

INTRODUCTION

The **LTC[®]2977** is a 100% pin-compatible upgrade to the **LTC2978/LTC2978A** featuring longer TON and TOFF delays, improved power-up and power good timing specifications, more fault management options, EEPROM with ECC, and other enhancements. This guide describes the differences and explains the configuration file changes needed when migrating a design from the LTC2978/LTC2978A to the LTC2977.

FEATURE COMPARISON

		LTC2978/LTC2978A	LTC2977
Sequencing	Time Based	✓	✓
	Tracking*		✓
Maximum Programmable TON_DELAY/TOFF_DELAY		0.655 sec	13.1 sec
Sequence Off Upon Fault			✓
Power Good De-Assertion Time		100ms	12μs or 100ms
Power-Up Time		135ms (Typ)	30ms (Typ)
Fault Retry Count Options		0 or ∞	0 to 6, or ∞
Fast Fault Log Mode			✓
EEPROM Bulk Programming (Without Affecting RAM)			✓
Pollable MFR_COMMON Register When Device Is Busy			✓
Command Plus			✓

*Note: Enables use of tracking DC/DC converters. Does not control ramp rates.

PIN CONFIGURATION

The pin configuration of the LTC2977 is 100% compatible with the LTC2978/LTC2978A. No changes to existing hardware are required to migrate from the LTC2978/LTC2978A to the LTC2977.

ELECTRICAL CHARACTERISTICS

The electrical characteristics of the LTC2977 are the same as the LTC2978/LTC2978A with the following exceptions:

	LTC2978/LTC2978A	LTC2977
Operating Temperature Range	-40°C to 85°C	-40°C to 105°C
Storage Temperature Range	-40°C to 125°C	-40°C to 150°C
GAIN_ADC (Current Sense Mode) Maximum	±0.2%	±0.35%*

*Note: Due to the higher operating temperature range of the LTC2977.

CONFIGURATION FILE

The following PMBus commands are new or have changed in the LTC2977. An automatic conversion utility is provided in LTpowerPlay[®] to simplify the transition from an LTC2978/LTC2978A configuration file to a functionally equivalent LTC2977 configuration file.

Writable Commands

	LTC2978/LTC2978A	LTC2977
MFR_CONFIG_ALL (0xD1)	Byte Command	Word Command

Migration Guide

CONFIGURATION FILE

For maximum compatibility with legacy LTC2978/LTC2978A designs, the new MFR_CONFIG_ALL bits [15:8] should be written to zero. This will disable short-cycle fault detection, fast PWRGD de-assertion, and fast fault logging. Note that factory programmed LTC2977 devices will have these features enabled by default.

	LTC2978/LTC2978A	LTC2977
MFR_CONFIG (0xD0), Bits [15:14]	Reserved	Mfr_config_chan_mode

For maximum compatibility with legacy LTC2978/LTC2978A designs, the new MFR_CONFIG bits [15:14] should be written to zero.

	LTC2978/LTC2978A	LTC2977
User Scratch Value	MFR_SPARE_0 (0xF7)	USER_DATA_04 (0xB4)
User Scratch Value	MFR_SPARE_2 (0xF9)	USER_DATA_03 (0xB3)
Retry Count	N/A	MFR_RETRY_COUNT (0xF7)

The unpagged data in MFR_SPARE_0 has been moved to USER_DATA_04. The 8-paged data in MFR_SPARE_2 has been moved to USER_DATA_03. The command code 0xF7 is used by the LTC2977 for the new MFR_RETRY_COUNT feature.

	LTC2978/LTC2978A	LTC2977
USER_DATA_00 (0xB0)	NACK	Reserved
USER_DATA_01 (0xB1)	NACK	Reserved
USER_DATA_02 (0xB2)	NACK	Reserved
MFR_LTC_RESERVED_1 (0xB5)	NACK	Reserved
MFR_LTC_RESERVED_2 (0xBC)	NACK	Reserved
MFR_EE_UNLOCK (0xBD)	NACK	New: EEPROM Bulk Access
MFR_EE_ERASE (0xBE)	NACK	New: EEPROM Bulk Access
MFR_EE_DATA (0xBF)	NACK	New: EEPROM Bulk Access
MFR_COMMAND_PLUS (0xC0)	NACK	New: Command Plus
MFR_DATA_PLUS0 (0xC1)	NACK	New: Command Plus
MFR_DATA_PLUS1 (0xC2)	NACK	New: Command Plus

These commands will NACK on the LTC2978/LTC2978A. The LTC2977 assigns new functionality to these commands. Consult the LTC2977 data sheet for more information.

Read-Only Commands

The following read-only commands return different values on the LTC2977 and LTC2978/LTC2978A. No configuration file changes are required, but interpretation of the values must be changed accordingly.

	LTC2978	LTC2978A	LTC2977
CAPABILITY (0x19)	0xE0	0xE0	0xB0
MFR_SPECIAL_ID (0xE7)	0x0122	0x0124	0x0131
MFR_COMMON (0xEF)	Bits [7:2] may return different values		

	LTC2978/LTC2978A	LTC2977
MFR_STATUS_2 (0xB7)	NACK	New
MFR_TELEMETRY (0xCF)	NACK	New
MFR_INFO (0xB6)	NACK	New

BEHAVIORAL CHANGES

There are some minor differences between the LTC2978 and LTC2977 with respect to the behavior of the DAC and the OPERATION command.

LTC2978

When the DAC is disconnected (`Mfr_config_dac_mode = 01`) and OPERATION is changed from OFF or ON to any MARGIN state, the LTC2978 will automatically connect the DAC in order to margin the supply. While in a MARGIN state, the LTC2978 DAC cannot be changed to the disconnected state. If OPERATION is changed back to the OFF or ON state, the DAC will remain in the DAC soft-connect mode. The DAC mode can then be changed to DAC disconnected (`Mfr_config_dac_mode = 01`) only in the ON (0x80) or one of the OFF states (0x00, 0x40).

LTC2977

When the DAC is disconnected (`Mfr_config_dac_mode = 01`) and OPERATION is changed from OFF or ON to any MARGIN state, the LTC2977 DAC will remain disconnected. To enable the servo in the ON or MARGIN states, the DAC mode must be configured to soft-connect (`Mfr_config_dac_mode = 00`). When the DAC is disconnected (`Mfr_config_dac_mode = 01`), the DAC remains disconnected independent of the state of the OPERATION command.