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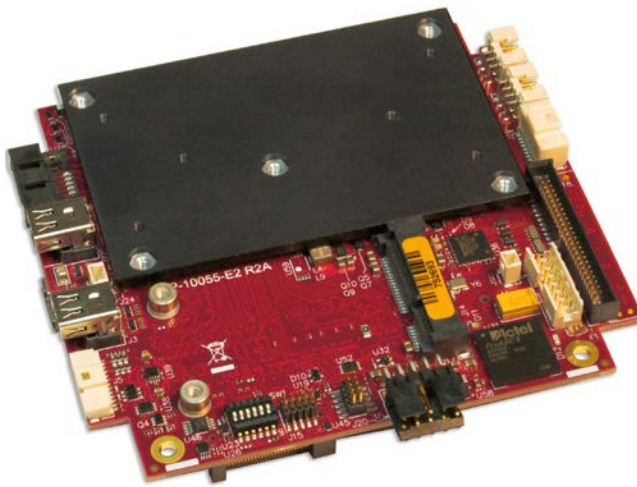
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BIOS Reference Manual

REV. 7 August 2017

Bengal (VL-EPMe-30)

Intel® Atom™-based SBC with Dual Ethernet, Video, USB, SATA, Serial I/O, Digital I/O, Trusted Platform Module Security, Counter/Timers, Mini PCIe, mSATA, SPX, and PCIe/104 OneBank™ Interface





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Product Release Notes

This document reflects the content of the BIOS Setup program for the EPMe-30 Bengal Board.

Board Revision	BIOS Version	BIOS ID String	Comments
Rev 2.00	1.01	Bengal_3.1.0.334.r1.101	First release of document
Rev 2.02A	1.02	Bengal_3.1.0.334.r1.102	Changed default setting of PCIe 1 speed from <u>Auto</u> to <u>Gen 1</u>
Rev 3.00	1.04	Bengal_3.1.0.547.r1.104	
Rev 3.01	1.05	Bengal_3.1.0.547.r1.105	Updated Web Links Refer to the table below

Table 1: Changes from BIOS 334.r1.104 to BIOS 547.r1.105

Change	Ref.
Updated video BIOS and GOP driver to better support DP++ mode.	N/A
Added Intel PXE ROM for built-in I210 Ethernet	N/A
<u>Added option to configure action on boot failure.</u>	N/A
Fixed fan control issues.	N/A
Removed 9600 baud setting from console redirection options.	Page 16
Removed Load Optimized Defaults from Exit tab.	Page 132

Support Page

The [Bengal Support Page](#) contains additional information and resources for this product including:

- Operating system information and software drivers
- Data sheets and manufacturers' links for chips used in this product
- BIOS information and upgrades

VersaTech KnowledgeBase

The [VersaTech KnowledgeBase](#) contains useful technical information about VersaLogic products, along with product advisories.

Customer Support

If you are unable to solve a problem after reading this manual, visiting the product support page, or searching the KnowledgeBase, contact VersaLogic Technical Support at (503) 747-2261. VersaLogic support engineers are also available via e-mail at Support@VersaLogic.com.

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The BIOS Setup utility is stored in the Serial Peripheral Interface (SPI) Flash device. The initial production BIOS ID string is Bengal_3.1.0.547.r1.104.

The BIOS Setup utility can be used to view and change the BIOS settings for the Bengal board.

To access the BIOS Setup utility, press  during the early boot cycle.

The top-level menu bar is shown below.

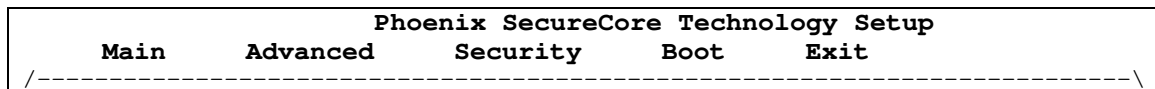













Table 2 lists the BIOS Setup utility top-level menu bar features.

Table 2: Top-level Menu Bar Features

Menu	Function
Main	Displays processor and memory configuration
Advanced	Configures advanced features available through the chipset
Security	Sets passwords and security features
Boot	Selects boot device options
Exit	Saves or discards changes to Setup utility options

Table 3 lists the function keys available for menu screens.

Table 3. BIOS Setup Utility Function Keys

Menu	Function
	Help
 or 	Selects an item (Moves the cursor up or down)
 or 	Changes values
	Loads setup default values
	Exits the menu
 or 	Selects a different menu screen (Moves the cursor left or right)
	Executes a command or selects a sub-menu
	Saves the current values and exits the BIOS Setup utility

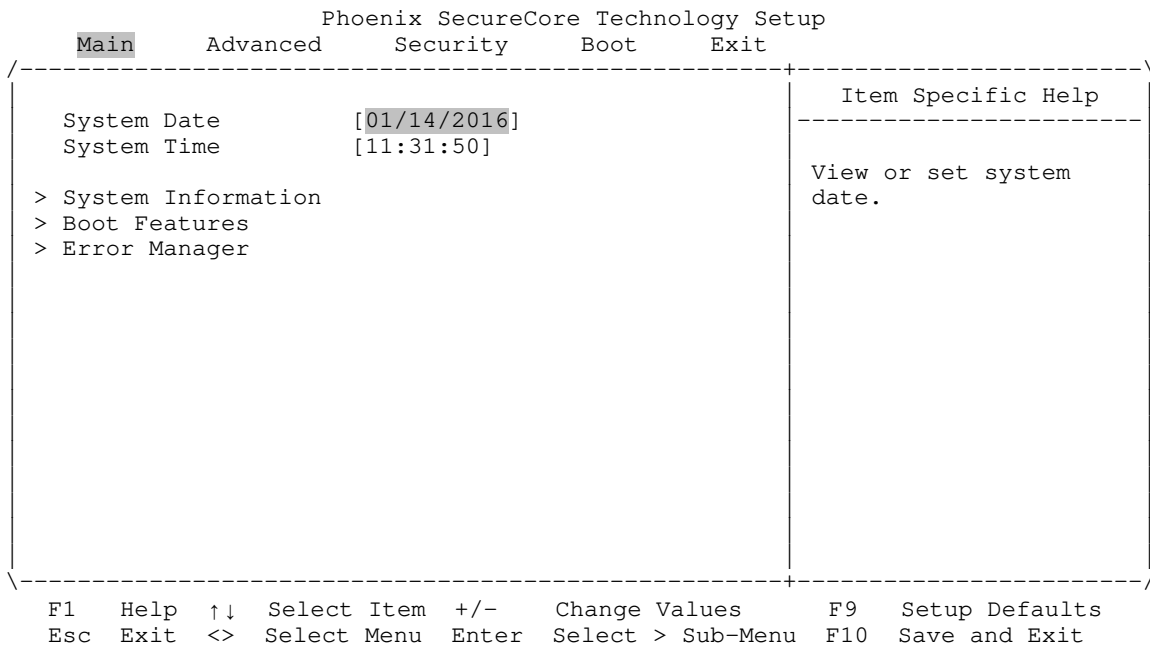
The Main menu enables you to:



- Set system date and time
- Set boot features
- View and clear the error log



Top level view of Main menu screen.



```
Phoenix SecureCore Technology Setup
Main Advanced Security Boot Exit
-----
System Date [01/14/2016]
System Time [11:31:50]
> System Information
> Boot Features
> Error Manager
Item Specific Help
-----
View or set system
date.
-----
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit
```

Main → System Date



Use the  and  keys to switch between the System Date and System Time fields.

Use the  and  keys to set the month, day, and year.

Use the  or  key to move from month → day → year.

Main → System Time

```



Phoenix SecureCore Technology Setup
Main  Advanced  Security  Boot  Exit
-----
System Date      [01/14/2016]
System Time      [11:32:50]



> System Information
> Boot Features
> Error Manager



Item Specific Help
-----
View or set system
time.

F1  Help  ↑↓  Select Item  +/-  Change Values  F9  Setup Defaults
Esc  Exit  <>  Select Menu  Enter  Select > Sub-Menu  F10  Save and Exit

```

Use the  and  keys to switch between the System Date and System Time fields.

Use the  and  keys to set the hours, minutes, and seconds.

Use the  or  key to move from hours → minutes → seconds.

Main → System Information

```

Phoenix SecureCore Technology Setup
Main  Advanced  Security  Boot  Exit
-----
System Date      [01/14/2016]
System Time      [11:38:50]

> System Information
> Boot Features
> Error Manager

Item Specific Help
-----
Display System
Information.

F1  Help  ↑↓  Select Item  +/-  Change Values  F9  Setup Defaults
Esc Exit  <>  Select Menu  Enter  Select > Sub-Menu  F10 Save and Exit

```

This screen is read-only; there are no user-configurable options.

Example view of System Information screen:

```

Phoenix SecureCore Technology Setup
Main  Advanced  Security  Boot  Exit
-----
System Information
-----
BIOS Version      Bengal_3.1.0.547.r1.104 X64
Build Time        02/04/2016
Processor Type    Intel(R) Atom(TM) CPU E3845 @ 1.91GHz
Processor Speed   1.924 GHz
System Memory Speed 1333 MHz
L2 Cache RAM     2048 KB
Total Memory      4096 MB
[1]               4096 MB (DDR3- 1333) @ DIMMO
[2]               0 MB

F1  Help  ↑↓  Select Item  +/-  Change Values  F9  Setup Defaults
Esc Exit  <>  Select Menu  Enter  Select > Sub-Menu  F10 Save and Exit

```

Main → Boot Features

Phoenix SecureCore Technology Setup							
Main	Advanced	Security	Boot	Exit			
Boot Features			Item Specific Help				
NumLock:	[On]		^	Selects Power-on state for NumLock.			
Timeout	[2]		*				
CSM Support	[Yes]		*				
Quick Boot	[Disabled]		*				
Diagnostic Splash Screen	[Disabled]		*				
Diagnostic Summary Screen	[Disabled]		*				
BIOS Level USB	[Enabled]		*				
Console Redirection	[Disabled]		*				
Allow Hotkey in S4 resume	[Enabled]		+				
UEFI Boot	[Enabled]		+				
Legacy Boot	[Enabled]		v				
Boot in Legacy Video Mode	[Disabled]		*				
Load OPROM	[On Demand]		v				
F1	Help	↑↓	Select Item	+/-	Change Values	F9	Setup Defaults
Esc	Exit	<>	Select Menu	Enter	Select > Sub-Menu	F10	Save and Exit

Main → Boot Features → NumLock

Phoenix SecureCore Technology Setup							
Main	Advanced	Security	Boot	Exit			
Boot Features			Item Specific Help				
NumLock:	[On]		^	Selects Power-on state for NumLock.			
Timeout	[2]		*				
CSM Support	[Yes]		*				
Quick Boot	[Disabled]		*				
Diagnostic Splash Screen	[Disabled]		*				
Diagnostic Summary Screen	[Disabled]		*				
BIOS Level USB	[Enabled]		*				
Console Redirection	[Disabled]		*				
Allow Hotkey in S4 resume	[Enabled]		+				
UEFI Boot	[Enabled]		+				
Legacy Boot	[Enabled]		v				
Boot in Legacy Video Mode	[Disabled]		*				
Load OPROM	[On Demand]		v				
F1	Help	↑↓	Select Item	+/-	Change Values	F9	Setup Defaults
Esc	Exit	<>	Select Menu	Enter	Select > Sub-Menu	F10	Save and Exit

Options	On (default)	Enable keyboard NumLock function at power-on
	Off	Disable keyboard NumLock function at power-on

Main → Boot Features → Timeout

Phoenix SecureCore Technology Setup							
Main	Advanced	Security	Boot	Exit			
Boot Features				Item Specific Help			
NumLock:		[On]	^	Number of seconds that P.O.S.T will wait for the user input before booting.			
Timeout		[2]	*				
CSM Support		[Yes]	*				
Quick Boot		[Disabled]	*				
Diagnostic Splash Screen		[Disabled]	*				
Diagnostic Summary Screen		[Disabled]	*				
BIOS Level USB		[Enabled]	*				
Console Redirection		[Disabled]	*				
Allow Hotkey in S4 resume		[Enabled]	+				
UEFI Boot		[Enabled]	+				
Legacy Boot		[Enabled]	v				
Boot in Legacy Video Mode		[Disabled]	*				
Load OPROM		[On Demand]	v				
F1	Help	↑↓	Select Item	+/-	Change Values	F9	Setup Defaults
Esc	Exit	<>	Select Menu	Enter	Select > Sub-Menu	F10	Save and Exit

Options	2 (default)	Two-second delay
	0-99	Acceptable range

Main → Boot Features → CSM Support

Phoenix SecureCore Technology Setup							
Main	Advanced	Security	Boot	Exit			
Boot Features				Item Specific Help			
NumLock:		[On]	^	The Compatibility Support Module supports legacy (non-UEFI) OSes and provides legacy BIOS services, such as software interrupt Int10/Int13.			
Timeout		[2]	*				
CSM Support		[Yes]	*				
Quick Boot		[Disabled]	*				
Diagnostic Splash Screen		[Disabled]	*				
Diagnostic Summary Screen		[Disabled]	*				
BIOS Level USB		[Enabled]	*				
Console Redirection		[Disabled]	*				
Allow Hotkey in S4 resume		[Enabled]	+				
UEFI Boot		[Enabled]	+				
Legacy Boot		[Enabled]	v				
Boot in Legacy Video Mode		[Disabled]	*				
Load OPROM		[On Demand]	v				
F1	Help	↑↓	Select Item	+/-	Change Values	F9	Setup Defaults
Esc	Exit	<>	Select Menu	Enter	Select > Sub-Menu	F10	Save and Exit

Options	No	Disable Compatibility Support Module (CSM)
	Yes (default)	Enable Compatibility Support Module (CSM)

Main → Boot Features → Quick Boot

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Features			Item Specific Help	
NumLock:	[On]	^	Enable/Disable quick boot.	
Timeout	[2]	*		
CSM Support	[Yes]	*		
Quick Boot	[Disabled]	*		
Diagnostic Splash Screen	[Disabled]	*		
Diagnostic Summary Screen	[Disabled]	*		
BIOS Level USB	[Enabled]	*		
Console Redirection	[Disabled]	*		
Allow Hotkey in S4 resume	[Enabled]	+		
UEFI Boot	[Enabled]	+		
Legacy Boot	[Enabled]	v		
Boot in Legacy Video Mode	[Disabled]	*		
Load OPROM	[On Demand]	v		
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit				

Options	Disabled (default)	Disable Quick Boot
	Enabled	Enable Quick Boot

Main → Boot Features → Diagnostic Splash Screen

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Features				Item Specific Help
NumLock:		[On]	^	If you select 'Enabled' the diagnostic splash screen always displays during boot. If you select 'Disabled' the diagnostic splash screen does not display unless you press HOTKEY during boot.
Timeout		[2]	*	
CSM Support		[Yes]	*	
Quick Boot		[Disabled]	*	
Diagnostic Splash Screen		[Enabled]	*	
Diagnostic Summary Screen		[Disabled]	*	
BIOS Level USB		[Enabled]	*	
Console Redirection		[Disabled]	*	
Allow Hotkey in S4 resume		[Enabled]	+	
UEFI Boot		[Enabled]	+	
Legacy Boot		[Enabled]	v	
Boot in Legacy Video Mode		[Disabled]	*	
Load OPROM		[On Demand]	v	
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit				

Options	Disabled (default)	Diagnostic splash screen does not display unless you press HOTKEY during boot
	Enabled	Diagnostic splash screen always displays during boot

Main → Boot Features → Diagnostic Summary Screen

Phoenix SecureCore Technology Setup							
Main	Advanced	Security	Boot	Exit			
Boot Features				Item Specific Help			
NumLock:		[On]	^	Display the Diagnostic summary screen during boot.			
Timeout		[2]	*				
CSM Support		[Yes]	*				
Quick Boot		[Disabled]	*				
Diagnostic Splash Screen		[Enabled]	*				
Diagnostic Summary Screen		[Disabled]	*				
BIOS Level USB		[Enabled]	*				
Console Redirection		[Disabled]	*				
Allow Hotkey in S4 resume		[Enabled]	+				
UEFI Boot		[Enabled]	+				
Legacy Boot		[Enabled]	v				
Boot in Legacy Video Mode		[Disabled]	*				
Load OPROM		[On Demand]	v				
F1	Help	↑↓	Select Item	+/-	Change Values	F9	Setup Defaults
Esc	Exit	<>	Select Menu	Enter	Select > Sub-Menu	F10	Save and Exit

Options	Disabled (default)	Diagnostic summary screen does not display during boot
	Enabled	Diagnostic summary screen displays during boot

Main → Boot Features → BIOS Level USB

Phoenix SecureCore Technology Setup							
Main	Advanced	Security	Boot	Exit			
Boot Features				Item Specific Help			
NumLock:		[On]	^	Enable/Disable all			
Timeout		[2]	*	BIOS support for USB			
CSM Support		[Yes]	*	in order to reduce			
Quick Boot		[Disabled]	*	boot time. Note that			
Diagnostic Splash Screen		[Enabled]	*	this will prevent			
Diagnostic Summary Screen		[Disabled]	*	using a USB keyboard			
BIOS Level USB		[Enabled]	*	in setup or a USB			
Console Redirection		[Disabled]	*	biometric scanner			
Allow Hotkey in S4 resume		[Enabled]	+	such as a finger			
UEFI Boot		[Enabled]	+	print reader to			
Legacy Boot		[Enabled]	v	control access to			
Boot in Legacy Video Mode		[Disabled]	*	setup, but does not			
Load OPROM		[On Demand]	v	prevent the operating			
			+	system from			
			v	supporting such			
				hardware.			
F1	Help	↑↓	Select Item	+/-	Change Values	F9	Setup Defaults
Esc	Exit	<>	Select Menu	Enter	Select >	Sub-Menu	F10 Save and Exit

Options	Disabled	Disables USB support within BIOS
	Enabled (default)	Enables USB support within BIOS

Main → Boot Features → Console Redirection

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Features				Item Specific Help
NumLock:		[On]	^	Enable/Disable
Timeout		[2]	*	Universal Console
CSM Support		[Yes]	*	Redirection.
Quick Boot		[Disabled]	*	
Diagnostic Splash Screen		[Enabled]	*	
Diagnostic Summary Screen		[Disabled]	*	
BIOS Level USB		[Enabled]	*	
Console Redirection		[Disabled]	*	
Allow Hotkey in S4 resume		[Enabled]	+	
UEFI Boot		[Enabled]	+	
Legacy Boot		[Enabled]	v	
Boot in Legacy Video Mode		[Disabled]	*	
Load OPROM		[On Demand]	v	
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit				

Options	Disabled (default)	Disables Universal Console Redirection (UCR)
	Enabled	Enables Universal Console Redirection (UCR). When enabled, four sub-menus appear for setting console redirection parameters.

Main → Boot Features → Console Redirection → Terminal Type

Phoenix SecureCore Technology Setup

Main Advanced Security Boot Exit

Boot Features		Item Specific Help
NumLock:	[On]	^ Set terminal type of
Timeout	[2]	* UCR.
CSM Support	[Yes]	*
Quick Boot	[Disabled]	* In VT100+ mode, send
Diagnostic Splash Screen	[Enabled]	* Fx keys as Esc,x
Diagnostic Summary Screen	[Disabled]	* sequence
BIOS Level USB	[Enabled]	*
Console Redirection	[Enabled]	* F1 = Esc,1
Terminal Type	[VT100+]	* F2 = Esc,2
Baudrate	[115200]	*
Flow Control	[None]	*
Continue C.R. after POST	[Enabled]	*
Allow Hotkey in S4 resume	[Enabled]	+
UEFI Boot	[Enabled]	+
Legacy Boot	[Enabled]	v

F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults
Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit

Options	ANSI	Sets terminal type to ANSI
	VT100	Sets terminal type to VT100
	VT100+ (default)	Sets terminal type to VT100+
	UTF8	Sets terminal type to UTF8

Main → Boot Features → Console Redirection → Baudrate

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Features			Item Specific Help	
CSM Support	[Yes]	^	Set baudrate of UCR.	
Quick Boot	[Disabled]	+		
Diagnostic Splash Screen	[Enabled]	+		
Diagnostic Summary Screen	[Disabled]	*		
BIOS Level USB	[Enabled]	*		
Console Redirection	[Enabled]	*		
Terminal Type	[VT100+]	*		
Baudrate	[115200]	*		
Flow Control	[None]	*		
Continue C.R. after POST	[Enabled]	*		
Allow Hotkey in S4 resume	[Enabled]	*		
UEFI Boot	[Enabled]	*		
Legacy Boot	[Enabled]	*		
Boot in Legacy Video Mode	[Disabled]	*		
Load OPROM	[On Demand]	v		
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit				

Options	19200	Sets baudrate to 19200
	38400	Sets baudrate to 38400
	57600	Sets baudrate to 57600
	115200 (default)	Sets baudrate to 115200

Main → Boot Features → Console Redirection → Flow Control

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Features				Item Specific Help
NumLock:	[On]		^	Set flow control
Timeout	[2]		*	method for UCR.
CSM Support	[Yes]		*	
Quick Boot	[Disabled]		*	[None] - No flow
Diagnostic Splash Screen	[Enabled]		*	control.
Diagnostic Summary Screen	[Disabled]		*	
BIOS Level USB	[Enabled]		*	[XON/XOFF] -
Console Redirection	[Enabled]		*	Software flow control.
Terminal Type	[VT100+]		*	
Baudrate	[115200]		*	
Flow Control	[None]		*	
Continue C.R. after POST	[Enabled]		*	
Allow Hotkey in S4 resume	[Enabled]		+	
UEFI Boot	[Enabled]		+	
Legacy Boot	[Enabled]		v	
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults				
Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit				

Options	None (default)	No flow control
	[XON/XOFF]	Software flow control

Main → Boot Features → Console Redirection → Continue C.R. after POST

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Features				Item Specific Help
NumLock:		[On]	^	Enables Console Redirection after OS has loaded.
Timeout		[2]	*	
CSM Support		[Yes]	*	
Quick Boot		[Disabled]	*	
Diagnostic Splash Screen		[Enabled]	*	
Diagnostic Summary Screen		[Disabled]	*	
BIOS Level USB		[Enabled]	*	
Console Redirection		[Enabled]	*	
Terminal Type		[VT100+]	*	
Baudrate		[115200]	*	
Flow Control		[None]	*	
Continue C.R. after POST		[Enabled]	*	
Allow Hotkey in S4 resume		[Enabled]	+	
UEFI Boot		[Enabled]	+	
Legacy Boot		[Enabled]	v	
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults				
Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit				

Options	Disabled	Disables console redirection after the operating system has loaded
	Enabled (default)	Enables console redirection after the operating system has loaded

Main → Boot Features → Allow Hotkey in S4 Resume

Phoenix SecureCore Technology Setup				
Main	Advanced	Security	Boot	Exit
Boot Features				Item Specific Help
NumLock:	[On]	^	Enable hotkey	
Timeout	[2]	*	detection when system	
CSM Support	[Yes]	*	resuming from	
Quick Boot	[Disabled]	*	Hibernate state	
Diagnostic Splash Screen	[Enabled]	*		
Diagnostic Summary Screen	[Disabled]	*		
BIOS Level USB	[Enabled]	*		
Console Redirection	[Disabled]	*		
Allow Hotkey in S4 resume	[Enabled]	+		
UEFI Boot	[Enabled]	+		
Legacy Boot	[Enabled]	v		
Boot in Legacy Video Mode	[Disabled]	*		
Load OPROM	[On Demand]	v		
F1 Help ↑↓ Select Item +/- Change Values F9 Setup Defaults Esc Exit <> Select Menu Enter Select > Sub-Menu F10 Save and Exit				

Options	Disabled	Disables Hotkey detection when system resumes from Hibernate state
	Enabled (default)	Enables Hotkey detection when system resumes from Hibernate state