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APPLICATION NOTE 4464

DS1875 Quick Reference Guide

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Abstract: The DS1875 burst-mode PON controller with integrated monitoring allows programming to configure the alarms, warnings, lookup tables, and other functions. The programming necessitates a large register memory map. This application note provides a simplified view of the register map, which is convenient when programming the device.

Memory Map of the DS1875

The DS1875 burst-mode PON controller features ten separate memory tables that are internally organized into 8-byte rows.

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.

Table 00h contains conversion results for MON5 through MON8.

Table 01h primarily contains user EEPROM (with PW1-level access), as well as some alarm and warning status bytes.

Table 02h is a multifunction space that contains configuration registers, scaling and offset values, passwords, interrupt registers, and other miscellaneous control bytes.

Table 03h is strictly user EEPROM that is protected by a PW2-level password.

Table 04h contains a temperature-indexed 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.

Table 05h contains a temperature-indexed LUT. It allows the APC set point to change as a function of temperature to compensate for TE (tracking error). The APC 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.

Table 06h contains a MON4-indexed LUT for controlling the M4DAC voltage. The MON4 LUT has 32 entries that are configurable to act as one 32-entry LUT of two 16-byte LUTs. When configured as one 32-byte LUT, each entry corresponds to an increment of 1/32 of the full scale. When configured as two 16-byte LUTs, the first 16 bytes and the last 16 bytes each correspond to 1/16 of full scale. Either of the two sections is selected with a separate configuration bit. Access to this register is protected by a PW2-level

password.

Table 07h contains a temperature-indexed LUT for controlling the PWM reference voltage (integration of FB input). The PWM 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.

Table 08h contains a temperature-indexed LUT for controlling the BIAS current. The BIAS 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.

Auxiliary memory (Device A0h) contains 256 bytes of EE memory accessible from address 00h–FFh. It is selected with the device address of A0h.

DS1875 Memory Map

More detailed image (PDF, 8kB)
Figure 1. DS1875 memory map.

Register Reference

The following tables provide an easy reference to the Lower Memory and Tables 00h, 01h, and 02h. For a description of the functionality for each bit, please refer to the corresponding register in the data sheet. Tables 03h through 08h are LUTs that do not require a separate reference and, therefore, not included here. Please refer to the data sheet for detailed information about these tables.

Note: RSVD is used as an acronym for Reserved.

Lower Memory

Register Name	Register Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
TEMP ALARM HI	00h, 04h	S	2^6	2^5	2^4	2^3	2^2	2^1	2^0
TEMP WARN HI	01h, 05h	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}	2^{-7}	2^{-8}
TEMP ALARM LO	02h, 06h	S	2^6	2^5	2^4	2^3	2^2	2^1	2^0
TEMP WARN LO	03h, 07h	2^{-1}	2^{-2}	2^{-3}	2^{-4}	2^{-5}	2^{-6}	2^{-7}	2^{-8}
V_{CC} ALARM HI / V_{CC} WARN	08, 0C, 10, 14, 18, 1C, 20, 24, 28, 2Ch	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8

Name	Address								
HI									
MON1-4 ALARM HI / MON1-4 WARN HI	09, 0D, 11, 15, 19, 1D, 21, 25, 29, 2Dh	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
V_{CC} ALARM LO / V_{CC} WARN LO	0A, 0E, 12, 16, 1A, 1E, 22, 26, 2A, 2Eh	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8
MON1-4 ALARM LO / MON1-4 WARN LO	0B, 0F, 13, 17, 1B, 1F, 23, 27, 2B, 2Fh	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
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	62, 64, 66, 68, 6Ah	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8
MON1-4 VALUE	63, 65, 67, 69, 6Bh	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
RESERVED	6C, 6Dh	0	0	0	0	0	0	0	0
STATUS	6Eh	FETG STATUS	SOFT FETG	RSVD	TXF RESET	SOFT TXD	TXF STATUS	LOS STATUS	RDYB
UPDATE	6Fh	TEMP RDY	V_{CC} RDY	MON1 RDY	MON2 RDY	MON3 RDY	MON4 RDY	MON5/7 RDY	MON6/8 RDY
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	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
ALARM$_1$	72h	RSVD	RSVD	RSVD	RSVD	BIAS HI	RSVD	TXP HI	TXP LO
ALARM$_0$	73h	M3QT HI	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	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
RESERVED	76h, 77h	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
DOUT	78h	M3QT RESET	SOFT M3QT	RSVD	RSVD	D3 OUT	D2 OUT	D1 OUT	D0 OUT
DIN	79h	INV M3QT	MUX M3QT	INV LOS	MUX LOS	D3 IN	D2 IN	D1 IN	D0 IN
RESERVED	7Ah	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
	7Bh	2^{31}	2^{30}	2^{29}	2^{28}	2^{27}	2^{26}	2^{25}	2^{24}

Register Name	Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
PASSWORD ENTRY	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	7Fh	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}

Table 00h

Register Name	Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MON5–MON8 VALUE	80, 82, 84, 86h	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}
	81, 83, 85, 87h	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}

Table 01h

Register Name	Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	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	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
ALARM$_1$	FAh	RSVD	RSVD	RSVD	RSVD	BIAS HI	RSVD	TXP HI	TXP LO
ALARM$_0$	FBh	M3QT HI	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	MON4 HI	MON4 LO	RSVD	RSVD	RSVD	RSVD
RESERVED	FEh–FFh	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

Table 02h

Register Name	Address	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MODE	80h	SEEB	RSVD	PWM EN	M4DAC EN	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}
V INDEX	84h	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
M4DAC	85h	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
DEVICE ID	86h	0	1	1	1	0	1	0	1
DEVICE VER	87h	DEVICE VERSION							

UPDATE RATE	88h	EE	EE	PWM_FR_1	PWM_FR_0	APC_SR_3	APC_SR_2	APC_SR_1	APC_SR_0
CONFIG	89h	FETG DIR	TXF LEN	M3QT LEN	ASEL	BOLFS	RSSI_FC	RSSI_FF	EN5TO8B
RESERVED	8Ah	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
MOD RANGING	8Bh	RSVD	RSVD	RSVD	RSVD	RSVD	MOD2	MOD1	MOD0
DEVICE ADDRESS	8Ch	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
COMP RANGING	8Dh	RSVD	$BIAS_2$	$BIAS_1$	$BIAS_0$	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	$MON4_2$	$MON4_1$	$MON4_0$
RESERVED	90h–91h	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
V_{CC} SCALE MON1-2 SCALE	92, 94, 96, 98, 9A, 9Ch	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8
MON3 FINE SCALE MON4 SCALE MON3 COARSE SCALE	93, 95, 97, 99, 9B, 9Dh	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
RESERVED	9Eh–A1h	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
V_{CC} OFFSET MON1-2 OFFSET	A2, A4, A6, A8, AA, ACh	S	S	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}
MON3 FINE OFFSET MON4 OFFSET MON3 COARSE OFFSET	A3, A5, A7, A9, AB, ADh	2^9	2^8	2^7	2^6	2^5	2^4	2^3	2^2
INTERNAL 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	B0h	2^{31}	2^{30}	2^{29}	2^{28}	2^{27}	2^{26}	2^{25}	2^{24}
	B1h	2^{23}	2^{22}	2^{21}	2^{20}	2^{19}	2^{18}	2^{17}	2^{16}
	B2h	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^9	2^8
	B3h	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

Name	Addr	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
PW2	B4h	2^{31}	2^{30}	2^{29}	2^{28}	2^{27}	2^{26}	2^{25}	2^{24}
	B5h	2^{23}	2^{22}	2^{21}	2^{20}	2^{19}	2^{18}	2^{17}	2^{16}
	B6h	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}
	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	MON4 EN	RSVD	RSVD
FETG ENABLE$_0$	B9h	TXP HI EN	TXP 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	MON4 EN	RSVD	RSVD
TX-F ENABLE$_0$	BBh	TXP HI EN	TXP LO EN	BIAS HI EN	BIAS MAX EN	RSVD	RSVD	RSVD	FETG EN
HTXP	BCh	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
LTXP	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}
DPU	C0h	INV M3QT	MUX M3QT	INV LOS	MUX LOS	D3 CNTL	D2 CNTL	D1 CNTL	D0 CNTL
RESERVED	C1h–C2h	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
M3QT DAC	C3h	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
DAC1	C4h	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
RESERVED	C5h–C6h	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD
M4 LUT CNTL	C7h	RSVD	RSVD	RSVD	RSVD	FBOL	FBCL	DBL_SB	UP_LOWB
MON5-8 SCALE	C8, CA, CC, CEh	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}
	C9, CB, CD, CFh	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}
MON5-8 OFFSET	D0, D2, D4, D6h	S	S	2^{15}	2^{14}	2^{13}	2^{12}	2^{11}	2^{10}
	D1, D3, D5, D7h	2^{9}	2^{8}	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}
EMPTY	D8h–F7h	EMPTY							
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
BIAS DAC	FBh	BOL	0	2^{12}	2^{11}	2^{10}	2^{9}	2^{8}	2^{7}
	FCh	2^{7}	2^{6}	2^{5}	2^{4}	2^{3}	2^{2}	2^{1}	2^{0}

BIAL OL	FDh	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
PWM DAC	FEh	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0
RESERVED	FFh	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD	RSVD

Related Parts

DS1875	PON Triplexer and SFP Controller	Free Samples

More Information
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