



GRAND-DUCHÉ DE LUXEMBOURG

Ministère du Développement durable
et des Infrastructures
Département des Transports

L-2938 Luxembourg

SOCIÉTÉ NATIONALE DE
CERTIFICATION ET D'HOMOLOGATION

s.à r.l.

Registre de Commerce: B 27180



L-5201 Sandweiler

Référence: E13*10R00*10R03*12737*00

Annexes: - Rapport Technique
- Fiche de Renseignements du constructeur

Sandweiler, le 23 août 2012

Communication concernant:⁽²⁾
Communication concerning:




- la délivrance d'une homologation
approval granted
- l'extension d'homologation
approval extended
- le refus d'homologation
approval refused
- le retrait d'homologation
approval withdrawn
- l'arrêt définitif de la production
production definitely discontinued

d'un type de sous-ensemble électrique/électronique⁽²⁾ en ce qui concerne le Règlement N° 10
of a type of electrical/electronic sub-assembly with regard to Regulation N° 10

Numéro d'homologation par type:
Approval number:

E13*10R00*10R03*12737*00

Marque d'homologation:
Approval mark:

 10R - 03 12737

1. **Fabricant (marque commerciale du constructeur):**
Make (trade name of manufacturer): AUTO GAUGE (TAIWAN) CO., LTD.
2. **Type:**
Type: #86267
Dénomination(s) commerciale(s) générale(s):
General commercial description(s): 60mm speedometer 0-260km/h
Version(s)/Variante(s):
Version(s)/Variant(s): #86209, #86210
3. **Moyens d'identification du type, s'ils sont marqués sur le véhicule / composant / entité technique⁽²⁾:**
Means of identification of type, if marked on the vehicle / component / separate technical unit: Laser printed label
- 3.1. **Emplacement de ce marquage:**
Location of that marking: Fixed durable on housing of ESA

4. **Catégorie du véhicule:**
Category of vehicle: Not applicable
5. **Nom et adresse du constructeur:**
Name and address of manufacturer: AUTO GAUGE (TAIWAN) CO., LTD.
2F., No. 12, Alley 18, Lane 325,
Jiankang Rd., Taipei, Taiwan,
R.O.C.
6. **Dans le cas de composants ou d'entités techniques, emplacement et procédé de fixation de la marque d'homologation CEE:**
In the case of components and separate technical units, location and method of affixing of the ECE approval mark: Printed label, fixed durable on housing of ESA
7. **Adresse(s) de l' (des) usine(s) d'assemblage:**
Address(es) of assembly plant(s): AUTO GAUGE (TAIWAN) CO., LTD.
1F., No. 6, Lane 50, Sec. 3, Nangang Rd.,
Nangang District, Taipei City, 11510,
Taiwan (R.O.C.)
8. **Informations supplémentaires (s'il y a lieu):**
Additional informations (where applicable): See appendix
9. **Autorité déléguée:**
Assigned authority: *Société Nationale de Certification et d'Homologation
L-5230 Sandweiler*
- Service technique responsable de l'exécution des essais:**
Technical service responsible for carrying out the tests: Société Nationale de Certification et d'Homologation
11, rue de Luxembourg
L-5230 Sandweiler
10. **Date du rapport d'essai:**
Date of test report: 16.08.2012
11. **Numéro du rapport d'essai:**
Number of test report: 25604AR
12. **Remarques (s'il y a lieu):**
Remarks (if any): None
13. **Lieu:**
Place: Sandweiler
14. **Date:**
Date: 23 août 2012
15. **Signature:**
Signature:

Pour le Département des Transports



Marco FELTES
Inspecteur principal 1^{er} en rang

Pour la SNCH



Claude LIESCH
Directeur



16. L'index de l'ensemble des renseignements déposé chez l'autorité de réception, qui peut être obtenu sur demande, est joint.

The index to the information package lodged with the approval authority, which may be obtained on request, is attached.

See index to type-approval report

17. Raison(s) de l'extension:

Not applicable

Reason(s) for extension:

Appendice

Appendix

au certificat d'homologation par type N° E13*10R00*10R03*12737*00
to type-approval certificate N° E13*10R00*10R03*12737*00
concernant l'homologation par type d'un sous ensemble électrique/électronique selon le Règlement N° 10.
concerning the type-approval of an electrical/electronic sub-assembly under Regulation N° 10.

- | | | | |
|---------------|--|---|--|
| 1. | Informations supplémentaires.
Additional information. | | |
| 1.1. | Tension nominale du système électrique [V]:
Electrical system rated voltage [V]: | 12V DC | |
| | Masse:
Ground: | Positive/Negative ⁽²⁾ | |
| 1.2. | Ce SEEE peut être utilisé sur n'importe quel type de véhicule avec les restrictions suivantes:
This ESA can be used on any vehicle type with the following restrictions: | Not applicable | |
| 1.2.1. | Conditions d'installation, s'il y a lieu:
Installation conditions, if any: | Not applicable | |
| 1.3. | Ce SEEE peut seulement être utilisé sur les types de véhicules suivants:
This ESA can be used only on the following vehicle types: | Not applicable | |
| 1.3.1. | Conditions d'installation, s'il y a lieu:
Installation conditions, if any: | Not applicable | |
| 1.4. | La (les) méthode(s) spécifique(s) d'essais utilisée(s) et les bandes de fréquences couvertes pour déterminer l'immunité étai(ent): (indiquez s'il vous plaît à partir de l'annexe 9 la méthode précise utilisée).
The specific test method(s) used and the frequency ranges covered to determine immunity were: (Please specify precise method used from annex 9). | 150mm Stripline
20 to 400MHz
Absorber chamber
400 to 2000MHz | ISO 11452-5: 2 nd ed. 2002
ISI 11452-2: 2 nd ed. 2004 |
| 1.5. | Laboratoire accrédité au titre de la norme ISO 17025 et reconnu par l'autorité d'homologation chargé d'effectuer les essais:
Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests: | SGS-TÜV SAARLAND FORSTER GmbH
Saarbrücker Strasse 1
D-66706 Perl-Sinz | |
| 2. | Commentaires:
Remarks: | Not applicable | |

² **Biffer la mention inutile**
Strike out what does not apply



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L-5201 Sandweiler

Référence: E13*10R00*10R03*12737*00

Annexes: - Rapport Technique
- Fiche de Renseignements du constructeur

Sandweiler, le 23 août 2012

Index du dossier d'homologation

Index to type-approval report

	Numéro d'homologation: Approval number:	E13*10R00*10R03*12737*00
	Révision: Revision:	00
	Marque de fabrication ou de commerce: <i>Trade name or mark:</i>	AUTO GAUGE (TAIWAN) CO., LTD.
	Type: <i>Type:</i>	#86267
1.	Procès-verbal d'essai: Test report:	No. 25604AR
	- Compilation:	Page 1;
	- Information sheet:	Attachment 1 - Page 2 & 3;
	- Test report:	Attachment 2 - Page 4 to 17.
2.	Dossier du constructeur: Report of the manufacturer:	Attachment 3
	- Content:	Refer to the 1 st page of manufacturer's report
3.	Autres documents annexés: Other documents annexed:	Not applicable
4.	Date de délivrance de l'homologation initiale: Date of issue of initial type approval:	23.08.2012
5.	Date de la dernière délivrance de pages révisées: Date of last issue of revised pages:	Not applicable
6.	Date de la dernière délivrance d'une homologation révisée: Date of last extension:	Not applicable

Kompilation Nr.: 25604AR

Kompilation

page 1

Composition of the Attachments

Attachment 1

Information sheet

page 2 to 3

Attachment 2

Test Report No.: 25604AR

page 4 to 17

Attachment 3

Report of the manufacturer

external documents

-Technical documents
-Photo of ESA,



Attachment 1

Technical information about the ESA type according to ECE Reg. No. 10R00, 03 series of amendments from 11.07.2008, corrigendum 1 to the 03 series of amendments of 05.07.2010 and supplement1 to 03 series of amendments of 09.12.2010

SECTION I

- | | | |
|------|---|--|
| 1. | Make (trade name of manufacturer): | AUTO GAUGE (TAIWAN) CO., LTD. |
| 2. | Type/
Brand name
General commercial description(s): | #86267
n. a.
60MM 0-260 KM/H SPEEDOMETER |
| | <i>Version(s)/Variant(s):</i>
<i>Brand name</i> | #86208, #86210
n. a. |
| 3. | Means of identification of type, if marked
on the vehicle / component /
separate technical unit : | Laser printed label |
| 3.1. | Location of that marking: | fixed durable on housing of ESA |
| 4. | Category of vehicle: | n.a. |
| 5. | Name and address of manufacturer: | AUTO GAUGE (TAIWAN) CO., LTD.
2F., NO.12, ALLEY.18, LANE. 325,
JIANKANG RD., TAIPEI, TAIWAN, R.O.C. |
| 5.1 | Representant | n.a. |
| 6. | In the case of components and
separate technical units, location
and method of affixing of the EC approval-mark: | printed label, fixed durable on housing of ESA |
| 7. | Address(es) of assembly plant(s) | AUTO GAUGE (TAIWAN) CO., LTD.
1F., NO., 6, LANE 50, SEC. 3, NANGANG RD.,
NANGANG DIST., TAIPEI CITY, 11510,
TAIWAN (R.O.C.) |
| 8. | Additional information (where applicable): | SEE APPENDIX |
| 9. | Assigned authority: | Société Nationale de Certification et
d'Homologation
L-5230 Sandweiler |
| | Technical service responsible for conducting
approval tests | Société Nationale de Certification et
d'Homologation
11, rue de Luxembourg
L-5230 Sandweiler |

- | | | |
|------------|-----------------------|------------|
| 10. | Date of test report: | 16.08.2012 |
| 11. | Number of test report | 25604AR |
| 12. | Remarks (if any): | n.a. |

Appendix

- | | | |
|---------------|---|---|
| 1. | Additional informations: | not applicable |
| 1.1. | Electrical system rated voltage [V]: | 12 VDC |
| | Ground: | Negative |
| 1.2. | This ESA can be used on any vehicle type with the following restrictions: | not applicable |
| 1.2.1. | Installation conditions, if any: | not applicable |
| 1.3. | This ESA can be used only on the following vehicle types: | not applicable |
| 1.3.1. | Installation conditions, if any: | not applicable |
| 1.4. | The specific test method(s) used and the frequency ranges covered to determine immunity were: | Tests were performed: 150mm Stripline (ISO 11452-5:2 nd ed. 2002) 20-400MHz, Absorber Chamber (ISO 11452-2:2ed. 2004) 400-2000 MHz, see report 25604AR |
| 1.5. | Approved/accredited laboratory responsible for carrying out the test: | SGS-TÜV Saarland Forster GmbH
Saarbrücker Strasse 1
66706 Perl-Sinz |
| 2. | Remarks: | not applicable |

Attachment 2

Test report #.: 25604AR

**Tests on electronic parts in vehicles (electromagnetic compatibility)
per ECE Regulation No. 10R00, 03 series of amendments from
11.07.2008, corrigendum 1 to 03 and supplement 1 to 03 from 09.12.2010**

0. General declaration:

- 0.1. **Model name:** 60MM 0-260 KM/H SPEEDOMETER
- 0.2. **Type/ Brand name:** #86267
Version's/ Brand name(s): #86208, #86210
- 0.3. **Type identification, place of type plate:**
Type plate with print to identify;
Type plate is permanent fixed on housing of product.
- 0.4. **Name and address of manufacturer:** AUTO GAUGE (TAIWAN) CO., LTD.
2F., NO.12, ALLEY.18, LANE. 325,
JIANKANG RD., TAIPEI, TAIWAN, R.O.C.
- 0.5. **Number of description map:** 001
date and change: 17.08.2012

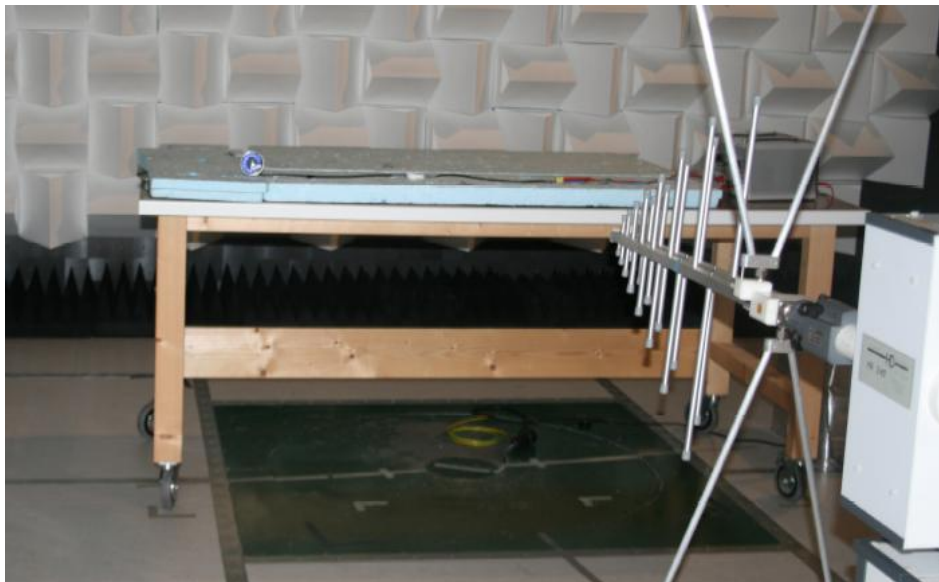
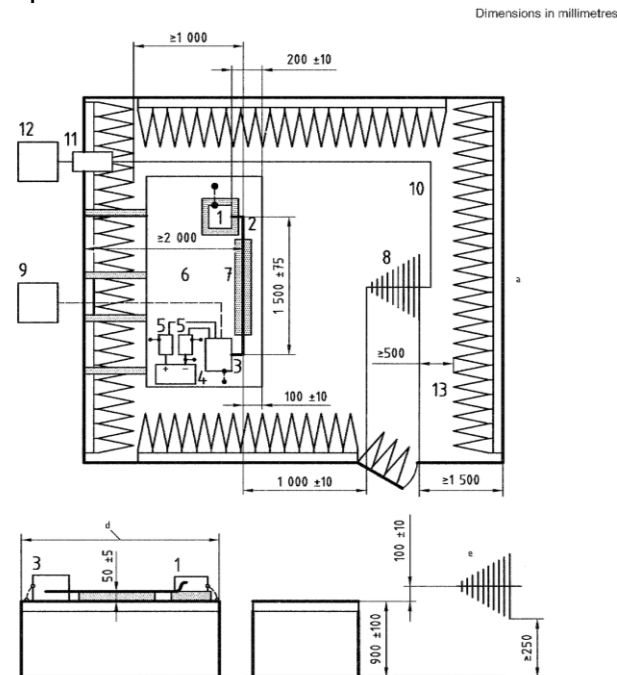
1. Details to equipment under test:

- 1.1. **Representative EUT:** #86267
- 1.2. **Description of EUT:** 60MM 0-260 KM/H SPEEDOMETER

2. Test protocol:

2.1. Measurements radiated broadband electromagnetic emissions (annex 7)

- 2.1.1. **Details to test:** Power supply of E.U.T. with car battery and were measured and observed with digital voltmeter METEX, type M2750. Power supply voltage comes over L.I.S.N. ($5\mu\text{H}/50\Omega$) and were connected with original cable from E.U.T.. Ground plane were connected to earth ground system. E.U.B. were isolated with 50mm isolation from ground Plane. Ground plane is a copper plate with dimension of 2x1.5m (l x w). Operation mode was with original cables during tests, works in speed simulation-mode and with worst case parameter in horizontal and vertical polarisation.



- 2.1.2. **Test results:** passed, broadband emissions
- 2.2. **Measurements radiated narrowband electromagnetic emissions (annex 8)**
 - 2.2.1. **Details to tests:** see pt.2.1.1
 - 2.2.2. **Test results:** passed, narrowband emissions

SGS-TÜV Saarland Forster GmbH

08.08.2012

Test Report

EUT Information

EUT Name: 60MM 0-260 KM/H Speedometer
 Type: 86276
 Manufacturer: Auto Gauge (Taiwan)Co.,Ltd.
 Part Number: ---
 HW.-Rev: ---
 SW.-Rev: ---
 Operating cond.: speed 50km/h simulate
 Operator: Stefan Turnsek, B. Eng.
 Test spec.: Veh Dir.
 Test Side: SAC1
 Supply: DC12V
 Polarisation: Vertical
 Project No.: 25604_08082012_86267
 Comment: ---

EMI Auto Test Template: Automotive Components

Hardware Setup: Automotive Components
 Measurement Type: Open-Area-Test-Site
 Frequency Range: 30 MHz - 1 GHz
 Graphics Level Range: 0 dBµV/m - 80 dBµV/m

Preview Measurements:
 Scan Test Template: Automotive Field Strength Prescan

Data Reduction:
 Limit Line #1: Automotive Components BB QP
 Limit Line #2: Automotive Components NB AV
 Peak Search: 6 dB , Maximum Results: 30
 Subrange Maxima: 30 Subranges , Maxima per Subrange: 1
 Acceptance Offset: -20 dB
 Maximum Number of Results: 30
 After Data Reduction: Interactive data reduction

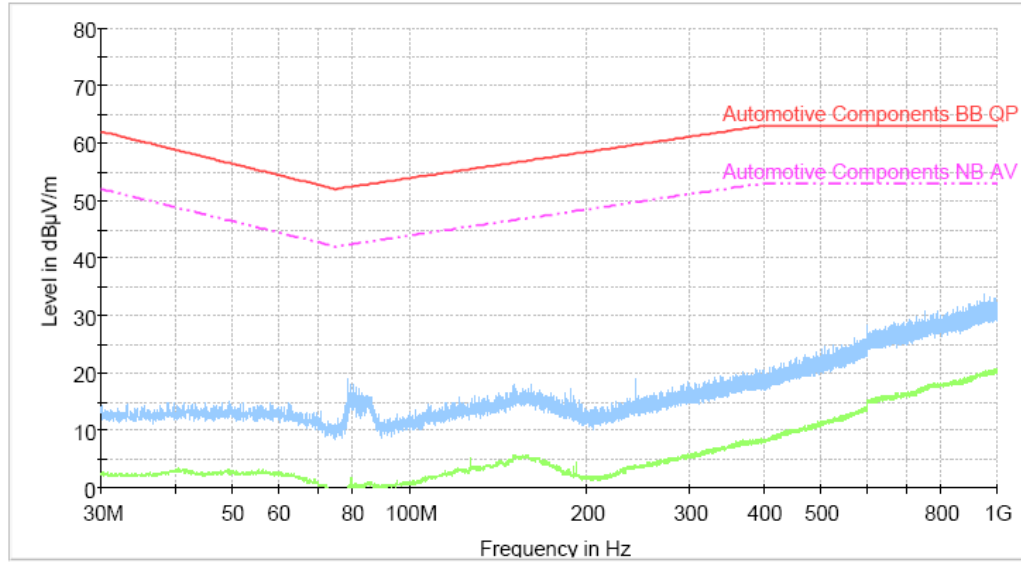
Final Measurements:
 Template for Single Meas.: Automotive Field Strength Final

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
30 MHz - 1 GHz	40 kHz	QPK, AVG	120 kHz	1 s	20 dB

Receiver: [ESU 26]

Report Settings:
 Report Template: AutomotiveTest Report

Automotive Components



— Automotive Components BB QP - - - Automotive Components NB AV
— Preview Result 1-PK+ — Preview Result 2-AVG

2.3. Tests to immunity against radiated electromagnetic fields (annex 9)

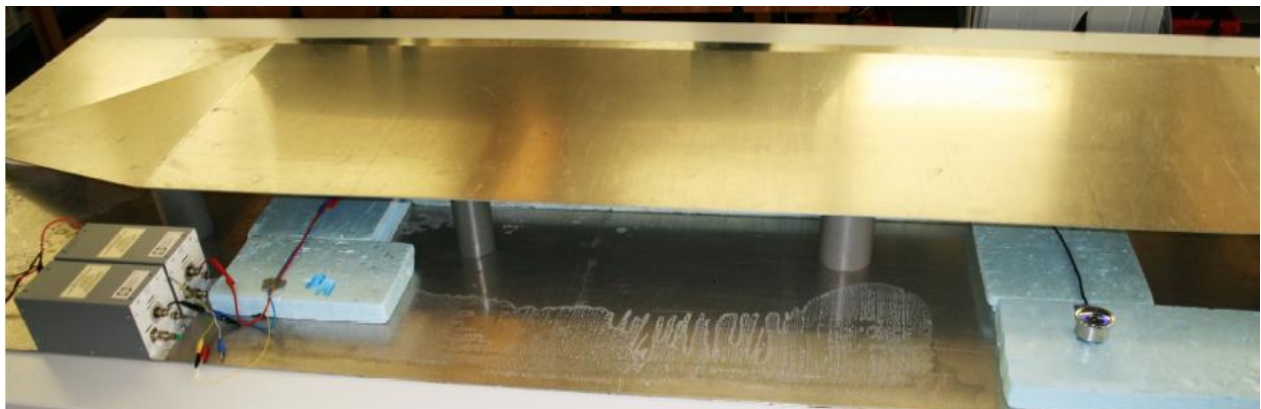
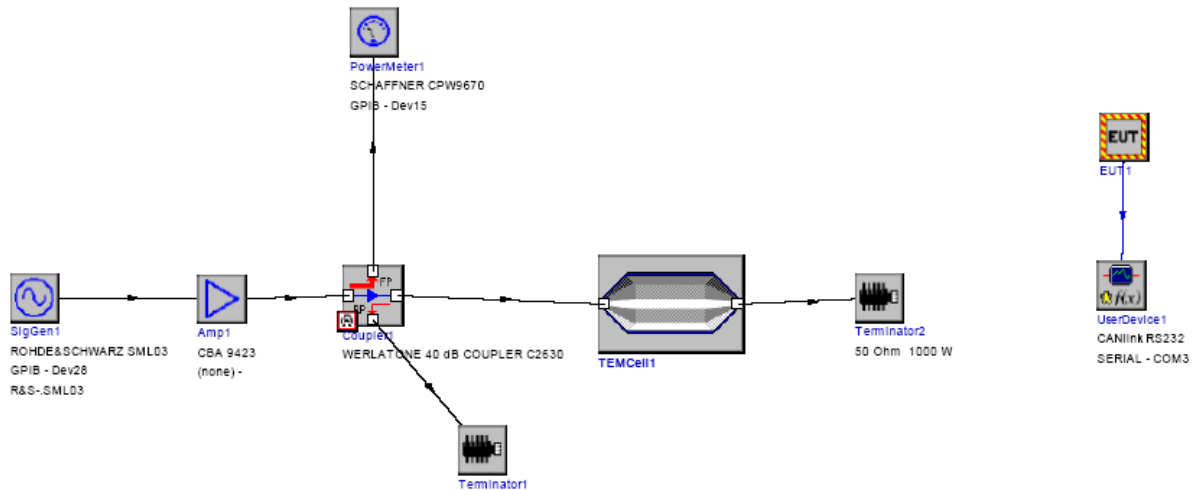
2.3.1. Test methods: Test setup and testing for electromagnetic radiation acc. annex 9 (absorber Chamber ISO 11452-2:2nd ed2004 and Stripline 150mm ISO 11452-5:2nd ed.2002).

2.3.1.1. Details to test: Functions simulated with separate simulation box, observed during tests with Laptop and CCD camera .

Power supply installed with 12V DC via L.I.S.N.

Testparameter:

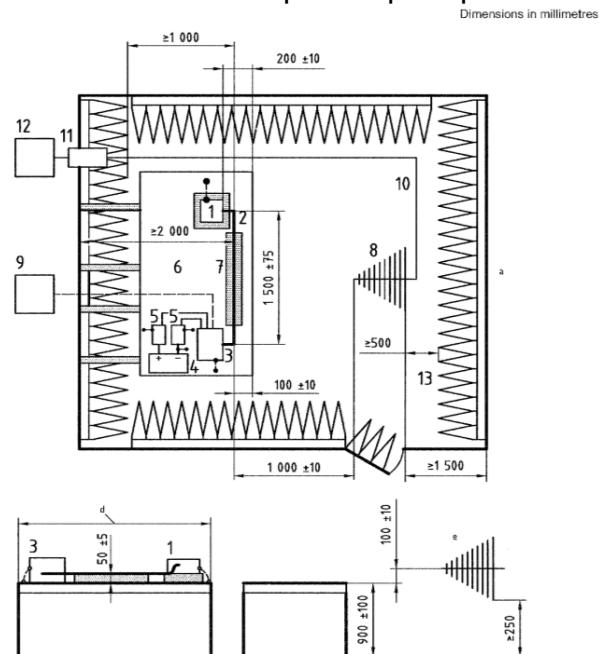
Tested frequencies: 20-400MHz
 Test amplitude: 50V/m
 Modulation: AM, 80%, 1kHz;
 Freq.Step: acc. ISO 11452-1:3rd ed.2005
 Duration: 3sec per freq. step



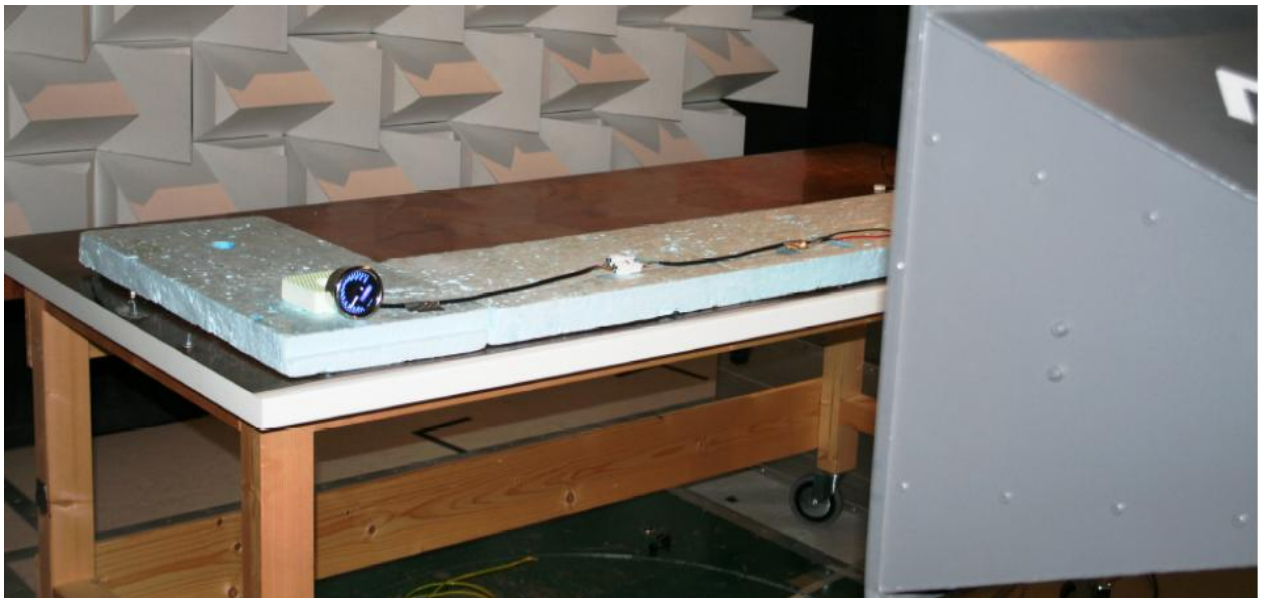
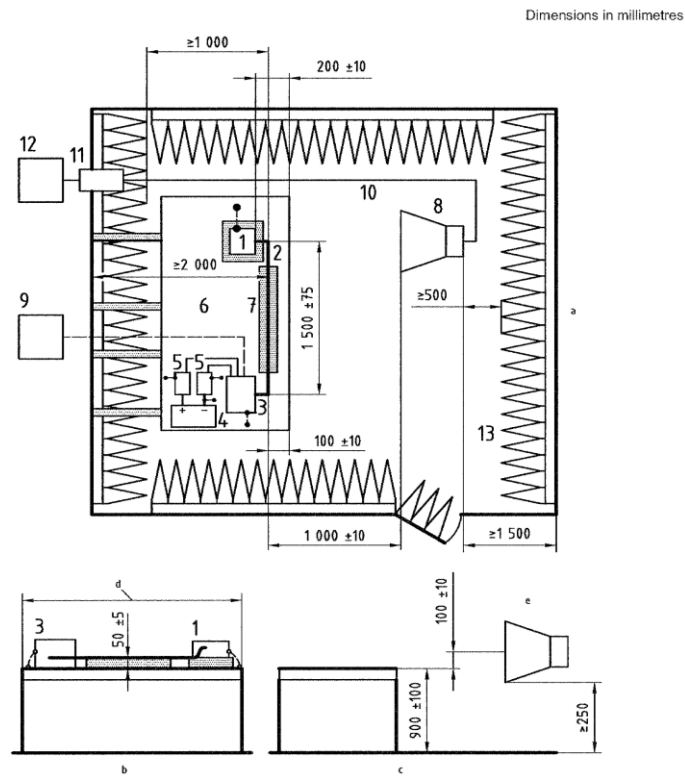
Testparameter:

- 1) Tested frequencies: 400-800MHz
 Test amplitude: 25V/m
 Modulation: AM, 80%, 1kHz;
 Freq. Step: acc. ISO 11452-1:3rd ed.2005
 Duration: 3sec per freq. Step

- 2) Tested frequencies: 800-1000MHz
 Test amplitude: 25V/m
 Modulation: PM, Tein 577µs,
 Period 4600µs
 Freq. Step: acc. ISO 11452-1:3rd ed.2005
 Duration: 3sec per freq. Step



Testparameter:
 Tested frequencies: 1000-2000MHz
 Test amplitude: 25V/m
 Modulation: PM, Tein 577µs,
 Period 4600µs
 Freq. Step: acc. ISO 11452-1:3rd ed.2005
 Duration: 3sec per freq. step

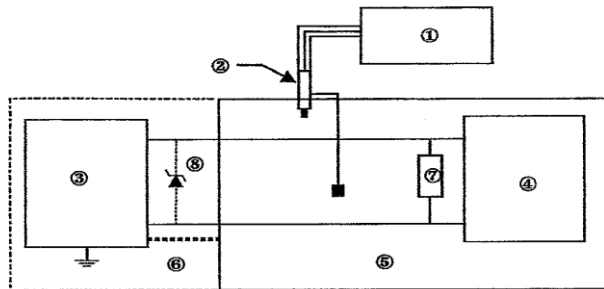


2.3.1.2. Test results: passed, no deviation of performance during tests.

2.4. Tests to immunity against transients disturbances (annex 10)

2.4.1. Test methods: tests were performed acc.ISO 7637-2 2nd edition 2004 as described in Annex 10 with required test levels given in table 1.

2.4.1.1. Details to test: E.S.A were connected to car battery and observed with CCD camera during operations and tests.



- 1 DSO, Tektronix, TDS 3052
- 2 Probe TDS
- 3 Car Tester, Spitzenberger & Spieß, PAS
- 4 E.S.A.
- 5 Ground Plane
- 6 Ground connection



Company: SGS-TÜV Saarland Forster GmbH
 Operator: Dipl.-Ing. (FH) S.E. Weber

Manufacturer: AUTO GAUGE (TAIWAN) CO., LTD.
 ModelNo.: #86267
 Operating mode: speed simulation mode
 Date of test: 08.08.2012

Nominal voltage: 12.00 Volt
 Test voltage: 13.50 Volt
 Shunt resistor Rs: no shunt
 Executed test:
 Test description:

Pulse	Us/Vs	Ri	Test parameters	Pulses / Time	Delay	Figure
ISO 7637-2 - Pulse 1	-75.0 V	10.00 Ohm	tr = 1.0us, td = 2.0ms, t1 = 1.0s, t2 = 200.0ms	5000 P.	0.0 s	
ISO 7637-2 - Pulse 2A	37.0 V	2.00 Ohm	td = 50.0us, t1 = 500.0ms	5000 P.	0.0 s	
ISO 7637-2 - Pulse 2B	10.0 V	0.00 Ohm	td = 1.0s	10 P.	60.0 s	

Spitzenberger & Spies
 Viechtach

Pulse	Us/Vs	Ri	Test parameters	Pulses / Time	Delay	Figure
ISO 7637-2 - Pulse 3A	-112.0 V	50.00 Ohm	t1 = 100.0us, t4 = 10.0ms, t5 = 90.0ms	60.0 min	0.0 s	
ISO 7637-2 - Pulse 3B	75.0 V	50.00 Ohm	t1 = 100.0us, t4 = 10.0ms, t5 = 90.0ms	60.0 min	0.0 s	
ISO 7637-2 - Pulse 4	-6.0 V	0.00 Ohm	Ua = -4.0V, t7 = 30.0ms, t8 = 30.0ms, t9 = 10.0s, t10 = 5.0ms, t11 = 50.0ms	1 P.	60.0 s	

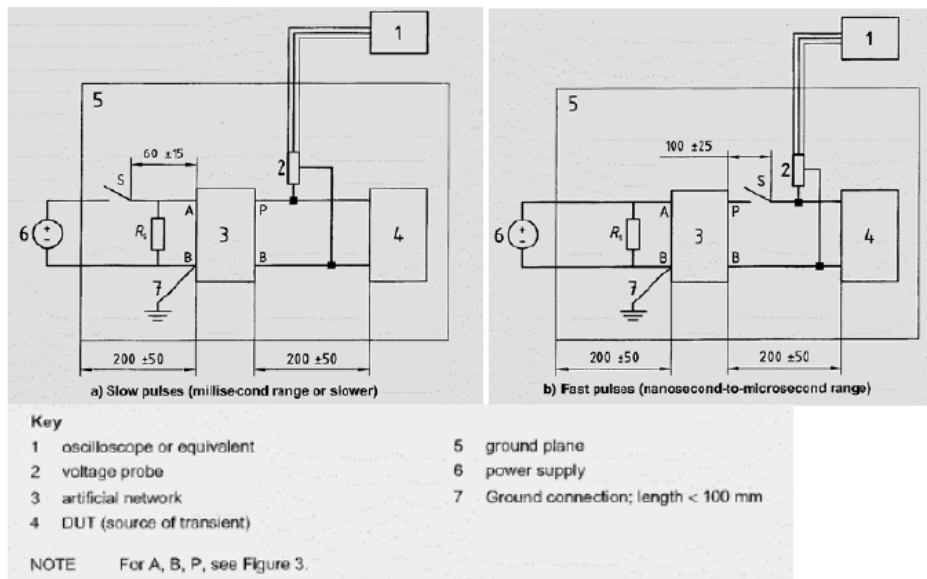
Comment:

2.4.1.2 Tests result: no degradation of any performance were registred during tests.

2.5. Tests to emissions of conducted disturbances (annex 10)

2.5.1. Test methods: tests were performed acc. ISO 7637-2 2nd edition 2004 as described in Annex 10 with required test levels given in table 2.

2.5.1.1. Details to test: E.S.A were connected to car battery and observed with CCD camera during operations and tests.

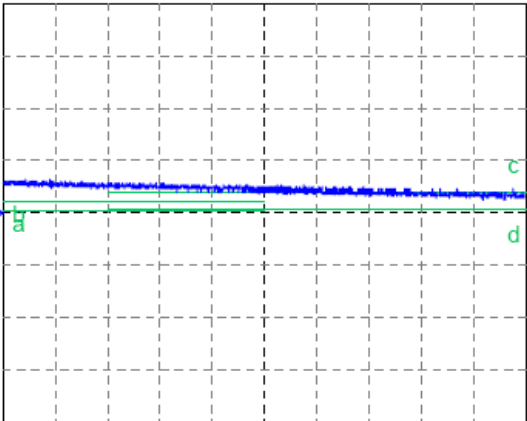
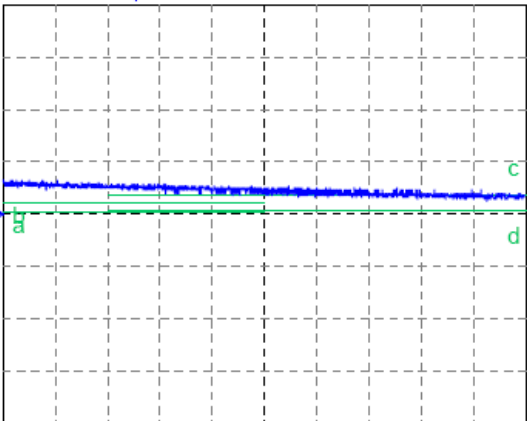


2.5.1.2 Tests result: passed conducted disturbances

Company: SGS-TÜV Saarland Forster GmbH
 Operator: Dipl.-Ing. (FH) S.E. Weber

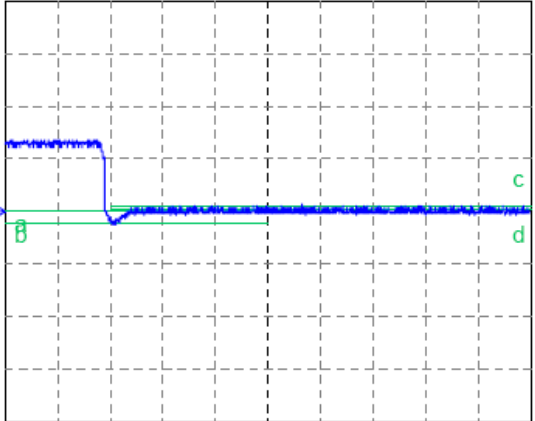
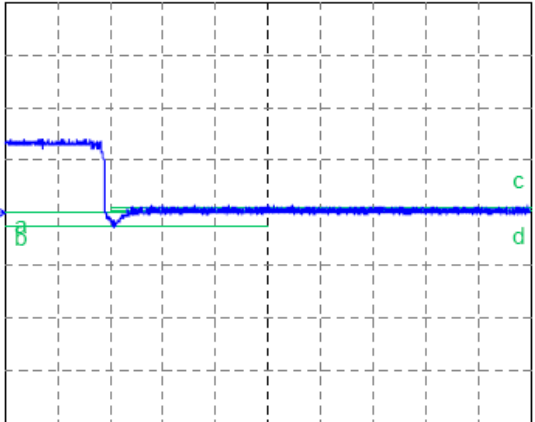
Manufacturer: AUTO GAUGE (TAIWAN) CO., LTD.
 Modelno.: #86267
 Operating mode: speed simulation mode
 Date of test: 08.08.2012

Nominal voltage: 12.00 Volt
 Test voltage: 13.50 Volt
 Shunt resistor Rs: no shunt
 Executed test: Voltage transient emission test
 Test description: 10 transients, 3 sec switch off, 10 sec delay time between repetitions
 Limits: 12V System, +75V/-150V
 Fast transients:

Transient	Amplitudes	Transient times	Figure
1 of 10 Max. pos. amplitude	Us1 = -3.1V Us2 = -1.2V	tr = 231.6us, td = 0.00us, tf = 0.00us, tr = 0.00us, td = 0.00us, tf = 0.00us, a = 0.23V, b = 2.11V, c = 3.87V, d = 0.43V	
3 of 10 Max. neg. amplitude	Us1 = -3.2V Us2 = -1.6V	tr = 220.0us, td = 0.00us, tf = 0.00us, tr = 0.00us, td = 0.00us, tf = 0.00us, a = 0.23V, b = 2.11V, c = 3.52V, d = 0.39V	

Comment:

Slow transients:

Transient	Amplitudes	Transient times	Figure
4 of 10 Max. pos. amplitude	Us1 = -15.3V Us2 = -11.4V	tr = 2.7us, td = 10.1us, tf = 7.20us, tr = 80.7us, td = 0.00us, tf = 0.00us, a = -0.27V, b = -2.46V, c = 1.05V, d = 0.12V	 <p>Ch1-10.0V/Div 25.0us/Div</p>
3 of 10 Max. neg. amplitude	Us1 = -16.0V Us2 = -11.7V	tr = 3.4us, td = 10.5us, tf = 7.00us, tr = 11.4us, td = 12.0us, tf = 0.50us, a = -0.31V, b = -2.81V, c = 1.05V, d = 0.12V	 <p>Ch1-10.0V/Div 25.0us/Div</p>

Comment:

Max pos.voltage transients: Umax=-1,2V
 Max.neg.voltage transients: Umax=-16,0V

- 2.6 Date of tests:** 08.08.2012
- 2.7 Place of tests:** SGS-TÜV Saarland Forster GmbH
Saarbrücker Str. 1
66706 Perl- Sinz
- 2.8 Remarks:** all versions as stated in the test report are covered with test object (s) respectively. No further tests are necessary. Tested model was #86267.

3. Annex

- 3.1.** not applicable
3.2. not applicable

4. Final statement

The description map and in that described type comply with above standards. Test lab is recognized from recognition body of Federal Office for Vehicles, Germany under the registration number: KBA-P 00029-98.

Parts of this report are not allowed to reproduced or published without written permission from test lab.

This report covers complete sheet 4-17.

Perl , 17.08.2012
(Place) (date)



Karl-Heinz Forster
(Head of test laboratory) (signature)



(stamp of test lab)

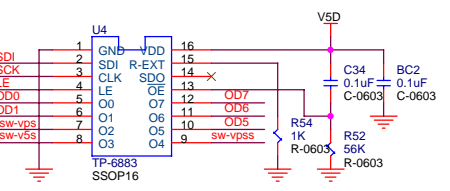
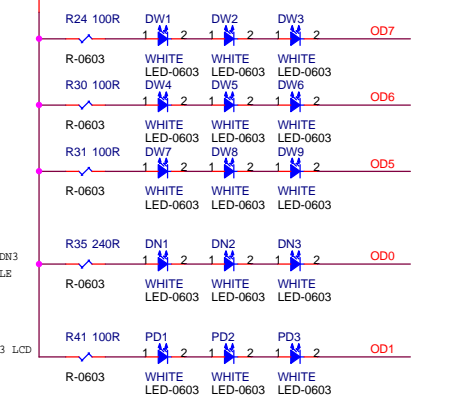
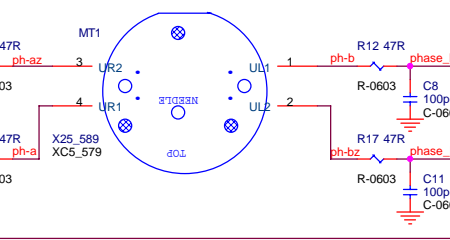
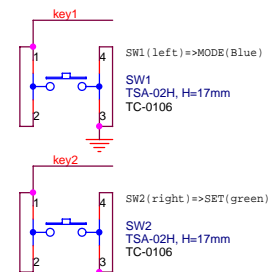
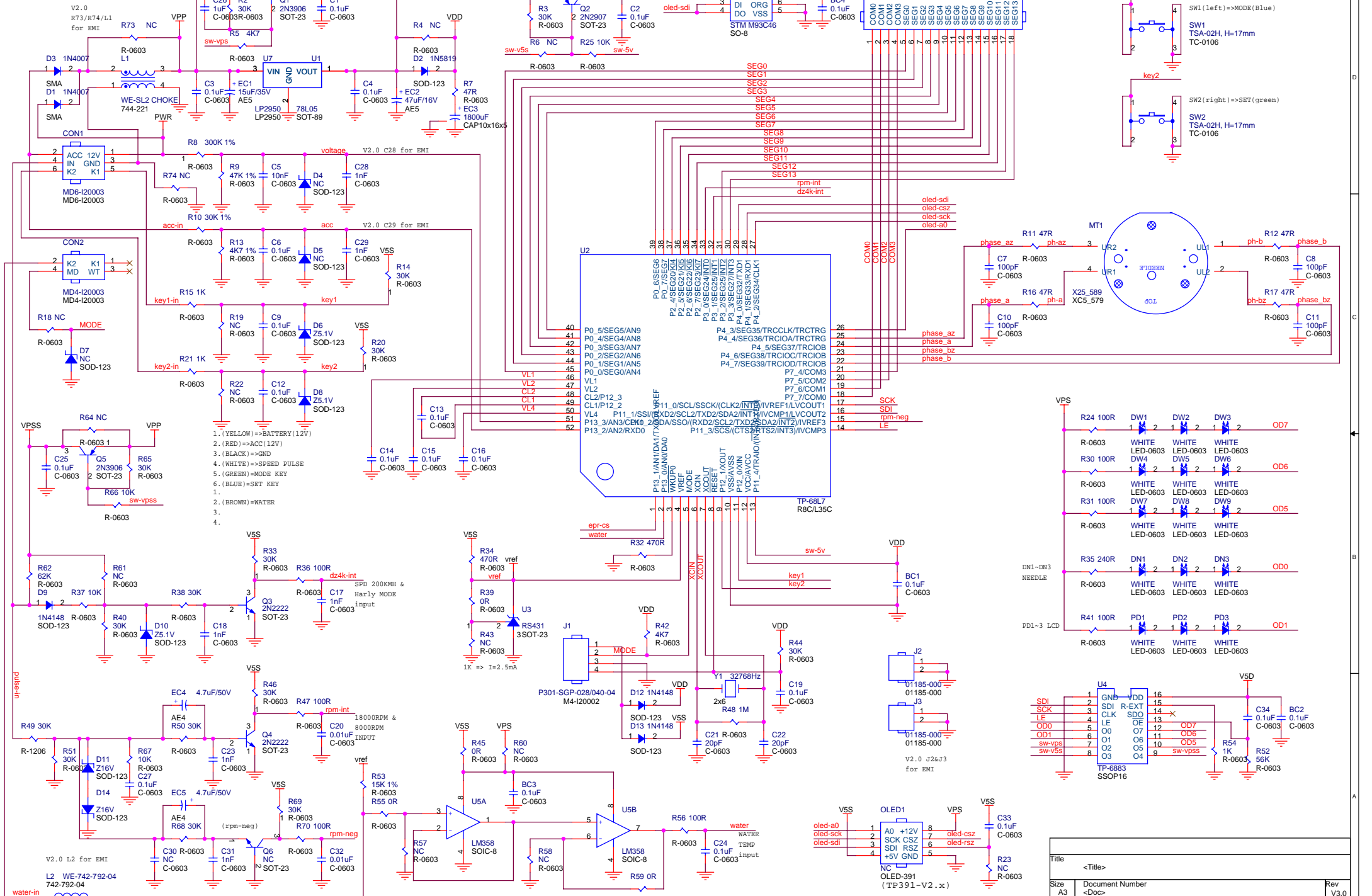
Report of the manufacturer

Report/Application No.: 25604AR, #86267

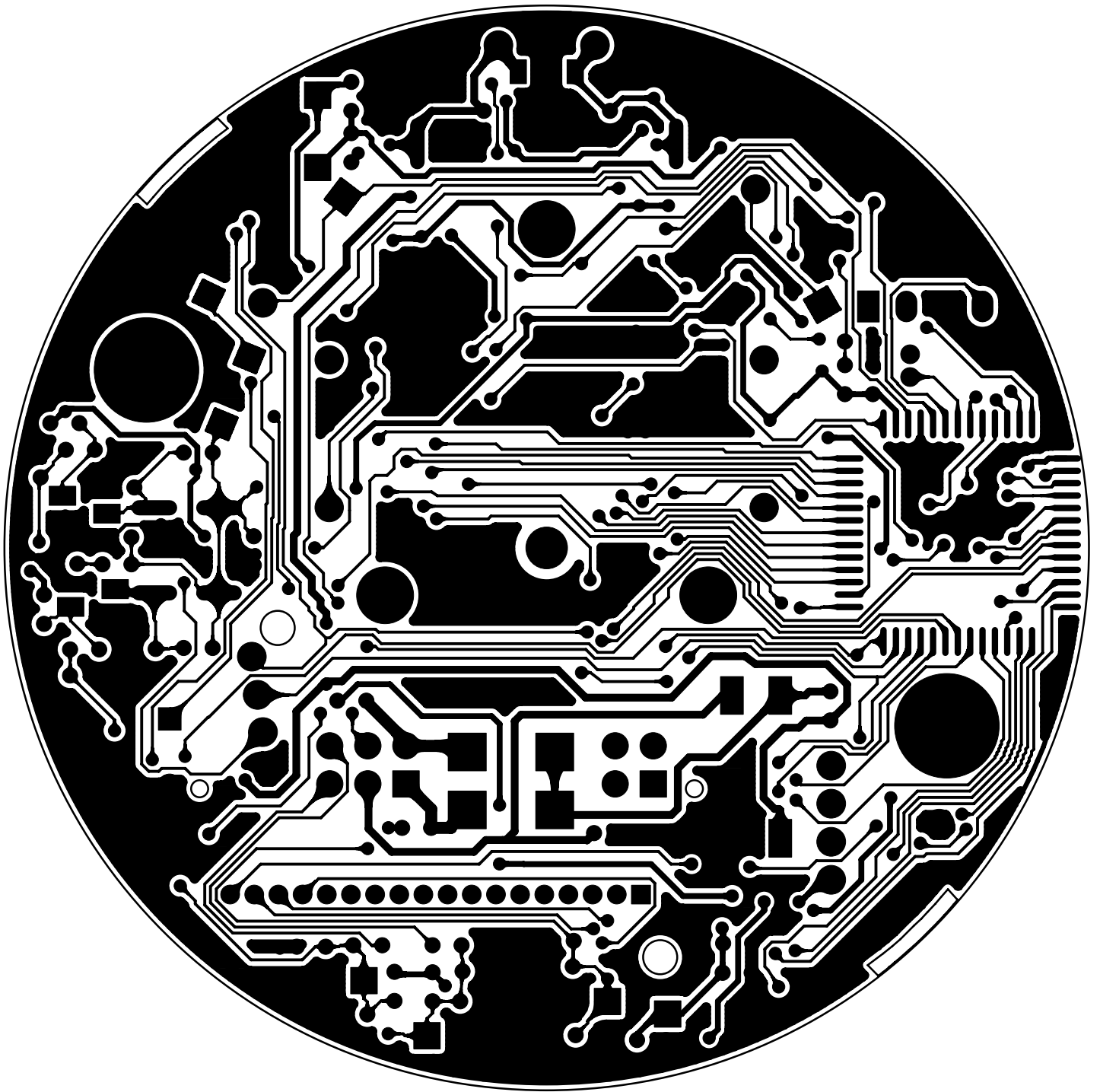
Make (trade name of manufacturer): AUTO GAUGE (TAIWAN) CO., LTD.
Type #86267
General commercial description(s): 60MM 0-260 KM/H SPEEDOMETER
Version(s)/Variant(s): #86208, #86210
Name and address of manufacturer: AUTO GAUGE (TAIWAN) CO., LTD.
2F., NO.12, ALLEY.18, LANE. 325,
JIANKANG RD., TAIPEI, TAIWAN, R.O.C.

Contents

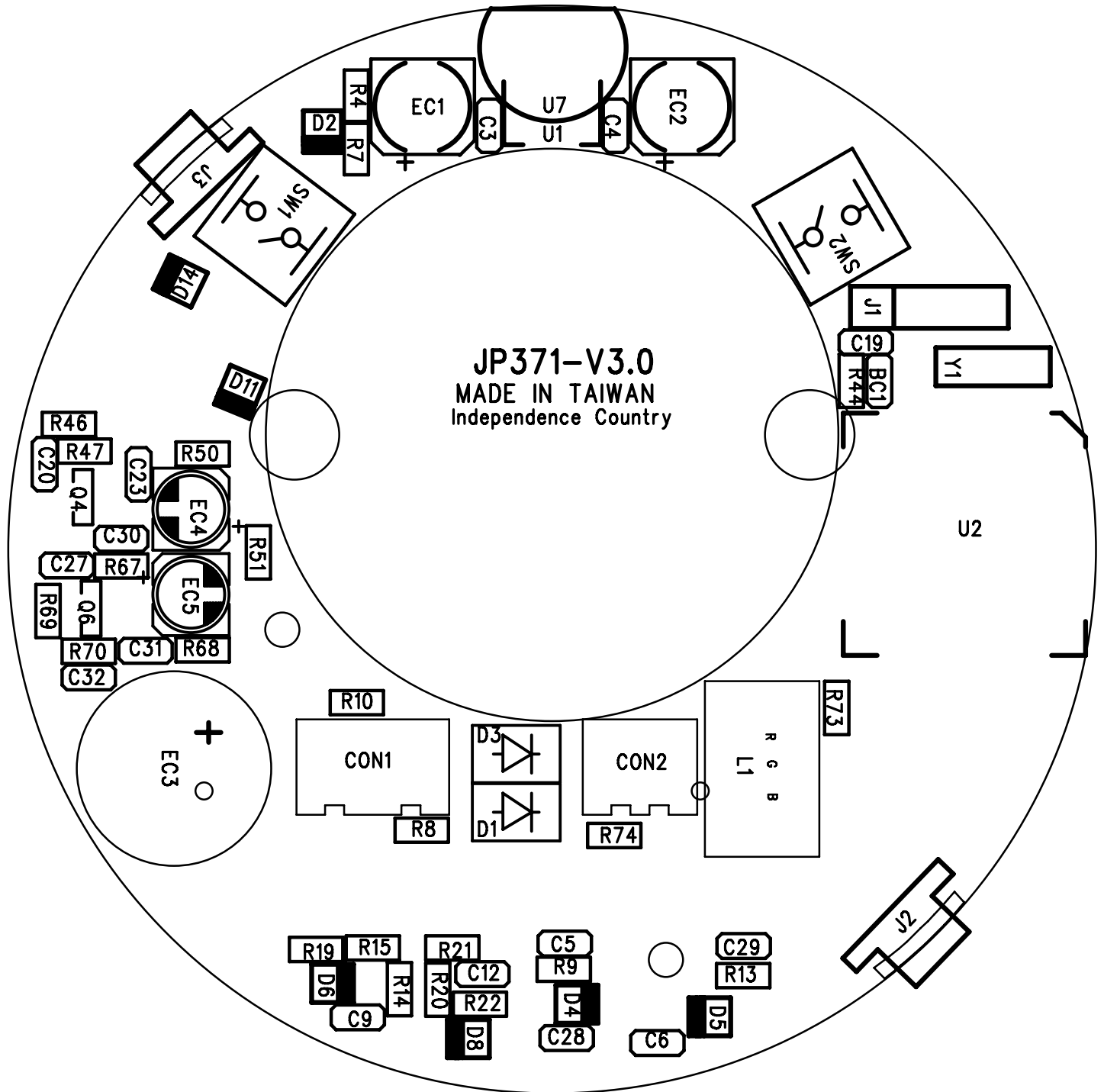
Technical Documents	Description	Sheet
Schematic	JP371-V3.0-x38	1
Layout	JP371-V3.0-bot	1
	JP371-V3.0-ssb	1
	JP371-V3.0-sst	1
	JP371-V3.0-top	1
BOM	JP371-V3.0-x38-bom	1
Photo E.u.T.	Photo	1

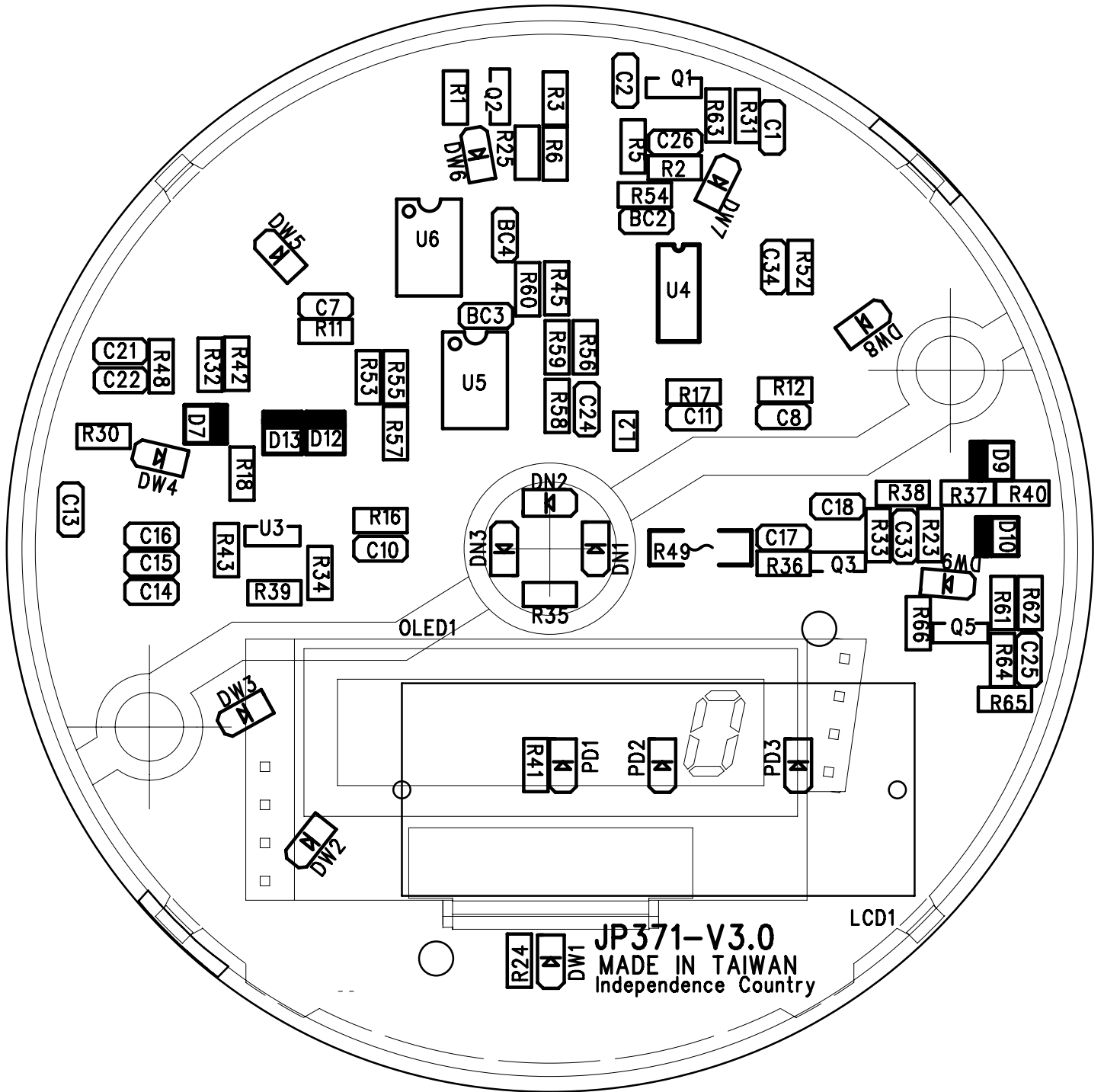


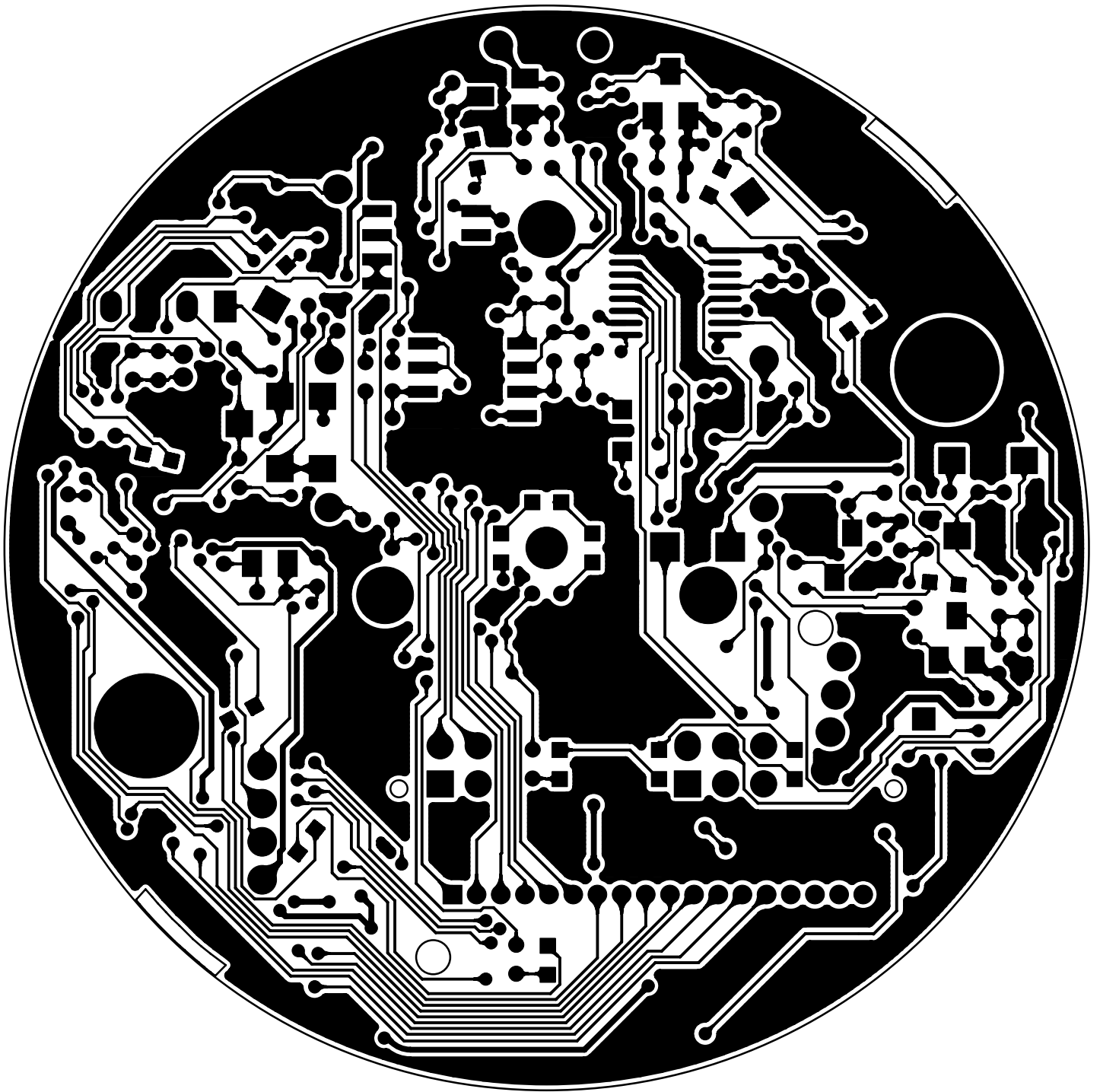
Title	<Title>
Size	A3
Document Number	<Doc>
Date:	Friday, November 04, 2011
Sheet	1 of 1
Rev	V3.0



JP371-V3.0
MADE IN TAIWAN
Independence Country







JP371-V3 Parts Quantity				JP371-V3-x38 BOM (Include(1)Basic +(2)LED Color Parts Location)					Ver 3.1	
Item	038R 038S	238R 238S	Part Name	Specification	Package	Quantity	JP371-V3-000 Basic Parts Location	JP371-V3-038R JP371-V3-038S	JP371-V3-238R JP371-V3-238S	2012/06/20
1	2	2	Chip Capacitor	20pF	0603	2	C21,C22			
2	4	4	Chip Capacitor	100pF	0603	4	C7,C8,C10,C11			
3	6	6	Chip Capacitor	0.001uF/1000pF/1nF	0603	6	C17,C18,C23,C28,C29,C31			
4	3	3	Chip Capacitor	0.01uF	0603	3	C5,C20,C32			
5	20	20	Chip Capacitor	0.1uF	0603	20	C13,C14,C15,C16,C19,C24,C25,C27,C34			
6	1	1	Chip Capacitor	1uF	0603	1	C26			
7	4	4	Chip Resistor	0R 5%	0603	4	R39,R45,R55,R59			
8	5	5	Chip Resistor	47R 5%	0603	5	R7,R11,R12,R16,R17			
9	8	8	Chip Resistor	100R 5%	0603	8	R24,R30,R31,R36,R41,R47,R56,R70			
10	1	1	Chip Resistor	240R 5%	0603	1	R35			
11	2	2	Chip Resistor	470R 5%	0603	2	R32,R34			
12	3	3	Chip Resistor	1K 5%	0603	3	R15,R21,R54			
13	2	2	Chip Resistor	4K7 5%	0603	2	R5,R42			
14	4	4	Chip Resistor	10K 5%	0603	4	R25,R37,R66,R67			
15	14	14	Chip Resistor	30K 5%	0603	14	R2,R3,R14,R20,R33,R38,R40,R44, R46,R50,R51,R65,R68,R69			
16	1	1	Chip Resistor	56K 5%	0603	1	R52			
17	1	1	Chip Resistor	62K 5%	0603	1	R62			
18	1	1	Chip Resistor	10M 5%	0603	1	R48			
19	1	1	Chip Resistor	4K7 1%	0603	1	R13			
20	1	1	Chip Resistor	15K 1%	0603	1	R53			
21	1	1	Chip Resistor	30K 1%	0603	1	R10			
22	1	1	Chip Resistor	47K 1%	0603	1	R9			
23	1	1	Chip Resistor	100K 1%	0603	1				
24	1	1	Chip Resistor	300K 1%	0603	1	R8			
25	1	1	Chip Resistor	30K 5%	1206	1	R49			
26	4	4	Blue LED	TO-1608BC-BE 424466 E3/E4/F1	0603	4			DW2,DW4,DW6,DW8	E3 Priority
27	5	5	Blue LED	HT-191NB Iv bin=P&O, Color bin=D	0603	5			DW1,DW3,DW5,DW7,DW9	P Priority
28	8	3	White LED	TO-1608BY-CWG G1/G2	0603	3	DN1,DN2,DN3	DW1,DW3,DW5,DW7,DW9		G2 Priority
29	7	3	White LED	WH104-C Cxx/Dxx	0603	3	PD1,PD2,PD3	DW2,DW4,DW6,DW8		Cxx Priority
30	3	3	Zener Diode	Z5.1V / MMSZ5231B	SOD-123	3	D6,D8,D10			
31	2	2	Zener Diode	Z16V / MMSZ5246B	SOD-123	2	D11,D14			
32	3	3	Switch Diode	1N4148	SOD-123	3	D9,D12,D13			
33	1	1	Schottky Diode	1N5819	SOD-123	1	D2			
34	2	2	Rectifier Diode	1N4004(GS1G)/1N4007(GS1M)/(M7)	SMA	2	D1,D3			
35	3	3	Transistor	2N2222	SOT-23	3	Q4,Q3,Q6			
36	3	3	Transistor	2N2907	SOT-23	3	Q1,Q2,Q5			
37	1	1	Shunt Regulator	RS431AN	SOT-23	1	U3			
38	1	1	Regulator	78L05	SOT-89	1				
39	1	1	IC (LED DRIVER)	TP-6883	SSOP-16	1	U4			Aligned through the top of pin1
40	1	1	IC (MCU)	TP-68L7	QFP52	1	U2			10x10
41	1	1	IC (OP AMP)	LM358	SO-8	1	U5			
42	1	1	EEPROM	M93C46/93LC46A	SO-8	1	U6			
43	2	2	Electrolytic capacitor	4.7uF/50V	AE4	2	EC4,EC5			SMD 4x5.5
44	1	1	Electrolytic capacitor	15uF/35V	AE5	1	EC1			SMD 5x5.5
45	1	1	Electrolytic capacitor	47uF/16V	AE5	1	EC2			SMD 5x5.5
46	1	1	Chip Inductor	742-792-04	0805	1	L2			
47	1	1	CHOCK	744-221	SMD	1	L1			
48	1	1	Regulator	LP2950	TO-92	1	U7			
49	1	1	Electrolytic capacitor	1800uF/6.3V	DIP 2	1	EC3			Attention to the capacitor polarity
50	1	1	Crystal	32.768KHz 3x8	DIP 2	1	Y1			3x8
51	1	1	Connector 2.00mm	MD4-I20003	DIP 4	1	CON2			
52	1	1	Connector 2.00mm	MD6-I20003	DIP 6	1	CON1			
53	1	1	Pin Header 2.0mm	P301-SGP-0401028-04	DIP 4	1	J1			Aligned through the top of pin1
54	2	2	Push Button	TS-A02H-2, 17mm	DIP 2	2	SW1,SW2			
55	1	1	Stepper Moter	XC5_589(With Stop)	DIP 4	1	MT1			Stepper Moter With Stop
56	2	2	Battery Spring	01185-000	DIP 2	2	J2,J3			
57	0	0	JP371-LCD	LCD	DIP 18	0		JP371-V2-038R Use=>VTA0607AHTP JP371-V2-038S Use=>VTA0608AHTP	JP371-V2-238R Use=>VTA0607AHTP JP371-V2-238S Use=>VTA0608AHTP	
58	1	1	PCB	JP371-V3.0		1				
TOTAL	143	143	(include PCBA)			134		9	9	

History :										
V2.0	126	126	2011/04/11	Initial				143	143	
V3.0	143	143	2011/11/4		Delete	2	R18(470R),D7(Z5.1V)=>Programming			
					Modify	2	R8(4K7 1%)=47K 1%, R9(30K 1%)=300K 1%			
					Modify	1	C5(0.1uF)=0.01uF			
					Modify	1	U4(TP-6883)=TP-6883			
V3.1	143	143	2012/02/07		Modify	1	R48(1M 5%)=10M 5%			
			2012/06/20		Modity	1	Y1=32.768KHz 3x8			

