

Straubing, August 3, 2000

TEST-REPORT

No. 52209-00390-1

for

TOAD RK 30 Transmitter

Applicant: Lite-On Automotive Corporation

Purpose of testing: To show compliance with

FCC Code of Federal Regulations, Part 15 Subpart C, Section §15.231

Industry Canada Radio Standards Specification RSS-210 Issue 2, Section 6.1 (Category I Equipment)

Note:

The test data of this report relate only to the individual item which has been tested. This report shall not be reproduced except in full extent without the written approval of the testing laboratory.



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1. Administrative Data

Equipment Under Test (EUT): TOAD RK 30 Transmitter

Serial number(s): R 118825

Version of EUT: as received with modifications

Parts/accessories: ---

FCC-ID: JLJ123456T

Applicant: Lite-On Automotive Corporation (full address) 37 Chung Yang Road NEPZ

Kaohsiung 811 Taiwan R.O.C.

Contract identification: ---

Contact person:

Manufacturer: Lite-On Automotive Corporation

Receipt of EUT: July 2000

Date of test: July/August 2000

Note: ---

Responsible for testing: Rupert Kohlhäufl
Responsible for test report: Rupert Kohlhäufl (cj)



2. Identification of Test Laboratory

Test Laboratory: Senton GmbH EMI/EMC Test Center

(full address): Aeussere Fruehlingstrasse 45

D-94315 Straubing

Germany

Contact person: Mr. Johann Roidt

Communication: Telephone (+49) 0 94 21 / 55 22-0

Fax (+49) 0 94 21 / 55 22-99 eMail: Office@senton.de

FCC file number: 31040/SIT 1300F2

Industry Canada file number: IC 3050



3. Summary of Test Results

The tested sample complies with the requirements set forth in the

Code of Regulations Part 15 Subpart C, Section §15.231 (intentional radiators) of the Federal Communication Commission (FCC)

and the

Radio Standards Specification RSS-210 Issue 2, Section 6.1 for Low Power Licence-Exempt Radiocommunication Devices of Industry Canada.

Johann Roidt Technical Manager Rupert Kohlhäufl Test Engineer

Rund Holling



Operation Mode of EUT 4.

- transmitting continuouslywith battery supply 3.0 V DC



5. Configuration of EUT and Peripheral Devices

	Configuratio	n of ca	bles of	EUT
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Not applicable

Configuration of peripheral devices connected to EUT

Not applicable



6. Measuring Methods

6.1. Bandwidth of Emission(FCC §15.231.c / RSS-210 Section 6.1.1.c)

The Bandwidth of Emission is measured with a spectrum analyzer connected to measuring antenna (radiated measurement) or test fixture while EUT is operating in transmit mode with modulation at the appropriate center frequency. To increase received signal level distance to EUT is reduced (appropriate level offset is included).

The spectrum analyzer was set to:

RBW = 10 kHz, VBW = 10 kHz, span = 1 MHz, sweep = 40 ms See figure 1 for the measurement setup.

Test equipment used (see equipment list for details): 02, 55, 67

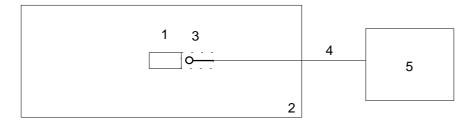


Figure 1: Measurement setup for bandwidth of emission test

1 Transmitter (EUT)

3 Test fixture

2 Wooden table

4 Test cable

5 Spectrum analyzer



6.2. Radiated Emission 30 MHz - 1 GHz (FCC §15.205.a,b, §15.209, §15.231.b / RSS-210 Sections 6.1.1.b, 6.3)

Radiated emissions are measured over the frequency range from 30 MHz to 1 GHz. The bandwidth of the EMI-receiver is set to 120 kHz and the detector-function is set to CISPR quasi-peak.

The test setup is made in accordance with ANSI C63.4-1992.

Measurements are made in both the horizontal and vertical planes of polarization. Preliminary scans are taken in a semi-anechoic room using a spectrum analyzer with the detector function set to peak. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

All tests are performed at a test-distance of 3 meters.

For final testing an open-area test-site is used. During the tests the EUT is rotated all around and the receiving-antenna is raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment is placed and moved within the range of position likely to find their maximum emissions.

See figure 2 for the measurement setup.

Test equipment used (see equipment list for details): 01, 02, 05, 12, 38, 39, 40, 41, 58, 61, 64, 66



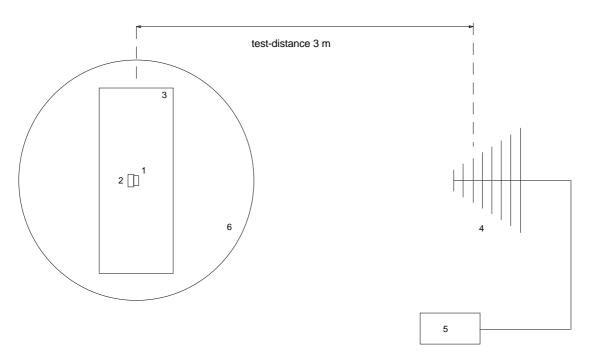


Figure 2: Measurement setup for radiated emission test below 1 GHz

- 1
- Transmitter (EUT) Wooden pedestal (if necessary) 2
- Wooden table

- 4 Measurement antenna
- 5 Test receiver
- Turn table



6.3. Radiated Emission 1 GHz - 10 GHz (FCC §15.205.a,b, §15.209, §15.231.b / RSS-210 Sections 6.1.1.b, 6.3)

Radiated emissions are measured in the frequency range 1 GHz to 10 GHz. Resolution and video bandwidth of the spectrum analyzer are set to 1 MHz.

Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.

Additional measurements are performed at critical frequencies with reduced span.

EUT is rotated all around and receiving antenna is raised and lowered to find the maximum levels of emission. The cables and equipment are placed and moved within the range of position likely to find their maximum emissions.

All tests are performed in a semi-anechoic chamber with a test-distance of 3 meters. If possible preamplifiers are used for the whole frequency range. Special care is taken to avoid overload in transmit mode (using appropriate attenuators if necessary).

See figure 3 for the measurement setup.

Test equipment used (see equipment list for details): 02, 13, 14, 16, ,42, 44, 45, 57, 64



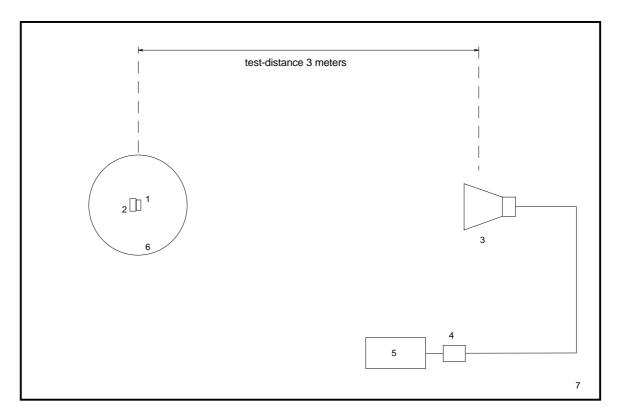


Figure 3: Measurement setup for radiated emission test above 1 GHz

- 1 Transmitter (EUT)
- 2 Wooden pedestal (if necessary)
- 3 Measurement antenna
- 4 Preamplifier (if applicable)
- 5 Spectrum analyzer
- 6 Turn table
- 7 Semi anechoic room



7. Equipment List

To facilitate reference to test equipment used for related tests, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory.

No.	Туре	Model	Serial Number	Manufacturer
01	Spectrum Analyzer	R 3271	05050023	Advantest
02	EMI Test Receiver	ESMI	839379/013 839587/006	Rohde & Schwarz
03	Test Receiver	ESH 3	880112/032	Rohde & Schwarz
04	Test Receiver	ESHS 10	860043/016	Rohde & Schwarz
05	Test Receiver	ESV	881414/009	Rohde & Schwarz
06	Test Receiver	ESVP	881120/024	Rohde & Schwarz
07	Audio Analyzer	UPA	862954	Rohde & Schwarz
80	Power Meter	NRVS	836856/015	Rohde & Schwarz
09	Power Sensor	NRV-Z52	837901/030	Rohde & Schwarz
10	Power Sensor	NRV-Z4	863828/015	Rohde & Schwarz
11	Preamplifier	ESV-Z3	860907/004	Rohde & Schwarz
12	Preamplifier	R14601		Advantest
13	Preamplifier	ACX/080-3030	32640	CTT
14	Preamplifier	ACO/180-3530	32641	CTT
15	Signal Generator	SMS	872166/039	Rohde & Schwarz
16	Signal Generator	HP 8673 D	2930A00966	Hewlett Packard
17	Waveform Generator	HP 33120 A	US34005375	Hewlett Packard
18	Attenuator 20 dB	4776-20	9503	Narda
19	Attenuator 10 dB	4776-10	9412	Narda
20	Pulse Limiter	ESH 3-Z2	1144	Rohde & Schwarz
21	Pulse Limiter	11947 A	3107A00566	Hewlett Packard
22	V-Network	ESH 3-Z5	862770/018	Rohde & Schwarz
23	V-Network	ESH 3-Z5	894785/005	Rohde & Schwarz
24	V-Network	ESH 3-Z5	830952/025	Rohde & Schwarz
25	V-Network	ESH 3-Z6	830722/010	Rohde & Schwarz
26	V-Network	NSLK 8127	8127152	Schwarzbeck
27	V-Network	NNLA 8119	8119148	Schwarzbeck
28	V-Network	SE 01	01	Senton
29	T-Network	ESH 3-Z4	890602/011	Rohde & Schwarz
30	T-Network	ESH 3-Z4	890602/012	Rohde & Schwarz
31	High Impedance Probe	TK 9416	01	Schwarzbeck
32	High Impedance Probe	TK 9416	02	Schwarzbeck
33	Current Probe	ESH 2-Z1	863366/18	Rohde & Schwarz
34	Current Probe	ESV-Z1	862553/3	Rohde & Schwarz



No.	Туре	Model	Serial Number	Manufacturer
35	Absorbing Clamp	MDS 21	80911	Lüthi
36	Absorbing Clamp	MDS 21	79690	Lüthi
37	Loop Antenna	HFH2-Z2	882964/1	Rohde & Schwarz
38	Biconical Antenna	HK 116	842204/001	Rohde & Schwarz
39	Biconical Antenna	HK 116	836239/02	Rohde & Schwarz
40	Log. Periodic Antenna	HL 223	841516/023	Rohde & Schwarz
41	Log. Periodic Antenna	HL 223	834408/12	Rohde & Schwarz
42	Horn Antenna	3115	9508-4553	Emco
43	Horn Antenna	3160-03	9112-1003	Emco
44	Horn Antenna	3160-04	9112-1001	Emco
45	Horn Antenna	3160-05	9112-1001	Emco
46	Horn Antenna	3160-06	9112-1001	Emco
47	Horn Antenna	3160-07	9112-1008	Emco
48	Horn Antenna	3160-08	9112-1002	Emco
49	Horn Antenna	3160-09	9403-1025	Emco
50	Digital multimeter	199	463386	Keithley
51	DC Power Supply	NGSM 32/10	203	Rohde & Schwarz
52	DC Power Supply	NGB	2455	Rohde & Schwarz
53	DC Power Supply	NGA	386	Rohde & Schwarz
54	Temperature Test Chamber	HT4010	07065550	Heraeus
55	Cable	RG214	1309	Senton
56	Cable	200CM_001	1357	Rosenberger
57	Cable	150CM_001	1479	Rosenberger
58	Cable Set EG1	RG214	1189 - 1191	Senton
59	Cable Set Cabine 1	RG214		Senton
60	Cable Set Cabine 2	RG214		Senton
61	Cable Set Cabine 3	RG214		Senton
62	Shielded Room	No. 1	1451	Senton
63	Shielded Room	No. 2	1452	Senton
64	Semi-anechoic Chamber	No. 3	1453	Siemens
65	Shielded Room	No. 4	1454	Euroshield
66	Open Area Test Site	EG 1		Senton
67	Test fixture			Senton



8.	Photographs	Taken	During	Testing
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Photos No. 8.1 - 8.2

Test setup for radiated emission pre-test 30 MHz - 1 GHz and measurement above 1 GHz (semi anechoic room)







Photos No. 8.3 - 8.4

Test setup for radiated emission pre-test 30 MHz - 1 GHz and measurement above 1 GHz (semi anechoic room) - continued -







Photos No. 8.5 - 8.6

Test setup for radiated emission pre-test 30 MHz - 1 GHz and measurement above 1 GHz (semi anechoic room) - continued







Photos No. 8.7 - 8.8

Test setup for radiated emission final test 30 MHz - 1 GHz (open area test site)







9. List of Measurements



9.1. List of Measurements According To FCC Part 15 Subpart C

FCC Part 15 S	FCC Part 15 Subpart C							
Section(s):	Test	Page(s)	Result					
	Transmit mode (TX):							
§15.231.c	Bandwidth of emission		Passed					
§15.207 Conducted emission test 450 kHz - 30 MHz			Not Applicable					
§15.231.b §15.209 §15.205.a,b	Radiated emission test 9 kHz - 30 MHz		Not Applicable (acc. to §15.33)					
§15.231.b §15.209 §15.205.a,b	Radiated emission test 30 MHz - 1 GHz		Passed					
§15.231.b §15.209 §15.205.a,b	Radiated emission test 1 GHz - 4.5 GHz		Passed					



9.2. List of Measurements According To Industry Canada RSS-210

Industry Cana			
madelly carre			
Section(s):	Test	Page(s)	Result
	Transmit mode (TX):		
6.1.1.c	Bandwidth		Passed
6.6	Conducted emission test 450 kHz - 30 MHz		Not Applicable
6.1.1.b 6.3	Radiated emission test 9 kHz - 30 MHz		Not Applicable (acc. to 6.3.e)
6.1.1.b 6.3	Radiated emission test 30 MHz - 1 GHz		Passed
6.1.1.b 6.3	Radiated emission test 1 GHz - 4.5 GHz		Passed



10. Referenced Regulations

All tests were performed with reference to the following regulations and standards:

FCC Part 15 Subpart A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)	October 20, 1997
FCC Part 15 Subpart B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)	October 20, 1997
FCC Part 15 Subpart C	Code of Regulations Part 15 (Radio Frequency Devices), Subpart C (Intentional Radiators) of the Federal Communication Commission (FCC)	October 20, 1997
ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz - 40 GHz	October, 1992
RSS-210	Radio Standards Specification RSS-210 Issue 2 for Low Power Licence-Exempt Radiocommuniction Devices of Industry Canada	February 24, 1996



11. Test Results

Bandwidth of emission according to FCC Part 15 Subpart C

Model: TOAD RK 30 transmitter Serial No.: R118825 Applicant: Lite-On Automotive Corporaton					Mode: - transmitting continuously - with battery supply 3.0 V DC Maximum bandwidth: 0.25% of center frequency = 1.08 MHz Measured bandwidth: 0.049 MHz				
Ref.Level 90 10 dB/Div.	dBµV/m			ATT	15 dB				
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Start 432.900 RBW 10 kHz	MHz			VBW 1	0 kHz			Stop 43	34.900 MHz SWP 60 ms
		No. 1 No. 2 No. 3	433.9	Multi Ma 13333 MHz 40000 MHz 62222 MHz	59. 79.	23 dBµV/ı 34 dBµV/ı 92 dBµV/ı	m		
Tested by: Rupert Kohll Date:	näufl				Project-No 52209-0		Page	e 25 of 47 P	Pages

Radiated Emission 30 MHz - 1 GHz (Final Test) according to FCC Part 15 Subpart C, §15.231.b

Model: TOAD RK 30 Type: Transmitter Serial No.: R118825

Applicant: Lite-On Automotive Corporation

Test-site: Open area test-site I

Test distance: 3 meters
Date of test: 07/31/2000
Operator: R. Kohlhäufl

Mode: - transmitting continuously

- with battery supply 3 V DC

EUT in vertical position front on top

Detector: Peak
Polarization: horizontal

Frequency	Receiver	Correction	Fieldstrength	Limit	Duty cycleF	ieldstrengt	Limit	Limit
	reading	factor	Peak	Peak	correction	Average	Average	exceeded
[MHz]	[dBµV]	[dB]	[dBµV/m]	dΒμV/m	[dB]	[dBµV/m]	[dBµV/m]	
433.90	57.3	23.0	80.3	100.8	5.8	74.5	80.8	
867.86	28.7	32.6	61.3	80.8	5.8	55.5	60.8	

Radiated Emission 30 MHz - 1 GHz (Final Test) according to FCC Part 15 Subpart C, §15.231.b

Model: TOAD RK 30 Type: Transmitter Serial No.: R118825

Applicant: Lite-On Automotive Corporation

Test-site: Open area test-site I

Test distance: 3 meters
Date of test: 07/31/2000
Operator: R. Kohlhäufl

Mode: - transmitting continuously

- with battery supply 3 V DC

EUT in vertical position front on top

Detector: Peak
Polarization: vertical

Frequency	Receiver	Correction	Fieldstrength	Limit	Duty cycleF	ieldstrengt	Limit	Limit
	reading	factor	Peak	Peak	correction	Average	Average	exceeded
[MHz]	[dBµV]	[dB]	[dBµV/m]	dΒμV/m	[dB]	[dBµV/m]	[dBµV/m]	
433.90	60.5	23.0	83.5	100.8	5.8	77.7	80.8	
867.86	26.5	32.6	59.1	80.8	5.8	53.3	60.8	

Model: TOAD RK 30 transmitter Serial No.: R 118825 Applicant:		- transmitting continuously - with battery supply 3.0 V DC - EUT in horizontal position LED on top			
Lite-On Automotive Corporatio	n	Test distance : 3 meters			
		Channel A: Horizontal polarization Channel B: vertical polarization PRESCAN WITHOUT ANY CORRECTIONS			
Ref.Level 97 dBuV 10 dB/Div.	ATT	0 dB			
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Start 30.000 MHz RBW 100 kHz	VBW 1	Stop 300.000 100 kHz SWP 14			
Tested by: Thomas Eberl		Project-No.: 52209-00390			
Date: 07/24/2000		Page 28 of 47 Pages			

Model: TOAD RK 30 transmitter	Mode:
Serial No.: R 118825	- transmitting continuously - with battery supply 3.0 V DC
Applicant: Lite-On Automotive Corporation	- EUT in horizontal position LED on top
	Test distance : 3 meters
	Channel A: Horizontal polarization Channel B: vertical polarization
	PRESCAN WITHOUT ANY CORRECTIONS
Ref.Level 97 dBuV / 10 dB/Div.	ATT 0 dB
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Start 300.000 MHz	Stop 1.000 GHz
	3W 100 kHz SWP 140 ms
	ti Marker List
No. 1 431.00000 No. 2 866.00000	
Tartadhii	Decise of No.
Tested by: Thomas Eberl	Project-No.: 52209-00390
Date: 07/24/2000	Page 29 of 47 Pages

Model: TOAD RK 30 transmitter Serial No.: R 118825 Applicant: Lite-On Automotive Corporation	- transmitting continuously - with battery supply 3.0 V DC - EUT in horizontal position right side on table Test distance: 3 meters Channel A: Horizontal polarization Channel B: vertical polarization PRESCAN WITHOUT ANY CORRECTIONS					
Ref.Level 97 dBuV ATT 10 dB/Div.	0 dB					
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Start 30.000 MHz RBW 100 kHz VBW 1	Stop 300.000 MHz 00 kHz SWP 140 ms					
Tested by: Thomas Eberl Date: 07/24/2000	Project-No.: 52209-00390 Page 30 of 47 Pages					

Model: TOAD RK 30 transm	nitter			Mode:								
Serial No.: R 118825				- transmitting continuously - with battery supply 3.0 V DC								
Applicant: Lite-On Automotive	Corporation	1		- EUT in horizontal position right side on table Test distance : 3 meters								
				Channel A: Horizontal polarization Channel B: vertical polarization								
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Start 300.000 MHz RBW 100 kHz			VBW 1	00 kHz		1	Stop SV	1.000 GHz VP 140 ms				
			Multi Ma	rker List								
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Tested by: Thomas Eberl				Project-No.: 52209-003	390							
Date: 07/24/2000						Page	31 of 47 P	ages				

Model: TOAD RK 30 trans Serial No.: R 118825 Applicant: Lite-On Automotiv		n		- transmitting continuously - with battery supply 3.0 V DC - EUT in verticall position front on top Test distance : 3 meters Channel A: Horizontal polarization Channel B: vertical polarization PRESCAN WITHOUT ANY CORRECTIONS					
Ref.Level 97 dBuV 10 dB/Div.			ATT	0 dB					
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Start 30.000 MHz RBW 100 kHz Tested by:			VBW 100 kHz				Stop 30 SV	0.000 MHz VP 140 ms	
Thomas Eberl Date: 07/24/2000				52209-00390 Page 32 of 47 Pages				ages	

Model: TOAD RK 30 transmitte	RK 30 transmitter								
Serial No.: R 118825			- transmitting continuously - with battery supply 3.0 V DC - EUT in verticall position front on top						
Applicant: Lite-On Automotive Co	rporation								
			Test distance : 3 m	neters					
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Start 300.000 MHz RBW 100 kHz		VBW 1	00 kHz	Sto	op 1.000 GHz SWP 140 ms				
		Multi Ma	rker List						
		31.000000 MF 66.000000 MF							
Tested by: Thomas Eberl			Project-No.: 52209-00390						
Date: 07/24/2000				Page 33 of 47	' Pages				

Model:) RK 30 t	ransmi	tter							Mode:	smitting cor	ntinuou	sly				
Serial no.: R118825								- with battery supply 3.0 V DC									
	Applicant: Lite-On Automotive Corporaton							- EUT in vertical position front on top									
Test sit Open	e: area test	-site I															
	on: distance 3 ontal Pola																
Date of 07/31					rator: Kohl	häufl											
Test pe	rformed:			File	name	:											
Detecto	or:									List of v	alues: ted by hand	d					
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0	30						100										100 MF
Result:										Project 52209	file: 0-00390			Page	34 of	47 P	

Model: TOAD RK 30 transmitter	
Serial no.: R118825	
Applicant: Lite-On Automotive Corpora	aton
Test site: Open area test-site I	
Tested on: Test distance 3 meters Horizontal Polarization	
Date of test: 07/31/2000	Operator: R. Kohlhäufl
Test performed: by hand	File name:

Mode:

- transmitting continuously
- with battery supply 3.0 V DC

- EUT in vertical position front on top

Detector: Peak List of values: Selected by hand

Frequency MHz	Reading dBµV	Correction factor dB	Value dBμV/m	Limit dBµV/m	Limit exceeded
433.90 867.86	57.3 28.7	23.0 32.6	80.3 61.3	46.0 46.0	*

Project file: 52209-00390

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Model: TOAD	RK 30 tr	ansmit	ter					Mode: - transmitting coil - with battery sup	ntinuously					
R1188														
Lite-O	Applicant: Lite-On Automotive Corporaton							- EUT in vertical position front on top						
Test site	e: area test-	-site I												
	_{on:} istance 3 al Polariz		S											
Date of 07/31/				Opera		ufl								
Test per by har				File na	ame:									
Detecto Peak	r:							List of values: Selected by han	d					
dBµV/n 70	n						Lir	nit1: FCC Subpart C	C Transduce	r: HK116	3 / HL22	23 (3 m)		
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0		1	1		1	1	1				1	1 1		
	30					1	00					100 MH:		
Result:								Project file: 52209-00390		Page 3	36 of 47	Pages		

Model: TOAD RK 30 transmitter	
Serial no.: R118825	
Applicant: Lite-On Automotive Corpora	aton
Test site: Open area test-site I	
Tested on: Test distance 3 meters Vertical Polarization	
Date of test: 07/31/2000	Operator: R. Kohlhäufl
Test performed: by hand	File name:

Mode:

- transmitting continuously
- with battery supply 3.0 V DC
- EUT in vertical position front on top

Detector: Peak List of values: Selected by hand

Frequency MHz	Reading dBμV	Correction factor dB	Value dBμV/m	Limit dBµV/m	Limit exceeded
433.90 867.86	60.5 26.5	23.0 32.6	83.5 59.1	46.0 46.0	*

Result:

Project file: 52209-00390

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Radiated Emission 1 GHz - 5 GHz according to FCC Part 15 Subpart C, §15.231.b

Model: TOAD RK 30
Type: Transmitter
Serial No.: R118825

Applicant: Lite-On Automotive Corporation

Test-site: Semi anechoic room

Test distance: 3 meters
Date of test: 07/24/2000
Operator: T. Eberl

Mode: - transmitting continuously

- with battery supply 3 V DC

- EUT in horizontal position with LED on top

Detector: Peak

		Analyzer-	Antenna-	Cable-	Fieldstrength	Limit	Duty cycle	Fieldstrength	Limit	Limit
Frequency	Polarization	reading	correction	correction	Peak	Peak	correction	Average	Average	exceeded
[GHz]		[dBµV]	[dB]	[dB]	[dBµV/m]	[dBµV/m]	[dB]	[dBµV/m]	[dBµV/m]	
1.3017	vertical	22.3	26.4	0.5	49.2	74.0	5.8	43.4	54.0	
1.7356	vertical	13.9	27.9	0.5	42.3	80.8	5.8	36.5	60.8	

Note: Frequency error of markers is depending on span of analyzer. Therefore exact frequency values

are calculated as harmonics of fundamental frequency.

Radiated Emission 1 GHz - 5 GHz according to FCC Part 15 Subpart C, §15.231.b

Model: TOAD RK 30
Type: Transmitter
Serial No.: R118825

Applicant: Lite-On Automotive Corporation

Test-site: Open area test-site I

Test distance: 3 meters
Date of test: 07/24/2000
Operator: T. Eberl

Mode: - transmitting continuously

- with battery supply 3 V DC

- EUT in horizontal position with right hand side on table

Detector: Peak

		Analyzer-	Antenna-	Cable-	Fieldstrength	Limit	Duty cycle	Fieldstrength	Limit	Limit
Frequency	Polarization	reading	correction	correction	Peak	Peak	correction	Average	Average	exceeded
[GHz]		[dBµV]	[dB]	[dB]	[dBµV/m]	[dBµV/m]	[dB]	[dBµV/m]	[dBµV/m]	
1.3017	vertical	26.1	26.4	0.5	53.0	74.0	5.8	47.2	54.0	
1.7356	vertical	16.4	27.9	0.5	44.8	80.8	5.8	39.0	60.8	

Note: Frequency error of markers is depending on span of analyzer. Therefore exact frequency values

are calculated as harmonics of fundamental frequency.

Radiated Emission 1 GHz - 5 GHz according to FCC Part 15 Subpart C, §15.231.b

Model: TOAD RK 30 Type: Transmitter Serial No.: R118825

Applicant: Lite-On Automotive Corporation

Test-site: Open area test-site I

Test distance: 3 meters
Date of test: 07/24/2000
Operator: T. Eberl

Mode: - transmitting continuously

- with battery supply 3 V DC

- EUT in vertical position with front on top

Detector: Peak

		Analyzer-	Antenna-	Cable-	Fieldstrength	Limit	Duty cycle	Fieldstrength	Limit	Limit
Frequency	Polarization	reading	correction	correction	Peak	Peak	correction	Average	Average	exceeded
[GHz]		[dBµV]	[dB]	[dB]	[dBµV/m]	[dBµV/m]	[dB]	[dBµV/m]	[dBµV/m]	
1.3017	vertical	17.2	26.4	0.5	44.1	74.0	5.8	38.3	54.0	

Note: Frequency error of markers is depending on span of analyzer. Therefore exact frequency values

are calculated as harmonics of fundamental frequency.

Radiated emission test 1GHz - 4.5 GHz acc. to FCC Part 15 Subpart C

Model: TOAD RI	K30 transm	itter			Mode:				
Serial No.: R118825					transmitting continuouslywith battery supply 3.0 V DC				
Applicant: Lite-On Automotive Corporation					- EUT in horizontal position with LED on top				
						stance: 3 m	1		
						el A : Horizo			
					Chann	el B : vertica	al polarisat	ion	
Defilered	00 E - ID)	1		A.T.T.	0ID			D-4 O#-	
5 dB/Div.	66.5 dBµV	/m 		AII	0 dB			Ref. Offs	set -30.5 dB
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		<u>.</u>			· ·				
Start 1.000			1	1	1	1	1	Stop	4.500 GHz
RBW 1 MH	Hz				1 MHz arker List				SWP 20 ms
		No. 1	1.307	7222 GHz		4 dBµV/m	В		
		No. 2	1.735	000 GHz		3 dBµV/m	В		
Tested by:	Fherl				Project-No 52209-0				
Date:					52209-0	บงฮบ	Dom	11 of 17 F	Doggo
07/24/20	00						Page	e 41 of 47 F	ayes

Radiated emission test 1GHz - 4.5 GHz acc. to FCC Part 15 Subpart C

Model: TOAD RK3	30 transmi	itter			Mode:				
Serial No.: R118825					- transmitting continuously - with battery supply 3.0 V DC				
Applicant: Lite-On Au	ıtomotive (Corporation	า		- EUT in horizontal position with right side on table				
						stance: 3 m			
					Channe	el A : Horizo	ontal polari	zation	
					Channe	el B : vertica	al polarisat	ion	
Ref.Level 66	6.5 dBµV/	/m		ATT	0 dB			Ref. Offs	et -30.5 dB
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	· 	-		· · ·				1	1
Start 1.000 (1	1	ı !	1	1	Stop	4.500 GHz
RBW 1 MHz	<u>z</u>				1 MHz arker List				SWP 20 ms
		No. 1	1.307	222 GHz		3 dBµV/m	В		
		No. 2	1.738	8889 GHz		4 dBµV/m	В		
Tested by: Thomas El	berl				Project-No 52209-0				
Date: 07/24/2000	0						Page	e 42 of 47 P	'ages

Radiated emission test 1GHz - 4.5 GHz acc. to FCC Part 15 Subpart C

Model: TOAD RK30 transmitte	er		Mode:				
Serial No.: R118825			transmitting continuouslywith battery supply 3.0 V DC				
Applicant: Lite-On Automotive Co	orporation		- EUT in vertical position with front on top				
			Test distance: 3 m				
			Channel A : Horizontal polarization Channel B : vertical polarisation				
			·				
Ref.Level 66.5 dBµV/m 5 dB/Div.	1	ATT	0 dB Ref. Offset -30.5 dB				
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Start 1.000 GHz		1	Stop 4.500 GHz				
RBW 1 MHz		VBW 1 Multi Ma					
	No. 1 1.307	222 GHz	44.13 dBµV/m B				
Tested by: Thomas Eberl			Project-No.: 52209-00390				
Date: 07/24/2000			Page 43 of 47 Pages				

Duty Cycle Test according to FCC Part 15 Subpart C, §15.231 / ANSI C63.4-1992 (I4.10)

Model: TOAD RK 30 Type: Transmitter Serial No.: R118825

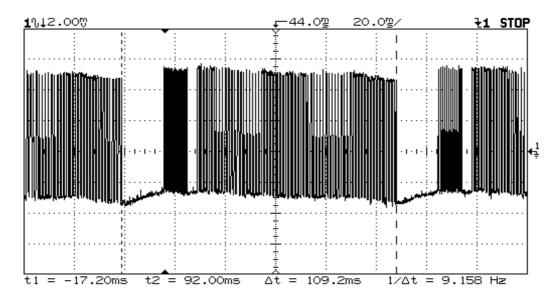
Applicant: Lite-On Automotive Corporation

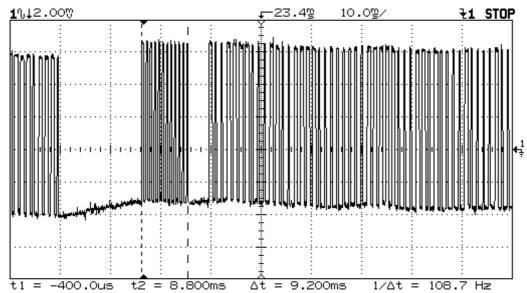
Test-site: Shielded room No.5

Date of test: 07/31/2000 Operator: R. Kohlhäufl

Mode: - transmitting continuously

- with battery supply 3 V DC





Duty Cycle Test (continued) according to FCC Part 15 Subpart C, §15.231 / ANSI C63.4-1992 (I4.10)

Model: TOAD RK 30 Type: Transmitter Serial No.: R118825

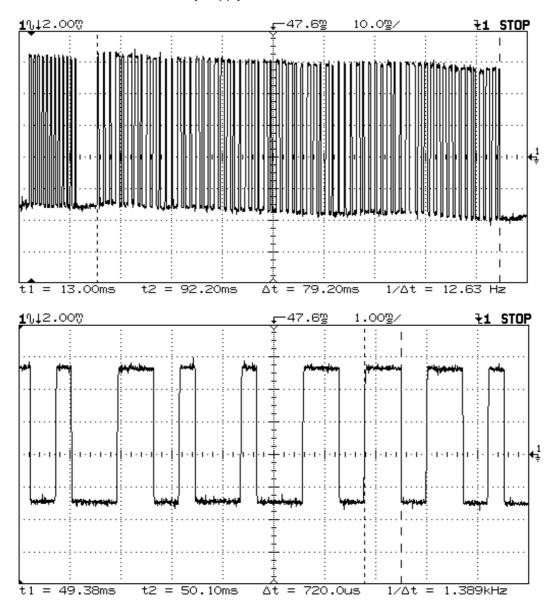
Applicant: Lite-On Automotive Corporation

Test-site: Shielded room No.5

Date of test: 07/31/2000 Operator: R. Kohlhäufl

Mode: - transmitting continuously

- with battery supply 3 V DC



Duty Cycle Test (continued) according to FCC Part 15 Subpart C, §15.231 / ANSI C63.4-1992 (I4.10)

Model: TOAD RK 30 Type: Transmitter Serial No.: R118825

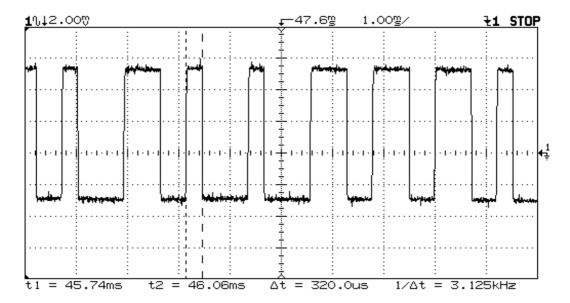
Applicant: Lite-On Automotive Corporation

Test-site: Open area test-site I

Date of test: 07/31/2000 Operator: R. Kohlhäufl

Mode: - transmitting continuously

- with battery supply 3 V DC



Duty Cycle Test (continued) according to FCC Part 15 Subpart C, §15.231 / ANSI C63.4-1992 (I4.10)

Model: TOAD RK 30 Type: Transmitter Serial No.: R118825

Applicant: Lite-On Automotive Corporation

Test-site: Shielded room No.5

Date of test: 07/31/2000 Operator: R. Kohlhäufl

Mode: - transmitting continuously

- with battery supply 3 V DC

(standard mode)

	Number of pulses	T [ms]	Duty Cycle	Duty Cycle Correction [dB]
Pulse Train		109.200		
Transmitter ON (long time)	1	9.200	0.399	-8.0
Transmitter ON (long time)	33	0.720		
Transmitter ON (short time)	33	0.320		

(worst case mode)

	Number of pulses	T [ms]	Duty Cycle	Duty Cycle Correction [dB]
Pulse Train		109.200		
Transmitter ON (long time)	1	9.200	0.516	-5.8
Transmitter ON (long time)	65	0.720		
Transmitter ON (short time)	1	0.320	1	