



**THE DATASHEET OF
PQ1CX41H2ZPQ**





Low Power-Loss Voltage Regulators

TO-220 Type

(Ta = 25°C)

| Model No. | Features | Absolute maximum ratings | | | | Electrical characteristics | | | Built-in functions | | | | | | Package |
|---------------------|---|-----------------------------------|-----------------------------------|-----------------------|------------------|--|------------------------------|--|---------------------|------------------------|-----------------|--------------------------------------|-------------------------|------------------------|----------------------------------|
| | | Output current I _o (A) | Input voltage V _{in} (V) | Power dissipation (W) | | Output voltage V _o ^{*3} (V) TYP. | Output voltage precision (%) | Dropout voltage V _{i-o} ^{*5} (V) | Overheat protection | Overcurrent protection | ON/OFF control | Low dissipation current at OFF state | Variable output voltage | Lead forming available | |
| | | | | Pd ^{*1} | Pd ^{*2} | | | | | | | | | | Package shape type ^{*7} |
| PQxxxRDA1SZH series | ASO protection function, low dissipation current at OFF state (I _{qs} : 5 μA (MAX.)) | 1 | 24 | 1.4 | 15 | 3.3, 5, 9, 12 | ±3 | 0.5 | ○ | ○ | ○ | ○ | | | A |
| PQxxxRDA2SZH series | | 2 | 20 | | | 3.3, 5, 9, 12 | ±2.5 | 1.0 | ○ | ○ | ○ | ○ | | | |
| PQ30RV11J00H | Variable output voltage | 1 | 35 | 1.5 | 18 | 1.5 to 30 | ±2 ^{*4} | 0.5 | ○ | ○ | △ ^{*6} | | ○ | ○ | B |
| PQ30RV21J00H | | 2 | | | | | | | ○ | ○ | △ ^{*6} | | ○ | ○ | B |
| PQ30RV31J00H | | 3 | | 2 | 20 | | | | ○ | ○ | △ ^{*6} | | ○ | ○ | B |

*1 At self-cooling

*2 With infinite heat sink attached

*3 The xxx in the model No. refer to the output voltage values of the model (e.g. 050 for 5 V, 120 for 12 V, 015 for 1.5 V).

*4 Reference voltage precision

*5 Current ratings are defined individually.

*6 △ : Available by adding circuit

*7 Refer to page 35

Surface Mount Type Low Power-Loss Voltage Regulators

SOT-89 Type

(Ta = 25°C)

| Model No. | Features | Absolute maximum ratings | | | Electrical characteristics | | | Built-in functions | | | | | Package | |
|--------------|---|-----------------------------------|-----------------------------------|--|--|------------------------------|--|---------------------|------------------------|----------------|--------------------------------------|-------------------------|---------|--------|
| | | Output current I _o (A) | Input voltage V _{in} (V) | Power dissipation Pd ^{*1} (W) | Output voltage V _o ^{*2} (V) TYP. | Output voltage precision (%) | Dropout voltage V _{i-o} ^{*3} (V) | Overheat protection | Overcurrent protection | ON/OFF control | Low dissipation current at OFF state | Variable output voltage | | |
| PQ1LAXx5MSPQ | Compact, high radiation package, ceramic capacitor compatible | 0.5 | 15 | 0.9 | 1.2, 1.5, 1.8, 2.5, 3.3, 5.0 | ±2.0 | 0.7 | ○ | ○ | ○ | ○ | | | SOT-89 |
| PQ1LAX95MSPQ | Ceramic capacitor compatible, variable output voltage | | | | 1.5 to 9.0 | ±2.0 ^{*4} | | ○ | ○ | ○ | ○ | ○ | | |

*1 When mounted on a board

*2 The xx in the model No. refer to the output voltage values of the model (e.g. 25 for 2.5 V, 50 for 5.0 V).

*3 Current ratings are defined individually.

*4 Reference voltage precision

Notice

In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc.

Except where specially indicated, models listed on this page comply with the RoHS Directive*. For details, please contact SHARP.

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●SC-63 Type (1) Output Voltage Fixed Type

(Ta = 25°C)

| Model No. | Features | Absolute maximum ratings | | | Electrical characteristics | | | | Built-in functions | | | | | | Package Package shape type ^{*4} | | |
|---------------------|---|-----------------------------------|---|-----|-----------------------------------|--|--|------------------------------|--|---------------------|------------------------|----------------|--------------------------------------|-------------------------|---|---------------|---|
| | | Output current I _o (A) | | | Input voltage V _{in} (V) | Power dissipation P _d ^{*1} (W) | Output voltage V _o ^{*2} (V) TYP. | Output voltage precision (%) | Dropout voltage V _{I-O} ^{*3} (V) | Overheat protection | Overcurrent protection | ON/OFF control | Low dissipation current at OFF state | Variable output voltage | | Taped package | |
| | | 0.5 | 1 | 1.5 | | | | | | | | | | | | | |
| PQxxxDNA1ZPH series | Ceramic capacitor compatible, ASO protection function, low dissipation current at OFF state (I _{qs} : 5 μA (MAX.)), solder dip compatible lead shape | ○ | | | 24 | 8 | 3.3, 5, 9, 12 | ±2.5 | 0.5 | ○ | ○ | ○ | ○ | - | ○ | F | |
| PQxxxENA1ZPH series | Minimum operating input voltage: 2.35 V, ceramic capacitor compatible, solder dip compatible lead shape | ○ | | | 10 | 8 | 1.5, 1.8, 2.5, 3.3 | ±2.0 | 0.3 | ○ | ○ | ○ | ○ | - | ○ | F | |
| PQxxxENB1ZPH series | | ○ | | | | 5 | 1.2, 1.5, 1.8, 2.5, 3.3 | | | ○ | ○ | ○ | ○ | - | ○ | F | |
| PQxxxENAHZPH series | | | | ○ | | | 1.5, 1.8, 2.5, 3.3 | | | 0.9 | ○ | ○ | ○ | ○ | - | ○ | F |
| PQxxxGN01ZPH series | | ○ | | | | 5.5 | 8 | | | 1.0, 1.2 | ±30 mV | - | ○ | ○ | | | - |
| PQxxxGN1HZPH series | | | ○ | | | | | | ○ | | | | ○ | | | - | ○ |

*1 With infinite heat sink attached
 *2 The xxx in the model No. refer to the output voltage values of the model (e.g. 033 for 3.3 V, 050 for 5 V, 120 for 12 V).
 *3 Current ratings are defined individually.
 *4 Refer to page 35

●SC-63 Type (2) Output Voltage Variable Type

(Ta = 25°C)

| Model No. | Features | Absolute maximum ratings | | | Electrical characteristics | | | | Built-in functions | | | | | | Package Package shape type ^{*4} | | | |
|--------------|---|-----------------------------------|---|---------|-----------------------------------|--|--|------------------------------|--|---------------------|------------------------|----------------|--------------------------------------|-------------------------|---|---------------|---|---|
| | | Output current I _o (A) | | | Input voltage V _{in} (V) | Power dissipation P _d ^{*1} (W) | Output voltage V _o (V) TYP. | Output voltage precision (%) | Dropout voltage V _{I-O} ^{*3} (V) | Overheat protection | Overcurrent protection | ON/OFF control | Low dissipation current at OFF state | Variable output voltage | | Taped package | | |
| | | 0.5 | 1 | 1.5 | | | | | | | | | | | | | | |
| PQ070XNA1ZPH | Minimum operating input voltage: 2.35 V, ceramic capacitor compatible, solder dip compatible lead shape | ○ | | | 10 | 8 | 1.5 to 7 | ±2.0 ^{*2} | 0.5 | ○ | ○ | ○ | ○ | ○ | ○ | F | | |
| PQ070XNAHZPH | | | | ○ | | | | | | | 0.9 | ○ | ○ | ○ | ○ | ○ | ○ | F |
| PQ070XNA2ZPH | | | | ○ (2 A) | | | | | | | 0.5 | ○ | ○ | ○ | ○ | ○ | ○ | F |
| PQ070XNB1ZPH | | ○ | | | | | | | | 5 | 1.2 to 7 | 0.3 | ○ | ○ | ○ | ○ | ○ | F |
| PQ035ZN01ZPH | Reference voltage (V _{ref}): 0.6 V, minimum operating input voltage: 1.7 V (Dual power supply type), ceramic capacitor compatible, solder dip compatible lead shape | ○ | | | 5.5 | 0.8 to 3.5 | ±30 mV | - | ○ | ○ | | | ○ | ○ | F | | | |
| PQ035ZN1HZPH | | | | ○ | | | | | | - | ○ | ○ | | ○ | ○ | F | | |
| PQ200WNA1ZPH | Minimum operating input voltage: 3.5 V, ASO protection function, low dissipation current at OFF state (I _{qs} : 5 μA (MAX.)), ceramic capacitor compatible, solder dip compatible lead shape | ○ | | | 24 | 8 | 3.0 to 20 | ±2.5 ^{*2} | 0.5 | ○ | ○ | ○ | ○ | ○ | ○ | F | | |
| PQ200WN3MZPH | Minimum operating input voltage: 5.5 V, low dissipation current at OFF state (I _{qs} : 5 μA (MAX.)), ceramic capacitor compatible, current limit: 800 mA | ○ (0.3) | | | | | | | | 6.8 | 5.0 to 20 | ○ | ○ | ○ | ○ | ○ | F | |

*1 With infinite heat sink attached
 *2 Reference voltage precision
 *3 Current ratings are defined individually.
 *4 Refer to page 35

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●SOP-8 Type

(Ta = 25°C)

| Model No. | Features | Absolute maximum ratings | | | Electrical characteristics | | Built-in functions | | Taped package | Package |
|--------------|---|-----------------------------------|-----------------------------------|--|---|---|---------------------|------------------------|---------------|---------|
| | | Output current I _o (A) | Input voltage V _{in} (V) | Power dissipation Pd ^{*1} (W) | Output voltage V _o (V) TYP. | Output voltage precision ^{*2} (mV) | Overheat protection | Overcurrent protection | | |
| PQ1DX095MZPQ | Built-in sink source function (For DDR II memory) | ±0.8 | 6 | 0.6 | V _{DD} x 1/2 (V _{DDQ} : 1.5 V (MIN.)) | ±25 | ○ | ○ | ○ | SOP-8 |

*1 When mounted on a board
*2 Reference voltage precision

■Surface Mount Type Chopper Regulators (DC-DC Converters)

(Ta = 25°C)

| Model No. | Features | Absolute maximum ratings | | Electrical characteristics | | | | | Package | |
|--------------|--|---------------------------------------|--|---|---|-------------|--|---|----------------------------------|---|
| | | Switching current I _{sw} (A) | Power dissipation Pd ^{*1} (W) | Input voltage range V _{in} (V) | Output voltage ² V _o (V) | Output type | Oscillation frequency f _o (Hz) TYP. | Output saturation voltage V _{sat} (V) TYP. | Outline shape type ^{*4} | |
| PQ6CU12X2APQ | <ul style="list-style-type: none"> High switching voltage: 40 V (MAX.) For tuner power supply Variable oscillation frequency Ceramic capacitor compatible | 0.25 | 0.35 | 3.0 to 5.5 | up to 36 | Step-up | 300 k to 800 k | R _{on} TYP. 1.7Ω | SOT-23-6W | |
| PQ1CN38M2ZPH | <ul style="list-style-type: none"> PWM chopper regulator (high oscillation frequency) Output ON/OFF control function Overcurrent/overheat protection circuits For light load | 0.8 | 8 | 4.5 to 40 | V _{REF} ^{*3} to 35 (step-down type)/ -V _{REF} to -30 (inverting type) | Step-down | 300 k | 0.9 | SC-63 | F |
| PQ1CN41H2ZPH | <ul style="list-style-type: none"> PWM chopper regulator (high oscillation frequency) Overcurrent/overheat protection circuits | 1.5 | 8 | | | Step-down | 300 k | 0.9 | | F |
| PQ1CX41H2ZPQ | <ul style="list-style-type: none"> Bootstrap system for high efficiency (Efficiency 90% (TYP.)) Low voltage output: 0.8 V (MIN.) Ceramic capacitor compatible | 1.5 | 0.8 When mounted on board | 4.75 to 27 | 0.8 to 20 | Step-down | 400 k | R _{Dson} TYP. 0.45Ω | SOP-8 | |
| PQ1CX53H2MPQ | <ul style="list-style-type: none"> Bootstrap system for high efficiency (Efficiency 89% (TYP.)) Low voltage output: 0.8 V (MIN.) Ceramic capacitor compatible | 3.5 | 2 When mounted on board | 4.75 to 27 | 0.8 to 16 | Step-down | 400 k | R _{Dson} TYP. 0.15Ω | USB-8 | |
| PQ1CX61H1ZPQ | <ul style="list-style-type: none"> Bootstrap system for high efficiency (Efficiency 88% (TYP.)) Low voltage output: 1.0 V (MIN.) Ceramic capacitor compatible | 1.5 | 0.8 When mounted on board | 4.75 to 28 | 1.0 to 18.9 | Step-down | 900 k | R _{Dson} TYP. 0.55Ω | SOP-8 | |

*1 With infinite heat sink attached or when mounted on a board listed in the specification sheets.
*2 Output variable range (step-down/inversion).
*3 V_{REF} nearly equal to 1.26 V
*4 Refer to page 35

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■ Chopper Regulators (DC-DC Converters)

● TO-220 Type

(Ta = 25°C)

| Model No. | Features | Absolute maximum ratings | | Electrical characteristics | | | | Package | | |
|--------------|---|---------------------------|----------------------------|-----------------------------|---|-------------|-------------------------------------|---|----------------------|---|
| | | Switching current Isw (A) | Power dissipation Pd*1 (W) | Input voltage range Vin (V) | Output voltage Vo*2 (V) | Output type | Oscillation frequency fo (kHz) TYP. | Output saturation voltage Vsat (V) TYP. | Outline shape type*5 | |
| PQ1CG21H2FZH | <ul style="list-style-type: none"> • PWM chopper regulator • Built-in overcurrent/overheat protection circuits • Output ON/OFF control function | 1.5*3 | 14 | 40 | VREF*4 to 35 (step-down type)/ -VREF*4 to -30 (inverting type) | Step-down | 100 | 1.0 | TO-220 | E |
| PQ1CG41H2FZH | <ul style="list-style-type: none"> • PWM chopper regulator (high oscillation frequency) • Built-in overcurrent/overheat protection circuits • Output ON/OFF control function | | | | | | 300 | 1.0 | | E |
| PQ1CG2032FZH | <ul style="list-style-type: none"> • PWM chopper regulator • Built-in overcurrent/overheat protection circuits • Output ON/OFF control function | 3.5*3 | | | | | 70 | 1.4 | | E |
| PQ1CG3032FZH | <ul style="list-style-type: none"> • PWM chopper regulator (high oscillation frequency) • Built-in overcurrent/overheat protection circuits • Output ON/OFF control function | | | | | | 150 | | | E |

*1 With infinite heat sink attached

*2 Output voltage variable range

*3 Peak current

*4 VREF nearly equal to 1.26 V (TYP.)

*5 Refer to page 35

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