Data Sheet

Type Description : SPS Secondary Supervisor IC

Product Name : EST.7703/7703S

Reversion : Rev 1.0

Reversion Date : 01, 2021

Page : 16 Pages

Description

EST7703 is higher integrated circuit incorporates all advanced sensing function to protect from over and under voltage a two-channels protection supervisor (3.3V/5V/12V).

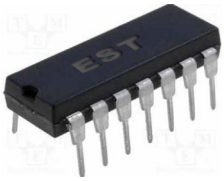
The protections include Over Voltage Protection(OVP), Under Voltage Protection(UVP), Over Current Protection (OCP),VX.

When VS3.3/VS5/VS12 OV/UV/OC/VX fault detected, the FPOB latched(LOW),.

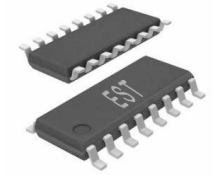
The function of Over Current Protection (OCP) monitors output currents through sense resistor by using smart comparator circuit is more exact and easy.

EST7703 provide three-channels of the fault protection latch (FPOB), Power on indicated LED signal, the PSONB control and the power good control (PGO).

Pin Assignments



DIP-16L



SOP-16L

Features

- The Over/Under Voltage Protection and 3.3V/5V/12V
- The Over Current Protection monitors 3.3V/5V/12V output currents and related lockout
- Fault protection output are open drain output stage
- 14us for OVP noise immunity de-bounce
- 25ms for OCP noise immunity de-bounce
- 38ms PSONB input signal de-bounce
- 73us for UVP noise immunity de-bounce
- 50ms delay for UVP/OCP mask time
- LED driver for power good signal
- Auto modulating 3.3V/5V/12V OCP function
- OCP delay time can adjustable by digital programming

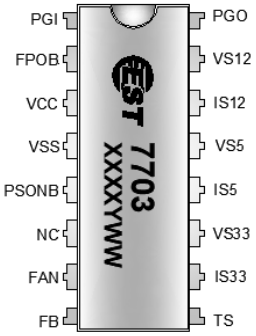
Application

- PC SPS line housekeeping IC (3.3V, 5V, and 12V)

Ordering Information

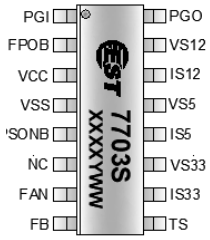
Order Number	Package Type	Packing	Top Marking
EST.7703	DIP-16 (RoHS)	Tube	EST.7703
EST.7703S	SOP-16 (RoHS)	Tube	EST.7703S
EST.7703SR	SOP-16 (RoHS)	Tape & Reel	EST.7703S

Pin connection (Top View)



EST: LOGO
7703 = Product name DIP
XXXXYWW:
XXXX= Production lot
YWW=Date Code

DIP-16L



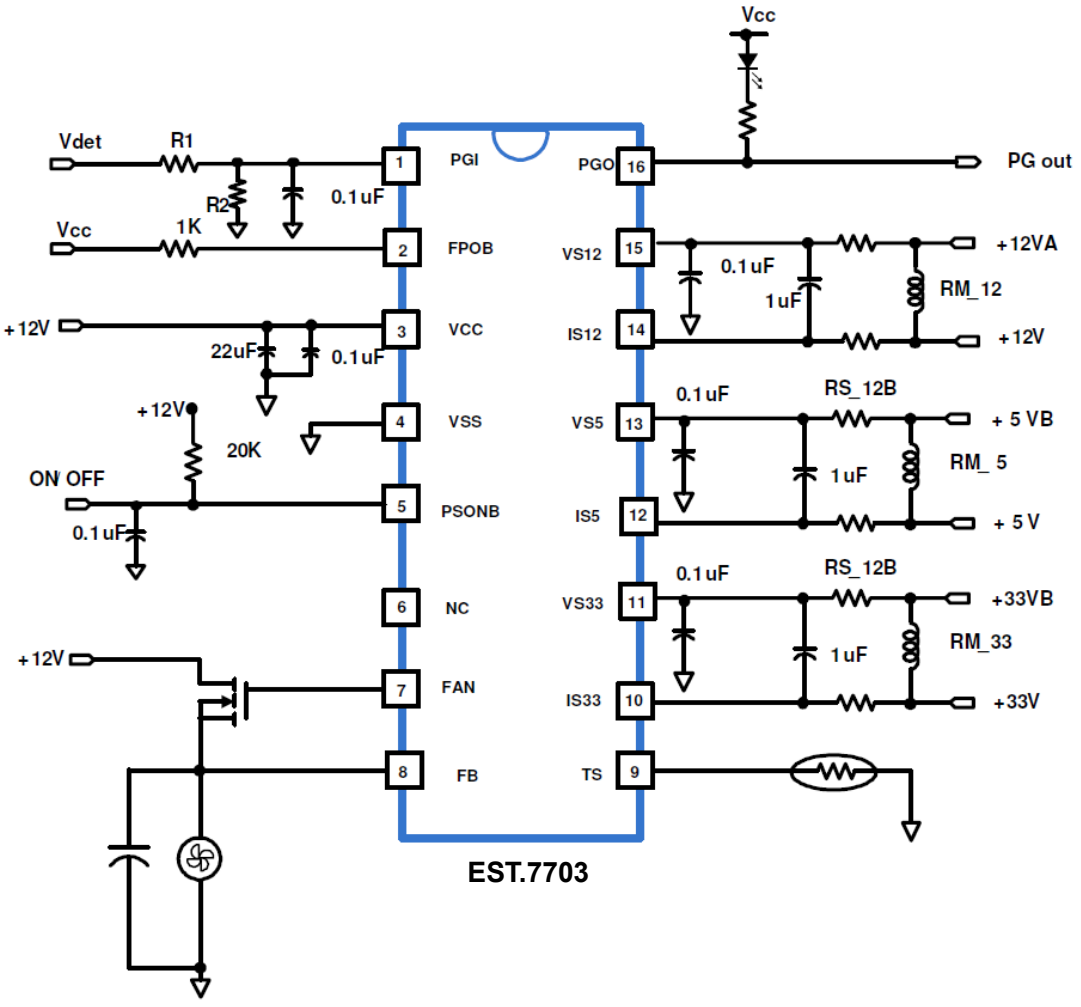
EST: LOGO
7703S : Product name SMD
XXXXYWW:
XXXX= Production lot
YWW= Date Code

SOP-16L

Pin Description

Designation	No.	I/O	Description
PGI	1	I	power good input signal pin
FPOB	2	O	Inverted fault protection output open drain output stage
VCC	3	I	Power supply
VSS	4	I	Ground
PSONB	5	I	Normal/Standby mode control signal input. H->Standby mode, L->Normal mode
NC	6		No conncet
FAN	7	O	Fan output pin
FB	8	I	Fan bias voltage pin
TS	9	I	Temperature sensor pin
IS33	10	I	3.3V over current protection sense input pin
VS33	11	I	3.3V over/under voltage protection input pin
IS5	12	I	5V over current protection sense input pin
VS5	13	I	5V over/under voltage protection input pin
IS12A	14	I	12V over current protection sense input pin
VS12A	15	I	12V over/under voltage protection input pin
PGO	16	O	Power good output stage

Typical Application Circuit



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Storage Temperature (Tstg)	---	-40 to 140	℃
Operating Temperature (Topr)	---	-25 to 105	℃
Junction Temperature (Tj)	---	150	℃
Supply Voltage (VCC)	VCC	-0.5 to 18	V
Input Voltage Range (VI)	VS12/5/33, IS12/5/33, PGI, PSONB, FB	VCC-0.6	V
	TS	-0.5 to 8	
Output Voltage Range (VO)	FPOB, FAN, PGO	VCC-0.6	V
Power Dissipation	PD	800	mW
Thermal Resistance	θJA	85	℃/W
	θJC	42.41	℃/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 reliablity.

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

Input Power Supply:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Supply Voltage	$V_{CC\,(N)}$	4.3	12	15	V	Normal mode
	$V_{CC\,(C)}$	11	12	13	V	Calibration mode
Supply Current	Icc	0.5	1.0	1.5	mA	V_{PSON} = 0V
Reset Threshold Voltage	V_{IH}	3.4	3.6	3.8	V	HIGH→LOW*1

Over-Voltage function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Over-Voltage Threshold	OVT_{VS33}	3.8	3.9	4.0	V	1.0 mV/℃
	OVT_{VS5}	5.6	5.8	6.0	V	1.0 mV/℃
	OVT_{VS12}	13.5	13.9	14.3	V	1.0 mV/℃

Under-Voltage function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Under-Voltage Threshold	UVT_{VS33}	2.8	2.9	3.0	V	1.0 mV/℃
	UVT_{VS5}	4.2	4.4	4.6	V	1.0 mV/℃
	UVT_{VS12}	9.5	10	10.5	V	1.0 mV/℃

Over-Current function: VCC=12V

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Offset Voltage	V_{OS12A}	-1.5	0	1.5	mV	Offset voltage between IS to VS
VS12 sink current	I_{VS12}				uA	
VS5 sink current	I_{VS5}					
VS33 sink current	I_{VS33}					
IS12/5 sink current	I_{Ssink}	56	60	64	uA	AT decrease current per bits
	ΔIS_{sink}		0.156		uA/bit	Scan range = 60uA~20uA

PSONB, Analog Input function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Low->High input threshold		1.45	1.60	1.75	V	0.3 mV/℃
High->Low input threshold		1.00	1.10	1.20	V	0.3 mV/℃

PGI, Analog Input function:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Temperature coefficient
Threshold Voltage of PGI		1.15	1.20	1.25		0.3 mV/℃
Temperature coefficient		-100		100	ppm/℃	0℃~75℃

FPOB, Open Drain Output:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Leakage Current	I_{leak}			+/- 5	uA	V_{FPOB}=12V
Low Level Output Voltage	V_{OL}			0.40	V	I_{SINK}=10mA

PGO (High level is into burst mode):

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Leakage Current	Ileak			+/- 5	uA	VPGO=12V
Low Level Output Voltage	VOL			0.4	V	ISINK=10mA

FAN Controller: VCC=12V

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
TS current	I_{TS}		350		uA	
TS current duty cycle	T_{SON}		6		mS	
	T_{SOFF}		100		mS	
TS max D/A input			3.5		V	
TS min D/A input			0.25		V	
FB divider			4		V/V	
FAN out driver				0.4	V	Iol = 10mA

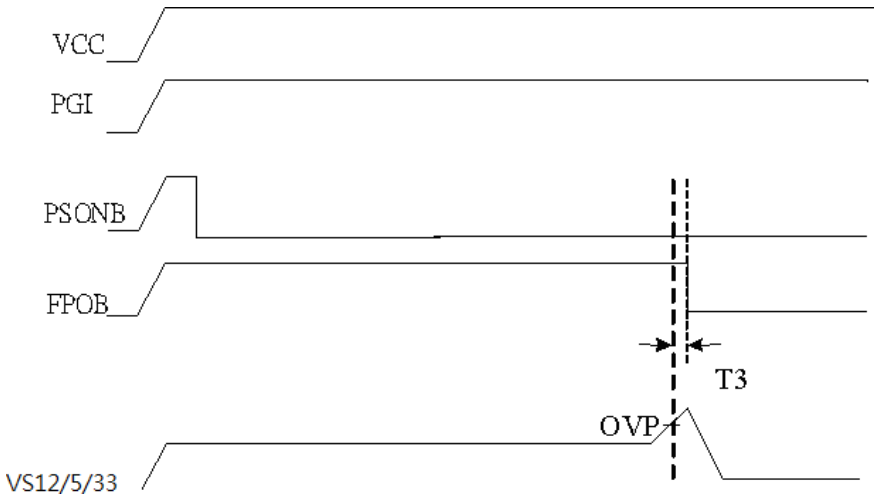
AC Electrical Characteristics (Vcc=12V, Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Temperature coefficient
Under voltage protection delay time	T1	49	73	100	mS	500 PPM/℃
PSONB De-bounce time	T2*	12	19	26	mS	
Over voltage protection delay time	T3	9	14	19	uS	
Over current delay time	T4**	21	25	30	mS	
PGI OC/UV mask time	T5	35	50	65	mS	
PGO De-bounce time	T6	47	73	100	uS	
PGO to FPOB delay time	T7	3	4	5	mS	
Over temperature protection delay time	T8***	175	250	325	mS	

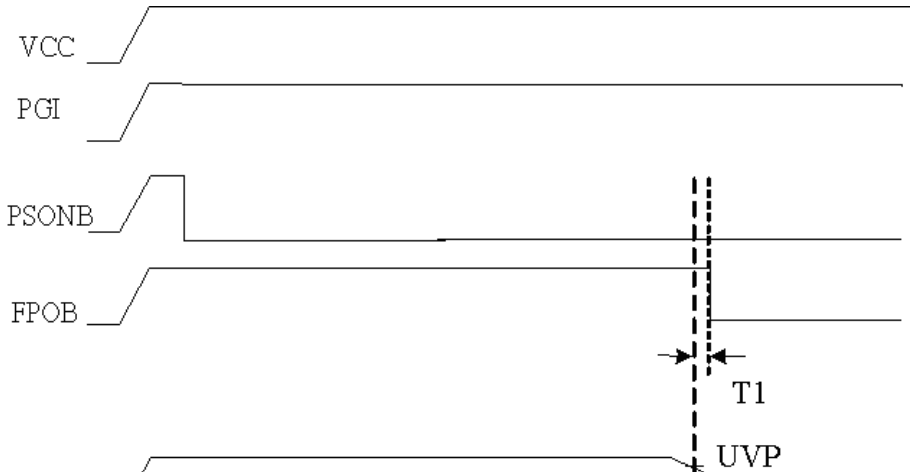
Note:
T2* : The PSOB de-bounce time is option, which can be programmed to 19/38mS
T4**: The Over current delay time is option, which can be programmed to 25/50/100/200/400/800/1600mS
T8***: The PGO delay time is option, which can be programmed to 125/250mS

Time Chart

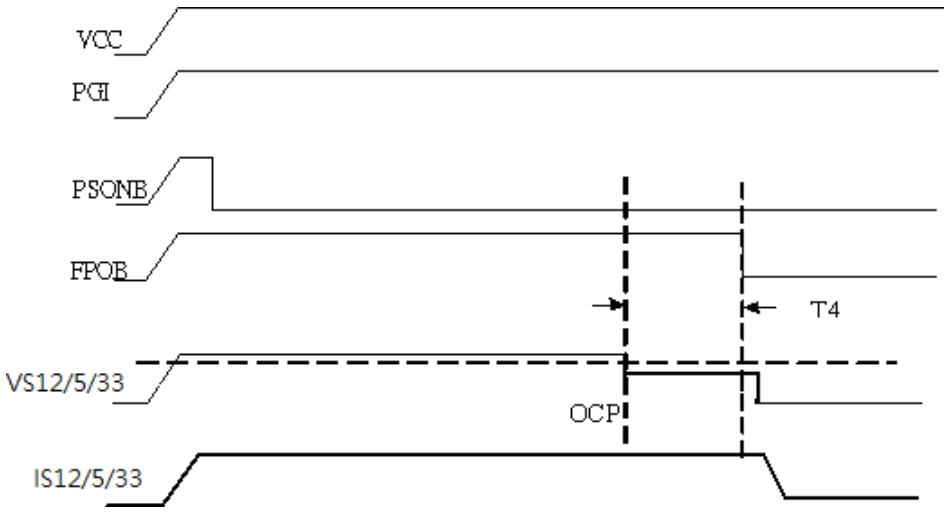
1. OVP timing



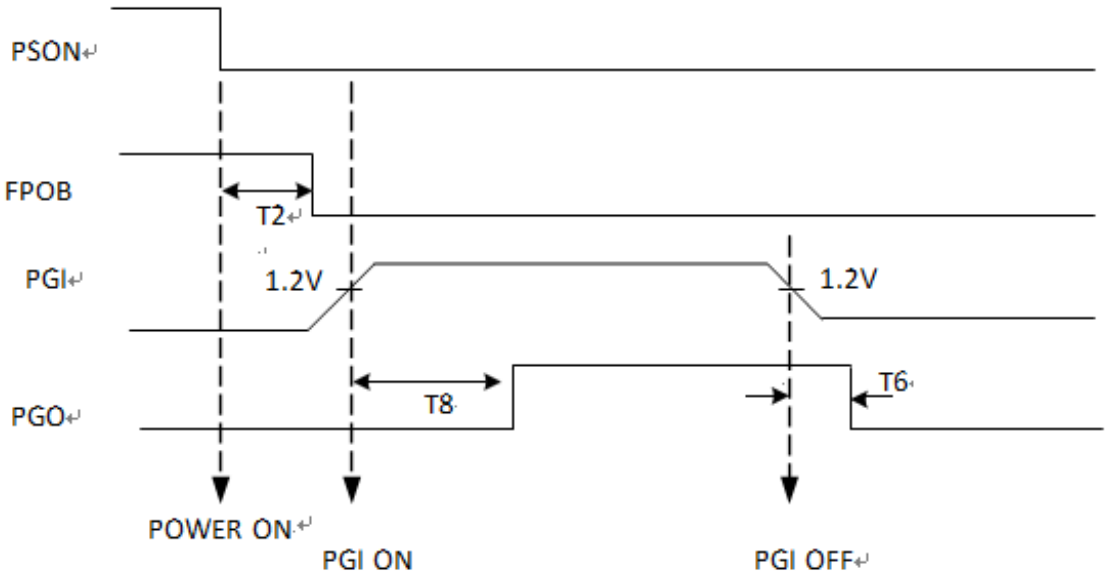
2. UVP timing



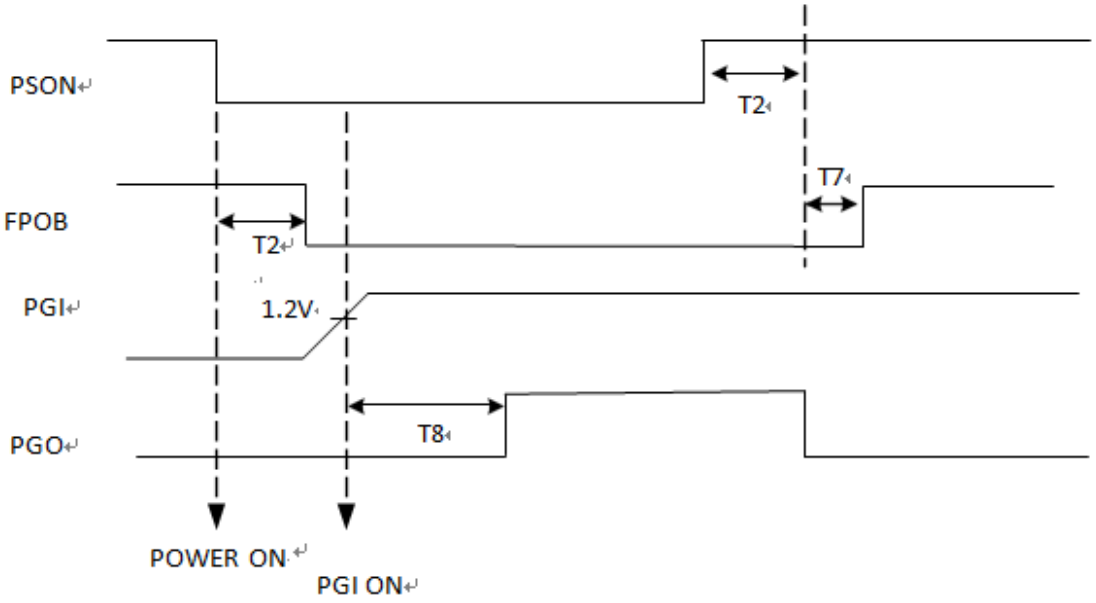
3. OCP timing



4. PGI timing

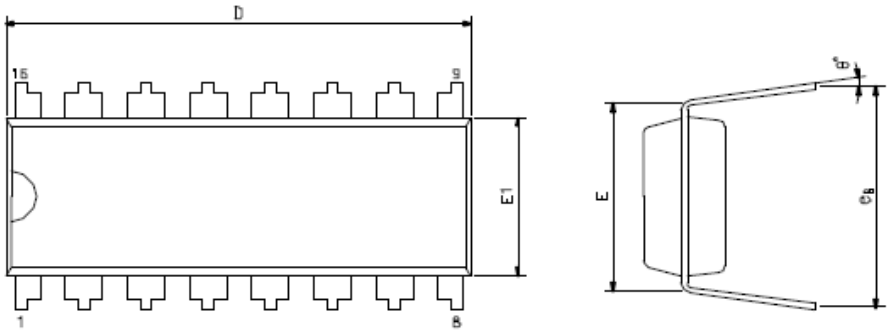


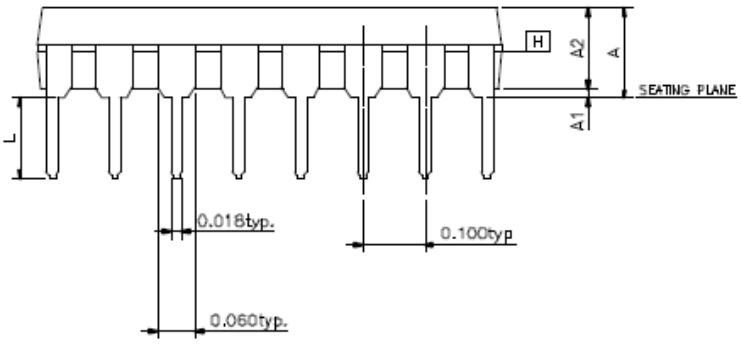
5. FPOB timing



PACKAGING INFORMATION

DIP-16 (300mil) UNIT : inch / mm

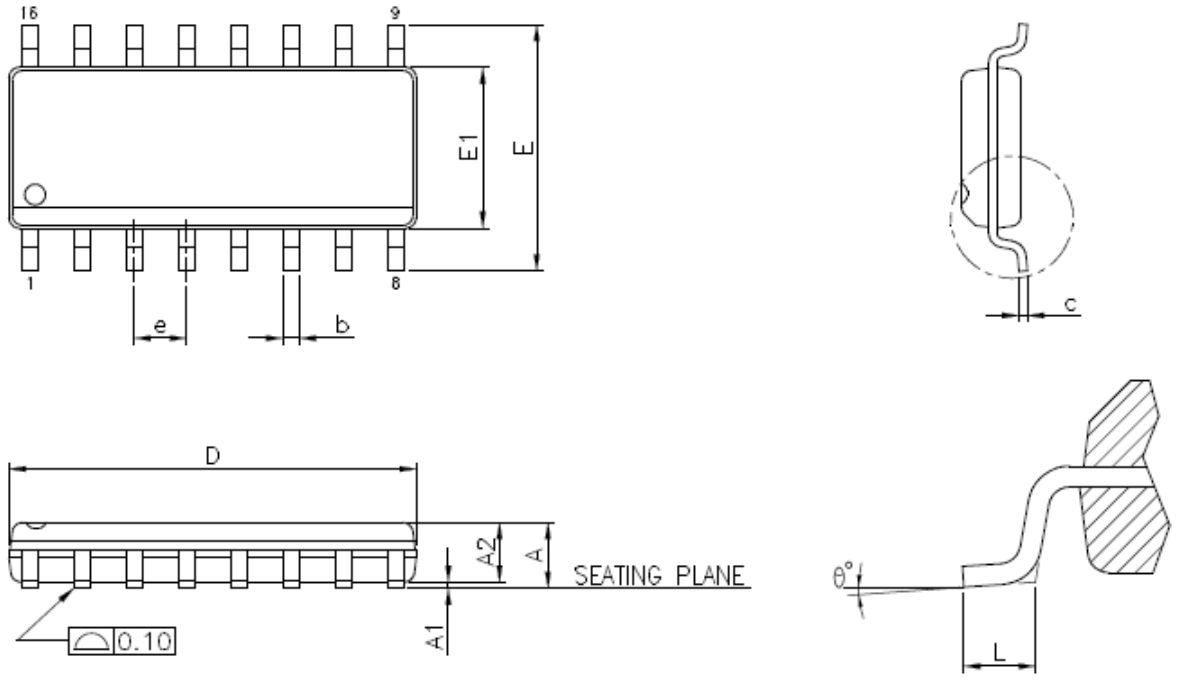




Symbols	Dimensions in inches			Dimensions in millimeters		
	MIN.	NOR.	MAX.	MIN.	NOR.	MAX.
A	---	---	0.215	---	---	5.461
A1	0.010	---	---	0.254	---	---
A2	0.120	0.133	0.145	3.048	3.378	3.683
D	0.730	0.755	0.780	18.542	19.177	19.812
E	0.300 BSC			7.620 BSC		
E1	0.240	0.253	0.265	6.096	6.426	6.731
L	0.110	0.133	0.155	2.794	3.378	3.937
eB	0.300	0.350	0.430	7.620	8.890	10.922
θ	0°	7°	15°	0°	7°	15°

SOP-16 (Standard)

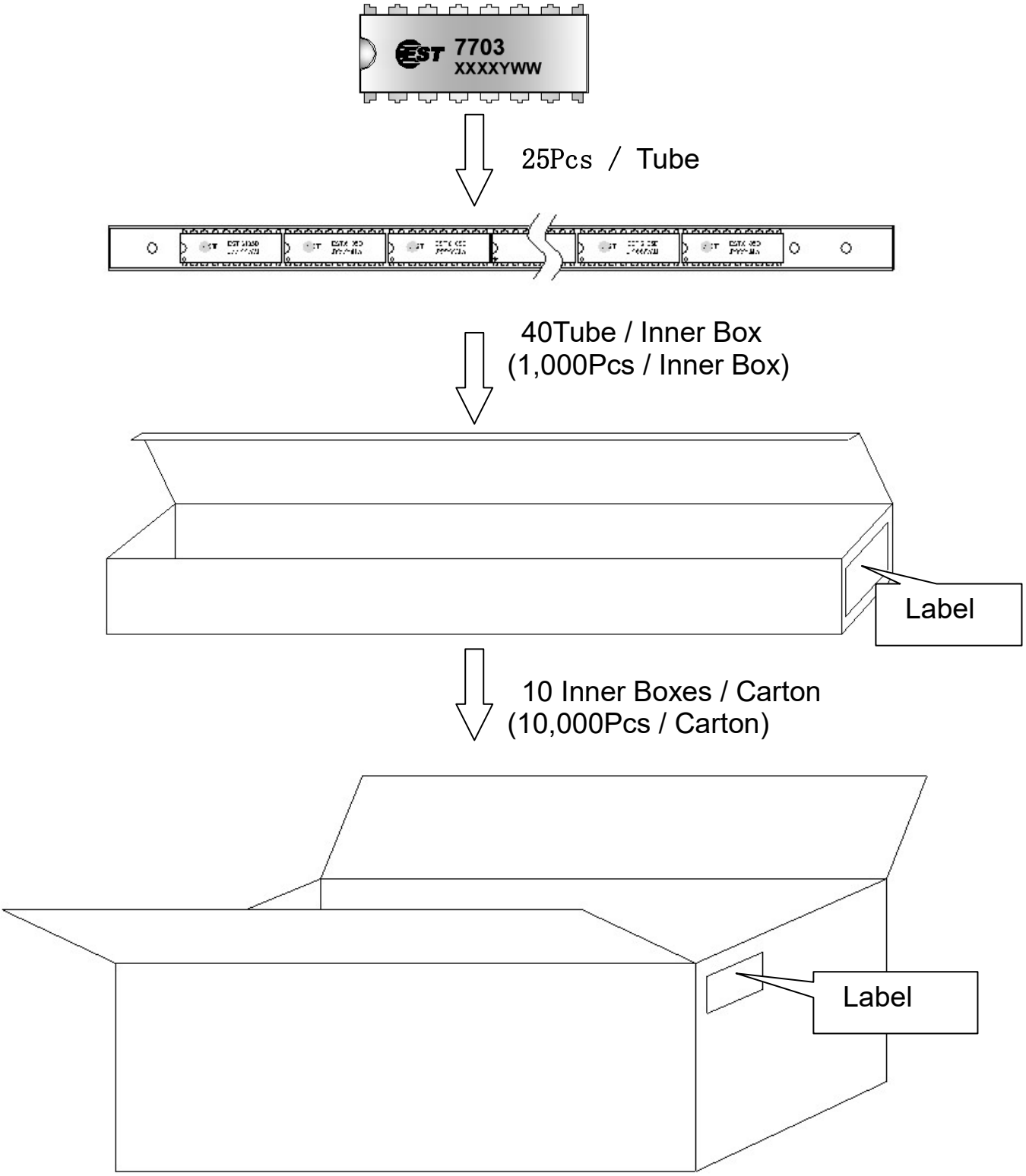
UNIT : inch / mm



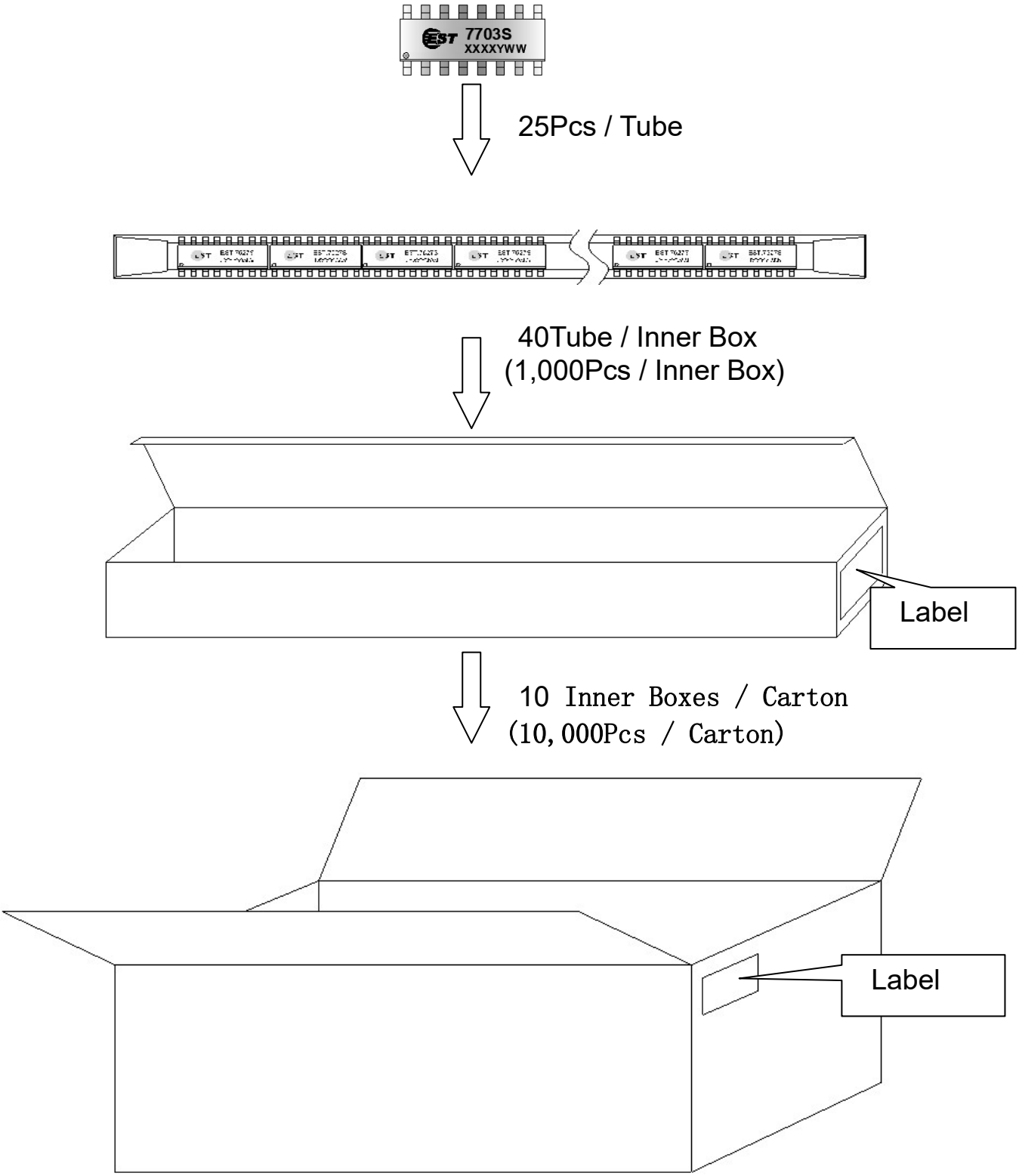
Symbols	Dimensions In inch		Dimensions In millimeters	
	Min.	Max.	Min.	Max.
A	------	0.072	------	1.837
A1	0.004	0.010	0.095	0.263
A2	0.047	------	1.187	------
b	0.012	0.021	0.294	0.535
c	0.004	0.010	0.095	0.263
D	0.390 BSC		9.900 BSC	
E	0.236 BSC		6.000 BSC	
E1	0.154 BSC		3.900 BSC	
e	0.050 BSC		1.270 BSC	
L	0.015	0.052	0.380	1.333
θ	0°	8°	0°	8°

Packing Information:

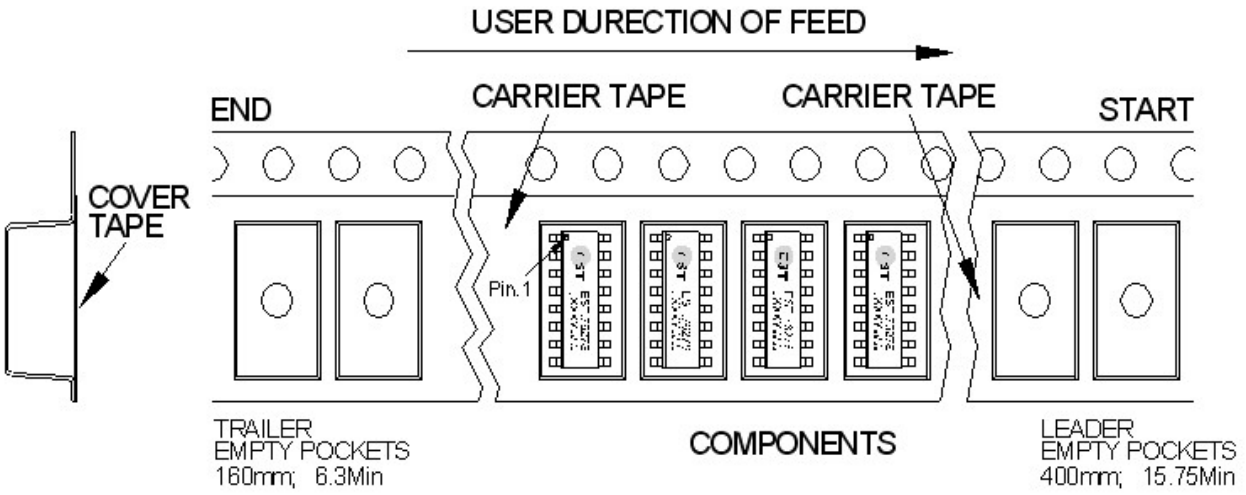
★**DIP-16 Tube:**

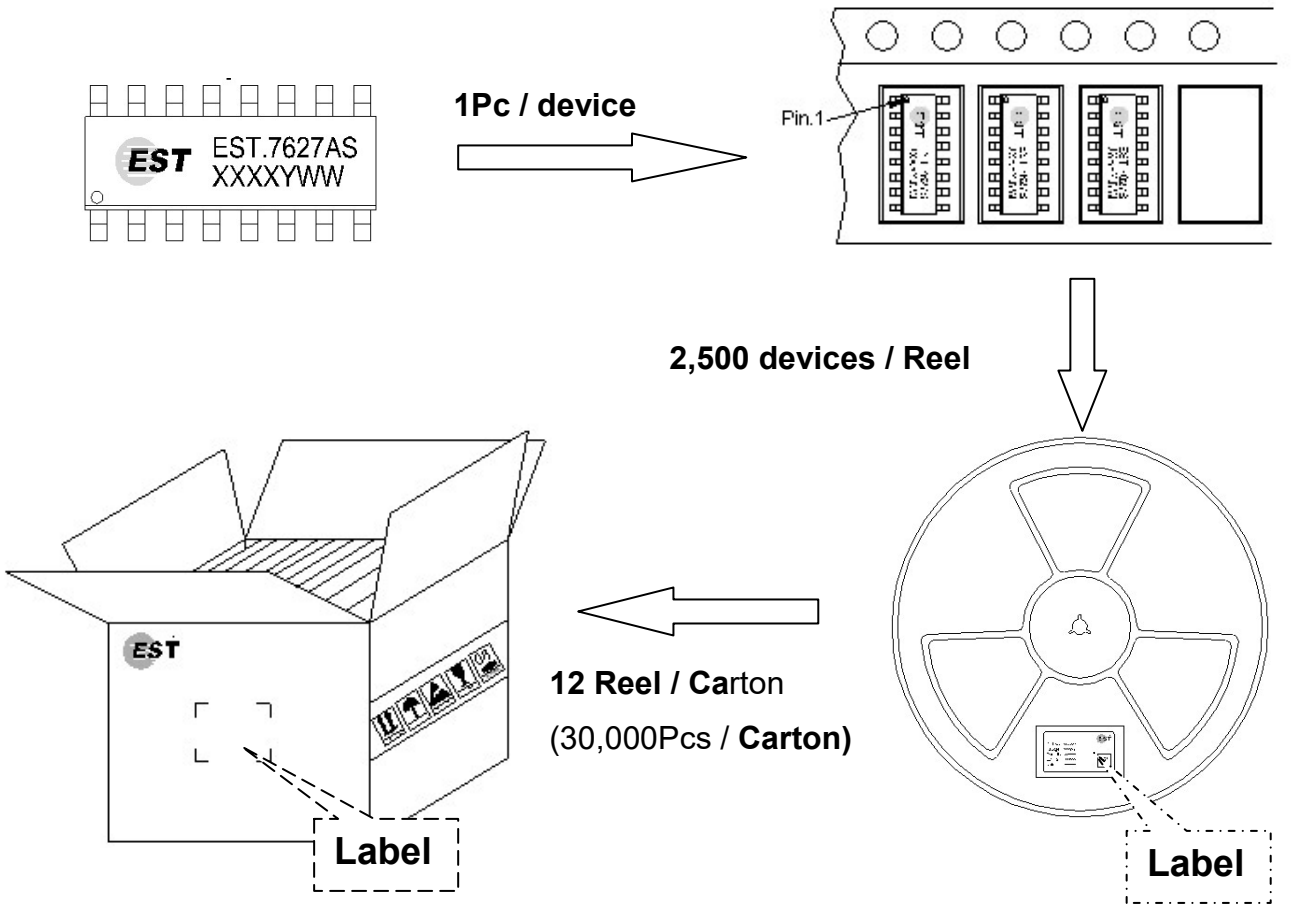


SOP-16 Tube:

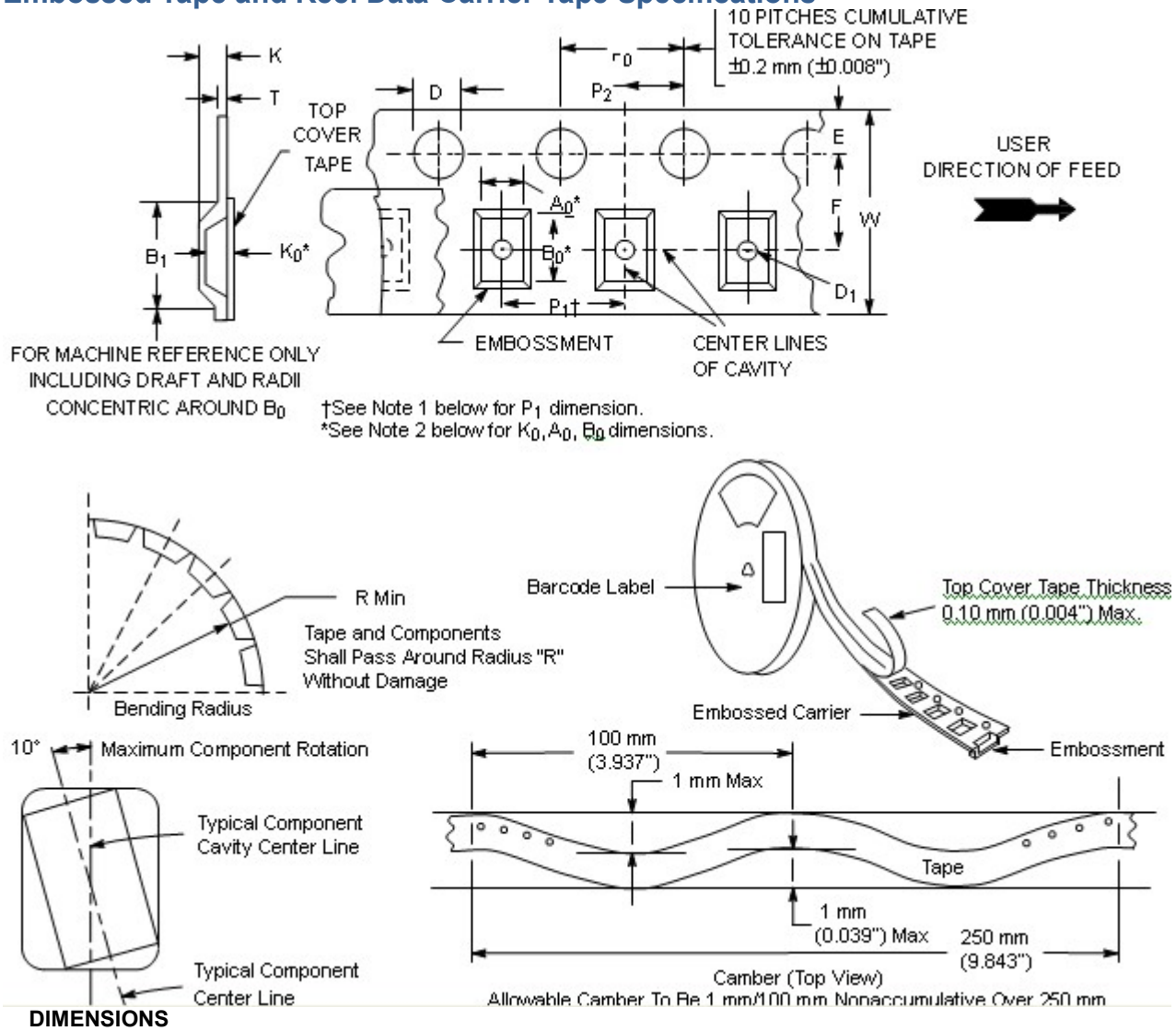

7703S
XXXXYWW
25Pcs / Tube
40Tube / Inner Box
(1,000Pcs / Inner Box)
Label
10 Inner Boxes / Carton
(10,000Pcs / Carton)
Label

SOP-16 tape & Reel:





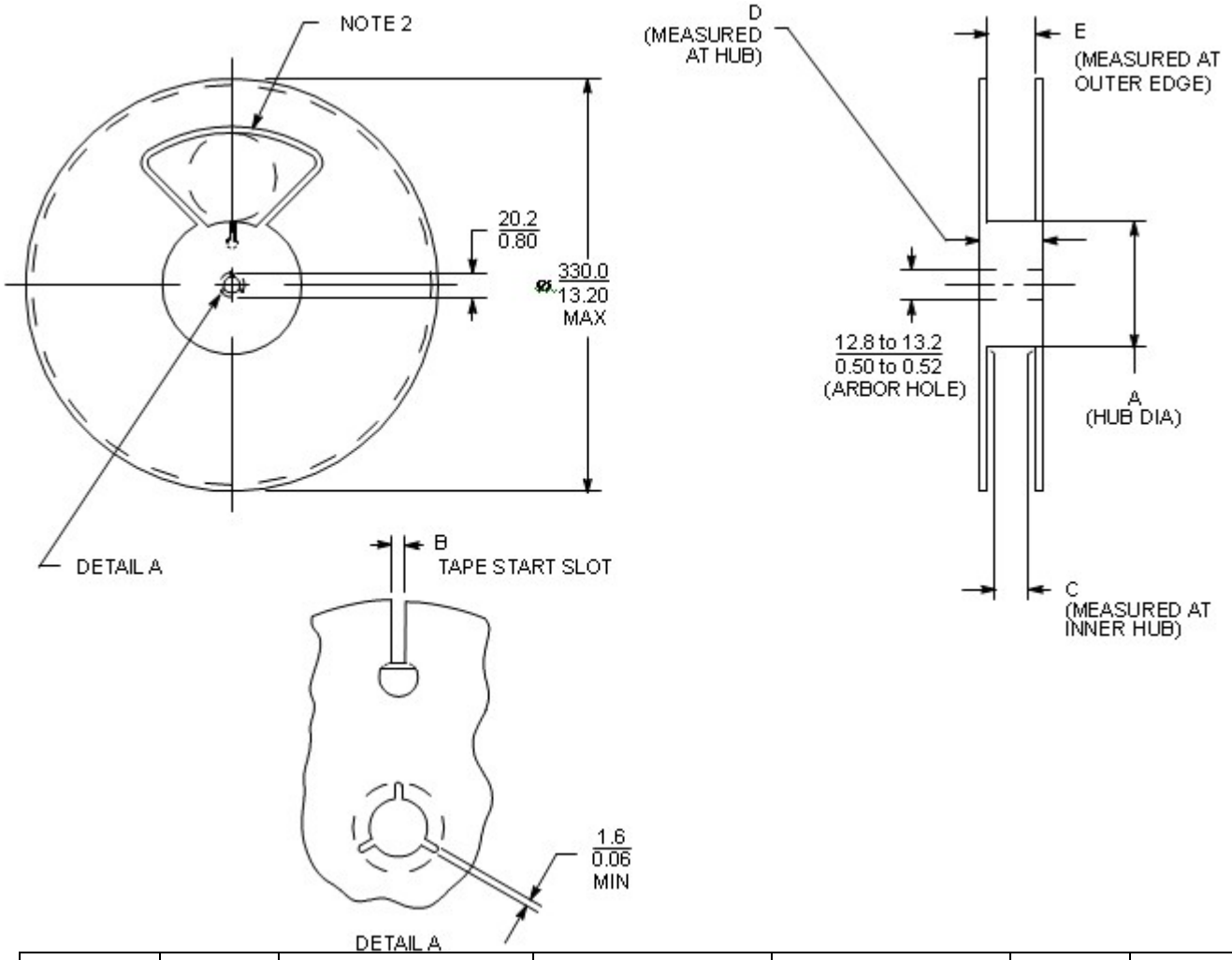
Embossed Tape and Reel Data Carrier Tape Specifications



DIMENSIONS

Tape Size (W)	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 (0.179 3)	1.5 + 0.1 mm − 0.0 (0.059 +0.004 3 − 0.0)	1.0 Min (0.039 3) or 0.5 mm Min (0.020 3)	1.75 ± 0.1 mm (0.069 + 0.004 3)	3.5 ± 0.05 mm (0.138 + 0.002 3)	2.4 mm Max (0.094 3)	4.0 ± 0.1 mm (0.157 + 0.004 3)	2.0 ± 0.1 mm (0.079 + 0.002 3)	25 mm (0.983)	0.6 mm (0.024 3)	8.3 mm (0.327 3)
12 mm	8.2 mm (0.323 3)		1.5 mm Min (0.060 3)		5.5 ± 0.05 mm (0.217 + 0.002 3)	6.4 mm Max (0.252 3)			30 mm (1.183)		12 ± 0.30 mm (0.470 + 0.012 3)
16 mm	**12.1 mm (0.476")**				**7.5 ± 0.10 mm (0.295 ±0.004 3)**	**7.9 mm Max(0.311 3)**					**16.3 mm (0.642 3)**
24 mm	20.1 mm (0.791)				11.5 ± 0.1 mm (0.453 + 0.004 3)	11.9 mm Max (0.468 3)					24.3 mm (0.957 3)

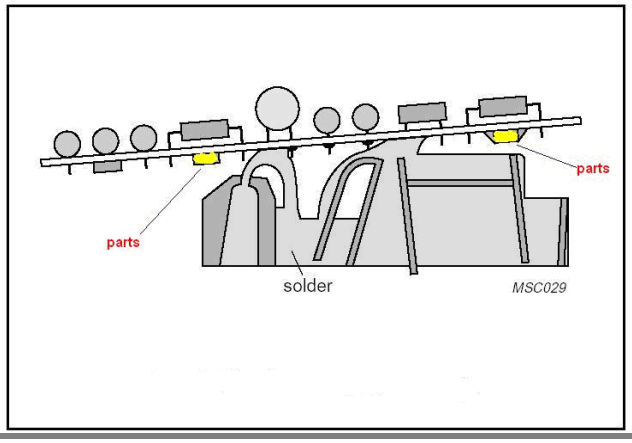
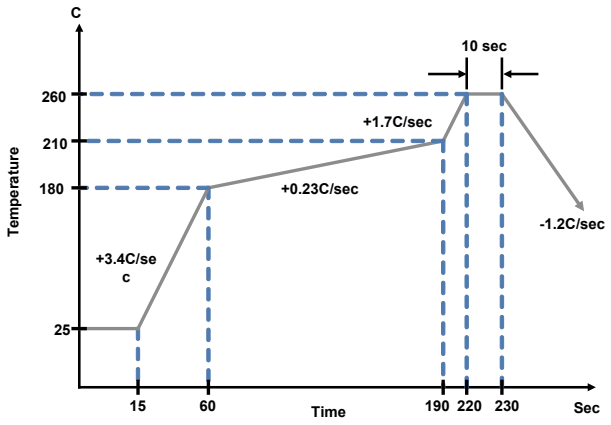
Reel Dimensions



Reel Diameter	Tape Size	A mm (inches)		B mm (inches)		C mm (inches)		D (Max)	E (Max)
		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)

Reliability Test Program

Reflow Condition **(IR/Convection or VPR Reflow)**

Wave Soldering Process	IR Re-flow Soldering Curve
	

Test Item	Method	Description
SOLDERABILITY	MIL-STD-883D-2003	245℃, 5sec
HOLT	MIL-STD-883D-1005.7	1000Hrs Bias@125℃
PCT	JESD-22-B,A102	168Hrs, 100% RH, 121℃
TST	MIL-STD-883D-1011.9	-65℃~150℃, 200 Cycles
ESD	MIL-STD-883D-3015.7	VHMB>2KV, VMM>200V
Latch-Up	JESD 78	10ms, 1tr> 100mA

Revision History

REVISION	DESCRIPTION	PAGE	DATE
Rev 1.0	First release	13	2021/01/06