

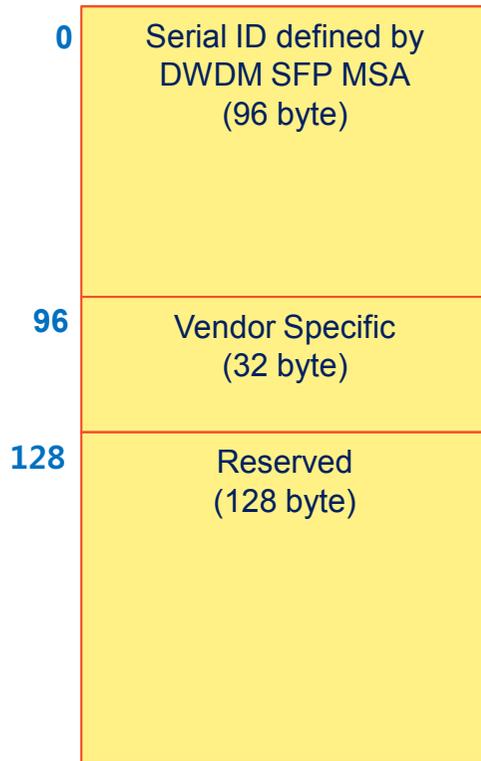
Application note of wavelength tuning procedure

OE solutions
Nov 25th, 2013

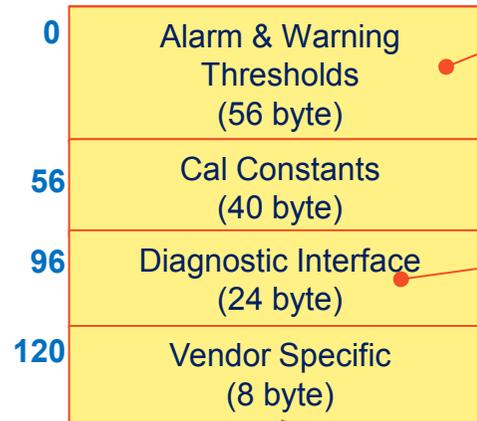


1. EEPROM Structure

2-wire address
1010000X (A0h EEPROM)



2-wire address
1010001X (A2h EEPROM)

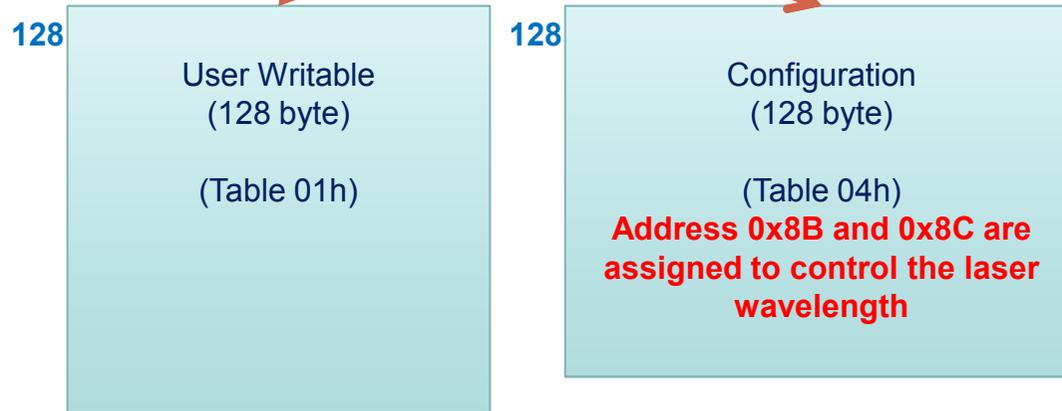


Laser temperature Threshold

- Low Alarm : 0x2A, 0x2B (2byte)
- Low Warn : 0x2E, 0x2F (2byte)
- High Alarm : 0x28, 0x29 (2byte)
- High Warn : 0x2C, 0x2D (2byte)

Laser temperature DDM

- Address : 0x6A, 0x6B (2byte)



2. EEPROM initial state and basic information

1. state of writing protection of DWDM transceiver

- State of writing protection to A0h/A2h EEPROM right after power on
- To unlock, password with 4 byte is required to address from 0x7B to 0x7E (4byte) of A2h
- once power is recycled, rightly switched to the password lock
- even if wrong password is entered, rightly switched to the password lock

2. Initial state of Table selection of DWDM transceiver

- Table selection Byte is located at address 0x7F of A2h
- Initially set to default Table 01h
- accessible to this register without any unlock procedure

3. Location of DAC registers for laser temperature control

- Located at Table 04h of A2h
- Prior to accessing to DAC register, Table 4 should be selected
- Address 0x8B-0x8C of A2h are assigned for laser temperature control.

4. Locations of Laser temperature monitored value and Alarm/Warning threshold value

- Laser temperature DDM(Digital Diagnostic Monitoring) value is located at address 0x6A and 0x6B (2byte) of A2h
- Laser temperature alarm and warning threshold value are located at address from 0x28 to 0x2F (8byte) of A2h
- In case laser temperature DDM value is outside the threshold value, transmitter's fault signal is asserted and simultaneously laser is not emitted during fault condition.

3. Tuning procedure of laser temperature (1)

Step 1: Input the password to unlock the protection

→ Write "4F 45 53 50h" to each address 0x7B, 0x7C, 0x7D, 0x7E of A2h

Step 2: Selection of Table 04h to control the laser temperature

→ Write "04h" to address 0x7F of A2h

Step 3: Reading the initial value of DAC register

→ Read the initial value of address 0x8B and 0x8C sequentially

Step 4: Changing the value written to the DAC register into the value which customer wants

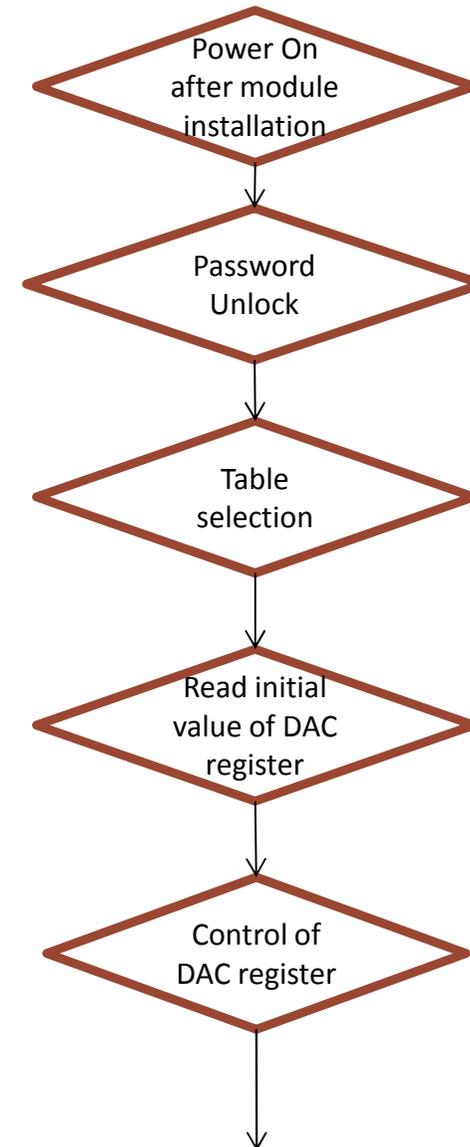
→ Write the value which customer wants to address 0x8B and 0x8C sequentially

→ Refer to the next page which shows the relationship between DAC value and change of wavelength

Step 5: Resetting laser temperature Alarm & Warning threshold value

→ Read the Laser temperature DDM value located at address 0x6A and 0x6B sequentially

(continued to the next page)



3. Tuning procedure of laser temperature (2)

→ With that monitored DDM value, add 0x0100(corresponding to 1 °C) to DDM value and then write that value to address both 0x28 to 0x29(high alarm) and 0x2C to 0x2D(high warning) sequentially

→ With that monitored DDM value, subtract 0x0100 from DDM value, and then write that value to address both 0x2A to 0x2B (Low alarm) and 0x2E to 0x2F(Low warning) sequentially

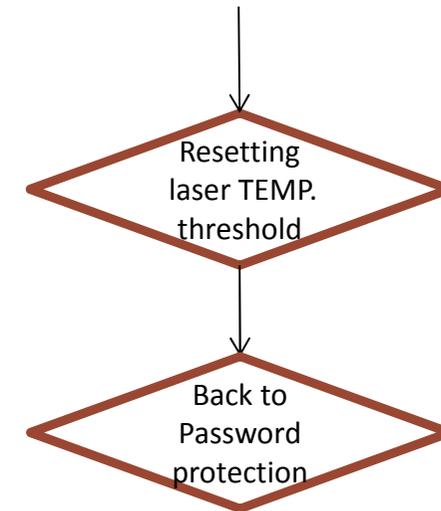
Step 6: 2 ways going back to the password protection

→ Case 1: In case power reset is available.

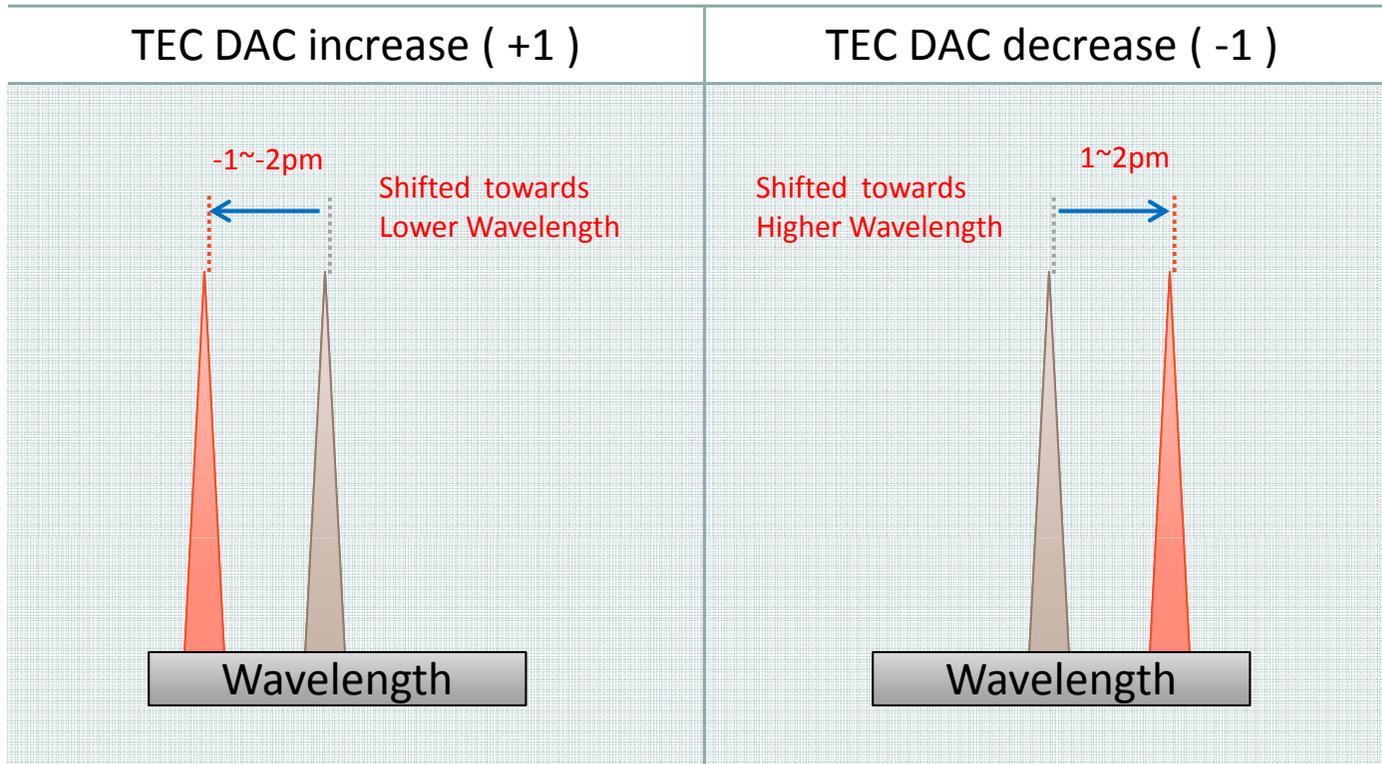
-Reset the power

→ Case 2: In case power reset is not available

-Input the incorrect password (etc “FF FF FF FFh”) to address 0x7B, 0x7C, 0x7D, 0x7E sequentially



3. Relationship between DAC value and laser wavelength



DAC register	Unit	Wavelength Change	
		Min	Max
1 step increment	nm	-0.001	-0.002
5 step increment		-0.007	-0.008
25 step increment		-0.035	-0.005
1 step decrement		0.001	0.002
5 step decrement		0.007	0.008
25 step decrement		0.035	0.05

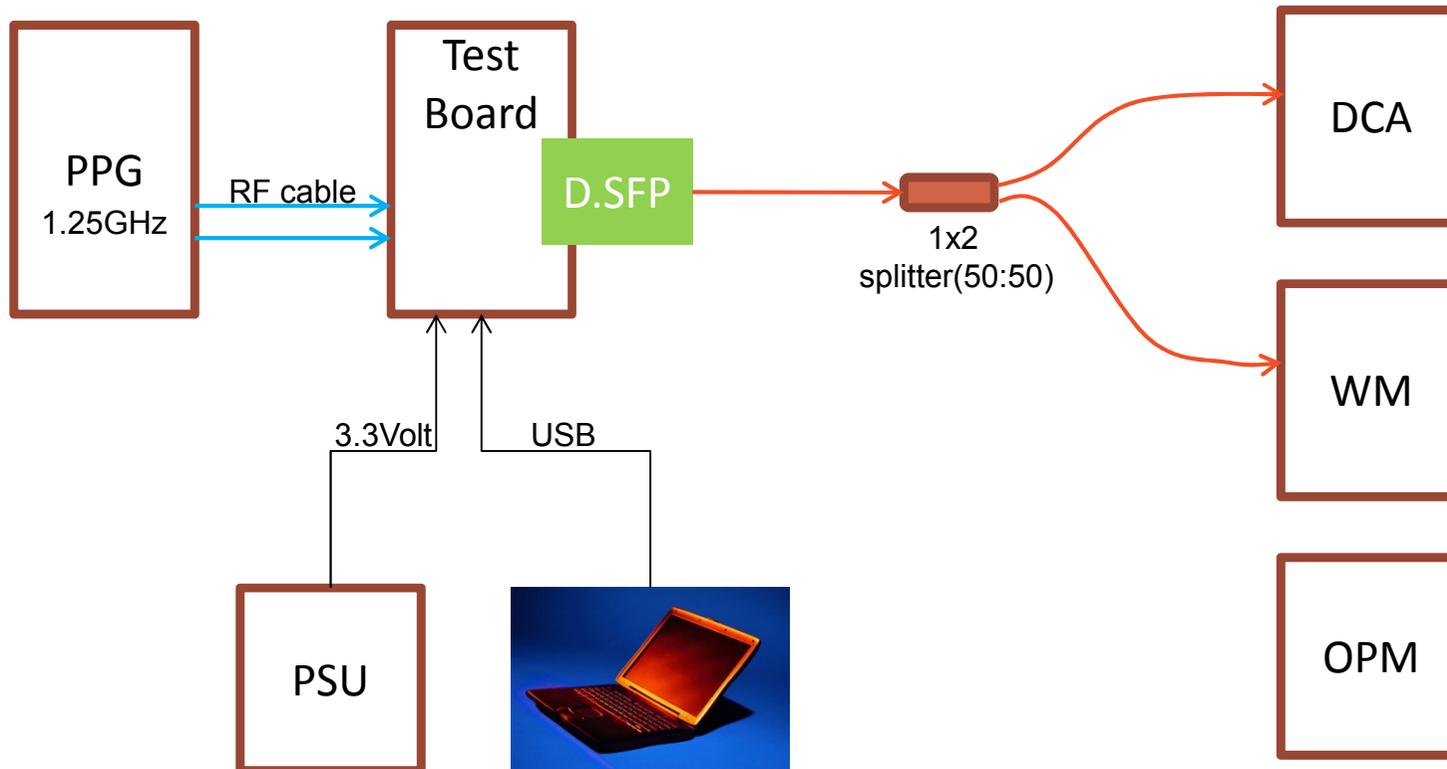
4. Cautions

※ **Be careful not shut down the power right after changing the register**

→ at least 1sec needed to back up the changed value to flash memory

→ Do not access to other registers besides the DAC register for laser wavelength control

Appendix: Setup for tuning the wavelength



PPG: Pulse Pattern Generator (prepared by Aim)
RF cable: 2pcs, (prepared by Aim)
DCA: Digital Communication Analyzer (prepared by Aim)
WM: Wavelength Meter (prepared by Aim)
OPM: Optical Power meter (Prepared by Aim)
PSU: Power Supply Unit (prepared by Aim)

Laptop PC: (prepared by OE)
D.SFP: DWDM SFP (prepared by OE)
1x2 splitter: (Prepared by OE)
Test Board: (Prepared by OE)
USB cable: (prepared by OE)