# PQ6CU12X2APQ

CMOS Step-up
Chopper Regulator

## ■ Features

1.High switching voltage :MAX.40V
2.Switching current: 250mA
3.Oscillation frequency variable: 300 to 800 kHz
4.Small package (2.9×2.8×1.3mm)
5.Possible to use ceramic capacitor
6.Built-in overcurrent protection functions
7.RoHS directive compliant

## ■ Applications

1.Power supply for tuner of digital AV equipment
2.LCD monitors

## ■ Absolute Maximum Ratings

(Ta=25°C)

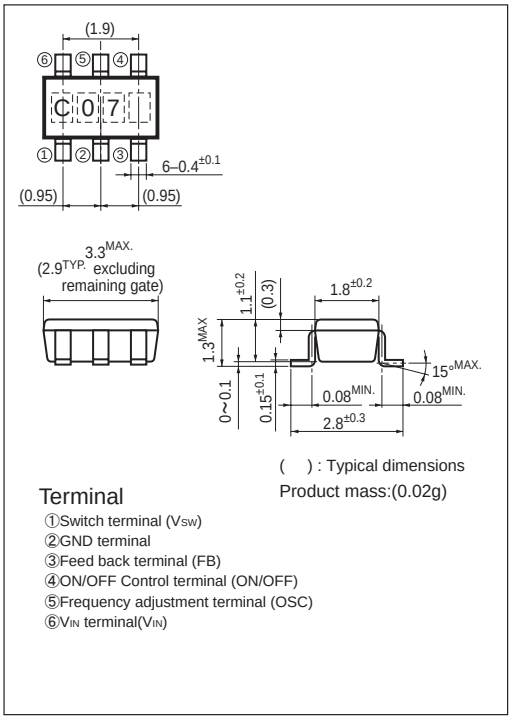
| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Input voltage | $V_{IN}$ | 6.5 | V |
| Switching voltage | $V_{SW}$ | 40 | V |
| ON/OFF control voltage | $V_C$ | $V_{IN}$ | V |
| OSC voltage | $V_C$ | $V_{IN}$ | V |
| Feed back voltage | FB | $V_{IN}$ | V |
| Switching current | $I_{SW}$ | 250 | mA |
| Power dissipation | Pd | 350 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Operating temperature | $T_{opr}$ | -40 to +85 | °C |
| Storage temperature | $T_{stg}$ | -40 to +150 | °C |
| Soldering temperature | $T_{sol}$ | 260(10s) | °C |

## ■ Operating conditions

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Operating Junction temperature | $T_j$ | -40 to +125 | °C |

## ■ Outline Dimensions

(Unit:mm)




( ) : Typical dimensions
Product mass:(0.02g)

Terminal
①Switch terminal ($V_{SW}$)
②GND terminal
③Feed back terminal (FB)
④ON/OFF Control terminal (ON/OFF)
⑤Frequency adjustment terminal (OSC)
⑥$V_{IN}$ terminal($V_{IN}$)

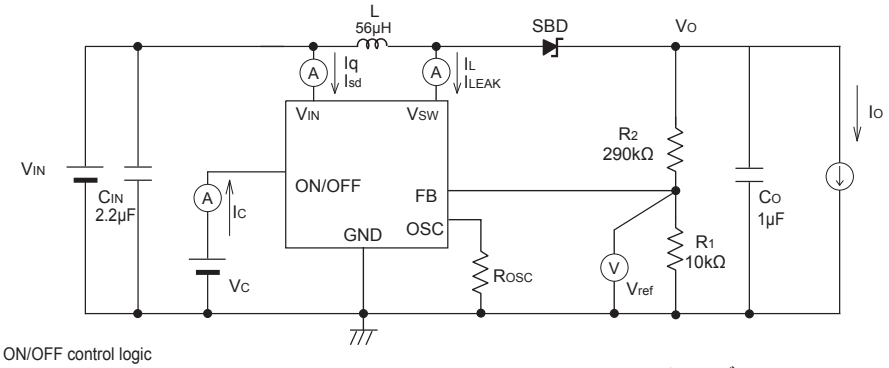
Lead finish:Lead-free solder plating
(Composition: Sn2Bi)

## ■ Electrical Characteristics

(Unless otherwise specified,condition shall be $V_{IN}$=$V_C$=5V,$V_O$=30V,$I_O$=10mA,$f_O$=500kHz,Ta=25°C)

| Parameter | Symbol | Conditions | MIN. | TYP. | MAX. | Unit |
|---|---|---|---|---|---|---|
| Input-output voltage range | $V_{IN}$ | - | 3 | - | 5.5 | V |
| Quiescent current | $I_q$ | Switching,$I_O$=0mA | - | 0.8 | 1.8 | mA |
| Stand-by current | $I_{SD}$ | $V_C$=0V | - | 0.1 | 1 | μA |
| **Error amplifier** | | | | | | |
| Reference voltage | $V_{REF}$ | - | 0.97 | 1 | 1.03 | V |
| Line regulation | $\|Reg_I\|$ | $V_{IN}$=4 to 5.5V,$I_O$=5mA | - | 0.7 | 3 | % |
| Load regulation | $\|Reg_L\|$ | $I_O$=1 to 15mA | - | 1 | 3 | % |
| **Oscillator** | | | | | | |
| Oscillation frequency range | fo(range) | - | 300 | - | 800 | kHz |
| Oscillation frequency | fo | $R_{OSC}$=130kΩ | 375 | 500 | 625 | kHz |
| Maximum duty | $D_{MAX}$ | - | 90 | - | - | % |
| **Power switch** | | | | | | |
| Overcurrent detection level | $I_L$ | Switching current peak | 260 | - | - | mA |
| On-resistance | $R_{ON}$ | $I_{SW}$=150mA | - | 1.7 | 2.5 | Ω |
| Leakage current | $I_{LEAK}$ | $V_{SW}$=40V | - | 0.01 | 1 | μA |
| **ON/OFF control terminal** | | | | | | |
| ON-state voltage for control | $V_{C(ON)}$ | - | 1 | - | - | V |
| OFF-state voltage for control | $V_{C(OFF)}$ | - | - | - | 0.4 | V |
| ON-state current for control | $I_{C(ON)}$ | - | - | - | 100 | μA |

Fig.1 Standard measuring circuit




| ON/OFF control logic | |
|---|---|
| 4pin | Output |
| LOW | OFF |
| HIGH | ON |
| OPEN | OFF |

L:CDRH4D18シリーズ(SUMIDA CORPORATION.)
D:MA2Z720(MATSUSHITA ELECTRIC INDUSTRIAL CO.,LTD)

Fig.2 Power Dissipation vs.Ambient Temperature

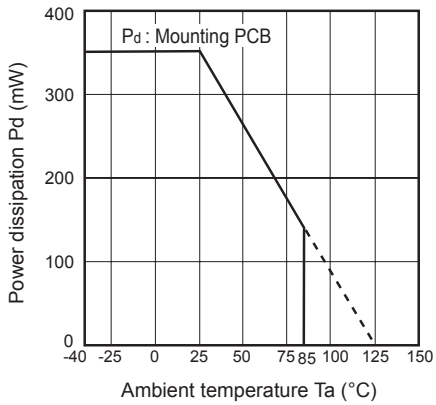



Fig.3 Reference Voltage Fluctuation vs. Junction Temperature

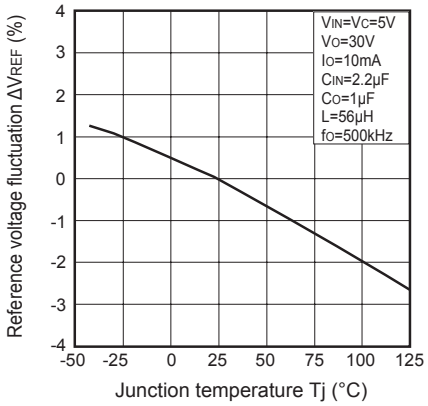


Fig.4 Oscillation Frequency Fluctuation vs. Junction Temperature

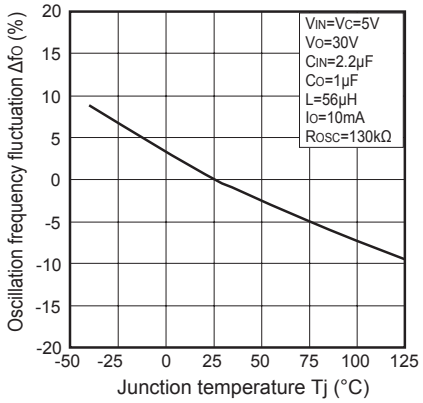



Fig.5 Oscillation Frequency vs.Resistance (ROSC)

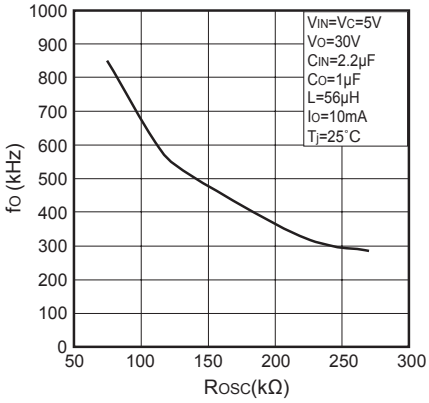



Fig.6 On-resistance vs. Junction Temperature

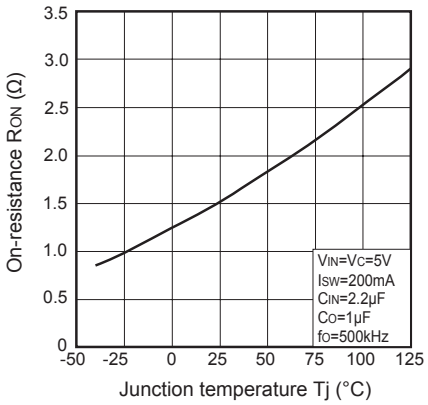



Fig.7 ON-state Voltage for Control vs. Junction Temperature

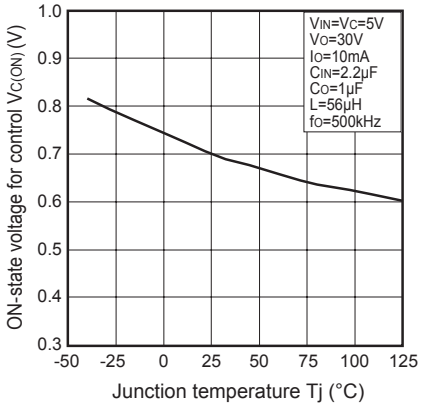
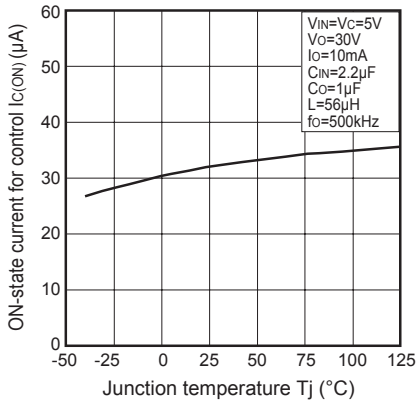
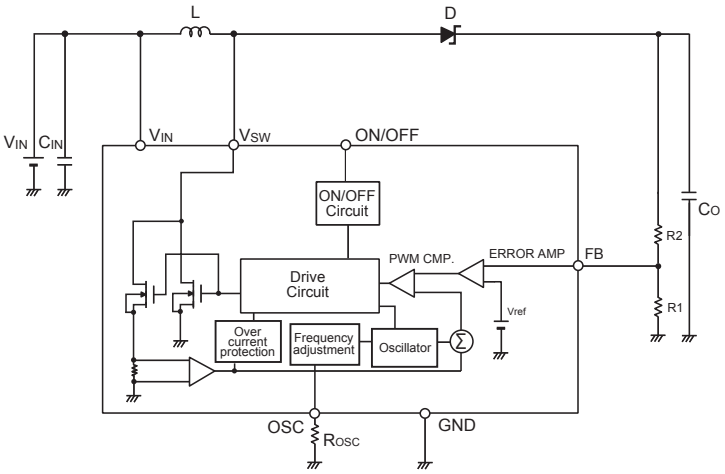



Fig.8 ON-state Current for Control vs. Junction Temperature



## ■ Block Diagram




## ■ Example of application