GL5010

100mA 100KHz DC-DC CONVERTOR BOOST REGULATOR

Description

The GL5010 Series are VFM (Chopper) Step-up DC/DC converter IC with ultra low supply current by CMOS process.

The GL5010 IC consists of an oscillator, a VFM control circuit, a driver transistor (Lx switch), a reference voltage unit, an error amplifier, resistors for voltage detection, and an Lx switch protection circuit. A low ripple, high efficiency step-up DC/DC converter can be constructed of this GL5010 IC with only three external components, that is, an inductor, a diode and a capacitor.

This GL5010 IC is suitable for use with battery-powered instruments with low noise and ultra low supply current.

Features

- Small Number of External Components
- ±2.5% Output Voltage Accuracy
- Low Ripple and Low Noise
- Max. 0.9V Start-up Voltage
  (When the output current is 1 mA)
- Typ. 80% Efficiency
- Low Input Current (Typ. 10μA) at no load,
  with 1.5V input)

Application

- **Power source for battery-powered equipment.**
- **Power source for cameras, camcorders, VCRs, PDAs, electronic data banks,and hand-held communicationequipment.**
- **Power source for appliances which require higher cell voltage than that of batteries used in the appliances.**

TYPICAL APPLICATION CIRCUITS

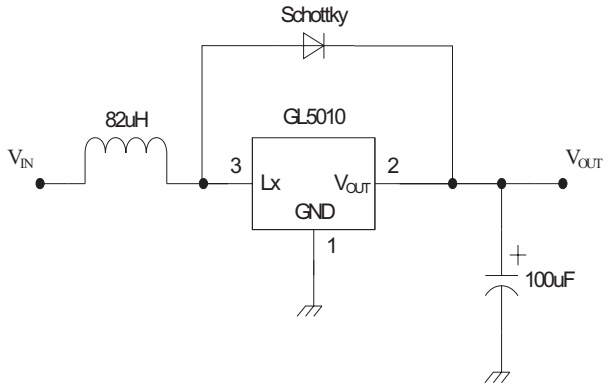
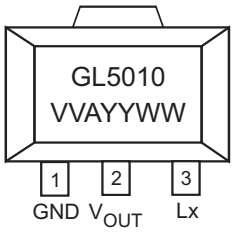


FIG. 1

◆ MARKING INFORMATION & PIN CONFIGURATIONS (TOP VIEW)

SOT-89



VV = Voltage Suffix (18=1.8V, 50=5.0V)
A = Assembly Location
YY = Year
WW, W = Weekly

◆ ORDERING INFORMATION (Green Package Products are available now!)

Ordering Number	Output Voltage	Voltage Code	Package	Shipping
GL5010-1.5ST89R	1.5V		SOT-89	1,000 Units/ Tape and Reel
GL5010-1.8ST89R	1.8V		SOT-89	1,000 Units/ Tape and Reel
GL5010-2.5ST89R	2.5V		SOT-89	1,000 Units/ Tape and Reel
GL5010-2.7ST89R	2.7V		SOT-89	1,000 Units/ Tape and Reel
GL5010-2.8ST89R	2.8V		SOT-89	1,000 Units/ Tape and Reel
GL5010-3.0ST89R	3.0V		SOT-89	1,000 Units/ Tape and Reel
GL5010-3.3ST89R	3.3V		SOT-89	1,000 Units/ Tape and Reel
GL5010-3.7ST89R	3.7V		SOT-89	1,000 Units/ Tape and Reel
GL5010-4.5ST89R	4.5V		SOT-89	1,000 Units/ Tape and Reel
GL5010-5.0ST89R	5.0V		SOT-89	1,000 Units/ Tape and Reel
GL5010-5.5ST89R	5.5V		SOT-89	1,000 Units/ Tape and Reel

* For detail ordering number identification, please see last page.

◆ PIN DESCRIPTION

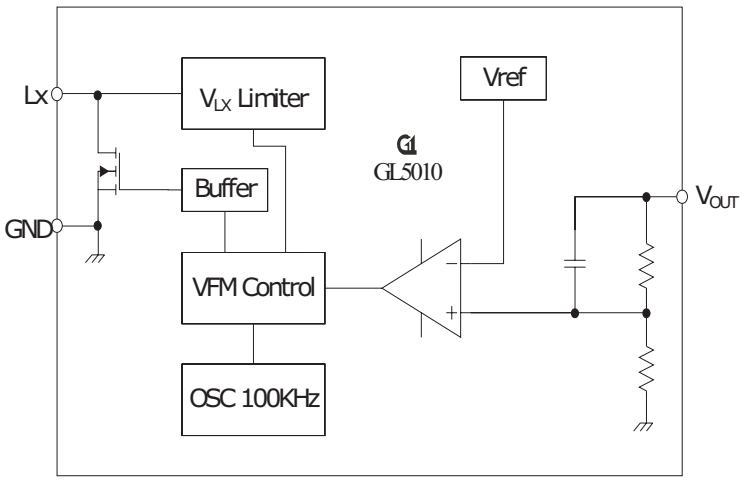
PIN NUMBER	PIN SYMBOL	FUNCTION
1	GND	Ground Pin
2	V_{OUT}	Step-up Output Pin, Power Supply (for device itself)
3	Lx	Switching Pin (Nch Open Drain)

◆ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNITS
Output Voltage	V_{OUT}	+8	V
Lx Voltage	V_{LX}	+8	V
Continuous Total Power Dissipation	P_D	500	mW
Operating Temperature Range	T_{opt}	-10 ~ +70	°C
Storage Temperature Range	T_{stg}	-60 ~ +125	°C
Peak Reflow Temperature		260	°C

* The maximum package power dissipation must be observed.

◆ BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

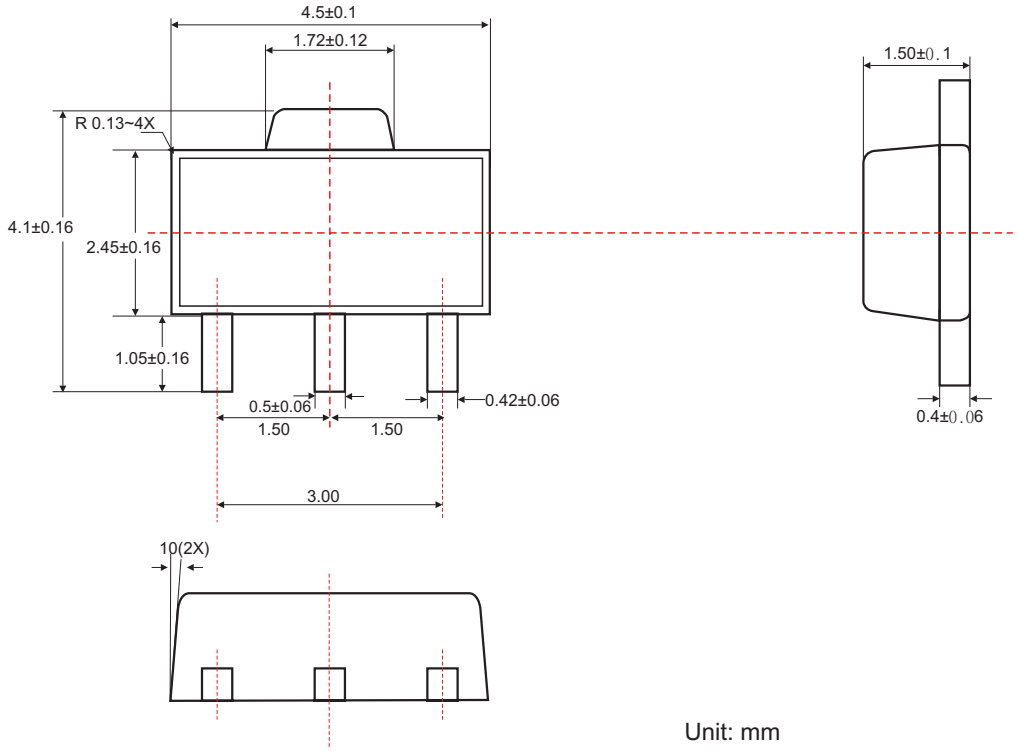
(1.0 V < V_{IN}< 7 V; Industrial Grade: 0°C < T_c< 70°C; Commercial Grade: -20°C < T_J< 125°C

Unless otherwise provided, I_{OUT}=10mA, Topt=25deg.C, and use External Circuit of Typical Application (FIG.1)

CHARACTERISTICS	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage (V_{OUT})	Vin = 1.5V		1.463	1.500	1.538	V
	Vin = 1.5V		1.755	1.800	1.845	V
	Vin = 1.8V		2.438	2.500	2.563	V
	Vin = 1.8V		2.633	2.700	2.768	V
	Vin = 1.8V		2.730	2.800	2.870	V
	Vin = 1.8V		2.925	3.000	3.075	V
	Vin = 2.0V		3.218	3.300	3.383	V
	Vin = 2.0V		3.608	3.700	3.793	V
	Vin = 2.5V		4.388	4.500	4.613	V
	Vin = 3.0V		4.875	5.000	5.125	V
	Vin = 3.0V		5.363	5.500	5.638	V
Input Voltage (V_{IN})					7	V
Start-Up Voltagev(Vstart)	I_{OUT} = 1mA V_{IN} = 0 ->2V		-	0.8	0.9	V
Hold-On Voltage (Vhold)	I_{OUT} = 1mA V_{IN} = 2 ->0V				0.7	V
Input Current 1 (I_{IN}1)	Vin = Vout * 0.95 Measurement of the IC input current	V_{OUT} = 1.5V	-	-	30	uA
		V_{OUT} = 1.8V	-	-	30	uA
		V_{OUT} = 2.5V	-	-	45	uA
		V_{OUT} = 2.7V	-	-	45	uA
		V_{OUT} = 2.8V	-	-	45	uA
		V_{OUT} = 3.0V	-	-	50	uA
		V_{OUT} = 3.3V	-	-	60	uA
		V_{OUT} = 3.7V	-	-	65	uA
		V_{OUT} = 4.5V	-	-	80	uA
		V_{OUT} = 5.0V	-	-	90	uA
		V_{OUT} = 5.5V	-	-	100	uA
Input Current 2 (I_{IN} 2)	Vin = Vout + 0.5V Measurement of the IC input current		-	7	-	uA
Lx Switching Current(I_{LX})	V_{LX} = 0.4V		60			uA
Lx Leakage Current (I_{LX}leak)	V_{LX} = 6V, Vin = 3.5V				0.5	uA
Maximum Oscillator Frequency (F_{osc})			75	100	130	Khz
Oscillator Duty Cycle (Maxdty)	on(V_{LX}"L")side, Vin=Vout*0.95		60	75	80	%
Efficiency (η)				80		%

(Note 1) Guaranteed by design, not 100% tested in production.

SOT-89 PACKAGE OUTLINE DIMENSIONS



Unit: mm

ORDERING NUMBER

GL5010 1.8 ST89 R

- GL5010 → Circuit Type
- 1.8 → Output Voltage
- ST89 → Package: ST89:SOT-89
- R → Shipping: R: Tape & Reel