GL8101

PROGRAMMABLE SINGLE CHANNEL DIGITAL SYNCHRONIZATION PWM CONTROLLER

Description

The GL8101 is a single-phase synchronization PWM converter controller designed to drive MOSFET. It provides a highly accurate, programmable output voltage precisely regulated to low voltage requirement & control constant current level.

The GL8101 also can provide a dual PWM controller output base on non-synchronization. If the PWM-L without used, it can support 30KHz~100MHz frequency to replacement X'TL.

The GL8101 uses an external compensated, single feedback loop voltage mode PWM control for fast transient response. An oscillator with Programmable frequency (30 kHz to 100MHz) reduces the external inductor and capacitor component size for saving PCB board area.

The GL8101 provides fast transient response to satisfy high current output applications (up to 25A) while minimizing external components. It is suitable for high performance graphic processors, DDR and VTT power. The GL8101 integrates complete protect functions such as Soft Start, Output Enable, UVLO (under-voltage lockout), constant current (OCP), 2 step internal protect (PWM enable and current fuse) into a TSSOP-16 package.

Features

- Single phase Synchronization Converter with
  - High Output Current (up to 25A)
  - Low Output Voltage (down to 0.2V)
  - High Input Voltage (Up to 32V)
- Dual output non- Synchronization Converter
- 1% Vout Tolerance
- Support 100MHz Fosc (when PWM-L without used)
- Low standby current (Avg. under 2mA)
- Low Noise SW noise≦100mV, noise ≦20mV
- External Programmable Vadj
  (Range: 0.03V to 1.8V)
- External Programmable Output Current
  (Range: 10mA to 25A)
- External Programmable Timer
  (Range: X nSec to Sec)
- External Programmable Frequency
  (Range: 30kHz to 10MHz) 0.5KHz Tolerance
  Adjustable by 0.5KHz
- Maximum Duty Cycle
  - Buck Mode: 100%
  - Boost Mode: 98%
  - Buck-Boost Mode: 175%
- Fast Transient Response
- The Max.Eff. over 98%, max. -3% Tolerance
- G-DRV ability minimum is 1A, can up to 2A
- High Efficiency controller over 99.8%

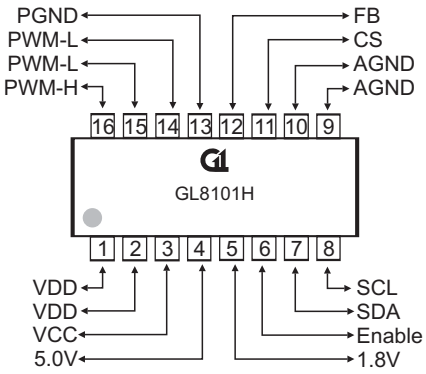
Application

- System (Graphic, MB) with 12V Power
- Graphic Cards (AGP 8X, 4X, PCI Express*16):
  - High-Current for High-Performance Graphic Processors (GPU, VPU)
  - Low Current with Sink Capacity for High-Performance Graphic Memory Power (DDR/VTT).
- 2.5V to Max. Input DC-DC Regulators
- External HDD Enclosure
- Notebook/Netbook Computer
- PC MainBoard
- Network Systems Power Supplies
- LCD TV/Monitor Systems Power Supplies
- DSL and Cable Modems
- Satellite Set Top Boxes
- Wireless LAN Systems
- AC Adaptor over 30W Support Energy Star

PROGRAMMABLE SINGLE CHANNEL DIGITAL SYNCHRONIZATION PWM CONTROLLER

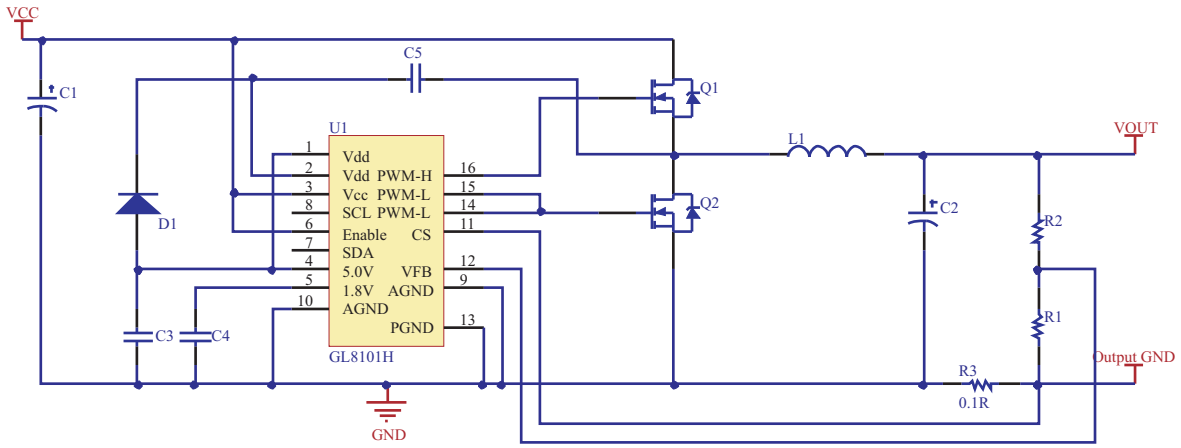
MARKING INFORMATION & PIN CONFIGURATIONS (Top View)

TSSOP-16

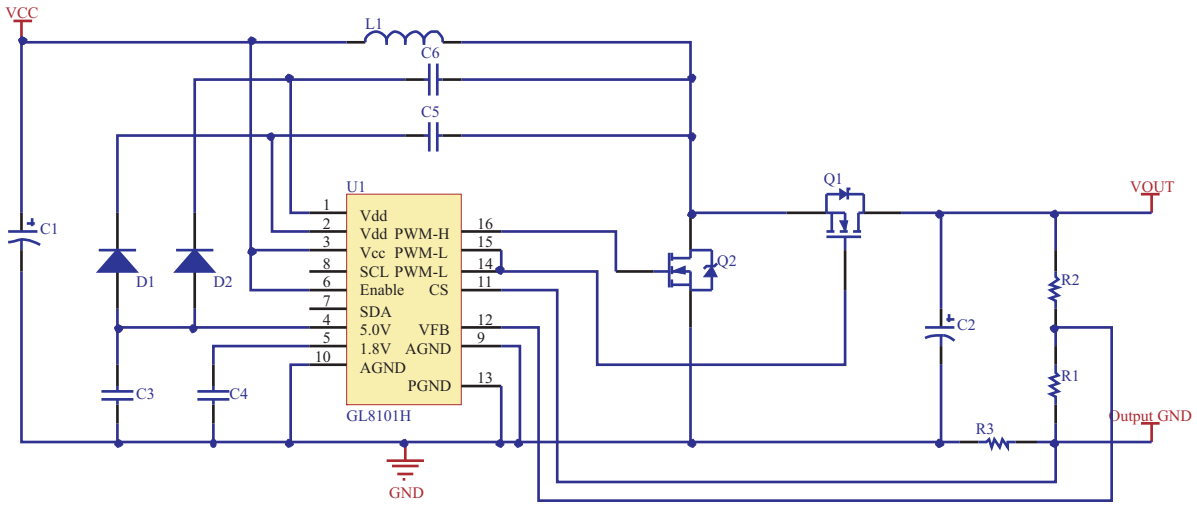


Typical Application Circuit

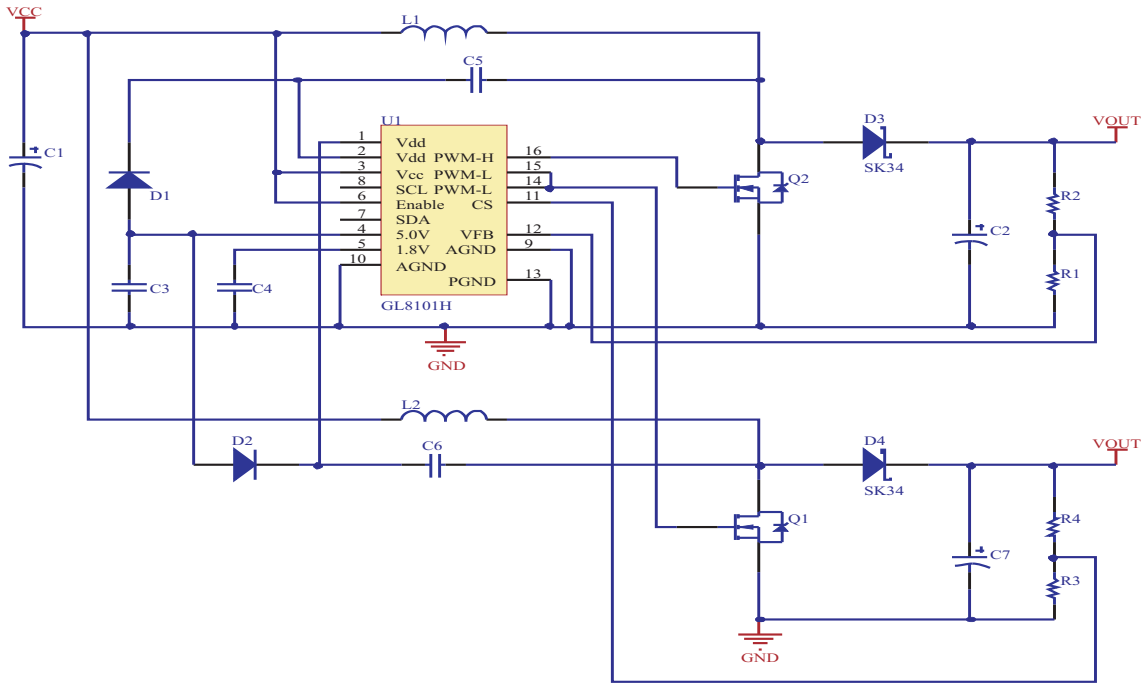
Synchronization Buck



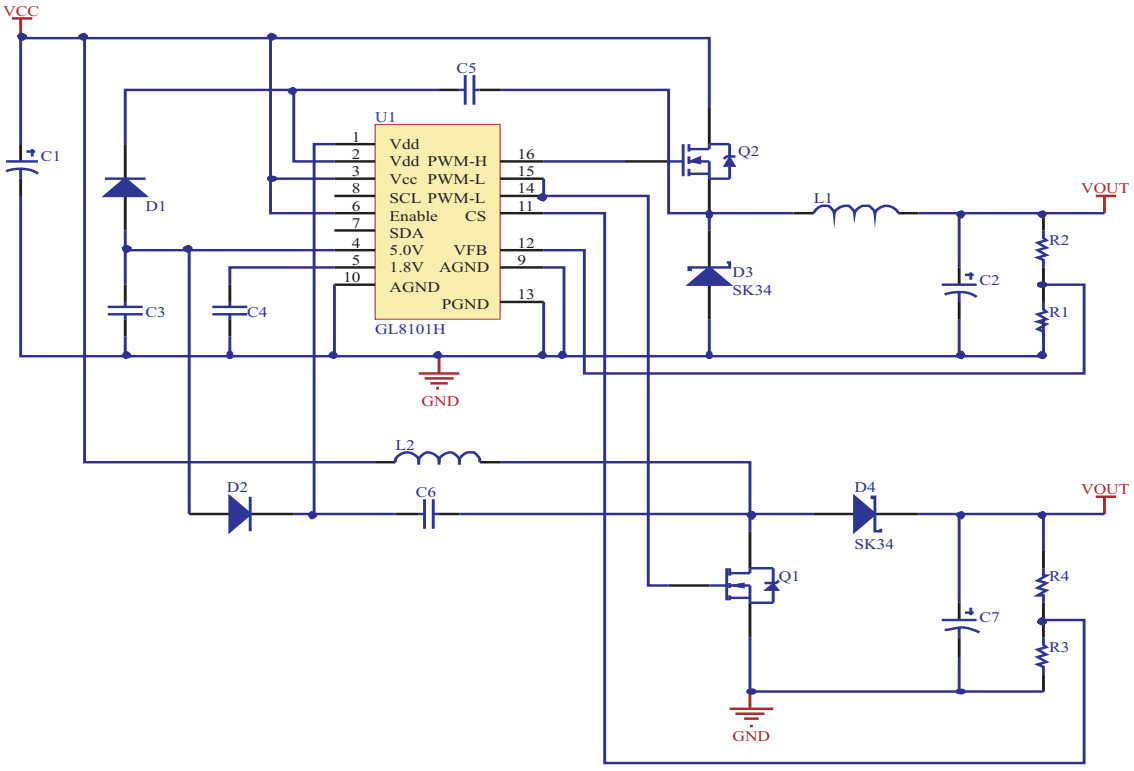
Synchronization Boost



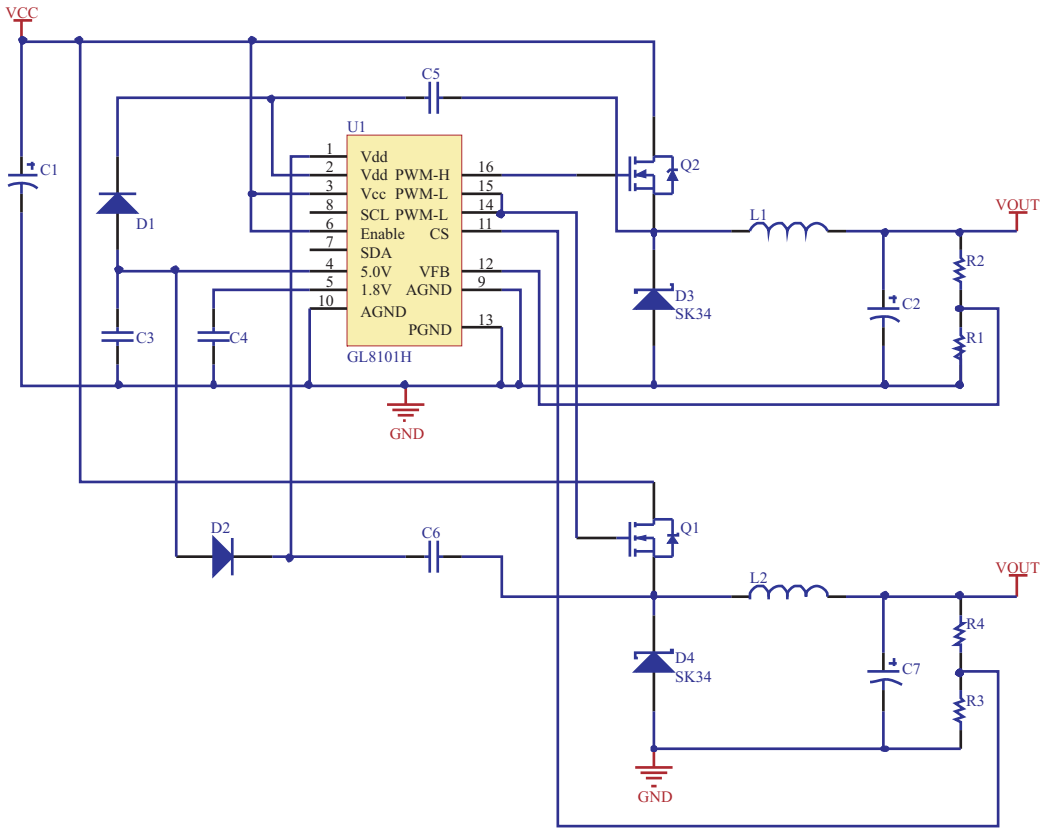
Non-Synchronization Boost for 2ch



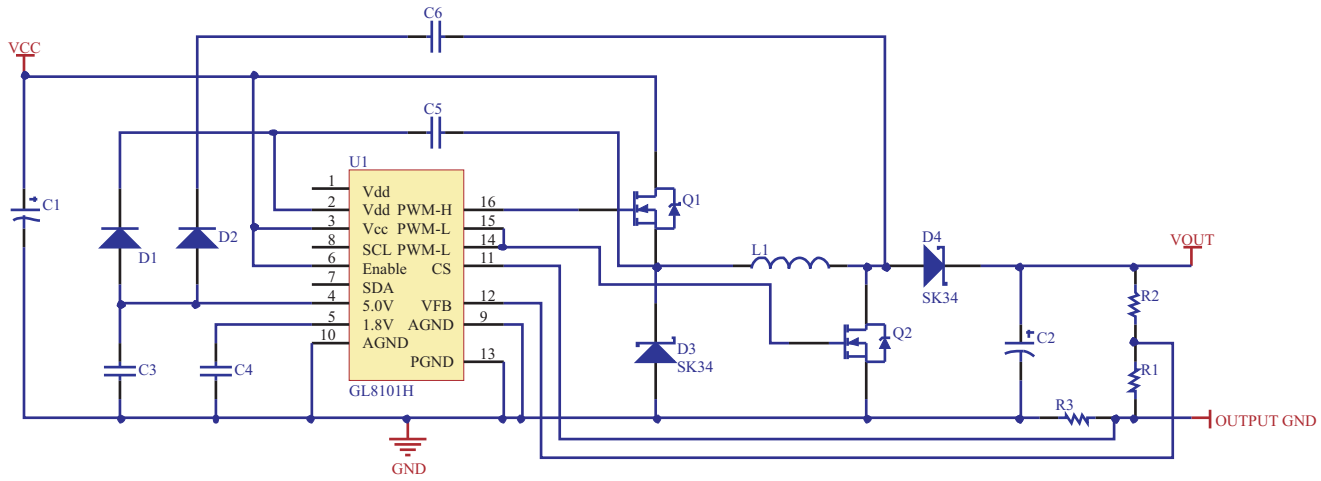
Non-Synchronization Buck and Boost



Non-Synchronization Buck for 2ch



Non-Synchronization Buck-Boost



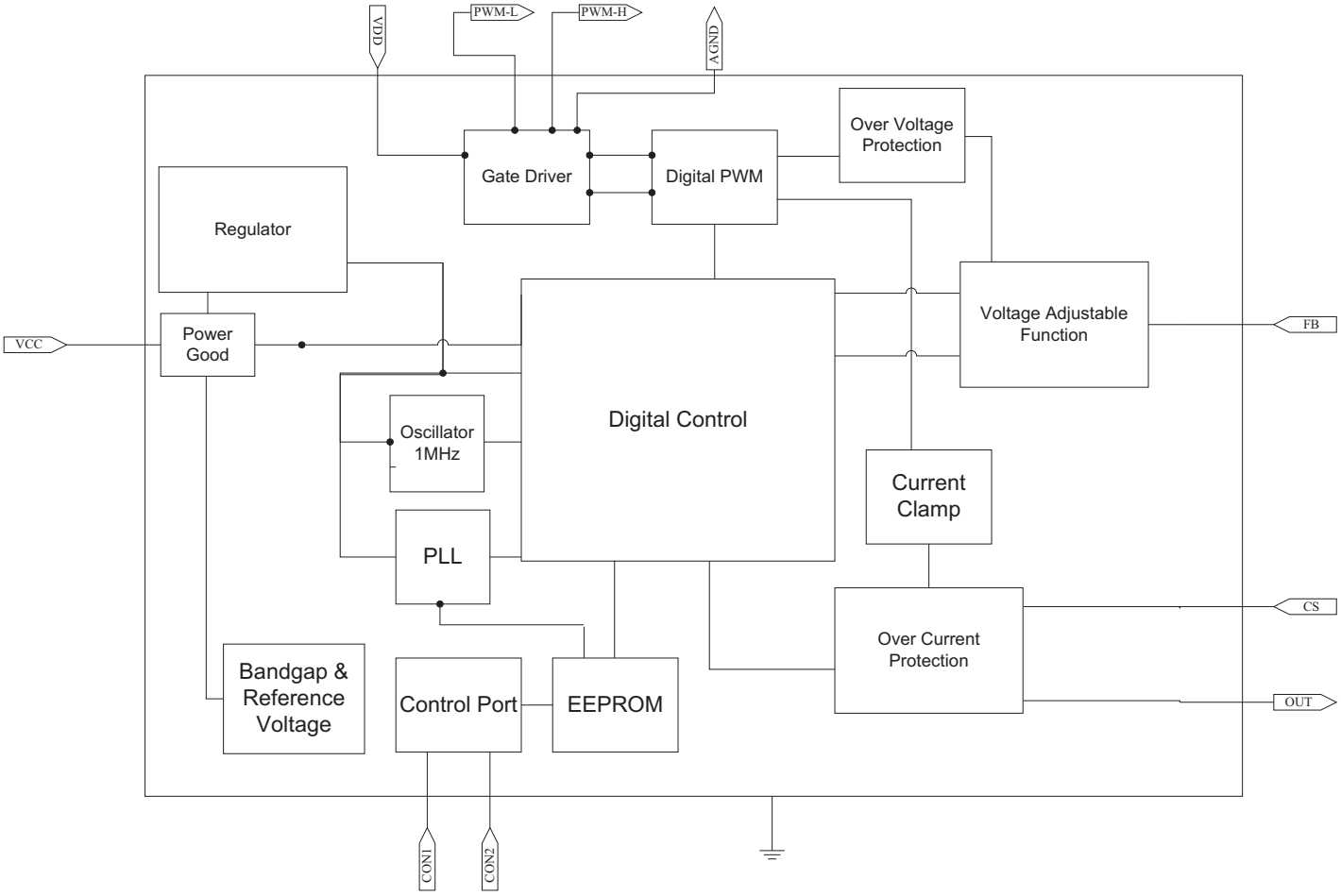
GL8101 Application Mode

Mode	Synchronization		Non-Synchronization		
	Boost	Buck	Boost	Buck	Buck
1	1 ch	-	-	-	-
2	-	1 ch	-	-	-
3	-	-	2 ch	-	-
4	-	-	-	2 ch	-
5	-	-	1 ch	1 ch	-
6	-	-	-	-	1 ch

PIN DESCRIPTION

PIN No.	PIN Symbol	Function	VOP
1	VDD	Power of Gate Driver Connection	32V
2	VDD	Power of Gate Driver Connection	32V
3	VCC	Power of Digital used	32V
4	5.0V	5.0V refer output	5.0V
5	1.8V	1.8V refer output	1.8V
6	Enable	This pin must connection to Vcc, IC just to operation.	32V
7	SDA	Software control pin and output option mode 0	1.8V
8	SCL	Software control pin and output option mode 1	1.8V
9	AGND	Analog Ground Connection	
10	AGND	Analog Ground Connection	
11	CS	Current Sense Resistor Connection	1.8V
12	FB	Feedback	1.8V
13	PGND	Gate Driver Ground Connection	
14	PWM-L	External Low site MOSFET Gate Driver	32V
15	PWM-L	External Low site MOSFET Gate Driver	32V
16	PWM-H	External High site MOSFET Gate Driver	32V

FUNCTION BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

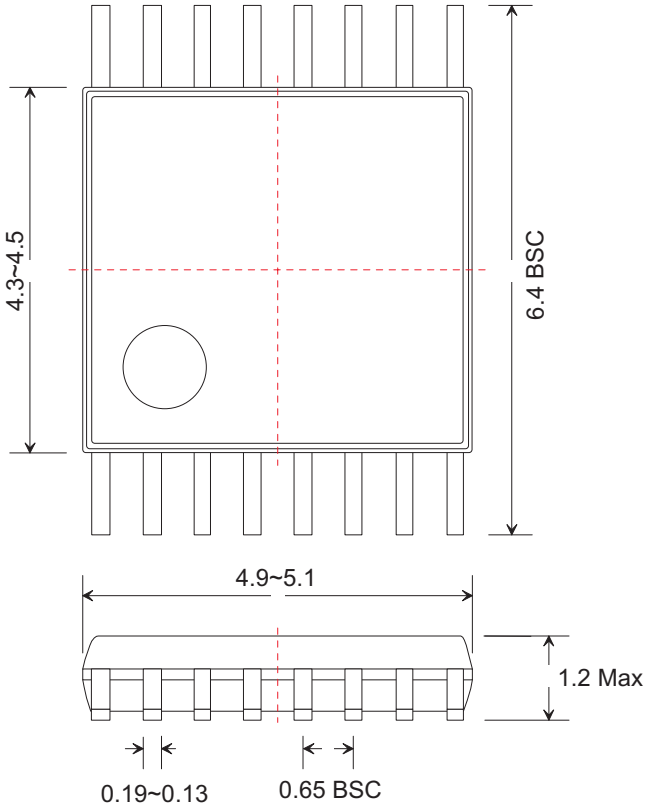
PARAMETER	RATINGS	UNIT
Voltage Range on SW	-0.5 to 32	V
Continuous Total Power Dissipation	350	mW
Operating Ambient Temperature	-30 to +80	°C
Storage Temperature Range	-40 to +125	°C
ESD Susceptibility		
HBM (Human Body Mode)	2K	V
MM (Machine Mode)	200	

◆ ELECTRICAL CHARACTERISTICS:

V_{IN}= 12V and T_A=25deg.C Unless otherwise specified.

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
IN Supply Voltage	V_{OUT} = 5V (Adjustable Version Only)		2.5	-	32	V
IN Supply Current	SW open, when Fosc≧5MHz	Icc	-	0.5	1.0	mA
	SW open, when 5M≧Fosc≧2.5MHz	Icc	-	250	500	uA
	SW open, when Fosc≦2.5MHz	Icc	-	100	200	uA
Standby Current	When Iout ≦Ø Iout max. Istdby/ ICC	I_{STBY}	-	10	20	uA
Adjustable Voltage		V_{ADJ}	0.03	-	1.8	V
Standby current level	Operating current under		-	20	-	%
Vout control Tolerance	Vin=5 to 32V, Iout=1mA~1A	ΔV	-1	-	+1	%
Standby Mode Vout Tolerance	When PWM into standby mode		-1	-	+1	%
Oscillator Variation Tolerance	Frequency =30 kHz to 200MHz	ΔFosc	-1	-	+1	%
Maximum Duty Cycle	FB short to ground	D_{MAX}	Option	-	Option	%
Vout	If need over 10V, pls addition Res.	V_{OUT}	0.2	-	1.8	V
Driver Ability Source-PWMH		ISCH	1	-	-	A
Driver Ability Sink-PWMH		ISNH	1	-	-	A
Driver Ability Source-PWML		ISCL	300	-	-	mA
Driver Ability Sink-PWML		ISNL	300	-	-	mA
Oscillator Range	When Vin ≧ 12V	Fosc	0.03	-	2	MHz
	When Vin =6V ~ 12V	Fosc	0.03	-	5	MHz
	When Vin ≦ 6V	Fosc	0.03	-	10	MHz
Fosc Support Range	1.8~5V oscillator	OSC	0.03	-	100	MHz
Voltage Control Range		V_{CON}	0.03	-	1.8	V
Current control Range		I_{CON}	0.01	-	25	A

TSSOP16 PACKAGE OUTLINE DIMENSIONS



Unit: mm