SHARP

Under Development

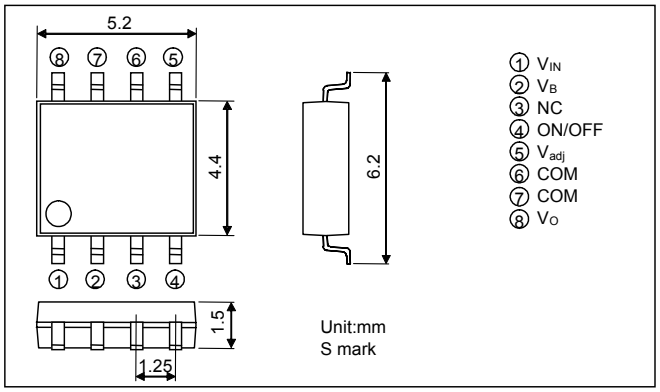
Boot Strap System Chopper Regulator

[PQ1CX12H2ZP]

Features

- High efficiency:TYP 87 %
  (Compare to conventional model:5 % up)
- Low dissipation current :I_{QS}=MAX 7mA
  (Compare to conventional model:56% down)
- Compact package:SOP8 -pin(Outline dimension:5.2 ×6.2×1.5 mm)
  Compare to SC -63 package (Mounting area):49 % down
  Compare to TO -263 package (Mounting area):77 % down

Outline Dimensions

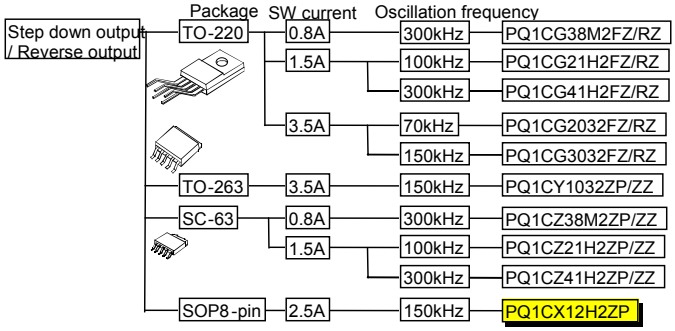


Expansion of Chopper Regulator

System	General purpose type	Boot strap system
Model No.	PQ1CY1032ZP/ZZ	PQ1CX12H2ZP
Efficiency	TYP 82% (12V → 5V,2A)	TYP 87% (12V → 5V,2A)
	TYP 75% (5V →3.3V,2A)	TYP 85% (5V →3.3V,2A)
SW current(MAX)	3.5 A	2.5 A
Input voltage	4.5 to 40 V	4.5 to 20 V
Package	TO-263type 5 -pin	SOP8 -pin
Outline dimension	10.6×13.7×3.5 mm	5.2×6.2×1.5 mm

High efficiency
Compact package

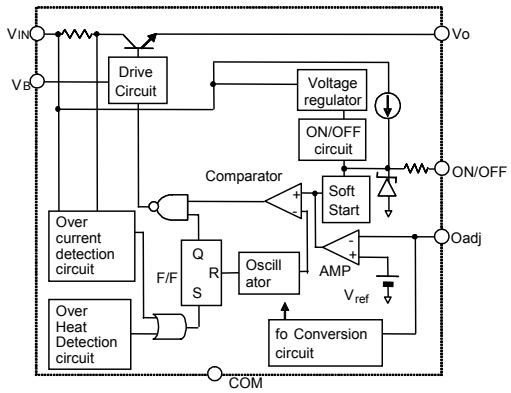
Line-up of Chopper Regulator



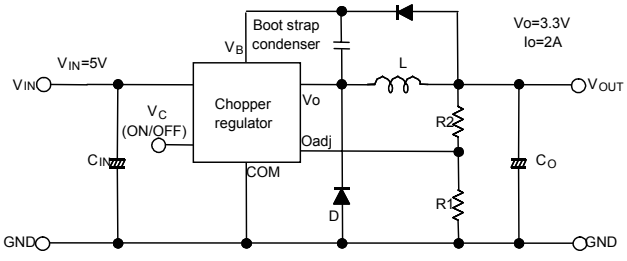
Specifications

Parameter	Symbol	Characteristics	Conditions
Input voltage	V_{IN}	MAX 20 V	
Output saturation voltage	V_{SAT}	TYP 0.3 V	I_{SW}=2.0 A
Switching current	I_{SW}	MAX 2.5 A	
Output OFF -state dissipation current	I_{QS}	MAX 7 mA	V_{IN}=20 V
Stand-by current	I_{SD}	MAX 400 μA	V_{IN}=20 V
Reference voltage	V_{ref}	TYP 1.26 V	
Oscillation frequency	f_{OSC}	TYP 150 kHz	
Efficiency	η	TYP 87%	V_{IN}=12V,V_O=5V,I_O=2A
Operating temperature	T_{opr}	-30 to +85 °C	

Block Diagram

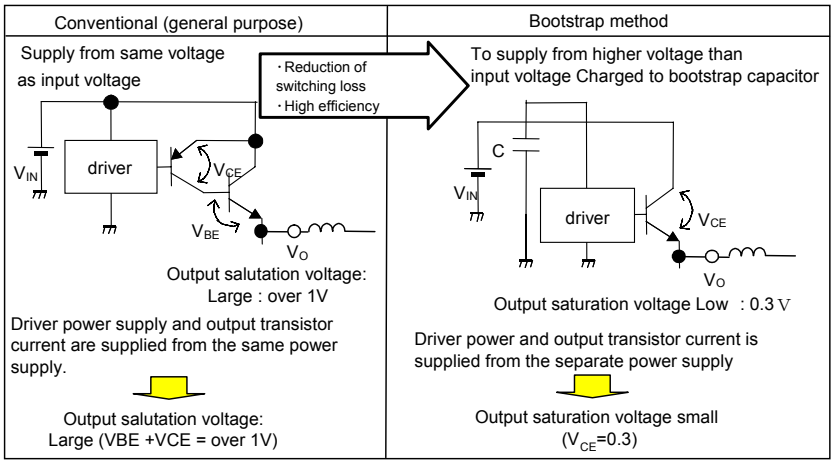


Application Circuit



Feature of Bootstrap Method Chopper Regulator

Bootstrap capacitor is installed to supply higher controlled vol tage than input voltage to switching transistor inside.
The higher efficiency is obtained due to the switching transisto r's saturated voltage become low by higher controlled voltage than supplied input voltage



・High Efficiency 82% against conventional model
---> The method 87%(at V_{IN}=12V-→ Vo=5V)

Drastic improvement of efficiencyesp in dropper application below 5V

・Efficiency improvement at low input
Conventional efficiency 75%→ 85% (V_{IN}=5V → VO =3.3V)

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