TEST REPORT
PPP 10040B:2013 Rev. 01
TÜV SÜD Test Report for
ENERGY STAR® Program Requirements for Imaging Equipment, Version 2.0

Report reference No. ....:	68.182.14.106.01
Date of issue ....:	2014-09-12
Project handler………….....................:	Andy Tong
Testing laboratory ....:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Address...:	Building12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, 518052 Shenzhen CHINA
Testing Procedure ....:	☐ TMP ☐ WMTL ☐ SMTL ☐ LTR
Testing location.................................:	as above
Client ....:	Frama AG
Client number………….......................:	89796
Address...:	Dorfstrasse 6, 3438 Lauperswil, SWITZERLAND
Contact person…… ....:	Christoph Reimann
Standard..:	This TÜV SÜD test report form is based on the following requirements: ENERGY STAR Program Requirements for Imaging Product Version 2.0 Rev. June 2013 Test method: ENERGY STAR Imaging Equipment Test Method (Rev. Jun-2013)
TRF originated by. ....:	TÜV SÜD Product Service GmbH, Mr. Alex Kong
Copyright blank test report.................:	This test report is based on the content of the standard (see above). The test report considered selected clauses of the a.m. standard(s) and experience gained with product testing. It was prepared by TÜV SÜD Product Service GmbH. TÜV SÜD Group takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.
Test procedure ....:	☐ ENERGY STAR certification ☒ without certification
Non-standard test method..................:	☒ No ☐ Yes, see details under Summary
National deviations............................:	None
Number of pages (Report).................:	31
Number of pages (Attachments)........:	2
Compiled by .....: Andy Tong	Approved by ..... : Daniel Chen
(+ signature)	(+ signature)

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Test sample.. :	One (Series production)
Type of test object .... :	Mailing Machine
Trademark .... :	Frama Matrix F
Model and/or type reference .... :	Matrix F12
Rating(s) .... :	24VDC, 700mA
	Remark: The Mailing Machine Is Supplied By An External Adaptor, Model Name: SAW40-24.0-1600, Manufactured By Fujikon International Ltd. With Following Rating: - Input: 100-240VAC, 50/60Hz, 1.5A - Output: 24VDC, 1600mA
Manufacturer .... :	Same as client
Manufacturer number…................... :	Same as client
Address .... :	Same as client
Sub-contractors/ tests (clause) .... :	N
Name .... :	N

Order description… .... :	☒	Complete test according to TRF
	☐	Partial test according to manufacturer's specifications
	☐	Preliminary test
	☐	Spot check
	☐	Others: Verification test

Date of order……… .... :	2014-08-27
Date of receipt of test item .... :	2014-08-28
Date(s) of performance of test........... :	2014-08-28 to 2014-09-12
Test item particulars:	
Target market of product……… .... :	☐ North America, Taiwan (115V, 60Hz) ☒ Europe, Australia, New Zealand (230V, 50Hz) ☐ Japan (100V, 50/60Hz) Client also required to test with voltage 115V/60Hz although they are not intended to sell in America and Taiwan markets.
Product type……… .... :	☐ Printer ☐ Scanner ☐ Copier ☐ Facsmile (Fax) Machine ☐ Multifunction Device (MFD) ☐ Digital Duplicator ☒ Mailing Machine

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Color Capability………..................... :	☐ colour
	☒ monochrome
Power source ……… .... :	☒ Ac Power (For EPS)
	☐ USB
	☐ Power over Ethernet (PoE)
	☐ USB Plus Power
	☐ IEEE 1394
	☐ Other:
Power supply ……….......................... :	☐ Internal power supply
	☒ External power supply Type: Ac/Dc Nameplate output power - P_{OUT}(W): 38.4W (24VDC, 1600mA) Performance level: V
Product Requirements ……….......... :	☐ Typical Electricity Consumption (TEC)
	☒ Operational Mode (OM)
Marking Technologies ………........... :	☐ Direct Thermal (DT)
	☐ Dye Sublimation (DS)
	☐ Electro-photographic (EP)
	☐ Impact
	☒ Ink Jet (IJ)
	☐ High Performance IJ
	☐ Solid Ink (SI)
	☐ Stencil
	☐ Thermal Transfer (TT)
Media Format Size ……….................. :	☒ Smal
	☐ Standard
	☐ Large
	☐ A3-capability
	☐ Continious form
Network or Data Connection ……….. :	☒ Wired: 100 Mb/s Ethernet (RJ45 network connection)
	☐ Fax Modem
	☐ Wireless : N
	☐ None
Cordless Handset……….................... :	☐
Memory (internal)……… .... (GB):	None
Scanner ……… .... :	☐

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Touch Panel Display………............... :	Yes
Internal Disk Drives………................ :	None
Digital Front-end (DFE) functionality ………......................... :	☐ Type 1 ☐ Type 2 Features: ☐ Network connectivity in various environments; ☐ Mailbox functionality ☐ Job queue management ☐ Machine management (e.g., waking the imaging equipment from a reduced power state) ☐ Advanced graphic user-interface (UI) ☐ Ability to initiate communication with other host servers and client computers (e.g., scanning to email, polling remote mailboxes for jobs) ☐ Ability to post-process pages (e.g., reformatting pages prior to printing) ☐ Auxiliary Processing Accelerator (APA) ☐ 2 ore more CPS's

Attachments:
1. Test Equipment List
2. Constructional Data Form

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 comma 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 the testing laboratory.

Summary of testing:

☐ deviation(s) found

☒ no deviations found

The specification is met .

If additional information is necessary, please provide

Specification Effective Date
January 1, 2014

Copy of marking plate:

FRAMA AG, CH-Lauperswil

24 V⎓
700 mA

Type : Matrix F12

CE

FC

Label for mailing machine

FRAMA ▓
SMART MAILING

SWITCHING
1013462 POWER SUPPLY
INPUT : AC 100-240V
50/60Hz 1.5A Ⓥ
OUTPUT : 24V⎓1600mA
MODEL : SAW40-24.0-1600

CE

⊖─Ⓒ─⊕ **LPS** 04 13
MADE IN CHINA FP
I.T.E. Netzgerät
I.T.E. POWER SUPPLY
ACHTUNG Risiko eines elektrischen Schlages
Das Gerät nur am trockenen Einsatzort
in Betrieb nehmen
CAUTION RISK OF ELECTRIC SHOCK
DRY LOCATION USE ONLY
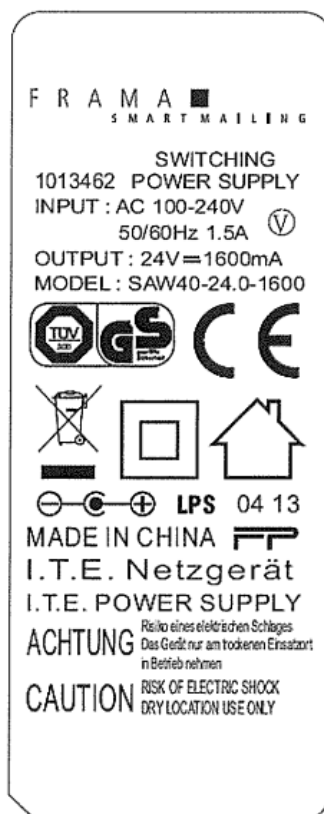
Label for EPS

Picture of the product:
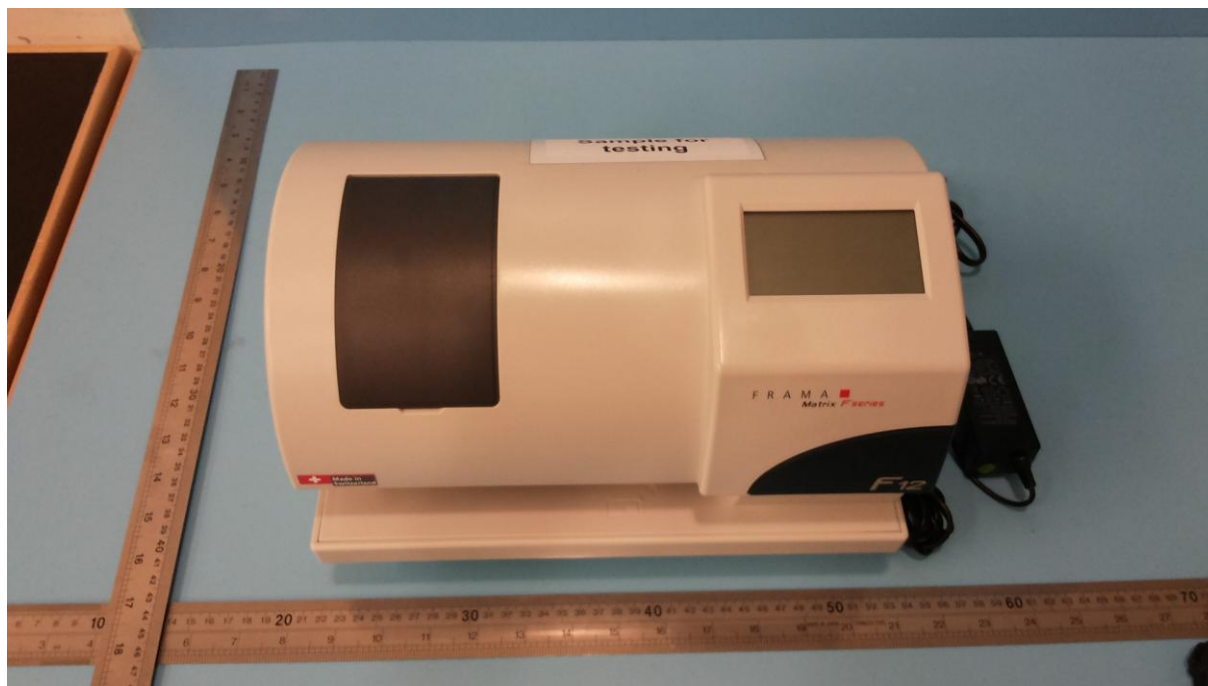
Figure 1 – Outside view 1

Figure 2 – Outside view 2

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Figure 3 – Outside view 3

Figure 4 – Outside view 4
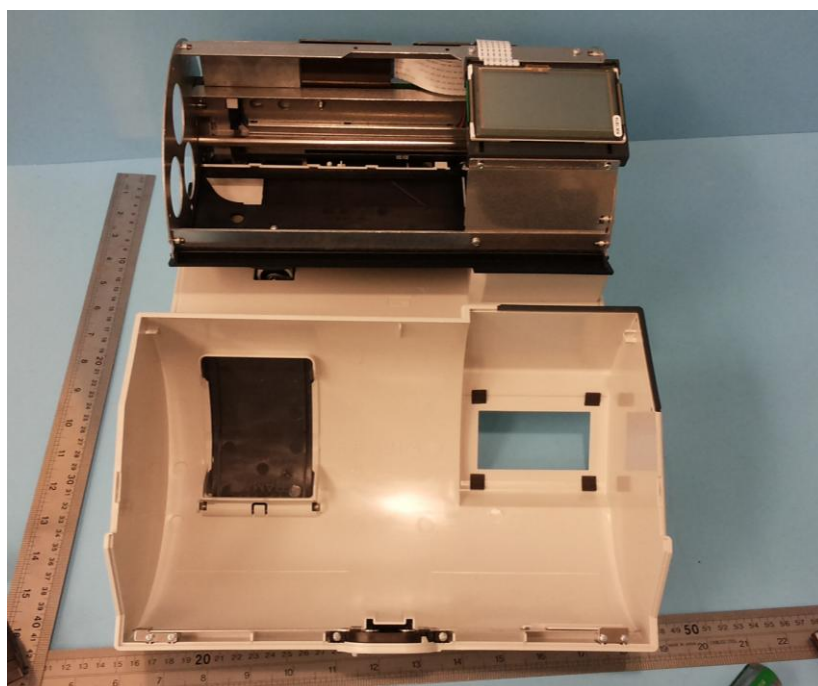
Figure 5 – Internal view 1

Figure 6 - Internal view 2
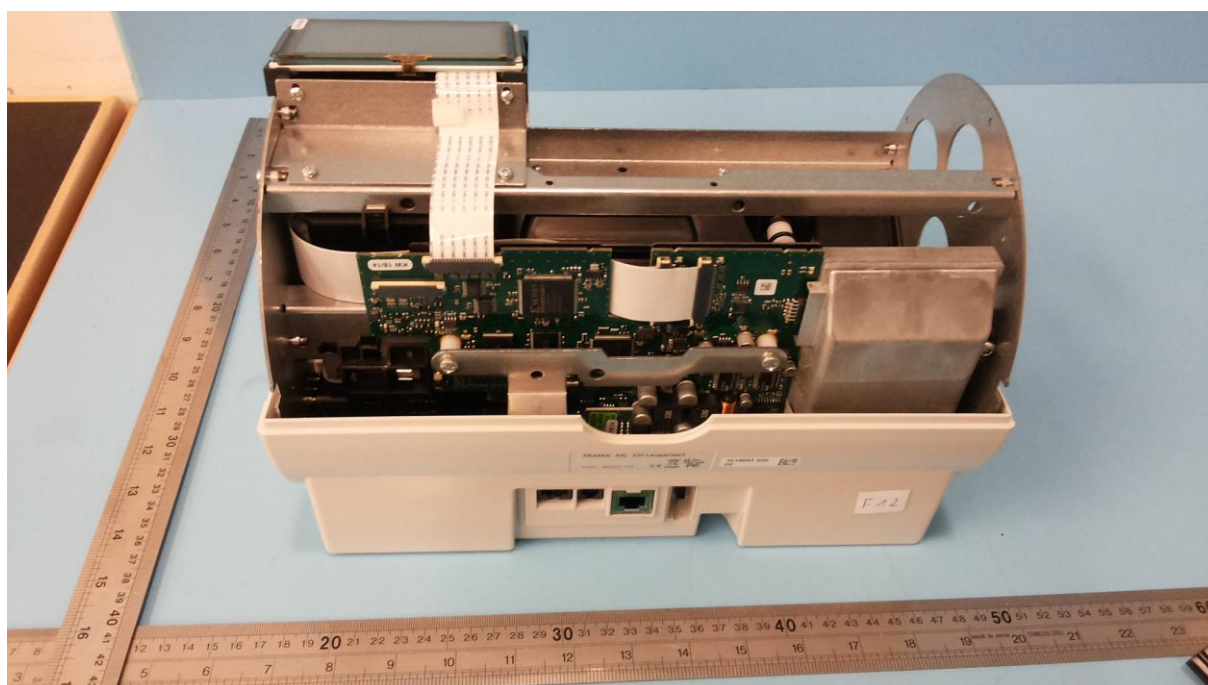
Test Report based on PPP 10040B:2013 Rev. 01 / 2013-12
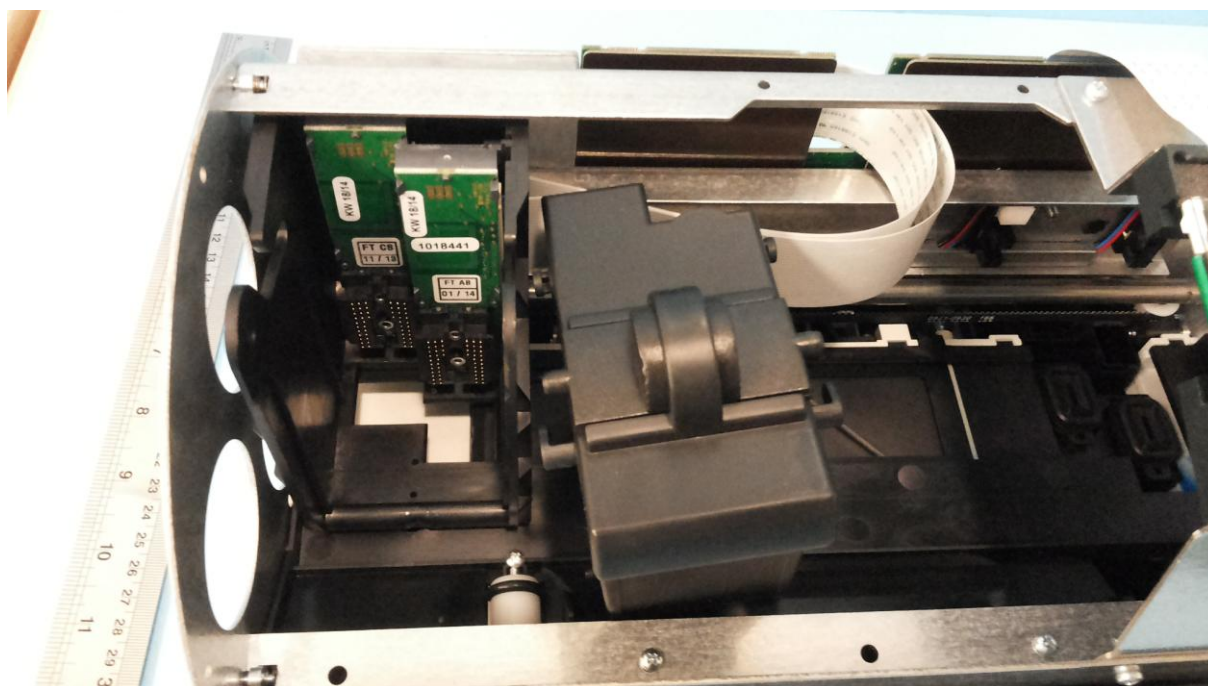
Figure 7 - Internal view 3
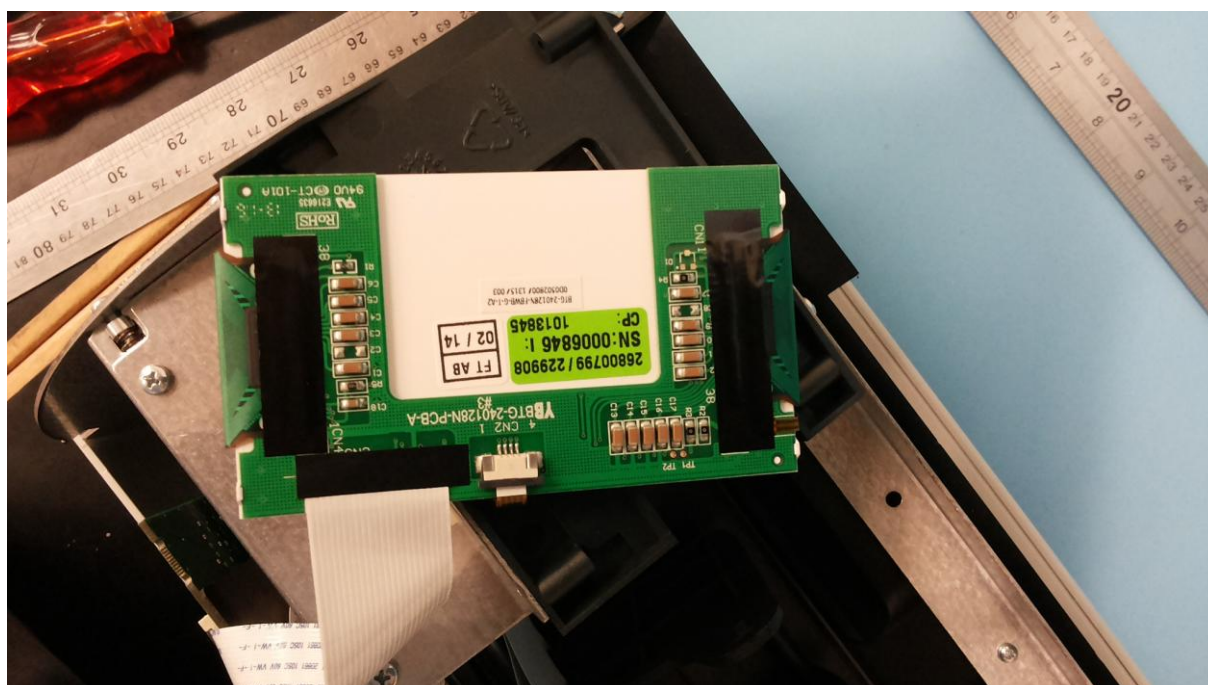
Figure 8 – PCB under touch panel display

Figure 9 – Main board view

Figure 10 – Outside view 1 of external power supply
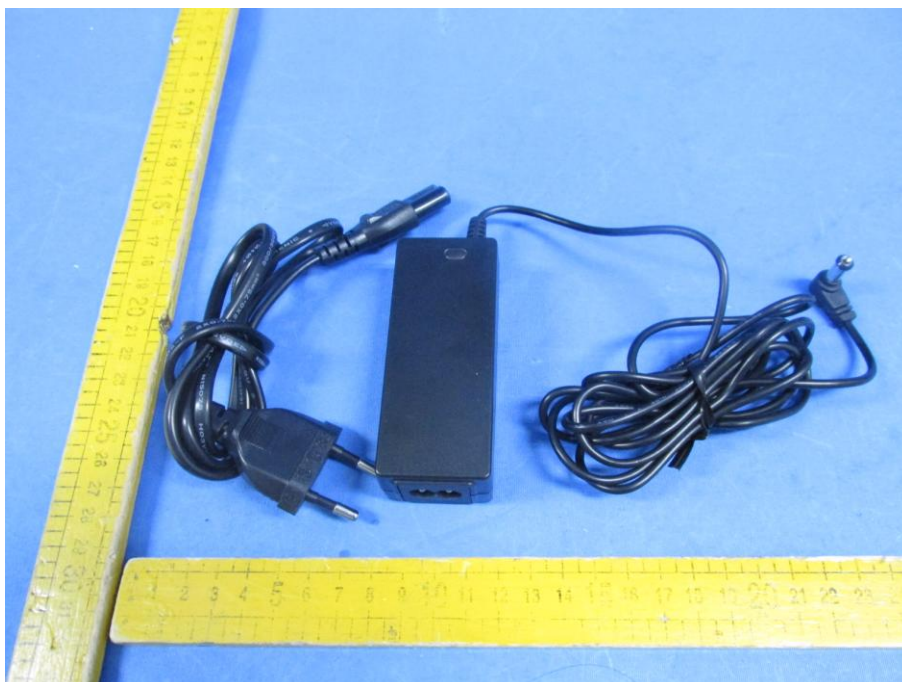
Figure 11 – Outside view 2 of external power supply
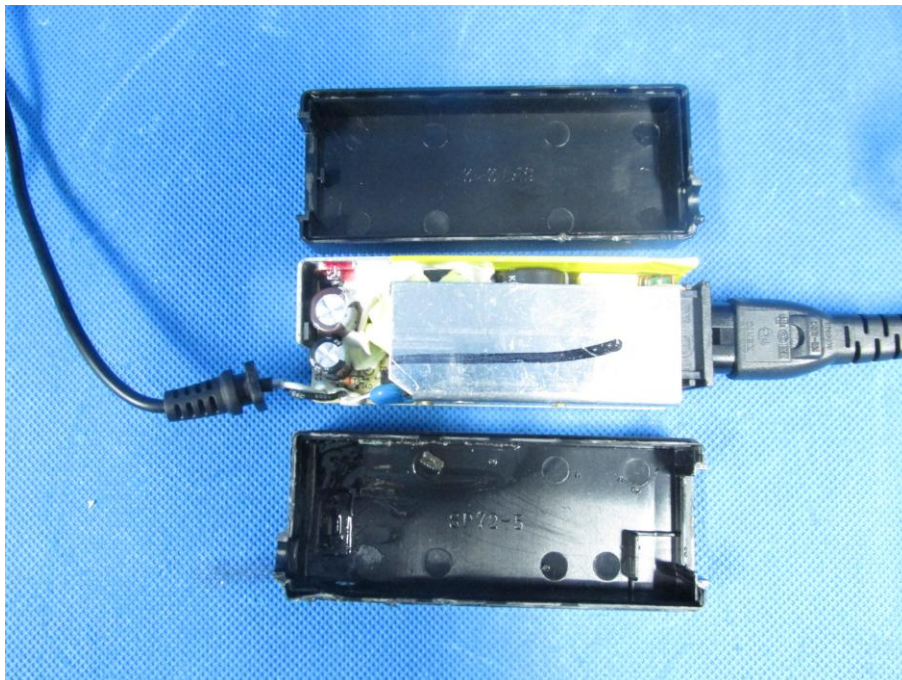
Figure 12 – Internal view 1 of external power supply
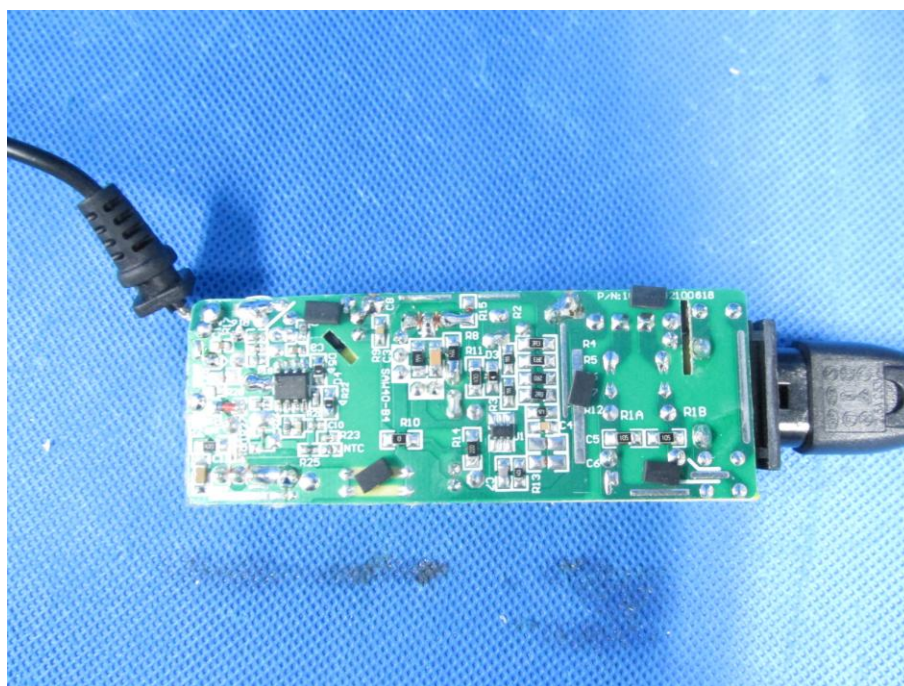
Figure 13 – Internal view 2 of external power supply

Characteristic data
(not shown on the marking plate)

Weight: Approx.6.8kg

Name and address of Factory
(only if certification is provided)

Frama AG
Dorfstrasse 6, 3438 Lauperswil, SWITZERLAND

Purpose of the product

(Description of intended use)

Mailing Machine

Possible test case verdicts:

- test case does not apply to the test object .... :   N(.A.) / not included in the order

- test object does meet the requirement .... :   P(ass)

- test object does not meet the requirement .... :   F(ail)

Possible suffixes to the verdicts:

- suffix for detailed information for the client……………..: - C(omment)

- suffix for important information for factory inspection...:   - M(anufacturing)

Clause	Requirement − Test	Measuring result − Remark	Verdict
3	**Qualification criteria**		P
3.1	**Significant Digits and Rounding**		—
3.1.1	All calculations shall be carried out with actual measured or observed values.		P
3.1.2	Unless otherwise specified, compliance with specification limits shall be evaluated using exact values without any benefit from further rounding.		P
3.1.3	Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.		P
3.2	**General Requirements**		—
3.2.1	External Power Supply (EPS):		
i	i. If the product is shipped with a **single-voltage EPS**, the EPS shall meet the level V performance requirements under the International Efficiency Marking Protocol and include the level V marking. Additional information on the Marking Protocol is available at www.energystar.gov/powersupplies.	See table 5.1&5.2 and attachment 2 for details	P
	• **Single-output EPS** shall meet level V requirements when tested using the *Test Method for Calculating the Energy Efficiency of Single-Voltage External Ac-Dc and Ac-Ac Power Supplies*, **Aug. 11, 2004.**		P
	• **Multiple-voltage EPS** shall meet the level V requirements when tested using the EPRI 306 **Generalized Internal Power Supply Efficiency Test Protocol, Rev. 6.6**. Power Supply data generated using Rev. 6.4.2 (as required in Version 1.2) is acceptable provided the test was conducted prior to the effective date of Version 2.0.		N
ii	ii. The above requirements shall not apply to any EPSs shipped with a Digital Front End (DFE).		N
3.2.2	Additional Cordless Handset:		N
	Fax machines and MFDs with fax capability that are sold with additional cordless handsets shall use an ENERGY STAR qualified handset, or one that meets the ENERGY STAR Telephony specification when tested to the ENERGY STAR test method on the date the Imaging Equipment product is qualified as ENERGY STAR. The ENERGY STAR specification and test method for telephony products may be found at www.energystar.gov/products.	No Cordless Handset	N
3.2.3	Functionality Integrated MFD:		N
	If an MFD consists of a set of functionally integrated components (i.e., the MFD is not a single physical device), the sum of the measured energy or power consumption for all components shall be less than the relevant MFD energy or power consumption requirements for ENERGY STAR qualification.	Not MFD	N
3.2.4	DFE Requirements:		N

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Clause	Requirement − Test	Measuring result − Remark	Verdict
	The Typical Electricity Consumption (TEC_{DFE}) of a Type 1 or Type 2 DFE sold with an Imaging Equipment product at the time of sale shall be calculated using Equation 1 for a DFE without Sleep Mode or Equation 2 for a DFE with Sleep Mode. **Equation 1: TEC_{DFE} Calculation for Digital Front Ends without Sleep Mode** $$TEC_{DFE} = \frac{168 \times P_{DFE\_READY}}{1000}$$ *Where:* • *TEC_{DFE} is the typical weekly energy consumption for DFEs, expressed in kilowatt-hours (kWh) and rounded to the nearest 0.1 kWh;* • *P_{DFE_READY} is Ready State power measured in the test procedure in watts.* **Equation 2: TEC_{DFE} Calculation for Digital Front Ends with Sleep Mode** $$TEC_{DFE} = \frac{(45 \times P_{DFE\_READY}) + (123 \times P_{DFE\_SLEEP})}{1000}$$ *Where:* • *TEC_{DFE} is the typical weekly energy consumption for DFEs, expressed in kilowatt-hours (kWh) and rounded to the nearest 0.1 kWh;* • *P_{DFE_READY} is the DFE Ready State power measured in the test procedure in watts.* • *P_{DFE_SLEEP} is the DFE Sleep Mode power measured in the test procedure in watts.*	No DFE	N
	The resulting TEC_{DFE} value shall be less than or equal to the maximum TEC_{DFE} requirement specified in Table 2 for the given DFE type. **Table 2: Maximum TEC_{DFE} Requirements for Type 1 and Type 2 DFEs** <table><thead><tr><th rowspan="2">DFE Category</th><th rowspan="2">Category Description</th><th colspan="2">Maximum TEC_{DFE} (kWh/week, rounded to the nearest 0.1 kWh/week for reporting)</th></tr><tr><th>Type 1 DFE</th><th>Type 2 DFE</th></tr></thead><tbody><tr><td>A</td><td>All DFEs that do not meet the definition of Category B will be considered under Category A for ENERGY STAR qualification.</td><td>10.9</td><td>8.7</td></tr><tr><td>B</td><td>To qualify under Category B DFEs must have: 2 or more physical CPUs or 1 CPU and ≥ 1 discrete Auxiliary Processing Accelerators (APAs)</td><td>22.7</td><td>18.2</td></tr></tbody></table>		N
	Evaluation TEC_{DFE}: $TEC_{DFE} ≤$ Maximum TEC_{DFE}		N
i	The TEC value or Ready State power of a DFE that meets the maximum TEC_{DFE} requirements should be excluded or subtracted from the TEC energy and OM power measurements of the Imaging Equipment product as appropriate.		N
ii	Section 3.3.2i provides further detail on subtracting TEC DFE values from TEC products;		N
iii	Section 3.4.2 provides further detail for excluding DFEs from OM Sleep and Standby levels.		N
iv	DFEs that fail to meet these requirements will not only <u>not</u> have their power subtracted from that of the Imaging Equipment product as a whole, but will disqualify the product from ENERGY STAR. Therefore, such DFEs may not be sold with ENERGY STAR qualified Imaging Equipment.		N
3.3	**Requirement for Typical Electricity Consumption (TEC) Products**		N

Clause	Requirement − Test	Measuring result − Remark	Verdict
3.3.1	Automatic Duplexing Capability:		N
i	For all copiers, MFDs, and printers subject to the TEC test method, automatic duplexing capability shall be present at the time of purchase as specified in Table 3 and Table 4. Printers whose intended function is to print on special single-sided media for the purpose of single sided printing (e.g., release coated paper for labels, direct thermal media, etc.) are exempt from this requirement. **Table 3: Automatic Duplexing Requirements for Color TEC Copiers, MFDs, and Printers**	OM test method	N

Table 3: Automatic Duplexing Requirements for Color TEC Copiers, MFDs, and Printers

Monochrome Product Speed, s, as calculated in the Test Method (ipm)	Automatic Duplexing Requirement
s ≤ 19	None
19 < s < 35	integral to the base product or optional accessory
s ≥ 35	Integral to the base product

Table 4: Automatic Duplexing Requirements for all Monochrome TEC Copiers, MFDs, and Printers

Monochrome Produc Speed, s, as Calculated in the Test Method (ipm)	Automatic Duplexing Equipment
s ≤ 24	None
24 < s <37	Integral to be base product or optional accessory
s ≥ 37	Integral to the base product

Clause	Requirement − Test	Measuring result − Remark	Verdict
ii	If a product is not certain to be bundled with an automatic duplex tray, the partner must make clear in their product literature, on their Web site, and in institutional sales literature that although the product meets the ENERGY STAR energy efficiency requirements, the product only fully qualifies for ENERGY STAR when bundled with or used with a duplexer tray. EPA asks that partners use the following language to convey this message to customers: "Achieves ENERGY STAR energy savings; product fully qualifies when packaged with (or used with) a duplex tray."		N
3.3.2	Typical Electricity Consumption (TEC)		N

Clause	Requirement − Test	Measuring result − Remark	Verdict
	Calculated Typical Electricity Consumption (TEC) per Equation 3 or Equation 4 shall be less than or equal to the Maximum TEC Requirement (TECMAX) specified in Equation 6. **Equation 6: Maximum TEC Requirement Calculation** $$TEC_{MAX} = TEC_{REQ} + Adder_{A3}$$ *Where:* • TEC_{MAX} *is the maximum TEC requirement in kilowatt-hours per week (kWh/wk), rounded to the nearest 0.1 kWh/wk for reporting;* • TEC_{REQ} *is the TEC requirement specified in Table 5, in kWh; and* • $Adder_{A3}$ *is a 0.3 kWh/wk allowance provided for A3-capable products.* **Table 5: TEC Requirement Before A3 Allowance (If Applicable)**		-

Table 5: TEC Requirement Before A3 Allowance (If Applicable)

Color Capability	Monochrome Product Speed, s, as Calculated in the Test Method (ipm)	TEC$_{REQ}$ (kWh/week, to the nearest 0.1 kWh/week for reporting)
Monochrome Non-MFD	$s \le 5$	0.3
	$5 < s \le 20$	$(s \times 0.04) + 0.1$
	$20 < s \le 30$	$(s \times 0.06) - 0.3$
	$30 < s \le 40$	$(s \times 0.11) - 1.8$
	$40 < s \le 65$	$(s \times 0.16) - 3.8$
	$65 < s \le 90$	$(s \times 0.2) - 6.4$
	$s > 90$	$(s \times 0.55) - 37.9$
Monochrome MFD	$s \le 5$	0.4
	$5 < s \le 30$	$(s \times 0.07) + 0.05$
	$30 < s \le 50$	$(s \times 0.11) - 1.15$
	$50 < s \le 80$	$(s \times 0.25) - 8.15$
	$s > 80$	$(s \times 0.6) - 36.15$
Color Non-MFD	$s \le 10$	1.3
	$10 < s \le 15$	$(s \times 0.06) + 0.7$
	$15 < s \le 30$	$(s \times 0.15) - 0.65$
	$30 < s \le 75$	$(s \times 0.2) - 2.15$
	$s > 75$	$(s \times 0.7) - 39.65$
Color MFD	$s \le 10$	1.5
	$10 < s \le 15$	$(s \times 0.1) + 0.5$
	$15 < s \le 30$	$(s \times 0.13) + 0.05$
	$30 < s \le 70$	$(s \times 0.2) - 2.05$
	$70 < s \le 80$	$(s \times 0.7) - 37.05$
	$s > 80$	$(s \times 0.75) - 41.05$

Clause	Requirement − Test	Measuring result − Remark	Verdict
	Evaluation TEC: TEC ≤ TEC$_{MAX}$		N

Clause	Requirement − Test	Measuring result − Remark	Verdict
i	For Imaging Equipment with a Type 2 DFE that meet the Type 2 DFE maximum TEC_{DFE} requirement in Table 2, the measured energy consumption of the DFE shall be divided by 0.80 to account for internal power supply losses and then excluded when comparing the product's measured TEC value to TEC_{MAX}. The DFE shall not interfere with the ability of the Imaging Equipment to enter or exit its lower-power modes. The energy use of a DFE can only be excluded if it meets the DFE definition in Section 1 and is a separate processing unit that is capable of initiating activity over the network.	No DFE	N
ii	The DFE shall not interfere with the ability of the Imaging Equipment to enter or exit its lower-power modes.		N
iii	The energy use of a DFE can only be excluded if it meets the Type 2 DFE definition in Section 1 and is a separate processing unit that is capable of initiating activity over the network.		N
iv	For printers, fax machines, digital duplicators with print capability, and MFDs with print capability, TEC shall be calculated per Equation 3. **Equation 3: TEC Calculation for Printers, Fax Machines, Digital Duplicators with Print Capability, and MFDs with Print Capability** $$TEC = 5 \times \{E_{JOB\_DAILY} + (2 \times E_{FINAL}) + [\,24 - (N_{JOBS} \times 0.25) - (2 \times t_{FINAL})\,] \times E_{SLEEP} / t_{SLEEP}\} + 48 \times E_{SLEEP} / t_{SLEEP}$$ *Where:* • *TEC is the typical weekly energy consumption for printers, fax machines, digital duplicators with print capability, and MFDs with print capability, expressed in kilowatt-hours (kWh) and rounded to the nearest 0.1 kWh;* • *E_{JOB_DAILY} is the daily job energy, as calculated per Equation 5, converted to kWh;* • *E_{FINAL} is the final energy, as measured in the test procedure in kWh;* • *N_{JOBS} is the number of jobs per day, as calculated in the test procedure,* • *t_{FINAL} is the final time to Sleep, as measured in the test procedure, converted to hours;* • *E_{SLEEP} is the Sleep energy, as measured in the test procedure , converted to kWh; and* • *t_{SLEEP} is the Sleep time, as measured in the test procedure, , converted to hours.*		-

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Clause	Requirement − Test	Measuring result − Remark	Verdict
v	For copiers, digital duplicators without print capability, and MFDs without print capability, TEC shall be calculated per Equation 4. **Equation 4: TEC Calculation for Copiers, Digital Duplicators without Print Capability, and MFDs without Print Capability** $TEC = 5 \times \{E_{JOB\_DAILY} + (2 \times E_{FINAL}) + [24 - (N_{JOBS} \times 0.25) - (2 \times t_{FINAL})] \times E_{AUTO} / t_{AUTO}\} + 48 \times E_{AUTO} / t_{AUTO}$ *Where:* • *TEC is the typical weekly energy consumption for copiers, digital duplicators without print capability, and MFDs without print capability, expressed in kilowatt-hours (kWh) and rounded to the nearest 0.1 kWh;* • *E_{JOB_DAILY} is the daily job energy, as calculated per Equation 5, in kWh;* • *E_{FINAL} is the final energy, as measured in the test procedure, converted to kWh;* • *N_{JOBS} is the number of jobs per day, as calculated in the test procedure;* • *t_{FINAL} is the final time to Sleep, as measured in the test procedure, converted to hours;* • *E_{AUTO} is the Auto-off energy, as measured in the test procedure, converted to kWh; and* • *t_{AUTO} is the Auto-off time, as measured in the test procedure, converted to hours.*		-
vi	Daily Job Energy shall be calculated per Equation 5. **Equation 5: Daily Job Energy Calculation for TEC Products** $E_{JOB\_DAILY} = (2 \times E_{JOB1}) + [(N_{JOBS} - 2) \times (E_{JOB2} + E_{JOB3} + E_{JOB4}) / 3]$ *Where:* • *E_{JOB_DAILY} is the daily job energy, expressed in kilowatt-hours (kWh);* • *E_{JOBi} is the energy of the ith job, as measured in the test procedure, in kWh; and* • *N_{JOBS} is the number of jobs per day, as calculated in the test procedure.*		-
3.3.3	Additional Test Results Reporting Requirements:		N
i.	Recovery times from various modes (Active 0, Active 1, Active 2 times) and Default Delay Time shall be reported for all products tested using the TEC test method.		N
ii.	DFE model name/number, Ready State power, Sleep Mode power, and TECDFE shall be reported for any Type 1 DFE sold with an Imaging Equipment product, including those not tested with the Imaging Equipment product as part of the highest energy using configuration per Section 4.2.1iii.		N
3.4	**Requirement for Operational Mode (OM) Products**		P
3.4.1	Multiple Sleep Modes:		P

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Clause	Requirement − Test	Measuring result − Remark	Verdict
	If a product is capable of automatically entering multiple successive Sleep Modes, the same Sleep Mode shall be used to determine qualification under the Default Delay Time to Sleep requirements specified in Section 3.4.3 and the Sleep Mode power consumption requirements specified in Section 3.4.4.		P
3.4.2	DFE Requirements:		N
	For Imaging Equipment with a functionally-integrated DFE that relies on the Imaging Equipment for its power, and that meets the appropriate maximum TEC$_{DFE}$ requirement found in Table 2, the DFE power shall be excluded subject to the following conditions:	No DFE	N
i	**Ready State power** of the DFE, as measured in the test method, shall be **divided by 0.60** to account for internal power supply losses.		N
	Sleep Mode Requirements: If the resultant power in Paragraph i, above, is less than or equal to the Ready State or Sleep Mode power of the Imaging Equipment, then the power shall be excluded from the Imaging Equipment's measured Ready State or Sleep Mode power when comparing to the Sleep Mode requirements in Section 3.4.4, below. Otherwise, the Sleep Mode power of the DFE, as measured in the test method, shall be **divided by 0.60** and excluded from the Ready or Sleep Mode power of the Imaging Equipment for comparing to the requirements.		N
	Standby Requirements: If the resultant power in Paragraph i, above, is less than or equal to the Ready State, Sleep Mode, or Off Mode power of the Imaging Equipment, then the power shall be excluded from the Imaging Equipment's Ready State, Sleep Mode, or Off Mode power when comparing to the Standby requirements in Section 3.4.5, below. Otherwise, the Sleep Mode power of the DFE, as measured in the test method, shall be **divided by 0.60** and excluded from the Ready State,Sleep Mode, or Off Mode power of the Imaging Equipment for comparing to the requirements.		N
ii	The DFE must not interfere with the ability of the Imaging Equipment to enter or exit its lower-power modes.		N
iii	In order to take advantage of this exclusion, the DFE must meet the Type 2 definition in Section 1 and be a separate processing unit that is capable of initiating activity over the network.		N
3.4.3	Default Delay Time:		P

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Clause	Requirement − Test	Measuring result − Remark	Verdict
	Measured Default Delay Time to Sleep (t_{SLEEP}) shall be less than or equal to the Required Default Delay Time to Sleep (t_{SLEEP_REQ}) requirement specified in Table 6, subject to the following conditions: **Table 6: Required Default Delay Time to Sleep for OM Products**<table><tr><th>Product Type</th><th>Media Format</th><th>Monochrome Product Speed, s, as Calculated in the Test Method (ipm or mppm)</th><th>Required Default Delay Time to Sleep, t_{SLEEP_REQ} (minutes)*</th></tr><tr><td>Copier</td><td>Large</td><td>s ≤ 30</td><td>30</td></tr><tr><td></td><td></td><td>s > 30</td><td>60</td></tr><tr><td>Fax Machine</td><td>Small or Standard</td><td>All</td><td>5</td></tr><tr><td rowspan="5">MFD</td><td rowspan="3">Small or Standard</td><td>s ≤ 10</td><td>15</td></tr><tr><td>10 < s ≤ 20</td><td>30</td></tr><tr><td>s > 20</td><td>60</td></tr><tr><td rowspan="2">Large</td><td>s ≤ 30</td><td>30</td></tr><tr><td>s > 30</td><td>60</td></tr><tr><td rowspan="6">Printer</td><td rowspan="4">Small or Standard</td><td>s ≤ 10</td><td>5</td></tr><tr><td>10 < s ≤ 20</td><td>15</td></tr><tr><td>20 < s ≤ 30</td><td>30</td></tr><tr><td>s > 30</td><td>60</td></tr><tr><td rowspan="2">Large</td><td>s ≤ 30</td><td>30</td></tr><tr><td>s > 30</td><td>60</td></tr><tr><td>Scanner</td><td>All</td><td>All</td><td>15</td></tr><tr><td rowspan="4">Mailing Machine</td><td rowspan="4">All</td><td>s ≤ 50</td><td>20</td></tr><tr><td>50 < s ≤ 100</td><td>30</td></tr><tr><td>100 < s ≤ 150</td><td>40</td></tr><tr><td>s > 150</td><td>60</td></tr></table>	t_{SLEEP_REQ}: 20 min (mailing machine with print speed 20 mppm)	-
i	The Default Delay Time to Sleep may not be adjusted by the user to be greater than the Maximum Machine Delay Time. This Maximum Machine Delay Time shall be set by the manufacturer at less than or equal to 4 hours.		P
ii	When reporting data and qualifying products that can enter Sleep Mode in multiple ways, partners should reference a Sleep level that can be reached automatically. If the product is capable of automatically entering multiple, successive Sleep levels, it is at the manufacturer's discretion which of these levels is used for qualification purposes; however, the default-delay time provided must correspond with whichever level is used.		-
iii	Default Delay Time does not apply to OM products that can meet Sleep Mode requirements in Ready State.	P_{READY} = 5.54 W P_{SLEPP_1} = 5.54 W P_{SLEPP_2} = 5.24 W (Record unfavourable value under different test voltage, see table 4 for details) P_{SLEEP_Max}= 6.1 W	P
	Evaluation t: $t_{SLEEP} \leq t_{SLEEP\_REQ}$	t_{SLEEP_1}: 10 min t_{SLEEP_2}: 20 min (See table 4 for details)	P

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Clause	Requirement – Test	Measuring result – Remark	Verdict
3.4.4	Sleep Mode Power Consumption:		P
	Measured Sleep Mode power consumption (P_{SLEEP}) shall be less than or equal to the maximum Sleep Mode power consumption requirement (P_{SLEEP_MAX}) determined per Equation 7, subject to the following conditions: **Equation 7: Calculation of Maximum Sleep Mode Power Consumption Requirement for OM products** $$P_{SLEEP\_MAX} = P_{MAX\_BASE} + \sum_{1}^{n} Adder_{INTERFACE} + \sum_{1}^{m} Adder_{OTHER}$$ *Where:* • *P_{SLEEP_MAX} is the maximum Sleep Mode power consumption requirement, expressed in watts (W), and rounded to the nearest 0.1 watt;* • *P_{MAX_BASE} is the maximum Sleep Mode power allowance for the base marking engine, as determined per Table 7 , in watts;* • *$Adder_{INTERFACE}$ is the power allowance for the interface functional adders used during the test, including any fax capability, and as selected by the manufacturer from Table 8, in watts;* • *n is the number of allowances claimed for interface functional adders used during the test, including any fax capability, and is less than or equal to 2;* • *$Adder_{OTHER}$ is the power allowance for any non-interface functional adders in use during the test, as selected by the manufacturer from Table 8, in watts; and* • *m is the number of allowances claimed for any non-interface functional adders in use during the test, and is unlimited.* **Table 7: Sleep Mode Power Allowance for Base Marking Engine**	P_{MAX_BASE} = 5.0W; (Mailing machine) $P_{ADDER\_INTERFACE}$ = 0.4W; (RJ45 network connection) P_{ADDER_EPS} = 0.568W; (EPS) $P_{ADDER\_TOUCH\ PANEL\ DISPLAY}$ = 0.2W; (touch panel display) P_{SLEEP_Max} = 6.1 W	P

Table 7 details:

Product Type	Media Format	Impact	Ink Jet	All Other	Not Applicable	P_{MAX_BASE} (watts)
Copier	Large			x		8.2
Fax Machine	Standard		x			0.6
Mailing Machine	N/A		x	x		5.0
MFD	Standard	x	x			0.6
MFD	Large		x			4.9
MFD				x		8.2
Printer	Small	x	x	x		4.0
Printer	Standard	x	x			0.6
Printer	Large	x		x		2.5
Printer	Large		x			4.9
Scanner	Any				x	2.5

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Clause	Requirement − Test	Measuring result − Remark	Verdict
	Table 8: Sleep Mode Power Allowances for Functional Adders		
	<table><tr><td>Adder Type</td><td>Connection Type</td><td>Max. Data Rate, r (Mbit/ second)</td><td>Details</td><td>Functional Adder Allowance (watts)</td></tr><tr><td rowspan="8">Interface</td><td rowspan="3">Wired</td><td>r < 20</td><td>Includes: USB 1.x, IEEE 488, IEEE 1284/Parallel/ Centronics, RS232</td><td>0.2</td></tr><tr><td>20 ≤ r < 500</td><td>Includes: USB 2.x, IEEE 1394/ FireWire/i.LINK, 100Mb Ethernet</td><td>0.4</td></tr><tr><td>r ≥ 500</td><td>Includes: USB 3.x,1G Ethernet</td><td>0.5</td></tr><tr><td>Any</td><td>Includes: Flash memory-card/smart-card readers, camera interfaces, PictBridge</td><td>0.2</td></tr><tr><td>Fax Modem</td><td>Any</td><td>**Applies to Fax Machines and MFDs only.**</td><td>0.2</td></tr><tr><td>Wireless, Radio-frequency (RF)</td><td>Any</td><td>Includes: Bluetooth, 802.11</td><td>2.0</td></tr><tr><td>Wireless, Infrared (IR)</td><td>Any</td><td>Includes: IrDA.</td><td>0.1</td></tr></table>	See above	P
	<table><tr><td>Adder Type</td><td>Connection Type</td><td>Max. Data Rate, r (Mbit/ second)</td><td>Details</td><td>Functional Adder Allowance (watts)</td></tr><tr><td>Cordless Handset</td><td>N/A</td><td>N/A</td><td>Capability of the Imaging Equipment to communicate with a cordless handset. Applied only once, regardless of the number of cordless handsets the product is designed to handle. Does not address the power requirements of the cordless handset itself.</td><td>0.8</td></tr><tr><td>Memory</td><td>N/A</td><td>N/A</td><td>Applies to the internal capacity available in the Imaging Equipment for storing data. Applies to all volumes of internal memory and should be scaled accordingly for RAM. This adder does not apply to hard disk or flash memory.</td><td>0.5/GB</td></tr><tr><td>Scanner</td><td>N/A</td><td>N/A</td><td>**Applies to MFDs and Copiers only.** Includes: Cold Cathode Fluorescent Lamp (CCFL) or a technology other than CCFL, such as Light-Emitting Diode (LED), Halogen, Hot-Cathode Fluorescent Tube (HCFT), Xenon, or Tubular Fluorescent (TL) technologies. (Applied only once, regardless of the lamp size or the number of lamps/bulbs employed.)</td><td>0.5</td></tr><tr><td>Power Supply</td><td>N/A</td><td>N/A</td><td>Applies to both internal and external power supplies of Mailing Machines and Standard Format products using Inkjet and Impact marking technologies with nameplate output power (P$_{OUT}$) greater than 10 watts.</td><td>0.02 x (P$_{OUT}$ − 10.0)</td></tr><tr><td>Touch Panel Display</td><td>N/A</td><td>N/A</td><td>Applies to both monochrome and color touch panel displays.</td><td>0.2</td></tr><tr><td>Internal Disk Drives</td><td>N/A</td><td>N/A</td><td>Includes any high-capacity storage product, including hard-disk and solid-state drives. Does not cover interfaces to external drives.</td><td>0.15</td></tr></table>		
	Evaluation t: $P_{SLEEP} \le P_{SLEEP\_MAX}$	$P_{SLEPP\_1} = 5.54$ W $P_{SLEPP\_2} = 5.24$ W	P
i	Only those interfaces that are present and used during the test, including any fax interface, may be considered functional adders.		P

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Clause	Requirement − Test	Measuring result − Remark	Verdict
ii	Product functionality offered through a DFE shall not be considered a functional adder.		N
iii	A single interface that performs multiple functions may be counted only once.		N
iv	Any interface that meets more than one interface type definition shall be classified according to the functionality used during the test.		N
v	For products that meet the Sleep Mode power requirement in Ready State, no further automatic power reductions are required to meet Sleep Mode requirements.	P_{READY} = 5.54 W	P
3.4.5	Standby Power Consumption		P
	Standby Mode power, which is the lesser of the Ready State Power, Sleep Mode Power, and Off Mode Power, as measured in the test procedure, shall be less than or equal to the Maximum Standby Power specified in Table 9, subject to the following condition. **Table 9: Maximum Standby Power Requirement** 	Product Type	Maximum Standby Power (watts)
All OM Products	0.5		$P_{STANDBY}$ = 0.38 W (A standby switch on touch panel display, see table 4 for details)	P
i	The Imaging Equipment shall meet the Standby Power requirement independent of the state of any other devices (e.g., a host PC) connected to it.		P
	Evaluation: $P_{STANDBY} \leq 0.5$ W		P
	Note: Products intended for sale in the US market are subject to minimum toxicity and recyclability requirements. Please see ENERGY STAR Program Requirements for Imaging Equipment: Partner Commitments for details.		-

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Table 1	Power measurement – DC Source unloaded					
Rated voltage (V):	--			T_{amb} (23 ±5°C) (°C):	--	
Rated frequency (Hz):	--			Rh (10-80%) (%):	--	
THD (%):	--			Airspeed (m/s):	--	
Model	Test	U_{IN} (V)	F (Hz)	I_{IN} (mA)	P_S (W)	Remarks
--	--	--	--	--	--	--

Supplementary information:
- Accessory configuration:
- Setting: as shipped
- Connection: none
-

Remarks:
1. Test: I: initial test, A: additional test, 1,2,3: number of test
2. Voltage & Frequency tolerance: ±1.0%, THD <2.0% (if P rated > 1500W is voltage tolerance ±4.0%, THD <5.0%)

Table 2	Power/ENERGY measurement – DFE						
Rated voltage (V):	--			T_{amb} (23 ±5°C) (°C):	--		
Rated frequency (Hz):	--			Rh (10-80%) (%):	--		
THD (%):	--			Airspeed (m/s):	--		
Model	Test	U_{IN} (V)	F (Hz)	I_{IN} (mA)	P_{DFE_READY} (W)	P_{DFE_SLEEP} (W)	Remarks
--	--	--	--	--	--	--	--

Supplementary information:
- Accessory configuration:
- Setting: as shipped
- Connection:

Remarks:
1. Test: I: initial test
2. Voltage & Frequency tolerance: ±1.0%, THD <2.0% (if P rated > 1500W is voltage tolerance ±4.0%, THD <5.0%)

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Table 3	Energy measurement – TEC test									
Model :			--							
Rated voltage (V):			--			T_{amb} (23 ±5°C) (°C):		--		
Rated frequency (Hz):			--			Rh (10-80%) (%):		--		
THD (%):			--			Airspeed (m/s):		--		

Part 1

Test	U_{IN} (V)	F (Hz)	E_{OFF} (Wh)	t_{OFF} (s)	$t_{Active0}$ (s)	E_{SLEEP} (Wh)	t_{SLEEP} (s)	N_{JOBS} (calculated)	Remarks
--	--	--	--	--	--	--	--	--	--

Part 2

Test	E_{JOB1} (Wh)	$t_{Active1}$ (s)	E_{JOB2} (Wh)	$t_{Active2}$ (s)	E_{JOB3} (Wh)	E_{JOB4} (Wh)	E_{JOB_DAILY} (calculated) (kWh)	Remarks
--	--	--	--	--	--	--	--	--

Part 3

Test	E_{FINAL} (Wh)	t_{Final} (s)	E_{AUTO} (Wh)	t_{AUTO} (min)	TEC (calculated) (kWh/wk)	Remarks
--	--	--	--	--	--	--

Supplementary information:

Remarks:
1. Test: I: initial test
2. Voltage & Frequency tolerance: ±1.0%, THD <2.0% (if P rated > 1500W is voltage tolerance ±4.0%, THD <5.0%)

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Table 4	Power measurement – OM test										
Model :			Matrix F12								
Rated voltage (V):			24VDC				T_{amb} (23 ±5°C) (°C):		23.5		
Rated frequency (Hz):			--				Rh (10-80%) (%):		50.0		
THD (%):			0.13				Airspeed (m/s):		0.1		
Test	U_{IN} (V)	F (Hz)	$P_{STANDBY}$ (W)	P_{READY} (W)	t_{SLEEP} (min)		P_{Sleep} (W)		$P_{Auto-OFF}$ (W)	$t_{AUTO-OFF}$ delay (min)	P_{OFF} (W)	Remarks
					t_{SLEEP_1}	t_{SLEEP_2}	P_{Sleep_1}	P_{Sleep_2}				
I/1	115.1	59.9	0.34	5.44	10	20	5.44	5.15	--	--	0.34	--
I/2	230.0	49.9	0.38	5.54	10	20	5.54	5.24	--	--	0.38	--

Supplementary information:
- Accessory configuration: EPS;
- Setting: as shipped;
- Network or data connection for use in test: RJ45 network interface;
- Test image: unit default output;
- Ready mode: Measured after printing and print head sealed;
- Diplay in sleep_1 mode: Touch and go with backlight;
- Diplay in sleep_2 mode: Display turn off
- A standby switch on touch panel display.

Remarks:

1. Test: I: initial test
2. Voltage & Frequency tolerance: ±1.0%, THD <2.0% (if P rated > 1500W is voltage tolerance ±4.0%, THD <5.0%)

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Table 5.1	Efficiency measurement for external Power Supply (EPS)				
Manufacturer:		Fujikon International Ltd.	Model:		SAW40-24.0-1600
Rated voltage (V):		100-240VAC	T_{amb} (23 ±5 ºC) (ºC):		24.5
Rated frequency (Hz):		50/60Hz	Rh (10-80%) (%):		65.1
Rated output power (W):		38.4	Airspeed (m/s):		0.1
		Measurement and calculation			
		Load 1	Load 2	Load 3	Load 4	Load 5
		100% ± 2%	75% ± 2%	50% ± 2%	25% ± 2%	0%
Input voltage (V)		115.22	115.229	115.36	115.68	115.47
Frequency (Hz)		60.0	60.0	60.0	60.0	60.0
Input current (mA)		761.6	578.7	404.5	219.9	11.97
Input Power (W)		43.86	32.78	21.91	11.23	0.233
True Power Factor		0.499	0.491	0.476	0.454	0.168
THD_{Input} (%)		1.62	1.32	0.99	0.61	0.09
Output current (mA)		1600	1200	800	400	
Output Voltage (V)		23.78	23.88	23.98	24.08	
Active Output Power (W)		38.05	28.66	19.18	9.63	
Power Consumed by UUT (W)		5.81	4.12	2.73	1.60	0.233
Efficiency (%)		86.75	87.42	87.56	85.77	
Average Efficiency(%)		86.87				

Calculation information:
True Power Factor =Input Power / (Input Voltage * Input current)
Power consumed = Input Power – Active Output Power
Efficiency = Active Output Power / Input Power
Average Efficiency = (Efficiency 1 + Efficiency 2 + Efficiency 3 + Efficiency 4)/4
No Load Power consumption = Input Power @ 0% load

Remarks:
Output wire: 22AWG, 200cm.

Limit for efficiency mark level V:
Average active mode efficiency limit ≥ [0.0626 * Ln (Pno)] + 0.622 = 85.04%
No load power limit: ≤0.3W.

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Table 5.2	Efficiency measurement for external Power Supply (EPS)				
Manufacturer:		Fujikon International Ltd.	Model:		SAW40-24.0-1600
Rated voltage (V):		100-240VAC	T_{amb} (23 ±5 ºC) (ºC):		24.5
Rated frequency (Hz):		50/60Hz	Rh (10-80%) (%):		65.1
Rated output power (W):		38.4	Airspeed (m/s):		0.1
		Measurement and calculation			
		Load 1	Load 2	Load 3	Load 4	Load 5
		100% ± 2%	75% ± 2%	50% ± 2%	25% ± 2%	0%
Input voltage (V)		229.28	229.31	229.92	229.64	229.45
Frequency (Hz)		50.0	50.0	50.0	50.0	50.0
Input current (mA)		436.3	338.7	238.4	131.9	17.48
Input Power (W)		43.34	32.66	22.04	11.37	0.264
True Power Factor		0.433	0.421	0.402	0.374	0.065
THD_{Input} (%)		0.56	0.46	0.35	0.22	0.06
Output current (mA)		1600	1200	800	400	
Output Voltage (V)		23.77	23.86	23.97	24.07	
Active Output Power (W)		38.03	28.63	19.18	9.63	
Power Consumed by UUT (W)		5.31	4.03	2.86	1.74	0.264
Efficiency (%)		87.75	87.67	87.00	84.68	
Average Efficiency(%)		86.78				

Calculation information:
True Power Factor =Input Power / (Input Voltage * Input current)
Power consumed = Input Power – Active Output Power
Efficiency = Active Output Power / Input Power
Average Efficiency = (Efficiency 1 + Efficiency 2 + Efficiency 3 + Efficiency 4)/4
No Load Power consumption = Input Power @ 0% load

Remarks:
Output wire: 22AWG, 200cm.

Limit for efficiency mark level V:
Average active mode efficiency limit ≥ [0.0626 * Ln (Pno)] + 0.622 = 85.04%
No load power limit: ≤0.3W.

Table 6	Measurement and calculation : Multiple-voltage External Power Supply				--
Manufacturer:	--		Model:	--	
Rated input voltage (V):	--		Rated input frequency (Hz):	--	
t$_{Ambient}$ (23 ±5°C) (°C)	--		Air speed (≤ 0.5 m/s) (m/s)	--	
	--		Fan :	Internal/ external/ none	

	Load condition 100%	Load condition 50%	Load condition 20%	Load condition 10%	Load condition 5 Other: %
1 Output current (mA)					
1 Output Voltage (V)					
1 Output Power (W)					
2 Output current (mA)					
2 Output Voltage (V)					
2 Output Power (W)					
3 Output current (mA)					
3 Output Voltage (V)					
3 Output Power (W)					
4 Output current (mA)					
4 Output Voltage (V)					
4 Output Power (W)					
5 Output current (mA)					
5 Output Voltage (V)					
5 Output Power (W)					
6 Output current (mA)					
6 Output Voltage (V)					
6 Output Power (W)					
Total Output Power (W)					
Input Voltage (V)					
Input Frequency (Hz)					
Input Current (A)					
Input Current THD (%)					
Input Power (W)					
Input Power Factor					
Efficiency					

Calculation information:
Power Factor = Input Power / (Input Voltage * Input current)
Efficiency = Total Output Power / Input Power

Supplementary information:
- -
- Derating factor for loading used:
- Setting:
- Test load:
- Stability achieved:
- Power supply fan: cycles/ does not cycle
- Power supply fan external signal : enabled / disabled

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Attachment 1: Equipment List

Equipment	ID No.	Model	Brand/Manufacturer	Calibration due date
Power meter	68-1-32-06-009	WT210	YOKOGAWA	10/23/2014
Stop watch	68-1-39-09-007	TS2106RT	Timestar	4/22/2015
Electronic balance	68-1-47-06-002	UWA-003	United Trade	11/7/2014
Temperature and humidity recorder	68-1-53-10-016	SK-L200RT	SATO	1/5/2015
Anemometer	68-1-11-11-003	471-1	Dwyer	1/9/2015
Multi-meter	68-1-34-07-009	179	FLUKE	11/15/2014
Tape	68-1-18-06-021	3.6M	TAJIMA	3/7/2015

Attachment 2: Constructional data form

Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Mark(s) of conformity
External Power Supply	Fujikon International Ltd.	SAW40-24.0-1600	Input: 100-240VAC, 50/60Hz, 1.5A Output: 24VDC, 1600mA	--
DC Motor, eject	Johnson Electric Engineering Ltd.	NF143G	13V 0,042A (no load) 0,63A (stall)	---
DC Motor, Service	Johnson Electric Engineering Ltd.	NF243G	13V 0,045A (no load) 1,83A (stall)	---
Marking Engine	FRAMA AG Lauperswil Hewlett-Packard	---	13,0V	---