AMPLEON

Customer Information Notification

202209001I

Hoglin,

Issue Date: 05/09/2022
Effective Date: 05/09/2022

Here is your personalized quality information concerning products our customers and partners purchased from Ampleon.
For detailed information we invite you to view this notification online

Management Summary

Several corrections and updates have been made to the datasheet of the C4H10P600A

Change Category

[ ] Wafer Fab process	[ ] Assembly Process	[ ] Product Marking	[ ] Design
[ ] Wafer Fab materials	[ ] Assembly Materials	[X] Electrical spec./Test coverage	[ ] Mechanical Specification
[ ] Wafer Fab location	[ ] Assembly Location	[ ] Test Location	[ ] Packing/Shipping/Labeling

Datasheet update C4H10P600A

Information Notification

see presentation available in the ePCN tool

Why do we issue this Information Notification

to inform the customer on the new issued datasheet

Identification of affected Products

Product identification does not change

Impact

Data Sheet Revision

A new datasheet will be issued

Disposition of Old Products

not applicable

Additional information

Affected products, sales history information as well as self qualification / additional documents can be accessed here: view online

Remarks

Contact and Support

For all inquiries regarding the ePCN tool application or access issues, please contact Ampleon "Quality Support Team".
For all Quality Notification content inquiries, please contact your local Ampleon Sales Support team.
For specific questions on this notice or the products affected please contact our specialist directly:

Name	Hans Buis
Position	Process Improvement manager
E-mail address	hans.buis@ampleon.com

At Ampleon we are dedicated to creating optimal value for our customers.
Ampleon Quality Management Team.

About Ampleon

Created in 2015, Ampleon is shaped by 50 years of RF power leadership and is set to exploit the full potential of data and energy transfer in RF. Ampleon has

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C4H10P600A Datasheet updating notification

Sep. 1st, 2022

Background

- C4H10P600A is released on wk2216. datasheet V1 is post on May 13.2022
- C4H10P600A datasheet update requested to correct description, updated items is list in the Table 14 of new datasheet.

Table 14. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
C4H10P600A v.2	<tbd>	Product data sheet	-	C4H10P600A v.1
Modifications:	• Table 4 on page 2: table updated • Table 7 on page 3: updated value of $V_{GS(amp)peak}$ in description • Table 8 on page 3: updated value of $V_{GS(amp)peak}$ in description • Section 7.1 on page 4: updated section • Section 7.2 on page 4: updated tables • Figure 2 on page 6: updated value of thickness • Table 11 on page 7: updated components X10 and R1 • Section 7.4 on page 7: added paragraph below title • Figure 7 on page 9: updated notes			
C4H10P600A v.1	20220513	Product data sheet	-	-

Detail updating on Table 4

Old version

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DD}	supply voltage	operating	-	52	V
V_{DS}	drain-source voltage	V_{GS} = –8 V	-	150	V
$V_{GS(amp)main}$	main amplifier gate-source voltage		–15	+2	V
$V_{GS(amp)peak}$	peak amplifier gate-source voltage		–15	+2	V
$I_{GF(amp)main}$	main amplifier forward gate current		-	4.8	mA
$I_{GF(amp)peak}$	peak amplifier forward gate current		-	7.2	mA
T_{stg}	storage temperature		–65	+150	°C
T_{ch}	active die channel temperature	[1]	-	275	°C
T_{case}	case temperature	operating [1]	–40	+140	°C

[1] Continuous use at maximum temperature will affect the reliability, for details refer to the online MTF calculator.

New Version

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DD}	supply voltage	operating	-	52	V
V_{DS}	drain-source voltage	V_{GS} = –8 V	-	150	V
$V_{GS(amp)main}$	main amplifier gate-source voltage		–15	+2	V
$V_{GS(amp)peak}$	peak amplifier gate-source voltage		–15	+2	V
$I_{GF(amp)main}$	main amplifier forward gate current		-	27	mA
$I_{GF(amp)peak}$	peak amplifier forward gate current		-	45	mA
T_{stg}	storage temperature		–65	+150	°C
T_{ch}	active die channel temperature	[1]	-	275	°C
T_{case}	case temperature	operating [1]	–40	+140	°C

[1] Continuous use at maximum temperature will affect the reliability, for details refer to the online MTF calculator.

Updated to:
IGF(amp)main Max = 27mA
IGF(amp)peak Max = 45mA

Detail updating on Table7 and Table8

- Table 7

Old version

Table 7. RF characteristics

Test signal: 1-carrier W-CDMA; PAR = 7.2 dB at 0.01 % probability on the CCDF; 3GPP test model 1; 64 DPCH; f_1 = 793.5 MHz; f_2 = 818.5 MHz; RF performance at V_{DS} = 48 V; I_{Dq} = 200 mA; $V_{GS(amp)peak}$ = –2.7 V (typical); T_{case} = 25 °C; unless otherwise specified; in a Doherty production RF test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)}$ = 83 W	17.0	18.2	-	dB
η_D	drain efficiency	$P_{L(AV)}$ = 83 W	56	61	-	%
RL_{in}	input return loss	$P_{L(AV)}$ = 83 W	-	–16.5	–8	dB
ACPR	adjacent channel power ratio	$P_{L(AV)}$ = 83 W	-	–24.4	–18	dBc

New Version

Table 7. RF characteristics

Test signal: 1-carrier W-CDMA; PAR = 7.2 dB at 0.01 % probability on the CCDF; 3GPP test model 1; 64 DPCH; f_1 = 793.5 MHz; f_2 = 818.5 MHz; RF performance at V_{DS} = 48 V; I_{Dq} = 200 mA; $V_{GS(amp)peak}$ = –5.5 V (typical); T_{case} = 25 °C; unless otherwise specified; in a Doherty production RF test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)}$ = 83 W	17.0	18.2	-	dB
η_D	drain efficiency	$P_{L(AV)}$ = 83 W	56	61	-	%
RL_{in}	input return loss	$P_{L(AV)}$ = 83 W	-	–16.5	–8	dB
ACPR	adjacent channel power ratio	$P_{L(AV)}$ = 83 W	-	–24.4	–18	dBc

- Table 8

Old version

Table 8. RF characteristics

Test signal: pulsed CW; t_p = 100 µs; δ = 10 %; f_1 = 791 MHz; f_2 = 821 MHz; RF performance at V_{DS} = 48 V; I_{Dq} = 200 mA; $V_{GS(amp)peak}$ = –2.7 V (typical); T_{case} = 25 °C; unless otherwise specified; in a Doherty production RF test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(4dB)}$	output power at 4 dB gain compression	maximum 4 dB compression	450	570	-	W

New Version

Table 8. RF characteristics

Test signal: pulsed CW; t_p = 100 µs; δ = 10 %; f_1 = 791 MHz; f_2 = 821 MHz; RF performance at V_{DS} = 48 V; I_{Dq} = 200 mA; $V_{GS(amp)peak}$ = –5.5 V (typical); T_{case} = 25 °C; unless otherwise specified; in a Doherty production RF test circuit.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(4dB)}$	output power at 4 dB gain compression	maximum 4 dB compression	450	570	-	W

- Updated $V_{GS(amp)peak}$ to -5.5V (typical)

Detail updating on Section 7.1 and 7.2

Old version	New Version
7.1 Ruggedness in Doherty operation **7.1.1 At f = 791 MHz; tested on the Doherty application demo board** The C4H10P600A is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 50 V; P_L = 600 W pulsed CW; f = 791 MHz on C4H10P600A correlation board. **7.2 Impedance information** **Table 9. Typical impedance of maximum power and drain efficiency** *Measured load-pull data (main device); all data measured on a non-harmonic impedance optimized load-pull fixture; I_{Dq} = 300 mA; V_{DS} = 48 V; test signal: pulsed CW; t_p = 100 µs; δ = 10 %; typical values unless otherwise specified.*	**7.1 Ruggedness in Doherty operation** The C4H10P600A is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: V_{DS} = 50 V; I_{Dq1} = 200 mA; V_{GS2} = –5.3 V; P_L = 600 W; test signal: pulsed CW, t_p =100 µs, δ = 10 %; f = 791 MHz in a Doherty production RF test circuit. **7.2 Impedance information** **Table 9. Typical impedance of maximum power and drain efficiency** *Measured load-pull data (main device); all data measured on a harmonic impedance optimized load-pull fixture; I_{Dq} = 400 mA; V_{DS} = 48 V; test signal: pulsed CW; t_p = 100 µs; δ = 10 %; typical values unless otherwise specified.*

- Optimized description with correct words clearly

Detail updating on Figure 2

Old version	New Version
 Printed-Circuit Board (PCB): Rogers RO4350B; thickness = 0.507 mm. See Table 11 for a list of components. **Fig 2. Component layout for test circuit**	 Printed-Circuit Board (PCB): Rogers RO4350B; thickness = 0.508 mm. See Table 11 for a list of components. **Fig 2. Component layout for test circuit**

- with correct thickness

Detail updating onTable11

Old version

Table 11. List of components *...continued*
See Figure 2 for component layout.

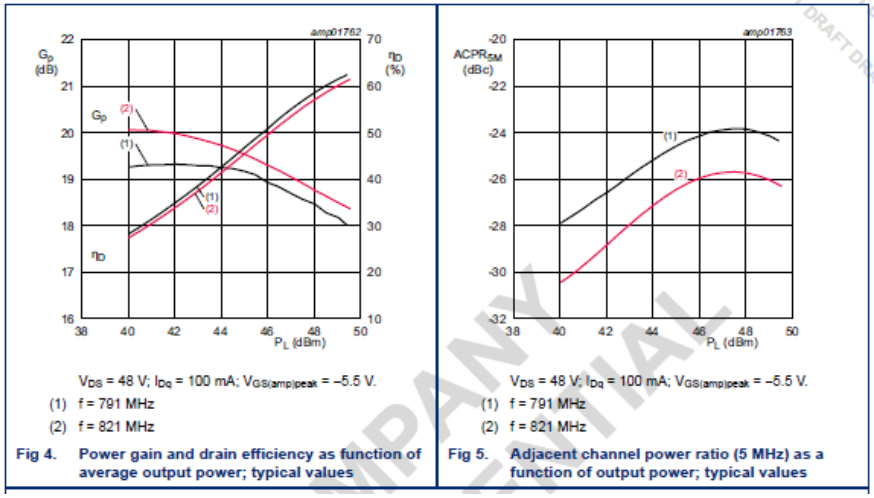
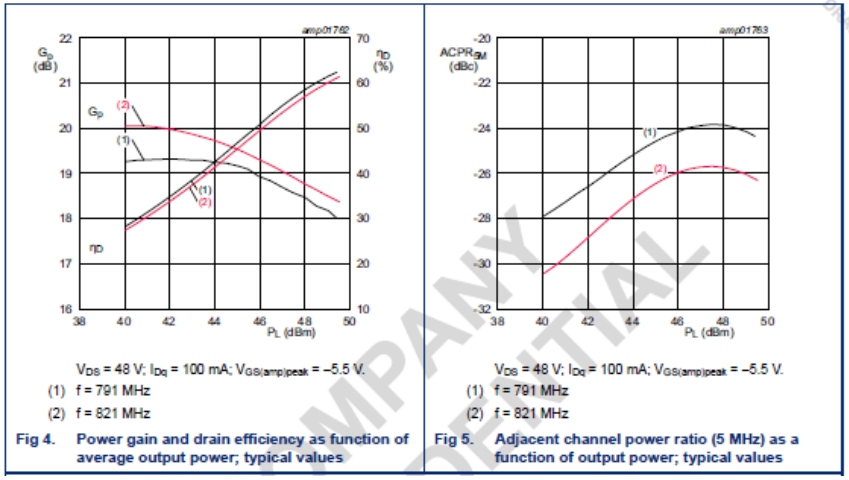
Component	Description	Value	Remarks
X10	hybrid coupler	2 dB	RJ2
R1	resistor	510 Ω	
R2	resistor	9.1 Ω	
R3	current sense resistor	10 mΩ	LVK25(1224)

New Version

X10	hybrid coupler	2 dB, 90°	Anaren: X3C07F1-02S
R1	resistor	51 Ω	
R2	resistor	9.1 Ω	
R3	current sense resistor	10 mΩ	LVK25(1224)

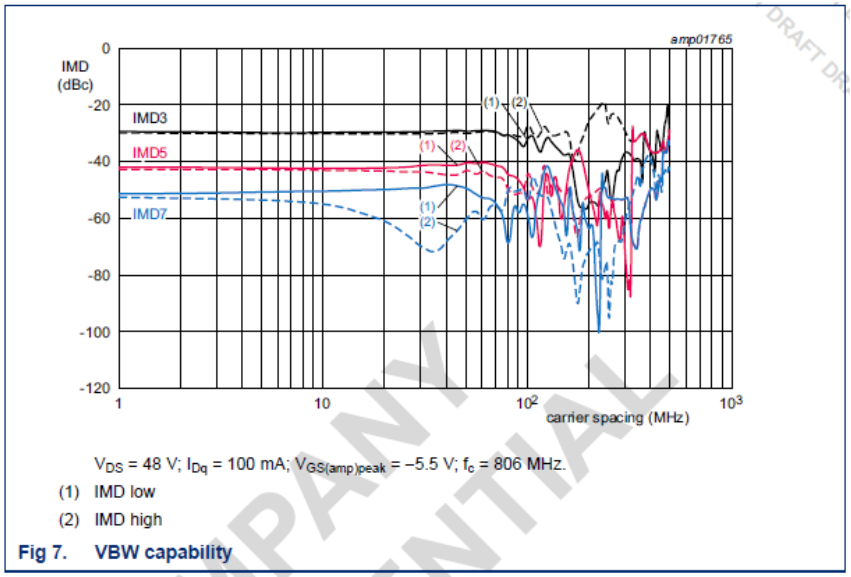
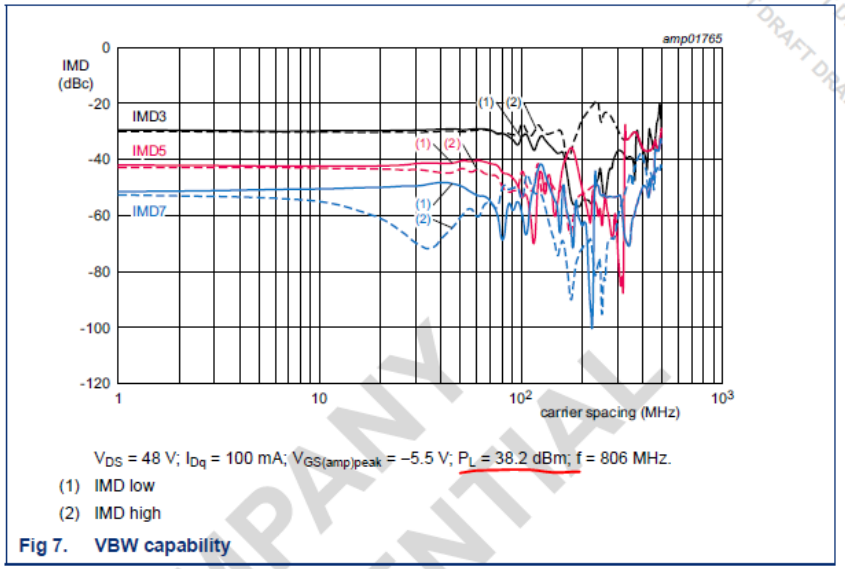
- with correct description for components

Detail updating on Section 7.4

Old version	New Version
7.4.2 1-Carrier W-CDMA  V_{DS} = 48 V; I_{Dq} = 100 mA; $V_{GS(amp)peak}$ = −5.5 V. (1) f = 791 MHz (2) f = 821 MHz **Fig 4. Power gain and drain efficiency as function of average output power; typical values** **Fig 5. Adjacent channel power ratio (5 MHz) as a function of output power; typical values**	7.4.2 1-Carrier W-CDMA Test signal: 1-carrier W-CDMA; 3GPP test model 1; 64 DPCH; PAR = 9.9 dB at 0.01 % probability on the CCDF.  V_{DS} = 48 V; I_{Dq} = 100 mA; $V_{GS(amp)peak}$ = −5.5 V. (1) f = 791 MHz (2) f = 821 MHz **Fig 4. Power gain and drain efficiency as function of average output power; typical values** **Fig 5. Adjacent channel power ratio (5 MHz) as a function of output power; typical values**

- Insert Test signal description

BackgroundDetail updating on Figure 7.4

Old version	New Version
	

V_{DS} = 48 V; I_{Dq} = 100 mA; $V_{GS(amp)peak}$ = −5.5 V; f_c = 806 MHz.

(1) IMD low

(2) IMD high

Fig 7. VBW capability

V_{DS} = 48 V; I_{Dq} = 100 mA; $V_{GS(amp)peak}$ = −5.5 V; P_L = 38.2 dBm; f = 806 MHz.

(1) IMD low

(2) IMD high

Fig 7. VBW capability

- Add detail description with P_L=38.2dBm

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Amplify the future