

SERIES: P783-S | **DESCRIPTION:** NON-ISOLATED SWITCHING REGULATOR

FEATURES

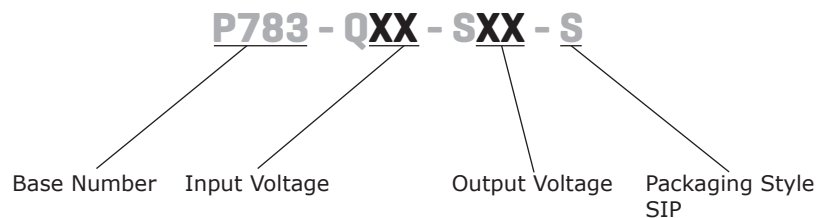
- 3A of output current
- high efficiency up to 97%
- no-load input current as low as 2mA
- output short circuit protection
- wide operating temp: -40°C to +85°C
- designed to meet EN 62368



| MODEL | input voltage | | output voltage (Vdc) | output current max (mA) | output power max (W) | ripple and noise ¹ max (mVp-p) | efficiency typ (%) |
|----------------|---------------|----------------|-------------------------|-------------------------------|----------------------------|---|--------------------------|
| | typ (Vdc) | range (Vdc) | | | | | |
| P783-Q24-S3-S | 24 | 8~36 | 3.3 | 3000 | 9.9 | 70 | 90 |
| P783-Q24-S5-S | 24 | 8~36 | 5 | 3000 | 15 | 70 | 93 |
| P783-Q24-S6-S | 24 | 10~36 | 6.5 | 3000 | 19.5 | 70 | 94 |
| P783-Q24-S9-S | 24 | 13~36 | 9 | 3000 | 27 | 70 | 95 |
| P783-Q24-S12-S | 24 | 16~36 | 12 | 3000 | 36 | 100 | 97 |
| P783-Q24-S15-S | 24 | 19~36 | 15 | 3000 | 45 | 100 | 97 |

Notes: 1. ripple and noise are measured at 20 MHz BW

PART NUMBER KEY



INPUT

| parameter | conditions/description | min | typ | max | units |
|-------------------------|------------------------|-----|-----|-----|-------|
| operating input voltage | 3.3 V output | 8 | 24 | 36 | Vdc |
| | 5 V output | 8 | 24 | 36 | Vdc |
| | 6.5 V output | 10 | 24 | 36 | Vdc |
| | 9 V output | 13 | 24 | 36 | Vdc |
| | 12 V output | 16 | 24 | 36 | Vdc |
| | 15 V output | 19 | 24 | 36 | Vdc |
| reverse polarity input | avoid / not protected | | | | |

OUTPUT

| parameter | conditions/description | min | typ | max | units |
|-------------------------|----------------------------------|-----|------|-------|-------|
| capacitive load | 3.3 V output | | | 1,000 | μF |
| | 5 V output | | | 680 | μF |
| | 6.5 V output | | | 330 | μF |
| | 9 V output | | | 330 | μF |
| | 12 V output | | | 330 | μF |
| | 15 V output | | | 330 | μF |
| line regulation | full load, input voltage range | | ±0.5 | ±1.0 | % |
| load regulation | from 10% to 100% load | | ±0.5 | ±1.0 | % |
| voltage accuracy | 0~100% load, input voltage range | | ±2 | ±3 | % |
| switching frequency | PWM mode | 100 | 250 | 400 | kHz |
| temperature coefficient | -40°C ~ 85°C | | | ±0.03 | %/°C |
| trimmability | see trim table | | | | |
| CTRL | module on: CTRL open or high | | 4.5 | 14 | Vdc |
| | module off: CTRL low to GND | | 0 | 0.8 | Vdc |

PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|--------------------------|--------------------------------|-----|-----|-----|-------|
| short circuit protection | continuous, automatic recovery | | | | |

SAFETY AND COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|---------------------|--|-------|-----|-----|---------|
| safety approvals | designed to meet 62368: EN, BS EN | | | | |
| conducted emissions | CISPR32/EN55032 Class B | | | | |
| ESD | IEC/EN 61000-4-2, contact ±6 kV, perf. criteria B | | | | |
| radiated immunity | IEC/EN 61000-4-3, 10V/m, perf. criteria A | | | | |
| EFT/burst | IEC/EN 61000-4-4, ±1 kV, perf. criteria B (see recommended circuit) | | | | |
| surge | IEC/EN 61000-4-5, Class B, line to line ±1 kV, perf. criteria B | | | | |
| EMI/EMC | IEC/EN 61000-4-6 Class A, 3 Vr.ms (see recommended circuit) perf. criteria A | | | | |
| MTBF | as per MIL-HDBK-217F @ 25°C | 2,000 | | | K hours |
| RoHS | yes | | | | |

ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curve | -40 | | 85 | °C |
| storage temperature | | -55 | | 125 | °C |
| storage humidity | non-condensing | 5 | | 95 | % |

SOLDERABILITY

| parameter | conditions/description | min | typ | max | units |
|---------------|------------------------|-----|-----|-----|-------|
| pin soldering | for 10 seconds | | | 260 | °C |

MECHANICAL

| parameter | conditions/description | min | typ | max | units |
|---------------|---|-----|-----|-----|-------|
| dimensions | 32.15 x 14.85 x 9.05 | | | | mm |
| case material | flame retardant and heat-resistant plastic (UL94 V-0) | | | | |
| weight | | | 9.3 | | g |

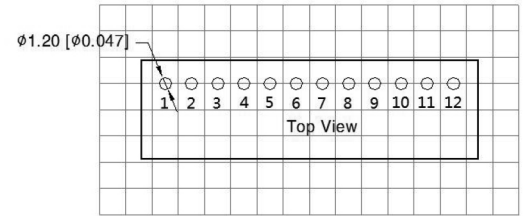
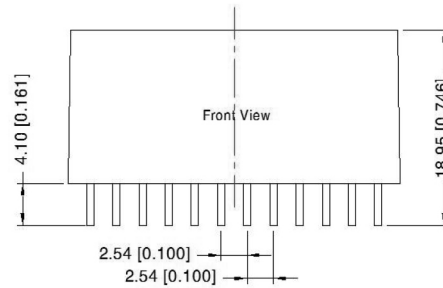
MECHANICAL DRAWING

units: mm [inches]

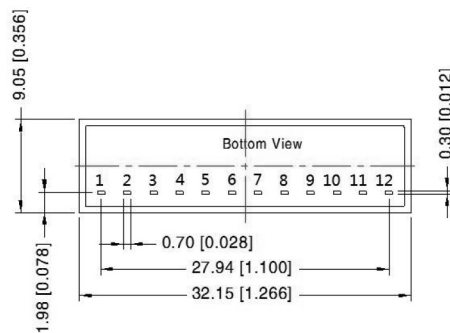
tolerance: ±0.50 [±0.020]

pin section tolerance: ±0.10 mm [±0.004]

| PIN CONNECTIONS | |
|-----------------|----------|
| Pin | Function |
| 1 | Ctrl |
| 2, 3, 4 | Vin |
| 5, 6, 7, 8 | GND |
| 9, 10 | +Vo |
| 11 | +Vo |
| 12 | Trim |

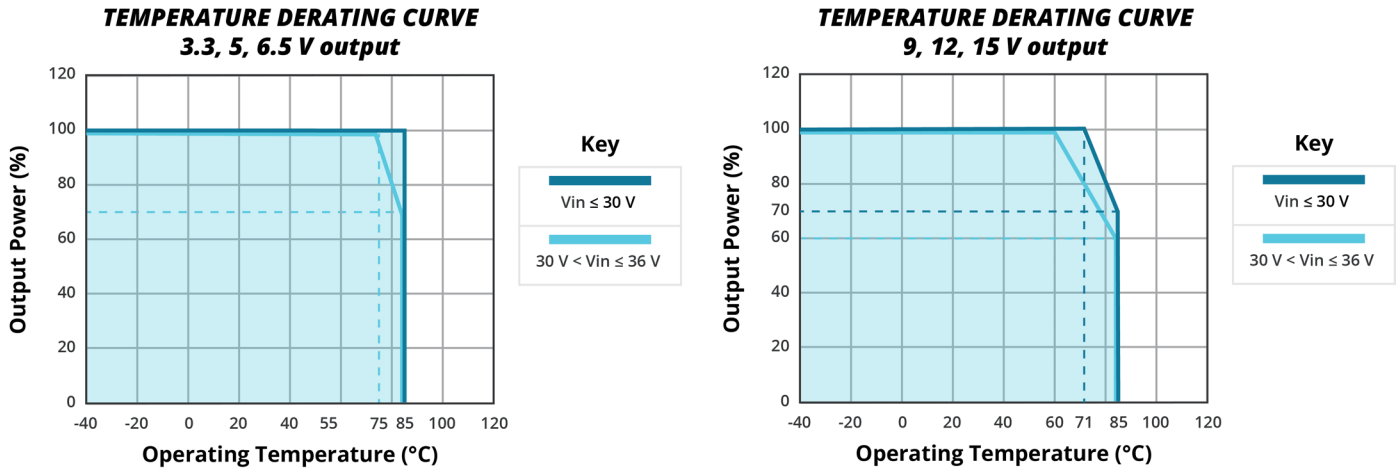


Note: Grid 2.54*2.54mm



DERATING CURVES

Figure 1



TYPICAL APPLICATION CIRCUIT

Figure 2

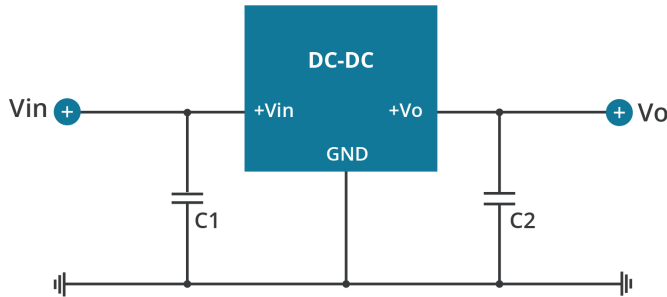


Table 1

| Part No. | C1 (ceramic capacitor) | C2 (ceramic capacitor) |
|----------------|---------------------------|---------------------------|
| P783-Q24-S3-S | 100µF/50V | 22µF/10V |
| P783-Q24-S5-S | | 22µF/10V |
| P783-Q24-S6-S | | 22µF/10V |
| P783-Q24-S9-S | | 22µF/16V |
| P783-Q24-S12-S | | 22µF/25V |
| P783-Q24-S15-S | | 22µF/25V |

- Note:
1. The required capacitors C1 and C2 must be connected as close as possible to the terminals of the module;
 2. Refer to Table 1 for C1 and C2 capacitor values. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
 3. Converter cannot be used for hot swap and with output in parallel.

EMC RECOMMENDED CIRCUIT

Figure 3

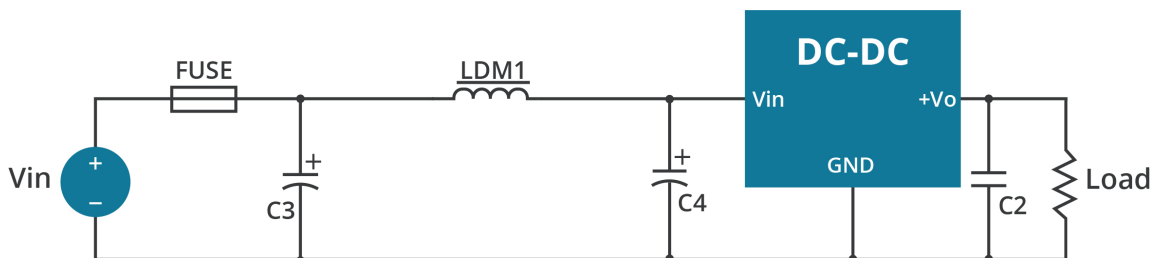


Table 2

| | FUSE | C3 | LDM1 | C4 | C2 |
|-----------|---|-----------------|------------|-----------------|-----------------------------|
| Emissions | select fuse value according to actual input current | 100 μ F/50V | 22 μ H | 100 μ F/50V | refer to the C2 in Figure X |
| Immunity | | | | 680 μ F/50V | |

TRIM FUNCTION FOR OUTPUT VOLTAGE ADJUSTMENT

Figure 4

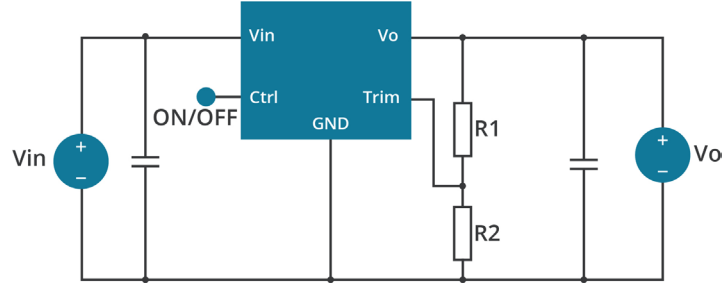


Table 3

| Vout nom. | 3.3 Vdc | | 5.0 Vdc | | 6.5 Vdc | | 9.0 Vdc | | 12 Vdc | | 15 Vdc | |
|-----------|---------|-----|---------|------|---------|------|---------|-----|--------|------|--------|-----|
| Vout adj. | R1 | R2 | R1 | R2 | R1 | R2 | R1 | R2 | R1 | R2 | R1 | R2 |
| 3 | 500K | | | | | | | | | | | |
| 3.3 | | | | | | | | | | | | |
| 4 | | 95K | 195K | | | | | | | | | |
| 4.5 | | 52K | 470K | | | | | | | | | |
| 5 | | | | | | | | | | | | |
| 5.5 | | | | 125K | 330K | | | | | | | |
| 6 | | | | 58K | 750K | | | | | | | |
| 6.5 | | | | | | | | | | | | |
| 7 | | | | | | 140K | 220K | | | | | |
| 8 | | | | | | 40K | 520K | | | | | |
| 9 | | | | | | | | | | | | |
| 10 | | | | | | | | 65K | 530K | | | |
| 11 | | | | | | | | 28K | 1180K | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | 110K | 590K | |
| 14 | | | | | | | | | | 50K | 1290K | |
| 15 | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | 90K |
| 17 | | | | | | | | | | | | 40K |

REVISION HISTORY

| rev. | description | date |
|------|---|------------|
| 1.0 | initial release | 06/29/2020 |
| 1.01 | derating curves and circuit figures updated | 09/23/2021 |
| 1.02 | CE certification removed | 11/02/2022 |

The revision history provided is for informational purposes only and is believed to be accurate.



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