

Product Carbon Footprint Verification Opinion

The Inventory of Product Carbon Footprint of WLCSP Services

which is calculated by

Winstek Semiconductor Co.,Ltd.

NO.176-5, 6 Ling, Hualung Chun, Chiung Lin,
307 Hsin-Chiu Hsien, Taiwan

Based on life cycle assessment verified in accordance
with ISO 14064-3:2019 as meeting the requirements of

ISO 14067:2018

Basis of Assessment

Cradle-to-Gate

Authorized by



Stephen Pao
Business Assurance Director
Version 1
Issue Date: 06 February 2025
Valid Date: 05 February 2027

TGP57-15-16 2411
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Product Name	WLCSP Services			
Declared Unit	per mm ²			
Functional Unit	-			
Life cycle GHG emissions				
Declared Unit emissions (Unit: grams of CO ₂ e)				Functional Unit emissions (Unit: grams of CO ₂ e)
Life Cycle Stage	Material	Manufacture	Total	
TypeA : WLCSPwCF ₄ → DPS&Package	1.119	4.843	5.96	-
TypeB : WLCSPwCF ₄ → CP→DPS&Package	1.149	8.016	9.17	-
TypeC : WLCSPw/oCF ₄ →DPS&Package	0.398	2.507	2.90	-
TypeD : WLCSPw/oCF ₄ →CP→DPS&Package	0.407	3.905	4.31	-

SGS has been commissioned by Winstek Semiconductor Co.,Ltd. (hereinafter referred to as "Winstek"), NO.176-5, 6 Ling, Hualung Chun, Chiung Lin, 307 Hsin-Chiu Hsien, Taiwan to conduct the life cycle Greenhouse Gas (hereinafter referred to as "GHG") emissions verification of WLCSP Services in accordance with ISO 14064-3:2019 against the requirements of

ISO 14067:2018

Roles and responsibilities

- The management of Winstek is responsible for the organization's GHG information system, the development and maintenance of records and reporting procedures in accordance with that system, including the calculation and determination of the life cycle GHG emissions for product information and the reported life cycle GHG emissions of the product.
- Contract Date: The verification was based on the verification scope, objectives and criteria as agreed between Winstek and SGS on 10 July 2024.
- Verification Standard: ISO 14067:2018
Greenhouse gases- Carbon footprint of products- Requirements and guidelines for quantification
- Verification Period: 11 November 2024 to 05 December 2024.

Scope

- GHG information for the following production period was verified : 01 January 2023 to 31 December 2023.
- Title or description of activities : Product carbon footprint verification of the Cradle-to-Gate life cycle GHG emissions manufactured by Winstek:
 - WLCSP Services
 - TypeA : WLCSPwCF₄→DPS&Package
 - TypeB : WLCSPwCF₄→CP→DPS&Package
 - TypeC : WLCSPw/oCF₄→DPS&Package
 - TypeD : WLCSPw/oCF₄→CP→DPS&Package
- Manufacturing location :
 - NO.176-5, 6 Ling, Hualung Chun, Chiung Lin, 307 Hsin-Chiu Hsien, Taiwan
- Product Category Rule : Integrated Circuit - Assembly & Test Services, 2024-001, V2.1, EPD.
- Functional unit : -
- Declared unit : per mm²

- System boundary : Covers a Cradle-to-Gate assessment of the full life cycle emissions; the system boundary was clearly defined in accordance with ISO 14067:2018. All GHG's enlisted on ISO 14067:2018.
- Data resources : The primary data collection is from manufacturing and operational control phases. The secondary data collection is from Carbon Footprint Information Platform, Ecoinvent 3.10.
- Life cycle assessment tool and index :
 - Life cycle emissions are calculated by Excel.
 - IPCC 2021 AR6 GWP values are applied in this inventory.
- Level of assurance: In accordance with verification criteria and the execution of verification procedures based on bilateral agreements, the process aligns with the materiality requirements and the reasonable assurance level recognized by authorities.
- Materiality : 5%.

Objective

The purpose of this verification exercise is, by review of objective evidence, to independently review:

- Whether the life cycle GHG emissions of the product are as declared by the organization's GHG assertion.
- The data reported is accurate, complete, consistent, transparent and free of material error or omission.

Conclusion

- SGS's approach is risk-based, drawing on an understanding of the risks associated with reporting the life cycle GHG emissions of product information and the controls in place to mitigate these risks. Our examination included assessment and a test of evidence relevant to the amounts and disclosures in relation to the reported life cycle GHG emissions of the product. We planned and performed our work to obtain the information, explanations and evidence that the life cycle GHG emissions are free from material misstatement.
- Verification Opinion: the opinion of SGS is modified in accordance with the following described circumstances.
 - The auditor has sufficient and appropriate evidence to support the material emissions, removals, or storage.
 - The auditor applies appropriate criteria for the material emissions, removals, or storage.
 - When the auditor intends to rely on relevant controls, the effectiveness of those controls has been assessed.

- The auditor, applying the ISO 14067:2018 standard, presents the following findings. After adjustments and corrections, no material errors were identified.
 - The revised opinion has been supported with appropriate evidence.
 - The carbon footprint report/inventory has been supplemented and revised based on supporting evidence.
- Retention Limitation: N/A

Confidentiality

The reports and attachments may contain relevantly confidential information of the clients. In addition to being submitted as governmental application or certification documents, the reports and attachments are not allowed to be edited, duplicated, or published without the clients' agreement in written form.

Avoidance of Conflict of Interest

The reports and attachments are completely complied with the standards and procedures that related-authorities established. The reports and attachments of auditing process are conducted with fairness and honesty. If not, the auditing institution not only has to bear the relevant compensation duties, but also to receive legal charge and punishment.

Verifier Group

Above opinions coincide with auditing process with fairness and impartiality, and aim at the emission of clients.

Lead Verifier:

Victor Tseng

Verifier:

Kai ping Teh

Sophia Chui

This opinion shall be interpreted with the GHG assertion of Winstek as a whole. This result shall be valid for a maximum period of two years, after which the GHG emission shall be re-assessed.

Note: This Opinion is issued, on behalf of Client, by SGS Taiwan Ltd. ("SGS") under its General Conditions for Green Gas Verification Services available at http://www.sgs.com/terms_and_conditions.htm. The findings recorded hereon are based upon an audit performed by SGS. A full copy of this Opinion, the findings and the supporting Carbon Footprint Assertion may be consulted at Winstek Semiconductor Co., Ltd., NO.176-5, 6 Ling, Hualung Chun, Chiung Lin, 307 Hsin-Chiu Hsien, Taiwan. This Opinion does not relieve Client from compliance with any bylaws, federal, national or regional acts and regulations or with any guidelines issued pursuant to such regulations. Stipulations to the contrary are not binding on SGS and SGS shall have no responsibility vis-à-vis parties other than its Client.