

# SMART CONTRACT SECURITY AUDIT MasterChef



SMART CONTRACT AUDIT | TEAM KYC | PROJECT EVALUATION

RELENTLESSLY SECURING THE PUBLIC BLOCKCHAIN | MADE IN CANADA

## **Summary**

**Auditing Firm** InterFi Network

**Architecture** InterFi "Echelon" Auditing Standard

Smart Contract Audit Approved By Chris | Blockchain Specialist at InterFi Network

Project Overview Approved BY

Albert | Project Specialist at InterFi Network

**Platform** Solidity

Audit Check (Mandatory) Static, Software, Auto Intelligent & Manual Analysis

Project Check (Optional) KYC, Website & Socials Analysis (Not Applicable)

Consultation Request Date September 14, 2021

Report Date September 16, 2021

### **Audit Summary**

InterFi team has performed a line-by-line manual analysis and automated review of the smart contract. The smart contract was analyzed mainly for common smart contract vulnerabilities, exploits, and manipulation hacks. According to the smart contract audit:

- MasterChef's smart contract source code has LOW RISK SEVERITY.
- MasterChef has successfully PASSED the smart contract audit.

For the detailed understanding of risk severity, source code vulnerability, and functional test, kindly refer to the audit. At the time of the audit, the contract is not deployed on any blockchain. Note, the owner/developer can change/modify contract before blockchain deployment. Please proceed with caution.



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## **Project Overview**

InterFi was consulted by MasterChef on September 14, 2021 to conduct a smart contract security audit of their solidity source code.

The idea behind MasterChef is to bring safe projects together working in unity and to give investors a constant list of safe projects vetted by their team.

MasterChef Mission: Give honest projects a chance to thrive in the BSC space and with this maybe save BSC. It is not news to anyone that a lot of money has been leaving BSC due to the insane amount of scam projects launched every day. People are tired of losing money to scammers. MasterChef plans on being a tool to bring projects and communities together, working side by side.

Project	MASTERCHEF
Blockchain	Binance Smart Chain
Language	Solidity Smart Contract
Contract	0x9c56d0dc5aac6f23d18f990f3e4783a2f1be2dba
Website	https://master-chef.app/
Twitter	https://twitter.com/MASTERCHEFBsc
Telegram	https://t.me/MASTERCHEFBsc



#### **Public logo**



## Solidity Source Code File & Extras

https://github.com/interfinetwork/audited-codes/blob/main/MasterChef.sol

#### **GitHub Commits**

Solidity source code committed at: 722f4d4fef346aac4546531cf8ea71301cc68052





# **Audit Scope & Methodology**

The scope of this report is to audit the smart contract source code of MasterChef. The source code can be viewed in its entirety on

#### https://github.com/interfinetwork/audited-codes/blob/main/MasterChef.sol

InterFi has scanned the contract and reviewed the project for common vulnerabilities, exploits, hacks, and back-doors. Below is the list of commonly known smart contract vulnerabilities, exploits, and hacks:

#### Category

Re-entrancy (RE)

Unhandled Exceptions (UE)

Transaction Order Dependency (TO)

Integer Overflow (IO)

Unrestricted Action (UA)

Ownership Takeover

Gas Limit and Loops

Deployment Consistency

Repository Consistency

Data Consistency

Token Supply Manipulation

Access Control and Authorization

Operations Trail and Event Generation

**Assets Manipulation** 

Liquidity Access

**Smart Contract Vulnerabilities** 

#### **Source Code Review**

#### **Functional Assessment**



#### InterFi's Echelon Audit Standard

The aim of InterFi's "Echelon" standard is to analyze the smart contract and identify the vulnerabilities and the hacks in the smart contract. Mentioned are the steps used by ECHELON-1 to assess the smart contract:

- 1. Solidity smart contract source code reviewal:
  - Review of the specifications, sources, and instructions provided to InterFi to make sure we understand the size, scope, and functionality of the smart contract.
  - Manual review of code, which is the process of reading source code line-byline to identify potential vulnerabilities.
- 2. Static, Manual, and Automated Al analysis:
  - Test coverage analysis, which is the process of determining whether the test cases are covering the code and how much code is exercised when we run those test cases.
  - Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
- 3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
- 4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts

#### Automated 3P frameworks used to assess the smart contract vulnerabilities

- Slither
- Consensys MythX
- Consensys Surya
- Open Zeppelin Code Analyzer
- Solidity Code Complier



## InterFi's Risk Classification

Smart contracts are generally designed to manipulate and hold funds denominated in ETH/BNB. This makes them very tempting attack targets, as a successful attack may allow the attacker to directly steal funds from the contract. Below are the typical risk levels of a smart contract:

**Vulnerable**: A contract is vulnerable if it has been flagged by a static analysis tool as such. As we will see later, this means that some contracts may be vulnerable because of a false-positive.

**Exploitable:** A contract is exploitable if it is vulnerable and the vulnerability could be exploited by an external attacker. For example, if the "vulnerability" flagged by a tool is in a function which requires to own the contract, it would be vulnerable but not exploitable.

**Exploited:** A contract is exploited if it received a transaction on the main network which triggered one of its vulnerabilities. Therefore, a contract can be vulnerable or even exploitable without having been exploited.

		Smart Contract
Risk severity	Meaning	Security Audit
	This level vulner	rabilities could be exploited easily, and can lead to asset loss, data
! Critical	loss, asset mani	pulation, or data manipulation. They should be fixed right away.
	This level vulner	rabilities are hard to exploit but very important to fix, they carry an
! High	elevated risk of	smart contract manipulation, which can lead to critical risk severity
	This level vulner	abilities are should be fixed, as they carry an inherent risk of future
! Medium	exploits, and ha	cks which may or may not impact the smart contract execution.
	This level vulne	erabilities can be ignored. They are code style violations, and
! Low	informational s	tatements in the code. They may not affect the smart contract
	execution	



## **Smart Contract - Overview**

## **Contract information**

Query	Result
Name	MasterChef
Symbol	MASTERCHEF2
Decimals	18
Total Supply	100000000000000000000000000000000000000
Cake Rewards	0xb7dba4c673bedb174dc3ff7ec65d17c863d39b16
Cake Rewards Fee	7
Marketing Wallet Address	0xec669ea2a78a2133646d8e90d76188678161cd64
Dividend Tracker	0xd6480e15bddc70bc85f70bf466b1ba593a4ccb64
Gas For Processing	499000
Liquidity Fee	Smart Contract
Marketing Fee	Security Audit
Owner	0xcff0cf05d66345414b6d0e0ed0850293d05c8a10
Uniswap V2 Pair	0xdd57cfdcec9c2f43f63e8a609941c60f8bbe720d
Uniswap V2 Router	0x10ed43c718714eb63d5aa57b78b54704e256024e



## **Smart Contract - Static Analysis**

Symbol	Meaning
•	Function can be modified
	Function is payable
	Function is locked
	Function can be accessed
!	Important functionality

```
**IERC20** | Interface | |||
 👢 📗 transfer | External 👢 | 🥮
 L | allowance | External ! |
 L | approve | External ! | 🛑
 👢 | transferFrom | External 📒 | 🥮 |NO 📙 |
| **IERC20Metadata** | Interface | IERC20 |||
L | symbol | External | | | NO! |
| **Context** | Implementation | |||
L | _msgData | Internal ← | | |
| **SafeMath** | Library | |||
 ^{\mathsf{L}} \mid add \mid Internal \stackrel{\mathsf{a}}{\mathsf{a}} \mid
 📙 | sub | Internal 🛍 |
 L | sub | Internal 🔒
 📙 | mul | Internal 🛍 |
 L | div | Internal 🔒
 👢 | div | Internal 🖴
 L | mod | Internal 🗎
 L | mod | Internal 🗎 |
**ERC20** | Implementation | Context, IERC20, IERC20Metadata |||
 L | <Constructor> | Public ! | 🛑
 L | name | Public ! |
                     |NO | |
    symbol | Public !
```



```
decimals | Public | |
                           |N0 |
 L | totalSupply | Public | | NO!
 L | balanceOf | Public | |
    transfer | Public 📒 | 🛑
                             INO! I
 L | allowance | Public | |
                            |N0 |
 📙 | approve | Public 📙 | 🥌
                            |NO |
 👢 | transferFrom | Public 📒 | 🥌
   | increaseAllowance | Public |
                                     |NO |
 L | decreaseAllowance | Public |
                                     |NO | |
 L | _transfer | Internal 🗎 | 🛑
 📙 | _mint | Internal 🛍 | 🧓
 L | _burn | Internal 🖴 | 🥌
 L | _approve | Internal 🗎 | 🥌
 📙 | _beforeTokenTransfer | Internal 🛍 | 🥌 | |
 **SafeMathUint** | Library | |||
 └ | toInt256Safe | Internal 🔓 |  | |
111111
| **SafeMathInt** | Library | |||
 L | mul | Internal 🖴 |
 L | div | Internal 🛍 |
 L | sub | Internal 🗎 |
 L | add | Internal 🗎 |
 L | abs | Internal 🖴 |
 └ | toUint256Safe | Internal 🔒 |
 **DividendPayingTokenInterface** | Interface | |||
 L | dividendOf | External | | | NO | |
| L | withdrawDividend | External | | 🛑 | NO! |
111111
 **DividendPayingTokenOptionalInterface** | Interface | |||
 L | withdrawableDividendOf | External | |
 L | withdrawnDividendOf | External | |
                                       |NO | |
 **Ownable** | Implementation | Context |||
 L | <Constructor> | Public | |
 L | owner | Public | | NO! |
    renounceOwnership | Public
                                     | onlyOwner |
 DividendPayingToken | Implementation | ERC20, Ownable, DividendPayingTokenInterface,
DividendPayingTokenOptionalInterface |||
 L | <Constructor> | Public | | 🛑 | ERC20 |
 👢 | distributeCAKEDividends | Public 👢 | 🧶 | onlyOwner |
 L | withdrawDividend | Public | | 🛑 |NO! |
   | _withdrawDividendOfUser | Internal 🛍 | 🥌
 L | dividendOf | Public | | NO
    withdrawableDividendOf | Public
     withdrawnDividendOf | Public | | NO
```



```
accumulativeDividendOf | Public ! |
                                    |N0 |
 | setReward | Public ! | 🛑
  | _transfer | Internal 🛍 | 🥌
 | _mint | Internal 🗎 | 🥌
 | _burn | Internal 🔒 | 🥌
👢 | _setBalance | Internal 🖴 | 🥌
**IterableMapping** | Library |
 | get | Public | | NO
 | getIndexOfKey | Public
                             |N0 |
  getKeyAtIndex | Public | |
                             INO I
|N0 |
L | set | Public ! | 🛑
                     |NO |
L | remove | Public | | 🛑 |NO | |
**MASTERCHEF** | Implementation | ERC20, Ownable |||
 | <Constructor> | Public ! | @
                             | ERC20 |
  L
   updateDividendTracker | Public 📒 | 🥌 | onlyOwner |
   rwdxUpdate | Public 📒 | 🥌 | onlyOwner |
   updateUniswapV2Router | Public | | 🛑 | onlyOwner |
   excludeMultipleAccountsFromFees | Public 📘 | 🥌
                                             | onlyOwner |
   setMarketingWallet | External 📒 | 🥌
                                   | onlyOwner |
   setCAKERewardsFee | External 📘 | 🛑
                                   | onlyOwner |
   setLiquiditFee | External 📒 | 🥌
                                onlyOwner |
   setMarketingFee | External 📘 | 🥮 | onlyOwner |
   setAutomatedMarketMakerPair | Public | | 🛑 | onlyOwner |
   blacklistAddress | External | | 🛑 | onlyOwner |
  __setAutomatedMarketMakerPair | Private 🛍 | 🥌 | |
   updateClaimWait | External 📒 | 🥮 | onlyOwner |
   getClaimWait | External | | | NO | |
   isExcludedFromFees | Public | |
                                 |NO | |
   withdrawableDividendOf | Public
                                     |N0
   dividendTokenBalanceOf | Public |
                                    |N0 | |
   excludeFromDividends | External
                                     | onlyOwner |
   getAccountDividendsInfo | External | | NO | |
   getAccountDividendsInfoAtIndex | External | | NO | |
  | processDividendTracker | External 📘 📗 |NO 📙 |
   claim | External 📒 | 🥌
                        |N0 |
   getLastProcessedIndex | External | | | NO! |
   getNumberOfDividendTokenHolders | External ! |
                                              |N0 |
  _transfer | Internal 🗎 | 🛑
   swapAndSendToFee | Private 🛍 | 🥌
   swapAndLiquify | Private 🔐 | 🥌
   swapTokensForEth | Private 😭 | 🥌
   swapTokensForCake | Private 🔐 | 🥌
   addLiquidity | Private 💕
```



Interfi

Smart Contract
Security Audit



## **Smart Contract - Software Analysis**

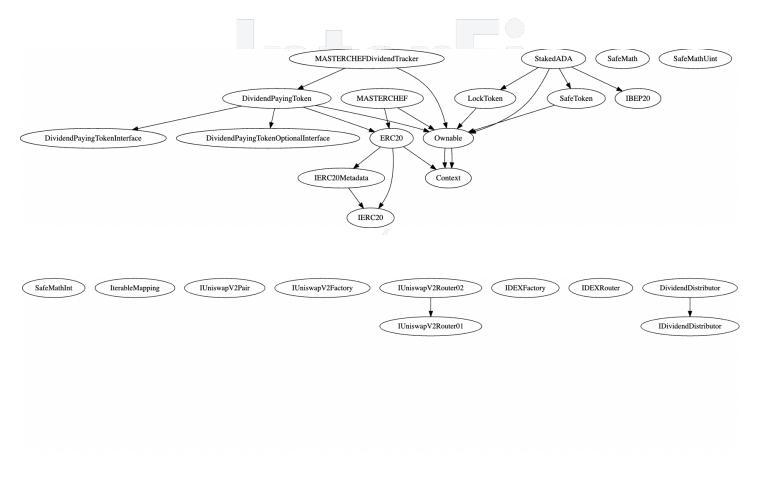
#### **Callout functions - Sighash**

```
Sighash
             Function Signature
39509351 => increaseAllowance(address,uint256)
43509138 \Rightarrow div(int256,int256)
18160ddd => totalSupplv()
70a08231 => balanceOf(address)
a9059cbb => transfer(address.uint256)
dd62ed3e => allowance(address,address)
095ea7b3 => approve(address,uint256)
23b872dd => transferFrom(address,address,uint256)
06fdde03 => name()
95d89b41 => symbol()
313ce567 => decimals()
119df25f => _msgSender()
8b49d47e => _msgData()
771602f7 => add(uint256,uint256)
b67d77c5 => sub(uint256,uint256)
e31bdc0a => sub(uint256,uint256,string)
c8a4ac9c => mul(uint256,uint256)
a391c15b => div(uint256,uint256)
b745d336 => div(uint256,uint256,string)
f43f523a => mod(uint256,uint256)
71af23e8 => mod(uint256,uint256,string)
a457c2d7 => decreaseAllowance(address,uint256)
30e0789e => _transfer(address,address,uint256)
4e6ec247 => mint(address,uint256)
6161eb18 => burn(address,uint256)
104e81ff => _approve(address,address,uint256)
cad3be83 => beforeTokenTransfer(address,address,uint256)
e823b9bf => toInt256Safe(uint256)
bbe93d91 => mul(int256,int256)
adefc37b => sub(int256,int256)
a5f3c23b => add(int256,int256)
1b5ac4b5 => abs(int256)
744f7c7d => toUint256Safe(int256)
91b89fba => dividendOf(address)
6a474002 => withdrawDividend()
a8b9d240 => withdrawableDividendOf(address)
aafd847a => withdrawnDividendOf(address)
27ce0147 => accumulativeDividendOf(address)
8da5cb5b => owner()
715018a6 => renounceOwnership()
f2fde38b => transfer0wnership(address)
ba72a955 => distributeCAKEDividends(uint256)
```



```
373de4aa
             withdrawDividendOfUser(address)
e5932c40
             setReward(address)
ab86e0a6
             _setBalance(address,uint256)
268d8e2e =>
             get(Map,address)
b45dad3d
             getIndexOfKey(Map,address)
7596720f
             getKeyAtIndex(Map,uint256)
b1b533f3
             size(Map)
6b06f325 => set(Map,address,uint256)
0eac8729
              remove(Map,address)
             DOMAIN_SEPARATOR()
3644e515
30adf81f
             PERMIT_TYPEHASH()
7ecebe00
         => nonces(address)
             permit(address,address,uint256,uint256,uint8,bytes32,bytes32)
d505accf
             MINIMUM LIQUIDITY()
ba9a7a56 =>
```

## <u>Callout functions – Inheritance Graph</u>





# **Smart Contract - Manual Analysis**

Function	Description	Tested	Verdict
TotalSupply	provides information about the total token	Yes	
	supply		Passed
BalanceOf	provides account balance of the owner's	Yes	Passed
BalariceOr	account		
Transfer	executes transfers of a specified number of		NIA
Hullstel	tokens to a specified address	NA	NA
TransferFrom	executes transfers of a specified number of		
	tokens from a specified address	NA	NA
Approve	allow a spender to withdraw a set number of		
	tokens from a specified account	NA	NA
Allowance	returns a set number of tokens from a spender to	.,	
	the owner	Yes	Passed
IsExcludedFromFees	allows a specific address to avoid transaction	.,	
	fees Security Audit	Yes	Passed

#### **Verified**

- Owner can mint tokens at token launch.
- Owner can-not pause the contract.
- Owner can-not lock or burn user assets.

#### **Safety Note**

Be aware that active smart contract owner privileges constitute an elevated impact to smart contract's safety and security.



#### **Important Information**

The MasterChef.sol smart contract utilizes the "SafeMath" to prevent Integer Overflow.

```
function add(uint256 a, uint256 b) internal pure returns (uint256) {
    uint256 c = a + b;
    require(c >= a, "SafeMath: addition overflow");
    return c;
}
```

The MasterChef.sol smart contract has a low severity issue which may not create any functional vulnerability.

Expected pragma, import directive or contract/interface/library definition.

Smart Contract Security Audit



# **Smart Contract - SWC Risk Assessment**

SWC ID	Description	Verdict
SWC-101	Integer Overflow and Underflow	Passed
SWC-102	Outdated Compiler Version	! Low
SWC-103	Floating Pragma	! Low
SWC-104	Unchecked Call Return Value	Passed
SWC-105	Unprotected Ether Withdrawal	Passed
SWC-106	Unprotected SELFDESTRUCT Instruction	Passed
SWC-107	Re-entrancy Control of the Control o	Passed
SWC-108	State Variable Default Visibility	Passed
SWC-109	Uninitialized Storage Pointer	Passed
SWC-110	Assert Violation Smart Contract	Passed
swc-111	Use of Deprecated Solidity Functions	Passed
SWC-112	Delegate Call to Untrusted Callee	Passed
SWC-113	DoS with Failed Call	Passed
SWC-114	Transaction Order Dependence	Passed
SWC-115	Authorization through tx.origin	Passed
SWC-116	Block values as a proxy for time	Passed
swc-117	Signature Malleability	Passed
SWC-118	Incorrect Constructor Name	Passed



SWC-119	Shadowing State Variables	Passed
SWC-120	Weak Sources of Randomness from Chain Attributes	Passed
SWC-121	Missing Protection against Signature Replay Attacks	Passed
SWC-122	Lack of Proper Signature Verification	Passed
SWC-123	Requirement Violation	Passed
SWC-124	Write to Arbitrary Storage Location	Passed
SWC-125	Incorrect Inheritance Order	Passed
SWC-126	Insufficient Gas Griefing	Passed
SWC-127	Arbitrary Jump with Function Type Variable	Passed
SWC-128	DoS With Block Gas Limit	Passed
SWC-129	Typographical Error	Passed
SWC-130	Right-To-Left-Override control character (U+202E)	Passed
SWC-131	Presence of unused variables	Passed
SWC-132	Unexpected Ether balance	Passed
SWC-133	Hash Collisions With Multiple Variable Length Arguments	Passed
SWC-134	Message call with hardcoded gas amount	Passed
SWC-135	Code With No Effects (Irrelevant/Dead Code)	Passed
SWC-136	Unencrypted Private Data On-Chain	Passed



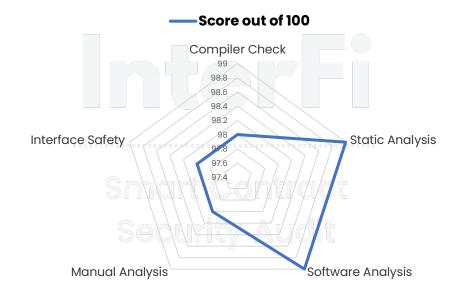
! Critical None critical severity issues identified

! High None high severity issues identified

! Medium None medium severity issues identified

! Low 2 Low severity issues identified

Passed 41 functions and instances verified and passed



Compiler Check	98
Static Analysis	99
Software Analysis	99
Manual Analysis	98
Interface Safety	98



## **Auditor's Verdict**

InterFi team has performed a line-by-line manual analysis and automated review of the smart contract. The smart contract was analyzed mainly for common smart contract vulnerabilities, exploits, and manipulation hacks.

MasterChef's smart contract source code has LOW RISK SEVERITY.

MasterChef has successfully PASSED the smart contract audit.



#### **Auditor's Footnote:**

- Be aware that active smart contract owner privileges constitute an elevated impact to smart contract's safety and security.
- Project's liquidity pair isn't checked and verified due to out of scope.
- Project website is not checked due to out of scope. The website hasn't been reviewed for SSL and lighthouse report.



## **Important Disclaimer**

InterFi Network provides contract auditing and project verification services for blockchain projects. The purpose of the audit is to analyse the on-chain smart contract source code, and to provide basic overview of the project. This report should not be transmitted, disclosed, referred to, or relied upon by any person for any purposes without InterFi's prior written consent.

InterFi provides the easy-to-understand assessment of the project, and the smart contract (otherwise known as the source code). The audit makes no statements or warranties on the security of the code. It also cannot be considered as an enough assessment regarding the utility and safety of the code, bug-free status, or any other statements of the contract. While we have used all the data at our disposal to provide the transparent analysis, it is important to note that you should not rely on this report only — we recommend proceeding with several independent audits and a public bug bounty program to ensure the security of smart contracts. Be aware that smart contracts deployed on a blockchain aren't resistant from external vulnerability, or a hack. Be aware that active smart contract owner privileges constitute an elevated impact to smart contract's safety and security. Therefore, InterFi does not guarantee the explicit security of the audited smart contract.

The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

This report should not be considered as an endorsement or disapproval of any project or team.

The information provided on this report does not constitute investment advice, financial advice, trading advice, or any other sort of advice and you should not treat any of the report's content as such. Do conduct your own due diligence and consult your financial advisor before making any investment decisions.



## **About InterFi Network**

InterFi Network provides intelligent blockchain solutions. InterFi is developing an ecosystem that is seamless and responsive. Some of our services: Blockchain Security, Token Launchpad, NFT Marketplace, etc. InterFi's mission is to interconnect multiple services like Blockchain Security, DeFi, Gaming, and Marketplace under one ecosystem that is seamless, multi-chain compatible, scalable, secure, fast, responsive, and easy-to-use.

InterFi is built by a decentralized team of UI experts, contributors, engineers, and enthusiasts from all over the world. Our team currently consists of 6+ core team members, and 10+ casual contributors. InterFi provides manual, static, and automatic smart contract analysis, to ensure that project is checked against known attacks and potential vulnerabilities.

To learn more, visit <a href="https://interfi.network">https://interfi.network</a>

To view our audit portfolio, visit <a href="https://github.com/interfinetwork">https://github.com/interfinetwork</a>

To book an audit, message <a href="https://t.me/interfiaudits">https://t.me/interfiaudits</a>





