

APPLICATION NOTE 4052

Quick Reference Guide to the DS1863 Memory Map

Abstract: The DS1863 burst-mode PON controller with integrated monitoring capabilities has programming options to configure the alarms, warnings, lookup tables, and other functions. This programmability necessitates a large register memory map. This application note provides an outline of the register map, which is convenient when programming the device.

Memory Map of the DS1863

The [DS1863](#) features six separate memory tables that are internally organized into eight byte rows (**Figure 1**).

1. The **Lower Memory** is addressed from 00h to 7Fh. It contains alarm and warning thresholds, flags, masks, several control registers, password entry area (PWE), and the Table Select byte.
2. **Table 01h** primarily contains user EEPROM (with PW1 level access) and some alarm and warning status bytes.
3. **Table 02h** is a multifunction space that contains configuration registers, scaling and offset values, passwords, interrupt registers, and miscellaneous control bytes.
4. **Table 03h** is strictly user EEPROM that is protected by a PW2-level password.
5. **Table 04h** contains a temperature-indexed lookup table (LUT) for controlling the modulation voltage. The modulation LUT can be programmed in 2°C increments over the -40°C to +102°C range. Access to this register is protected by a PW2-level password.
6. **Table 05h** contains another LUT, which allows the APC set point to change as a function of temperature to compensate for Tracking Error (TE). This TE LUT has 36 entries that determine the APC setting in 4°C windows between -40°C to +100°C. Access to this register is protected by a PW2-level password.

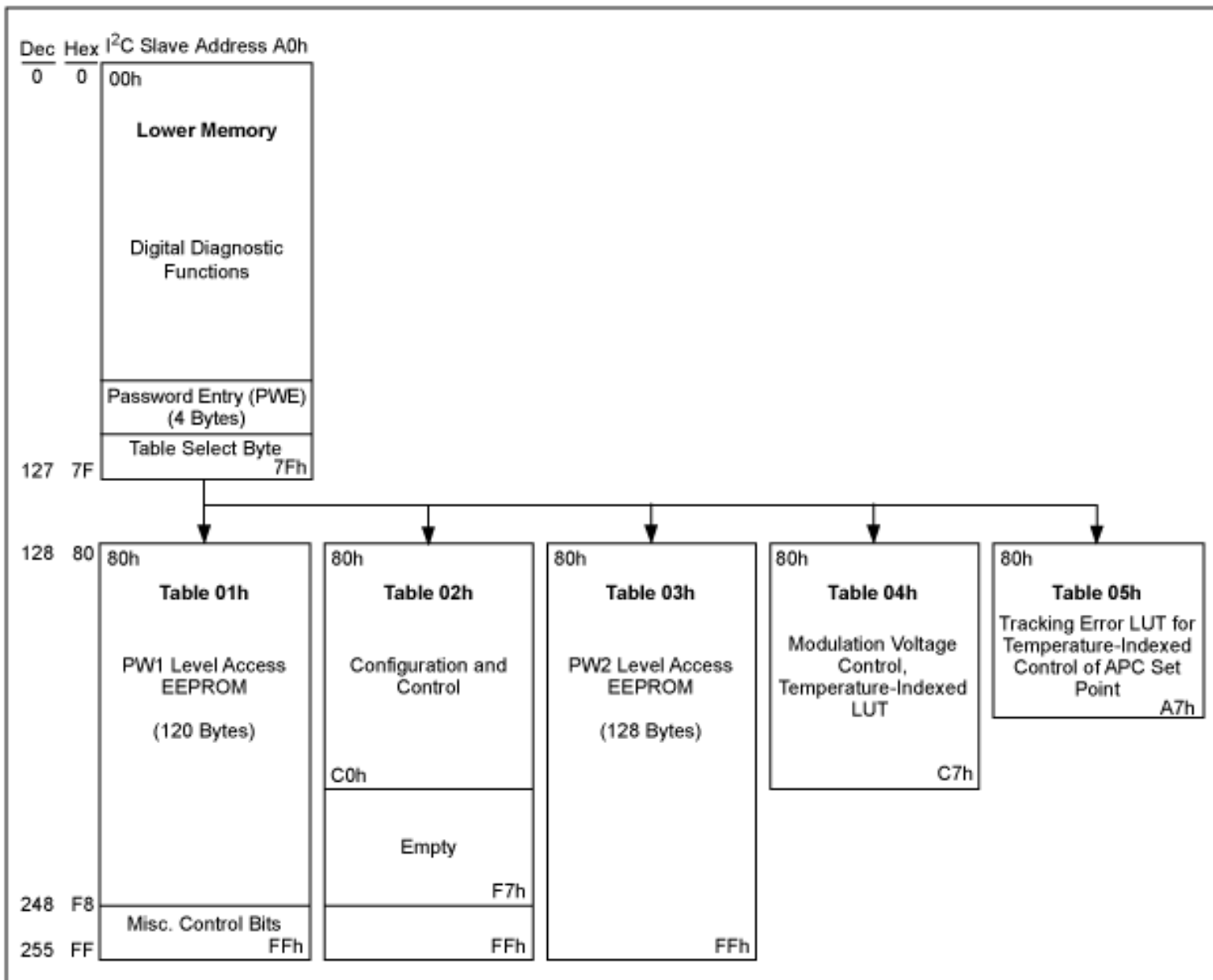


Figure 1. Structure of the memory map in the DS1863.

Register Reference

The following tables provide an easy reference to the **Lower Memory** and **Tables 01h** and **02h**. For a description of the functionality for each bit, please refer to the corresponding register in the DS1863 data sheet. Tables 03h, 04h, and 05h are lookup tables that do not require a separate reference and, therefore, are not included here.

Note: RSVD is an acronym for RESERVED.

Lower Memory

Register Name		Bit7							Bit0
TEMP ALARM HI	00h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	01h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
TEMP ALARM LO	02h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	03h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
TEMP WARN HI	04h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	05h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
TEMP WARN LO	06h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	07h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
V _{CC} ALARM HI	08h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	09h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
V _{CC} ALARM LO	0Ah	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	0Bh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
V _{CC} WARN HI	0Ch	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	0Dh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
V _{CC} WARN LO	0Eh	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	0Fh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON1 ALARM HI	10h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	11h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON1 ALARM LO	12h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	13h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON1 WARN HI	14h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	15h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON1 WARN LO	16h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	17h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON2 ALARM HI	18h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	19h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON2 ALARM LO	1Ah	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	1Bh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON2 WARN HI	1Ch	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	1Dh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON2 WARN LO	1Eh	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	1Fh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON3 ALARM HI	20h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	21h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON3 ALARM LO	22h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	23h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON3 WARN HI	24h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	25h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON3 WARN LO	26h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	27h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
SHADOWED EEPROM	28h-2Fh	SEE	SEE	SEE	SEE	SEE	SEE	SEE	SEE

PW2 EE	30h-5Fh	EE	EE	EE	EE	EE	EE	EE	EE
TEMP VALUE	60h	S	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
	61h	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶	2 ⁻⁷	2 ⁻⁸
V _{CC} VALUE	62h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	63h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON1 VALUE	64h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	65h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON2 VALUE	66h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	67h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MON3 VALUE	68h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	69h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
STATUS	6Eh	FETG STATUS	SOFT FETG	RSVD	TX-F RESET	SOFT TX-D	TX-F STATUS	RSVD	RDYB
UPDATE	6Fh	TEMP RDY	V _{CC} RDY	MON1 RDY	MON2 RDY	MON3 RDY	RSVD	RSVD	RSVD
ALARM ₃	70h	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
ALARM ₂	71h	MON3 HI	MON3 LO	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
ALARM ₁	72h	RSVD	RSVD	RSVD	RSVD	BIAS HI	RSVD	TX-P HI	TX-P LO
ALARM ₀	73h	RSVD	RSVD	RSVD	RSVD	BIAS MAX	RSVD	RSVD	RSVD
WARN ₃	74h	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
WARN ₂	75h	MON3 HI	MON3 LO	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
PASSWORD ENTRY (PWE)	7Bh	2 ³¹	2 ³⁰	2 ²⁹	2 ²⁸	2 ²⁷	2 ²⁶	2 ²⁵	2 ²⁴
	7Ch	2 ²³	2 ²²	2 ²¹	2 ²⁰	2 ¹⁹	2 ¹⁸	2 ¹⁷	2 ¹⁶
	7Dh	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	7Eh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
TABLE SELECT (TBL SEL)	7Fh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰

Table 01h

		Bit7							Bit0
PW1 EEPROM	80h-F7h	EE	EE	EE	EE	EE	EE	EE	EE
ALARM ₃	F8h	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
ALARM ₂	F9h	MON3 HI	MON3 LO	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
ALARM ₁	FAh	RSVD	RSVD	RSVD	RSVD	BIAS HI	RSVD	TX-P HI	TX-P LO
ALARM ₀	FBh	RSVD	RSVD	RSVD	RSVD	BIAS MAX	RSVD	RSVD	RSVD
WARN ₃	FCh	TEMP HI	TEMP LO	V _{CC} HI	V _{CC} LO	MON1 HI	MON1 LO	MON2 HI	MON2 LO
WARN ₂	FDh	MON3 HI	MON3 LO	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

Table 02h

		Bit7							Bit0
MODE	80h	SEEB	RSVD	RSVD	RSVD	AEN	MOD-EN	APC-EN	BIAS-EN
T INDEX	81h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MOD DAC	82h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
APC DAC	83h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
BIAS DAC	84h	0	0	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷
	85h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
DEVICE ID	86h	0	1	1	0	0	0	1	1
DEVICE VER	87h	DEVICE VERSION							
UPDATE RATE	86h	0	0	0	0	SR(3:0)	SR(3:0)	SR(3:0)	SR(3:0)
CONFIG	89h	FETG DIR	TX-F EN	RSVD	ASEL	RSVD	RSVD	RSVD	RSVD
START-UP STEP	8Ah	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵
MOD RANGING	8Bh	RSVD	RSVD	RSVD	RSVD	RSVD	MOD ₂	MOD ₁	MOD ₀
DEVICE ADDRESS	8Ch	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	X
COMP RANGING	8Dh	RSVD	RSVD	RSVD	RSVD	RSVD	APC ₂	APC ₁	APC ₀
RIGHT SHIFT ₁	8Eh	RSVD	MON1_2	MON1_1	MON1_0	RSVD	MON2_2	MON2_1	MON2_0
RIGHT SHIFT ₀	8Fh	RSVD	MON3_2	MON3_1	MON3_0	RSVD	RSVD	RSVD	RSVD
V _{CC} SCALE MON1-4 SCALE	92, 94, 96, 98, 9Ah	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	93, 95, 97, 99, 9Bh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
V _{CC} OFFSET MON1-4 OFFSET	A2, A4, A6, A8, AAh	S	S	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰
	A3, A5, A7, A9, ABh	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²
TEMP OFFSET	AEh	S	2 ⁸	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²
	AFh	2 ¹	2 ⁰	2 ⁻¹	2 ⁻²	2 ⁻³	2 ⁻⁴	2 ⁻⁵	2 ⁻⁶
PW1, PW2	B0h, B4h	2 ³¹	2 ³⁰	2 ²⁹	2 ²⁸	2 ²⁷	2 ²⁶	2 ²⁵	2 ²⁴
	B1h, B5h	2 ²³	2 ²²	2 ²¹	2 ²⁰	2 ¹⁹	2 ¹⁸	2 ¹⁷	2 ¹⁶
	B2h, B6h	2 ¹⁵	2 ¹⁴	2 ¹³	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸
	B3h, B7h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
FETG ENABLE ₁	B8h	TEMP EN	V _{CC} EN	MON1 EN	MON2 EN	MON3 EN	RSVD	RSVD	RSVD
FETG ENABLE ₀	B9h	TX-P HI EN	TX-P LO EN	BIAS HI EN	BIAS MAX EN	RSVD	RSVD	RSVD	RSVD
TX-F ENABLE ₁	BAh	TEMP EN	V _{CC} EN	MON1 EN	MON2 EN	MON3 EN	RSVD	RSVD	RSVD
TX-F ENABLE ₀	BBh	TX-P HI EN	TX-P LO EN	BIAS HI EN	BIAS MAX EN	RSVD	RSVD	RSVD	FETG EN
HXP	BCh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
LXP	BDh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
HBIAS	BEh	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MAX IBIAS	BFh	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷	2 ⁶	2 ⁵

MAN_IBIAS	F8h	RSVD	RSVD	2 ¹²	2 ¹¹	2 ¹⁰	2 ⁹	2 ⁸	2 ⁷
	F9h	2 ⁷	2 ⁶	2 ⁵	2 ⁴	2 ³	2 ²	2 ¹	2 ⁰
MAN_CNTL	FAh	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	MAN_CLK

Application Note 4052: <http://www.maxim-ic.com/an4052>

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