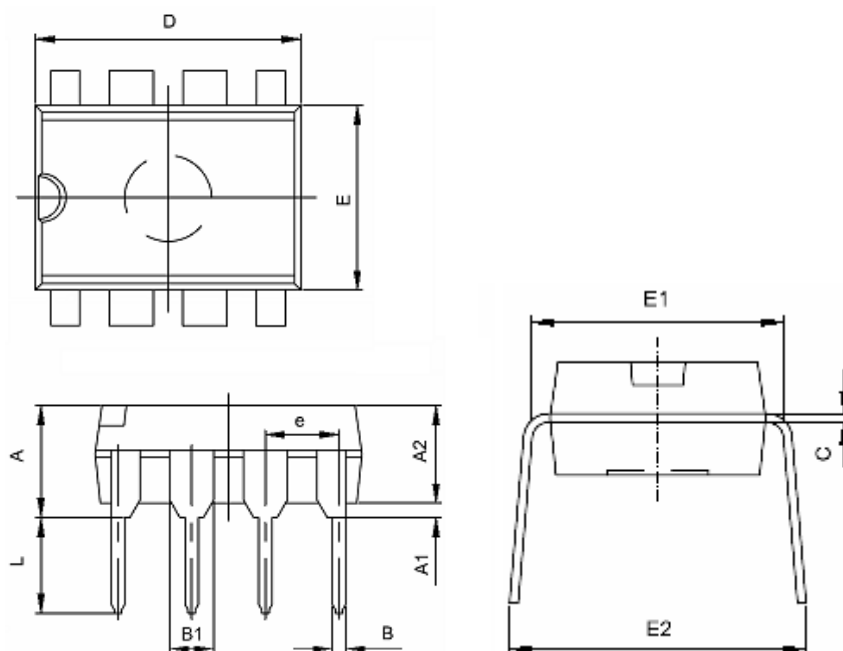
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PACKAGING INFORMATION

DIP-8 Package



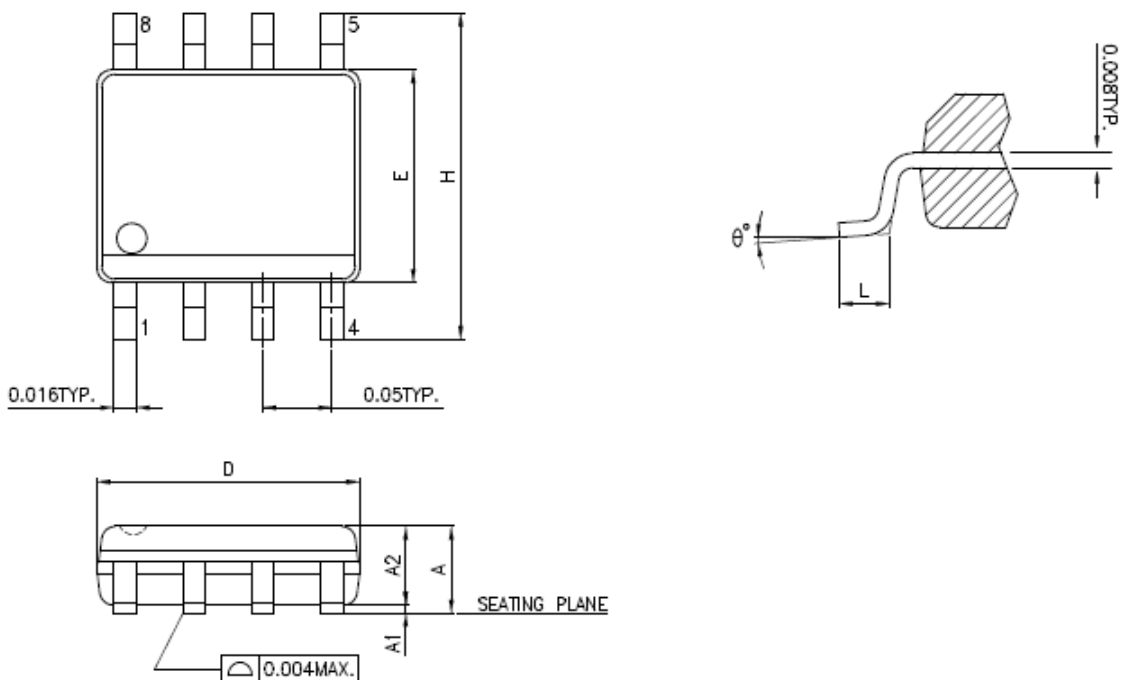
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.360	0.560	0.014	0.022
B1	1.524(TYP)		0.060(TYP)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.620(TYP)		0.300(TYP)	
e	2.540(TYP)		0.100(TYP)	
L	3.000	3.600	0.118	0.142
E2	8.200	9.400	0.323	0.370

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SOP-8 Package (mm)



Symbols	Dimensions In Inches			Dimensions In millimeters		
	MIN.	NOR.	MAX.	MIN.	NOR.	MAX.
A	0.050	0.061	0.072	1.270	1.549	1.829
A1	0.000	-----	0.010	0.000	-----	0.254
A2	-----	-----	0.062	-----	-----	1.575
D	0.185	0.193	0.200	4.699	4.902	5.080
E	0.147	0.154	0.160	3.734	3.912	4.064
H	0.225	0.237	0.249	5.715	6.020	6.325
L	0.013	0.033	0.053	0.330	0.838	1.346
θ	0°	4°	8°	0°	4°	8°

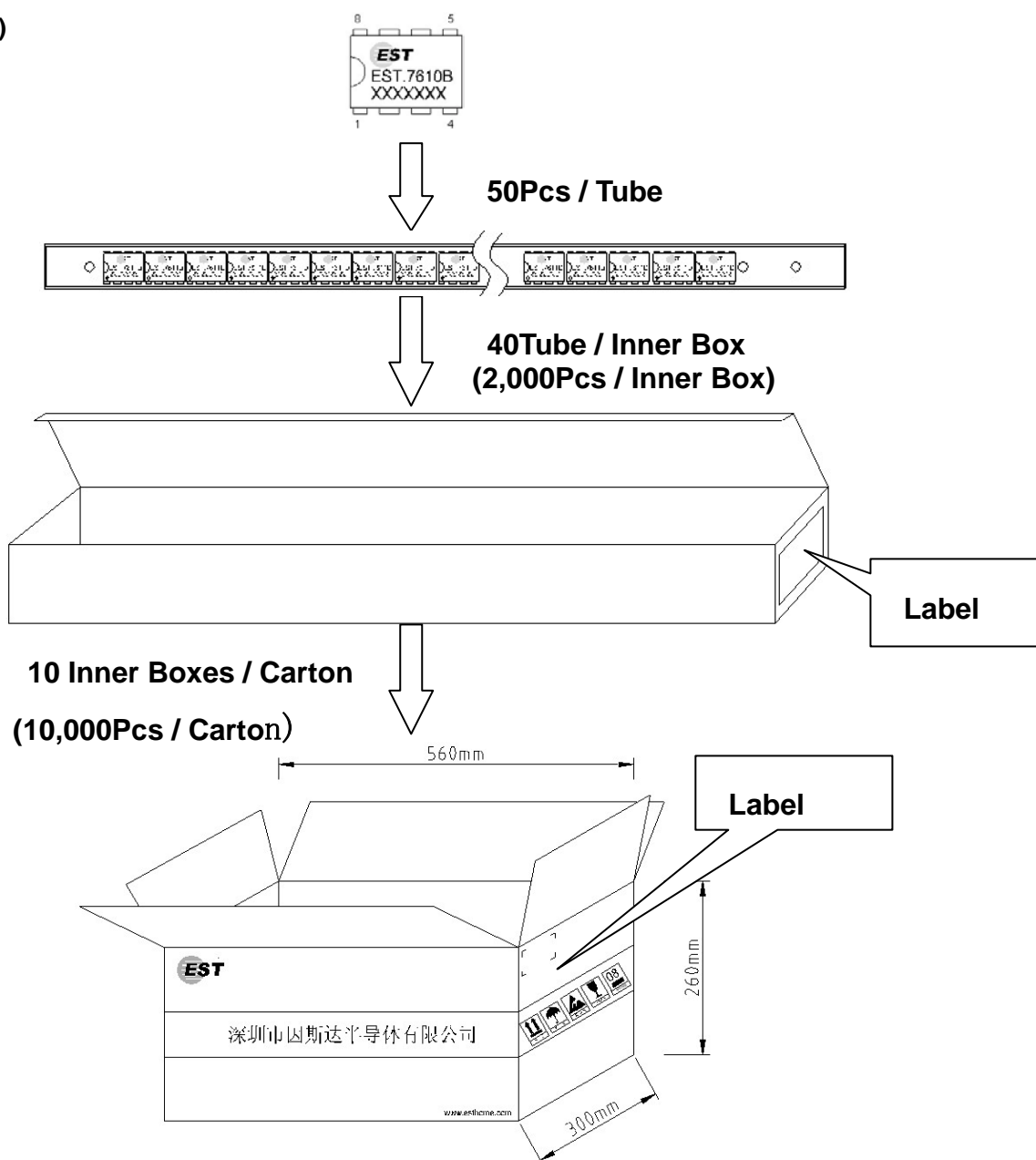
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Packing Information:

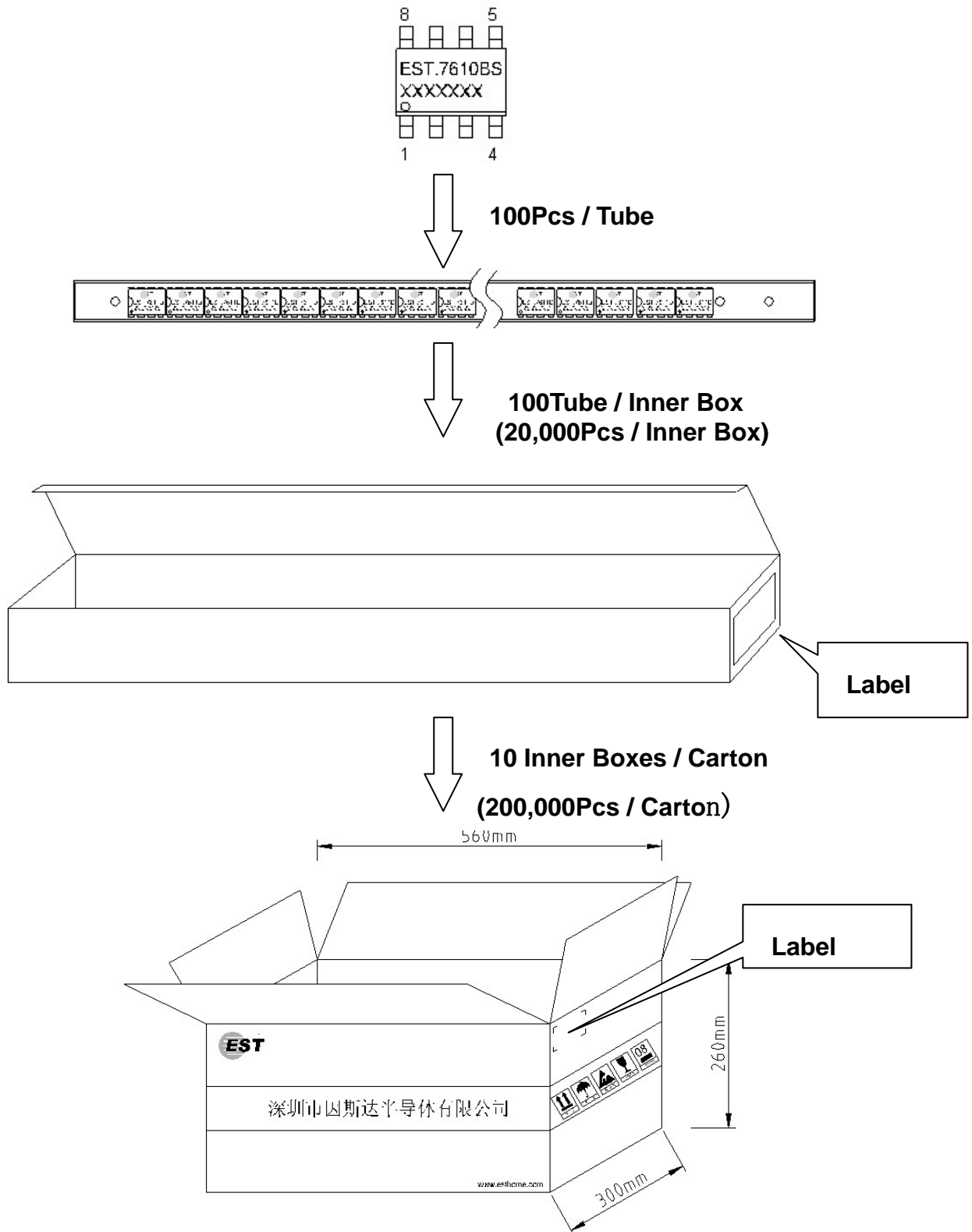
★DIP-8: (Tube)



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★SOP-8: (Tube)



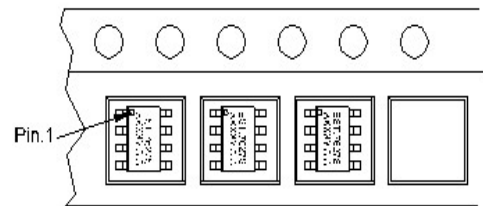
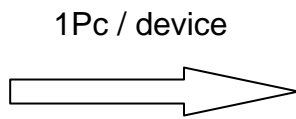
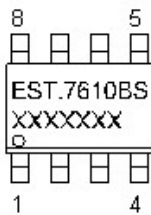
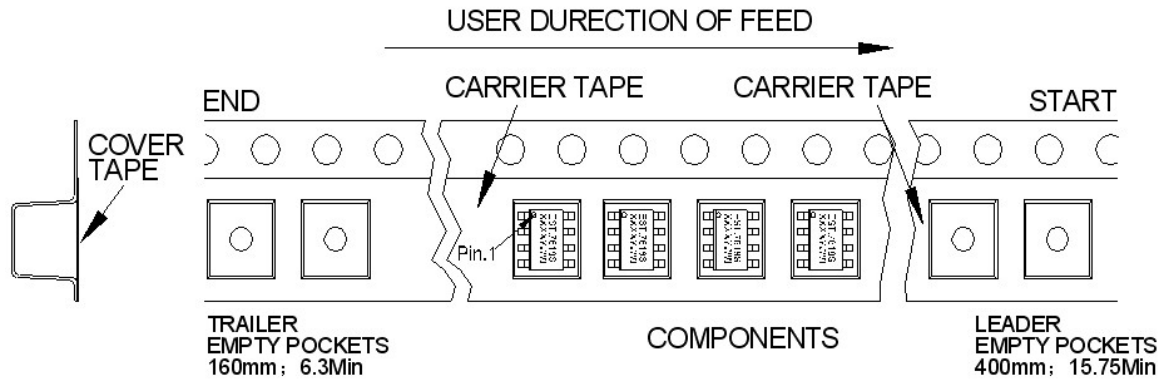
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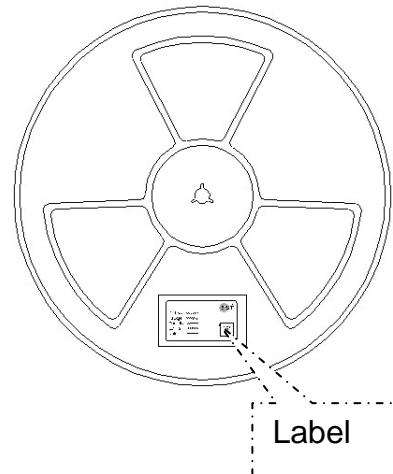
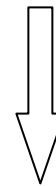


Shipping packing:

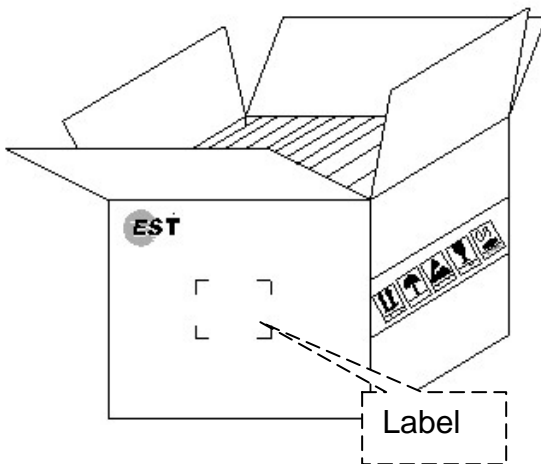
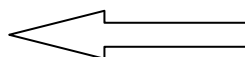
★SOP-8:(tape & Reel)



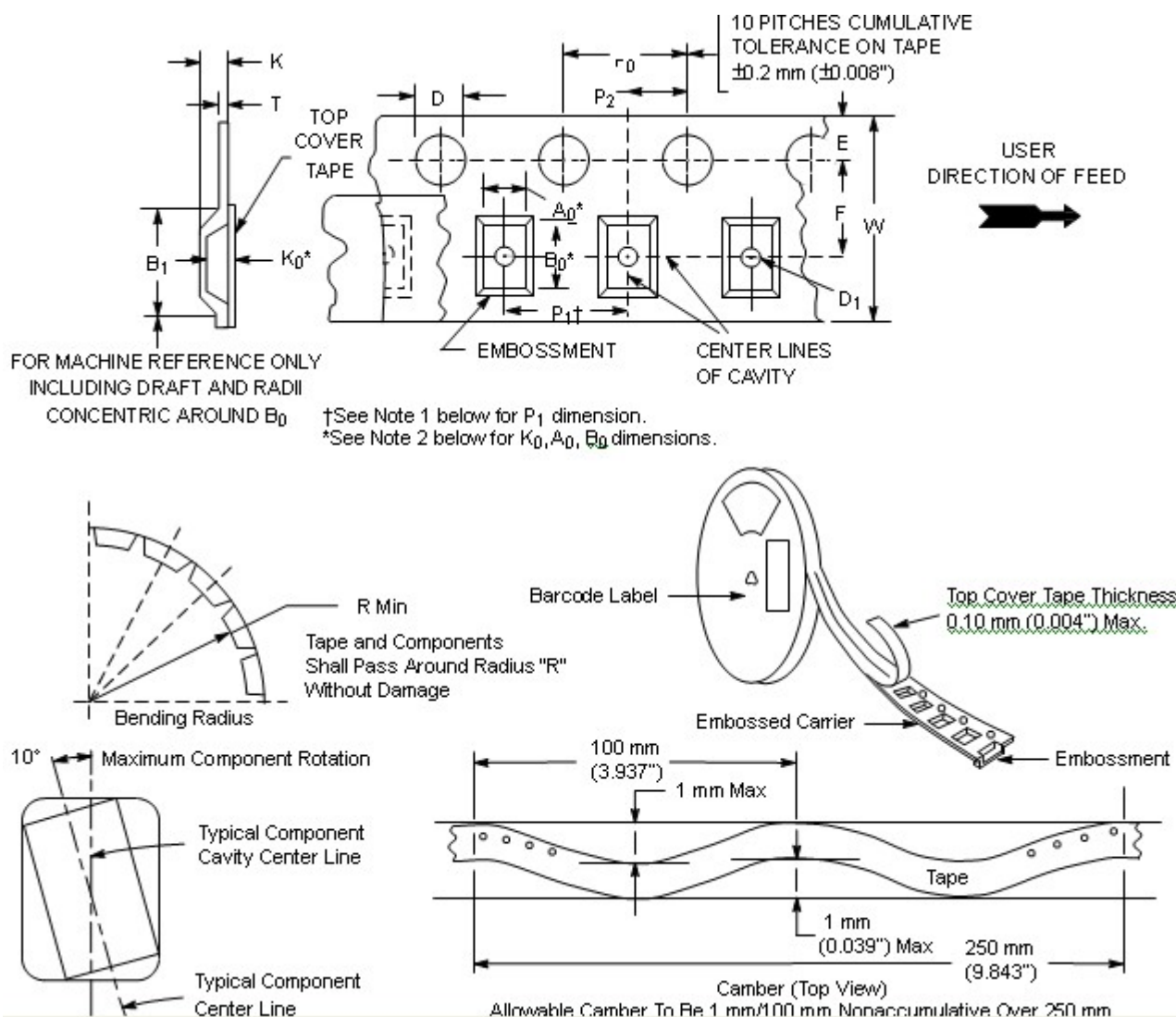
2500 devices / Reel



12 Reel / Carton
(30,000Pcs / Carton)



Embossed Tape and Reel Data Carrier Tape Specifications



DIMENSIONS

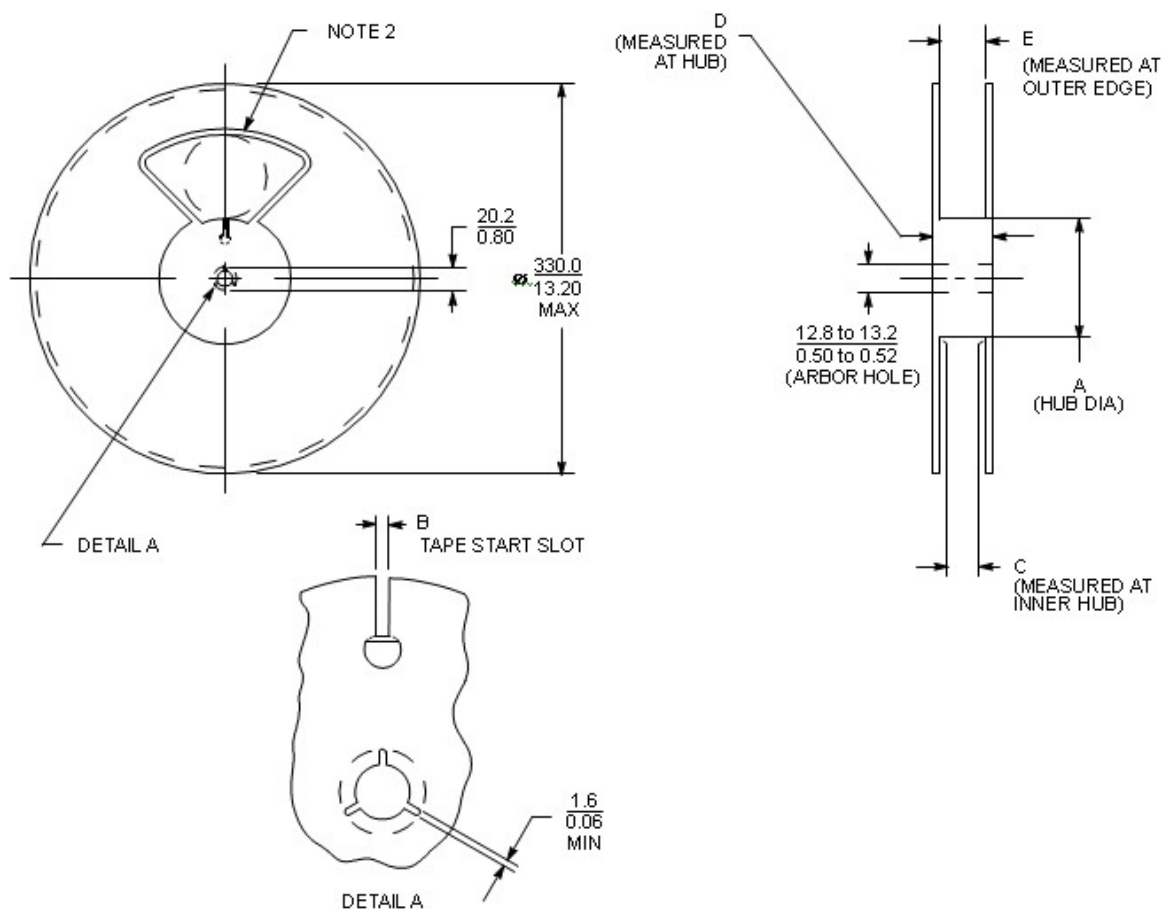
Tape	B_1 Max (Note 1)	D	D_1	E	F	K	P_0	P_2	R Min	T Max	W Max
8 mm	4.55 mm (0.1793)	1.5 + 0.1 mm - 0.0 (0.059 + 0.0043 - 0.0)	1.0 Min (0.0393) or 0.5 mm Min (0.0203)	1.75 ± 0.1 mm (0.069 ± 0.0043)	3.5 ± 0.05 mm (0.138 ± 0.0023)	2.4 mm Max (0.0943)	4.0 ± 0.1 mm (0.157 ± 0.0043)	2.0 ± 0.1 mm (0.079 ± 0.0023)	25 mm (0.983)	0.6 mm (0.0243)	8.3 mm (0.3273)
12 mm	8.2 mm (0.3233)		1.5 mm Min (0.0603)		5.5 ± 0.05 mm (0.217 ± 0.0023)	6.4 mm Max (0.2523)					12 ± 0.30 mm (0.470 ± 0.0123)
16 mm	12.1 mm (0.4763)		7.5 ± 0.10 mm (0.295 ± 0.0043)		7.9 mm Max (0.3113)	16.3 mm (0.6423)					
			11.5 ± 0.1 mm (0.453 ± 0.0043)		11.9 mm Max (0.4683)	24.3 mm (0.9573)					

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Reel Dimensions



Reel	Tape	A		B		C		D	E
		Min	Max	Min	Max	Min	Max		
178.0 (7.01)	16.0 (0.63)		50.0 (1.97)	6.5 (0.26)	7.5 (0.30)	16.4 (0.65)	18.4 (0.72)	22.4 (0.88)	19.4 (0.76)
330.0 (12.99)	12.0 (0.47)	178.0 (7.01)		4.5 (0.18)	5.5 (0.22)	12.4 (0.49)	14.4 (0.57)	18.4 (0.72)	15.4 (0.61)
330.0 (12.99)	56.0 (2.20)	150.0 (5.91)		10.0 (0.39)	11.0 (0.43)	56.4 (2.22)	58.4 (2.30)	62.4 (2.46)	59.4 (2.34)
330.0 (12.99)	44.0 (1.73)	100.0 (3.94)		10.0 (0.39)	11.0 (0.43)	44.4 (1.75)	46.4 (1.83)	62.4 (2.46)	47.4 (1.87)
330.0 (12.99)	32.0 (1.26)	100.0 (3.94)		10.0 (0.39)	11.0 (0.43)	32.4 (1.28)	34.4 (1.35)	38.4 (1.51)	35.4 (1.39)
330.0 (12.99)	24.0 (0.94)	60.0 (2.36)		9.5 (0.37)	10.5 (0.41)	24.4 (0.96)	26.4 (1.04)	30.4 (1.51)	27.4 (1.08)
330.0 (12.99)	16.0 (0.63)			6.5 (0.26)	7.5 (0.30)	16.4 (0.65)	18.4 (0.72)	22.4 (0.88)	19.4 (0.76)
330.0 (12.99)	12.0 (0.47)			4.5 (0.18)	5.5 (0.22)	12.4 (0.49)	14.4 (0.57)	18.4 (0.72)	15.4 (0.61)
330.0 (12.99)	8.0 (0.31)	50.0 (1.97)		2.5 (0.10)	3.5 (0.14)	8.4 (0.33)	9.9 (0.39)	14.4 (0.57)	10.9 (0.43)
178.0 (7.01)	12.0 (0.47)	50.0 (1.97)		4.5 (0.18)	5.5 (0.22)	12.4 (0.49)	14.4 (0.57)	18.4 (0.72)	15.4 (0.61)
178.0 (7.00)	8.0 (0.31)	50.0 (1.97)		2.5 (0.10)	3.5 (0.14)	8.4 (0.33)	9.9 (0.39)	14.4 (0.47)	10.9 (0.43)
330.0 (12.99)	8.0 (0.31)	50.0 (1.97)		4.0 (0.16)	5.0 (0.20)	8.4 (0.33)	9.9 (0.39)	14.4 (0.57)	10.9 (0.43)
178.0 (7.00)	8.0 (0.31)	50.0 (1.97)		4.0 (0.16)	5.0 (0.20)	8.4 (0.33)	9.9 (0.39)	14.4 (0.57)	10.9 (0.43)