SHARP

Under development	
New product	●

PQ1CG2032FZ
PQ1CG2032RZ

Chopper Regulator

TO-220 Type Chopper Regulator

■ General Description

Sharp's chopper regulator **PQ1CG2032FZ/PQ1CG2032RZ** of TO-220 package uses PWM method.
It is suitable for the applications of large voltage difference between input and output and applications of negative power supply thanks to its low heat loss.

■ Features

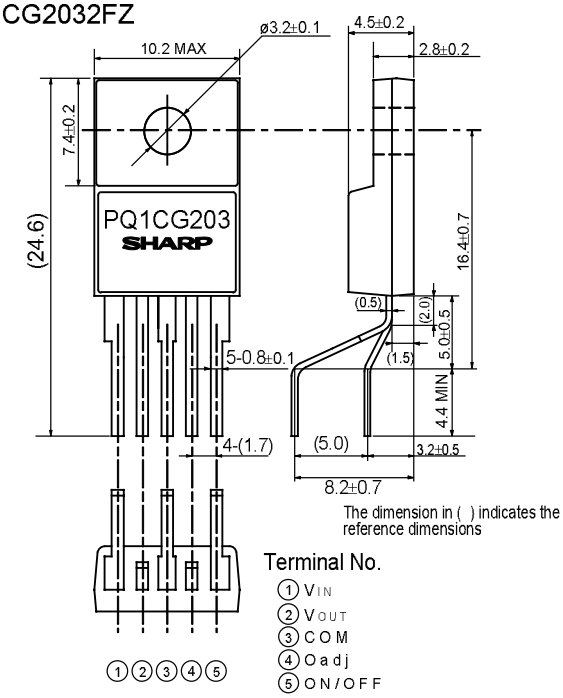
(1) Maximum switching current: 3.5 A
(2) Built-in ON/OFF control function
(3) Built-in soft start function to suppress overshoot of output voltage in power on sequeuce or ON/OFF controll sequence.
(4) Built-in oscillation circuit
(Oscillation frequency : TYP. 70 kHz)
(5) Built-in overheat/overcurrent protection function
(6) TO-220 type package
(7) Variable output voltage
(Output variable range : 1.26 to 35 V/-1.26 to -30 V)
[Possible to choose step-down output/inversing output according to external connection circuit]
(8) **PQ1CG2032FZ** : Zigzag forming
PQ1CG2032RZ : Self-stand forming

■ Applications

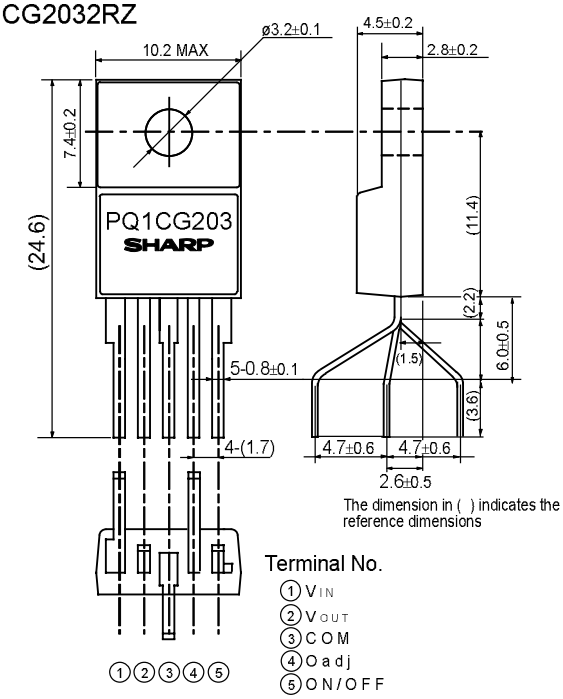
(1) Switching power supplies
(2) Facsimiles, printers and other OA equipment
(3) Battery chargers
(4) Personal computers and amusement equipment

■ Outline Dimensions (Unit: mm)

PQ1CG2032FZ



PQ1CG2032RZ



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Chopper Regulator

■ Absolute Maximum Ratings

(Ta=25˚C)

Parameter	Symbol	Rating	Unit
*1 Input voltage	V_{IN}	40	V
Output adjustment terminal voltage	V_{adj}	7	V
Dropout voltage	V_{I-O}	41	V
*2 Output-COM voltage	V_{out}	−1	V
*3 ON/OFF control voltage	V_c	−0.3 to 40	V
Switching current	I_{sw}	3.5	A
*4 Power dissipation	P_{d1}	1.4	W
	P_{d2}	14	W
*5 Junction temperature	T_j	150	˚C
Operating temperature	T_{opr}	−20 to +80	˚C
Storage temperature	T_{stg}	−40 to +150	˚C
Soldering temperature	T_{sol}	260(for 10s)	˚C

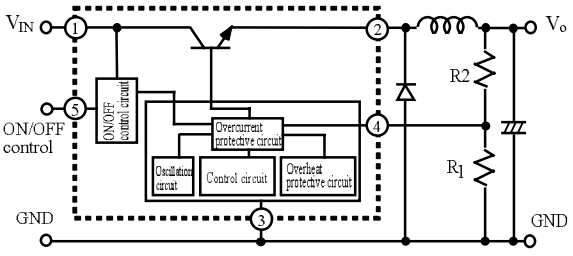
*1 Voltage between Vin and COM
*2 Voltage between Vout and COM
*3 Voltage between ON/OFF and COM
*4 P_{d1}: No heat sink P_{d2}: With infinite heat sink.
*5 Overheat protector may operate for Tj=125 to 150˚C.

■ Electrical Characteristics

(Vin=12 V, Io=0.5 A, Terminal No. 5 open and Ta=25˚C unless otherwise specified)

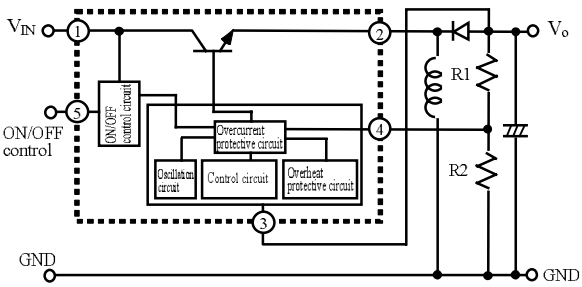
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Output saturation voltage	V_{sat}	Isw=3A	–	1.4	1.8	V
Reference voltage	V_{ref}	–	1.235	1.26	1.285	V
Reference voltage temperature fluctuation	ΔV_{ref}	Tj=0 to 125˚C	–	±0.5	–	%
Load regulation	$\lvert R_{egL} \rvert$	Io=0.5 to 3A	–	0.2	1.5	%
Line regulation	$\lvert R_{egI} \rvert$	Vin=8 to 35V	–	0.5	2.5	%
Efficiency	η	Io=3A	–	80	–	%
Oscillation frequency	fo	–	60	70	80	kHz
Oscillation frequency temperature fluctuation	Δfo	Tj=0 to 125˚C	–	±2	–	%
Overcurrent detection level	I_L	–	3.6	4.2	5.8	A
Charge current	I_{CHG}	Terminals 2/4 are open, Terminal 5	–	−10	–	μA
Input threshold voltage	V_{THL}	Duty=0% Terminal 4 = 0 V, Terminal 5	–	1.3	–	V
	V_{THH}	Duty=100%, Terminal 4 is open, Terminal 5	–	2.3	–	V
ON threshold voltage	V_{THON}	Terminal 4 = 0 V, Terminal 5	0.7	0.8	0.9	V
Standby current	I_{SD}	Vin=40V,Terminal 5=0 V=0V	–	140	400	μA
Output OFF-state consumption current	I_{QS}	Vin=40V,Terminal 5=0 V=0.9V	–	8	16	mA

Step-down voltage output circuit diagram
PQ1CG2032FZ/PQ1CG2032RZ



Vo=Vref×(1+R2/R1)
Vo=1.26V ~ 35V (Vref=1.26V)
Here, the upper limit is restricted by Vin-Vsa value according to the input.

Inversing output circuit diagram
PQ1CG2032FZ/PQ1CG2032RZ



Vo= −Vref×(1+R2/R1) (Vref=1.26V)
Vo= −1.26V ~ −30V
Here, the upper limit of the absolute value is restricted by 40V-Vi according to the input.

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  - Office automation equipment
  - Telecommunication equipment [terminal]
  - Test and measurement equipment
  - Industrial control
  - Audio visual equipment
  - Consumer electronics

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  - Traffic signals
  - Gas leakage sensor breakers
  - Alarm equipment
  - Various safety devices, etc.

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