

## 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

GR8313 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 GR8313: 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.

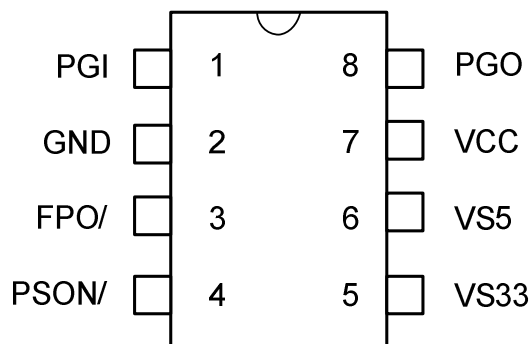
### Ordering and Marking Information

<div style="text-align: center;"> <b>GR8313</b> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Package Code</b>  J: DIP-8  K: SOP-8 </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>RoHS Code</b>  G: Green (Halogen Free) Device </div> </div>	
<b>DIP- 8</b>  <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: 100px;"> GR8313 XXXXX </div> <p style="text-align: center;"><b>XXXXX – Date Code</b></p>	<b>SOP-8</b>  <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: 100px;"> GR8313 XXXXX </div> <p style="text-align: center;"><b>XXXXX – Date Code</b></p>

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## Pin Configuration

**Top View**



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## 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

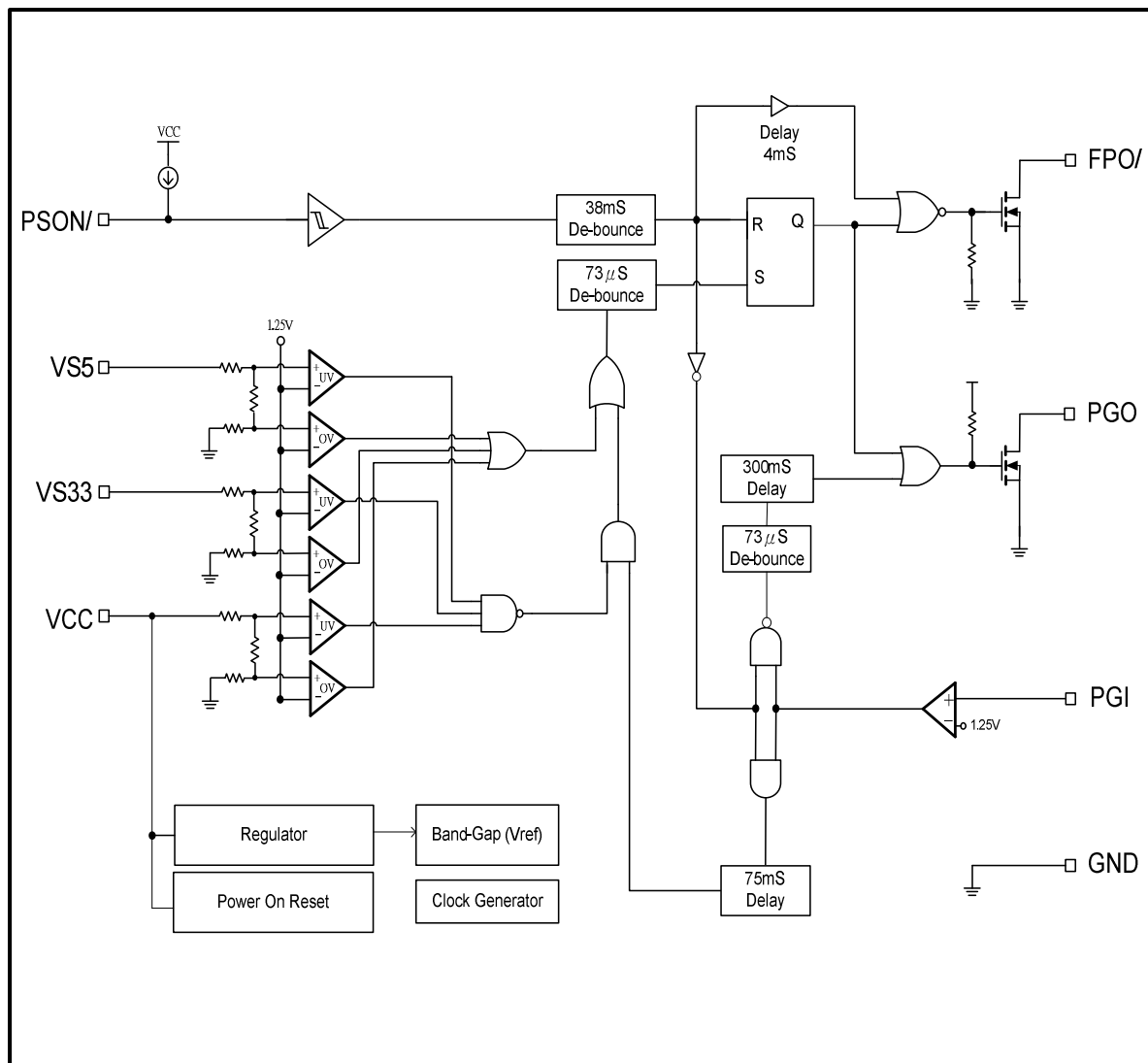
## Absolute Maximum Ratings

VCC, PGI, FPO/	-0.5 ~ 16V
VS5, VS33, PSON/, PGO	-0.5 ~ VCC + 0.5V
Junction temperature	150°C
Operating ambient temperature	-20°C ~ 85°C
Storage temperature range	-65°C ~ 150°C
DIP-8 package thermal resistance	100°C/W
Power dissipation (DIP-8, at ambient temperature = 85°C)	650mW
Lead temperature (All Pb free packages, soldering, 10 sec)	260°C
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

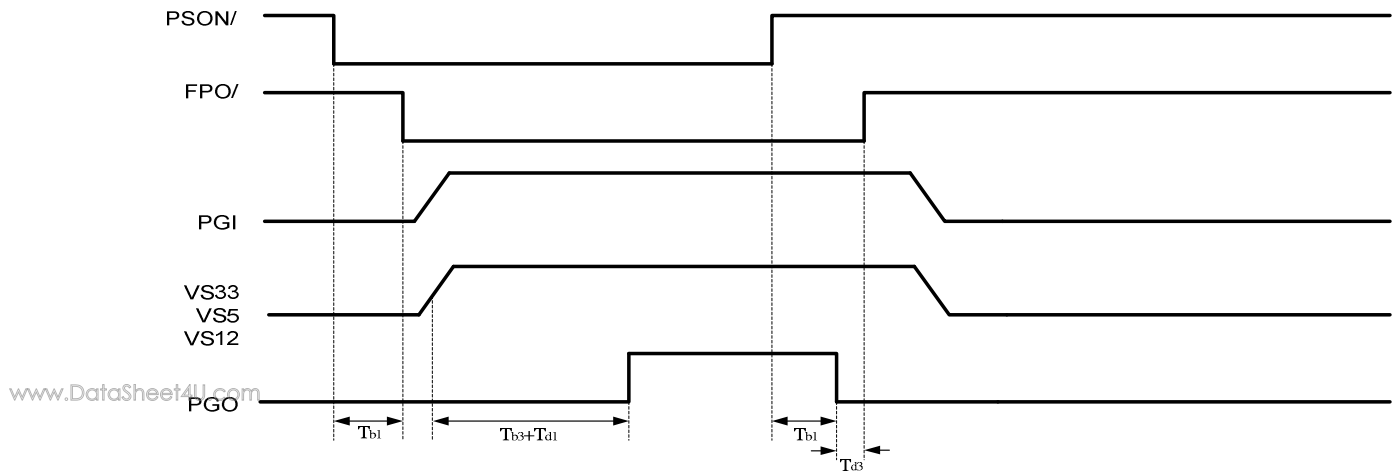
## Block Diagram



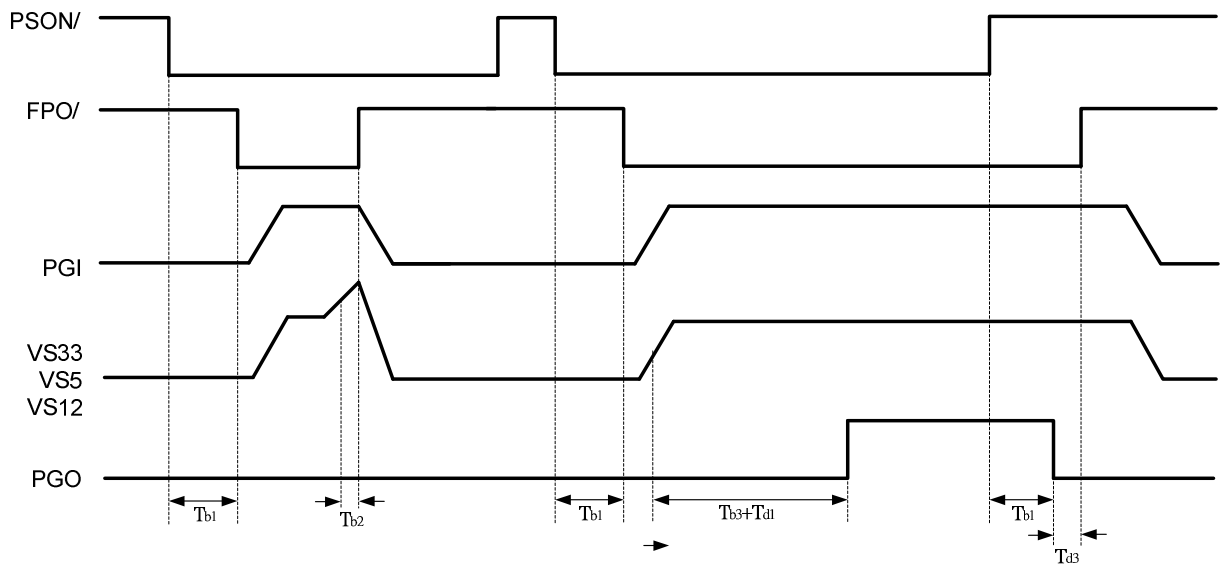


## Timing Chart

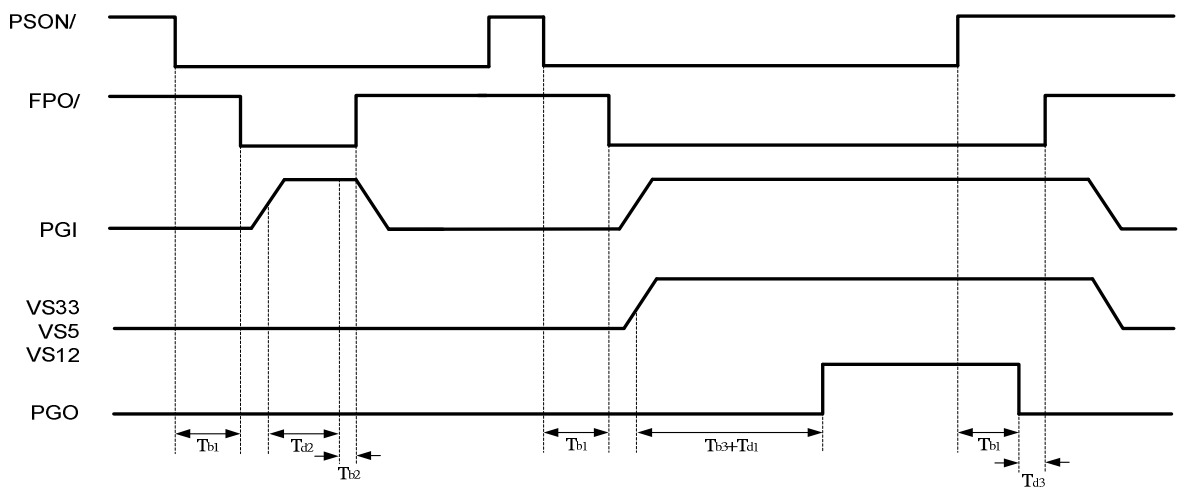
### 1. PSON/ Signal Characteristics



### 2. Over-Voltage Characteristics



### 3. Under-Voltage Characteristics



**Electrical Characteristics** ( $T_A = +25^{\circ}\text{C}$  unless otherwise stated,  $V_{CC} = 12.0\text{V}$ )

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
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**POWER SUPPLY**

Supply voltage		$V_{CC}$	4.0	5.0	16.0	V
Supply current	$V_{PSON/} = 5\text{V}$	$I_{VCC}$		2	3	mA

**OVER-VOLTAGE PROTECTION**

Over-voltage threshold		$V_{S33}$	3.7	3.9	4.1	V
		$V_{S5}$	5.7	6.1	6.5	V
		$V_{S12}$	13.2	13.8	14.4	V

**UNDER-VOLTAGE PROTECTION**

Under-voltage threshold		$V_{S33}$	2.0	2.2	2.4	V
		$V_{S5}$	3.3	3.5	3.7	V
		$V_{S12}$	8.5	9.0	9.5	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

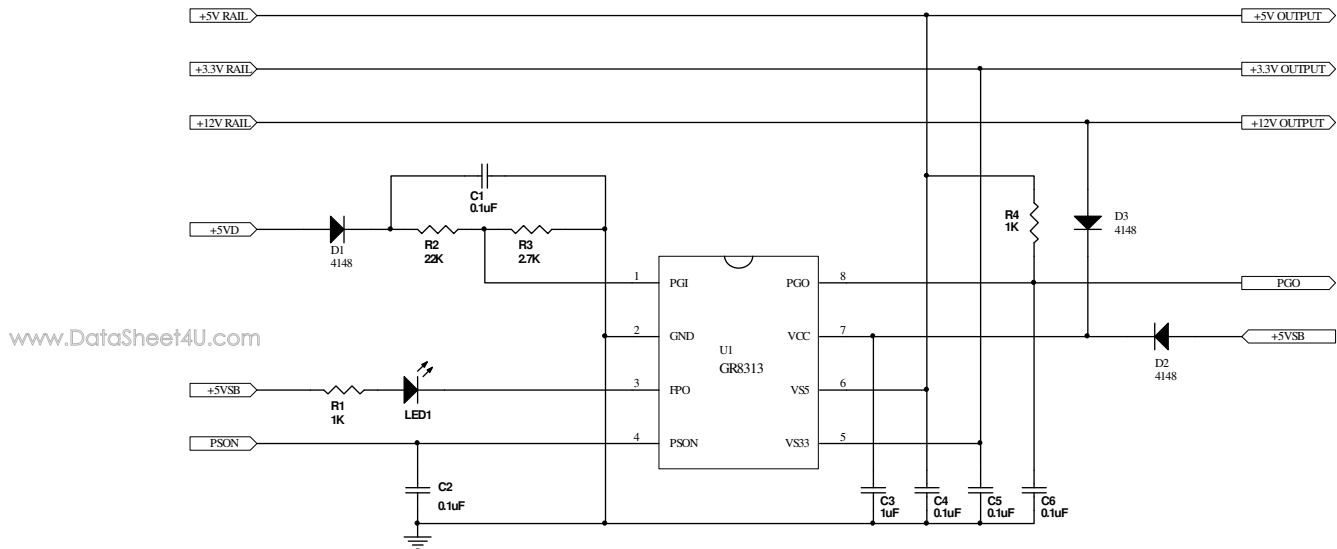
**PGI AND PGO, FPO/**

PGI threshold voltage		$V_{PGI}$	1.16	1.25	1.33	V
Leakage current (PGO)	$V_{PGO} = 5\text{V}$	$I_{LKG}$			5	uA
Low level output voltage (PGO)	$I_{SINK} = 10\text{mA}$	$V_{OL}$			0.35	V
Leakage current (FPO/)	$V_{FPO/} = 5\text{V}$	$I_{LKG}$			5	uA
Low level output voltage(FPO/)	$I_{SINK} = 10\text{mA}$	$V_{OL}$			0.35	V

**SWITCHING CHARACTERISTICS**

PSON/ de-bounce time		$T_{b1}$	24	38	61	mS
FPO/ Noise de-glitch time		$T_{b2}$	47	73	110	uS
PGO Noise de-glitch time		$T_{b3}$	47	73	110	uS
PGI to PGO delay time		$T_{d1}$	200	300	480	mS
UVP protection delay time		$T_{d2}$	49	75	114	mS
PGO to FPO/ delay time		$T_{d3}$	2	4	6	mS

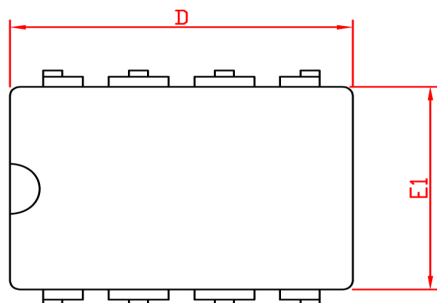
## Typical Application Circuit



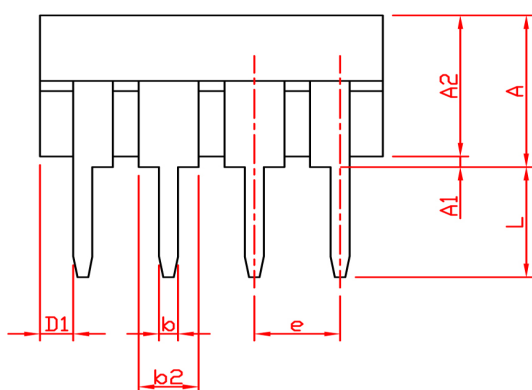
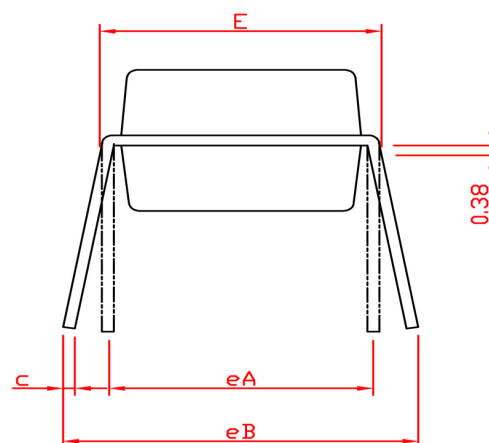
## Application Information

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

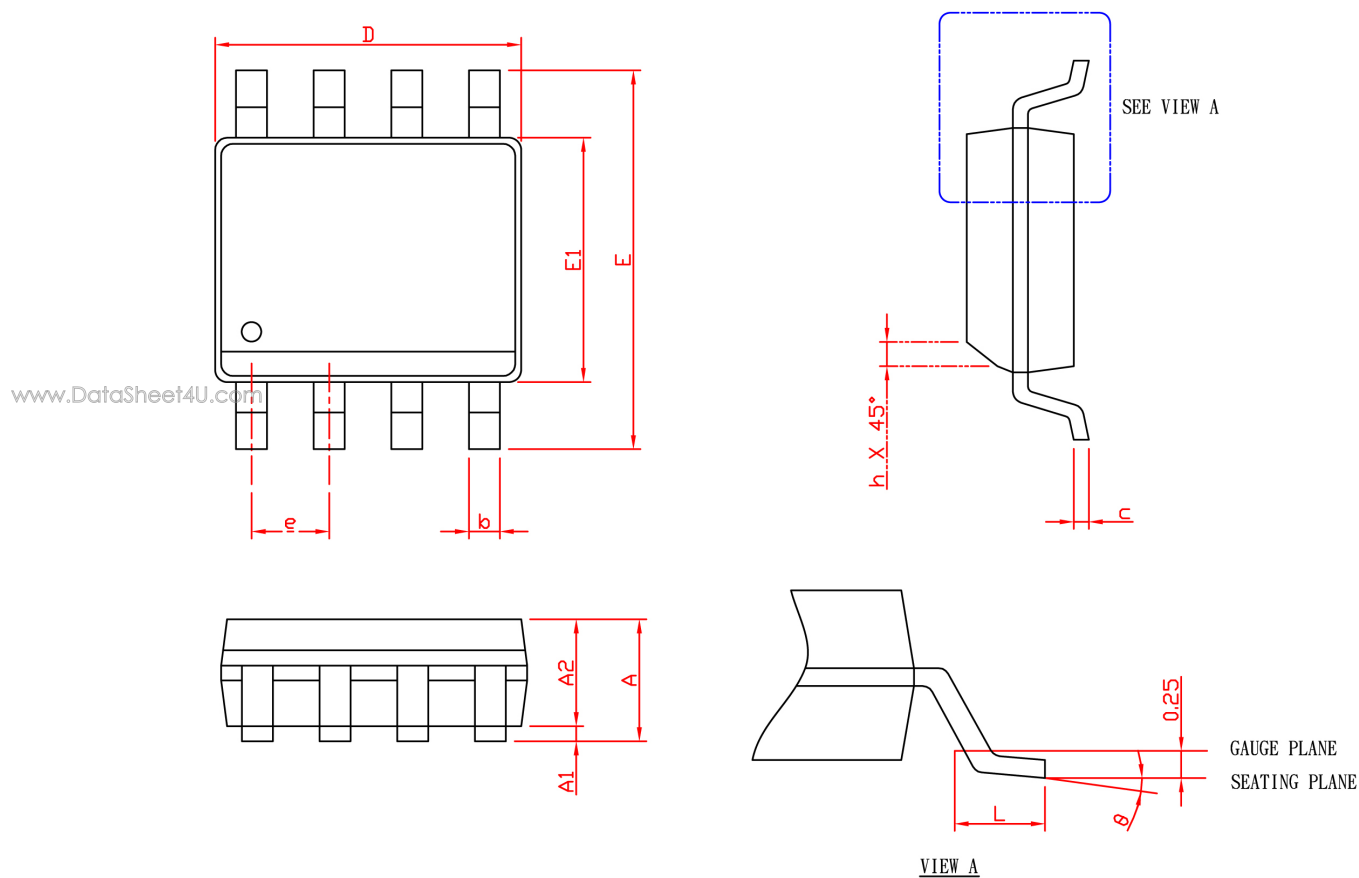


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SYMBOL	DIP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		5.33		0.210
A1	0.38		0.015	
A2	2.92	4.95	0.115	0.195
b	0.36	0.56	0.014	0.022
b2	1.14	1.78	0.045	0.070
c	0.20	0.35	0.008	0.014
D	9.01	10.16	0.355	0.400
D1	0.13		0.005	
E	7.62	8.26	0.300	0.325
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

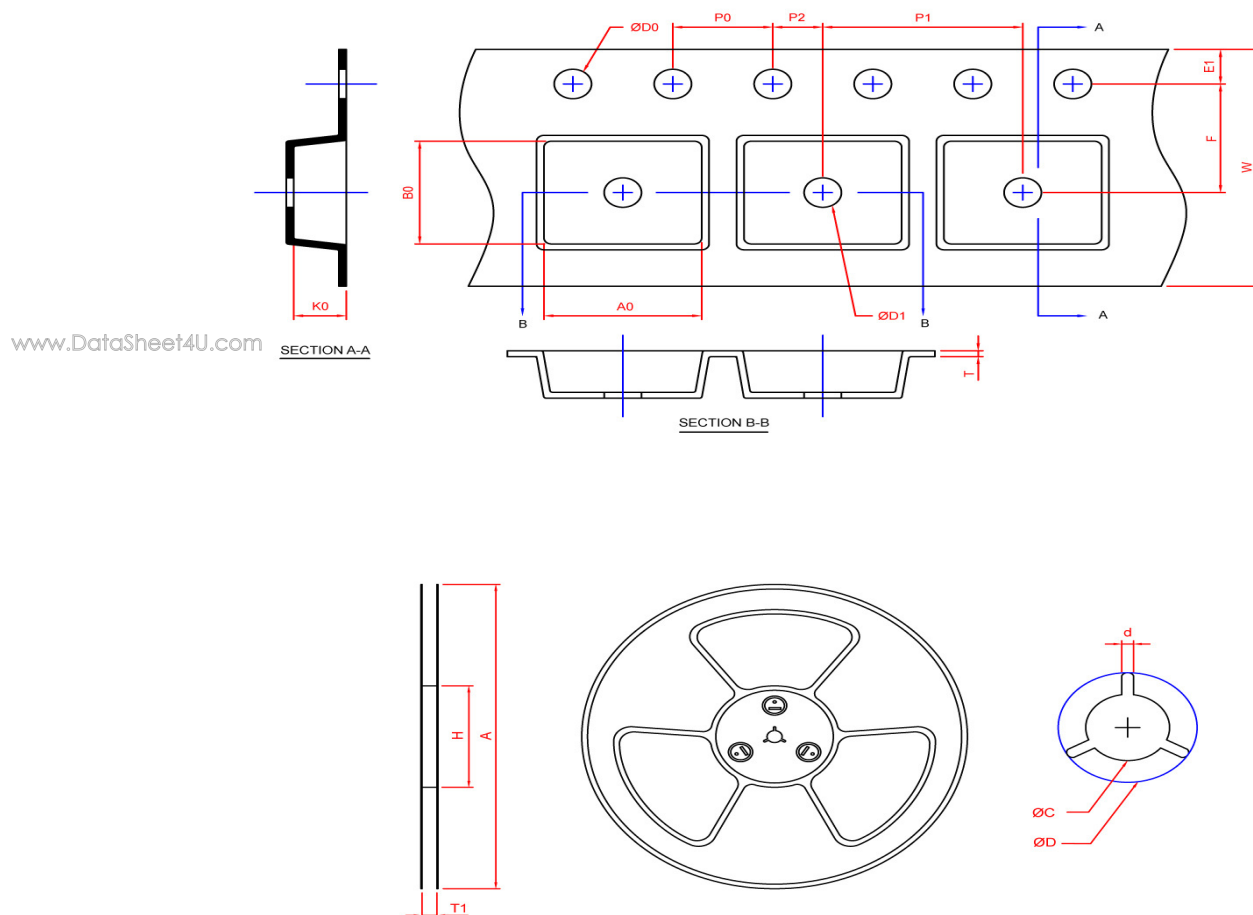


SYMBOL	SOP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.75		0.069
A1	0.10	0.25	0.004	0.010
A2	1.25		0.049	
b	0.31	0.51	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016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



## 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

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