[Guide] ML-Sandy_Bridge-HD3000-6_series-hdmi_audio_dsdt_edits

Mountain Lion HDMI Audio
Sandy Bridge –
HD3000 Graphics/6 Series Motherboards w/AMI EFI or BIOS or Award BIOS/DSDT

A simple HDMI Audio dsdt editing tool for OS X HDMI audio on 6 Series motherboards with HD4000 graphics. Based on the MaciASL built by SJ_UnderWater, the Apply button automatically makes the HDMI audio dsdt edits.

Verify BIOS supplier:
1.Verify first line of an AMI dsdt is similar to:
DefinitionBlock ("./dsdt.aml", "DSDT", 2, "ALASKA", "A M I", 0x000000..)
2.Verify first line of an Award dsdt is similar to:
DefinitionBlock ("./dsdt.aml", "DSDT", 1, "GBT ", "GBTUACPI", 0x00001000)

Benefits
1. Automated HDMI audio dsdt editing
2. Installs HD4000 integrated graphics HDMI audio dsdt edits
3. Installs AMD/Nvidia discrete graphics card HDMI audio dsdt edits
4. No copy, no paste, no finding the right place to paste….

Before You Start:
1. OS X does not provide HDMI audio controls (No volume, no mute, no balance, etc.)
2. The connected HDMI device (TV, receiver, etc.) provides any and all audio controls
3. Delete any audio enablers (S/L/E/HDAEnabler1.kext)
4. Remove any property-type injection (Extra/org.chameleon.Boot.plist)

Requirements
1. Intel
1a. Sandy Bridge 6 Series motherboards - H61, H67, P67, Z68
2. OS X
2a. Mountain Lion - 10.8.2 and newer

3. dsdt - no compile errors
3a. No dsdt, extract dsdt, see **I. Preparation**
4. Motherboard onboard audio codec
4a. Realtek supported audio codecs (8xy): 885, 887, 888, 889, 892, 898
4b. Unsupported audio codecs: ML HDMI audio works with any unsupported audio codec/no onboard audio
5. AppleHDA.kext (one of the following)
5a. ML: MultiBeast 5.2.1 or newer/Audio/Realtek ALC8xx/With DSDT/ALC...
5b. ML: Native AppleHDA.kext (unsupported audio codecs)

More Information
Special HDMI Audio Considerations
Detailed Instructions
See **Mountain Lion HDMI Audio - AMI DSDT**
Or **Mountain Lion HDMI Audio - Award DSDT**

Tools
1. MaciASL MaciASL | Free Development software downloads at SourceForge.net
2. IORegistryExplorer see [Guide] How to Make a Copy of IOReg
3. CarbonCopyCloner or SuperDuper
4. Download/ZIP: https://github.com/toleda/audio_hdmi_hd3000

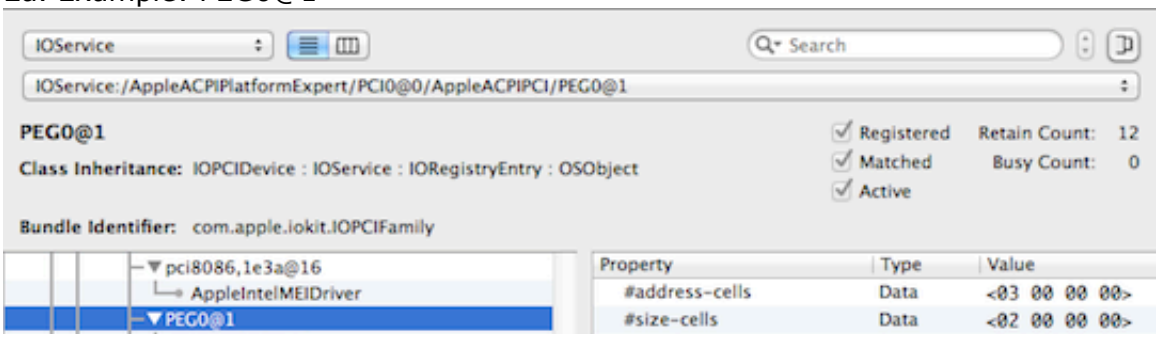
Mountain Lion Audio IDs (10.8.2 AppleHDA.kext_v2.3.1 or newer)
1. Audio ID 1/A1: AMD/Nvidia HDMI audio with 3/5/6 port onboard audio
2. Audio ID 3/A3: HD3000 HDMI audio with 3/5/6 port onboard audio
Note: For Audio ID: 3 (HD3000 HDMI audio), the appropriate Patch must be edited.

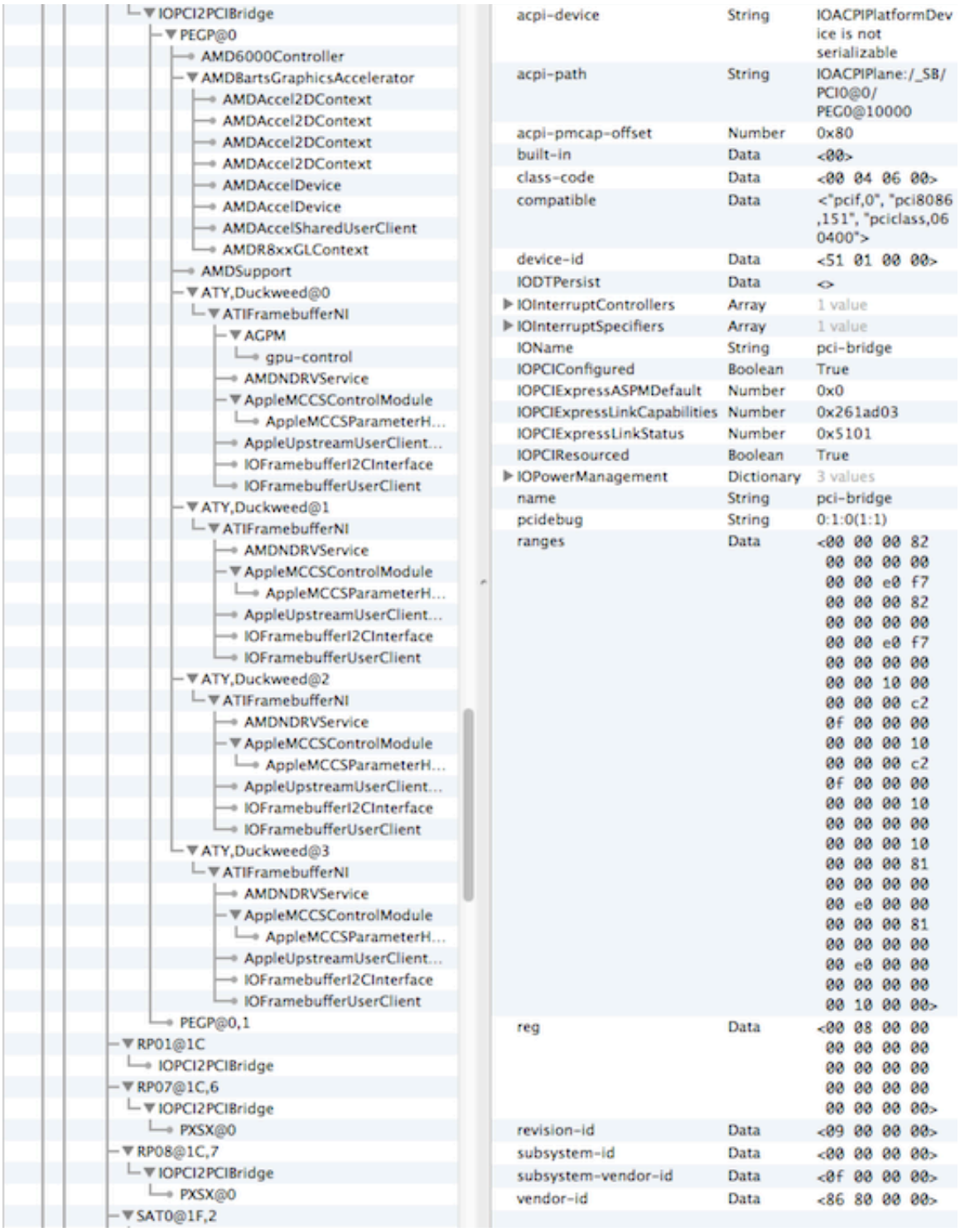
Patches - github.com/toleda/audio_hdmi_hd3000/tree/master/Patches
IB1. AMI-EFI/Clean Compile - fix native EFI dsdt compiler errors for successful dsdt edits
SB2. AMI-EFI-HD3000-AMD-Nvidia-6_Series-A1 - AMD/Nvidia/HD3000 HDMI audio dsdt edits
SB3. AMI-BIOS-HD3000-AMD-Nvidia-6_Series-A1 - AMD/Nvidia/HD3000 HDMI audio dsdt edits
SB4. Award-BIOS-HD3000-AMD-Nvidia-6_Series-A1 - AMD/Nvidia/HD3000 HDMI audio dsdt edits
SB5. HD3000-on-7_Series_MB - HD3000 MEI dsdt edit

Attachments
N/A ML HDMI audio dsdt edits are available in MaciASL/Patch

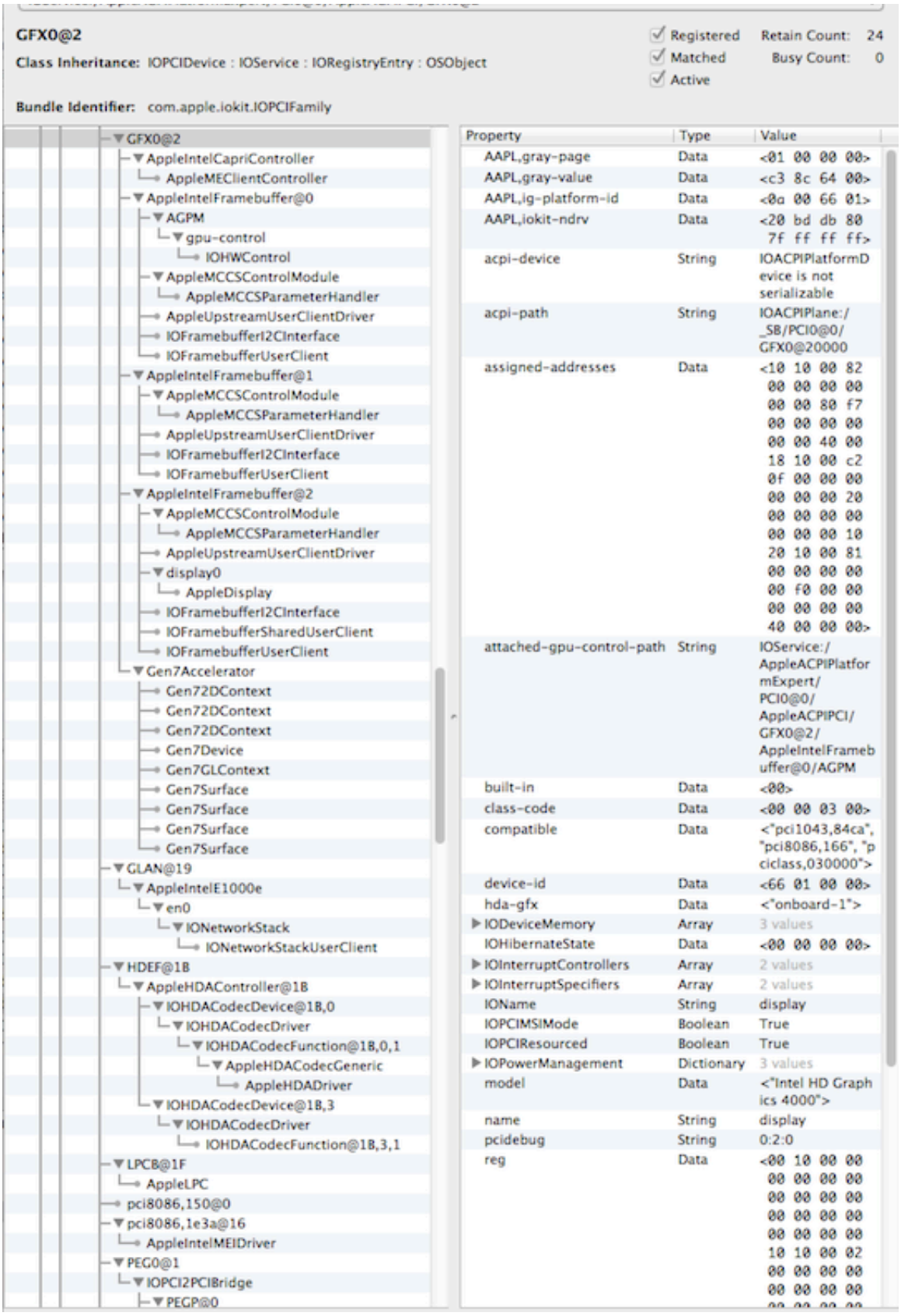
Key Information
1. Determine graphics device names and address
1a. IOReg/Search display
1a. Example: Discrete Graphics - PEG0@1, P0P1@1, P0P3@3, NVE3@3, etc.
1a. Example: Integrated Graphics - GFX0@2

2. Determine discrete graphics device names and address
2a. IOReg/Search PEG0
2a. Example: PEG0@1

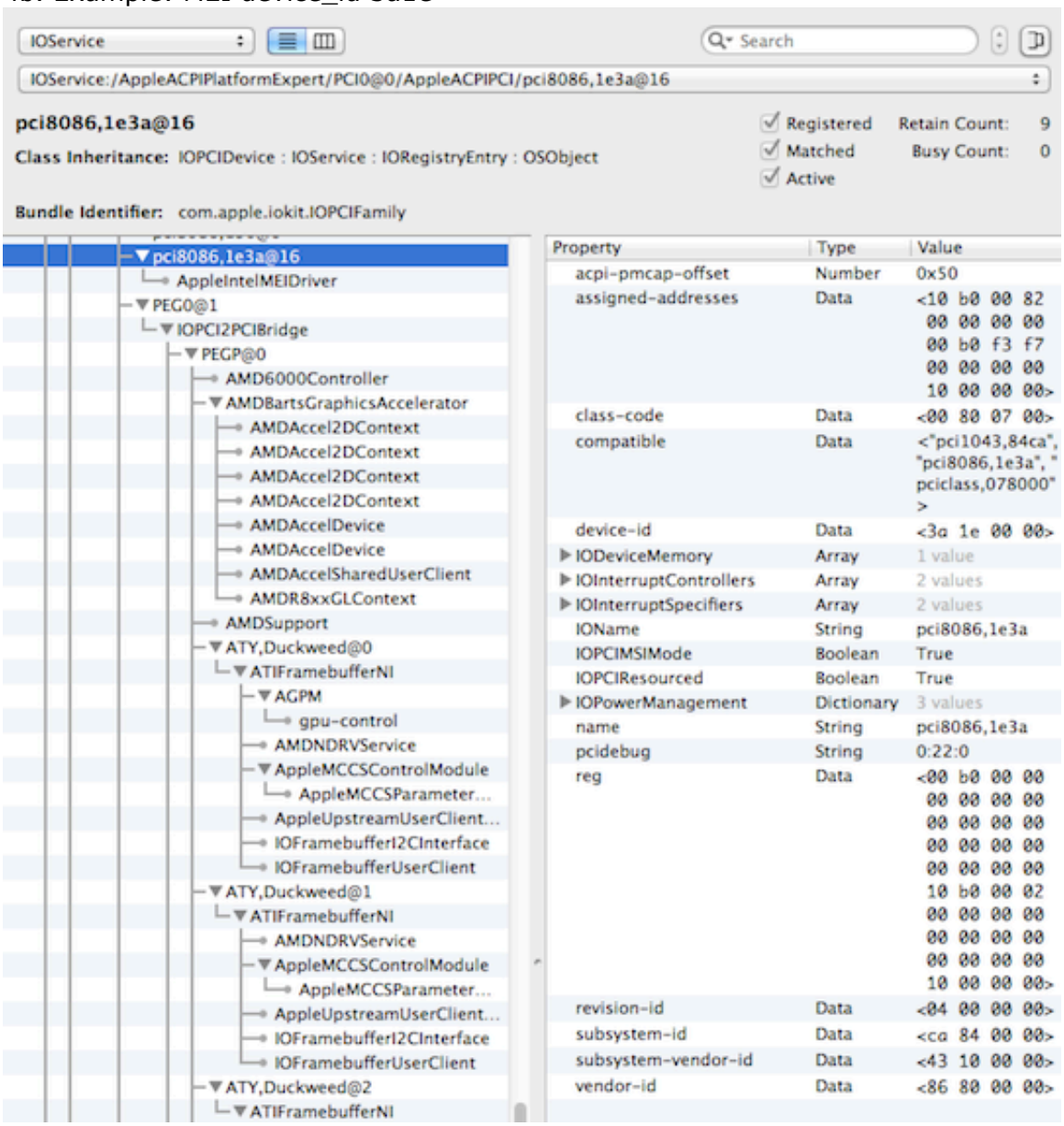




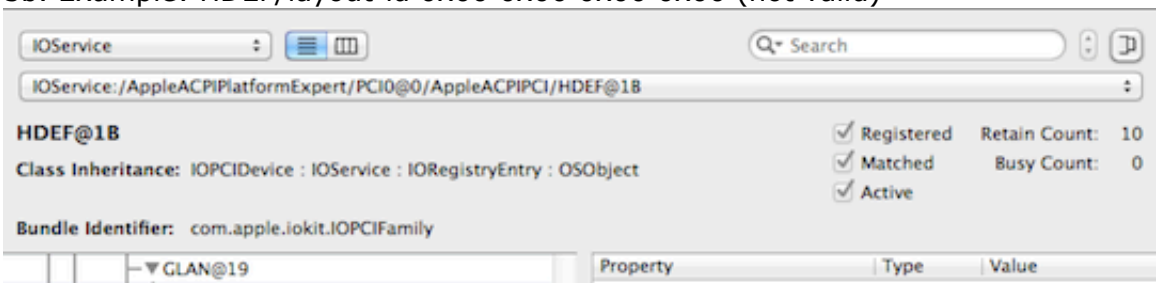
3. Determine integrated graphics device names and address (N/A - HD3000 is not enabled)
3a. IOReg/Search GFX0, Select GFX0, Cancel Search (X), Scroll up
3a. Example: GFX0@2

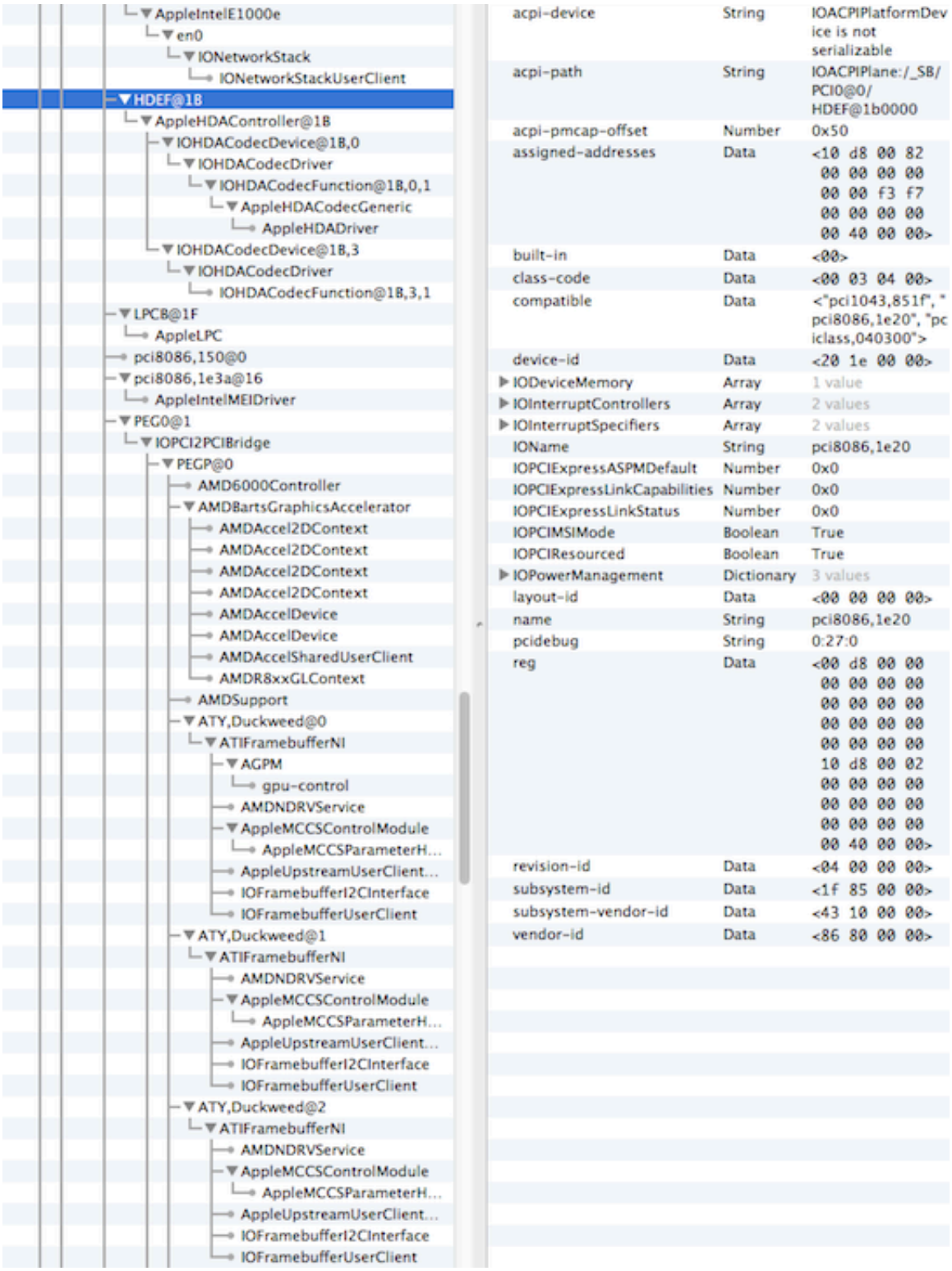

GFX0@2
Class Inheritance: IOPCIDevice : IOService : IORegistryEntry : OSObject
Registered
Matched
Active
Retain Count: 24
Busy Count: 0
Bundle Identifier: com.apple.iokit.IOPCIFamily
GFX0@2
AppleIntelCapriController
AppleMEClientController
AppleIntelFramebuffer@0
AGPM
gpu-control
IOHWControl
AppleMCCSControlModule
AppleMCCSParameterHandler
AppleUpstreamUserClientDriver
IOFramebufferI2CInterface
IOFramebufferUserClient
AppleIntelFramebuffer@1
AppleMCCSControlModule
AppleMCCSParameterHandler
AppleUpstreamUserClientDriver
IOFramebufferI2CInterface
IOFramebufferUserClient
AppleIntelFramebuffer@2
AppleMCCSControlModule
AppleMCCSParameterHandler
AppleUpstreamUserClientDriver
display0
AppleDisplay
IOFramebufferI2CInterface
IOFramebufferSharedUserClient
IOFramebufferUserClient
Gen7Accelerator
Gen72DContext
Gen72DContext
Gen72DContext
Gen7Device
Gen7GLContext
Gen7Surface
Gen7Surface
Gen7Surface
Gen7Surface
GLAN@19
AppleIntelE1000e
en0
IONetworkStack
IONetworkStackUserClient
HDEF@1B
AppleHDAController@1B
IOHDACodecDevice@18,0
IOHDACodecDriver
IOHDACodecFunction@18,0,1
AppleHDACodecGeneric
AppleHDADriver
IOHDACodecDevice@18,3
IOHDACodecDriver
IOHDACodecFunction@18,3,1
LPCB@1F
AppleLPC
pci8086,150@0
pci8086,1e3a@16
AppleIntelMEIDriver
PEG0@1
IOPCI2PCIBridge
PEGP@0
Property
Type
Value
AAPL,gray-page
Data
<01 00 00 00>
AAPL,gray-value
Data
<c3 8c 64 00>
AAPL,ig-platform-id
Data
<0a 00 66 01>
AAPL,iokit-ndrv
Data
<20 bd db 80 7f ff ff ff>
acpi-device
String
IOACPIPlatformDevice is not serializable
acpi-path
String
IOACPIPlane:/_SB/PCI0@0/GFX0@20000
assigned-addresses
Data
<10 10 00 82 00 00 00 00 00 00 80 f7 00 00 00 00 00 00 40 00 18 10 00 c2 0f 00 00 00 00 00 00 20 00 00 00 00 00 00 00 10 20 10 00 81 00 00 00 00 00 f0 00 00 00 00 00 00 00 40 00 00 00>
attached-gpu-control-path
String
IOService:/AppleACPIPlatformExpert/PCI0@0/AppleACPIPCI/GFX0@2/AppleIntelFramebuffer@0/AGPM
built-in
Data
<00>
class-code
Data
<00 00 03 00>
compatible
Data
<"pci1043,84ca", "pci8086,166", "pciclass,030000">
device-id
Data
<66 01 00 00>
hda-gfx
Data
<"onboard-1">
IODeviceMemory
Array
3 values
IOHibernateState
Data
<00 00 00 00>
IOInterruptControllers
Array
2 values
IOInterruptSpecifiers
Array
2 values
IOName
String
display
IOPCIMSIMode
Boolean
True
IOPCIResourced
Boolean
True
IOPowerManagement
Dictionary
3 values
model
Data
<"Intel HD Graphics 4000">
name
String
display
pcidebug
String
0:2:0
reg
Data
<00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 10 10 00 02 00 00 00 00 00 00 00 00

4. Verify MEIDriver (Applies only to HD3000 on 7 series)
4a. IOReg/Search MEI, Select MEI Cancel Search (X), Scroll up
4b. Example: MEI device_id 3a1e

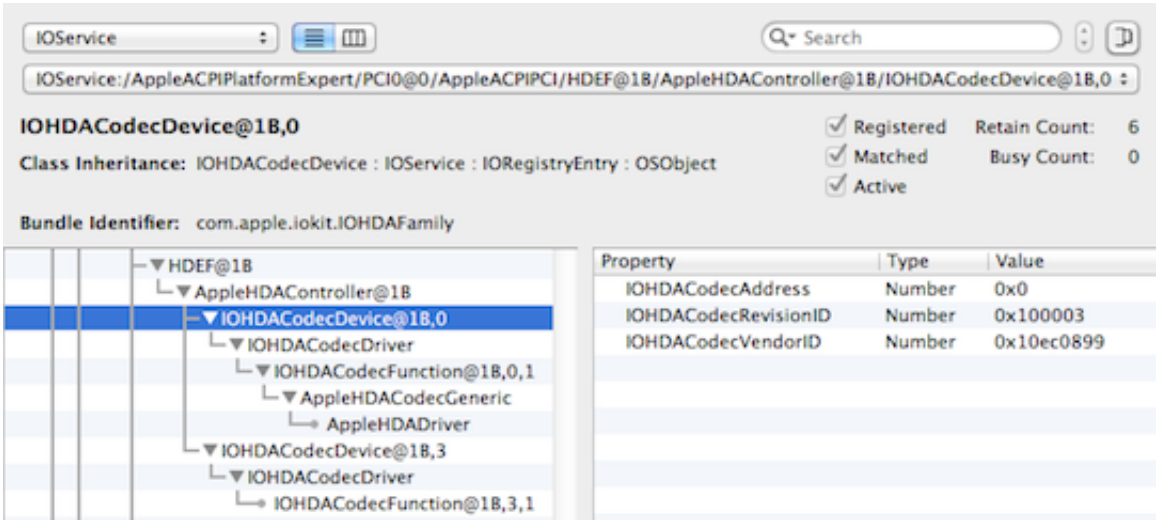


5. Verify HDEF
5a. IOReg/Search HDEF, Select HDEF, Cancel Search (X), Scroll up
5b. Example: HDEF/layout-id 0x00 0x00 0x00 0x00 (not valid)





6. Determine motherboard audio codec device_id (Select 2nd line after HDEF)
6a. IOReg/AppleHDAController/OHDACodecDevice/IOHDACodecVendorId
6b. Example: IOReg/10ec0899
6c. Note: if CodecVendorId is not 10ec8xx, onboard audio is not supported.



Evaluate IOReg > HDMI Audio dsdt edit file Key Information

1. AMI EFI/6 Series

AMI EFI/6 Series	IOReg	HDMI Audio Edit file	After HDMI Audio Edits
discrete graphics	**@**	PEGO@1	PEGP@1
integrated graphics	**@**	GFX0@2	IGPU@2

1a. If IOReg shows PEGO@1, no edit is required
1b. If IOReg shows ABCD@n, the edits are:
1c. Edit Name/Find: PEG0/Replace All: ABCD
1d. Edit Address/Find: 0x00010000/Replace All: 0x000n0000
1e. If IOReg shows no GFX0@2, no edit is required
1f. If IOReg shows DEFG@2, the edits are:
1g. Edit Name/Find: GFX0/Replace All: DEFG
1h. If Audio ID: 1 is correct, no edit is required
1i. For Audio ID: 3/Find: 0x01, 0x00, 0x00, 0x00/Replace All: 0x03, 0x00, 0x00, 0x00

2. AMI BIOS/6 Series

AMI BIOS/6 Series	IOReg	HDMI Audio Edit file	After HDMI Audio Edits
discrete graphics	**@**	P0P1@1	PEGP@1
integrated graphics	**@**	GFX0@2	IGPU@2

2a. If IOReg shows P0P1@1, no edit is required
2b. If IOReg shows ABCD@n, the edits are:
2c. Edit Name/Find: P0P1/Replace All: ABCD
2d. Edit Address/Find: 0x00010000/Replace All: 0x000n0000
2e. If IOReg shows no GFX0@2, no edit is required
2f. If IOReg shows DEFG@2, the edits are:
2g. Edit Name/Find: GFX0/Replace All: DEFG
2h. If Audio ID: 1 is correct, no edit is required
2i. For Audio ID: 3/Find: 0x01, 0x00, 0x00, 0x00/Replace: 0x03, 0x00, 0x00, 0x00

3. Award BIOS/6 Series (Verify PEG0 address, 1 or 3)

Award BIOS/6 Series	IOReg	HDMI Audio Edit file	After HDMI Audio Edits
discrete graphics	PEG0@1	PEG0@1	PEGP@1

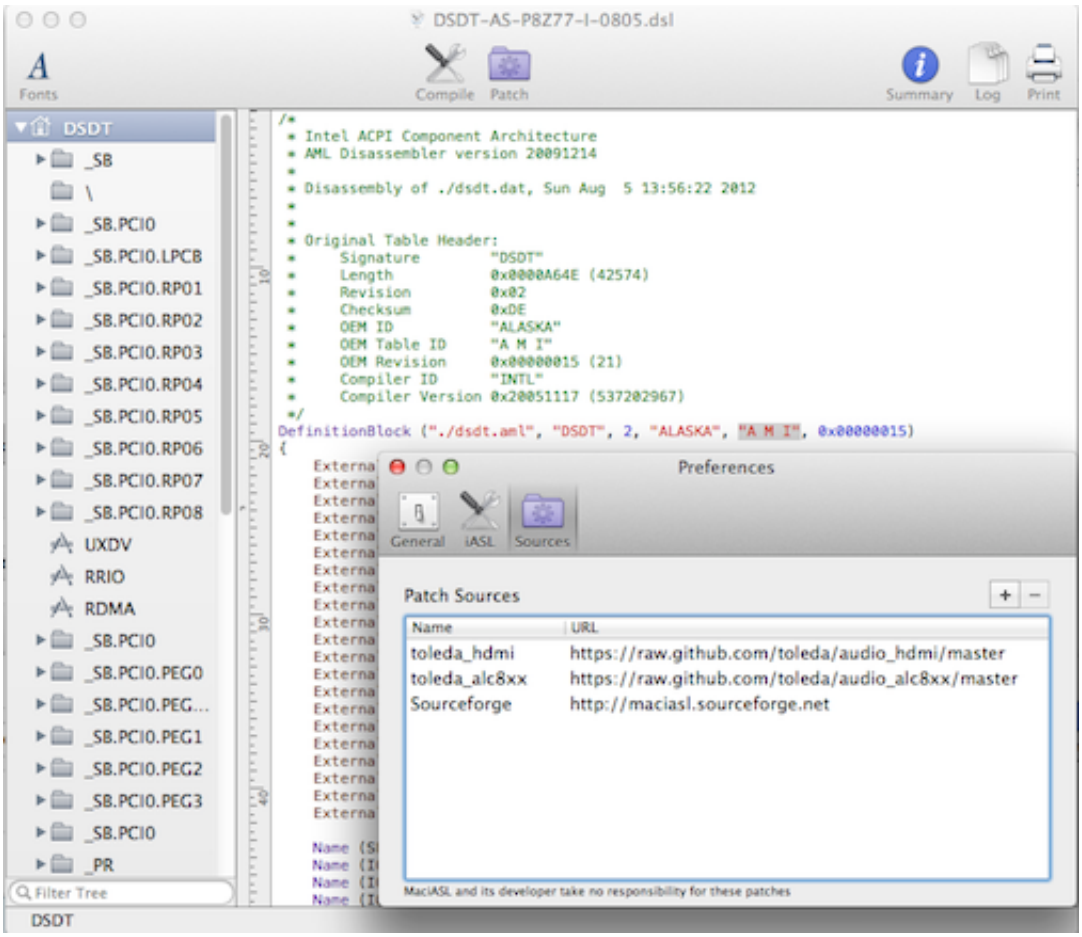
integrated graphics	IGD0@2	IGD0@2	IGPU@2

3a. IOReg shows PEGO@1 and IGD0@2 (if present)
3b. If Audio ID: 1 is correct, no edit is required
3c. For Audio ID: 3/Find: 0x01, 0x00, 0x00, 0x00/Replace All: 0x03, 0x00, 0x00, 0x00

Patch File Edits
1. If the Patch file requires edits,
1a. Edit the Patch file in MaciASL Patch window or
1b. Download the Patch from:
Download/ZIP: https://github.com/toleda/audio_hdmi_hd3000
edit with TextEdit and save to desktop.

Start of Procedure
Sandy Bridge/HD3000/6 Series Motherboards - Mountain Lion HDMI audio edits

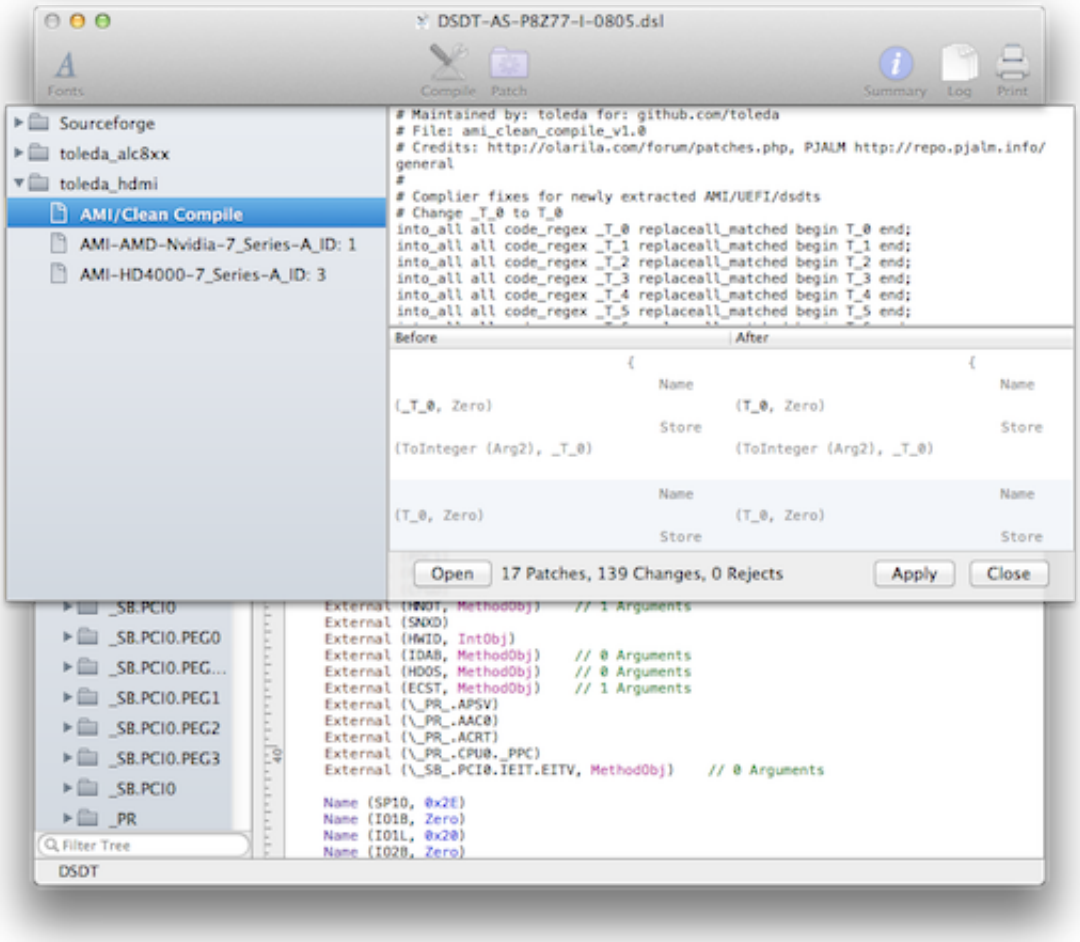
I. Preparation
1. Make bootable backup of system (CarbonCopyCloner or SuperDuper)
2. Make a copy of IOReg, see **Tools**/2.
3. Verify no audio enablers (S/L/E/HDAEnabler1.kext, HDAEnabler8xx.kext, etc.)
4. MultiBeast 5.2.1 or newer - Select/Drivers & Bootloaders/Drivers/Audio/Realtek ALC8xx/With DSDT/ALC8--, if Realtek ALC8xx audio,
5. Download MaciASL and install/Applications, see **Tools**/1.
6. Applications/MaciASL
7. MaciASL/Preferences/Sources/+/https://raw.github.com/toleda/audio_hdmi_hd3000/master
7a. URL: https://raw.github.com/toleda/audio_hdmi_hd3000/master
7b. Screenshot



8. With dsdt,
8a. Copy Extra/dsdt.aml to Desktop
8b. MaciASL/File/Open/Desktop/dsdt.aml
8c. jump to **II. Native Compile**
9. If no dsdt,
9a. MaciASL/File/New from ACPI/DSDT
9b. MaciASL/File/Save As../Desktop/dsdt-motherboard-native.dsl

II. Native Compile

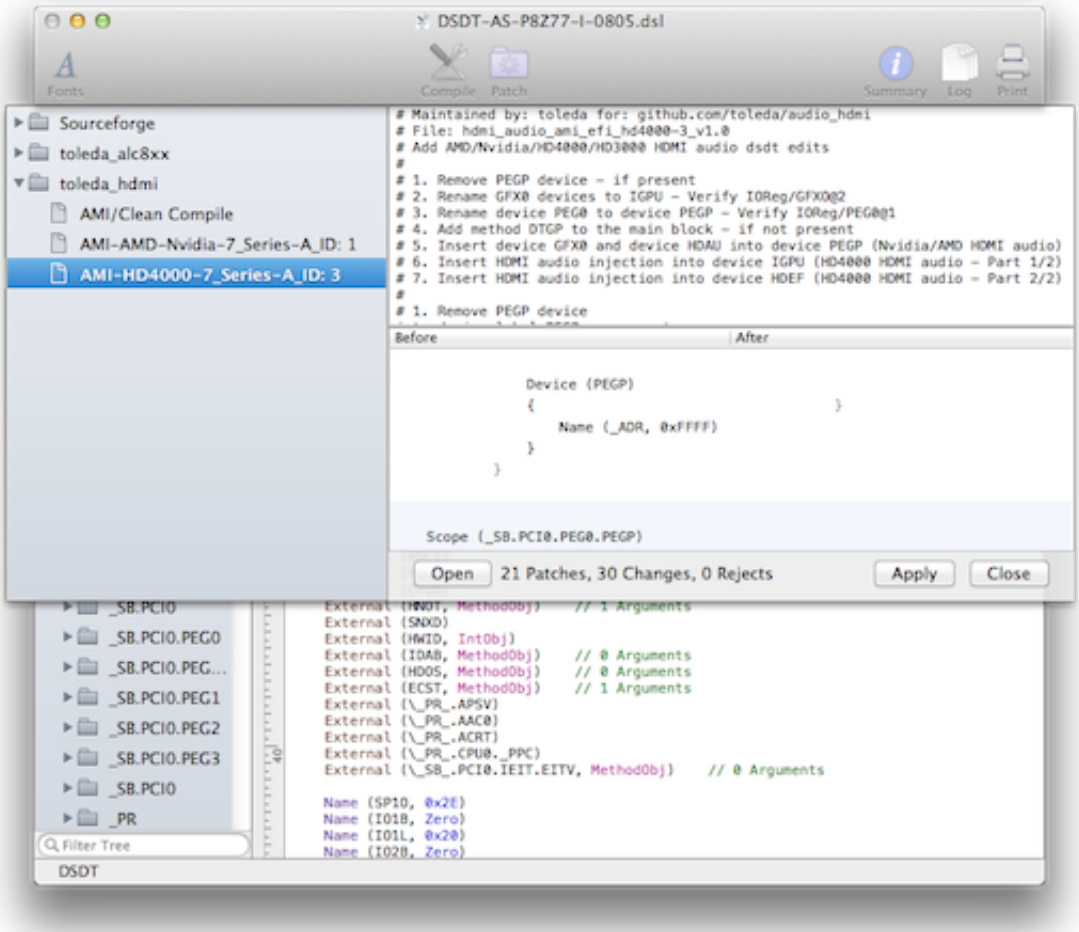
10. Verify AMI dsdt (1st line)
10a. DefinitionBlock ("./dsdt.aml", "DSDT", 2, "ALASKA", "A M I", 0x000000..)
OR
10. Verify Award dsdt (1st line)
10a. DefinitionBlock ("./dsdt.aml", "DSDT", 1, "GBT ", "GBTUACPI", 0x00001000)
10b. If dsdt is not AMI or Award, this method will not work. Full Stop.
11. MaciASL/Patch/Select AMI-EFI/Clean Compile (AMI-EFI only)
11a. Screenshot



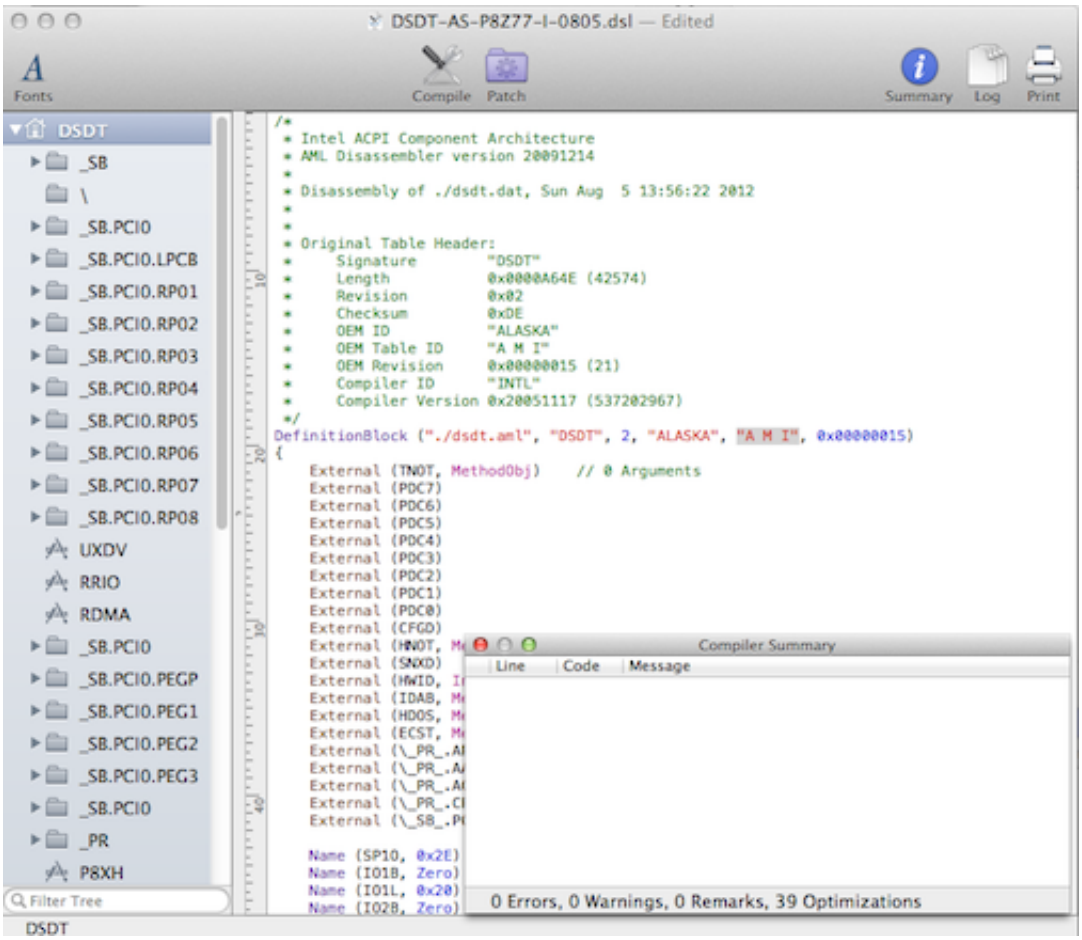
12. MaciASL/Patch/Apply
13. MaciASL/Patch/Close
14. MaciASL/Compile
14a. See Screenshot at 19a
15. If no errors, jump to **III. Apply Patch file - MaciASL**
15a. Errors, see Troubleshooting/Problem Reporting/4.

III. Apply Patch file - MaciASL

16. Choose Patch:
16a. Patch/toleda_hdmi_hd3000/Select appropriate Patch file and make any edits
OR Patch/Open/Desktop/Edited Patch file from **Patch File Edits** above
16b. Screenshot



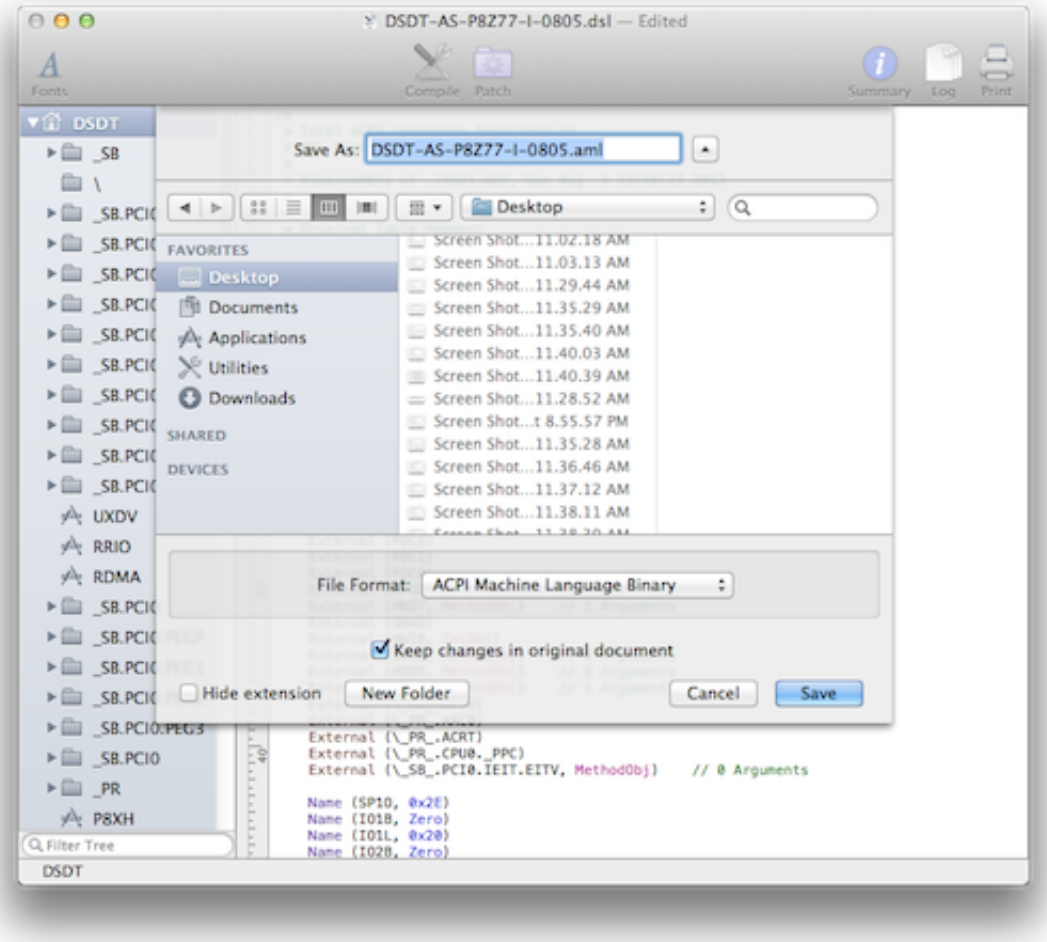
17. MaciASL/Patch/Apply
18. MaciASL/Patch/Close
19. MaciASL/Compile
19a. Screenshot



20. If no errors, jump to **IV. Save dsdt.aml - MaciASL**
20a. Errors, see Troubleshooting/Problem Reporting/4.

IV. Save dsdt.aml - MaciASL

21. MaciASL/File/Save As… /ACPI Machine Language Binary/Desktop/dsdt.aml (add extension)
21a. Screenshot



V. Install dsdt.aml - MaciASL

22. MaciASL/File/Save As… /ACPI Machine Language Binary/Extra/dsdt.aml (add extension)

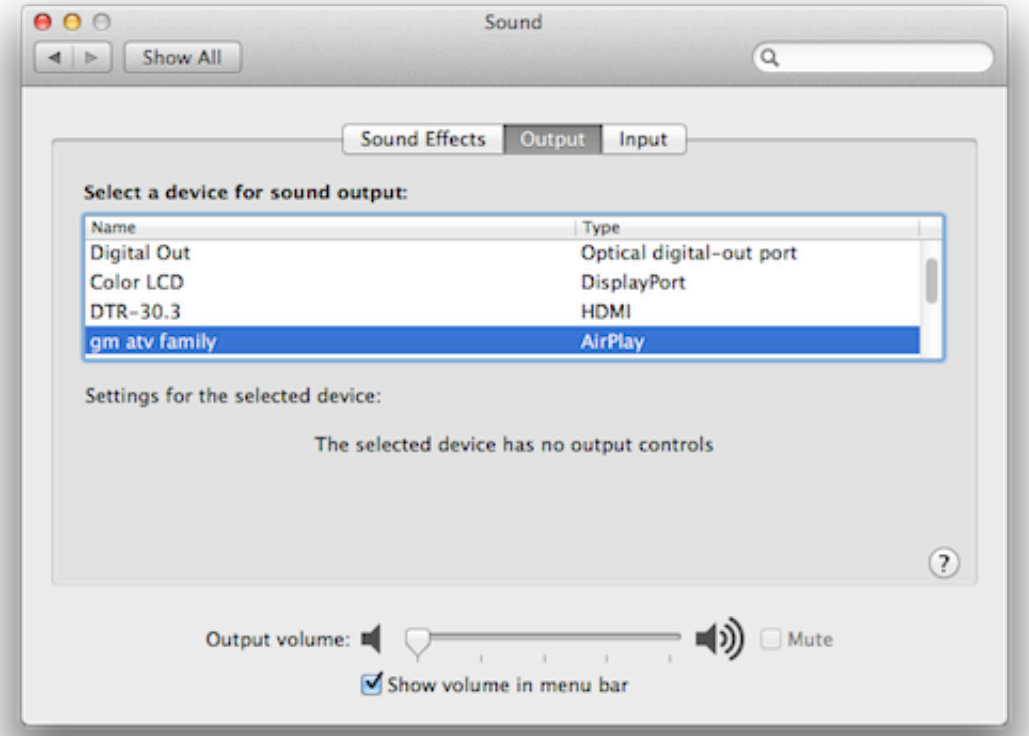
VI. Restart

23. Repair permissions and cache (Ex., Disk Utility, Kext Beast, Kext Utility, Kext Wizard, etc.)
24. Restart

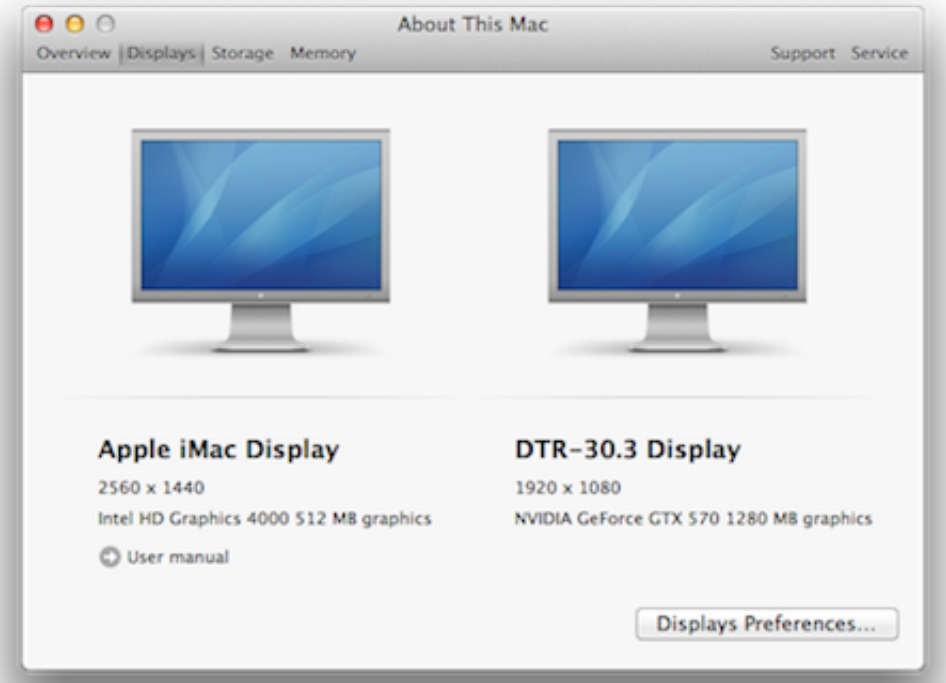
VII. Verify HDMI Audio

P8Z77 I Deluxe/i7-3770K/HD4000 DP audio/NVidia HDMI audio/AirPlay Mirroring

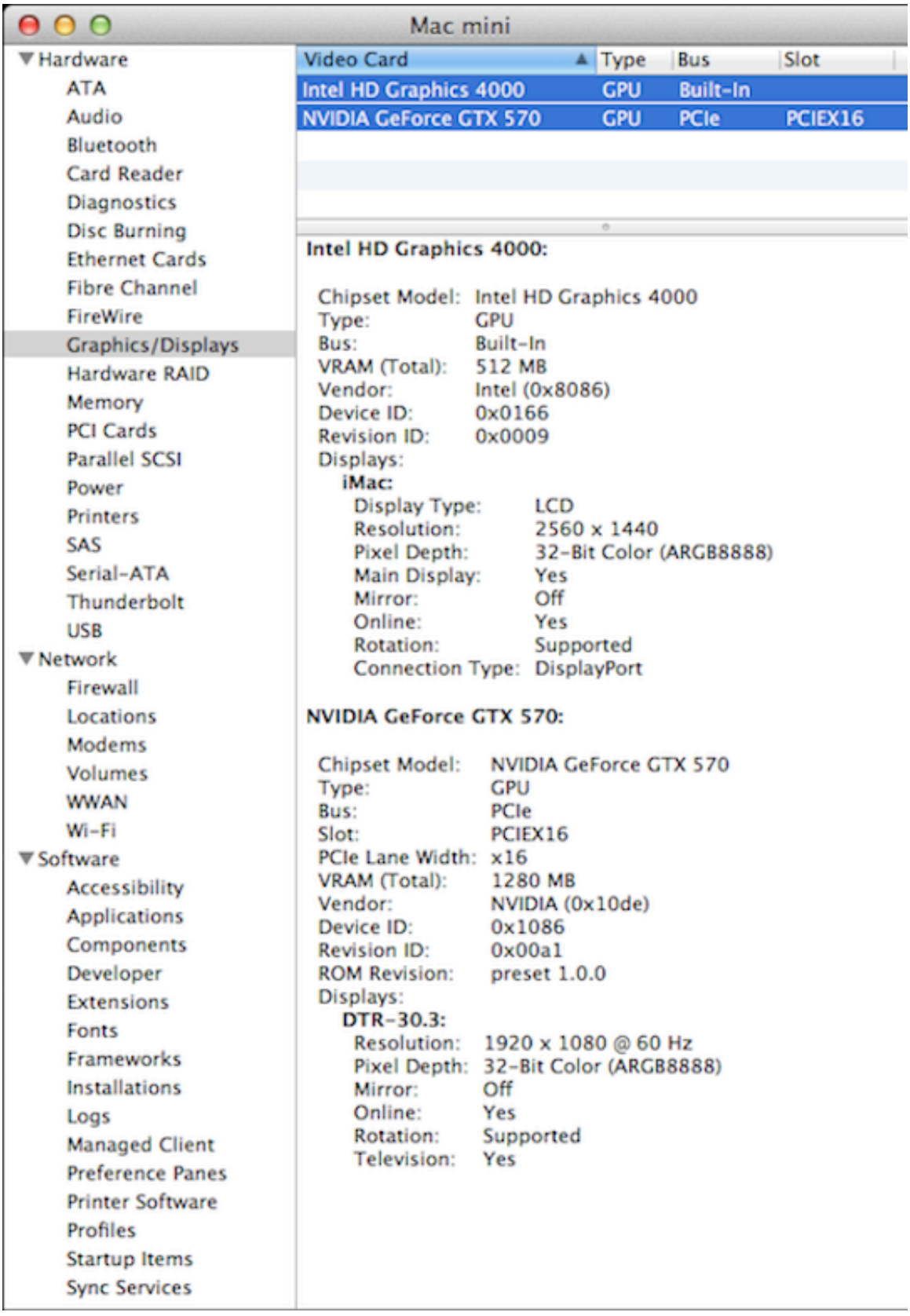
25. System Preferences/Sound/Outputs/Select HDMI


Sound
Show All
Sound Effects
Output
Input
Select a device for sound output:
Name
Type
Digital Out
Optical digital-out port
Color LCD
DisplayPort
DTR-30.3
HDMI
gm atv family
AirPlay
Settings for the selected device:
The selected device has no output controls
Output volume:
Mute
Show volume in menu bar


About This Mac
Overview
Displays
Storage
Memory
Support
Service
Mac mini
Late 2012
Processor 3.51 GHz Intel Core i7
Memory 8 GB 1333 MHz DDR3
Graphics Intel HD Graphics 4000 512 MB
Serial Number C07JF8Z4DWYL
Software OS X 10.8.2 (12C60)
System Report...
Software Update...


About This Mac
Overview
Displays
Storage
Memory
Support
Service
Apple iMac Display
2560 x 1440
Intel HD Graphics 4000 512 MB graphics
User manual
DTR-30.3 Display
1920 x 1080
NVIDIA GeForce GTX 570 1280 MB graphics
Displays Preferences...


iMac
Show All
Display
Arrangement
Color
Resolution:
Best for display
Best for AirPlay
Scaled
Rotation:
Standard
AirPlay Mirroring:
gm atv family
Overscan correction
Show mirroring options in the menu bar when available
Gather Windows


Mac mini
Hardware
ATA
Audio
Bluetooth
Card Reader
Diagnostics
Disc Burning
Ethernet Cards
Fibre Channel
FireWire
Graphics/Displays
Hardware RAID
Memory
PCI Cards
Parallel SCSI
Power
Printers
SAS
Serial-ATA
Thunderbolt
USB
Network
Firewall
Locations
Modems
Volumes
WWAN
Wi-Fi
Software
Accessibility
Applications
Components
Developer
Extensions
Fonts
Frameworks
Installations
Logs
Managed Client
Preference Panes
Printer Software
Profiles
Startup Items
Sync Services
Video Card
Type
Bus
Slot
Intel HD Graphics 4000
GPU
Built-In
NVIDIA GeForce GTX 570
GPU
PCIe
PCIEX16
Intel HD Graphics 4000:
Chipset Model: Intel HD Graphics 4000
Type: GPU
Bus: Built-In
VRAM (Total): 512 MB
Vendor: Intel (0x8086)
Device ID: 0x0166
Revision ID: 0x0009
Displays:
iMac:
Display Type: LCD
Resolution: 2560 x 1440
Pixel Depth: 32-Bit Color (ARGB8888)
Main Display: Yes
Mirror: Off
Online: Yes
Rotation: Supported
Connection Type: DisplayPort
NVIDIA GeForce GTX 570:
Chipset Model: NVIDIA GeForce GTX 570
Type: GPU
Bus: PCIe
Slot: PCIEX16
PCIe Lane Width: x16
VRAM (Total): 1280 MB
Vendor: NVIDIA (0x10de)
Device ID: 0x1086
Revision ID: 0x00a1
ROM Revision: preset 1.0.0
Displays:
DTR-30.3:
Resolution: 1920 x 1080 @ 60 Hz
Pixel Depth: 32-Bit Color (ARGB8888)
Mirror: Off
Online: Yes
Rotation: Supported
Television: Yes

Troubleshooting
1. Verify HDMI device connected
1a. System Information/Graphics/Display/HDMI device name/Television/Yes
2. Verify Extra/dsdt.aml is
2a. .aml file
2b. edited
3. Run IOReg/Verify Devices (PEGP, GFX0, HDAU, HDEF and IGPU)
3a. Device (IGPU) may not be present if HD4000 Graphics is not enabled
3b. Device (GFX0) and Device (HDAU) may not be present if no discrete graphics
4. Problem Reporting/AMI dsdt/Post to Mountain Lion HDMI Audio - AMI DSDT
4. Problem Reporting/Award dsdt/Post to Mountain Lion HDMI Audio - Award DSDT
4a. Motherboard/BIOS version/processor/graphics/OS and version
4b. dsdt
4c. copy of IOReg

References
Mountain Lion HDMI Audio - AMI DSDT
Mountain Lion HDMI Audio - Award DSDT
https://github.com/toleda/audio_hdmi_hd3000

Credits:
VCH888: ALC889A, Gigabyte (Intel): now having a working front mic - Page 38 - Sound - InsanelyMac Forum
SJ_UnderWater: Native DSDT/AML IDE & Compiler: MaciASL Open Beta

[Guide] ML-Sandy_Bridge-HD3000-6_series-hdmi_audio_dsdt_edits_v1.0