


ZyXEL WEEE 3R REPORT

ZyXEL WEEE program – Evaluation of Recyclability and Recoverability rate for ZyXEL Networked equipment EU Directive 2012/19/EU

Company name.....	: ZyXEL Communications Corporation
Address	: No. 2, Gongye E. 9th Road, Hsinchu Science Park, Hsinchu, Taiwan, R.O.C.
Department.....	: Quality Management Department
Report No.....	: ZQ20151208005
Version.....	: 1.0
Issue date.....	: 2015-12-08
Reporting period	: 2015-09-16 to 2015-12-08
Product category	: IT and Telecommunications equipment
Test Object.....	: Wireless N Fiber WAN Small Business Gateway
Model name	: SBG3500-N000
P/N no.	: SBG3500-N000-EU01V1F
Trademark.....	: 
Power supply (I/O)	: External Power Supply
Rating(s).....	: AC 100-240V, 50/60Hz, 0.8A max.
Standard	: ZyXEL WEEE program is based on following: Directive 2012/19/EU (WEEE Recast) A guide to the marketing, product development and manufacturing actions you need to take IEC 62635
Test Report Form No.....	: ZyXEL TRF52001_2013-02-06 / Ver. 1
Number of pages (Contents)	: 12 pages
Number of pages (Attachments) ..	: 3 pages
Reported by...: Lisa Chen	Approved by .: Emma Bao

INDEX

1. ABBREVIATIONS USED IN THE REPORT	3
2. GENERAL DESCRIPTION OF PRODUCT	4
3. DISASSEMBLING INFORMATION	6
4. CALCULATION RESULT	9

ATTACHMENT

ATTACHMENT A : PLASTIC MATERIALS MARKING	13
ATTACHMENT B : IDENTIFIED FOR SELECTIVE TREATMENT	14
ATTACHMENT C : REGISTRATION RESPONSIBILITY	15

1. Abbreviations used in the report

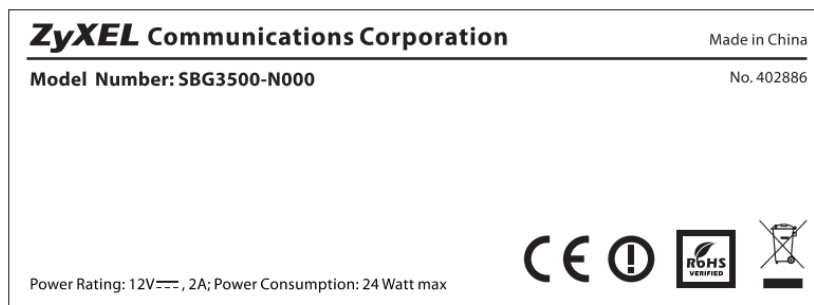
Abbr.	Full name
QMD	Quality Management Department
3R	Reused, Recycle, Recovery
MB	MotherBoard
PSU	Power supply unit
$M_{(i)}$	Mass of ith part (ref.: IEC/TR 62635:2012)
$RCR_{(i)}$	Recycling rate of the ith part in the corresponding end-of-life treatment scenario (ref.: IEC/TR 62635:2012)
$RVR_{(i)}$	Recovery rate of the ith part in the corresponding end-of-life treatment scenario (ref.: IEC/TR 62635:2012)
m_{EEE}	Total product mass (ref.: IEC/TR 62635:2012)
Recyclability	Ability of waste product to be recycled, based on actual practices
Recoverability	Ability of a waste product to be recovered, based on actual practices
EoL	End-of-life

2. General description of Product

Picture of Product:



Copy of Marking plate:



Characteristic data:

Product total weight : 1369.17 g

Product dimension : L:242 mm * W:170 mm * H:36 mm

Normative reference:

Directive 2012/19/EU

IEC/TR 62635:2012, Ed.1

ISO 11469:2000 Plastics — Generic identification and marking of plastics products

ISO 1043 Plastics — Generic identification and marking of plastics products

Part 1: Basic polymers and their special characteristics

Part 2: Fillers and reinforcing materials

Part 3: Plasticizers

Part 4: Flame retardants

General Remarks:

"(see remark #) refers to a remark appended to the report.

" (see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of ZyXEL Communication Corporation.

3. Disassembling information

3.1 Disassembling object:

Device		
		
Accessories & Assemblies		
Antenna	Power adaptor	Power adaptor plug
		
/	/	/
/	/	/

3.2 Derivation tree of Product

Device



• Enclosure



- Upper case x 1
- Bottom case x 1

• Enclosure assemblies

- Screw x 23
- Nameplate x 1
- Shield x 2

• PCBA



- PCBA x 1
- Capacitance x 10
- Transformer x 6
- Inductor 100 x 6
- Inductor 4R7 x 2
- White Plastic x 4
- Black HAXPO x 2
- Black HAXPO x 2 (Metal)
- Black Wire x 1
- Gray Wire x 1
- Nut x 2
- Gasket x 2
- 4 pin x 1
- 14 pin x 1
- Choke x 2
- Console Port x 1
- Switch Button x 2
- Power jack x 1
- RJ11 I/O x 2
- RJ45 I/O x 1
- USB x 1
- Fiber x 1
- Black Plastic LED x 2
- Tact switch x 1
- PCBA Back-IC x 2

- Antenna



- Antenna x 2

- Accessory

- Adaptor x 1



4. Calculation result

Basic information:

Brand name	ZyXEL	Recycling scenario	IT & telecommunication
Model name	SBG3500-N000	Sample weight	1369.17 g

Calculation information:

EoL info	No	Name of part	Mass (g)	Material	Recyclability mass (g)	Recoverability mass (g)
Resuable parts	—	—	—	—	—	—
Parts for selective treatment	2.1	PCBA MB	80.68	PCBA	8.07	72.61
	2.2	Capacitance - 1	2.18	Capacitor (PCB)	1.09	1.96
	2.3	Capacitance - 2	7.48	Capacitor (PCB)	3.74	6.73
	2.4	Capacitance - 3	1.03	Capacitor (PCB)	0.52	0.93
	2.5	Capacitance - 4	0.93	Capacitor (PCB)	0.47	0.84
	2.6	Capacitance - 5	0.63	Capacitor (PCB)	0.31	0.56
	2.7	Capacitance - 6	0.93	Capacitor (PCB)	0.47	0.84
	2.33	Capacitance - 7	1.00	Capacitor (PCB)	0.50	0.90
	5.1	PCBA Adaptor	25.10	PCBA	2.51	22.59
	5.2	Capacitance (C8)	1.00	Capacitor (PCB)	0.50	0.90
	5.3	Capacitance (C3)	8.00	Capacitor (PCB)	4.00	7.20
	5.4	Capacitance (C7)	2.00	Capacitor (PCB)	1.00	1.80
	Parts with single recyclable material	1.1	Cover case	432.04	Stainless steel (non-magnetic)	410.44
1.2		Bottom case	474.50	Stainless steel (non-magnetic)	450.78	450.78
1.3		Screw-1	1.07	Steel	1.02	1.02
1.4		Screw-2	1.07	Steel	1.02	1.02
1.5		Screw-3	1.80	Stainless steel (non-magnetic)	1.71	1.71
1.6		Screw-4	1.28	Stainless steel (non-magnetic)	1.22	1.22
1.7		Screw-5	1.00	Stainless steel (non-magnetic)	0.95	0.95
1.8		Screw-6	6.03	Stainless steel (non-magnetic)	5.73	5.73
1.9		Nameplate	51.80	Aluminum	49.21	49.21
1.10		Shield	18.50	Aluminum	17.58	17.58
2.12		SMD Power Inductor 100-1	4.55	Copper	4.46	4.46
2.13		SMD Power Inductor 100-2	0.91	Copper	0.89	0.89
2.14		SMD Power Inductor 4R7	1.06	Copper	1.04	1.04

EoL info	No	Name of part	Mass (g)	Material	Recyclability mass (g)	Recoverability mass (g)
Parts with single recyclable material	2.19	Black HAXPO (Metal)	0.66	Copper	0.65	0.65
	2.21	Nut	0.68	Copper	0.67	0.67
	2.22	Gasket	0.28	Copper	0.27	0.27
	2.27	4 pin (metal)	0.05	Copper	0.05	0.05
	2.29	14 pin (metal)	0.18	Copper	0.18	0.18
	2.32	Choke	1.54	Nickel Pure	1.46	1.46
	2.40	Switch Button-1 (Metal)	0.78	Copper	0.76	0.76
	2.41	Switch Button-1 (Metal Wire)	0.64	Stainless steel (magnetic)	0.61	0.61
	2.44	Switch Button-2 (Wire)	0.64	Stainless steel (magnetic)	0.61	0.61
	2.45	Switch Button-2 (Metal)	0.78	Copper	0.76	0.76
	2.48	Power jack (Metal)	0.45	Copper	0.44	0.44
	2.50	RJ11 (Metal)	0.12	Copper	0.12	0.12
	2.52	USB (Blue Plastic)	0.50	PC	0.45	0.45
	2.53	Fiber	5.00	Copper	4.90	4.90
	2.54	RJ11 I/O (Metal)	1.37	Copper	1.34	1.34
	2.56	RJ11 I/O (Metal-Pin)	0.23	Copper	0.23	0.23
	2.57	RJ45 I/O (4 ports-Metal)	3.06	Copper	3.00	3.00
	2.59	RJ45 I/O (4 ports-Yellow Plastic)	0.91	Copper	0.89	0.89
	2.63	Tact switch (Metal)	0.10	Stainless steel (non-magnetic)	0.10	0.10
	3.1	Antenna-Metal	16.42	Copper	16.09	16.09
	4.1	Upper and Bottom case (Adaptor)	22.48	PC	20.23	20.23
	4.3	Adaptor Plug EU-Metal	10.49	Copper	10.28	10.28
	4.4	Adaptor Plug EU-Plastic	11.34	PC	10.21	10.21
	4.5	Adaptor Plug EU-Plastic bottom	1.21	PC	1.09	1.09
4.6	Adaptor Plug EU-Screw	0.48	Steel	0.45	0.45	

EoL info	No	Name of part	Mass (g)	Material	Recyclability mass (g)	Recoverability mass (g)
Parts with single recyclable material	4.7	Adaptor Plug GB-Metal	12.23	Copper	11.99	11.99
	4.8	Adaptor Plug GB-Plastic	12.88	PC	11.59	11.59
	4.9	Adaptor Connector	1.25	Copper	1.22	1.22
Parts difficult to process	2.8	Transformer	3.40	Transformer	3.06	3.06
	2.31	VDSL Transformer	4.08	Transformer	3.67	3.67
	2.35	Transformer-1	5.40	Transformer	4.86	4.86
	2.36	Transformer-2	2.43	Transformer	2.19	2.19
	5.5	Adaptor Transformer	24.00	Transformer	21.60	21.60
Separation Process	2.15	White Plastic	0.17	PP (Polypropylene)	0.12	0.15
	2.16	Black HAXPO	1.44	PBT	1.01	1.30
	2.17	Black Wire	1.00	PBT	0.70	0.90
	2.18	Gray Wire	1.00	PBT	0.70	0.90
	2.28	4 pin (plastic)	0.18	PA (Polyamide)	0.13	0.16
	2.30	14 pin (plastic)	0.65	PA (Polyamide)	0.46	0.59
	2.37	Console Port-Plastic	1.65	PBT	1.16	1.49
	2.38	Console Port-Metal	0.87	Aluminum	0.78	0.78
	2.39	Switch Button-1 (Black Plastic)	2.07	PA (Polyamide)	1.45	1.86
	2.42	Switch Button-1 (Yellow Plastic)	1.37	ABS	0.96	1.23
	2.43	Switch Button-2 (Black Plastic)	2.07	PA (Polyamide)	1.45	1.86
	2.46	Switch Button-2 (Yellow Plastic)	1.37	ABS	0.96	1.23
	2.47	Power jack (Plastic)	0.85	PA (Polyamide)	0.60	0.77
	2.49	RJ11 (Plastic)	1.35	PA (Polyamide)	0.95	1.22
	2.51	USB (Metal)	1.69	Aluminum	1.52	1.52
	2.55	RJ11 I/O (Blue Plastic)	1.69	PA (Polyamide)	1.18	1.52
	2.58	RJ45 I/O (4 ports-Metal-Pin)	26.00	PA (Polyamide)	18.20	23.40
	2.60	Black Plastic LED	5.04	PA (Polyamide)	3.53	4.54
2.62	Tact switch (Brown plastic)	0.10	PA (Polyamide)	0.07	0.09	

EoL info	No	Name of part	Mass (g)	Material	Recyclability mass (g)	Recoverability mass (g)
Separation Process	2.64	Tact switch (Black plastic)	0.35	PA (Polyamide)	0.25	0.32
	2.66	PCBA Back (IC-2)	0.19	EP (Epoxy resin)	0.00	0.17
	2.67	PCBA Back (IC-3)	21.86	EP (Epoxy resin)	0.00	19.68
	3.2	Antenna-Plastic	23.60	PC/ABS	16.52	21.24
Sum					$\sum(m_{(i)} \times RCR_{(i)})$ 1157.86	$\sum(m_{(i)} \times RVR_{(i)})$ 1286.79
Recyclability rate			$\frac{\sum(m_{(i)} \times RCR_{(i)})}{m_{EEE}} \times 100\% = 84.57\%$			
Recoverability rate			$\frac{\sum(m_{(i)} \times RVR_{(i)})}{m_{EEE}} \times 100\% = 93.98\%$			

ATTACHMENT A PLASTIC MATERIALS MARKING

The equipment of SBG3500-N000 enclosure is made by metal which is outside of scope of ISO 11469 as well as ISO 1043 part 1 to part 4 on the requirement of the weight of plastic material equal and/or more than 25g shall be marked.

ATTACHMENT B IDENTIFIED FOR SELECTIVE TREATMENT

In the light of Annex VII on the Directive 2012/19/EU (so called as WEEE recast), selective treatment for materials and components have been defined for further specifically treatment during the end-of-life electrical and electronic equipment, which are:

No	details
1	polychlorinated biphenyls (PCB) containing capacitors in accordance with Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) (1),
2	mercury containing components, such as switches or backlighting lamps,
3	batteries,
4	printed circuit boards of mobile phones generally, and of other devices if the surface of the printed circuit board is greater than 10 square centimetres,
5	toner cartridges, liquid and paste, as well as colour toner,
6	plastic containing brominated flame retardants,
7	asbestos waste and components which contain asbestos,
8	cathode ray tubes,
9	chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC) or hydrofluorocarbons (HFC), hydrocarbons (HC),
10	gas discharge lamps,
11	liquid crystal displays (together with their casing where appropriate) of a surface greater than 100 square centimetres and all those back-lighted with gas discharge lamps,
12	external electric cables,
13	components containing refractory ceramic fibres as described in Commission Directive 97/69/EC of 5 December 1997 adapting to technical progress for the 23rd time Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (2),
14	components containing radioactive substances with the exception of components that are below the exemption thresholds set in Article 3 of and Annex I to Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation (3),
15	electrolyte capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume).
<p>Remark: These substances, mixtures and components shall be disposed of or recovered in compliance with Directive 2008/98/EC.</p>	

ATTACHMENT C REGISTRATION RESPONSIBILITY

According to Art. 12 & Art. 13 on the financing in respect of WEEE from private households and non-private households. Recycling fees cover costs of collection, transportation, handling, maintenance of recycling ZyXEL network and equipment as well as solvency required in the Decree.

According to Art. 16 of Directive 2012/19/EU “*Registration, information and reporting*”. ZyXEL has completed and fulfilled EU registration responsibility requirement which shall be registered through their authorised representatives, for detail, please refer to the table below.

Coutry	Registration No.	Approved compliance scheme
UK	WEE/CC0067TX (CD01/00100)	Comply Direct Ltd.
DE	71587309	EAR
DK	21229237	DPA-System
...

For other countries registry information, please feel free to contact with ZyXEL Communications Corporation. email to: ZyXEL_Certification@zyxel.com.tw