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Letter of Volatility

Product Information

Product Series: ICE-TRAY-2422 series of devices

Product Models: ICE-TRAY-M2422

Summary: ICE-TRAY devices contain both volatile and non-volatile memory.

Non-Volatile Memory

Com Express				
TYPE	**SIZE**	**Manufacturer's Part #**	**User Modifiable**	**Physical Access**
Flash	128 Mbit	W25Q128FV	Yes, limited	No
Function	Stores EFI Boot information and settings			
Process for Clearing	Reprogram or erase Boot Flash with vendor utility			
TYPE	**SIZE**	**Manufacturer's Part #**	**User Modifiable**	**Physical Access**
EEPROM	32 Kbit	24C32	Yes, limited	No
Function	Stores Module ID Data			
Process for Clearing	Reprogram or erase Module ID EEPROM with vendor utility			
TYPE	**SIZE**	**Manufacturer's Part #**	**User Modifiable**	**Physical Access**
FPGA	108 KBit	MAX10	Yes, limited	No
Function	Stores FPGA Configuration data			
Process for Clearing	Reprogram or erase FPGA configuration with vendor utility			
TYPE	**SIZE**	**Manufacturer's Part #**	**User Modifiable**	**Physical Access**
TPM	7206 Bytes	SLB9670	Yes	No
Function	Stores User and OS Data (encryption keys)			
Process for Clearing	Reprogram or erase TPM with vendor utility			
TYPE	**SIZE**	**Manufacturer's Part #**	**User Modifiable**	**Physical Access**
Approtect CodeMeter ASIC	1 MByte	1504-03	Yes	No
Function	Stores User Data (encryption keys, CodeMeter license)			
Process for Clearing	Reprogram or erase ASIC with vendor utility			

ICE-TRAY Board

TYPE	SIZE	Manufacturer's Part #	User Modifiable	Physical Access
Flash	256 KByte	ATSAMD21G18A-AFT	No	No
Function	Stores ICE-TRAY firmware			
Process for Clearing	None; clearing would make ICE-TRAY non-functional			
Notes	This component only stores power sequencing and IPMI code for the ICE-TRAY.			

TYPE	SIZE	Manufacturer's Part #	User Modifiable	Physical Access
M.2 SSD	1 Tbyte	SA500	Yes	Yes
Function	Stores OS and User Data			
Process for Clearing	Can be physically removed by user			
Notes	Lid must be removed from unit, then SSD can be removed with a screwdriver.			

ICE-K8M x2

TYPE	SIZE	Manufacturer's Part #	User Modifiable	Physical Access
Flash	128 Mbit	N25Q128A11ESE40G	Yes	No
Function	Flash is generally unused on processor modules			
Process for Clearing	Reprogram or erase with vendor utility – provided with device			
Notes	The checksum of the flash can be verified to confirm flash integrity. See website for checksum of RR load.			

TYPE	SIZE	Manufacturer's Part #	User Modifiable	Physical Access
F-RAM	256 Kbit	FM31256-G	Yes	No
Function	Stores module ID			
Process for Clearing	Reprogram or erase with vendor utility – provided with device			

ICE-PIC8-S and K8 Crossbars

TYPE	SIZE	Manufacturer's Part #	User Modifiable	Physical Access
Flash	128 Mbit	N25Q128A11ESE40G	Yes	No
Function	Stores ICE flash for operating ICE modules			
Process for Clearing	Reprogram or erase with vendor utility – provided with device			
Notes	The checksum of the flash can be verified to confirm flash integrity. See website for checksum of HHMT and HHWG load.			

TYPE	SIZE	Manufacturer's Part #	User Modifiable	Physical Access
F-RAM	256 Kbit	FM31256-G	Yes	No
Function	Stores module ID			
Process for Clearing	Reprogram or erase with vendor utility – provided with device			

To ensure the user EEPROM contains only the content from ICE firmware, provided by ICE, a 32-bit CRC checksum is calculated on the entire content of the EEPROM. A procedure is provided to read-back the user accessible EEPROM content and calculate its 32-bit CRC. This 32-bit CRC is then checked against the 32-bit CRC signatures located in the icexxx/hlp/crcs.hlp file for a match.

Example of a check flash session within NeXt-Midas:

```
nM> picd checkflash pic1
Unloading SPI FLASH – 16006832 bytes
............................................................................
............................................................................
........................................................... done
Flash ChkSum = 0x04AFF507

nM> pic help crcs

PIC5:
LoadFlash File=ICEPIC5_SS CRC=0x792BAD35
LoadFlash File=ICEPIC5_DD CRC=0x6ABE1CE9
LoadFlash File=ICEPIC5_HH CRC=0x2C2BA130
Press RETURN=NextLine, SPACE=NextPage, Q=Quit:
```

See ICE website for official checksums of ICE products.

Volatile Memory

All I/O modules, including the ICE-GPS, A2Dm20, and D2AWGm3 contain only volatile memory, which is cleared upon powering down the ICE-TRAY.

The ICE-TRAY series of devices contain volatile memory across multiple subcomponents which are cleared when AC power and the CMOS battery are removed. All memory not specified in the non-volatile section (above) is to be considered volatile, requiring no additional sanitization procedures after removing AC power and the CMOS battery for 24 hours from the ICE-TRAY device.