

# TPS7A20 xx PDQNR-A-TP

## Ultra Low Consumption CMOS Voltage Regulator

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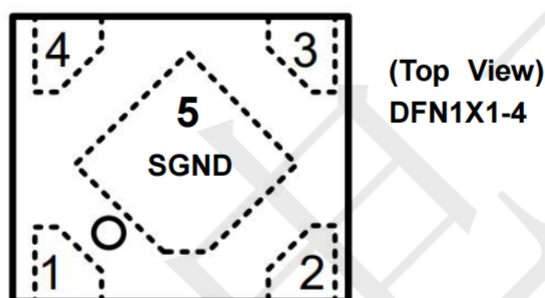
### Features

- 0.8μA Current at no Load(TYP.)
- ±2% Output Accuracy
- 300mA Output Current
- Compact package: DFN1X1-4

### Applications

- Portable consumer equipments
- Radio control systems
- Wireless Communication Equipments
- Ultra Low Power Micro controller

### PIN CONFIGURATION



| Pin Number | Pin Name         | Pin Function                                                                                                                                                                  |
|------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1          | V <sub>OUT</sub> | Output Pin                                                                                                                                                                    |
| 2          | GND              | Ground                                                                                                                                                                        |
| 3          | EN               | Chip Enable Pin                                                                                                                                                               |
| 4          | V <sub>IN</sub>  | Power Input Pin                                                                                                                                                               |
| 5          | SGND             | Connect this pad to GND or leave floating. Do not connect to any potential other than GND. Connect the thermal pad to a large-area ground plane for best thermal performance. |

### Ordering Information

TPS7A2012PDQNR-A-TP

**Example:** TPS7A2012PDQNR-A-TP

→ 1.2V Version, in DFN1X1-4 Package  
& Tape & Reel Packing Type

OUTPUT VOLTAGE

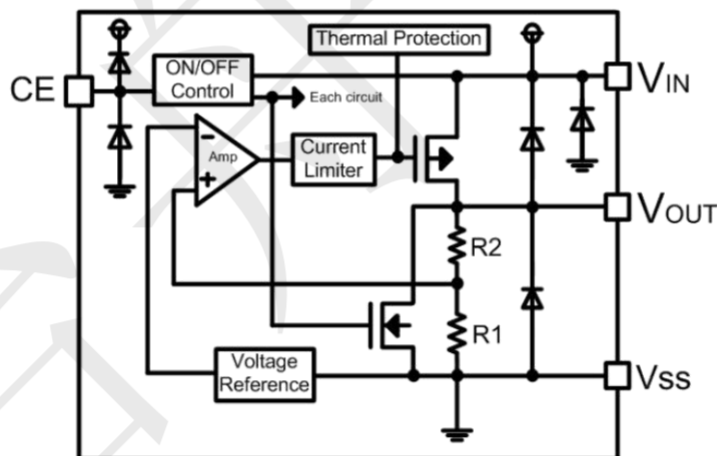
|          |          |
|----------|----------|
| 12: 1.2V | 15: 1.5V |
| 18: 1.8V | 25: 2.5V |
| 28: 2.8V | 30: 3.0V |
| 33: 3.3V | 36: 3.6V |

## Absolute Maximum Ratings

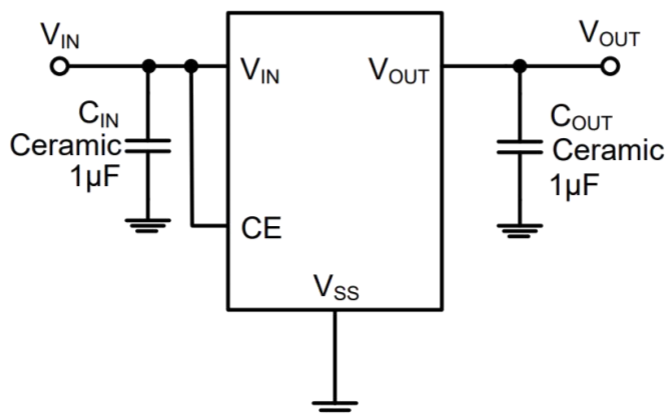
over operating free-air temperature range (unless otherwise noted)

|                   |                                       | MIN                | MAX       | UNIT |
|-------------------|---------------------------------------|--------------------|-----------|------|
| VIN               | Continuous input voltage range        | -0.3               | 6.5       | V    |
| VOUT              | Output voltage range                  | -0.3               | VIN+0.3   |      |
| Current           | Maximum output current                | Internally limited |           | mA   |
| Temperature       | Operating Temperature, Topr           | -40                | +85       | °C   |
|                   | Storage, Tstg                         | -40                | +150      |      |
|                   | Welding temperature and time, Tsolder |                    | +260, 10s |      |
| Power Dissipation | Pd DFN1X1-4                           | 400                |           | mW   |

## BLOCK DIAGRAM



## Typical Application Circuit



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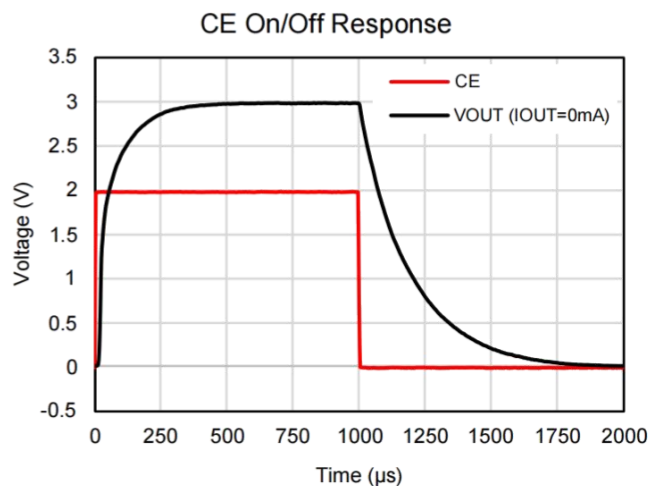
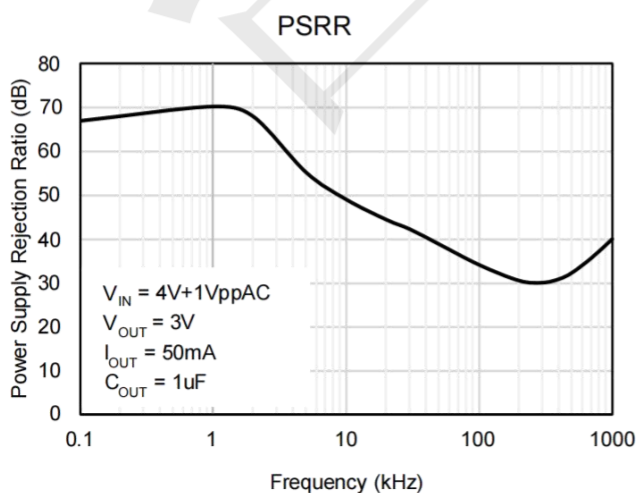
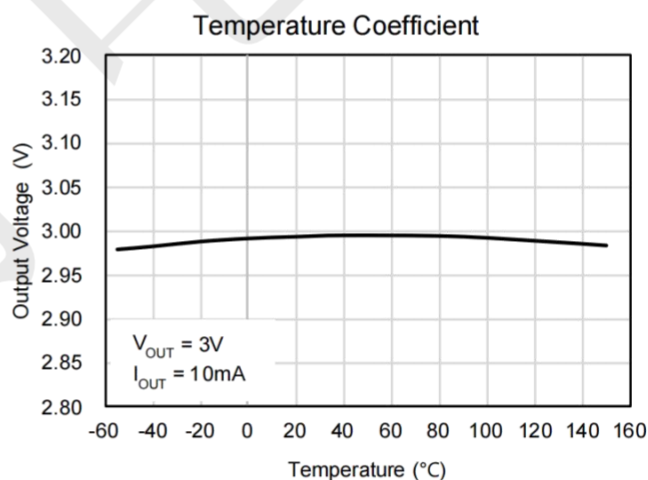
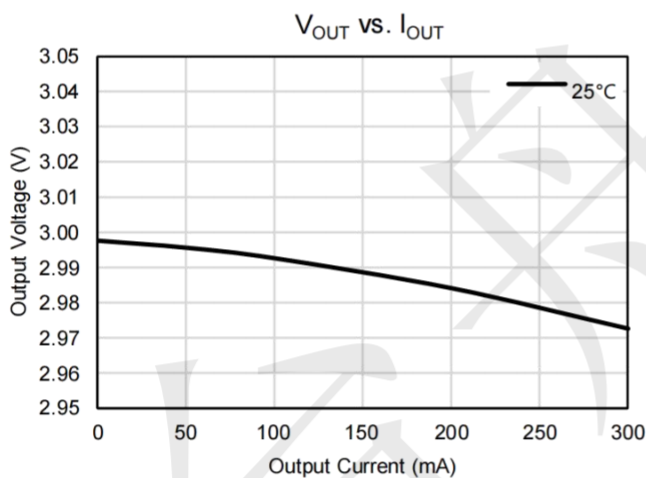
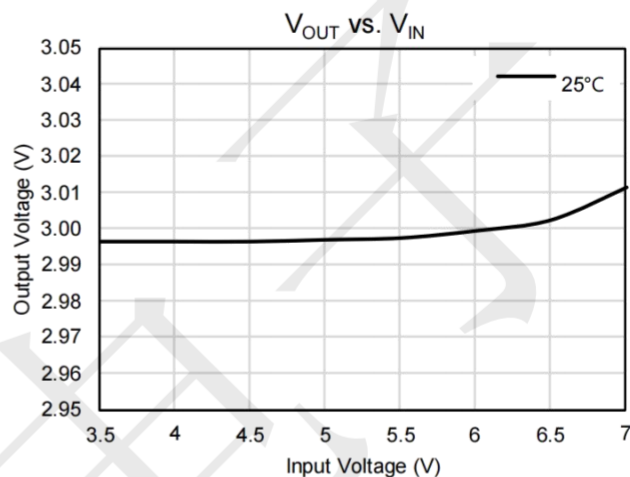
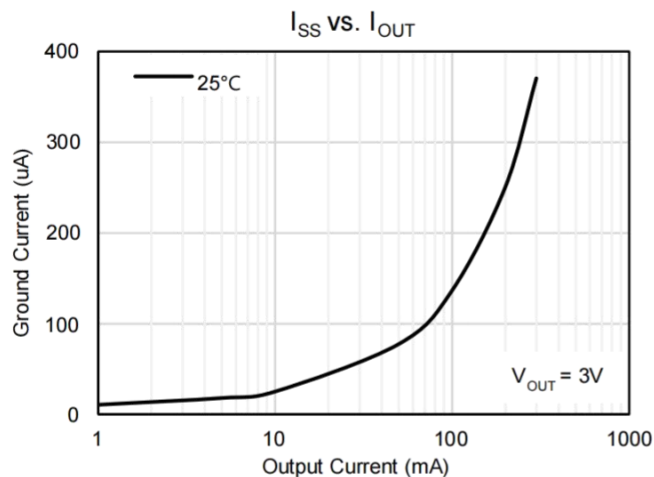
### Electrical Characteristics (TA=25°C, unless otherwise specified)

| PARAMETER                       | SYMBOL                                                | CONDITIONS                                               | MIN.   | TYP. | MAX.     | UNITS    |
|---------------------------------|-------------------------------------------------------|----------------------------------------------------------|--------|------|----------|----------|
| Input Voltage                   | $V_{IN}$                                              | --                                                       | 1.8    | --   | 5.5      | V        |
| Output Voltage                  | $V_{OUT}$                                             | --                                                       | 1.2    | --   | 3.6      | V        |
| DC Output Accuracy              | --                                                    | $I_{OUT}=1mA$                                            | -2     | --   | 2        | %        |
| Output Current                  | $I_{OUT}$                                             | $V_{IN}=1.8V$                                            | 150    | --   | --       | mA       |
|                                 |                                                       | $V_{IN}=4.3V$                                            | 350    | --   | --       |          |
| Dropout Voltage                 | $V_{dif}^{(2)}$                                       | $I_{OUT}=100mA, V_{OUT}=3.3V$                            | --     | 110  | --       | mV       |
| Supply Current                  | $I_{SS}$                                              | $I_{OUT}=0$                                              | --     | 0.8  | 1.3      | $\mu A$  |
| Standby Current                 | $I_{STBY}$                                            | $CE=V_{SS}$                                              | --     | --   | 0.1      | $\mu A$  |
| Load Regulation                 | $\Delta V_{OUT}$                                      | $V_{IN}=V_{OUT}+1V$<br>$1mA \leq I_{OUT} \leq 100mA$     | --     | 5    | --       | mV       |
| Line Regulation                 | $\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta V_{IN}}$ | $I_{OUT}=10mA$<br>$V_{OUT}+1V \leq V_{IN} \leq 6V$       | --     | 0.03 | 0.2      | %/V      |
| Temperature Coefficient         | $\frac{\Delta V_{OUT}}{V_{OUT} \times \Delta T_A}$    | $I_{OUT}=10mA$<br>$-40^\circ C < T_A < 85^\circ C$       | --     | 50   | --       | ppm      |
| Output Current Limit            | $I_{LIM}$                                             | $V_{OUT}=90\% \times V_{OUT}$<br>( $V_{OUT} \geq 3.0V$ ) | 350    | --   | --       | mA       |
| Short Current                   | $I_{SHORT}$                                           | $V_{OUT}=V_{SS}$                                         | --     | 10   | --       | mA       |
| Power Supply Rejection Ratio    | PSRR                                                  | $I_{OUT}=50mA$                                           | 100Hz  | --   | 65       | dB       |
|                                 |                                                       |                                                          | 1kHz   | --   | 70       |          |
|                                 |                                                       |                                                          | 10kHz  | --   | 50       |          |
|                                 |                                                       |                                                          | 100kHz | --   | 35       |          |
| CE "High" Voltage               | $V_{CE}^{"H"}$                                        | --                                                       | 1.5    | --   | $V_{IN}$ | V        |
| CE "Low" Voltage                | $V_{CE}^{"L"}$                                        | --                                                       | --     | --   | 0.3      | V        |
| COOUT Auto-Discharge Resistance | $R_{DISCHRG}$                                         | $V_{IN}=5V, V_{OUT}=3.0V$<br>$V_{CE}=V_{SS}$             | --     | 200  | --       | $\Omega$ |

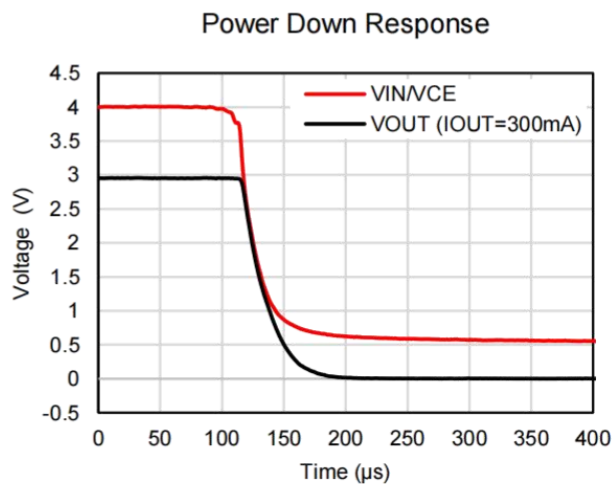
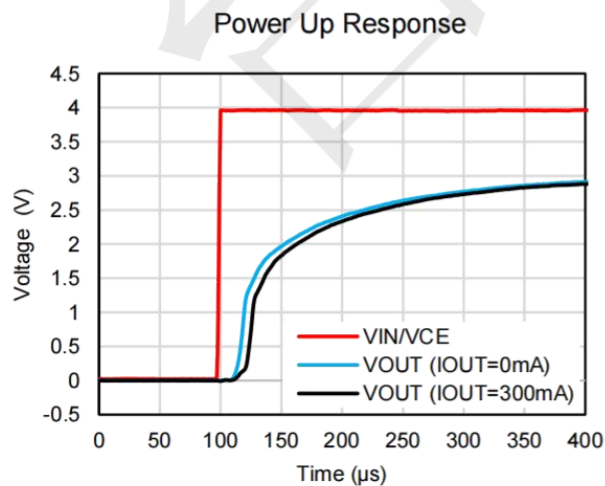
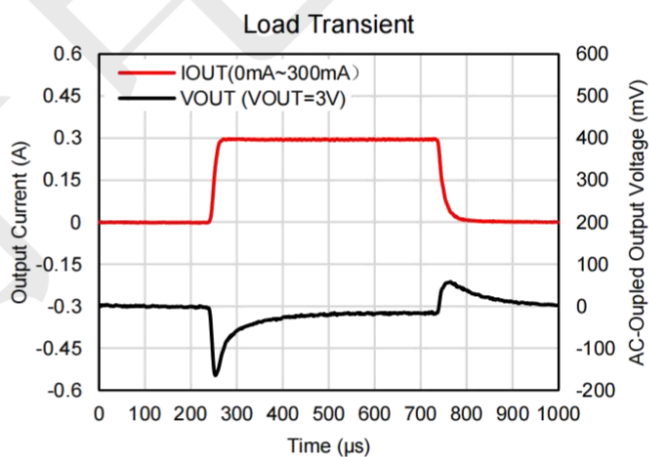
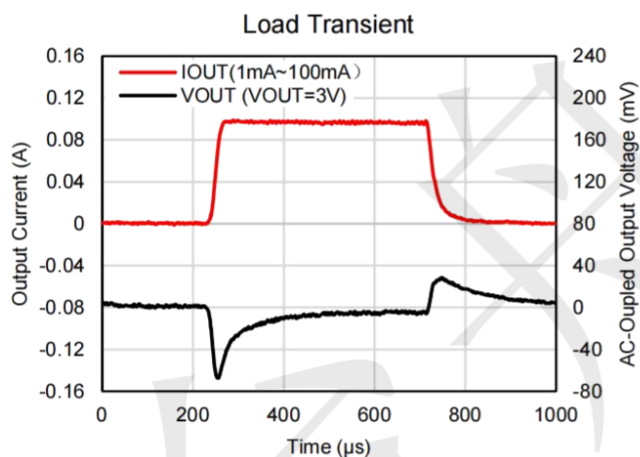
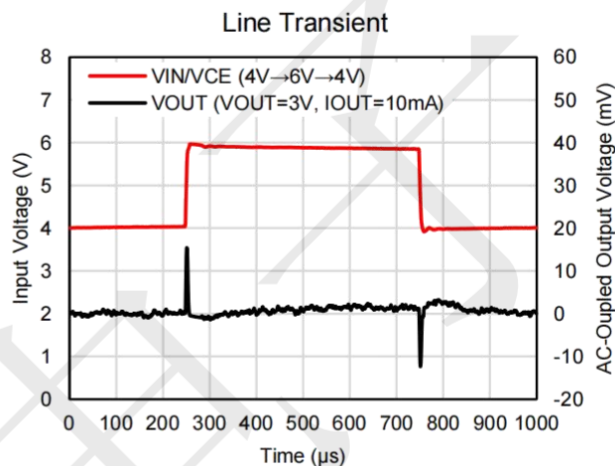
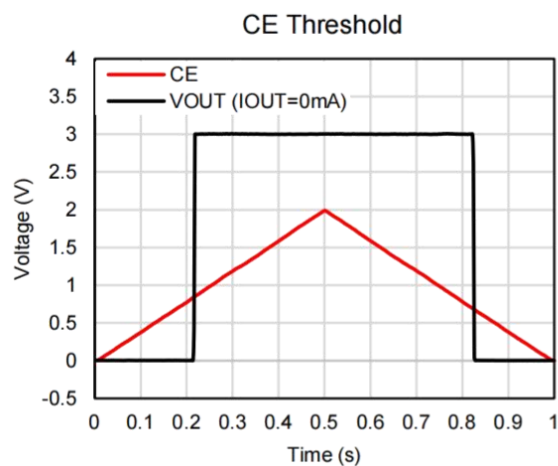
Note:

- Test condition: the device is mounted on FR-4 substrate PC board, with minimum recommended pad layout.
- $V_{dif}$ : The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of  $V_{OUT}$ .

### Typical Operating Characteristics (25 °C, unless otherwise noted)

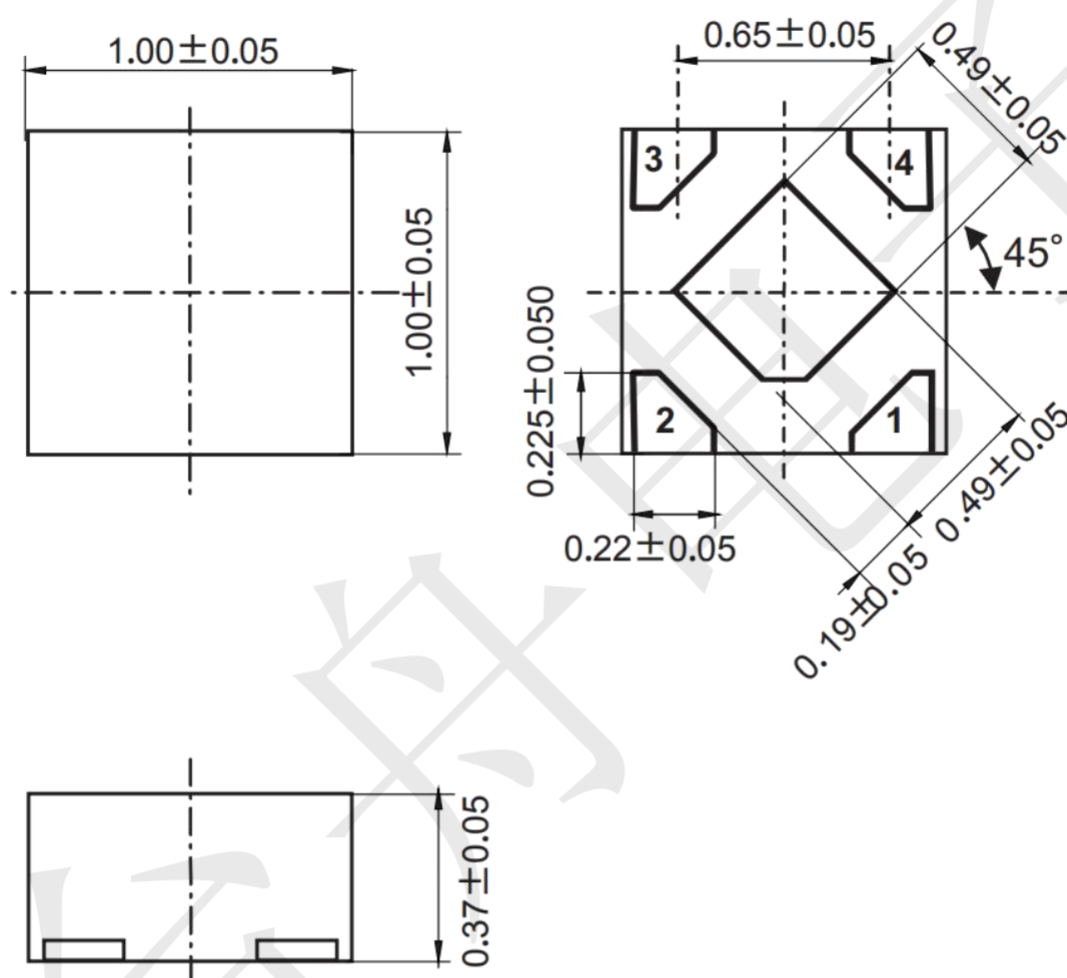


### Typical Operating Characteristics (25 °C, unless otherwise noted)



## Package Outline Dimensions (unit: mm)

DFN1X1-4



## Mounting Pad Layout (unit: mm)

