

Technical Reference Manual

LP87562T-Q1 Technical Reference Manual



ABSTRACT

This document provides the register bit values for the one-time programmable (OTP) bits of the orderable part number LP87562TRNFRQ1.

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1 Introduction

This technical reference manual can be used as a reference for the LP87562T-Q1 default register bits after OTP memory download. This technical reference manual does not provide information about the electrical characteristics, external components, package, or the functionality of the device. For this information and the full register map, refer to the [LP8756x-Q1 Four-Phase 16-A Buck Converter With Integrated Switches data sheet](#).

Table 1-1 lists the main OTP settings for power rails. Table 2-1 lists the register bits loaded from OTP memory.

Table 1-1. Main OTP Settings for Power Rails

| Description | | Bit Name | LP87562T-Q1 Value |
|---|--|---|-------------------|
| Device identification | OTP configuration | OTP_ID | 0x117 |
| BUCK0, BUCK1, BUCK2 (3-phase operation) | Output voltage | BUCK0_VSET | 850 mV |
| | Enable, EN pin, or I ² C register | EN_BUCK0, EN_PIN_CTRL0, BUCK0_EN_PIN_SELECT | EN1 |
| | Force PWM | BUCK0_FPWM | Yes |
| | Force multiphase | BUCK0_FPWM_MP | Yes |
| | Peak current limit per phase | ILIM0,ILIM1,ILIM2 | 5 A |
| | Maximum load current | N/A | 12 A |
| | Slew rate | SLEW_RATE0 | 3.8 mV/μs |
| BUCK3 | Output voltage | BUCK3_VSET | 850 mV |
| | Enable, EN pin, or I ² C register | EN_BUCK3, EN_PIN_CTRL3, BUCK3_EN_PIN_SELECT | EN1 |
| | Force PWM | BUCK3_FPWM | Yes |
| | Peak current limit | ILIM3 | 5 A |
| | Maximum load current | N/A | 4 A |
| | Slew rate | SLEW_RATE3 | 3.8 mV/μs |
| Switching frequency | | N/A | 2 MHz |
| I ² C address | | N/A | 0x63 |

Note

The maximum total output capacitance (local + POL) per phase (BUCK0, BUCK1, BUCK2, and BUCK3) depends on the slew rate setting. Check the data sheet for the allowed capacitance value.

2 Register Bits Loaded From OTP Memory

Table 2-1 lists the register bit values loaded from the OTP memory during device start-up.

Table 2-1. Summary of Registers Bits

| Address | Register Name | Bit | LP87562T-Q1 Value |
|---------|---------------|---------------------------|-------------------|
| 0x01 | OTP_REV | OTP_ID[7:0] | 0x117 |
| 0x02 | BUCK0_CTRL1 | EN_BUCK0 | 0x01 |
| 0x02 | BUCK0_CTRL1 | EN_PIN_CTRL0 | 0x01 |
| 0x02 | BUCK0_CTRL1 | BUCK0_EN_PIN_SELECT[1:0] | 0x00 |
| 0x02 | BUCK0_CTRL1 | BUCK0_FPWM | 0x01 |
| 0x02 | BUCK0_CTRL1 | BUCK0_FPWM_MP | 0x01 |
| 0x03 | BUCK0_CTRL2 | ILIM0[2:0] | 0x07 |
| 0x03 | BUCK0_CTRL2 | SLEW_RATE0[2:0] | 0x04 |
| 0x04 | BUCK1_CTRL1 | EN_BUCK1 | 0x01 |
| 0x04 | BUCK1_CTRL1 | EN_PIN_CTRL1 | 0x01 |
| 0x04 | BUCK1_CTRL1 | BUCK1_EN_PIN_SELECT[1:0] | 0x00 |
| 0x04 | BUCK1_CTRL1 | BUCK1_FPWM | 0x01 |
| 0x05 | BUCK1_CTRL2 | ILIM1[2:0] | 0x07 |
| 0x05 | BUCK1_CTRL2 | SLEW_RATE1[2:0] | 0x04 |
| 0x06 | BUCK2_CTRL1 | EN_BUCK2 | 0x01 |
| 0x06 | BUCK2_CTRL1 | EN_PIN_CTRL2 | 0x01 |
| 0x06 | BUCK2_CTRL1 | BUCK2_EN_PIN_SELECT[1:0] | 0x00 |
| 0x06 | BUCK2_CTRL1 | BUCK2_FPWM | 0x01 |
| 0x06 | BUCK2_CTRL1 | BUCK2_FPWM_MP | 0x01 |
| 0x07 | BUCK2_CTRL2 | ILIM2[2:0] | 0x07 |
| 0x07 | BUCK2_CTRL2 | SLEW_RATE2[2:0] | 0x04 |
| 0x08 | BUCK3_CTRL1 | EN_BUCK3 | 0x01 |
| 0x08 | BUCK3_CTRL1 | EN_PIN_CTRL3 | 0x01 |
| 0x08 | BUCK3_CTRL1 | BUCK3_EN_PIN_SELECT[1:0] | 0x00 |
| 0x08 | BUCK3_CTRL1 | BUCK3_FPWM | 0x01 |
| 0x09 | BUCK3_CTRL2 | ILIM3[2:0] | 0x07 |
| 0x09 | BUCK3_CTRL2 | SLEW_RATE3[2:0] | 0x04 |
| 0x0A | BUCK0_VOUT | BUCK0_VSET[7:0] | 0x2F |
| 0x0C | BUCK1_VOUT | BUCK1_VSET[7:0] | 0x2F |
| 0x0E | BUCK2_VOUT | BUCK2_VSET[7:0] | 0x2F |
| 0x10 | BUCK3_VOUT | BUCK3_VSET[7:0] | 0x2F |
| 0x12 | BUCK0_DELAY | BUCK0_SHUTDOWN_DELAY[3:0] | 0x02 |
| 0x12 | BUCK0_DELAY | BUCK0_STARTUP_DELAY[3:0] | 0x00 |
| 0x13 | BUCK1_DELAY | BUCK1_SHUTDOWN_DELAY[3:0] | 0x02 |
| 0x13 | BUCK1_DELAY | BUCK1_STARTUP_DELAY[3:0] | 0x00 |
| 0x14 | BUCK2_DELAY | BUCK2_SHUTDOWN_DELAY[3:0] | 0x02 |
| 0x14 | BUCK2_DELAY | BUCK2_STARTUP_DELAY[3:0] | 0x00 |
| 0x15 | BUCK3_DELAY | BUCK3_SHUTDOWN_DELAY[3:0] | 0x02 |
| 0x15 | BUCK3_DELAY | BUCK3_STARTUP_DELAY[3:0] | 0x01 |
| 0x16 | GPIO2_DELAY | GPIO2_SHUTDOWN_DELAY[3:0] | 0x00 |
| 0x16 | GPIO2_DELAY | GPIO2_STARTUP_DELAY[3:0] | 0x00 |
| 0x17 | GPIO3_DELAY | GPIO3_SHUTDOWN_DELAY[3:0] | 0x00 |
| 0x17 | GPIO3_DELAY | GPIO3_STARTUP_DELAY[3:0] | 0x00 |
| 0x19 | CONFIG | DOUBLE_DELAY | 0x00 |
| 0x19 | CONFIG | CLKIN_PD | 0x01 |
| 0x19 | CONFIG | EN4_PD | 0x00 |
| 0x19 | CONFIG | EN3_PD | 0x01 |
| 0x19 | CONFIG | TDIE_WARN_LEVEL | 0x01 |

Table 2-1. Summary of Registers Bits (continued)

| Address | Register Name | Bit | LP87562T-Q1 Value |
|---------|---------------|---------------------|-------------------|
| 0x19 | CONFIG | EN2_PD | 0x01 |
| 0x19 | CONFIG | EN1_PD | 0x01 |
| 0x21 | TOP_MASK1 | GPIO_MASK | 0x01 |
| 0x21 | TOP_MASK1 | SYNC_CLK_MASK | 0x01 |
| 0x21 | TOP_MASK1 | TDIE_WARN_MASK | 0x00 |
| 0x21 | TOP_MASK1 | I_LOAD_READY_MASK | 0x01 |
| 0x22 | TOP_MASK2 | RESET_REG_MASK | 0x01 |
| 0x23 | BUCK_0_1_MASK | BUCK1_PG_MASK | 0x01 |
| 0x23 | BUCK_0_1_MASK | BUCK1_ILIM_MASK | 0x01 |
| 0x23 | BUCK_0_1_MASK | BUCK0_PG_MASK | 0x01 |
| 0x23 | BUCK_0_1_MASK | BUCK0_ILIM_MASK | 0x01 |
| 0x24 | BUCK_2_3_MASK | BUCK3_PG_MASK | 0x01 |
| 0x24 | BUCK_2_3_MASK | BUCK3_ILIM_MASK | 0x01 |
| 0x24 | BUCK_2_3_MASK | BUCK2_PG_MASK | 0x01 |
| 0x24 | BUCK_2_3_MASK | BUCK2_ILIM_MASK | 0x01 |
| 0x28 | PGOOD_CTRL1 | PG3_SEL[1:0] | 0x01 |
| 0x28 | PGOOD_CTRL1 | PG2_SEL[1:0] | 0x00 |
| 0x28 | PGOOD_CTRL1 | PG1_SEL[1:0] | 0x00 |
| 0x28 | PGOOD_CTRL1 | PG0_SEL[1:0] | 0x01 |
| 0x29 | PGOOD_CTRL2 | HALF_DELAY | 0x00 |
| 0x29 | PGOOD_CTRL2 | EN_PG0_NINT | 0x00 |
| 0x29 | PGOOD_CTRL2 | PGOOD_SET_DELAY | 0x00 |
| 0x29 | PGOOD_CTRL2 | EN_PGFLT_STAT | 0x00 |
| 0x29 | PGOOD_CTRL2 | PGOOD_WINDOW | 0x01 |
| 0x29 | PGOOD_CTRL2 | PGOOD_OD | 0x01 |
| 0x29 | PGOOD_CTRL2 | PGOOD_POL | 0x00 |
| 0x2B | PLL_CTRL | PLL_MODE[1:0] | 0x00 |
| 0x2B | PLL_CTRL | EXT_CLK_FREQ[4:0] | 0x01 |
| 0x2C | PIN_FUNCTION | EN_SPREAD_SPEC | 0x01 |
| 0x2C | PIN_FUNCTION | EN_PIN_CTRL_GPIO3 | 0x01 |
| 0x2C | PIN_FUNCTION | EN_PIN_SELECT_GPIO3 | 0x00 |
| 0x2C | PIN_FUNCTION | EN_PIN_CTRL_GPIO2 | 0x01 |
| 0x2C | PIN_FUNCTION | EN_PIN_SELECT_GPIO2 | 0x00 |
| 0x2C | PIN_FUNCTION | GPIO3_SEL | 0x01 |
| 0x2C | PIN_FUNCTION | GPIO2_SEL | 0x01 |
| 0x2C | PIN_FUNCTION | GPIO1_SEL | 0x00 |
| 0x2D | GPIO_CONFIG | GPIO3_OD | 0x01 |
| 0x2D | GPIO_CONFIG | GPIO2_OD | 0x01 |
| 0x2D | GPIO_CONFIG | GPIO1_OD | 0x00 |
| 0x2D | GPIO_CONFIG | GPIO3_DIR | 0x00 |
| 0x2D | GPIO_CONFIG | GPIO2_DIR | 0x00 |
| 0x2D | GPIO_CONFIG | GPIO1_DIR | 0x00 |
| 0x2F | GPIO_OUT | GPIO3_OUT | 0x01 |
| 0x2F | GPIO_OUT | GPIO2_OUT | 0x01 |

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