

# FIPS-140 Level 4+ Security Supervisor Preliminary Data Sheet

## Description

The MSFIPS integrated circuit provides 4 physical tamper switch inputs (3 with polarity control), over/under voltage detection and a temperature sensor. The MSFIPS provides the sensor interfaces needed for the Federal Information Processing Standard (FIPS) 140.

The polarity selectable inputs are intended to interface with a variety of tamper switches. The 1 kHz lowpass filters provide better noise immunity than the single input available on other interfaces. An internal bandgap reference provides an accurate comparison voltage for sensing a over-voltage or undervoltage tampering technique. Temperature variation outside of expected environmental conditions also will trigger an alarm. The MSFIPS operates from 2.4V up to 5.5 VDC. For battery backup, the supply switching is automatically done internally.

The MSFIPS is available in die form and in a 24 pin SSOIC package. Temperature range is -40 to +85 °C.

## Features

- Temperature sensor
- Bandgap reference for under/over voltage detect
- Four switch inputs (Three with polarity selection)
- Automatic battery switchover

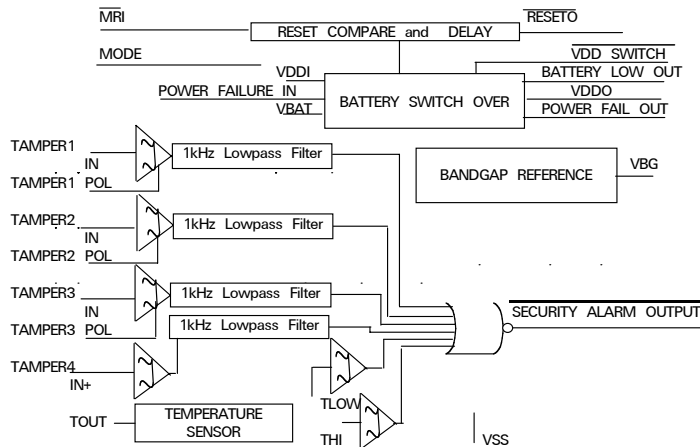
## Applications

- Cryptography boxes
- Electronic Medical Storage security
- Credit processing storage security
- Point of Sales Terminals
- Alarm Systems.

## Absolute Maximum Ratings

Power Supply Voltage	+6V
Storage Temperature Range	-60 to +150 °C
Operating Temperature Range	-40 to +85 °C

MSFIPS





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### Electrical Characteristics

(VDD = +5.0V, T = 25 °C)

MSFIPS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>DC Specifications</b>						
Operating Voltage	VDD		2.4	5.0	5.5	V
Supply Current	IDD		0.5	1.0	2.0	mA
Reference Voltage	VREF	RL = 1 MΩ		1.25		V
Reset Threshold Voltage 5V	VRST	RESETC=0		4.7		V
		RESETC=1/2·VDD		4.4		V
		RESETC=VDD		4.1		V
Reset Threshold Voltage 3.3V	VRST	RESETC=0		3.1		V
		RESETC=1/2·VDD		2.85		V
		RESETC=VDD		2.6		V
Voltage Output Low	VOL		0.2		V	
Voltage Output High	VOH		4.0		V	
Input Voltage Low	VIL		0.4·V		V	
Input Voltage High	VIH		0.6·V		V	
Battery Backup SwitchoverV	VSO	VDD=5.0V or 3.3VDC		2.6		V
Under Voltage Detect	VLV	VDD=5.0V		3.3		V
Under Voltage Detect	VLV	VDD=3.3		2.7		V
Over Voltage Detect	VHV	VDD=5.0		5.5		V
Over Voltage Detect	VHV	VDD=3.3		4.2		V
Battery Low Detect Voltage	VDET			2.4		V
Power Failure Comparator V	VPFI			1.25		V
TOUT Voltage	VTOUT	T = 25 °C		1.6		Vdc
TOUT Voltage tempco	VTOUT/°C	from -40°C to +85°C		3		mV/°C

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## Principle of Operation

The MSFIPS integrated circuit with 4 physical tamper switch inputs are ideal for either normally open or normally closed switches. With these switches attempts to open the system, or remove socketed components are detected.

Attempts to heat a box, to remove potting material, or to cause RAM R/W errors, are detected by the temperature sensor.

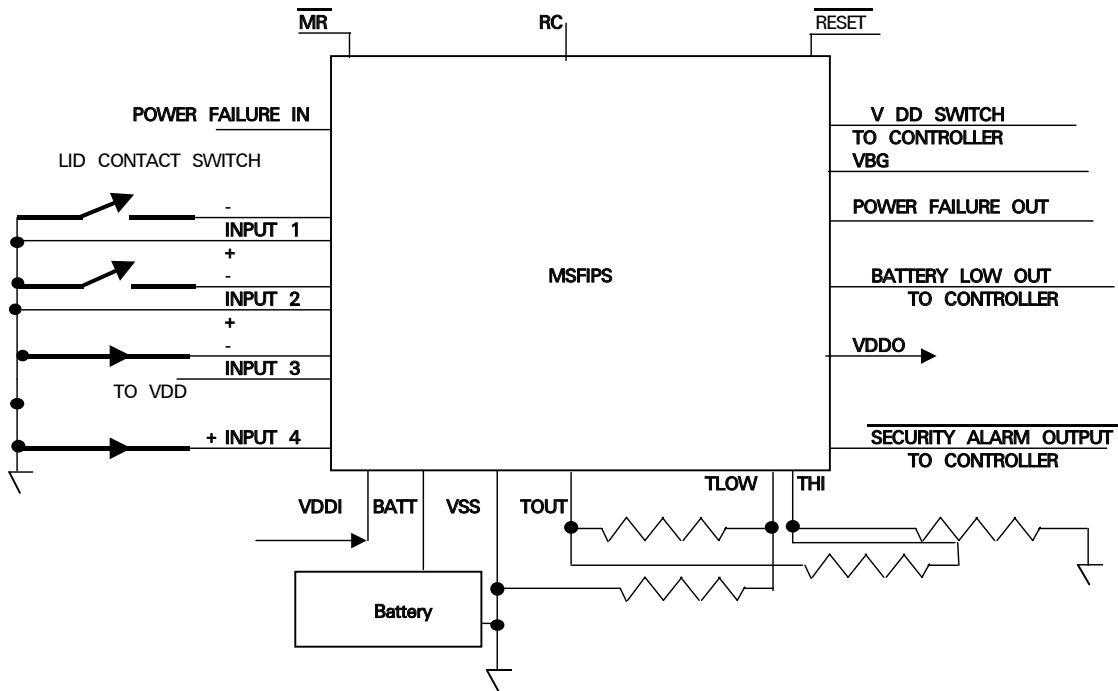
If the unit is unplugged from its power source, the switch to battery power is detected. When

the battery voltage is too low, a signal is provided for action to be taken

Attempts at glitching the reset signal or overvoltage are detected by the reset voltage timing compare with the VDDO voltage and a delay. If attempts to override the system firmware by applying an overvoltage to VDD are detected, action to protect the internal code can be taken.

VDDO for the controller can switch up to 0.2 A.

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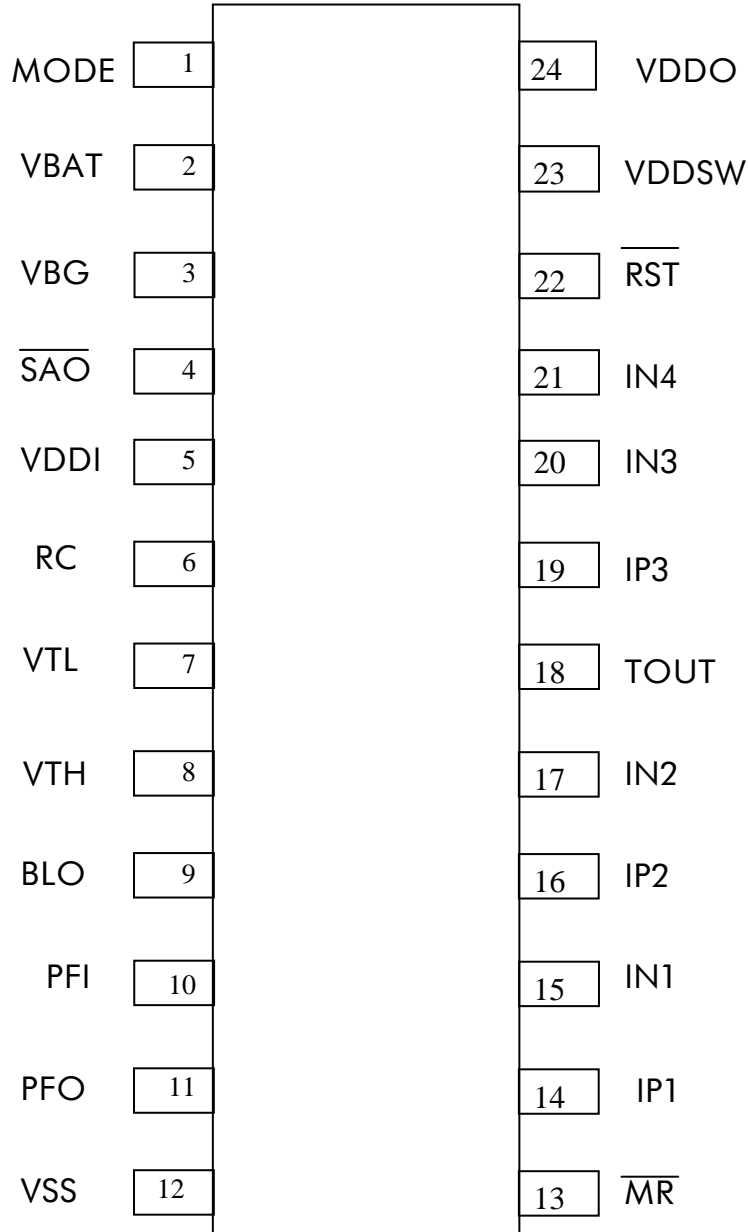
## Pin Description

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| <p>1. MODE Selects 3.3V or 5.0 VDC operation. When MODE is at Logic "1" 3.3V thresholds are selected, When MODE is at Logic "0", 5.0VDC is selected.</p> <p>2. VBAT Positive Battery Input,</p> <p>3. VBG Bandgap Voltage Output</p> <p>4. <math>\overline{SAO}</math> Security Alarm Output Not</p> <p>5. VDDI Positive System Supply; For 5V Operation Typically 5.0 VDC</p> <p>6. RC Set Reset Voltage: Tertiary Control</p> <p>7. VTL Temperature Low set Input</p> <p>8. VTH Temperature High set input</p> <p>9. BLO Battery Low Voltage Indicator. When High, Battery is below 2.4V</p> <p>10. PFI Power Failure Input Sense</p> <p>11. PFO Power Failure Output: Output high when power is absent</p> <p>12. VSS Negative Supply; Typically 0.0 VDC</p> | <p>13. <math>\overline{MR}</math> Master Reset Not Input</p> <p>14. IP1 Tamper Switch Polarity Input 1 When tied to logic "1", Tamper switch logic is inverted (uses NO switch). NC switch when logic "0".</p> <p>15. IN1 Tamper Switch Input 1</p> <p>16. IP2 Tamper Switch Polarity Input 2 When tied to logic "1", Tamper switch logic is inverted (uses NO switch). NC switch when logic "0".</p> <p>17. IN2 Tamper Switch Input 2</p> <p>18. TOUT Temperature Sensor Output</p> <p>19. IP3 Tamper Switch Polarity Input 3 When tied to logic "1", Tamper switch logic is inverted (uses NO switch). NC switch when logic "0".</p> <p>20. IN3 Tamper Switch Input 3</p> <p>21. IN4 Tamper Switch Positive Input 4</p> <p>22. <math>\overline{RST}</math> Voltage Qualified Reset Not Output</p> <p>23. VDDSW Power Switch Indicator: When High, Battery backup is in use</p> <p>24. VDDO Positive Power Supply Output Typically 5 VDC for 5V operation</p> |
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**STANDARD PRODUCTS**

MSGEQ5A	Five Band Graphic Equalizer
MSGEQ7	Seven Band Graphic Equalizer
MSHFS1-6	Selectable High Frequency LP/BP Filter
MSFS1-6	Selectable Lowpass/Bandpass Filter
MSCAHF	Selectable High Frequency Active Lowpass/Bandpass Filter
MSU1F1-4, MSU2F1	Resistor Programmable Universal Active Filter
MSU1HF1-4, MSU2HF1	High Frequency Resistor Programmable Universal Active Filter
MSELP	Switched Capacitor Elliptic Lowpass Filter with Op Amps
MSNBLP	Switched Capacitor Butterworth Lowpass Filter
MSLE/B/C5L/M	Switched Capacitor General Purpose Lowpass Filter
MS2LFS	Dual Selectable Low Voltage Lowpass/Bandpass Filter
MSLFS	Selectable Low Voltage Lowpass/Bandpass Filter
MSHN1-6	Selectable High Pass/Notch Filter
MSRAAF	Resistor Programmable Active Audio Filter
MSRAHF	Resistor Programmable Active High Frequency Filter
MSDET	Tone Detector
MSEPAF	Electrically Programmable Active Filter
MSCBT	Communications Baseband Transceiver
MSLV14	14 MHz Video Lowpass Filter
MSSPSI	Smart Programmable Sensor Interface
MSCPSI	Computer Programmable Sensor Interface
MSTHDA	Total Harmonic Distortion Analyzer
MSSCSA	Single Chip Spectrum Analyzer
MSFIPS	FIP-140 Level 4+ Security Supervisor
MSLSA	Low Power Single Chip Spectrum Analyzer
MSRFIF	Radio Frequency Interface Front-End

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