



Aptio[®] V
TeraDIMM eModule
FAQ



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American Megatrends, Inc.
5555 Oakbrook Parkway,
Building 200
Norcross, GA 30093

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Revision History

| Date | Rev | Description |
|-------------|------------|--------------------|
| 2016-02-25 | 1.0 | Initial version |

A. What do I need to do to add TeraDIMM/Memory1 device support in my BIOS?

Adding TeraDIMM support in a BIOS source is a simple 3-step add-merge-build process:

1. **ADD:** Add the TeraDIMM eModule from AptioV;\$/AptioV/Binary/Hardware/TeraDIMM to your BIOS source.
2. **MERGE:** “TeraDimmPkg.chm” in the eModule has a “Chipset Porting” section that lists the MRC Private files & has the orig-mod diff file of MRC changes included as hyperlink “Click here to download above mentioned Private files based on Grantley label “5.009_Grantley_0ACCB031””. Merge these files to the MRC files in your BIOS source.

Chipset Porting:

TeraDIMM training relies heavily on cooperation with memory reference code, so some code needs to be ported for each chipset. Example has been provided for the Intel Grantley & Intel Grantley Refresh chipsets. This are also the platform used for validation.

To enable example chipset code for Grantley/Grantley Refresh, the token TERADIMM_CHIPSET_PORTED can be enabled. This enables Grantley/Grantley Refresh specific library functions to support the TeraDIMM training. However, in some cases, these functions need to be called directly from Grantley MRC. In this case, the following files need to be set private with the given function calls added.

Grantley:

- MemHost.h**
Add `UINT8 ModuleByte, UINT8 SPDMSd[26] & UINT16 NvmSCMId` to the `dimmNvram` structure definition to provide space for manufacturer specific SPD data & DDR4 fields.
- MemorySetup.hfr**
Modified defaults for `promoteMrcWarnings, promoteWarnings & RankMargin` for MRC not to error out on TeraDIMM.
- MemSPD.c**
Call `CSP_TeraDimmFillMsd(host, socket, ch, dimm, &(*dimmNvList)[dimm])` from `GatherSPDDataDDR4()` in the DIMM For loop to collect Diablo's manufacturer specific SPD data.
- OemMemoryQpiInit.c**
Call `CSP_TeraDimmSetupInit(host)` from `OemGetPlatformSetupValueforMRC()` to override MRC Setup values that are related to TeraDIMM functionality.
- PowerManagementSetup.hfr**
Modified defaults for `CpuPm` for TeraDIMM functionality.
- Uncoreinit.c**
Call `TeraDimmInitAfterMrc(&Host)` immediately after the call to `MemoryQpiInit(&host)` in `PeimMemoryQpiInit()` to reserve TeraDimm address space detected on last boot.

[Click here to download above mentioned Private files based on Grantley label "5.009_Grantley_0ACCB031"](#)

3. **BUILD:** Build a `DEBUG_MODE` BIOS to get Serial trace messages identifying any issues in TeraDIMM support code.

B. Where is the TeraDIMM eModule located?

TeraDIMM eModule is located at AptioV; \$/AptioV/Binary/Hardware/TeraDimm.

C. After adding TeraDIMM eModule, I get a build error like this:

```
error C2039: 'SPDMSd' : is not a member of 'dimmNvram'  
error C2039: 'ModuleByte' : is not a member of 'dimmNvram'  
error C2039: 'NvmSCMId' : is not a member of 'dimmNvram'
```

How to fix them?

Recheck whether Private files in TeraDimmPkg.chm are merged to your source as described in step #2 of question A.

D. What to expect of TeraDIMM device in BIOS or after POST?

BIOS trains the TeraDIMM device, reserves the mapped memory region of TeraDIMM device as “Reserved in E820” table, and creates ACPI table for OS to use the device with the aid of the tmini OS driver provided by Diablo Technologies. The device is not accessible from the UEFI Shell with just the TeraDIMM eModule.

E. Where can I find more information on TeraDIMM eModule?

Further information is available in the following documents:

1. Release Notes “TeraDimmPkg.chm” in the eModule has details on BIOS control flow, chipset porting details, inferring Serial debug messages, and troubleshooting.
2. The “*Aptio 5.x TeraDIMM Porting Guide*” contains porting details and is available under “*Aptio V > Porting Guides*” in the AMI Customer Portal (<https://cp.ami.com/>).

F. What CPU/chipsets are supported in TeraDIMM eModule

The current version of the TeraDIMM eModule (TeraDimmBin_05) supports Grantley (0ACCB) & Grantley Refresh (0ACFL) CRB sources. A few Haswell-EP & Broadwell-EP CPUs are tested. The 0ACCB031 version of Grantley and 0ACFL016 version of Grantley Refresh were tested and the corresponding MRC Private file changes of those projects are attached in the CHM file separately. If your BIOS uses a different version of the CRB BIOS, the MRC Private file changes must be merged to that MRC version, not dropped-in.

G. How do I know if the TeraDIMM eModule worked?

1. By checking the trace Serial trace messages for this message:
`[TeraDIMM]: Node 00 training TeraDIM #0 at 0x18000000... Success!`
2. “memmap” in UEFI Shell should show the base address of TeraDIMM listed in above message reserved as RT_data:
`RT_data 0000000180000000-000000027FFFFFFF 0000000000100000-800000000000000F`
3. After BIOS successfully trains the TeraDIMM device, with the tadmini OS driver from Diablo, you should be able to access the TeraDIMM device like a standard storage device under OS.