AR161033

BLS9G2735LS-50, 3100 to 3500MHz

v1.0 — 30 March 2016

AMPLEON

Application Report

3100 to 3500MHzDocument information	
Status	Company Public
Author(s)	Hans Mollee
Abstract	Measurement results of a Class-AB design for the 3100 to 3500MHz band with the BLS9G2735LS-50

1. Revision History

Table 1: Report revisions

Revision	Date	Description	Author
1.0	20160330	Initial document	Hans Mollee

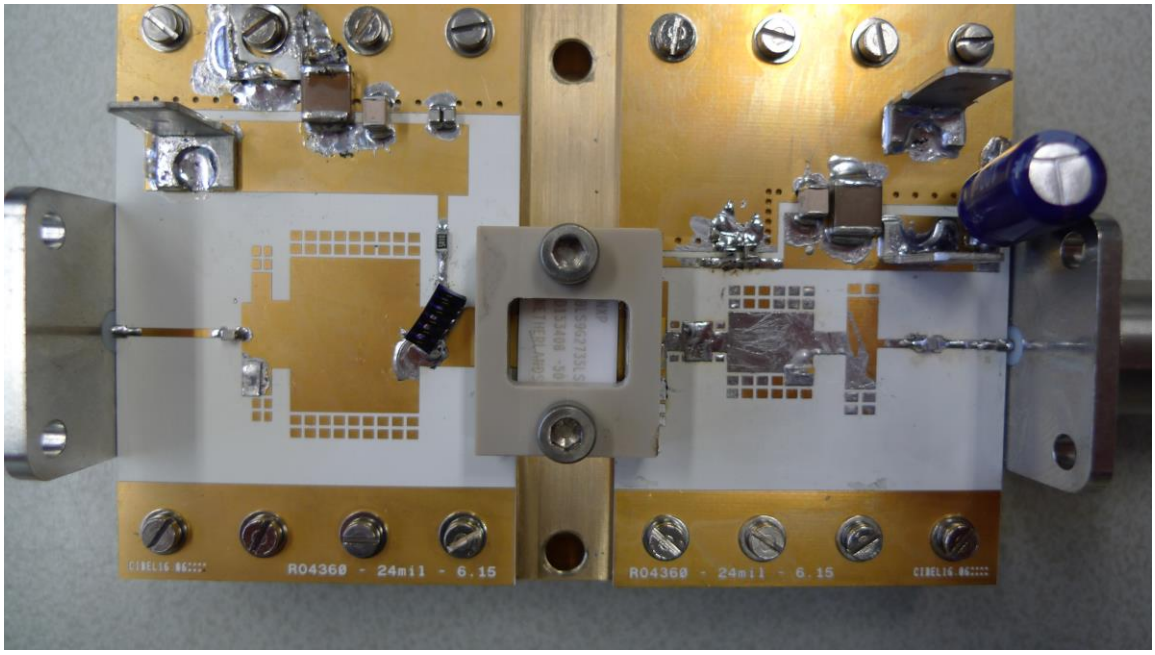
2. Contents

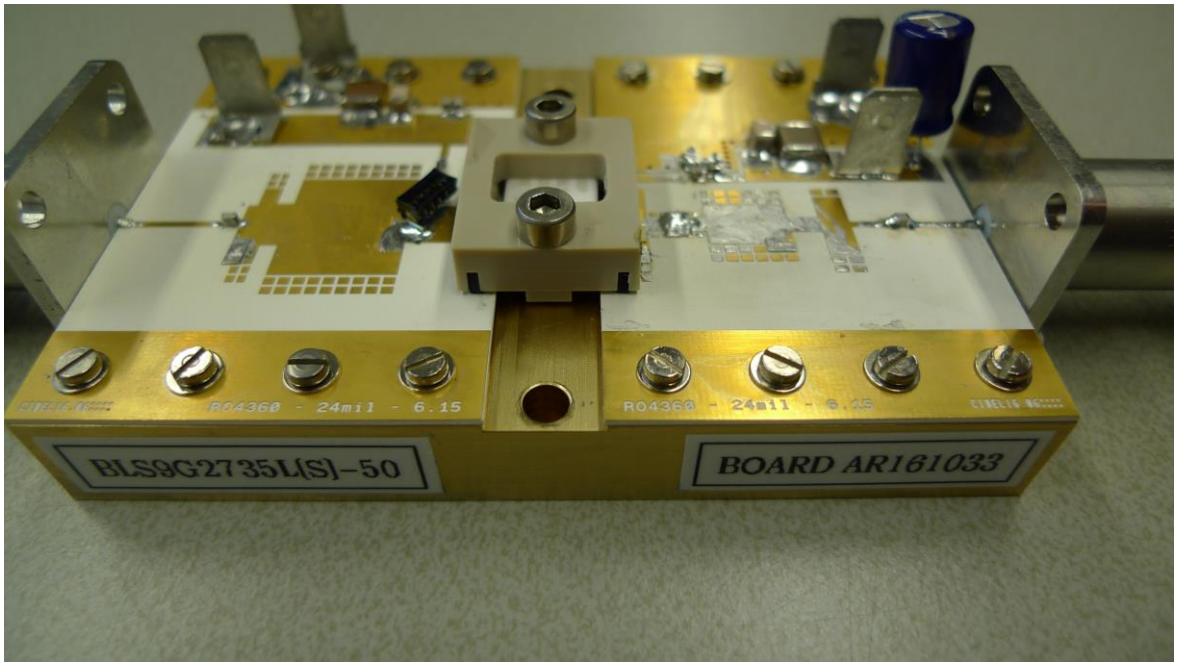
3. List of figures

4. List of tables

5. General description

This report presents the measurement results of the Class-AB demo AR161033. The device used is a 9th generation LDMOS single ended package, the BLS9G2735LS-50. The presented demo is tuned for the frequency band 3100 to 3500MHz.





The PCB has been designed on Rodgers RO4360G2, h=0.61mm, ε_R=6.2, 35um double sided copper. Supply voltage (drain-source) is 32V. Gate bias voltage is connected to the Vg terminals on the input board. To set the drain quiescent current, slowly increase V_{GS} until the I_{DQ} will be 100 mA, starting at about 1V.

When switching of the RF-pulse a spike may appear on the drain supply due to the inductance and the fall time of the pulse. When using signal with a rapid fall time this spike may become (too) large. By placing a 10µF SMD capacitor (C9) on the drain supply. These spikes will be reduced to virtually zero.

Performance Details

The pulse format used is a 300 μs pulse with a duty cycle of 10%. The power sweep was performed up to 3 dB gain compression.

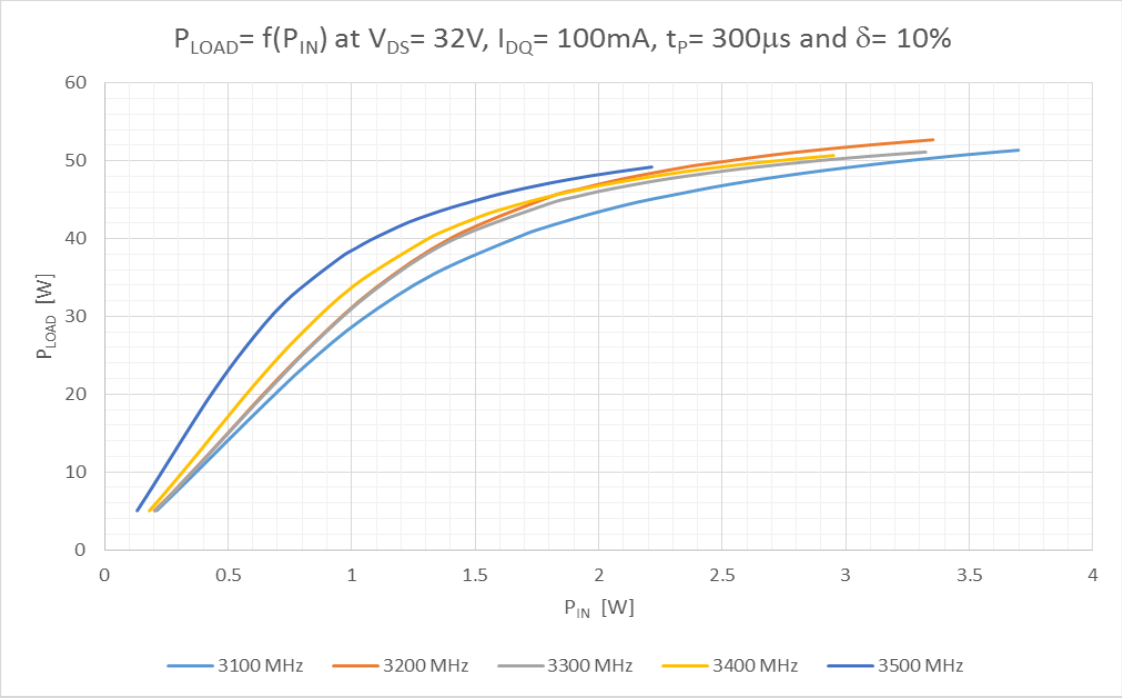


Figure 1 P_{LOAD} vs P_{IN}

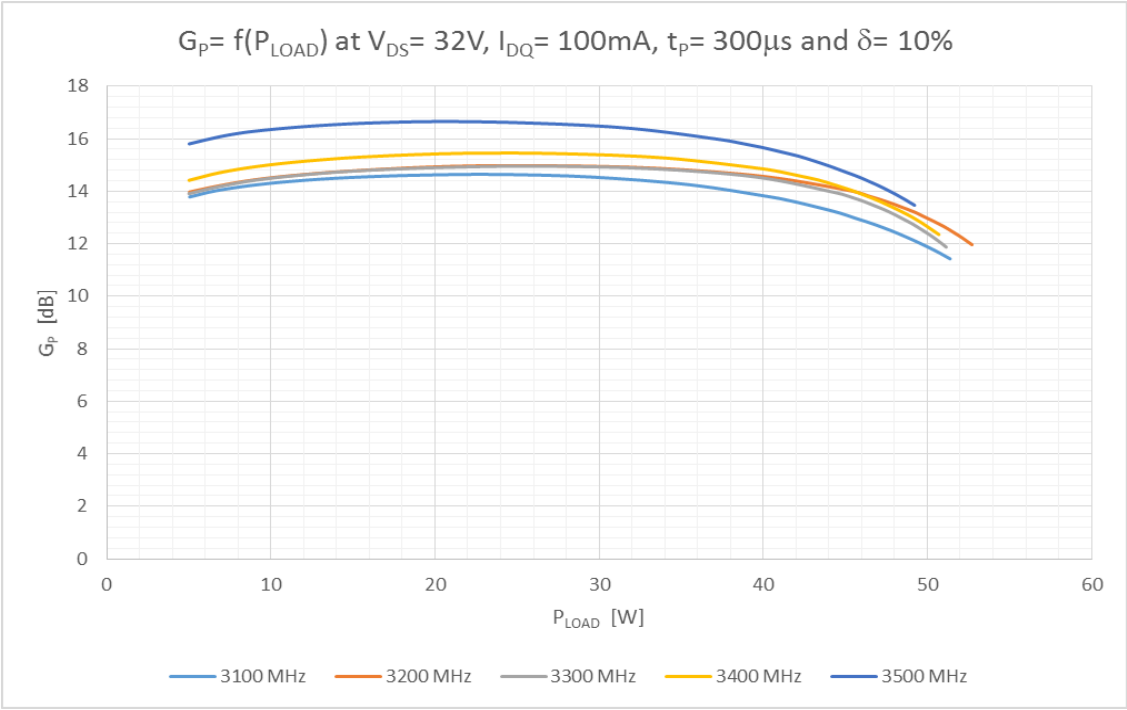


Figure 2 Gain vs P_{LOAD}

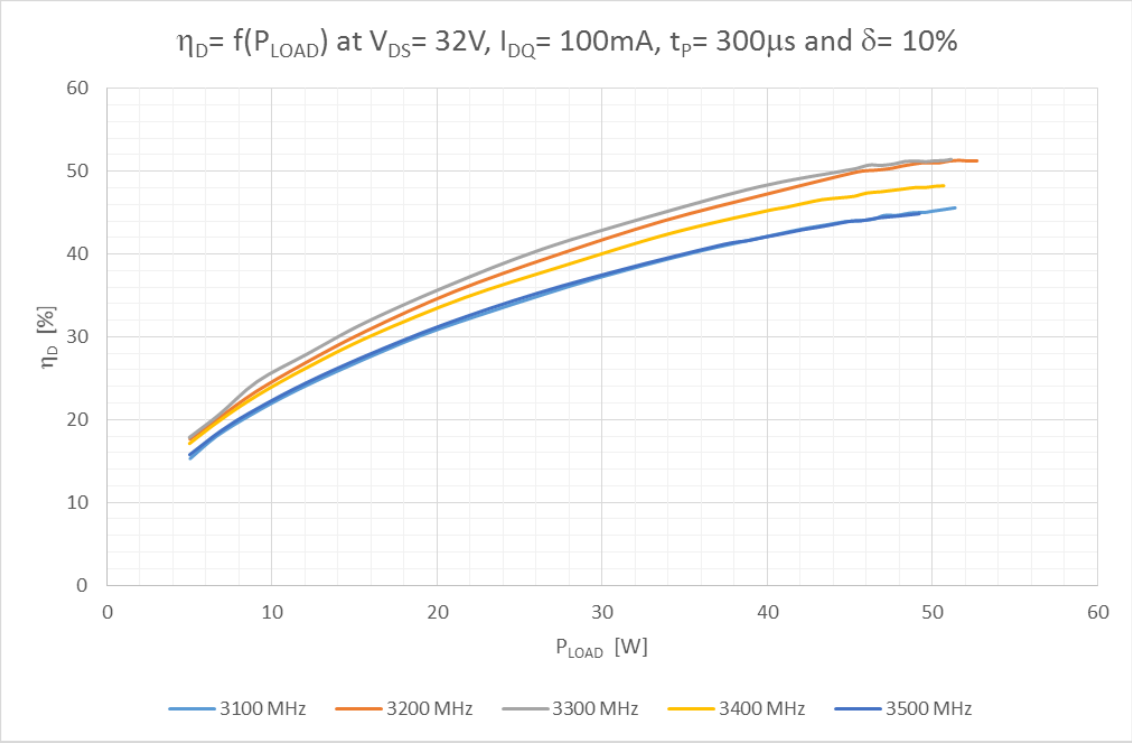


Figure 3 Drain efficiency vs P_{LOAD}

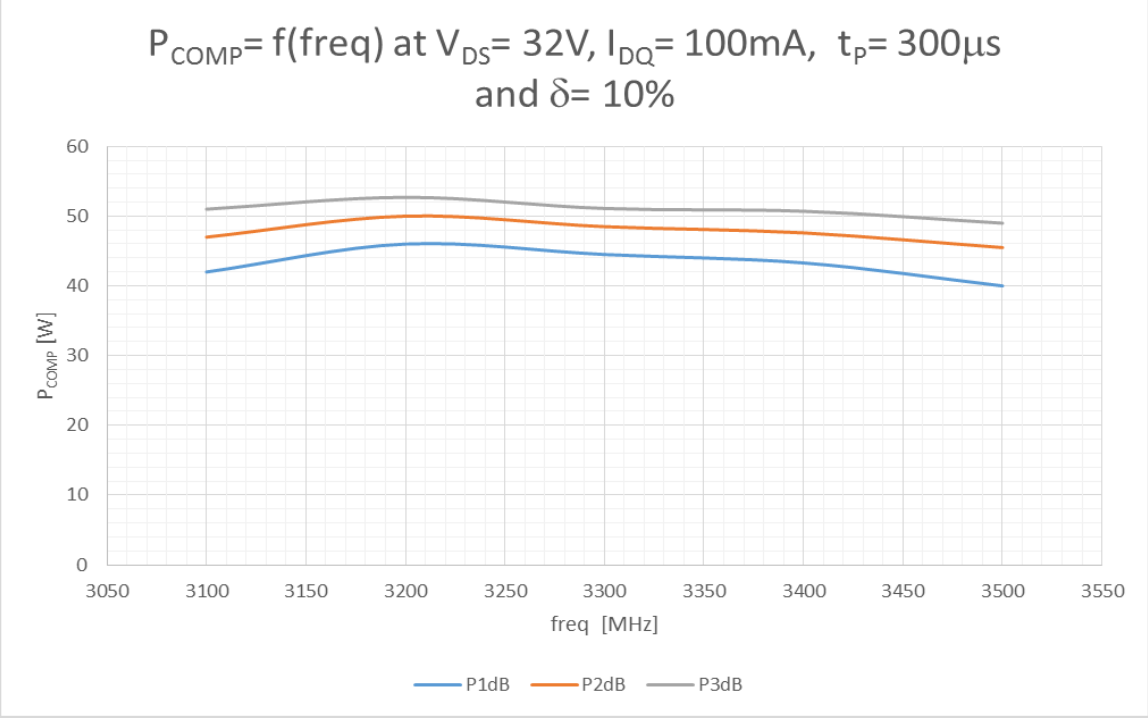


Figure 4 Compressed Power

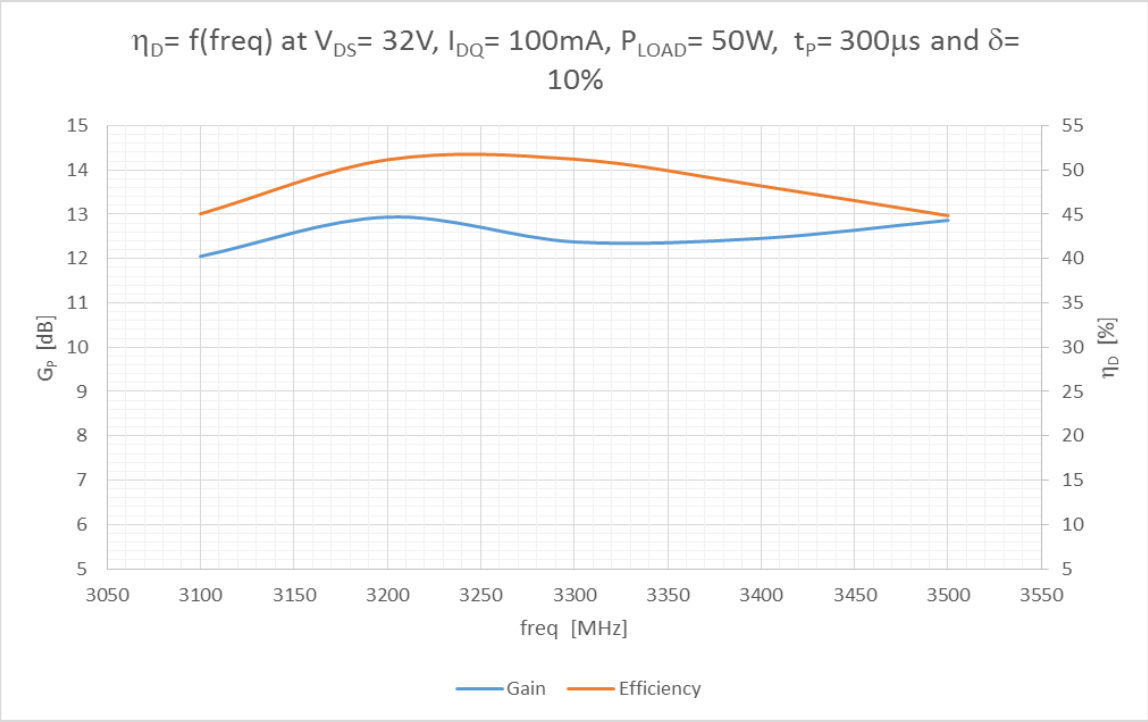
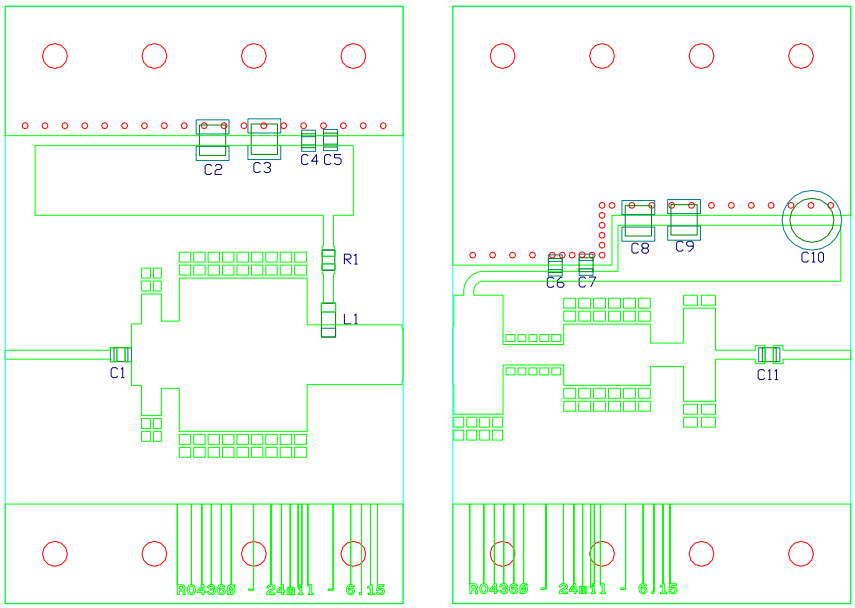


Figure 5 Performance at 50 W

5.1 Hardware



Components list application circuit.		
C1, C5, C6	5.1 pF	ATC800A
C4, C7	10 pF	ATC800A
C3, C8	910 pF	ATC800B
C11	4.7 pF	ATC800A
C2, C9	10 μF – 50V	GRM55DR61H106KA88L
C10		63 V, Electrolytic capacitor
C2		
L1	17.5 nH	Coilcraft B06TGLB
R1	5 Ω	0805 SMD Resistor

PCB Material: Rogers 4360, thickness 0.61 mm (24 mil) or equivalent, ε_R = 6.15, Cu = 35 micron

5.2 Board material

Table 2: Board specifications

Parameter	Value
Manufacturer	Rogers
Type	RO4360G2
Thickness	24 mil, 0.61 mm
Layers	2, top/bottom. Bottom all copper

5.3 Device markings

Table 3: Device specifics

Parameter	Value
Manufacturer	Ampleon
Device	BLS9G2735LS-50
Marking	BLS9G2735LS-50, D153408, Netherlands
Comments	Engineering sample

6. Legal information

6.1 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Ampleon does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

6.2 Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, Ampleon does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. Ampleon takes no responsibility for the content in this document if provided by an information source outside of Ampleon.

In no event shall Ampleon be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, Ampleon's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of Ampleon.

Right to make changes — Ampleon reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — Ampleon products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an Ampleon product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Ampleon and its suppliers accepts no liability for inclusion and/or use of Ampleon products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. Ampleon makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using Ampleon products, and Ampleon accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the Ampleon product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

Ampleon does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using Ampleon products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). Ampleon does not accept any liability in this respect.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

6.3 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

Any reference or use of any 'NXP' trademark in this document or in or on the surface of Ampleon products does not result in any claim, liability or entitlement vis-à-vis the owner of this trademark. Ampleon is no longer part of the NXP group of companies and any reference to or use of the 'NXP' trademarks will be replaced by reference to or use of Ampleon's own trademarks.

6.4 Contact information

For more information, please visit: http://www.ampleon.com

For sales office addresses, please visit: http://www.ampleon.com/sales