


COMMUNICATION

 **10 R - 04 0072**

concerning:

APPROVAL GRANTED
~~APPROVAL EXTENDED~~
~~APPROVAL REFUSED~~
~~APPROVAL WITHDRAWN~~
~~PRODUCTION DEFINITELY DISCONTINUED~~


of a type of electrical/electronic sub-assembly with regard to Regulation No. 10 as amended by the 04 series of amendments.


Approval No. **040072**

Extension No. -

- | | | |
|------|---|---|
| 1. | Make (trade name of manufacturer): | Hella or Talmu |
| 2. | Type and general commercial description(s): | 345600; rectangular signal light Versions: 345603-00, 345603-01, 345603-02, 345603-03, 345603-04 and 345603-05 |
| 3. | Means of identification of type, if marked on the vehicle/component/separate technical unit : | Type marked on the housing of the product. |
| 3.1. | Location of that marking: | At the back of the housing. |
| 4. | Category of vehicle: | not applicable |
| 5. | Name and address of manufacturer: | Hella Lighting Finland Oy Inkereentie 566 FI-24280 Salo, FINLAND |
| 6. | In the case of components and separate technical units, location and method of affixing of the ECE approval-mark: | Engraved on the casing of the light. |
| 7. | Address(es) of assembly plant(s): | See item 5. |
| 8. | Additional information (where applicable): | - |



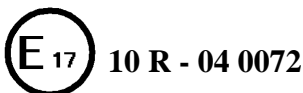
9. Technical service responsible for carrying out the tests: SGS Fimko Oy
Särkiniementie 3
P.O. Box 30
FI-00210 Helsinki
FINLAND
10. Date of test report: 20.12.2013
11. No. of test report: 274416-2
12. Remarks (if any): -
13. Place: Helsinki
14. Date: 18.02.2014
15. Signature: 
Marko Sinerkari
Head of Unit
16. The index to the information package lodged with the approval authority, which may be obtained on request, is attached.
- Information document Doc No. Hella-e-46, 2.12.2013, 7 pages
 - Schematic circuit diagram, 1 page
 - Mechanical drawing 10001113547, 1 page
 - Component layout drawing 345603_xx.v05, 18.12.2013, 1 page
 - Component list, 6 pages
 - Test report 274416-2, 20.12.2013, 16 pages
17. Reasons for extension: not applicable

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Appendix to type-approval communication form No. 040072 concerning the type-approval of an electrical/electronic sub-assembly under Regulation No. 10 as amended by the 04 series of amendments.

1. Additional information
 - 1.1. Electrical system rated voltage: 12 V / 24 V pos/neg ground
 - 1.2. This ESA can be used on any vehicle type with the following restrictions:
 - 1.2.1. Installation conditions, if any: -
 - 1.3. This ESA can only be used on the following vehicle types: not applicable
 - 1.3.1. Installation conditions, if any: -
 - 1.4. The specific test method(s) used and the frequency ranges covered to determine immunity were: (Please specify precise method used from Annex 9): Absorber chamber test:
ISO 11452-2:2004, 20–2000 MHz
 - 1.5. Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests: SGS Fimko Oy
P.O. Box 30
FI-00210 Helsinki
FINLAND
2. Remarks: -



**Information document of 345.600 relating to
EC type approval of an electric/electronic
subassembly with respect to electromagnetic
compatibility E Regulation No. 10 – Rev.4 –
Amend.1**



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0. General

0.1 Make (trade name of manufacturer):

Hella or Talmu

0.2 Type:

345600 Rectangular SMLR

0.3 Means of identification of type, if marked on the component/separate technical unit

There is a type marking on the housing of product.

0.3.1 Location of that marking

Type marking is located at the back of the housing.

0.5 Name and address of manufacturer:

Hella Lighting Finland Oy
Inkereentie 566
FI-24280 Salo
FINLAND

0.7 Location and method of affixing of the EC approval mark

The "E-mark" symbol will be engraved on the casing of the rectangular SMLR.

0.8 Address(es) of assembly plant(s):

Hella Lighting Finland Oy
Inkereentie 566
FI-24280 Salo
FINLAND

1. This ESA shall be approved as a component

2. Any restrictions of use and conditions for fitting:

Rectangular SMLR is intended for signal lighting of the vehicle.

3. Electrical system rated voltage:

The input voltage is 12V.



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Appendix 1**Description of the ESA**

Rectangular SMLR is signal light for vehicle use.

Table 1. Contents of ESA

There is three color versions and two voltage versions of the product 345 600-xxx. On the next table is all PCB versions for 345 600.

| Type | Description |
|-----------|---------------------------|
| 345603-00 | PCB for SMLR 12V (Yellow) |
| 345603-01 | PCB for SMLR 24V (Yellow) |
| 345603-02 | PCB for SR 12V (Red) |
| 345603-03 | PCB for SR 24V (Red) |
| 345603-04 | PCB for POR 12V (White) |
| 345603-05 | PCB for POR 24V (White) |

Rated input voltage:

- 12 Vdc Or 24Vdc

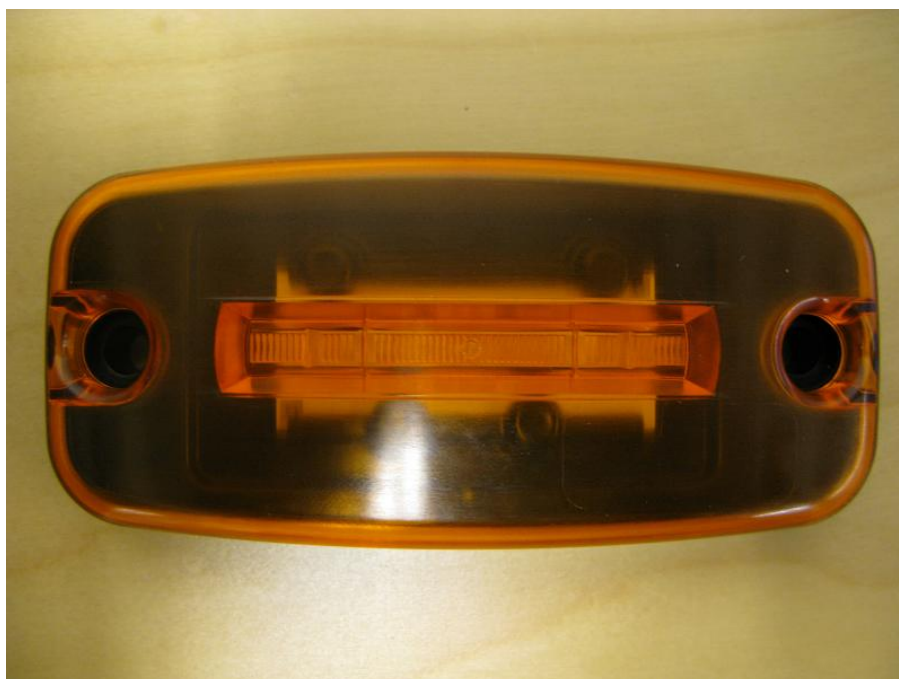
Rated power:

- 0,5W at 12 V DC / 1W at 24 V DC

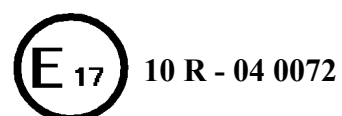


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Picture 1. Rectangular SMLR (345.600)

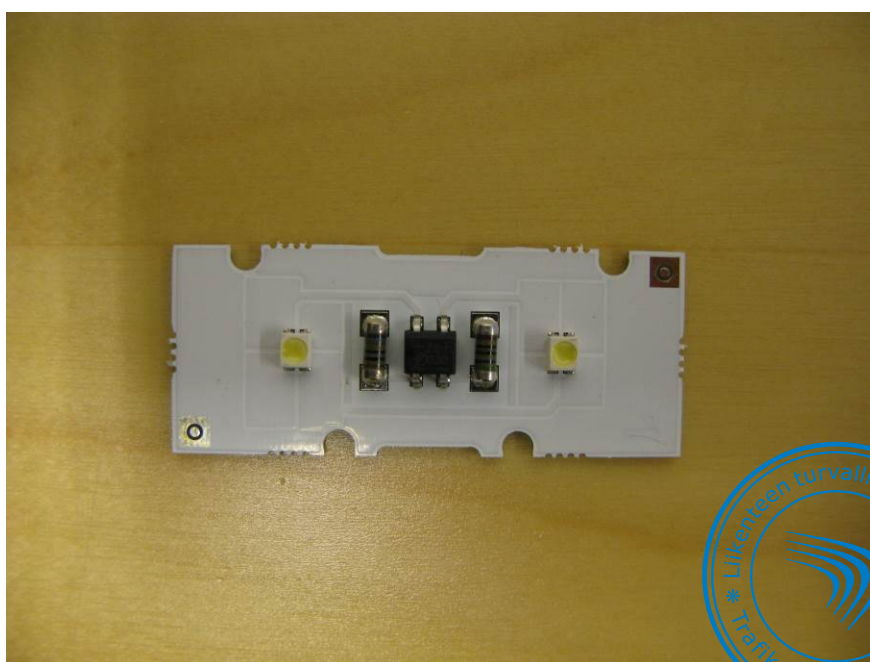


Picture 2. Rectangular SMLR (345.600)

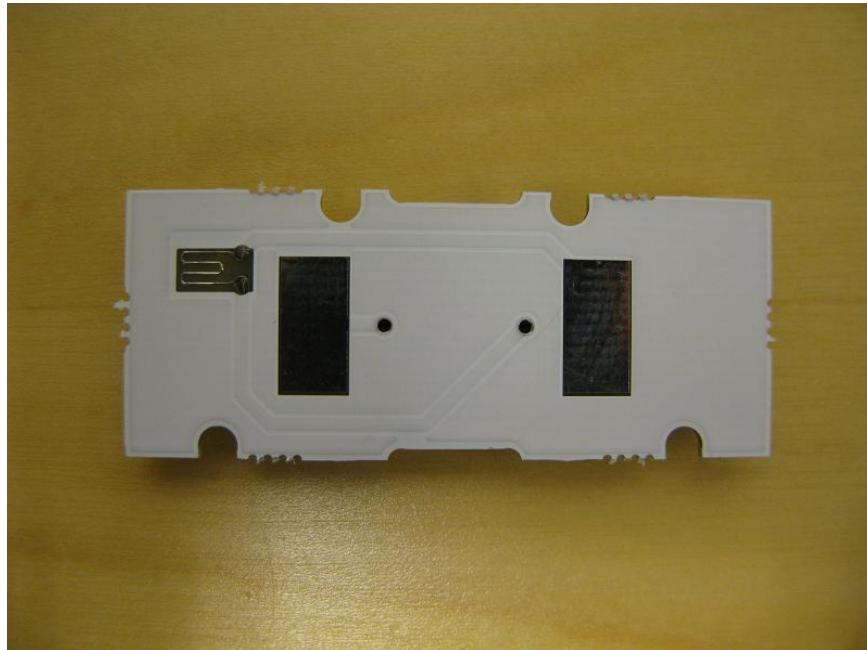




Picture 3. Front side of the printed circuit board of rectangular SMLR (345.600)



Picture 4. Backside of the printed circuit board () of Flexible Rectangular SMLR (345.600)



Electronic block diagram

Block diagram of Rectangular SMLR is attached.

Schematic circuit diagram

Schematic circuit diagram of Rectangular SMLR is attached.

Component location picture

Component location picture of printed circuit board of Rectangular SMLR is attached.

Component list

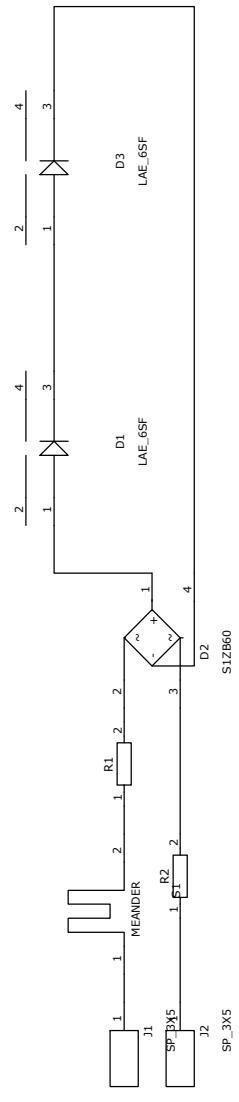
Component list of Rectangular SMLR is attached.



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6 5 4 3 2 1

| REVISION RECORD | | |
|-----------------|---------|-----------|
| LTR | ECO NO: | APPROVED: |
| | | DATE: |
| | | |
| | | |
| | | |
| | | |



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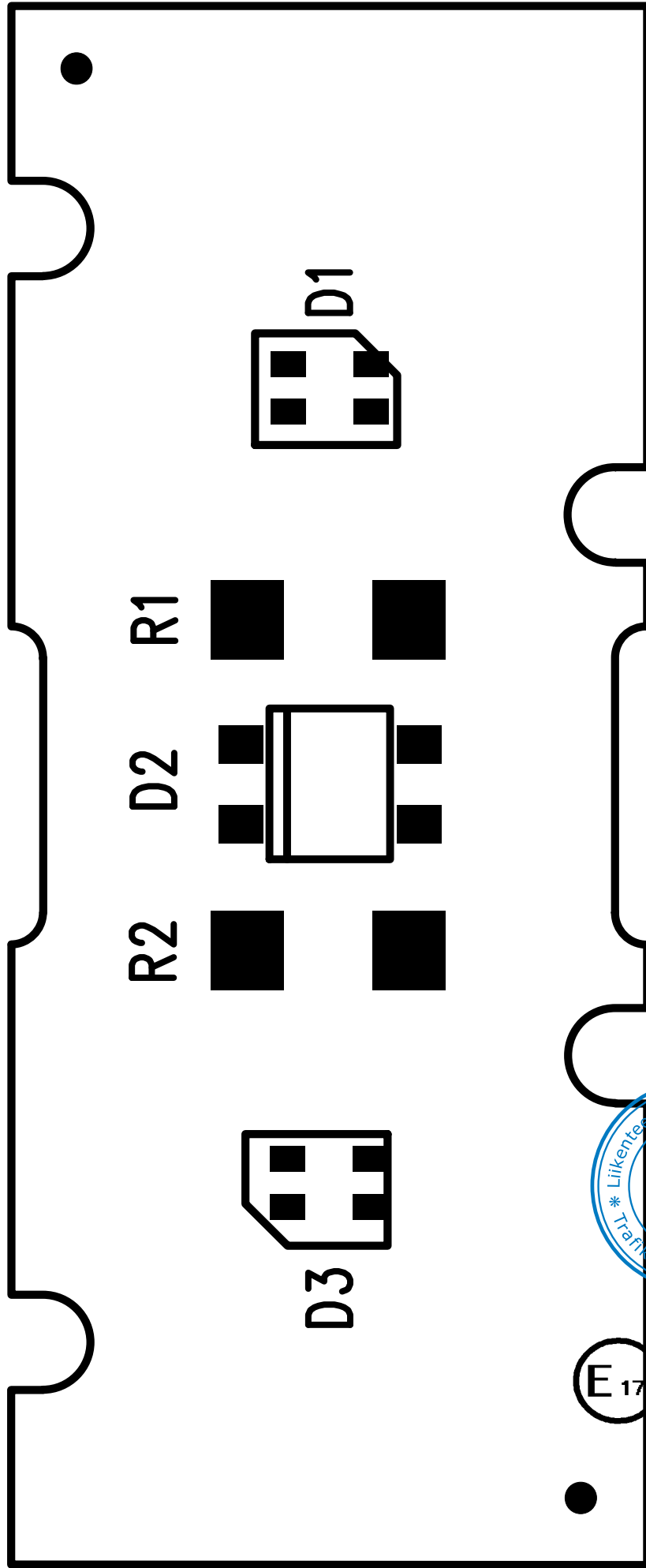
02_1
FDU_ROUND



| | |
|------------------|--------|
| DRAWN: | DATED: |
| CHECKED: | DATED: |
| QUALITY CONTROL: | DATED: |
| RELEASED: | DATED: |

| | | | | |
|----------|--|-------------|----------------|--------|
| COMPANY: | | DRAWING NO: | | REV: |
| TITLE: | | CODE: | SIZE: B | SCALE: |
| SCALE: | | | SHEET: 1 of 1 | 1 |

D C B A



E 17

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345603-00

Yellow 12V

| Item | Qty | Reference | Part Name | Manufacturer | Description | Hella nro |
|------|-----|-----------|--------------|--------------|-------------|------------|
| 1 | 2 | D1 D3 | LY ETSF | | | 791580-03 |
| 2 | 2 | R1-2 | RES_MELF0207 | See table | | |
| 3 | 1 | D2 | S1ZB60 | | | 724 447-00 |

| LYE 6SF | R1 | R2 |
|---------|-----|-----|
| AB | 100 | 133 |
| BA | 133 | 133 |
| BB | 221 | 133 |
| CA | 196 | 243 |



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345603-01

Yellow 24V

| Item | Qty | Reference | Part Name | Manufacturer | Description | Hella nro |
|------|-----|-----------|--------------|--------------|-------------|------------|
| 1 | 2 | D1 D3 | LYE TSF | | | 791.580-03 |
| 2 | 2 | R1-2 | RES_MELF0207 | See table | | |
| 3 | 1 | D2 | S1ZB60 | | | 724 447-00 |

| LYE 6SF | R1 | R2 |
|---------|-----|-----|
| AB | 267 | 309 |
| BA | 340 | 374 |
| BB | 453 | 453 |
| CA | 562 | 562 |



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345603-02

Red 12V

| Item | Qty | Reference | Part Name | Manufacturer Description | Hella nro |
|------|-----|-----------|--------------|--------------------------|------------|
| | 1 | 2 D1 D3 | LAE TSF | | 791538-00 |
| | 2 | 2 R1-2 | RES_MELF0207 | See table | |
| | 3 | 1 D2 | S1ZB60 | | 724 447-00 |

| LAE 6SF | R1 | R2 |
|---------|-----|-----|
| AB | 100 | 133 |
| BA | 133 | 133 |
| BB | 221 | 133 |
| CA | 196 | 243 |



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345603-03

Red 24V

| Item | Qty | Reference | Part Name | Manufacturer | Description | Hella nro |
|------|-----|-----------|--------------|--------------|-------------|------------|
| | 1 | 2 D1 D3 | LAE TSF | | | 791538-00 |
| | 2 | 2 R1-2 | RES_MELF0207 | See table | | |
| | 3 | 1 D2 | S1ZB60 | | | 724 447-00 |

| LAE 6SF | R1 | R2 |
|---------|-----|-----|
| AB | 267 | 309 |
| BA | 340 | 374 |
| BB | 453 | 453 |
| CA | 562 | 562 |



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345603-04

White 12V

| Item | Qty | Reference | Part Name | Manufacturer | Description | Hella nro |
|------|-----|-----------|--------------|--------------|-------------|------------|
| | 1 | 2 D1 D3 | LWETSG | | | 791697-02 |
| | 2 | 2 R1-2 | RES_MELF0207 | See table | | |
| | 3 | 1 D2 | S1ZB60 | | | 724 447-00 |

| LCW 6SG | R1 | R2 |
|---------|-----|-----|
| AB | 100 | 196 |
| BA | 196 | 196 |
| BB | 243 | 243 |
| CA | 309 | 309 |



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345603-05

White 24V

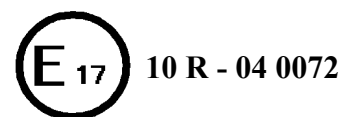
| Item | Qty | Reference | Part Name | Manufacturer | Description | Hella nro |
|------|-----|-----------|--------------|--------------|-------------|------------|
| | 1 | 2 D1 D3 | LW ETSG | | | 791697-02 |
| | 2 | 2 R1-2 | RES_MELF0207 | See table | | |
| | 3 | 1 D2 | S1ZB60 | | | 724 447-00 |

| LCW 6SG | R1 | R2 |
|---------|-----|-----|
| AB | 475 | 475 |
| BA | 604 | 604 |
| BB | 750 | 825 |
| CA | 1k | 953 |



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Electromagnetic Compatibility EMC TEST REPORT 274416-2



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Test Report

Electromagnetic Compatibility (EMC)

Equipment Under Test (EUT): Signal light for vehicle use
Type: 345600 Rectangular SMLR
Manufacturer: Hella Lighting Finland Oy
Inkereentie 566
FI-24280 SALO
FINLAND
Customer: Hella Lighting Finland Oy
Inkereentie 566
FI-24280 SALO
FINLAND



TL-0005

**The Customer wants to comply with the
UN Regulation No.10 Revision 4.**

**It is agreed that SGS Fimko will perform measurements according to UN
Regulation No.10. Revision 4.**

Date: 20 December 2013

Issued by:


Rauno Repo
Testing Engineer

Date: 20 December 2013

Checked by:


Arto Kasanen
Testing Engineer

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Equipment Under Test

Signal light for vehicle use

Type: 345600 Rectangular SMLR

There are three colour versions and two voltage versions of the product 345 600-xxx.

Power requirements

Rated power:

- 0.5 W at 12V DC
- 1 W at 24V DC

Rated input voltage 12V or 24 V

Mechanical Size of the EUT

Height: 21 mm

Width: 49 mm

Depth: 4 mm

Cable lengths and types

Cable:

Length:

Type:

DC –input cable

0.5 or 1.5 m

Unshielded (2 wires)

Peripherals

Battery 12 V and 24 V.



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Disclaimer

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Performance Criteria A for Immunity Testing

All functions of a EUT perform as designed during and after exposure to disturbance.

Performance Criteria B for Immunity Testing

All functions of EUT perform as designed during and after exposure. However, one or more of them can go beyond specified tolerance. All functions return automatically to within normal limits after exposure is removed. Memory functions shall remain Class A

Performance Criteria C for Immunity Testing

One or more functions of EUT do not perform as designed during exposure but return automatically to normal operation after exposure is removed.

Performance Criteria D for Immunity Testing

One or more functions of EUT do not perform as designed during exposure and do not return to normal operation until exposure is removed and the device/system is reset by simple "operator/use" action.

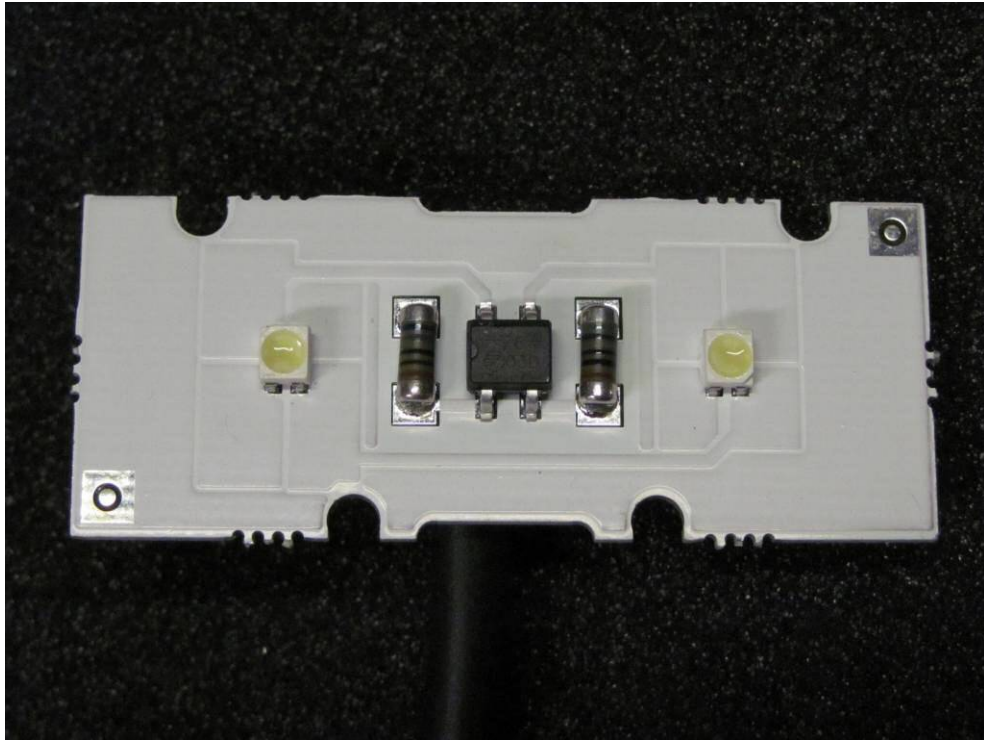
EUT Test Conditions during EMC-Testing

During the testing the EUT was in continuous operation. Every function of the EUT was connected (at on state) during the testing. At the Radiated Emission and Radiated Field Immunity tests the DC-supply (Battery) was fed through the LISN (50 μ H/ 50 Ω). The performance of the EUT was monitored visually during the testing.



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Photographs of the EUT

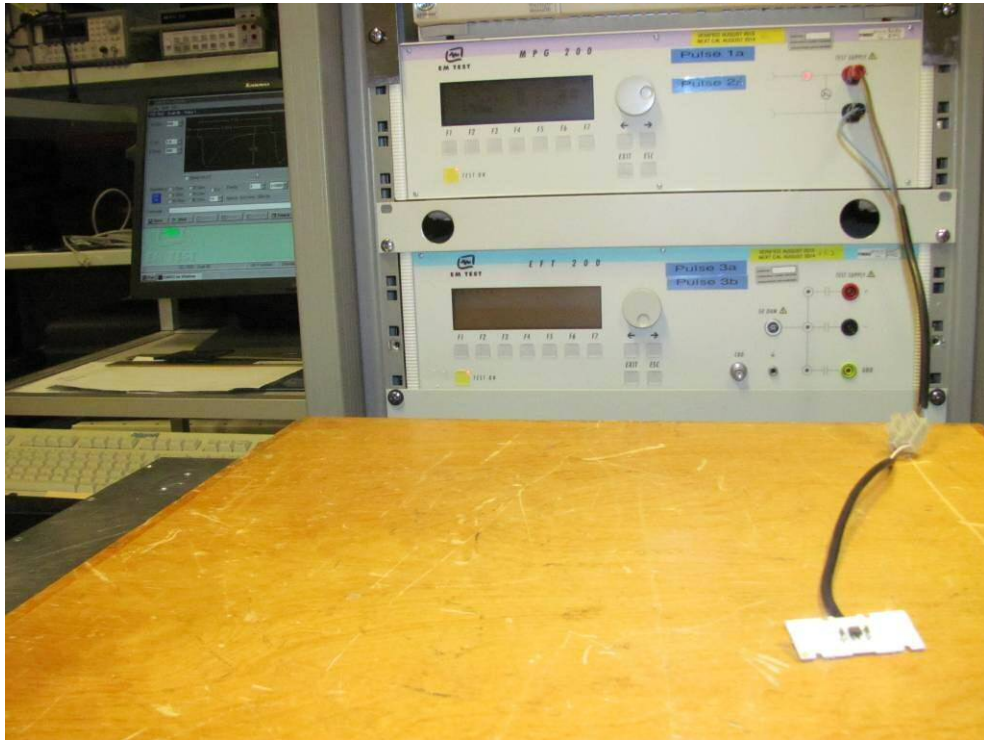


Photograph 1. The EUT.



Photograph 2. The EUT and the radiated emission and radiated field immunity test setup.

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Photograph 3. The EUT and the test set-up for transient immunity test.

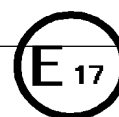


Test Suite

| Measurement/Test | Reference standard | Test site | Result |
|------------------------------|--------------------|-----------|------------------|
| Conducted Emissions | ISO 7637-2: 2004 | | N/A [*] |
| Radiated Emissions | CISPR 25: 2002 | 5m | PASS |
| Radiated RF-field Immunity | ISO 11452-2:2004 | 5m | PASS |
| Conducted Transient Immunity | ISO 7637-2: 2004 | | PASS |

^{*} ESA which is not switched, contain no switches or do not include inductive loads need not be tested for conducted emission.

| | |
|---|--|
| Testing location: | |
| <input type="checkbox"/> CB Testing Laboratory: | |
| <input type="checkbox"/> Testing Location / address: | SGS Fimko Ltd Särkiniementie 3 FI-00210, HELSINKI FINLAND |
| <input checked="" type="checkbox"/> Testing Location / address: | SGS Fimko Ltd Karakaarenkuja 4 FI-02610, ESPOO FINLAND |



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Radiated Emissions

Product family standard: CISPR 25
Tested by: RRE
Date: 16 December 2013
Temperature: 20 °C
Humidity: 22 % RH
Barometric pressure: 1012 hPa
Measurement uncertainty: ± 5.1 dB (30 - 200 MHz) Level of confidence 95 % (k = 2).
± 4.2 dB (0.2 -1 GHz)

Limit: UN Reg. No.10 Rev. 4.

Test result: **PASS**

Test plan

The radiated emission measurements were done within a semi-anechoic chamber. The distance between the test harness and the antenna was 1.0 m. The antenna was set at the fixed height of 1.10 m and both horizontal and vertical antenna polarisations were measured. DC-supply (Battery) was fed through the LISN (50 µH/50 Ω). The EUT and test harness was placed 50 mm above the metal ground plane which is placed on a wooden table 1.0 m above the floor of the test chamber.

First preliminary measurement was performed with Peak- and Average detectors. After finishing preliminary measurement, final measurement was made with Quasipeak- and Average detectors, if there are peaks over the relevant limit line (limits for broadband and narrowband emission).



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Radiated Emission Results In The Frequency Range 30 MHz - 1000 MHz

UN 10 Rev.4 Electric Field Strength

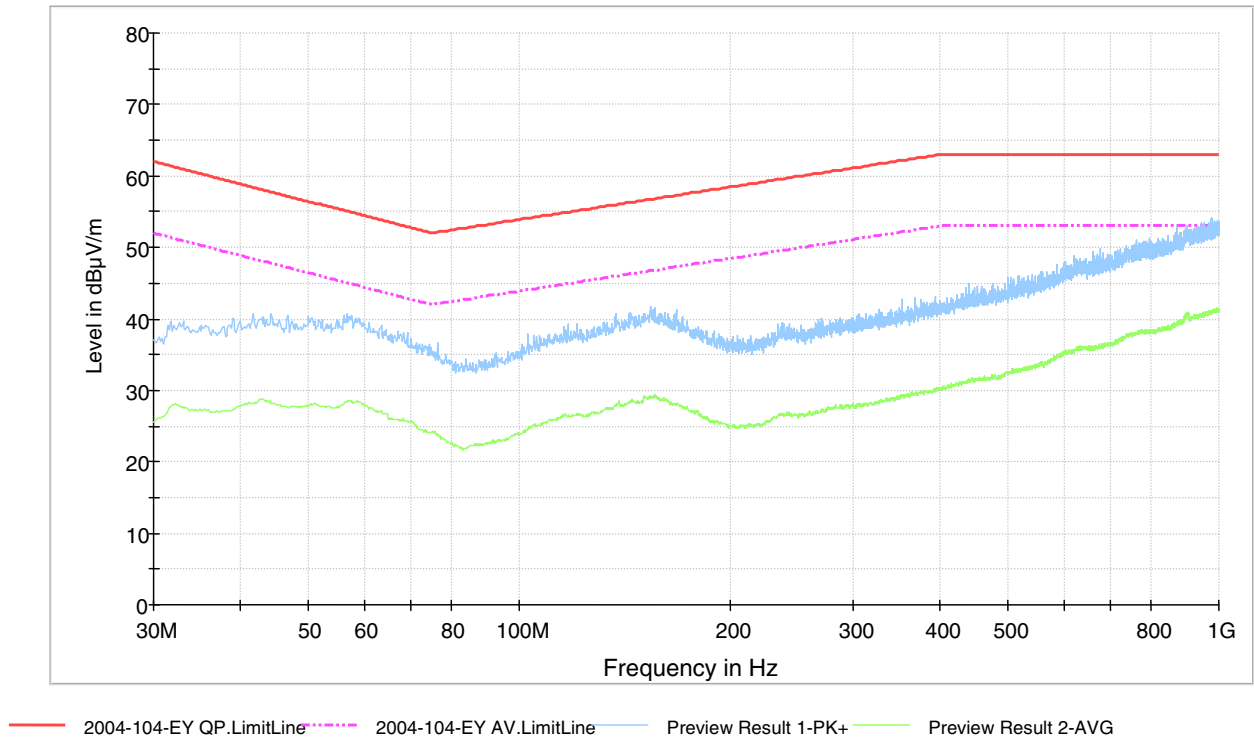
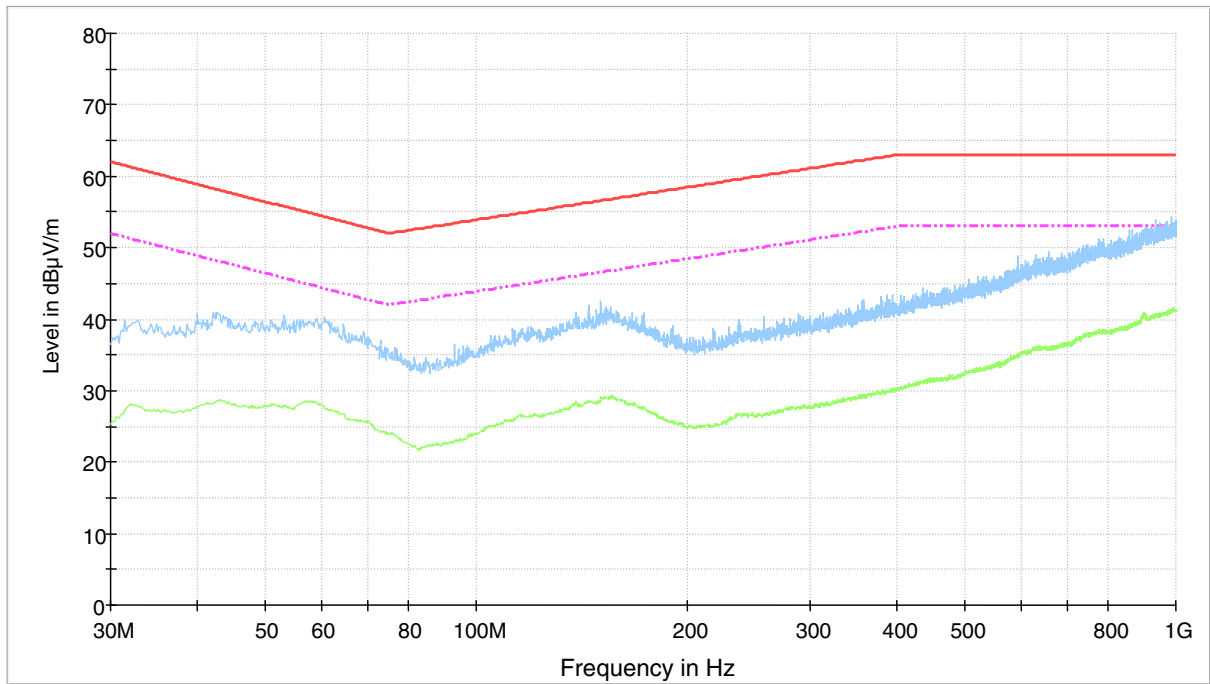


Figure 1. The measured results with peak- and average detectors (12 V DC).

No final measurements were made because the peak and average interference levels were below the limits more than 10 dB.



UN 10 Rev.4 Electric Field Strength



— 2004-104-EY QP.LimitLine — 2004-104-EY AV.LimitLine — Preview Result 1-PK+ — Preview Result 2-AVG

Figure 2. The measured results with peak- and average detectors (24 V DC).

No final measurements were made because the peak and average interference levels were below the limits more than 10 dB.



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Radiated RF-field Immunity

Reference document: ISO 11452-2:2004
Tested by: RRE
Date: 16 December 2013
Temperature: 20 °C
Humidity: 22 % RH
Barometric pressure: 1012 hPa

Performance criteria: A
Test result: **PASS**

Test plan

Test was done in an anechoic chamber. The ESA was placed 50 mm above the metal ground plane which was placed on a wooden table 1.0 m above the floor of the test chamber. The distance between the test harness and the measuring antenna was 1.0 m. Only vertical antenna position was tested. Tests were performed with 12 V DC and 24 V DC test voltages.

Test results

Frequency range: 20 - 80 MHz
Antenna height: 145 cm
Modulation: 80% AM with 1 kHz modulation frequency
Test level: 30 V/m
Step size: 5 % logarithmic
Dwell time: 3 s
Test remarks: No loss of function was observed

Frequency range: 80 - 400 MHz
Antenna height: 125 cm
Modulation: 80% AM with 1 kHz modulation frequency
Test level: 30 V/m
Step: 5 % logarithmic
Dwell time: 3 s
Test remarks: No loss of function was observed

Frequency range: 400 - 800 MHz
Antenna height: 125 cm
Modulation: 80% AM with 1 kHz modulation frequency
Test level: 30 V/m
Step: 2 % logarithmic
Dwell time: 3 s
Test remarks: No loss of function was observed

Frequency range: 800 - 1000 MHz
Antenna height: 125 cm
Modulation: PM modulation, t on 577 us, period 4600 us
Test level: 30 V/m
Step: 2 % logarithmic
Dwell time: 3 s
Test remarks: No loss of function was observed

Frequency range: 1000 - 2000 MHz
Antenna height: 115 cm
Modulation: PM modulation, t on 577 us, period 4600 us
Test level: 30 V/m
Step: 2 % logarithmic
Dwell time: 3 s
Test remarks: No loss of function was observed


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Conducted Transient Immunity

Reference document: ISO 7637-2
Tested by: RRE
Date: 17 - 20 December 2013
Humidity: 22 °C
Temperature: 24 - 28 % RH
Barometric pressure: 1003 - 1012 hPa

Test result: **PASS**

Test plan

Tests are done to DC-power port with 12 V DC and 24 V DC voltages.

Tests with 12 V DC

| | |
|------------------|---|
| <u>Pulse 1</u> | Test level: - 75 V Number of pulses: 5000 Burst cycle: 1 s Test remarks: No loss of function was observed after the test. Performance criteria: C |
| <u>Pulse 2a:</u> | Test level: + 37 V Number of pulses: 5000 Burst cycle: 200 ms Test remarks: No loss of function was observed during or after the test. Performance criteria: B |
| <u>Pulse 2b:</u> | Test level: +10 V Number of pulses: 10 Burst cycle: 1000 ms Test remarks: No loss of function was observed after the test. Performance criteria: C |
| <u>Pulse 3a:</u> | Test level: - 150 V Coupling duration: 60 min Burst cycle: 90 ms Test remarks: No loss of function was observed during or after the test. Performance criteria: A |
| <u>Pulse 3b:</u> | Test level: + 75 V Coupling duration: 60 min Burst cycle: 90 ms Test remarks: No loss of function was observed during or after the test. Performance criteria: A |
| <u>Pulse 4:</u> | Test level: - 6 V Number of pulses: 1 Test remarks: No loss of function was observed after the test. Performance criteria: C |



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Conducted Transient Immunity
Tests with 24 V DC

| | | |
|------------------|-----------------------|--|
| <u>Pulse 1</u> | Test level: | - 600 V |
| | Number of pulses: | 5000 |
| | Burst cycle: | 1 s |
| | Test remarks: | No loss of function was observed after the test. |
| | Performance criteria: | C |
| | | |
| <u>Pulse 2a:</u> | Test level: | + 50 V |
| | Number of pulses: | 5000 |
| | Burst cycle: | 200 ms |
| | Test remarks: | No loss of function was observed during or after the test. |
| | Performance criteria: | B |
| | | |
| <u>Pulse 2b:</u> | Test level: | + 20 V |
| | Number of pulses: | 10 |
| | Burst cycle: | 500 ms |
| | Test remarks: | No loss of function was observed after the test. |
| | Performance criteria: | C |
| | | |
| <u>Pulse 3a:</u> | Test level: | - 150 V |
| | Coupling duration: | 60 min |
| | Burst cycle: | 90 ms |
| | Test remarks: | No loss of function was observed during or after the test. |
| | Performance criteria: | A |
| | | |
| <u>Pulse 3b:</u> | Test level: | + 150 V |
| | Coupling duration: | 60 min |
| | Burst cycle: | 90 ms |
| | Test remarks: | No loss of function was observed during or after the test. |
| | Performance criteria: | A |
| | | |
| <u>Pulse 4:</u> | Test level: | - 12 V |
| | Number of pulses: | 1 |
| | Test remarks: | No loss of function was observed after the test. |
| | Performance criteria: | C |



Radiated Emissions and Radiated Field Immunity Test

| Manufacturer | Type | Serial no | Inv. no |
|----------------------------------|-------------|--------------|---------|
| ROHDE & SCHWARZ | | | |
| EMI Test receiver | ESU26 | 1302.6005.26 | - |
| Test software | EMC32 | - | - |
| Antenna (80-1000 MHz) | HL 023 A1 | 354135/016 | 8015 |
| SCHWARZBECK | | | |
| Antenna (emissions) | VULB 9168 | 9168-503 | 8911 |
| AMPLIFIER RESEARCH | | | |
| Amplifier | 200W1000M2A | - | 5027 |
| Amplifier | 500A100M1 | 19672 | 5026 |
| Antenna (1-2 GHz) | AT4002 | 20738 | 8014 |
| Amplifier 60W | 60S1G3 | 313200 | 7915 |
| EMCO | | | |
| Antenna (26-80 MHz) | 3109XLP | 9609-3036 | 5014 |
| LISN (50 µH/ 50 Ω) | 3825/2 | 9501-2289 | 8388 |
| DEISEL | | | |
| Antenna mast | MA 240 | 240/455 | 7896 |
| COMTEST | | | |
| Controller | HD 100 | 100/457 | - |
| AGILENT TECHNOLOGIES | | | |
| PSG Signal Generator | E8257C | MY43320718 | 7292 |
| BOONTON ELECTRONICS CORP. | | | |
| Power meter | 4300 | 87105ED | 4962 |
| Power sensor | 51013-4E | 29017 | 5030 |

Conducted Transient Immunity

EM Test

| | | | |
|------------------------|---------------|-----------|------|
| Voltage drop simulator | VDS 200B | 0301-02 | 5284 |
| Burst generator | EFT 200 A / B | 0301-05 | 5285 |
| Micropulse generator | MPG 200B | 1000-16 | 5286 |
| Test software | ISMISO | Ver. 3.62 | - |



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