

SI-8100QL Series

Current Mode Control Step-down Switching Mode Regulator ICs

Features

- DIP8 package
- Introduction of current mode control method
- Output current: 3.5A
- High efficiency: 90% (Vo=5V)
- Built-in reference oscillator (350kHz)
- Built-in drooping-type overcurrent and thermal protection circuits
- Built-in soft start circuit
- Built-in on/off function (Active Hi)
- Low current consumption during off

Applications

- DVD recorder, FPD-TV
- Onboard local power supplies
- OA equipment

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Input Voltage	VIN	30	V	
Power Dissipation ^{*1}	Pd	1.56	W	When mounted on glass-epoxy board measuring 70×60 mm (copper laminate area: 1310 mm ²)
Junction Temperature ^{*2}	Tj	−30 to +150	°C	
Storage Temperature	Tstg	−40 to +150	°C	
Thermal Resistance (Junction to Case)	θj-c	25	°C/W	
Thermal Resistance (Junction to Ambient Air)	θj-a	64	°C/W	When mounted on glass-epoxy board measuring 70×60 mm (copper laminate area: 1310 mm ²)

^{*1}: Limited by thermal protection circuit
^{*2}: Note that the detect temperature for thermal protection is about 140°C.

Recommended Operating Conditions

Parameter	Symbol	Ratings	Unit	Conditions
		SI-8105QL		
Input Voltage Range	VIN	Vo+1 ^{*1} to 28	V	
Output Voltage Range	Vo	0.5 to 24	V	
Output Current Range	Io	0 to 3.5	A	
Operating Junction Temperature Range	Tjop	−30 to +125	°C	
Operating Temperature Range	Top	−30 to +85	°C	

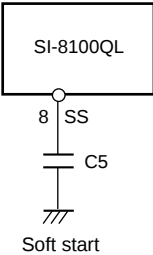
^{*1}: The minimum value of the input voltage range is 4.75 V or Vo + 1 V, whichever is higher.

Electrical Characteristics

(When Ta=25°C and Vo=5V)

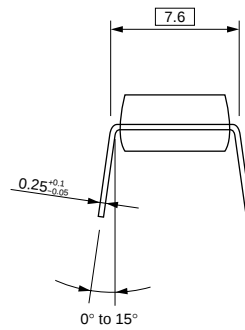
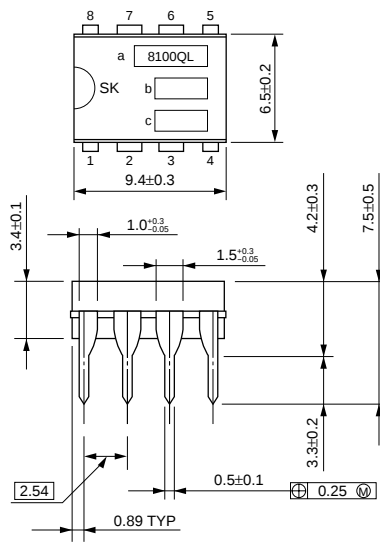
Parameter		Symbol	Ratings			Unit
			SI-8105QL			
			min.	typ.	max.	
Reference Voltage		V _{ADJ}	0.485	0.500	0.515	V
		Conditions	V _{IN} =12V, I _o =1A			
Temperature Coefficient of Reference Voltage		(ΔV _{ADJ} /ΔT)		0.05		mV/°C
		Conditions	V _{IN} =12V, I _o =1A, T _a =−40 to +85°C			
Efficiency		η		90		%
		Conditions	V _{IN} =12V, I _o =1A			
Oscillation Frequency		f _o	315	350	385	kHz
		Conditions	V _{IN} =16V, I _o =1A			
Line Regulation		ΔV _{LINE}		30	60	mV
		Conditions	V _{IN} =8 to 28V, I _o =1A			
Load Regulation		ΔV _{LOAD}		30	60	mV
		Conditions	V _{IN} =12V, I _o =0.1 to 3.5A			
Overcurrent Protection Starting Current		I _S	3.6		6.0	A
		Conditions	V _{IN} =12V			
Quiescent Circuit Current		I _q		18		mA
			Conditions	V _{IN} =12V, I _o =0A, V _{EN} =open		
		I _{q(OFF)}			20	μA
			Conditions	V _{IN} =12V, I _o =0A, V _{EN} =0V		
SS Pin	Outflow Current at Low Voltage	I _{SSL}		5		μA
		Conditions	V _{IN} =12V, V _{SSL} =0V			
EN Pin	High Level Voltage	V _{CI/EH}	2.8			V
		Conditions	V _{IN} =12V			
	Low Level Voltage	V _{CI/EL}			2.2	V
		Conditions	V _{IN} =12V			
	Inflow Current at Low Voltage	I _{CI/EH}		5		μA
		Conditions	V _{EN} =0V			
Error Amplifier Voltage Gain		AEA		1000		V/V
Error Amplifier Transformer Conductance		GEA		800		μA/V
Current Sense Amplifier Impedance		1/GCS		0.35		V/A
Maximum ON Duty		DMAX		92		%
Minimum ON Time		DMIN		100		nsec.

^{*}: Pin 8 is the SS pin. Soft start at power on can be performed with a capacitor connected to this pin.
The SS pin is pulled up to the power supply in the IC, so applying the external voltage is prohibited.



■External Dimensions (DIP8)

(Unit : mm)

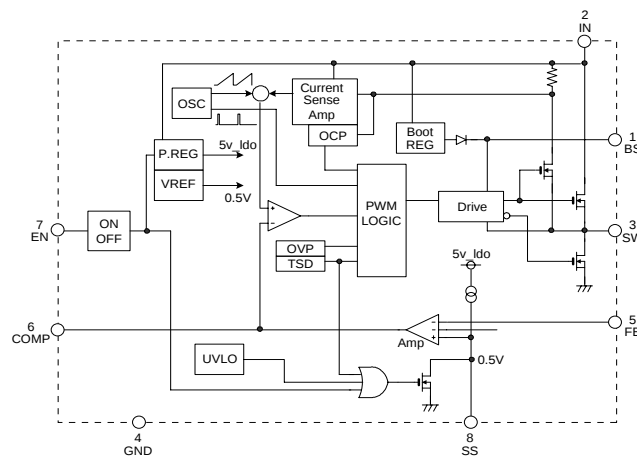


Pin Assignment

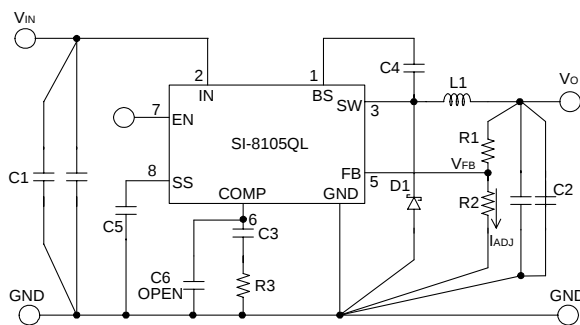
- ① BS
- ② IN
- ③ SW
- ④ GND
- ⑤ FB
- ⑥ COMP
- ⑦ EN
- ⑧ SS

Plastic Mold Package Type
 Flammability: UL 94V-0
 Product Mass: Approx. 0.49 g

■Block Diagram



■Typical Connection Diagram



- C1:10μ F/50V
(Murata: GRM55DB31H106KA87)
- C2:22μ F/16V
(Murata: GRM32ER71A226KE20)
- C3:560pF
(Murata: GRM18 Type)
- C4:10nF
(Murata: GRM18 Type)
- C5:10nF
(Murata: GRM18 Type)
- L1:10μ H
- D1:SPB-G56S (Sanken)
SJPB-L4 (Sanken)
- R1:46kΩ (When V_o = 5 V)
- R2:5.1kΩ
- R3:24kΩ