

PRODUCTS FAMILY DECLARATION FOR AUDIO MODULE OF ABB

PRODUCT ENVIRONMENTAL PROFILE

Environmental Product Declaration



ORGANIZATION ABB Xiamen Smart Technology Co., Ltd		WEBSITE https://new.abb.com/cn/en/about/businesses/electrification/xiamen-smart-technology-co			
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ABB Purpose & Embedding Sustainability

ABB is demonstrating their commitment to sustainability by making themselves sustainable. Across their own operations and value chain, aspiring to become a role model for others to follow. With **ABB Purpose** ABB is focusing on reducing harmful emissions, preserving natural resources, and championing ethical and humane behavior to achieve this. Detail info see the website: Sustainability strategy 2030 — ABB Group (global.abb)



General Information

Reference product	The reference product is one unit of Audio module produced by ABB, the representative product is M251021A-A-02 (2TMA210010A0001).
Description of the product	The audio modules are important functional modules for outdoor station which can be fixed in the OS frame and to achieve the function of communication between the visitors outside the building and the master in the buildings through receiving and sending sounds.
Functional unit of the representative product	To receive and send sounds between people outside the building and inside of the building so that to achieve the effective communication between the visitors (outdoor) and residents (indoor) over a reference lifetime of 10 years.
Products concerned	<p>The products covered by this PEP are:</p> <p>A251381A-A-03 (2TMA200160A0027), A251381A-A-04 (2TMA220160A0001), A251381A-S-03 (2TMA220160X0008), A251381A-B-03 (2TMA220160B1007), A251381A-W-03 (2TMA220160W0015), M251021A-A (2TMA070150A0002), M251021A-W (2TMA070150W0026), M251021A-B-02 (2TMA210160B0016), M251381A-A (2TMA200160A0001), M251381A-B (2TMA220161B1007), M251021A-B (2TMA210160B0007), M251021A-A-02 (2TMA210010A0001), M251021A-W-02 (2TMA210010W0001), M251022A-A (2TMA070150A0003), M251022A-W (2TMA070150W0027), M251022A-B-02 (2TMA210160B0020), M251022A-B (2TMA210160B0011), M251022A-A-02 (2TMA210010A0002), M251022A-W-02 (2TMA210010W0002), M251023A-A (2TMA070150A0004), M251023A-W (2TMA070150W0028), M251023A-B-02 (2TMA210160B0026), M251023A-B (2TMA210160B0025), M251023A-A-02 (2TMA210010A0003), M251023A-W-02 (2TMA210010W0003), M251024A-A (2TMA070150A0006), M251024A-W (2TMA070150W0029), M251024A-A-02 (2TMA210010A0004), M251024A-W-02 (2TMA210010W0004), M251025A-A-02 (2TMA210160A0003), M251026A-A-02 (2TMA210160A0004).</p>

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Constituent materials

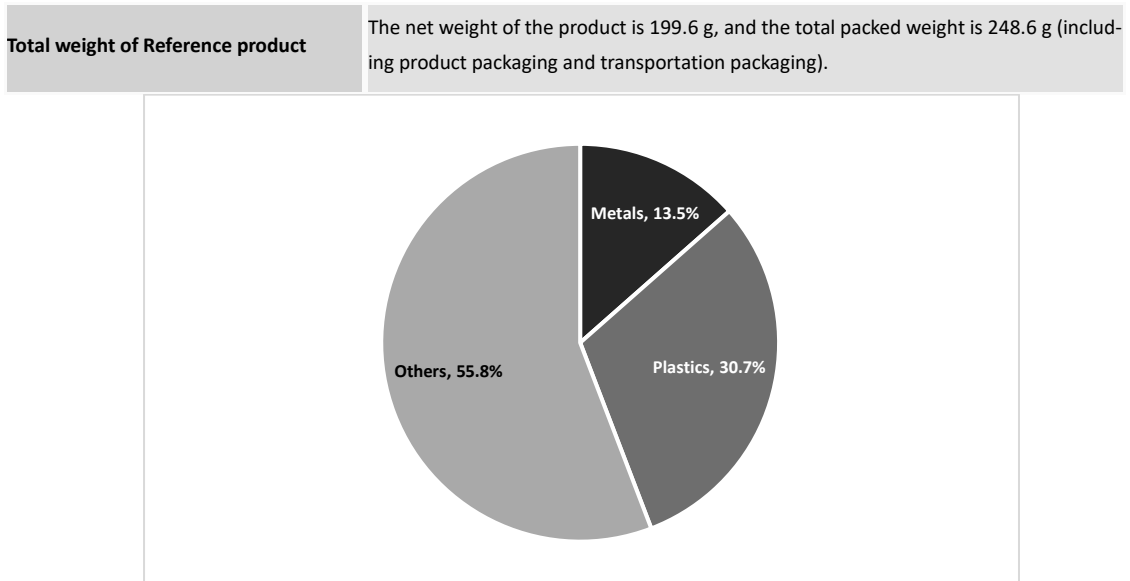


Figure 1 Constituent materials of the reference product M251021A-A-02 (2TMA210010A0001)

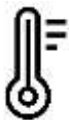
Table 1 Information on mass of reference product and its packaging

Components	2TMA210010A0001	Product weight, incl. product pack (g)	Product weight, incl. product pack and transportation pack (g)
Product (g)	199.6	246.0	248.6
Product packaging (g)	46.4		
Transportation packaging (g)	2.6		

Detailed constituent materials of the reference product were shown in Figure 1 and then listed in Table 2.

Table 2 Materials distribution of the reference product

Plastics as % of weight		Metals as % of weight		Paper as % of weight		Other as % of weight	
Name and CAS number	Weight-%	Name and CAS number	Weight-%	Name and CAS number	Weight-%	Name and CAS number	Weight-%
PC	26.0%	Al alloy	11.8%	Corrugated paper	18.0%	Electronic parts	37.4%
Silicone rubber	2.6%	Low carbon steel	1.2%			Acrylic adhesive	0.4%
PU foam	1.0%	Stainless steel 304	0.5%				
PE	0.9%						
Nylon 66	0.2%						



Environmental impacts

Reference lifetime	10 years
Product category	Audio module. According to the Specific rules for electrical switchgear and control gear Solutions (PSR-0005-ed3-EN-2023 06 06), the product is covered by other equipment - Category 2: active products.

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Installation elements		The product is installed manually. There is no input of materials / accessories and energy during the installation. The main environmental impact was caused by the waste generated in this stage.			
Use scenario		The use stage has been modeled based on the sales mix data in 2022. The corresponding low voltage electricity countries mix.			
Geographical representativeness		The product produced in China but is used in the worldwide.			
Technological representativeness		In the manufacturing stage, specific data was collected to calculate the environmental impact caused by the manufacturing process. For the production of raw materials and parts, datasets from Ecoinvent 3.8 were used. During the dataset selection, the technological representation was considered carefully. Datasets with the same production processes were preferred. If not available, datasets with similar production processes were chosen.			
Software and databases used		Simapro version 9.4.04 & databases ecoinvent 3.8 & EF3.0			
Standards applied in ABB		ABB had used many recycling materials, e.g., plastic and metal. The products' standards applied include: EN 62368-1:2014/A11:2017 EN IEC 61000-6-1:2019 EN 61000-6-3:2007/A1:2011			
Energy model used	Manufacturing	Distribution	Installation	Use	End of life
	Average electricity mix in China	Global	Non-applicable	Global	Global

Table 3 Environmental impact indicators of life cycle Impact assessment

Compulsory Indicators

Impact indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Climate change	kg CO2 eq	3.43E+01	1.15E+01	1.79E+00	7.36E-02	2.06E+01	3.40E-01
Climate change - Fossil	kg CO2 eq	3.37E+01	1.15E+01	1.78E+00	3.80E-03	2.01E+01	3.38E-01
Climate change - Biogenic	kg CO2 eq	5.37E-01	-6.73E-03	5.81E-04	6.98E-02	4.73E-01	1.13E-03
Climate change - Land use and LU change	kg CO2 eq	5.81E-02	1.85E-02	1.22E-04	8.30E-07	3.94E-02	7.57E-05
Ozone depletion	kg CFC11 eq	1.90E-06	5.12E-07	4.05E-07	2.96E-10	9.67E-07	1.88E-08
Acidification	mol H+ eq	2.07E-01	8.92E-02	9.34E-03	1.59E-05	1.05E-01	3.85E-03
Eutrophication, freshwater	kg P eq	3.28E-02	1.14E-02	2.51E-05	2.37E-07	2.14E-02	2.24E-05
Eutrophication, marine	kg N eq	4.13E-02	1.55E-02	3.41E-03	7.45E-06	1.99E-02	2.57E-03
Eutrophication, terrestrial	mol N eq	3.79E-01	1.67E-01	3.74E-02	6.70E-05	1.73E-01	2.02E-03
Photochemical ozone formation	kg NMVOC eq	1.07E-01	4.94E-02	9.66E-03	1.71E-05	4.71E-02	7.17E-04
Resource use, minerals and metals	kg Sb eq	3.45E-03	3.31E-03	6.21E-07	6.70E-09	1.33E-04	4.16E-06
Resource use, fossils	MJ	4.74E+02	1.33E+02	2.50E+01	2.18E-02	3.14E+02	1.95E+00
Water use	m3 depriv.	1.01E+01	2.87E+00	1.83E-02	1.75E-03	7.12E+00	6.75E-02

Note: the recycled content and the scrape rates of raw materials of the products and products' packaging are adjusted to 0% and 30% respectively according to the PSR.

Table 4 Resource use indicators of life cycle Impact assessment

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Compulsory Indicators

Resource use indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Use of renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	6.54E+01	1.41E+01	8.02E-02	5.44E-04	5.10E+01	2.33E-01
Use of renewable primary energy resources as raw materials	MJ	5.26E-01	5.26E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources	MJ	6.60E+01	1.46E+01	8.02E-02	5.44E-04	5.10E+01	2.33E-01
Use of non-renewable primary energy, excluding renewable primary energy resources used as raw materials	MJ	4.72E+02	1.31E+02	2.50E+01	2.18E-02	3.14E+02	1.95E+00
Use of non-renewable primary energy resources as raw materials	MJ	2.30E+00	2.30E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources	MJ	4.74E+02	1.33E+02	2.50E+01	2.18E-02	3.14E+02	1.95E+00
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Freshwater	m ³	4.75E-01	9.02E-02	7.68E-04	5.85E-05	3.82E-01	2.00E-03

Table 5 Waste category indicators of life cycle Impact assessment

Compulsory Indicators

Waste category indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Hazardous waste disposed	kg	1.87E-03	1.36E-03	6.67E-05	5.28E-08	2.63E-04	1.80E-04
Non-hazardous waste disposed	kg	4.07E+00	1.45E+00	7.06E-02	4.65E-02	1.64E+00	8.60E-01
Radioactive waste disposed	kg	2.16E-03	2.96E-04	1.77E-04	9.90E-08	1.68E-03	1.05E-05

Table 6 Output flow indicators

Compulsory Indicators

Output flow indicators	Unit	Total	Manufacturing	Distribution	Installation	Use	End of life
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	2.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.35E-02
Materials for energy recovery	kg	3.67E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.67E-02
Exported energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Note: The recovery of materials for materials and energy was calculated according to Annex D of the PCR.

Biogenic Carbon of product and packaging

As no biogenic carbon in the product, thus, only the biogenic carbon in the packaging was calculated. Of the product packaging and packaging for transportation, the materials containing biogenic carbon are wood pallet and paper board.

Table 7 Amount of biogenic carbon of product and packaging

Item	Unit (kg of C)	Total
Biogenic carbon content of the product	0.00E+00	0.00E+00
Biogenic carbon content of the associated packaging	1.60E-02	1.60E-02

Extrapolation to a homogeneous environmental family

To determine the environmental impact of a product covered by the PEP other than the representative product, the following rules apply:

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1) Manufacturing stage

The impact for this phase of a product covered by the PEP other than the representative product is proportional to weight of the product, thus, the impacts should be calculated by multiple the coefficients factor_1 in Table 8 by the environmental impact for this phase of the representative product.

2) Distribution

The impact for this phase of a product covered by the PEP other than the representative product is proportional to the packaged product weight, thus, the impacts should be calculated by multiple the coefficients factor_2 in Table 8 by the environmental impact for those phases of the representative product.

3) Installation

The impact for this phase of a product covered by the PEP other than the representative product is proportional to weight of the product packaging, thus, the impacts should be calculated by multiple the coefficients factor_3 in Table 8 by the environmental impact for those phases of the representative product.

4) Use

The impact for this phase of a product covered by the PEP other than the representative product is proportional to the amount of energy consumed in the use stage, thus, the impacts should be calculated by multiple the coefficients factor_4 in Table 8 by the environmental impact for those phases of the representative product.

5) End of life phases


The impacts of the representing product from the end-of-life are less than 2% of the total impact. However, the impact for this phase of a product covered by the PEP other than the representative product is calculated by multiple the coefficients factor_1 in Table 8 by the environmental impact for this phase of the representative product.

Table 8 Extrapolation rules for homogeneous family product

SAP Number	Article Number	Factor_1	Factor_2	Factor_3	Factor_4
2TMA220160B1007	A251381A-B-03	0.67	0.86	1.69	0.67
2TMA220160W0015	A251381A-W-03	0.67	0.86	1.69	0.67
2TMA200160A0027	A251381A-A-03	0.67	0.86	1.69	0.67
2TMA220160A0001	A251381A-A-04	0.67	0.86	1.69	0.67
2TMA220160X0008	A251381A-S-03	0.95	1.08	1.69	0.67
2TMA200160A0001	M251381A-A	0.73	0.91	1.69	1.00
2TMA220161B1007	M251381A-B	0.73	0.91	1.69	1.00
2TMA210160B0026	M251023A-B-02	0.96	0.98	1.04	1.00
2TMA210160B0025	M251023A-B	0.97	1.01	1.03	1.00
2TMA210010W0003	M251023A-W-02	0.97	0.98	1.04	1.00
2TMA070150A0004	M251023A-A	0.97	0.98	1.03	1.00
2TMA070150W0028	M251023A-W	0.97	0.98	1.03	1.00
2TMA210010A0003	M251023A-A-02	0.97	0.98	1.04	1.00
2TMA210160A0004	M251026A-A-02	0.98	0.98	1.00	1.00
2TMA070150A0003	M251022A-A	0.99	0.99	1.03	1.00
2TMA210010W0002	M251022A-W-02	0.99	1.01	1.04	1.00
2TMA210160B0020	M251022A-B-02	0.99	0.99	1.04	1.00
2TMA210010A0002	M251022A-A-02	0.99	0.99	1.04	1.00
2TMA070150W0027	M251022A-W	0.99	0.99	1.03	1.00
2TMA210160B0011	M251022A-B	0.99	0.99	1.03	1.00
2TMA210160A0003	M251025A-A-02	0.99	0.99	1.02	1.00

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2TMA210010W0001	M251021A-W-02	1.00	1.01	1.04	1.00
2TMA210160B0016	M251021A-B-02	1.00	1.01	1.04	1.00
2TMA070150A0002	M251021A-A	1.00	1.01	1.03	1.00
2TMA210160B0007	M251021A-B	1.00	1.01	1.03	1.00
2TMA070150W0026	M251021A-W	1.00	1.01	1.03	1.00
2TMA070150A0006	M251024A-A	1.00	1.01	1.03	1.00
2TMA070150W0029	M251024A-W	1.00	1.01	1.03	1.00
2TMA210010A0004	M251024A-A-02	1.00	1.01	1.04	1.00
2TMA210010W0004	M251024A-W-02	1.00	1.01	1.04	1.00
2TMA210010A0001	M251021A-A-02	1.00	1.00	1.00	1.00

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Independent verification of the declaration and data in compliance with ISO 14025: 2006	
Internal: <input type="checkbox"/>	External: <input checked="" type="checkbox"/>
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)	
PEPs are compliant with XP C08-100-1:2016 or EN 50693:2019 The components of the present PEP may not be compared with components from any other program.	
Document complies with ISO 14025:2006 "Environmental labels and declarations. Type III environmental declarations"	

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