

EST7610A

3-Channel PC Power Supply Supervisors



Description

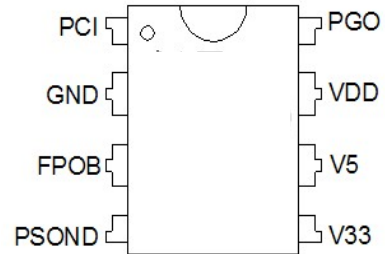
The EST.7610 is a PC switching power supply monitor with minimum external components. It provides protection circuits, power-good output (PGO), fault protection output (FPOB) and on/off control (PSONB).

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.

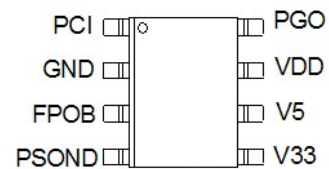
Features

- The Over Current Protection monitors 3.3V/5V and double 12V output currents and related lockout
- 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
- 25us for OVP noise immunity de-bounce.
- 73us for internal noise immunity de-bounce
- 300ms power good delay time for PGO
- 4ms time delay between PGO and FPOB when PSONB turn of

Pin Assignments



DIP-8L

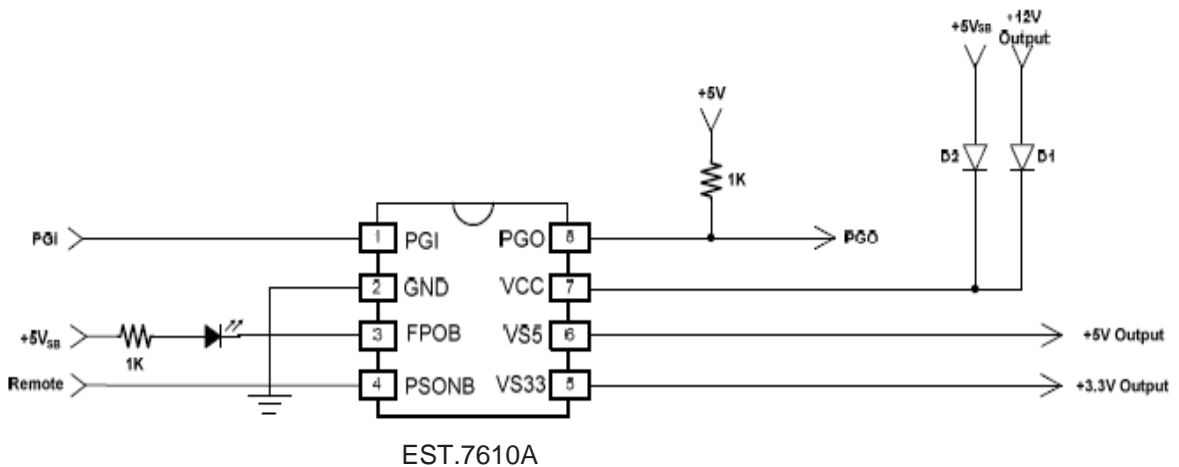


SOP-8L

Ordering Information

Order Number	Package Type	Packing	Top Marking
EST7610A	DIP-8 (RoHS)	Tube	EST.7610A
EST7610AS	SOP-8 (RoHS)	Tube	EST.7610AS
EST7610ASR	SOP-8 (RoHS)	Tape & Reel	EST.7610AS

Typical Application Circuit



EST7610A

3-Channel PC Power Supply Supervisors



Pin Description

Pin	Symbol	Function
1	PGI	Power good input signal pin
2	GND	Ground
3	FPOB	Inverted fault protection output ,open drain output stage
4	PSONB	Remote ON/OFF switch input pin
5	V33	3.3V over/under voltage protection input pin
6	V5	5.0V over/under voltage protection input pin
7	VDD	Power supply
8	PGO	power good output stage pin

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	-0.5 to 18	V
Input Voltage Range (VI)	PGI, PSON, VS5, VS33	-0.5 to 16	V
Output Voltage Range (VO)	FPOB	-0.5 to 16	V
	PGO	-0.5 to 16	V
Power Dissipation	PD	650	mW
Thermal Resistance	θJA	85	°C/W
ESD(HBM)		Class 2A	V

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.

Time-switching Characteristics (VDD=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	30	40	50	uS	
PGI OC/UV mask time	T4	47	75	100	mS	PGI>0.65V
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	4	6	mS	

EST7610A

3-Channel PC Power Supply Supervisors



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

Input Power Supply:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	V _{CC}	3.6	12	16	V	
Supply Current	I _{CC}			1.0	mA	VPSON = 5V
Power On Reset Threshold Voltage	V _{POR}	2.8	3.0	3.2	V	
Power On Reset	V _{HYST}			+/- 0.6	V	

Over-Voltage function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Over-Voltage Threshold	OVT _{VS33}	3.7	3.8	3.9	V	
	OVT _{VS5}	5.7	5.85	6.0	V	
	OVT _{VS12}	12.8	13.2	13.6	V	For VCC

Under-Voltage function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Under-Voltage Threshold	UVT _{VS33}	2.55	2.69	2.83	V	
	UVT _{VS5}	4.1	4.3	4.47	V	
	UVT _{VS12}	8.8	9.2	9.6	V	For VCC

PSONB, Analog Input function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Voltage		1.80			V	LOW-HIGH
Threshold Voltage				1.0	V	HIGH-LOW
Input pull up current			100		uA	

PGI, Analog Input:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Voltage of PGI	T _{d1}	0.60	0.65	0.70	V	Enable/Disable UVP
	T _{d2}	1.16	1.20	1.24	V	PGO Enable
	TR	1.16	1.20	1.20	V	PGO/UVP Disable
	V _{HYST}		+/- 50		mV	

FPOB, Open Drain Output:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Leakage Current	ILKG			5	uA	VFPOB=5V
Low Level Output Voltage	VOL			0.	V	ISINK=10mA
				0.7	V	

PGO, Open Drain Output:

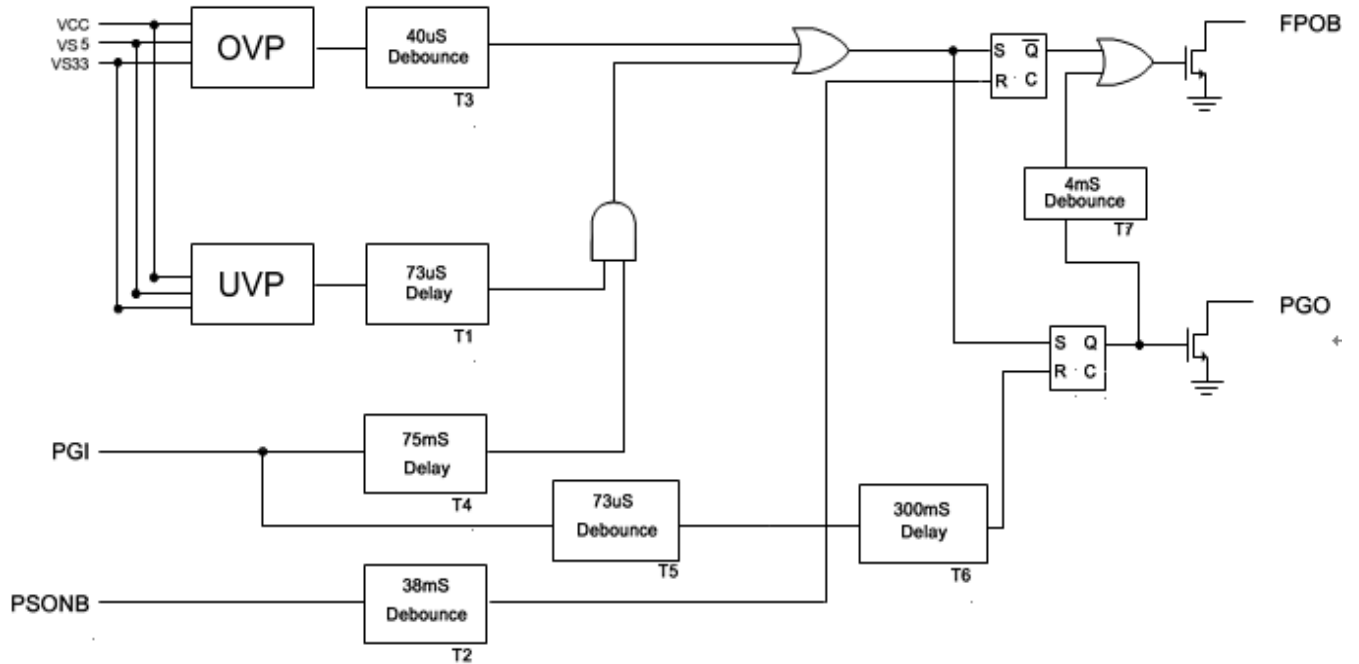
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Leakage Current	ILKG			5	uA	VPGO=5V
Low Level Output Voltage	VOL			0.3	V	ISINK=10mA
				0.8	V	ISINK=30mA

EST7610A

3-Channel PC Power Supply Supervisors

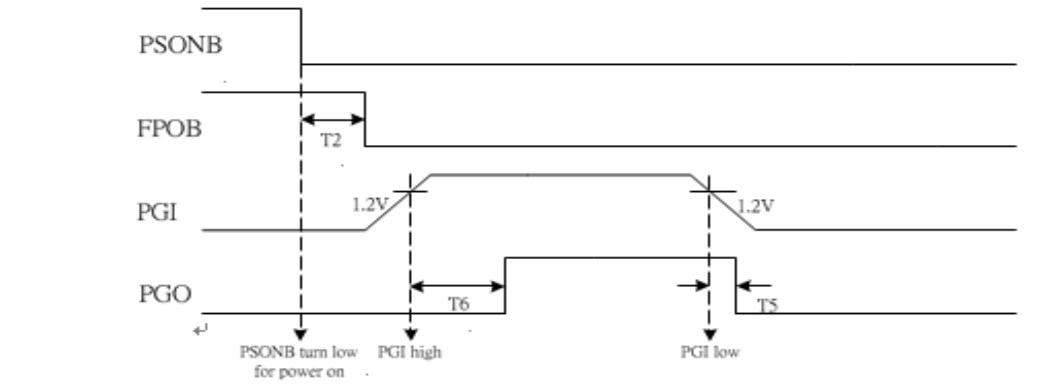


Block Diagram

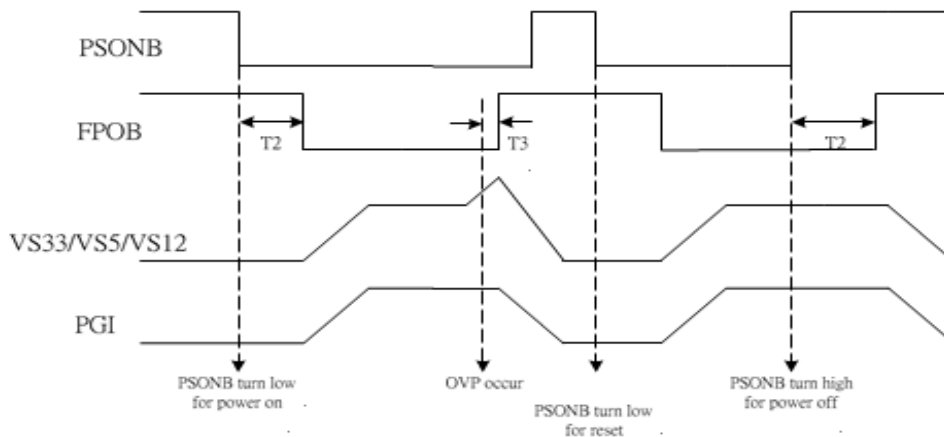


Time Chart

PGI Timing



OVP Timing



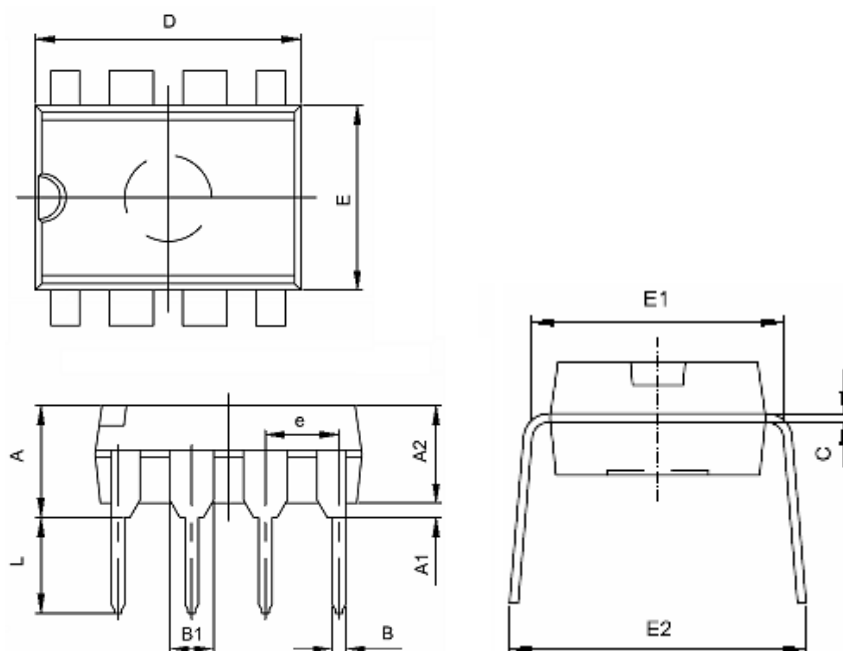
EST7610A

3-Channel PC Power Supply Supervisors



PACKAGING INFORMATION

DIP-8 Package



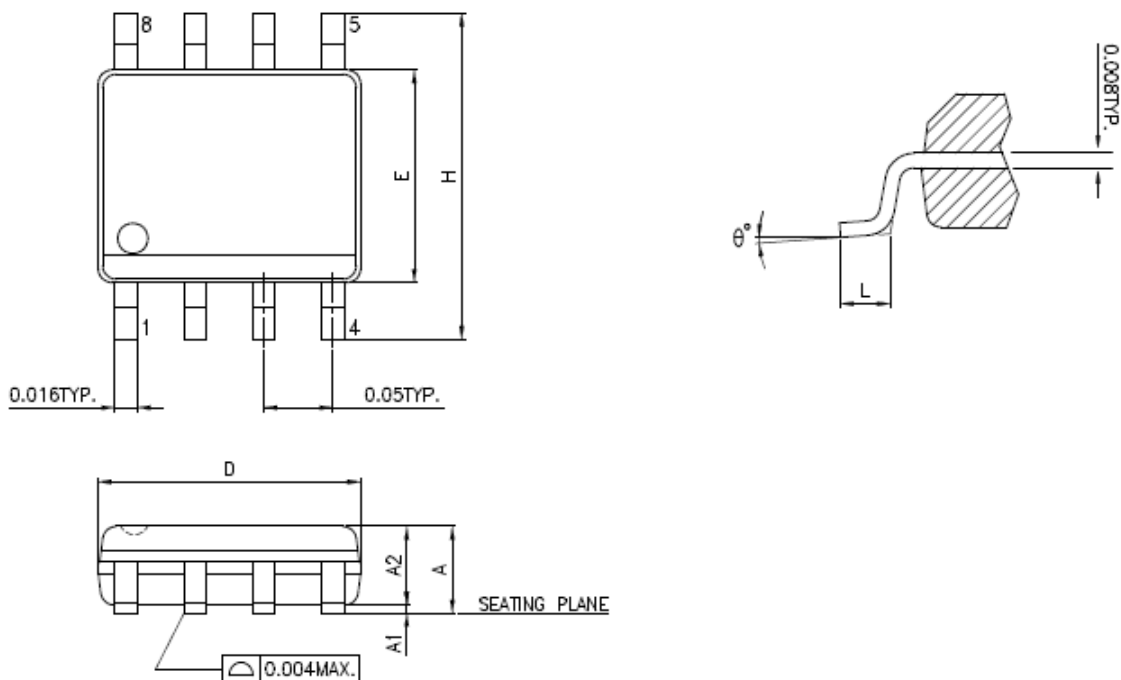
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.360	0.560	0.014	0.022
B1	1.524(TYP)		0.060(TYP)	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.620(TYP)		0.300(TYP)	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

EST7610A

3-Channel PC Power Supply Supervisors



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°

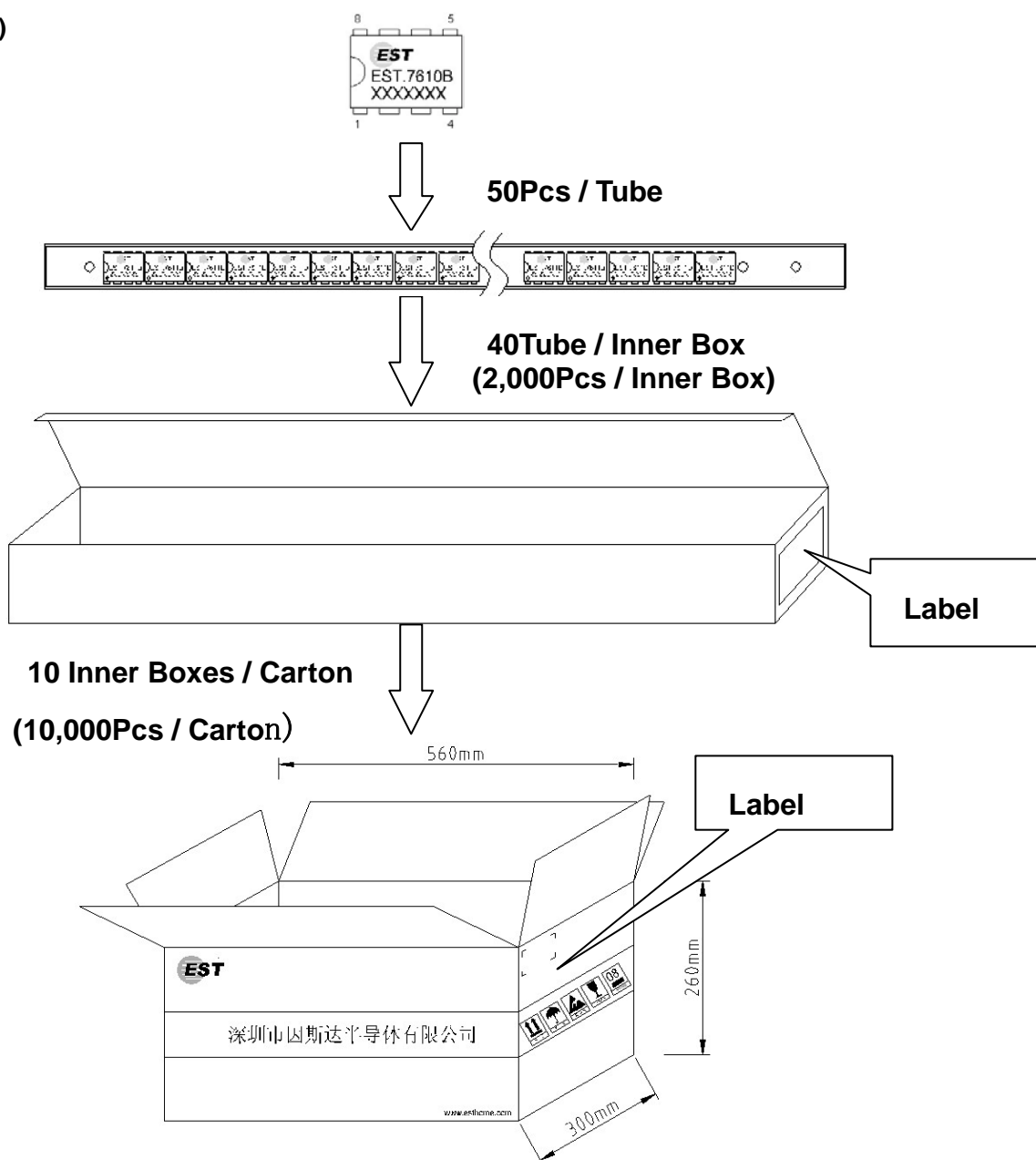
EST7610A

3-Channel PC Power Supply Supervisors



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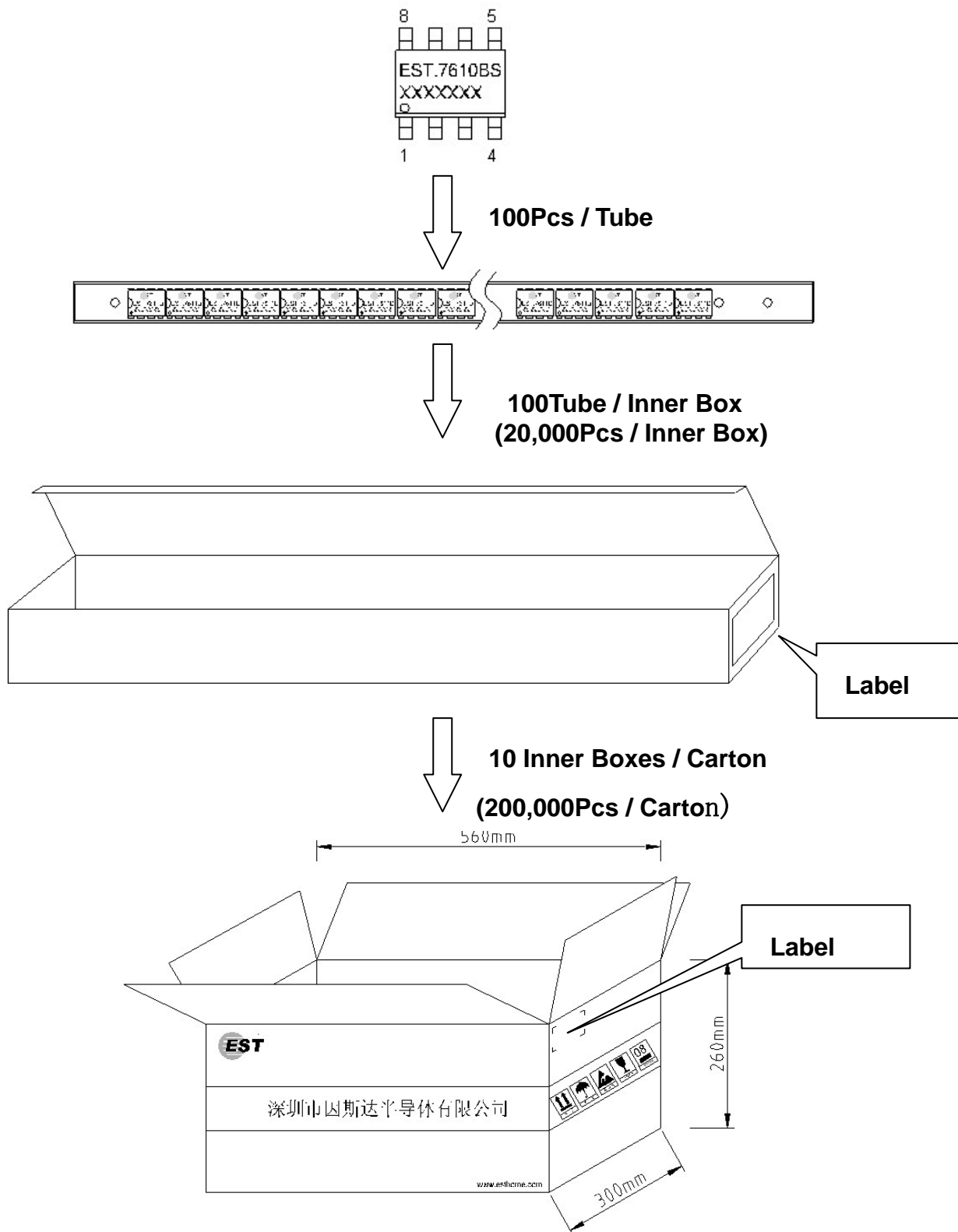
★DIP-8: (Tube)



EST7610A 3-Channel PC Power Supply Supervisors



★SOP-8: (Tube)

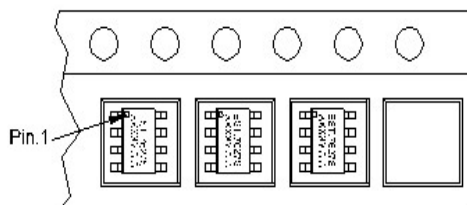
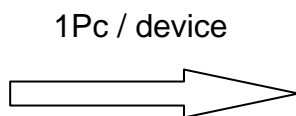
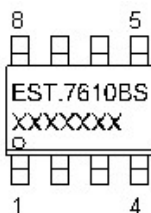
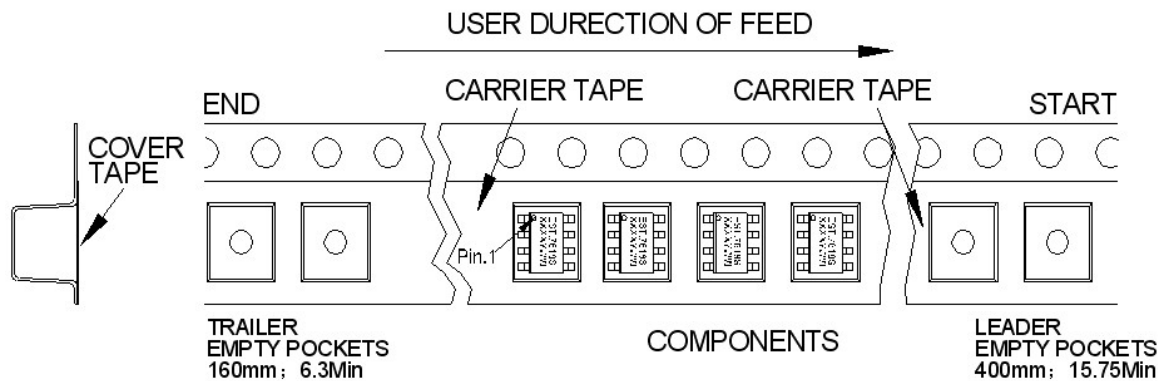


EST7610A 3-Channel PC Power Supply Supervisors

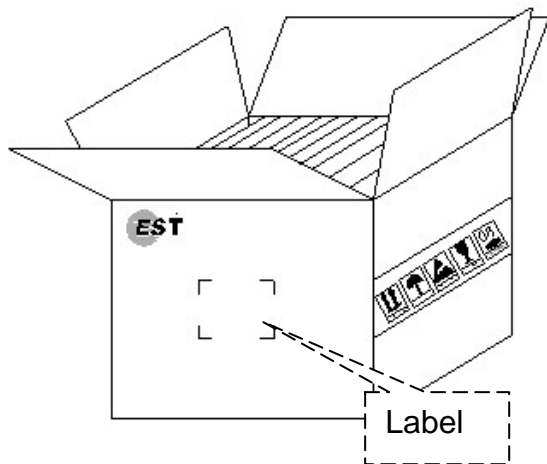


Shipping packing:

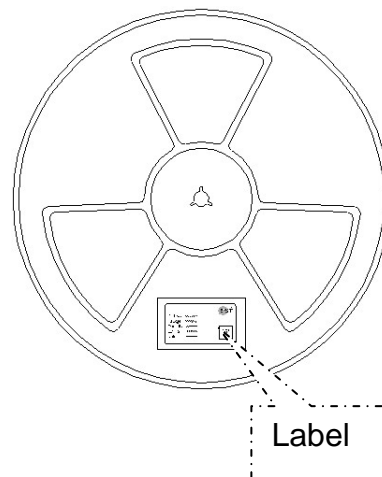
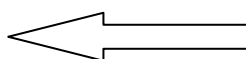
★SOP-8:(tape & Reel)



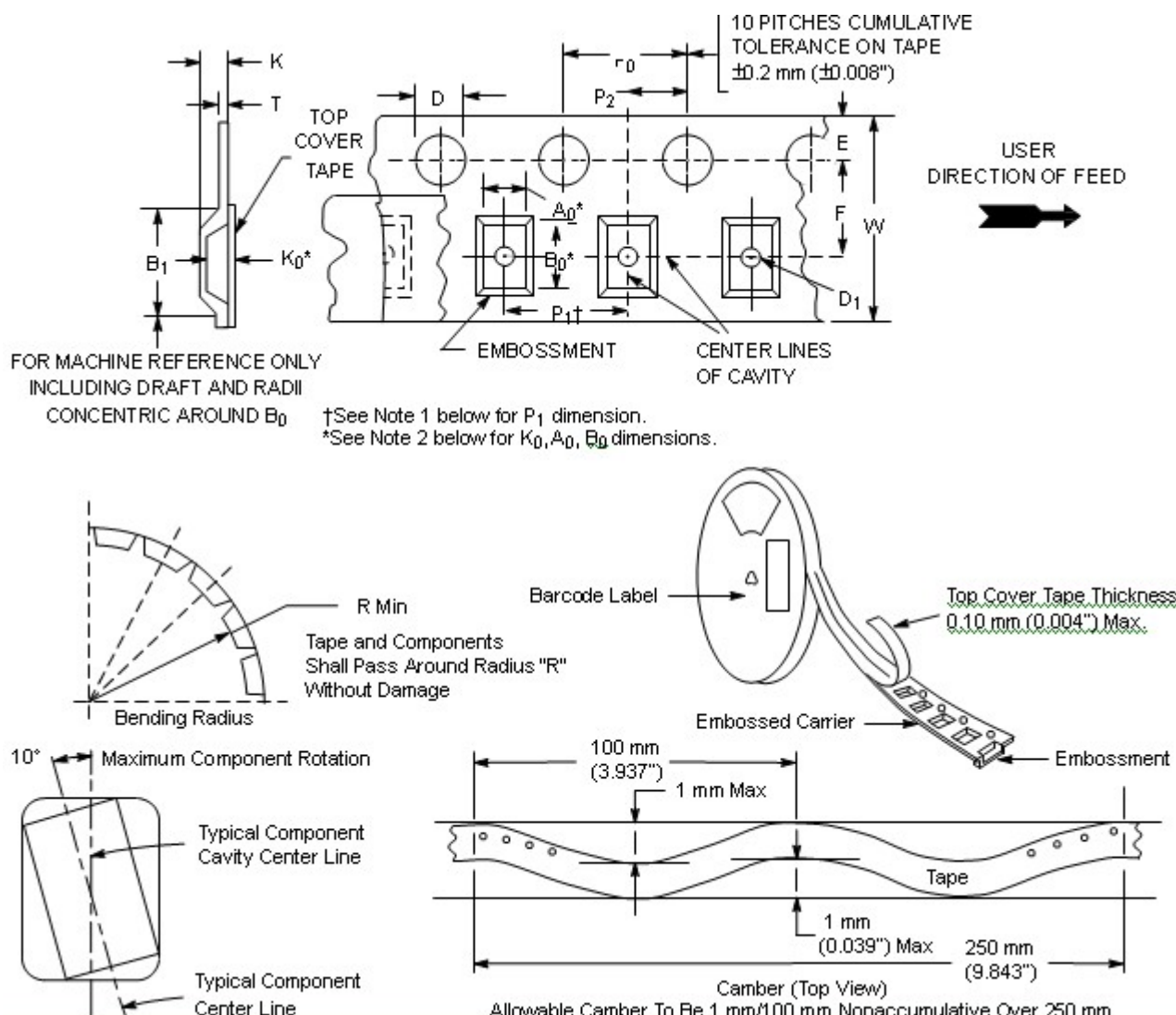
2500 devices / Reel



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



Embossed Tape and Reel Data Carrier Tape Specifications



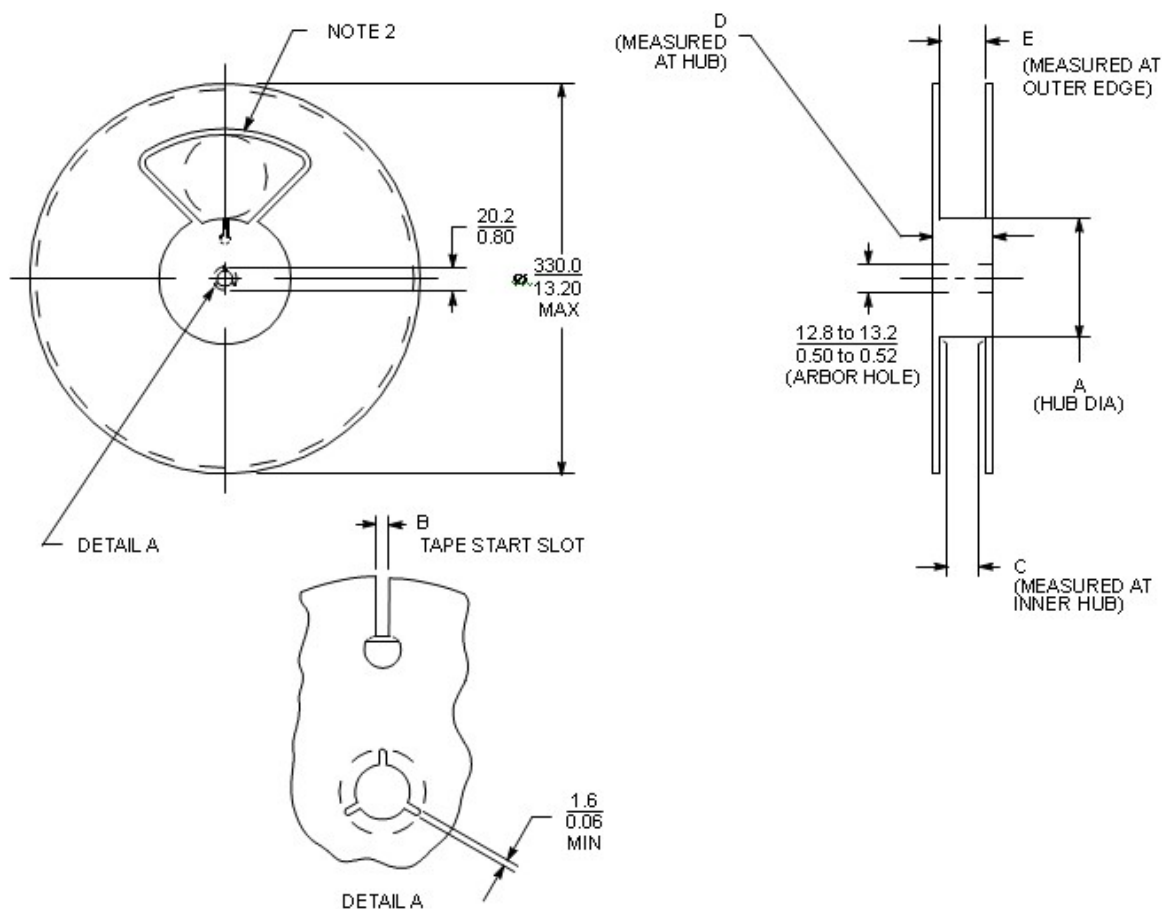
DIMENSIONS

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	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)

EST7610A 3-Channel PC Power Supply Supervisors



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)