Data Sheet

Type Description : SPS Secondary Supervisor IC

Product Name : EST.7610F/FS

Reversion : Rev 1.0

Reversion Date : Jan, 2018

Page : 15 Pages

Description

EST.7610F is higher integrated circuit incorporates a advanced sensing function to protect from over and unde voltage a three-channels protection supervisor (3.3V/5V/ an 12V).

EST.7610F provide the fault protection latch (FPOB), a powe good output (PGO), the PSONB control and the power goo input control (PGI).

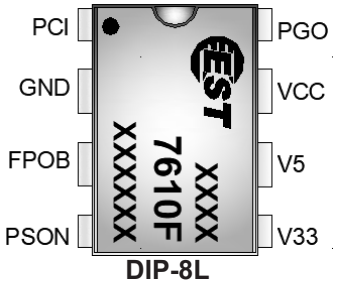
Features

- **The Over/Under Voltage Protection for 3.3V/5V and**
- **12V**
- **Both of fault protection output and power good**
- **output are open drain output stage**
- **75mS delay for SPS short circuit protect**
- **2mS PSONB input signal de-bounce**
- **25uS for OVP noise immunity de-bounce.**
- **73uS for internal noise immunity de-bounce**
- **125mS power good delay time for PGO**
- **4mS time delay between PGO and FPOB when**

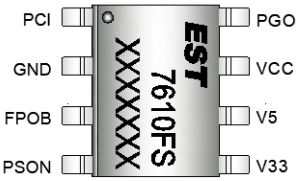
Application

- **PC SPS line housekeeping IC (3.3V, 5V, and 12V)**
- **Industry Computer**
- **Mining Pool Power**

Pin Assignments



DIP-8L



SOP-8L

Top View/Marking

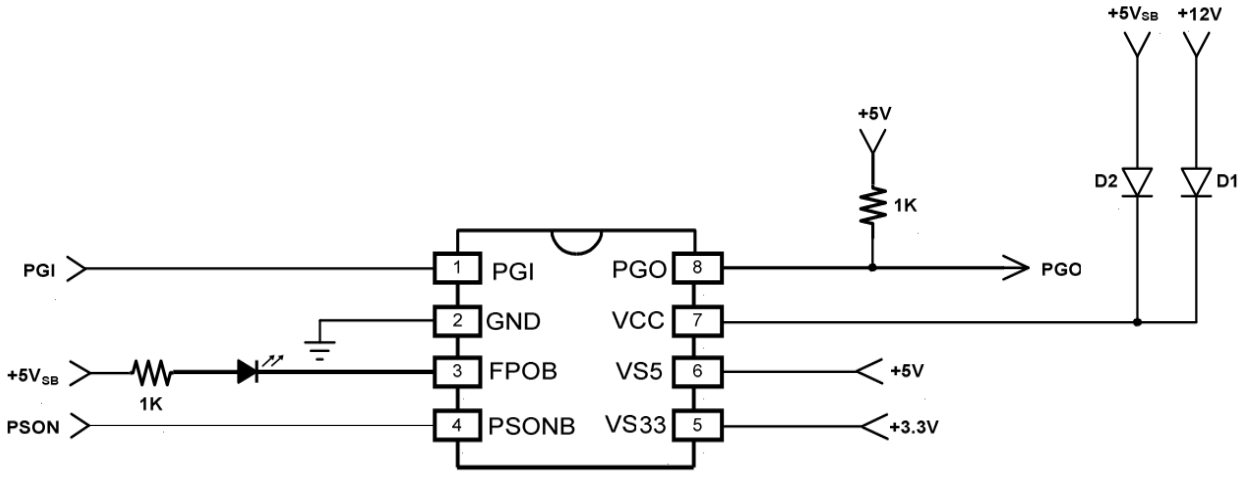
DIP-8L:
EST: LOGO
YYWW= Date Code
7610F = Product name
XXXXXXX: Production lot code

SOP-8L:
EST: LOGO
7610FS= SMD;
XXXXXXX: Production lot code

Ordering Information

Order Number	Package Type	Packing	Top Marking
EST.7610F	DIP-8 (RoHS)	Tube	7610F
EST.7610FS	SOP-8 (RoHS)	Tube	7610FS
EST.7610FSR	SOP-8 (RoHS)	Tape & Reel	7610FS

Typical Application Circuit



EST.7610F

Pin Assignments and Package Type

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	Remote ON/OFF control input pin.
5	VS33	3.3V input pin for OVP and UVP.
6	VS5	5.0V input pin for OVP and UVP.
7	VCC	Power supply. 12V input pin for OVP.
8	PGO	Open drain output of power good signal.

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Remark
Storage Temperature (Tstg)	---	-40 to 140	℃	
Operating Temperature (Topr)	---	-25 to 120	℃	
Junction Temperature (Tj)	---	150	℃	
Supply Voltage (VCC)	VCC	-0.5 to 18	V	
Output Voltage Range (VO)	VS5,VS33	-0.5 to 8		
	PGI	-0.5 to 8		
	PSONB,	-0.5 to 8		
Output Voltage Range (VO)	FPOB	-0.5 to 16	V	
	PGO	-0.5 to 8		
	RI	-0.5 to 8		
Junction-to-Ambient Thermal Resistance*	θJA	180	℃/W	SOP-8
Junction-to-Case Thermal Resistance**	θJC	39	℃/W	
Junction-to-Ambient Thermal Resistance*	θJA	110	℃/W	DIP-8
Junction-to-Case Thermal Resistance**	θJC	30	℃/W	
Power Dissipation (@TA<50℃)	PD	420	mW	SOP-8
		680	mW	DIP-8

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	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}	3.70	3.80	3.90	V	
	OVT_{VS5}	5.70	5.55	6.00	V	
	OVT_{VS12}	12.80	13.20	13.60	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}	4.10	4.30	4.47	V	
	UVT_{VS12}	8.80	9.20	9.60	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

PGI, Analog Input:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold Voltage of PGI		0.60	0.65	0.70	V	Enable UVP
		1.16	1.2	1.24	V	Enable PGO
		1.16	1.2	1.24	V	PGO/UVP Disable

FPOB, Open Drain Output:

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Leakage Current	Ileak			+/- 5	uA	VFPOB=5V
Low Level Output Voltage	VOL			0.3	V	ISINK=10mA

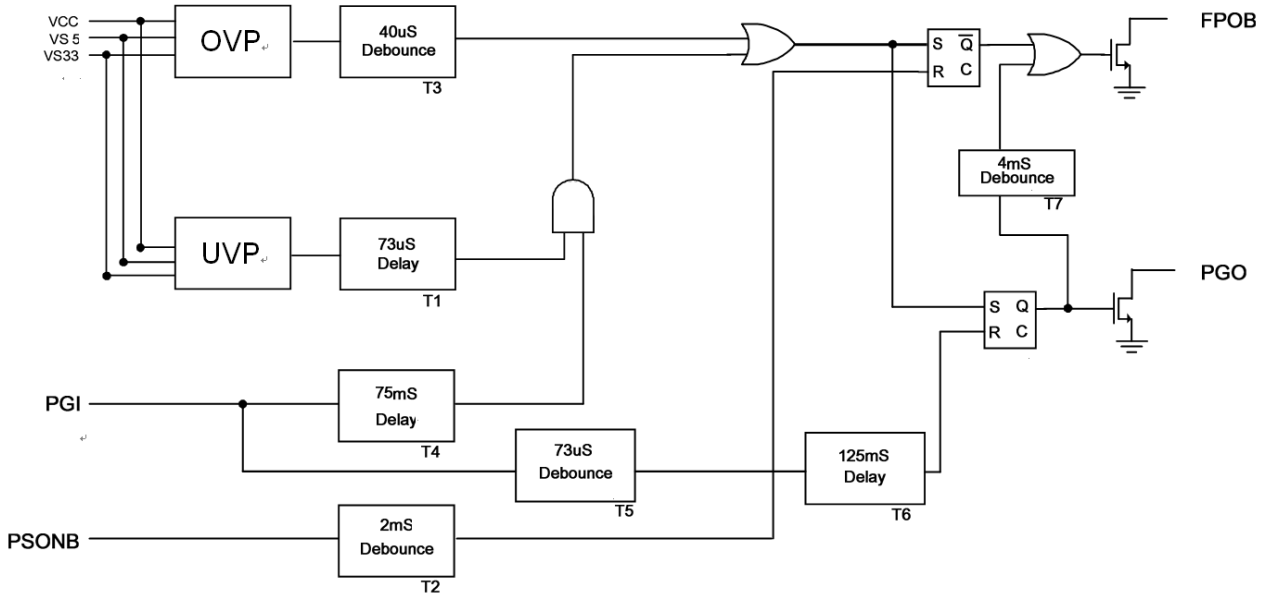
PGO, Open Drain Output:

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

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

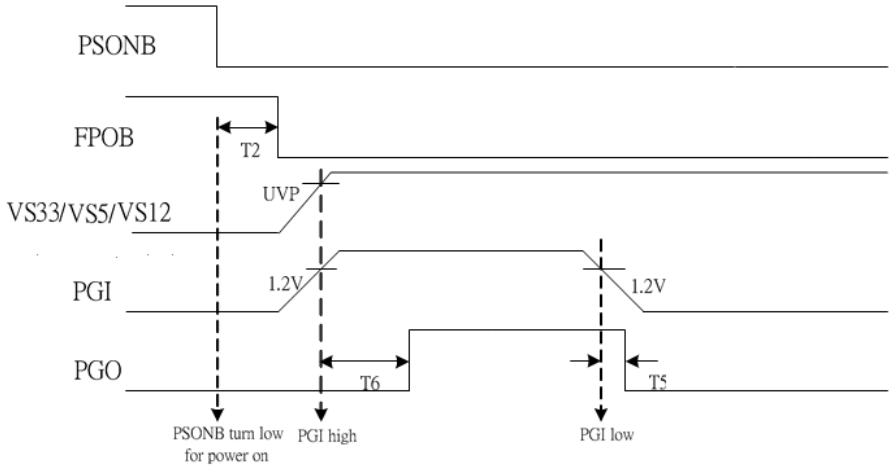
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Under voltage protection delay time	T1	47	73	100	uS	
PSON De-bounce time	T2	1	2	3	mS	
Over voltage protection delay time	T3	30	40	50	uS	
PGI OC/UV mask time	T4	47	75	100	mS	PGI > 0.65V (TYP)
PGO De-bounce time	T5	47	73	100	uS	
PGI to PGO delay time	T6	110	125	140	mS	
PGO to FPOB delay time	T7	2	4	6	mS	

Block Diagram

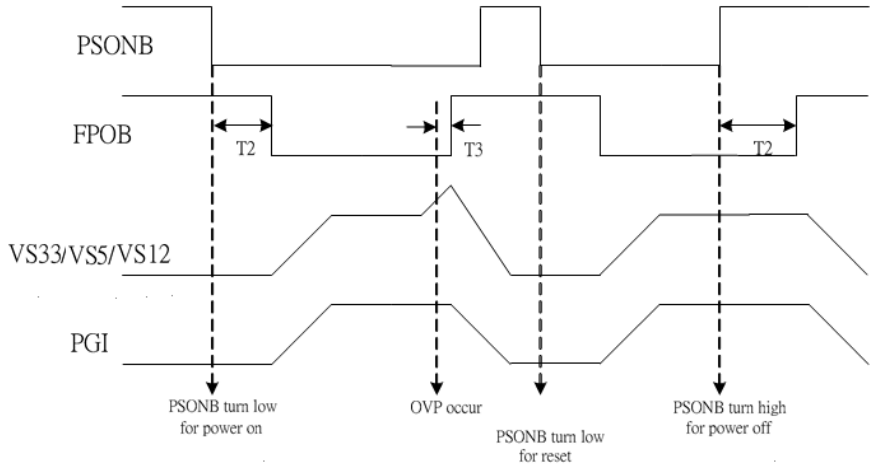


Time Chart

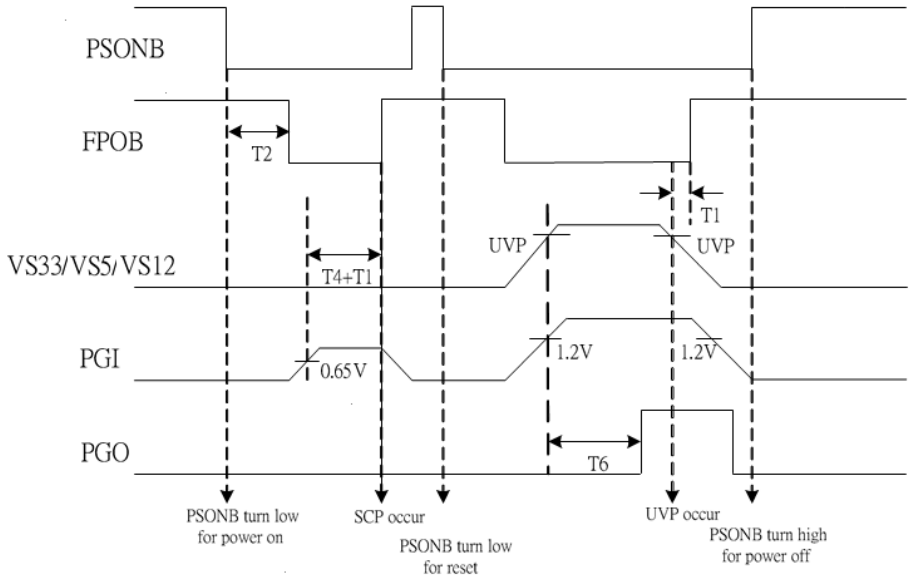
PGI Timing



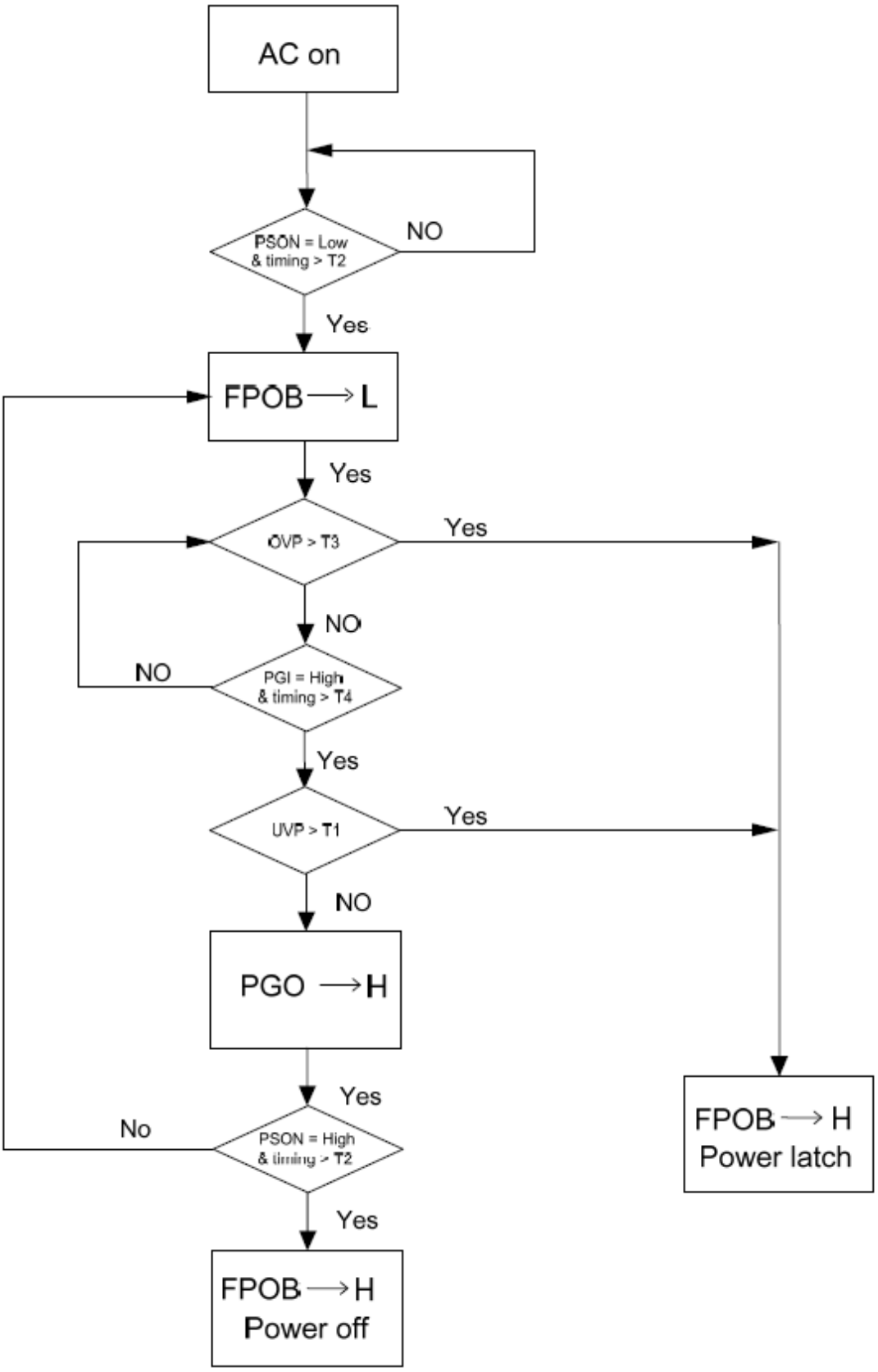
OVP Timing



SCP& UVP Timing

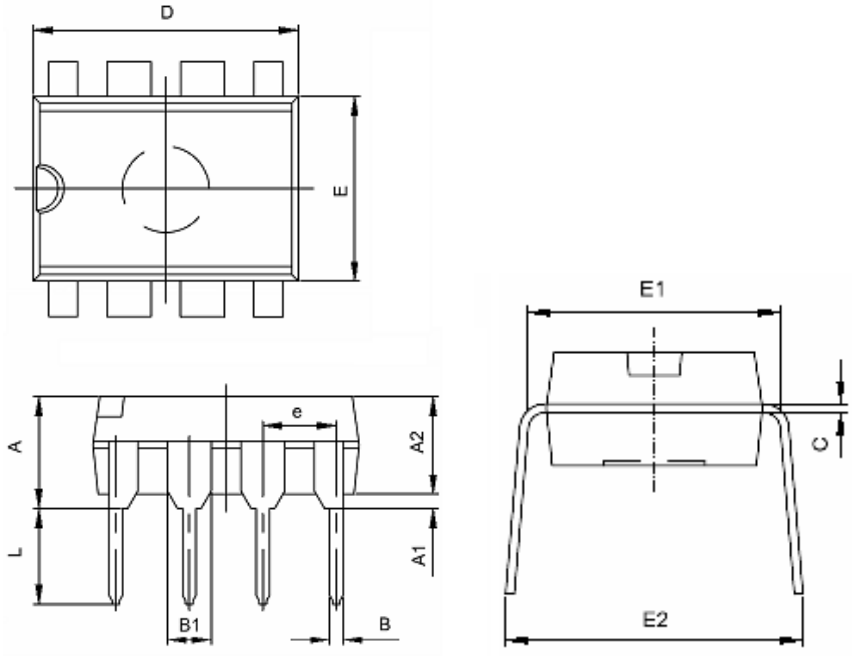


Flow Chart


AC on
PSON = Low & timing > T2
NO
Yes
FPOB ⟶ L
Yes
OVP > T3
Yes
NO
PGI = High & timing > T4
NO
Yes
UVP > T1
Yes
NO
PGO ⟶ H
Yes
PSON = High & timing > T2
No
Yes
FPOB ⟶ H
Power off
FPOB ⟶ H
Power latch

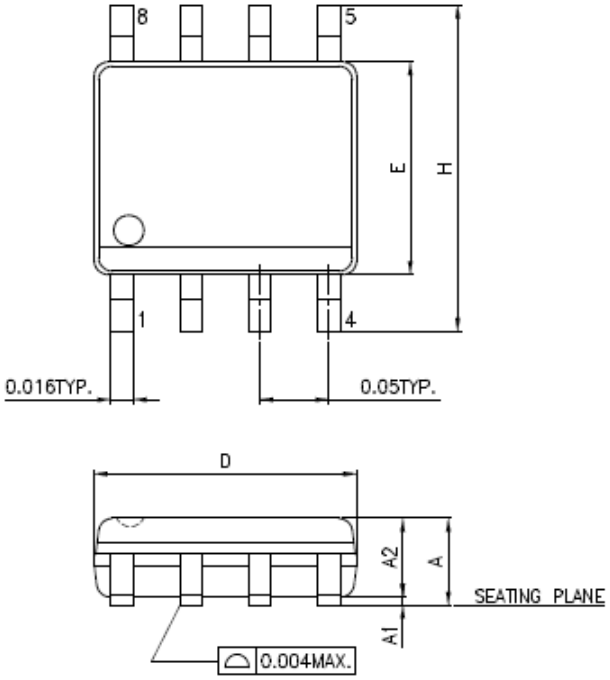
PACKAGING INFORMATION

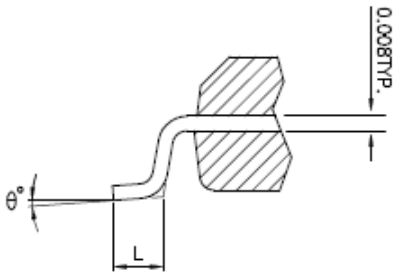
DIP-8 Package



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

SOP-8 Package （mm）



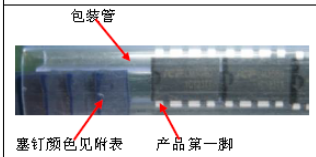
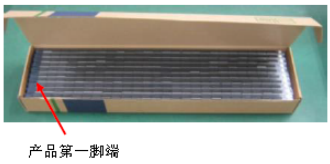


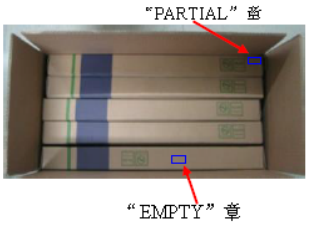
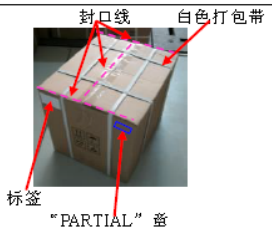
Symbols	Dimensions In Inches			Dimensions In millimeters		
	MIN.	NOR.	MAX.	MIN.	NOR.	MAX.
A	0.050	0.061	0.072	1.270	1.549	1.829
A1	0.000	------	0.010	0.000	------	0.254
A2	------	------	0.062	------	------	1.575
D	0.185	0.193	0.200	4.699	4.902	5.080
E	0.147	0.154	0.160	3.734	3.912	4.064
H	0.225	0.237	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°

Shipping Packing

DIP-8 / Tube data

	名称	包装管	通用管装气泡袋	通用管装包装盒	通用管装（1*10）包装箱
材料	规格	见附表	180*135（mm）	545*127*55（mm）	565*305*275 (mm)
	图号	见附表	PTCN1380HTTY	PTCHG1255HTTY	PTCBG5630HTTY
	材质特点	PVC，无色透明	PVC，红色	三层单瓦楞	五层双瓦楞
	图片				

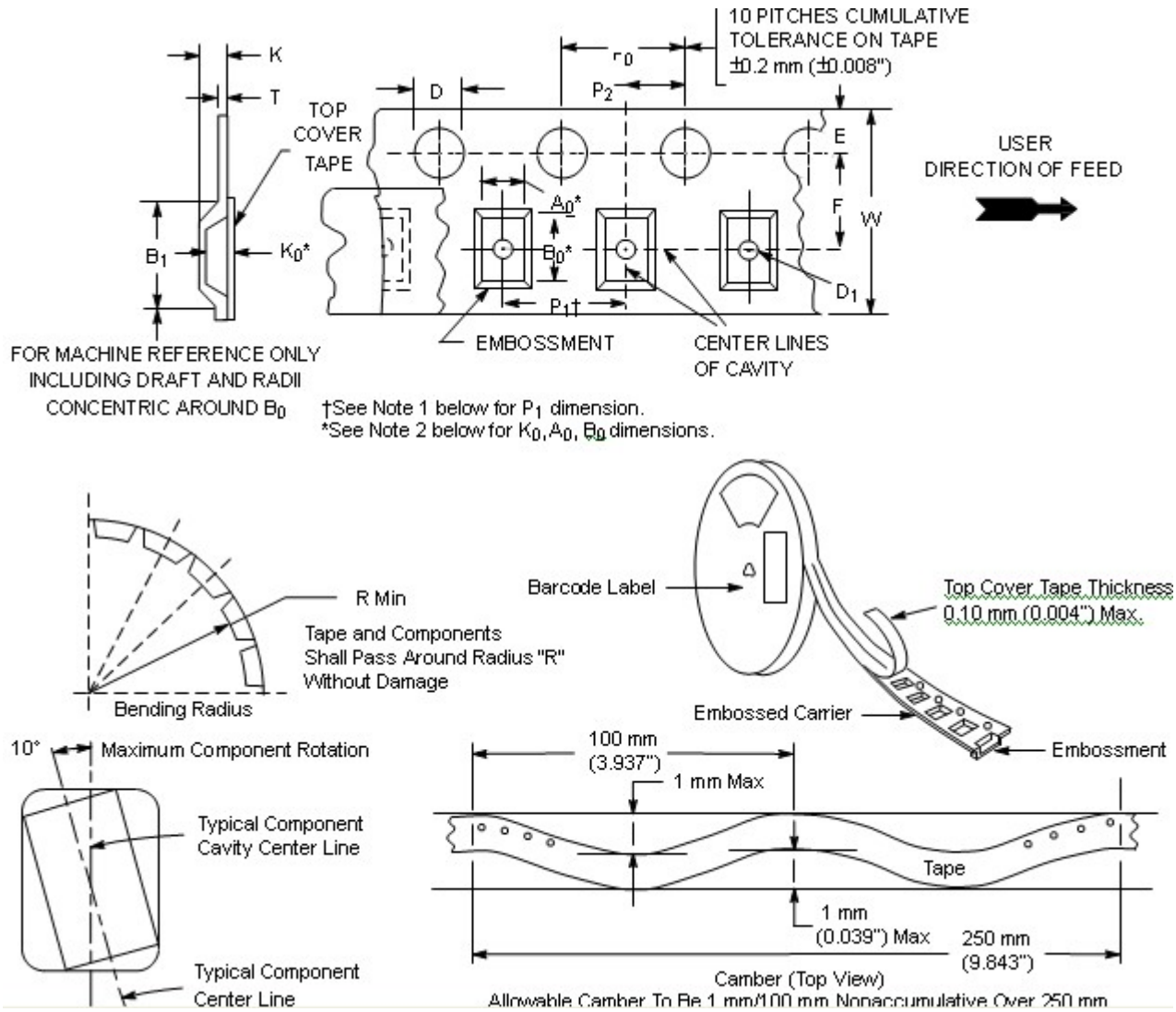
包装流程	产品在包装管中方向	放入包装盒	包装盒封口，贴标签
			
	1.产品第一脚朝向塞钉的颜色见附表（背面），包装管另一端为白色端。 2.所有产品在包装管中的方向一致。	1.将产品按图示方向放入包装盒。 2.每个工单批只能有一个不满管。不满管放在包装盒的最上层，方向与满管方向相反。	1.合住包装盒盖子，用宽胶带封口在包装盒图示位置贴产品标签。 2.是不满盒时，在包装盒上图示位置盖“PARTIAL”章。

装入包装箱，贴标签	包装箱封口，打包
	
1.如图示装入包装箱。 2.不满包装箱用空盒填满。空盒不贴任何标签，在图示位置盖“EMPTY”章。	1.包装箱上下面分别用宽透明胶带以“工”字形封口（即所有开口处都封住）。 2.如图贴产品标签，不满箱图示位置盖“PARTIAL”章。 3.用白色打包带以“井”字形打包，间隔匀称，垂直相交。

序号	包装数量					材料					
	封装形式	只/管	管/盒	盒/箱	只/箱	包装管图号	塞子颜色	销钉颜色	产品在包装管中第一脚塞子或销钉颜色	销钉位置	
1	DIP7L	50	40	10	20000	PTCGD0300HTTY04	蓝色	白色	蓝色塞子	第 2 孔	
2	DIP8L	50	40	10	20000	PTCGD0300HTTY04	蓝色	白色	蓝色塞子	第 2 孔	
3	DIP14L	25	40	10	10000	PTCGD0300HTTY04	蓝色	白色	蓝色塞子	第 1 孔	装有产品的包装管在包装盒中整齐放置

Embossed Tape and Reel Data Carrier Tape Specifications

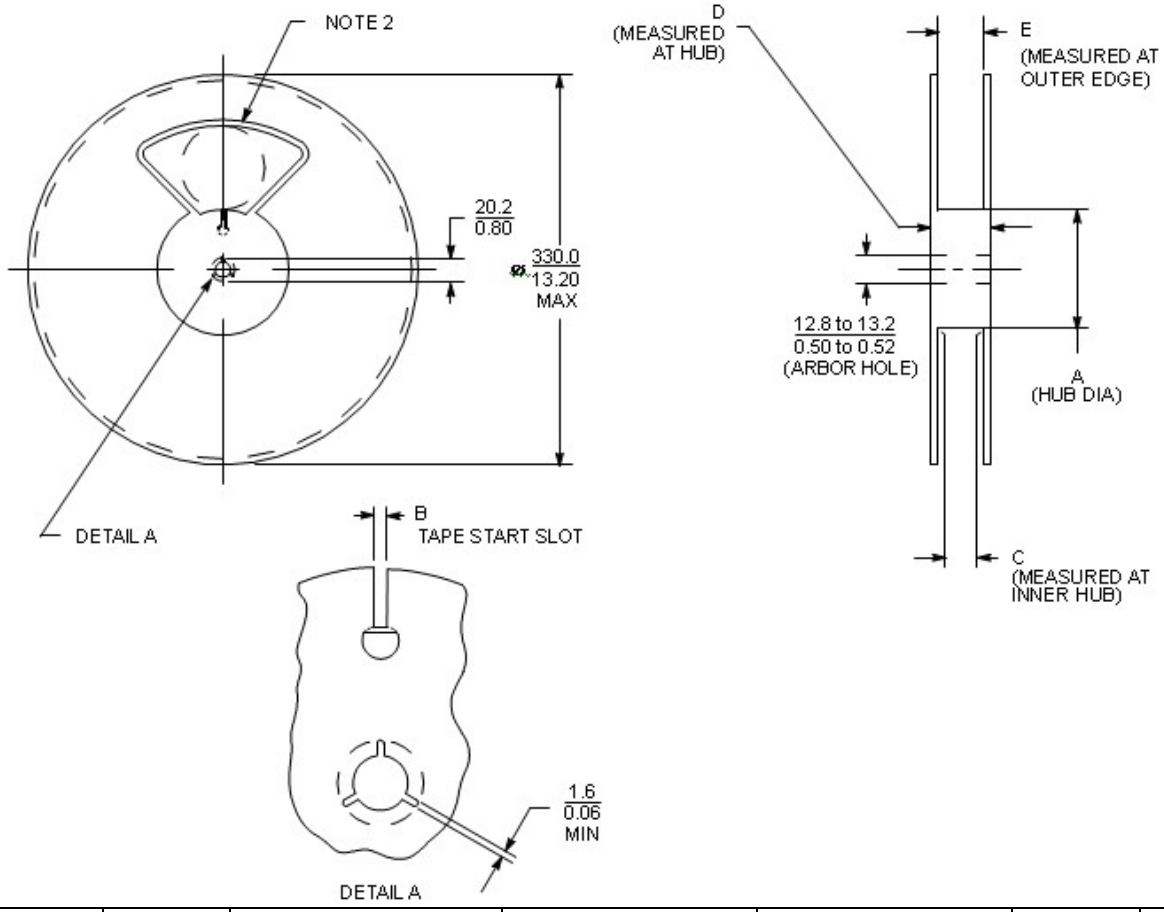
SOP-8/ Tape Reel Data



DIMENSIONS

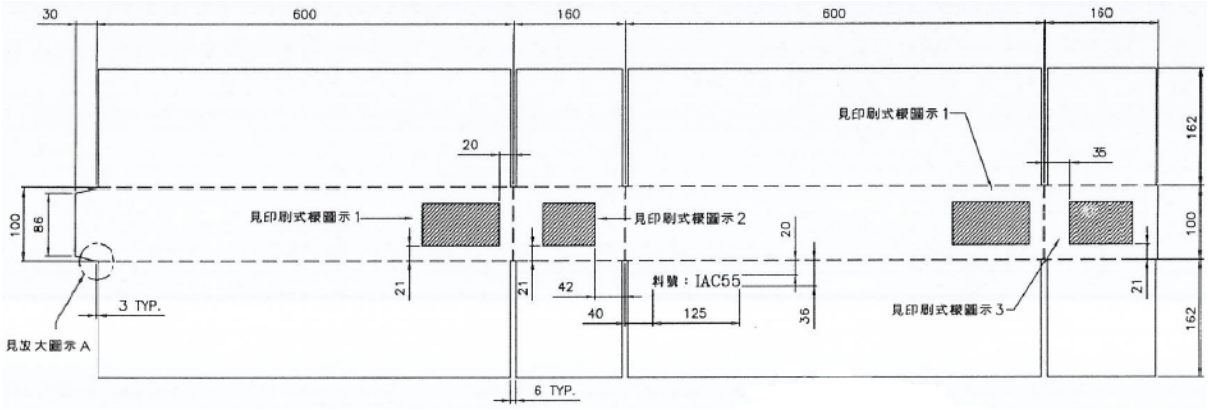
Tape	B_1 Max (Note 1)	D	D_1	E	F	K	P_0	P_2	R Min	T Max	W Max
8 mm	4.55 mm (0.179 3)	1.5 + 0.1 mm − 0.0 (0.059 + 0.004 3 − 0.0)	1.0 Min (0.039 3) or 0.5 mm Min (0.020 3)	1.75 ± 0.1 mm (0.069 ± 0.004 3)	3.5 ± 0.05 mm (0.138 ± 0.002 3)	2.4 mm Max (0.094 3)	4.0 ± 0.1 mm (0.157 ± 0.004 3)	2.0 ± 0.1 mm (0.079 ± 0.002 3)	25 mm (0.98 3)	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 (1.18 3)		12 ± 0.30 mm (0.470 ± 0.012 3)
16 mm	12.1 mm (0.476 3)				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)

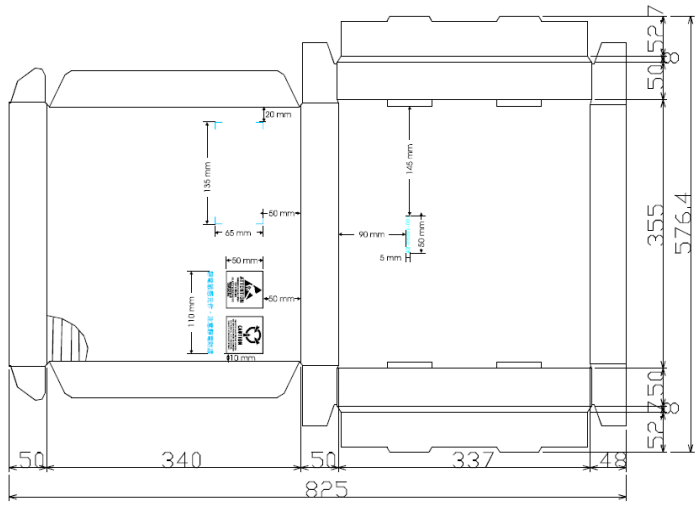
Reel Dimensions



Reel	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)

Tube Inner box Data

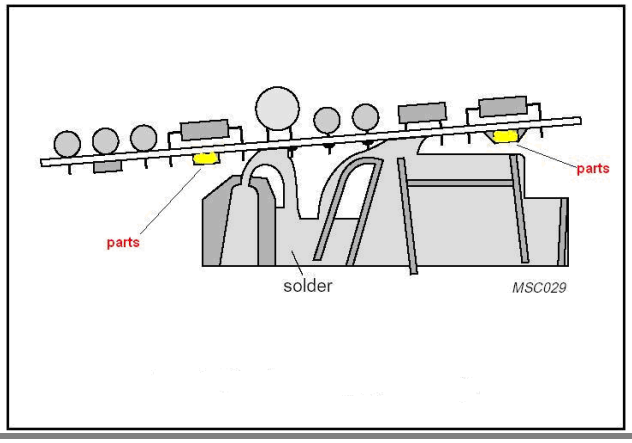
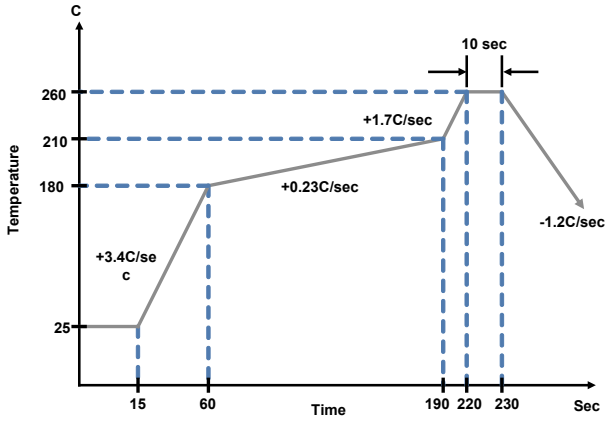




Reliability Test Program

SOP-8/DIP-8

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	2018/01/18