3-Channel Supervisor IC for Power Supply

Features

- Over-voltage protection and lockout
- Under-voltage protection and lockout
- Open drain power good output signal
- Built-in 300mS delay for power good
- 38mS de-bounce for PSON/ control
- 73uS de-bounce for noise immunity
- Wide power supply range

Applications

- PC power supply
- LCD TV power supply

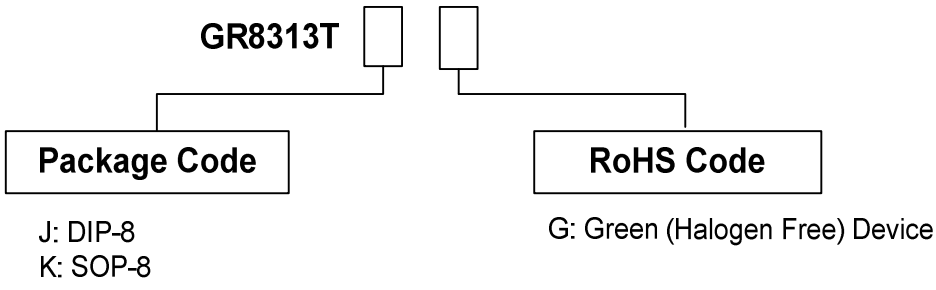
Description

GR8313T is designed to monitor the outputs of switching power supply and generate the power good signal to inform the system. There are three important functions of GR8313T: over-voltage protection, under-voltage protection and power good signal generating.

Over-voltage protection (OVP) monitors 3.3V, 5V and 12V to protect the power supply and system when one of these supply voltages exceeds their normal operation voltage.

Under-voltage protection (UVP) monitors 3.3V, 5V and 12V to protect the power supply and system. When power supply is ready or going to shutdown, power good signal generating notifies personal computers; it provides a reliable power supply environment for system.

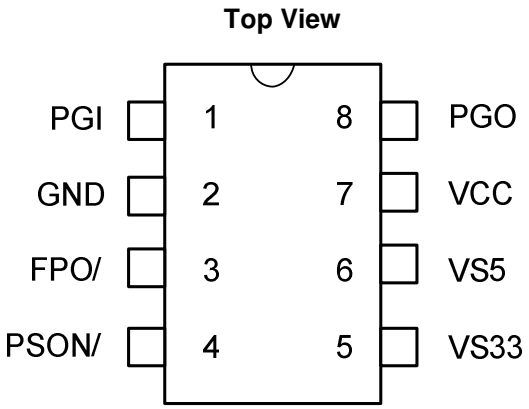
Ordering and Marking Information



DIP- 8	SOP-8
GR8313T XXXXX	GR8313T XXXXX
XXXXX – Date Code	**XXXXX – Date Code**

Grenergy OPTO Inc. reserves the right to make changes to improve reliability or manufacture ability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

Pin Configuration



Pin Descriptions

Pin No.	Name	Function
1	PGI	Power good input signal pin
2	GND	Ground
3	FPO/	Inverted fault protection output, open drain output stage
4	PSON/	Remote ON/OFF control input pin
5	VS33	3.3V over/under-voltage protection input pin
6	VS5	5.0V over/under-voltage protection input pin
7	VCC	Power supply
8	PGO	Power good output signal pin, open drain output stage

Absolute Maximum Ratings

VCC, PGI, FPO/ ---------- -0.5 ~ 16V

VS5, VS33, PSON/, PGO ---------- -0.5 ~ VCC + 0.5V

Junction temperature ---------- 150℃

Operating ambient temperature ---------- -20℃ ~ 85℃

Storage temperature range ---------- -65℃ ~ 150℃

DIP-8 package thermal resistance ---------- 100℃/W

Power dissipation (DIP-8, at ambient temperature = 85℃) ---------- 650mW

Lead temperature (All Pb free packages, soldering, 10 sec) ---------- 260℃

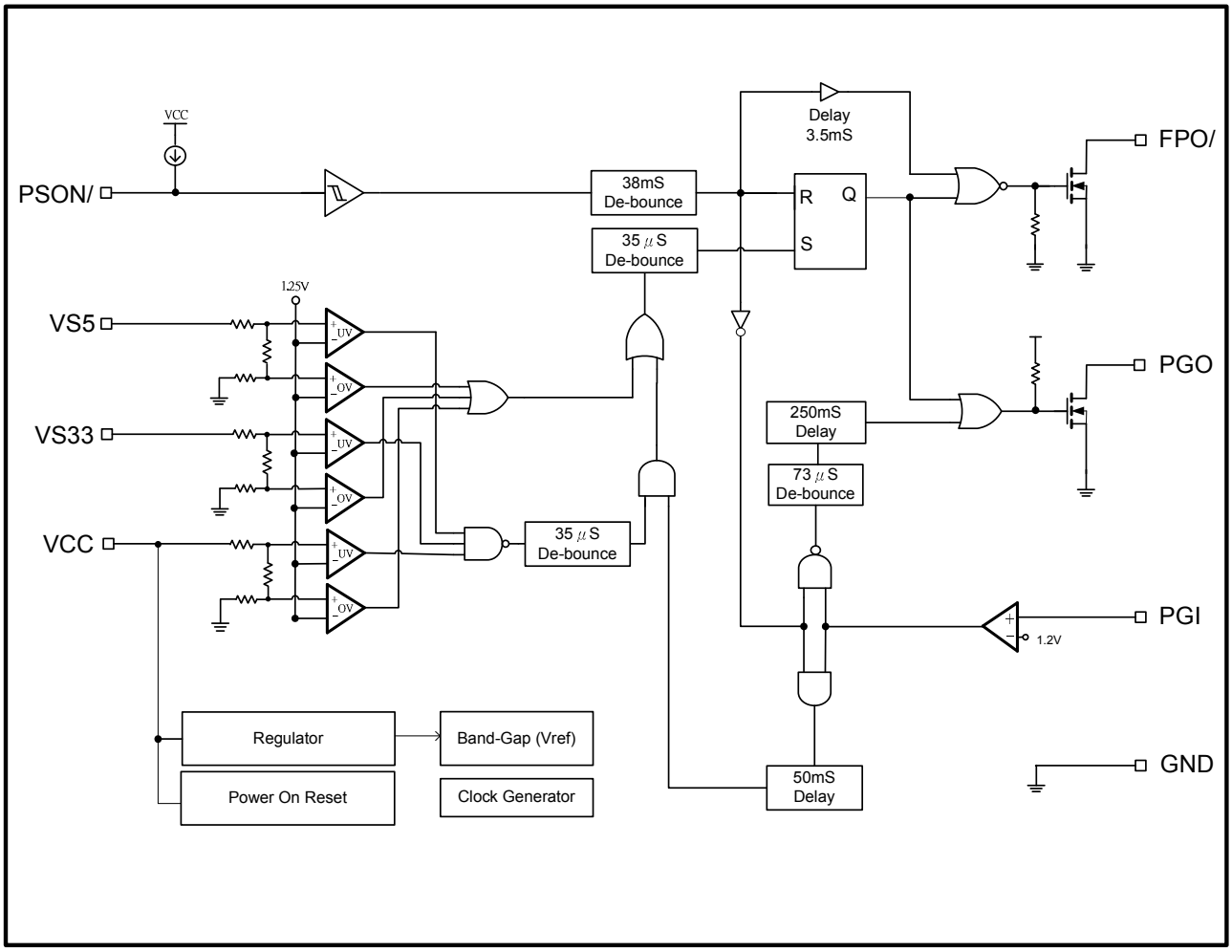
ESD voltage protection, human body model ---------- 3KV

ESD voltage protection, machine model ---------- 250V

Recommended Operating Conditions

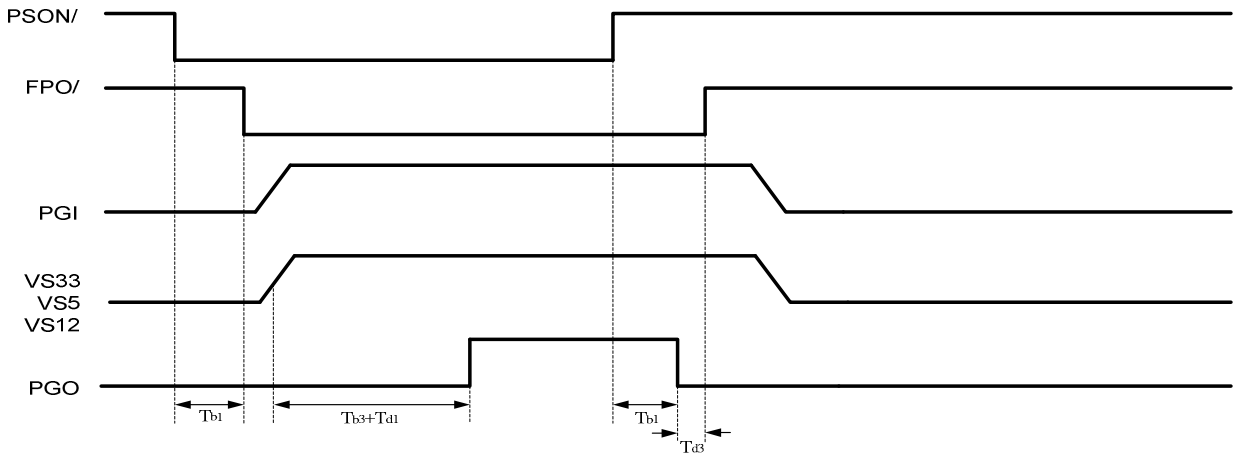
Item	Min.	Max.	Unit
Supply voltage VCC	4.5	15	V

Block Diagram

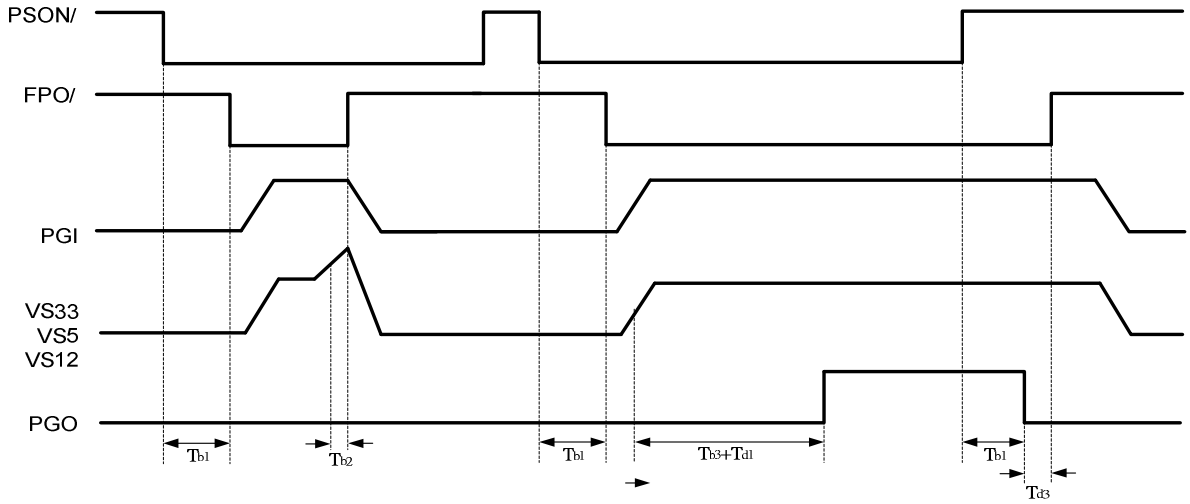


Timing Chart

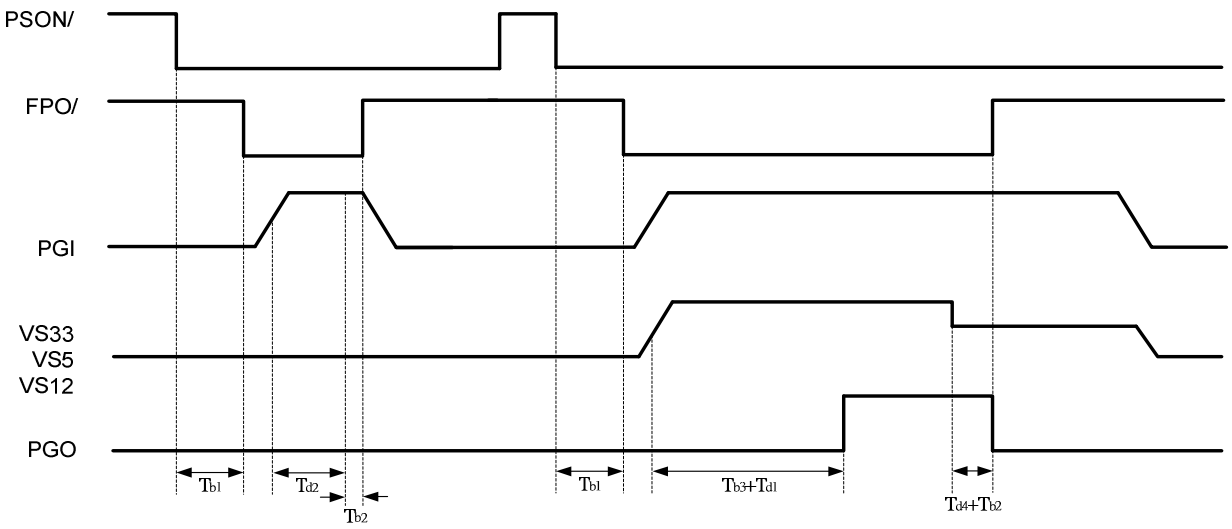
1. PSON/ Signal Characteristics



2. Over-Voltage Characteristics



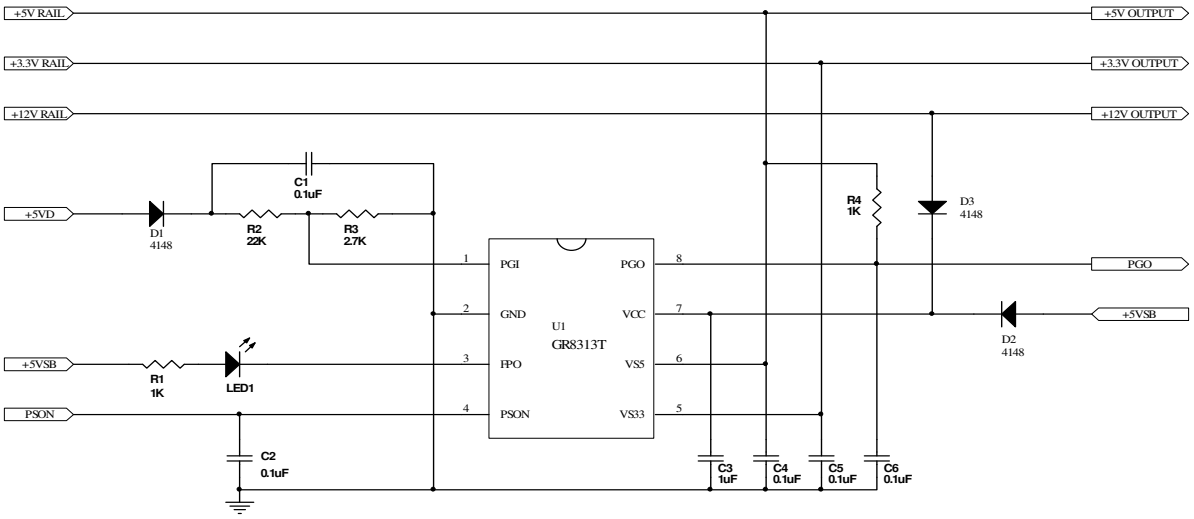
3. Under-Voltage Characteristics



Electrical Characteristics (TA = +25℃ unless otherwise stated, V_{CC} = 12.0V)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
POWER SUPPLY						
Supply voltage		VCC	4.0	5.0	16.0	V
Supply current	$V_{PSON/}$ = 5V	Ivcc		2	3	mA
OVER-VOLTAGE PROTECTION						
Over-voltage threshold		VS33	3.7	3.8	3.9	V
		VS5	5.7	5.85	6	V
		VS12	12.9	13.25	13.6	V
UNDER-VOLTAGE PROTECTION						
Under-voltage threshold		VS33	2.55	2.69	2.83	V
		VS5	4.1	4.3	4.47	V
		VS12	8.8	9.3	9.8	V
PSON/						
High-level input threshold voltage		V_{IH}	1.4	1.5		V
Low-level input threshold voltage		V_{IL}		1.0	1.1	V
PGI AND PGO, FPO/						
PGI threshold voltage		V_{PGI}	1.16	1.2	1.24	V
Leakage current (PGO)	V_{PGO} = 5V	I_{LKG}			5	uA
Low level output voltage (PGO)	I_{SINK} = 10mA	V_{OL}			0.35	V
Leakage current (FPO/)	$V_{FPO/}$ = 5V	I_{LKG}			5	uA
Low level output voltage(FPO/)	I_{SINK} = 10mA	V_{OL}			0.35	V
SWITCHING CHARACTERISTICS						
PSON/ de-bounce time		Tb1	24	38	52	mS
FPO/ noise de-glitch time		Tb2	20	35	50	uS
PGO noise de-glitch time		Tb3	47	73	110	uS
PGI to PGO delay time		Td1	200	250	300	mS
UVP protection delay time		Td2	35	50	55	mS
PGO to FPO/ delay time		Td3	2	3.5	5	mS
Under-voltage delay time		Td4	20	35	50	uS

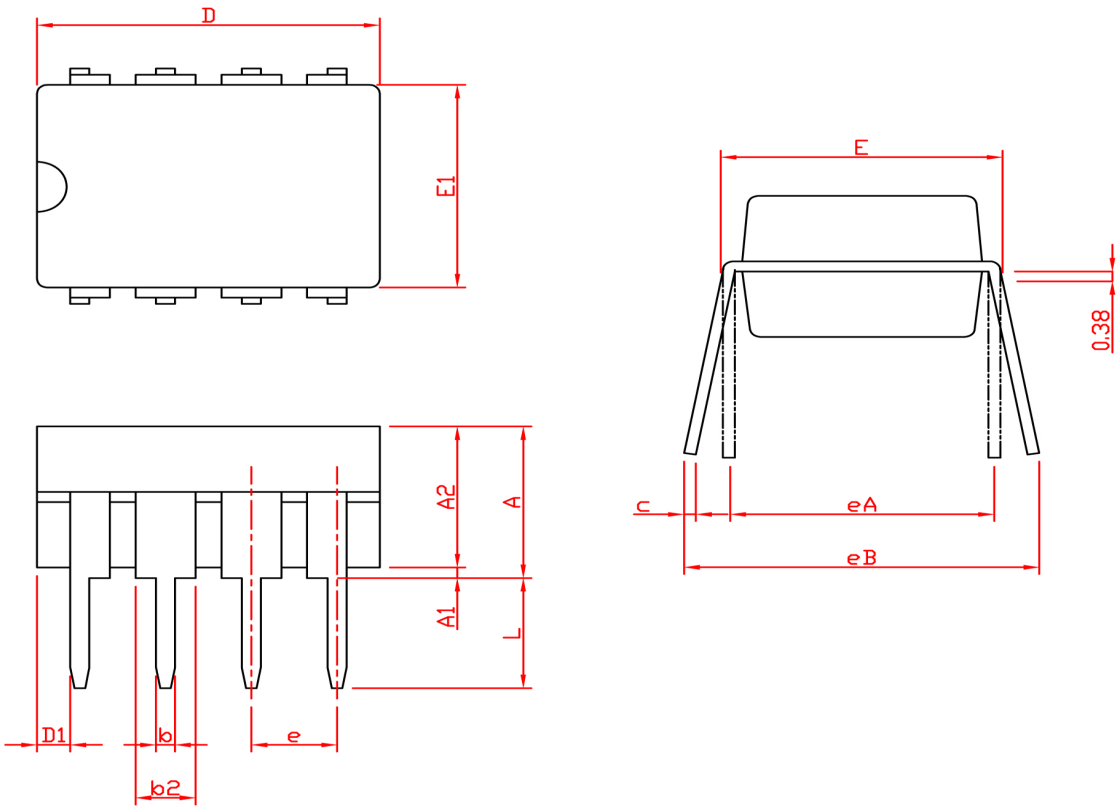
Typical Application Circuit



Application Information

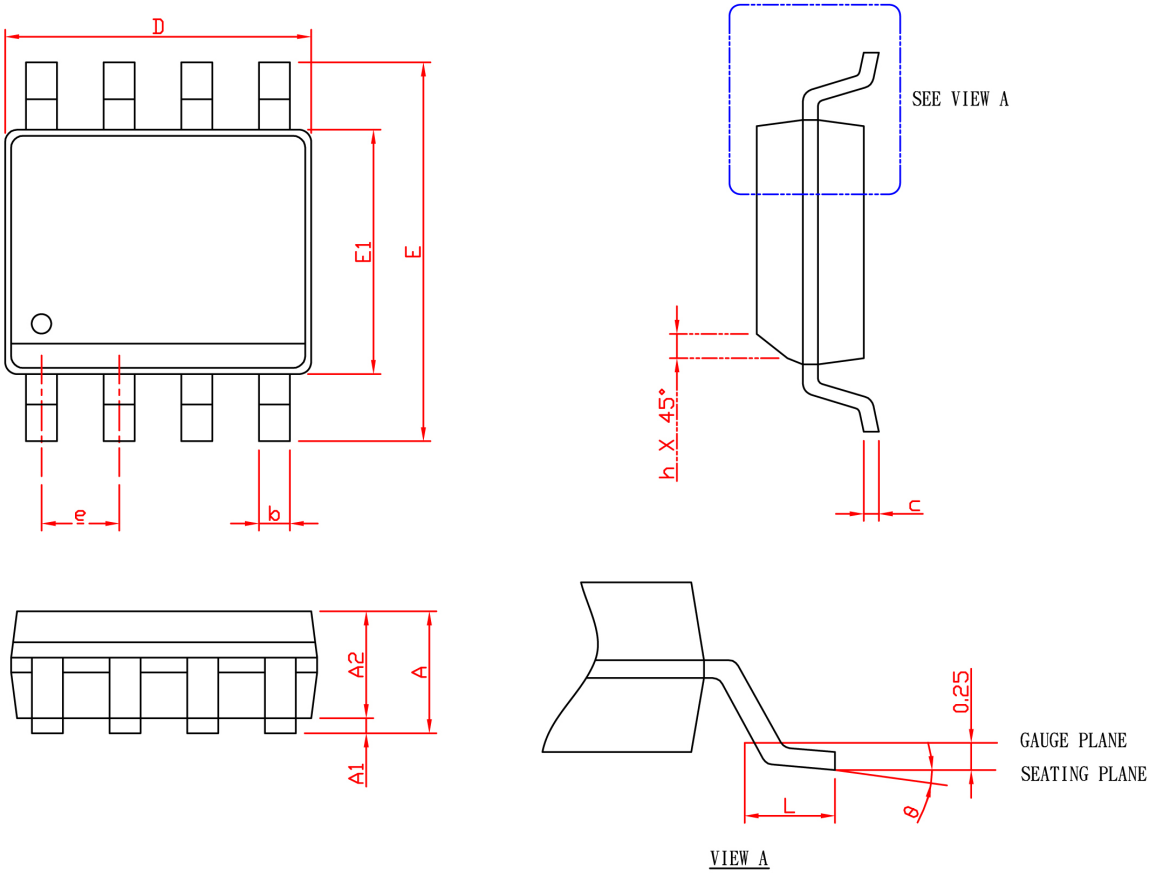
1. The power supply bypass capacitor C3 suggests to be 0.1uF ~ 10uF and around the VCC pin and GND pin while layout. Other bypass capacitors suggests to be 0.01uF ~ 1uF.

Package Information



SYMBOL	DIP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		5.33		0.210
A1	0.38		0.015	
A2	2.92	4.95	0.115	0.195
b	0.36	0.56	0.014	0.022
b2	1.14	1.78	0.045	0.070
c	0.20	0.35	0.008	0.014
D	9.01	10.16	0.355	0.400
D1	0.13		0.005	
E	7.62	8.26	0.300	0.325
E1	6.10	7.11	0.240	0.280
e	2.54 BSC		0.100 BSC	
eA	7.62 BSC		0.300 BSC	
eB		10.92		0.430
L	2.92	3.81	0.115	0.150

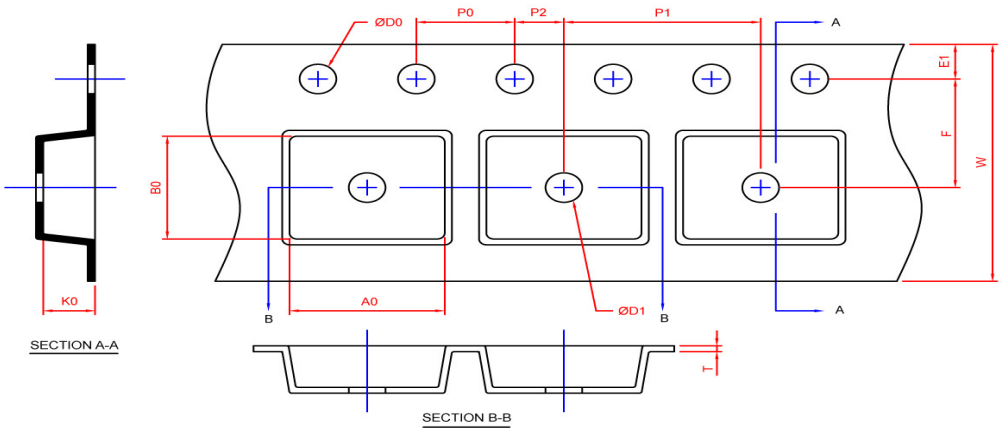
Package Information

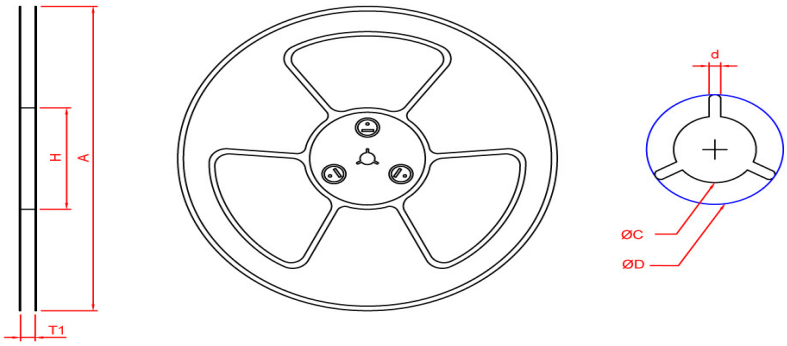


SYMBOL	SOP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.75		0.069
A1	0.10	0.25	0.004	0.010
A2	1.25		0.049	
b	0.31	0.51	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
θ	0^o	8^o	0^o	8^o

Carrier Tape & Reel Dimensions

SOP- 8





Application	A	H	T1	C	d	D	W	E1	F
SOP-8	330.0±2.0	50 MIN.	12.4+2.00 -0.00	13.0+0.50 -0.20	1.5 MIN.	20.2 MIN.	12.0±0.30	1.75±0.10	5.5±0.05
	P0	**P1**	**P2**	**D0**	**D1**	**T**	**A0**	**B0**	**K0**
	4.0±0.10	8.0±0.10	2.0±0.05	1.5+0.10 -0.00	1.5 MIN.	0.6+0.00 -0.40	6.40±0.20	5.20±0.20	2.10±0.20

(mm)

Devices Per Unit

Application	Carrier Width	Cover Tape Width	Devices Per Reel
SOP- 8	12	-	2500