electronic GmbH

a member of the STC

Prüfbericht / Test report

Test-Firm-Registration-Number: 90870

FCC
(Federal Communications Commission)

EMC-SAFETY-MULTIMEDIA pkm SINCE 1978 TESTED IN GERMANY	Ohmstrasse 1 84160 Frontenhausen, Germany Tel.: + 49 (0) 87 32 - 63 81 Fax: + 49 (0) 87 32 - 23 45 E-mail: info@pkm.eu.com	Prüfbericht Nr./ Test report no.: **13/06-0085** Seite 1 von 20 Seiten Page 1 of 20 pages

TABLE OF CONTENTS

Note:
The test equipments used at PKM are calibrated by an external DKD-calibration laboratory. Calibration documents are available upon request.

1. CLIENT INFORMATION:

Name:	DATECS Ltd.	
Address:	4 "Datecs" Str., 1592 SOFIA, BULGARIA	
Name of contact:	Mr. P. Iliev, Vice President	Mrs. Ludmila Nikolova
Telephone:	00359 2 816 55 50	
Fax:	00359 2 816 55 65	
E-mail:	pencho@datecs.bg	lusi@datecs.bg

2. EQUIPMENT UNDER TEST:

2.1 Identification of the EUT

Equipment:	Scanner
Model:	LINEA PRO 5.0
Brand name:	-/-
Serial no.:	913000103
Manufacturer:	DATECS Ltd.
Country of origin:	BULGARIA
Rating:	Lithium-Ion battery 4.2V / 5V DC, powered by USB

2.2 Additional information about the EUT:	In course of this test report only the EMC measurements of the Scanner function are performed (part 15 subpart B, unintentional radiator). The conformity of the Radio part for this product is shown by separate report.

3. TEST SITE

3.1. Shielded room for conducted emission

Measurement of conducted emission from EUT was made in the shielded chamber (Siemens DC-10GHz) that has been found in compliance with Federal Communications Commissions (FCC) requirements of 47CFR2.948 according to ANSI C63.4-2009 on March 01, 2012.

3.2. Semi-anechoic chamber/OATS for radiated emission

Measurement of radiated emissions from EUT was made in the semi-anechoic chamber that has been found in compliance with Federal Communications Commissions (FCC) requirements of 47CFR2.948 according to ANSI C63.4-2009 on March 01, 2012.

3.3 Cable input conducted emission

Measurement of cable input conducted emission from EUT was made in the semi-anechoic chamber that has been found in compliance with Federal Communications Commissions (FCC) requirements of 47CFR2.948 according to ANSI C63.4-2009 on March 01, 2012.

4. CALIBRATIONS OF MEASURING INSTRUMENTS

All measurements were made with instruments calibrated according to the requests of EN/IEC 17025 according to which the test site is accredited. Measurement of radiated emissions was made with instruments conforming to American National Standard Specification, ANSI C63.4-2009. The calibration of measuring instrument, including any accessories that may affect test results, was performed according to the requests of EN/IEC 17025.

5. DESCRIPTION OF THE TEST CONDITIONS

5.1 Conducted emission measurements

5.1.1 Test site

Measurements were made in shielded chamber as described at 3.1 in this report.

5.1.2 Detector function selection and bandwidth

In conducted emissions measurement CISPR quasi-peak- and average-detector were used.
The bandwidth of the detector of instrument is 10 kHz over the frequency range of 150 kHz to 30 MHz. Conducted emissions to be measured are detected in CISPR quasi-peak- and average-mode.

5.1.3 Unit of measurement

Test results of conducted emission measurement are reported in dBµV.

5.1.4 Frequency range to be scanned

For conducted emission measurements, the spectrum in the range of 150 kHz to 30 MHz was investigated.

5.1.5 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum conducted emission generated from EUT.
The power was furnished with rated (normal) voltage. The EUT was placed on a 80 cm high non metallic table.
Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurements as for the typical usage and applicable as nearly as practicable.

5.1.6 Measurement uncertainty

Conducted emission measurements: $\pm$ 1.8dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurements uncertainty was calculated in accordance with NAMAS NIS 81: "The treatment of uncertainty in EMC measurement" and "Guide to the Expression of Uncertainty in Measurement (GUM)".

The measurement uncertainty was given with a confidence of 95 %.

5.2 Radiated emissions measurements

5.2.1 Test site

Measurements were made in semi-anechoic chamber as described at 3.2 in this report.

5.2.2 Detector function selection and bandwidth

In radiated emissions measurement, field strength meters that have CISPR quasi-peak and average were used.
The bandwidth of the detector of instrument is 120 kHz over frequency range of 30 to 1000 MHz, emissions to be measured are detected in CISPR quasi peak mode.

The bandwidth of the detector of instrument is 1000 kHz for frequencies above 1000 MHz, emissions to be measured are detected in average mode.

5.2.3 Unit of measurement

Test results of radiated emissions measurement are reported in dB(microvolts per meter) at the specific distance. Using the unit of dBµV on the test instrument, the indication unit can be converted to field strength unit of µV/m as following method for frequencies 30 MHz – 1000 MHz;

$$F/S = 10^{[(R + CF)/20]}$$

here,

F/S: Field strength in µV/m
R: Meter reading in dB (µV)
CF: Correction factor (includes cable loss, antenna factor, field deviation)

5.2.4 Antennas

Measurements were made using a calibrated bilog antenna in the range of 30 to 1000 MHz and a calibrated horn antenna above 1000 MHz to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization.
The horizontal distance between the receiving antenna and the closest periphery of the EUT is 3 meters.

5.2.5 Frequency range to be scanned

For radiated emissions measurements, the spectrum in the range of 30 to 1000 MHz was investigated and above 1000 MHz up to the 5th harmonic of the highest frequency or 40 GHZ, whichever is lower.

5.2.6 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum RF energy generated from EUT.
The power was furnished with rated (normal) voltage. The EUT was placed on a 80 cm high non metallic 1 m diameter table. The turntable containing the system was rotated and the antenna height was varied 1m to 4 m to find the maximum RF energy generated from EUT.
Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurements to the typical usage and applicable as nearly as practicable.

5.2.7 Measurement uncertainty

Radiated emissions measurements, bilog antenna: $\pm$ 2.7 dB, horn antenna $\pm$ 2.9 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurements uncertainty was calculated in accordance with NAMAS NIS 81: "The treatment of uncertainty in EMC measurement" and "Guide to the Expression of Uncertainty in Measurement (GUM)".

The measurement uncertainty was given with a confidence of 95 %.

5.3 Cable input conducted emission measurements

5.3.1 Test site

Measurements were made in shielded chamber as described at 3.3 in this report.

5.3.2 Detector function selection and bandwidth

In conducted cable input emissions measurement CISPR quasi-peak were used.
The bandwidth of the detector of instrument is 120 kHz over frequency range of 30 MHz to 1000 MHz, Conducted cable input emission is detected in CISPR quasi peak mode.

5.3.3 Unit of measurement

Test results of conducted emission measurement are reported in dBµV. Using the unit of dBµV on the test instrument, indication unit was converted to voltage unit of µV as following method for frequencies 30 MHz – 1000 MHz;

$$U = 10^{[R/20]}$$

here,

U: Voltage of conducted emission in µV
R: Meter reading in dB(µV)

5.3.4 Frequency range to be scanned

For conducted cable input emission measurements, the spectrum in the range of 54 MHz to 804 MHz was investigated.

5.3.5 Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation so as to find the maximum conducted emission generated from EUT.
The power was furnished with rated (normal) voltage. The EUT was placed on a 1 m high non metallic table.
Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurements to the typical usage and applicable as nearly as practicable.

5.3.6 Measurement uncertainty

Conducted cable input emission measurements: $\pm$ 1.3 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurements uncertainty was calculated in accordance with NAMAS NIS 81: "The treatment of uncertainty in EMC measurement" and "Guide to the Expression of Uncertainty in Measurement (GUM)".

The measurement uncertainty was given with a confidence of 95 %.

6. MEASURING INSTRUMENTS AND SET-UP

6.1 Conducted emission

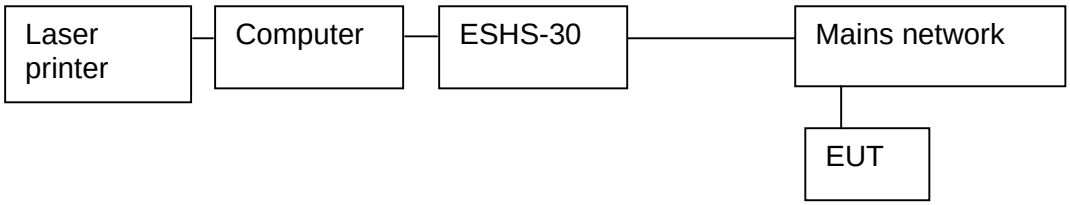
6.1.1 Test receiver

Rohde & Schwarz, model ESHS-30 (9 kHz – 30 MHz)
Detector function: quasi peak and average
IF bandwidth: 10 kHz

6.1.2 Mains network

Rohde & Schwarz, model ESH2-Z5 (9 kHz – 30 MHz)

6.1.3 Measurement setup



6.2 Radiated emission

6.2.1 Test receiver

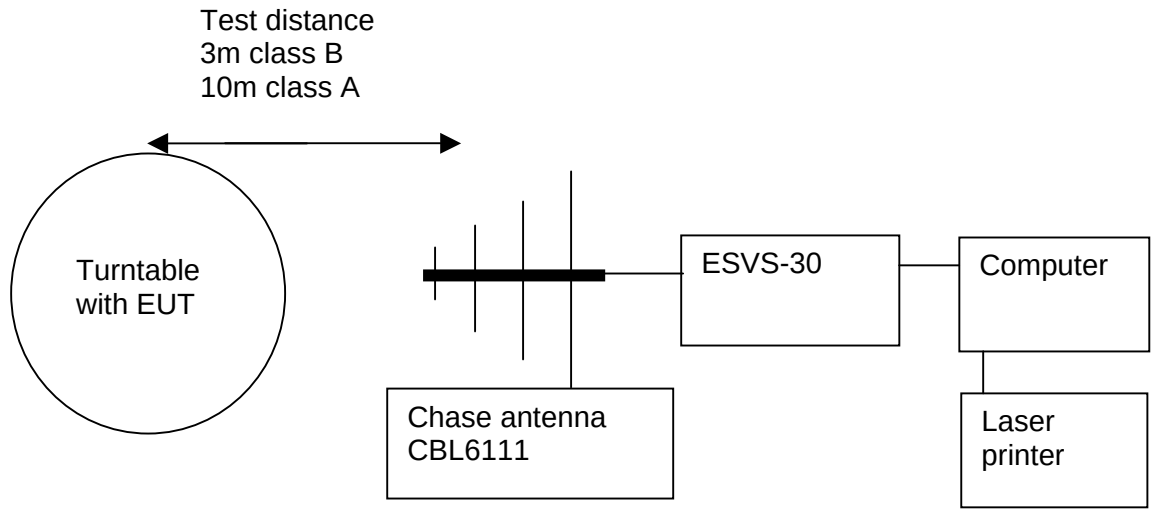
Rohde & Schwarz, model ESVS-30 (20 MHz – 1000 MHz)
Detector function: quasi peak
IF bandwidth: 120kHz
Rohde & Schwarz, model FSMS26 (above 1000MHz)
Schwarzbeck, Preeamplifier model BBV 9718 1 GHz - 18 GHz
Detector function: average
IF bandwidth: 1000 kHz

6.2.2 Receiving antenna

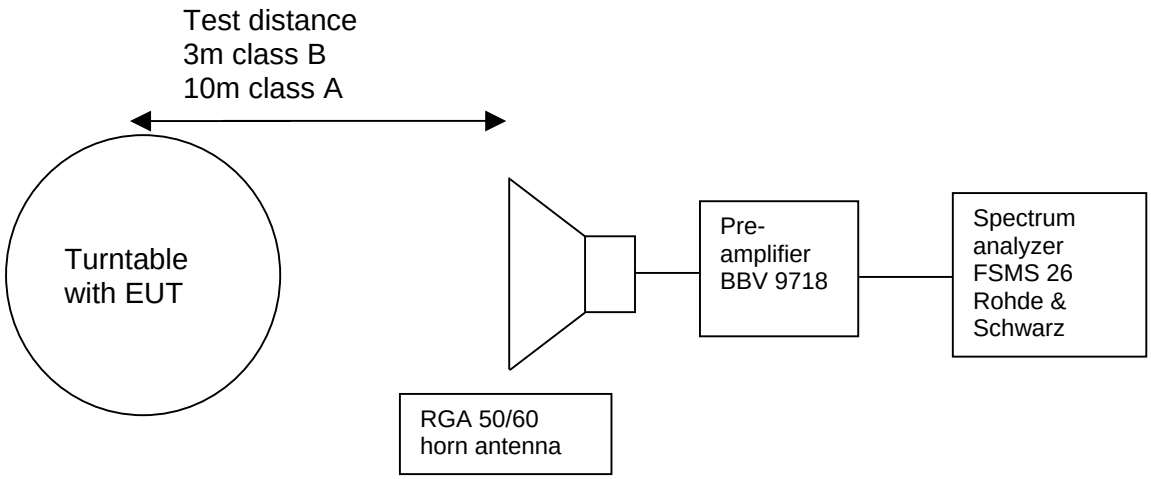
Chase, model CBL6111: bilog antenna (30 MHz – 1000 MHz)
Electro Metric RGA 50/60 horn antenna (above 1000 MHz)

6.2.3 Measurement setup

30 MHz - 1000 MHz



above 1000 MHz



6.3 Cable input conducted emission

6.3.1 Test receiver

Rohde & Schwarz, model ESVS-30 (20 MHz – 1000 MHz)
Detector function: quasi peak
IF bandwidth: 120 kHz

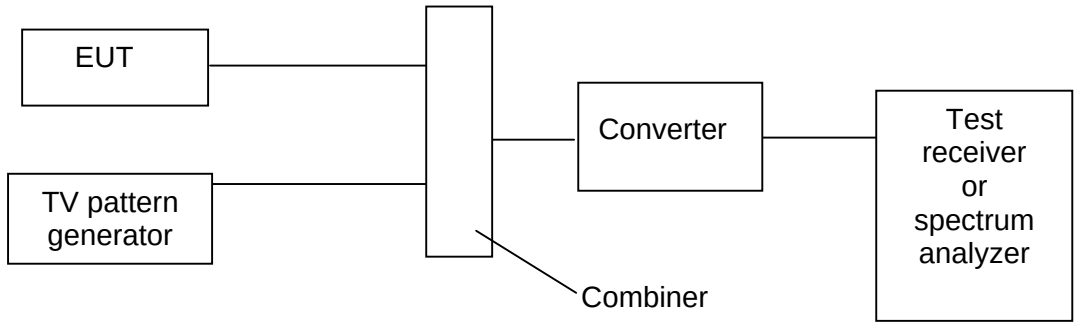
6.3.2 Power divider

Model 50 Ohm-6 dB, Suhner
DC- 2000 MHz

6.3.3 Converter (matching network) 50/75 Ohm

Model ZM57, Texscan

6.3.4 Measurement setup



7. MEASUREMENTS AND RESULTS

7.1 Conducted emission

The Scanner LINEA PRO 5.0 (equipment under test – EUT) is battery operated or powered by USB (5V DC) and has no connection facility to mains power.

7.2 Radiated emission

Tests have been performed with an iPhone 5 connected in the modes USB connected to PC (charge mode), Bluetooth connection (printing on Bluetooth printer), card reading and barcode scanning. As the highest frequency generated by the Scanner function is less than 1 GHz, frequencies up to 5 GHz have been investigated. The EUT complied with the requirements of section 15.109 (a) class B.

7.3 Cable input conducted emission

As the EUT has no connection facility to an external antenna or cable network, no cable input conducted emission can be measured.

8. CONCLUSIONS

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant clauses of Federal Communications Commission Rules for unintentional radiators (part 15 subpart B)

pkm electronic GmbH
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Zuständiger Laborleiter:
Responsible head of laboratory:

23.07.2013	G. Raithel Dipl.-Ing. (FH)	
(Datum/*Date*)	**(Name/*Name*)**	**(Unterschrift/*Signature*)**

9. LIST OF USED TEST EQUIPMENT AT PKM

Test place	Kind of equipment	Manufacturer	Type	PKM-ident no.
Conducted emissions cabin 1 9kHz - 30MHz	EMI test receiver	Rohde&Schwarz	ESHS-30	10571
	Line impedance stabilisation network	Rohde&Schwarz	ESH2-Z5	10139
	Shielded room	Siemens	1 GHz Typ B83102	10111
Radiated emissions 30MHz - 1000MHz	EMI test receiver	Rohde&Schwarz	ESVS-30	10572
	EMI test antenna	Chase	CBL6111	10022
	Antenna mast system	Schwarzbeck	AM9104	10099
	AC-linefilter	Timonta	FV2-10-D	10755
	Turntable	Deisel	DT 310	10774
Cable input conducted emissions	TV-test transmitter	Grundig	VTG700SAT	10531
	Spectrum analyzer	Hewlett Packard	HP8562B	10208
	EMI test receiver	Rohde&Schwarz	ESVS-30	10572
	50/75 Ohm converter	Texscan	ZM57	10305
	Power divider	Suhner	50 Ohm-6dB	10421
Interference radiation 1000MHz – 18GHz	Spectrum analyzer (100Hz – 26.5GHz)	Rohde & Schwarz	FSMS 26	10481 / 10482
	Horn antenna (1GHz – 18GHz)	Electro Metrics	RGA-50/60	10018
	Broadband-Preamplifier 1-18 GHz	Schwarzbeck	BBV 9718	11230
	Antenna mast system	Schwarzbeck	AM9104	10099
	AC-linefilter	Timonta	FV2-10-D	10755
	Turntable	Deisel	DT 310	10774
Frequency measurements	Spectrum analyzer (100Hz – 26.5GHz)	Rohde & Schwarz	FSMS 26	10481 / 10482
	Antenna mast system	Schwarzbeck	AM9104	10099
	AC linefilter	Timonta	FV2-10-D	10755
	Turntable	Deisel	DT 310	10774

The test equipments used at PKM are calibrated by an external DKD-calibration laboratory. Calibration documents are available upon request.

10. PHOTOS


MODEL: Linea Pro 5
SN: 913000103


Buffer size: 128 KB
Country: USA
Code page: Western (1252)
Black mark: Disabled
Protocol mode: Enabled
Intensity: 100 %
Auto off: 10 min
Temperature: 27°C
Date & time: Not set
Battery: 8.0V 90%
Switches:


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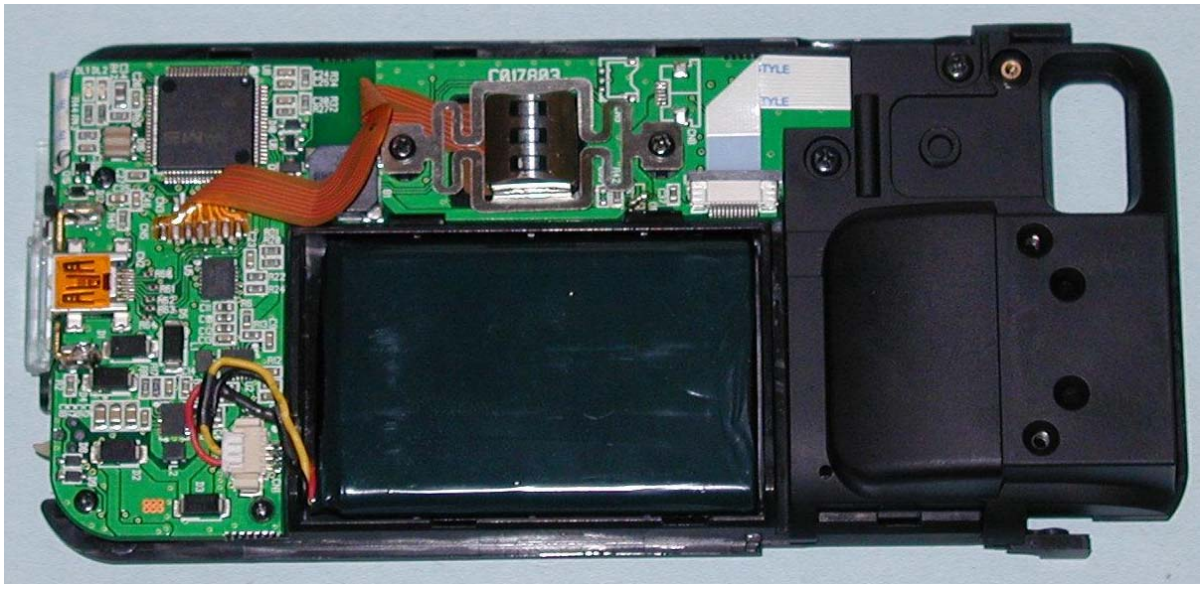

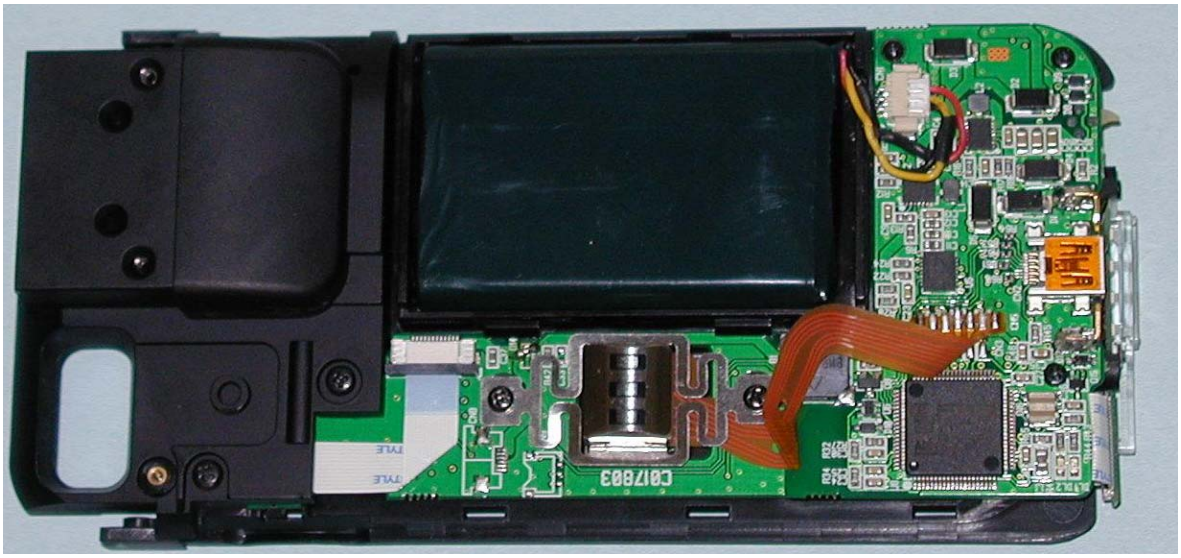

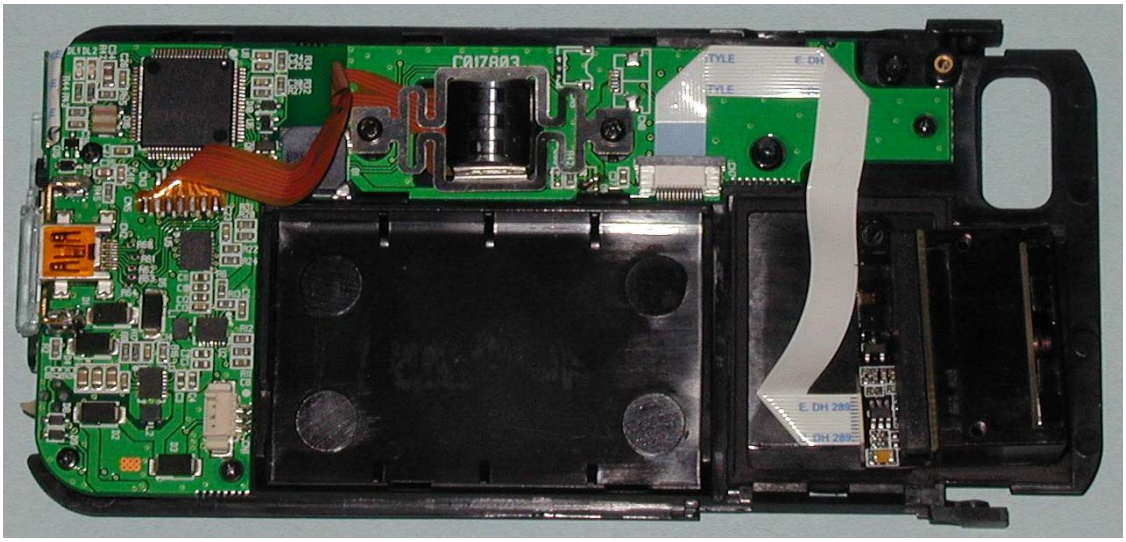
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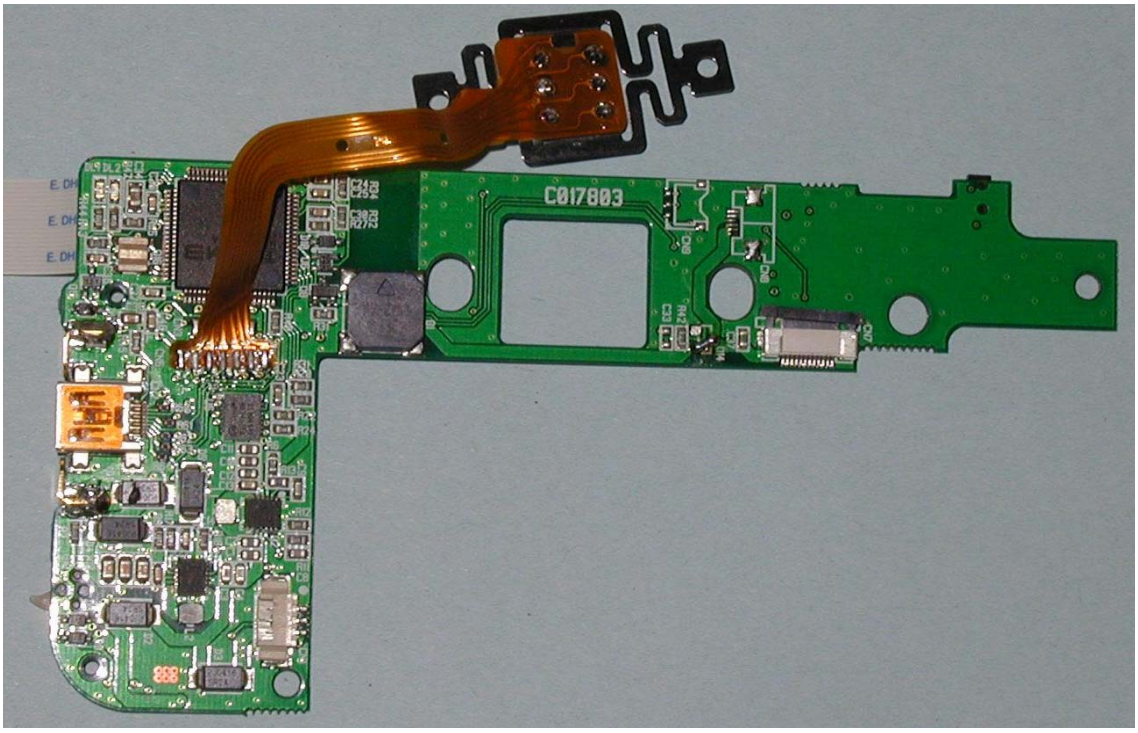
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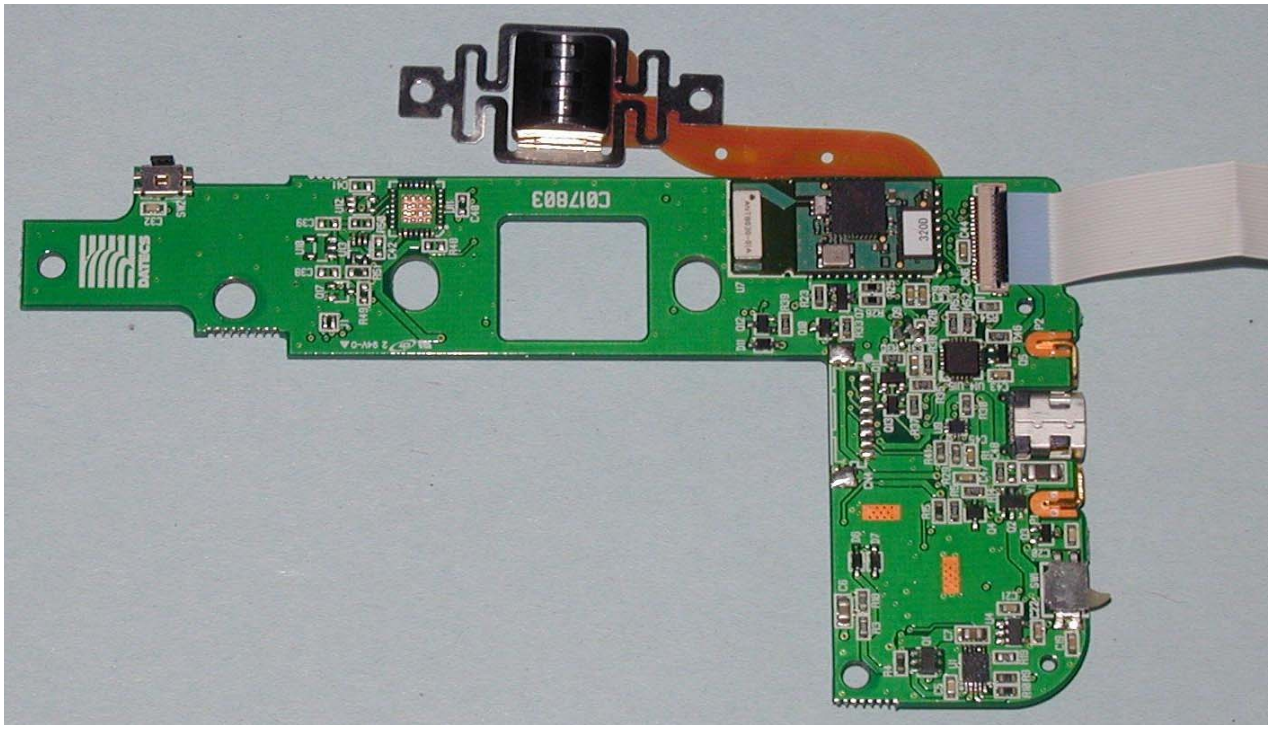
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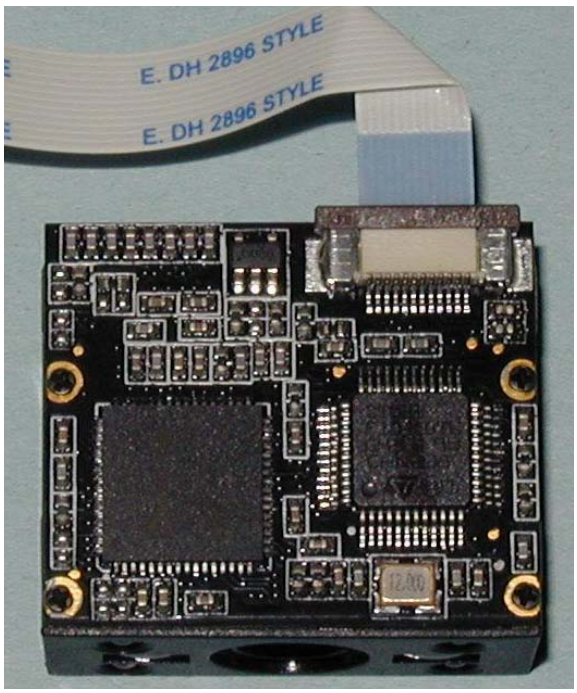
E. DH 2896 STYLE
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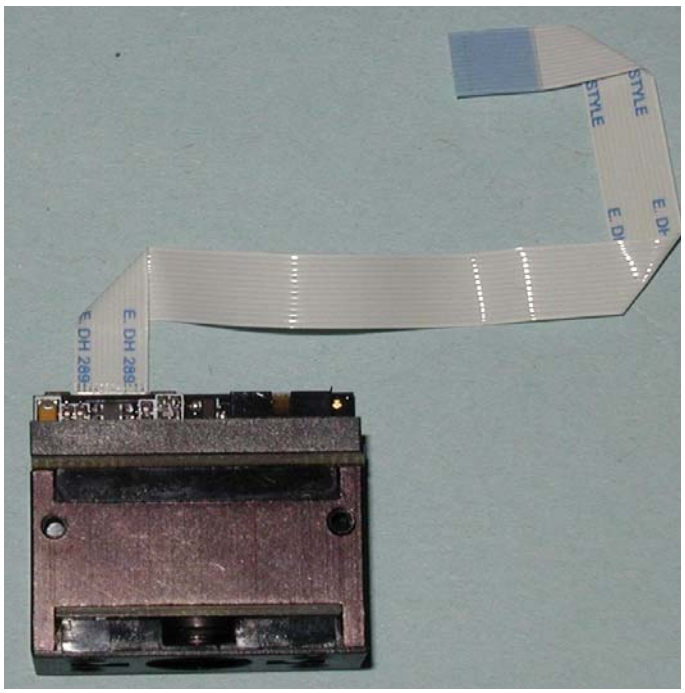
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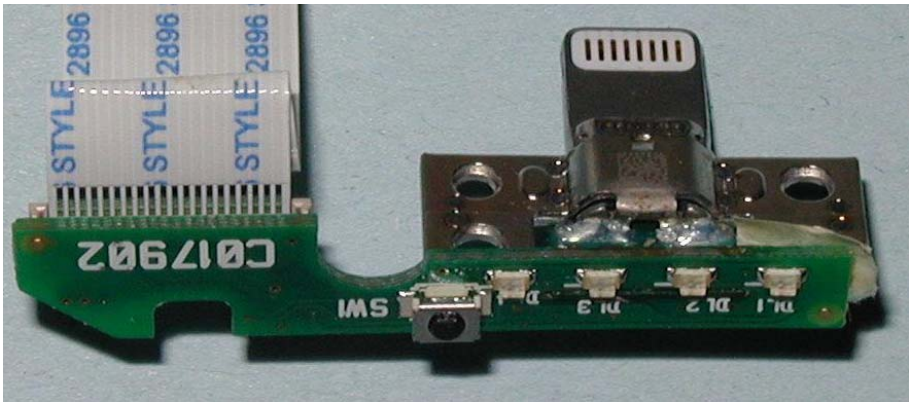
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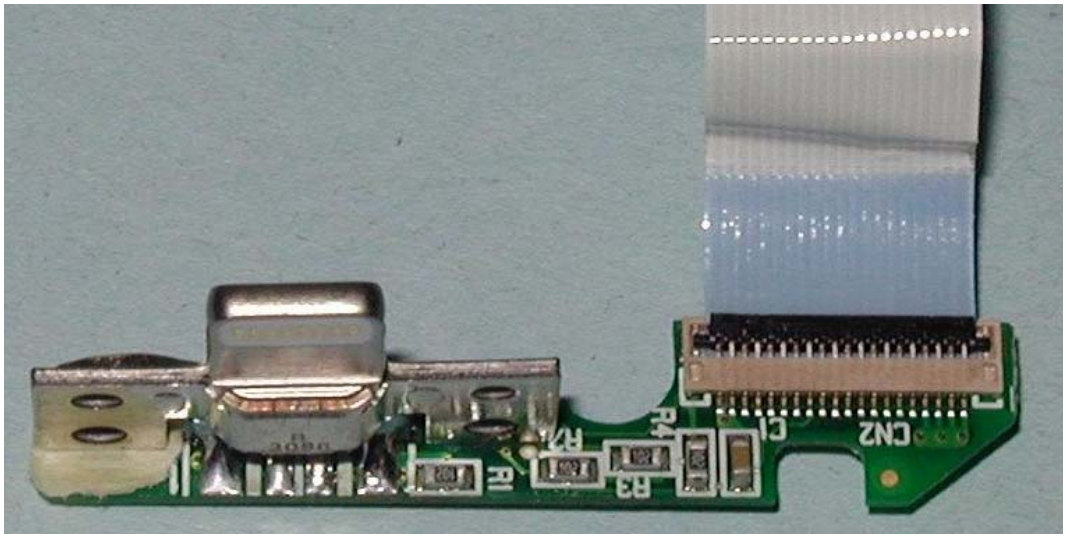

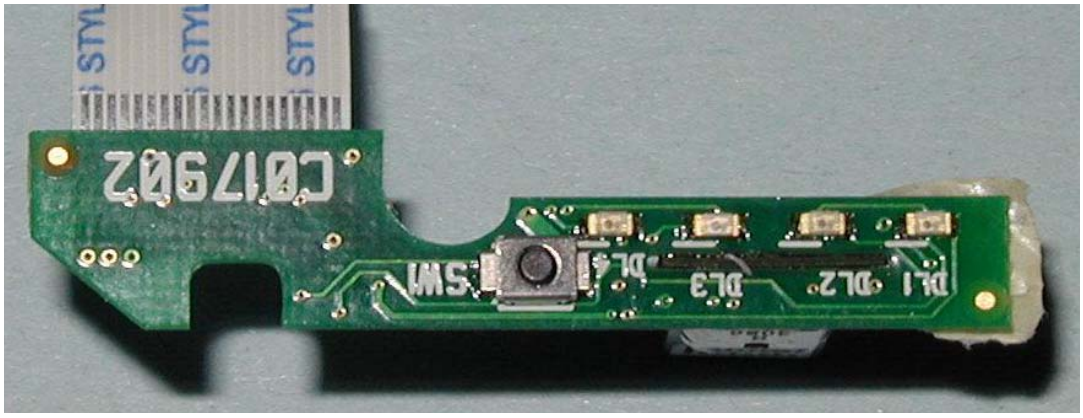

End of test report