

BLP9H10S-850AVT

Power LDMOS transistor

Rev. 1 — 25 May 2022

AMPLEON

Product data sheet

1. Product profile

1.1 General description

850 W LDMOS packaged asymmetric Doherty power transistor for base station applications at frequencies from 617 MHz to 960 MHz.

Table 1. Typical performance 942 MHz

Typical RF performance at $T_{case} = 25\text{ °C}$ in an asymmetrical Doherty test circuit. $V_{DS} = 50\text{ V}$; $I_{DQ} = 700\text{ mA}$ (main); $V_{GS(amp)peak} = 0.083\text{ V}$, unless otherwise specified.

Test signal	f	V_{DS}	$P_{L(AV)}$	G_p	η_D	ACPR
	(MHz)	(V)	(dBm)	(dB)	(%)	(dBc)
1-carrier W-CDMA	925 to 960	50	50.8	17.5	51.7	-35.6 [1]

[1] Test signal: 1-carrier W-CDMA; 3GPP test model 1; 64 DPCH; PAR = 9.6 dB at 0.01 % probability on CCDF.

Table 2. Typical performance 806 MHz

Typical RF performance at $T_{case} = 25\text{ °C}$ in an asymmetrical Doherty test circuit. $V_{DS} = 48\text{ V}$; $I_{DQ} = 820\text{ mA}$ (main); $V_{GS(amp)peak} = 0.25\text{ V}$, unless otherwise specified.

Test signal	f	V_{DS}	$P_{L(AV)}$	G_p	η_D	ACPR
	(MHz)	(V)	(dBm)	(dB)	(%)	(dBc)
1-carrier W-CDMA	791 to 821	48	50.8	18.6	52.7	-32.6 [1]

[1] Test signal: 1-carrier W-CDMA; 3GPP test model 1; 64 DPCH; PAR = 9.6 dB at 0.01 % probability on CCDF.

Table 3. Typical performance 698 MHz

Typical RF performance at $T_{case} = 25\text{ °C}$ in an asymmetrical Doherty test circuit. $V_{DS} = 48\text{ V}$; $I_{DQ} = 720\text{ mA}$ (main); $V_{GS(amp)peak} = 0.25\text{ V}$, unless otherwise specified.

Test signal	f	V_{DS}	$P_{L(AV)}$	G_p	η_D	ACPR
	(MHz)	(V)	(dBm)	(dB)	(%)	(dBc)
1-carrier W-CDMA	616 to 746	48	49.5	18.5	48.5	-36.9 [1]

[1] Test signal: 1-carrier W-CDMA; 3GPP test model 1; 64 DPCH; PAR = 9.6 dB at 0.01 % probability on CCDF.

Table 4. Typical performance 859 MHz

Typical RF performance at $T_{case} = 25\text{ °C}$ in an asymmetrical Doherty test circuit. $V_{DS} = 48\text{ V}$; $I_{DQ} = 740\text{ mA}$ (main); $V_{GS(amp)peak} = 0.4\text{ V}$, unless otherwise specified.

Test signal	f	V_{DS}	$P_{L(AV)}$	G_p	η_D	ACPR
	(MHz)	(V)	(dBm)	(dB)	(%)	(dBc)
1-carrier W-CDMA	758 to 960	48	49.6	18.3	45.2	-38.4 [1]

[1] Test signal: 1-carrier W-CDMA; 3GPP test model 1; 64 DPCH; PAR = 9.6 dB at 0.01 % probability on CCDF.

1.2 Features and benefits

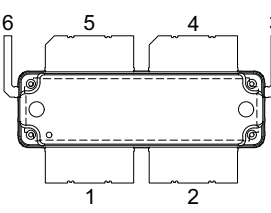
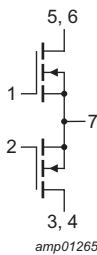
- Excellent ruggedness
- High efficiency
- Low thermal resistance providing excellent thermal stability
- Lower output capacitance for improved performance in Doherty applications
- Designed for low memory effects providing excellent digital pre-distortion capability
- Internally matched for ease of use
- Integrated ESD protection
- For RoHS compliance see the product details on the Ampleon website

1.3 Applications

- RF power amplifiers for base stations and multi carrier applications in the 617 MHz to 960 MHz frequency range

2. Pinning information

Table 5. Pinning

Pin	Description	Simplified outline	Graphic symbol
1	gate1		
2	gate2		
3	video decoupling		
4	drain2		
5	drain1		
6	video decoupling		
7	source ^[1]		

[1] Connected to flange.

3. Ordering information

Table 6. Ordering information

Type number	Package		
	Name	Description	Version
BLP9H10S-850AVT	-	overmolded plastic earless flanged package; 6 leads	OMP-1230-6F-1

4. Limiting values

Table 7. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	drain-source voltage		-	105	V
$V_{GS(amp)main}$	main amplifier gate-source voltage		-6	+11	V
$V_{GS(amp)peak}$	peak amplifier gate-source voltage		-6	+11	V

Table 7. Limiting values ...continued

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

Symbol	Parameter	Conditions	Min	Max	Unit
T_{stg}	storage temperature		-65	+150	°C
T_j	junction temperature	[1]	-	225	°C
T_{case}	case temperature	[1]	-40	+125	°C

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

5. Thermal characteristics

Table 8. Thermal characteristics

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$V_{DS} = 48\text{ V}$; $I_{Dq} = 720\text{ mA}$ (main); $V_{GS(amp)peak} = 0.25\text{ V}$; $T_{case} = 80\text{ °C}$		
		$P_L = 89\text{ W}$	0.35	K/W
		$P_L = 112\text{ W}$	0.32	K/W

6. Characteristics

Table 9. DC characteristics $T_j = 25\text{ °C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Main device						
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}$; $I_D = 2\text{ mA}$	108	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$; $I_D = 200\text{ mA}$	1.5	2.0	2.5	V
V_{GSq}	gate-source quiescent voltage	$V_{DS} = 48\text{ V}$; $I_D = 820\text{ mA}$	-	2.2	-	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}$; $V_{DS} = 50\text{ V}$	-	-	2.8	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $V_{DS} = 10\text{ V}$	-	33	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}$; $V_{DS} = 0\text{ V}$	-	-	280	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}$; $I_D = 10\text{ A}$	-	13.2	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $I_D = 7.0\text{ A}$	-	114	155	mΩ
Peak device						
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}$; $I_D = 3\text{ mA}$	108	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}$; $I_D = 300\text{ mA}$	1.5	2.0	2.5	V
V_{GSq}	gate-source quiescent voltage	$V_{DS} = 48\text{ V}$; $I_D = 1600\text{ mA}$	-	2.2	-	V
I_{DSS}	drain leakage current	$V_{GS} = 0\text{ V}$; $V_{DS} = 50\text{ V}$	-	-	2.8	μA
I_{DSX}	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $V_{DS} = 10\text{ V}$	-	48	-	A
I_{GSS}	gate leakage current	$V_{GS} = 11\text{ V}$; $V_{DS} = 0\text{ V}$	-	-	280	nA
g_{fs}	forward transconductance	$V_{DS} = 10\text{ V}$; $I_D = 15\text{ A}$	-	19.6	-	S
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}$; $I_D = 10.5\text{ A}$	-	80	107	mΩ

Table 10. RF characteristics

Test signal: 1-carrier W-CDMA; PAR = 9.6 dB at 0.01 % probability on the CCDF; 3GPP test model 1; 1 to 64 DPCH; $f_1 = 793.5$ MHz; $f_2 = 818.5$ MHz; RF performance at $V_{DS} = 48$ V; $I_{DQ} = 820$ mA (main); $V_{GS(amp)peak} = 0.30$ V; $T_{case} = 25$ °C; unless otherwise specified in an asymmetrical Doherty test circuit at frequencies from 791 MHz to 821 MHz.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
G_p	power gain	$P_{L(AV)} = 120$ W	16.8	17.8	-	dB
RL_{in}	input return loss	$P_{L(AV)} = 120$ W	-	-14	-9	dB
η_D	drain efficiency	$P_{L(AV)} = 120$ W	46	51	-	%
ACPR	adjacent channel power ratio	$P_{L(AV)} = 120$ W	-	-33	-28	dBc

Table 11. RF characteristics

Test signal: pulsed CW; $\delta = 10$ %; $t_p = 100$ μ s; $f = 793.5$ MHz; RF performance at $V_{DS} = 48$ V; $I_{DQ} = 820$ mA (main); $V_{GS(amp)peak} = 0.30$ V; $T_{case} = 25$ °C; unless otherwise specified in an asymmetrical Doherty test circuit at frequencies from 791 MHz to 821 MHz.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$P_{L(3dB)}$	output power at 3 dB gain compression	-	675	800	-	W

7. Test information

7.1 Ruggedness in Doherty operation

The BLP9H10S-850AVT is capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions: $V_{DS} = 50$ V; $I_{DQ} = 820$ mA; $V_{GS(amp)peak} = 0.25$ V; $f = 821$ MHz; $P_L = 310$ W (5 dB OBO); 1-carrier W-CDMA, 100 % clipping.

7.2 Impedance information

Table 12. Typical impedance of main device

Measured load-pull data of main device; $I_{DQ} = 1000$ mA (main); $V_{DS} = 50$ V; pulsed CW ($t_p = 100$ μ s; $\delta = 10$ %).

f	Z_S	Z_L	P_L	η_D	G_p
(MHz)	(Ω)	(Ω)	(W)	(%)	(dB)
Maximum power load					
617	4.5 + j2.0	3.4 – j1.2	457.8	64.8	17.7
652	4.0 + j1.5	3.3 – j0.9	445.1	64.6	18.6
698	2.8 + j1.3	2.6 – j0.0	426.6	63.4	18.7
720	3.1 + j1.6	3.1 + j0.2	416.6	61.9	18.5
746	3.0 + j1.8	2.8 – j0.7	461.7	62.6	18.1
757	3.0 + j1.9	2.8 – j0.5	469.4	64.2	18.2
769	2.9 + j2.1	3.1 – j0.7	465.9	66.2	18.6
790	2.8 + j2.3	2.6 – j0.3	467.4	65.7	18.5
805	2.4 + j2.3	2.3 – j0.1	455.9	70.0	19.1
820	2.4 + j2.4	2.2 – j1.0	469.6	63.3	18.1
869	2.6 + j3.0	2.4 – j1.3	462.4	64.1	17.9
894	2.7 + j3.3	2.1 – j0.5	457.0	70.6	18.6

Table 12. Typical impedance of main device ...continued

Measured load-pull data of main device; $I_{DQ} = 1000 \text{ mA (main)}$; $V_{DS} = 50 \text{ V}$; pulsed CW ($t_p = 100 \text{ } \mu\text{s}$; $\delta = 10 \text{ } \%$).

f (MHz)	Z _S (Ω)	Z _L (Ω)	P _L (W)	η_D (%)	G _p (dB)
925	3.0 + j3.7	1.9 – j1.1	468.1	65.3	17.8
942	3.2 + j3.9	2.1 – j1.4	462.7	64.0	17.6
960	3.5 + j4.2	2.0 – j1.0	459.3	66.7	17.8
Maximum drain efficiency load					
617	4.3 + j2.0	6.5 – j1.0	329.6	71.9	19.7
652	3.8 + j1.6	5.7 + j0.2	332.5	71.3	20.4
698	2.7 + j1.4	5.0 – j0.2	325.6	68.3	20.0
720	3.0 + j1.7	5.6 + j1.6	313.1	71.1	20.4
746	2.8 + j2.0	5.2 + j3.1	271.0	75.1	21.2
757	2.8 + j2.1	5.1 + j2.0	313.6	75.9	20.7
769	2.7 + j2.2	4.0 + j2.5	303.0	76.5	21.1
790	2.7 + j2.4	3.8 + j2.1	310.3	76.8	20.9
805	2.3 + j2.4	3.6 + j2.0	263.2	75.2	21.4
820	2.3 + j2.5	2.7 + j1.9	263.3	77.2	21.9
869	2.5 + j3.0	2.3 + j0.8	345.4	77.3	20.0
894	2.6 + j3.3	2.1 + j0.7	339.0	77.3	20.0
925	2.9 + j3.7	1.9 + j0.6	306.5	75.3	20.6
942	3.2 + j4.0	2.0 + j0.5	315.7	75.1	20.3
960	3.5 + j4.2	1.7 + j0.5	288.8	74.8	20.2

Table 13. Typical impedance of peak device

Measured load-pull data of peak device; $I_{DQ} = 1400 \text{ mA (peak)}$; $V_{DS} = 50 \text{ V}$; pulsed CW ($t_p = 100 \text{ } \mu\text{s}$; $\delta = 10 \text{ } \%$).

f (MHz)	Z _S (Ω)	Z _L (Ω)	P _L (W)	η_D (%)	G _p (dB)
Maximum power load					
617	3.2 – j0.8	2.1 – j1.0	666.4	63.7	18.6
652	2.0 – j0.6	1.7 – j0.9	653.2	61.7	19.4
698	1.8 – j0.9	1.5 – j0.8	669.6	62.5	19.1
720	1.7 – j1.1	1.7 – j0.8	678.5	65.1	19.4
746	1.7 – j1.3	1.4 – j0.8	669.1	62.1	19.0
757	1.7 – j1.4	1.7 – j0.7	666.1	68.4	19.7
769	1.7 – j1.5	1.6 – j0.7	665.0	68.1	19.8
790	1.8 – j1.6	1.5 – j0.8	663.3	68.5	19.7
805	1.9 – j1.7	1.5 – j0.9	629.8	69.2	19.8
820	2.0 – j1.8	1.5 – j1.2	658.9	65.8	19.3
869	2.4 – j2.2	1.5 – j1.2	637.7	68.3	19.5
894	2.7 – j2.3	1.3 – j1.3	642.1	68.0	19.2
925	3.3 – j2.4	1.4 – j1.8	639.0	63.0	18.6

Table 13. Typical impedance of peak device ...continued

Measured load-pull data of peak device; $I_{DQ} = 1400 \text{ mA (peak)}$; $V_{DS} = 50 \text{ V}$; pulsed CW ($t_p = 100 \text{ } \mu\text{s}$; $\delta = 10 \text{ \%}$).

f (MHz)	Z _S (Ω)	Z _L (Ω)	P _L (W)	η_D (%)	G _p (dB)
942	3.6 – j2.4	1.3 – j1.6	639.6	64.8	18.7
960	4.1 – j2.3	1.1 – j1.7	629.8	62.7	18.3
Maximum drain efficiency load					
617	3.0 + j0.8	4.1 + j0.0	481.0	73.3	20.8
652	1.9 + j0.7	3.2 + j0.2	460.2	71.8	21.8
698	1.8 + j1.0	2.9 + j0.0	511.3	73.3	21.2
720	1.7 + j1.1	2.6 + j0.0	523.6	73.4	21.2
746	1.7 + j1.3	2.8 + j0.1	485.3	73.8	21.3
757	1.7 + j1.4	2.5 + j0.3	477.5	74.6	21.4
769	1.7 + j1.5	2.4 + j0.2	477.2	74.5	21.5
790	1.8 + j1.7	2.3 + j0.2	477.8	75.1	21.4
805	1.9 + j1.7	1.9 + j0.0	452.1	73.9	21.4
820	1.9 + j1.8	2.0 – j0.3	496.0	74.3	21.1
869	2.4 + j2.1	1.6 – j0.3	451.5	74.6	21.2
894	2.7 + j2.3	1.4 – j0.2	409.1	74.5	21.3
925	3.3 + j2.3	1.2 – j0.4	404.1	73.7	21.2
942	3.7 + j2.3	1.4 – j0.6	449.0	73.0	20.8
960	4.1 + j2.0	1.3 – j0.6	426.6	72.1	20.7

7.3 Test circuit

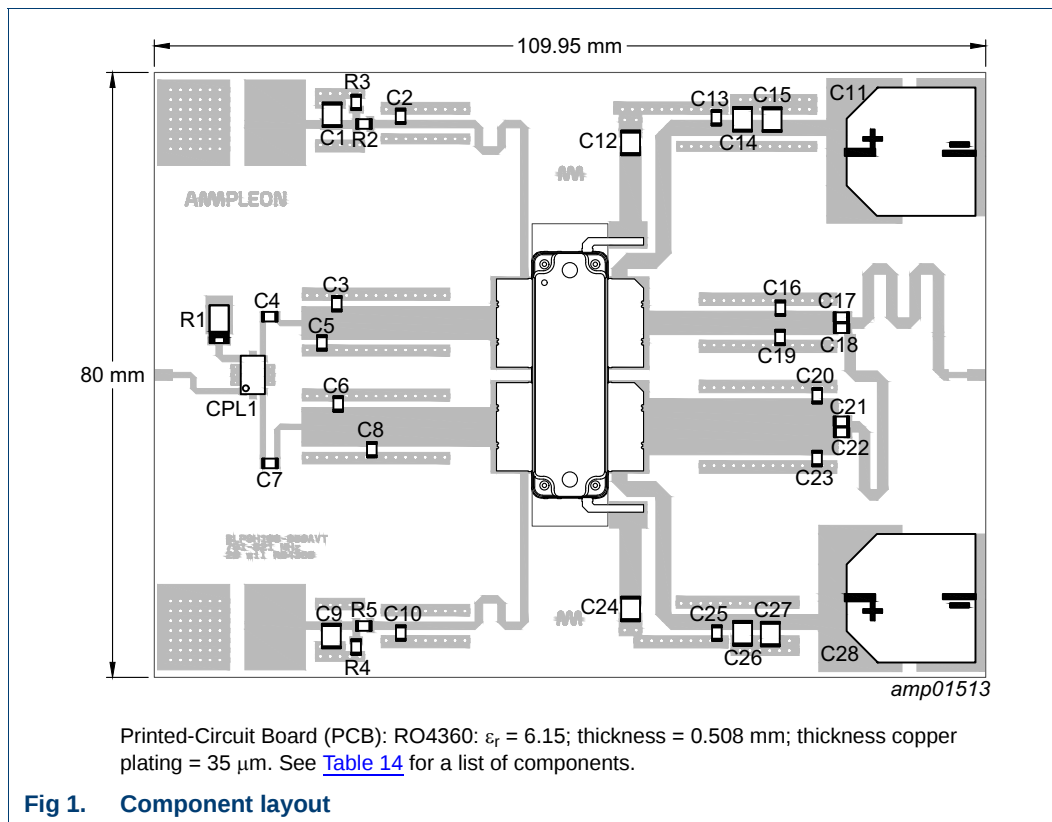


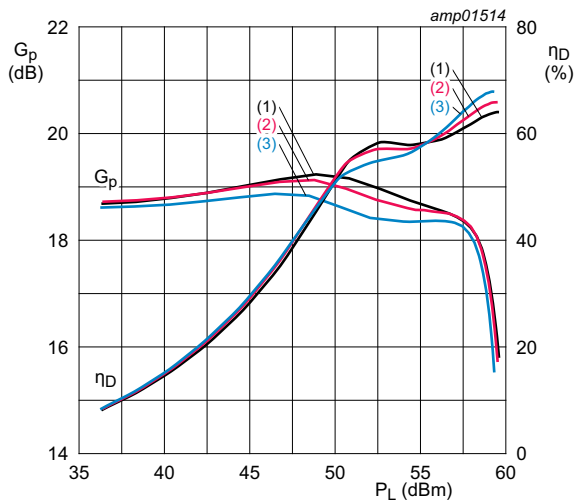
Table 14. List of components

See [Figure 1](#) for component layout.

Component	Description	Value	Remarks
C1, C9, C12, C14, C15, C24, C26, C27	multilayer ceramic chip capacitor	4.7 μF , 100 V	Murata: GCM32DC72A475KE02L
C2, C4, C7, C10, C13, C25	multilayer ceramic chip capacitor	68 pF	Murata: HiQ GQM21 0805
C3, C5	multilayer ceramic chip capacitor	1.5 pF	Murata: HiQ GQM21 0805
C6	multilayer ceramic chip capacitor	3 pF	Murata: HiQ GQM21 0805
C8, C16, C19	multilayer ceramic chip capacitor	2.2 pF	Murata: HiQ GQM21 0805
C11, C28	electrolytic capacitor	470 μF , 63 V	radial leaded
C17, C18	multilayer ceramic chip capacitor	4.3 pF	Murata: HiQ GQM21 0805
C20	multilayer ceramic chip capacitor	2.7 pF	Murata: HiQ GQM21 0805
C21, C22	multilayer ceramic chip capacitor	33 pF	Murata: HiQ GQM21 0805
C23	multilayer ceramic chip capacitor	1.6 pF	Murata: HiQ GQM21 0805
R1	resistor	50 Ω , 16 W	Anaren: C16A50Z4
R2, R5	resistor	4.7 Ω , 1 %	SMD 0805
R3, R4	resistor	10 k Ω , 1 %	SMD 0805
CPL1	hybrid coupler	2 dB, 90°	Anaren: X3C07F1-02S

7.4 Graphical data

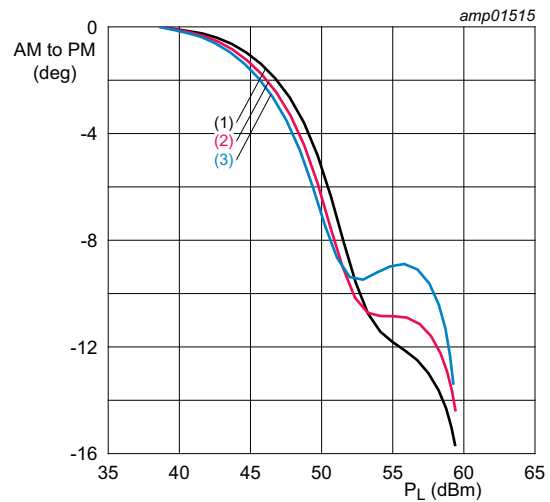
7.4.1 Pulsed CW



$V_{DS} = 48 \text{ V}$; $I_{DQ} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$;
 $t_p = 100 \text{ } \mu\text{s}$; $\delta = 10 \text{ } \%$.

- (1) $f = 791 \text{ MHz}$
- (2) $f = 805 \text{ MHz}$
- (3) $f = 821 \text{ MHz}$

Fig 2. Power gain and drain efficiency as function of output power; typical values



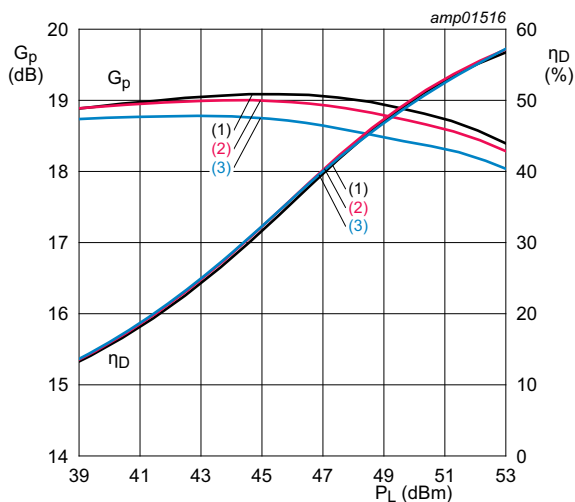
$V_{DS} = 48 \text{ V}$; $I_{DQ} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$;
 $t_p = 100 \text{ } \mu\text{s}$; $\delta = 10 \text{ } \%$.

- (1) $f = 791 \text{ MHz}$
- (2) $f = 805 \text{ MHz}$
- (3) $f = 821 \text{ MHz}$

Fig 3. Normalized AM to PM as a function of output power; typical values

7.4.2 1-Carrier W-CDMA

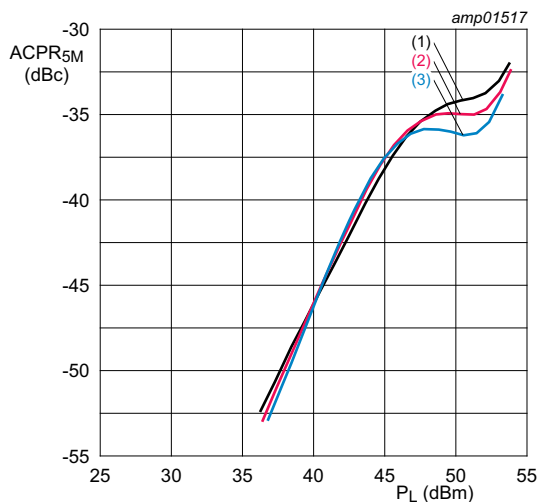
Test signal: 3GPP test model 1; 1 to 64 DPCH (100 % clipping); PAR = 9.9 dB at 0.01 % probability on CCDF per carrier.



$V_{DS} = 48 \text{ V}$; $I_{Dq} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$.

- (1) $f = 791 \text{ MHz}$
- (2) $f = 805 \text{ MHz}$
- (3) $f = 821 \text{ MHz}$

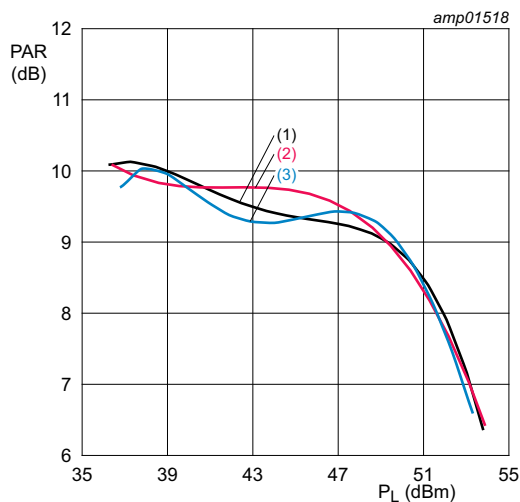
Fig 4. Power gain and drain efficiency as function of output power; typical values



$V_{DS} = 48 \text{ V}$; $I_{Dq} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$.

- (1) $f = 791 \text{ MHz}$
- (2) $f = 805 \text{ MHz}$
- (3) $f = 821 \text{ MHz}$

Fig 5. Adjacent channel power ratio (5 MHz) as a function of output power; typical values



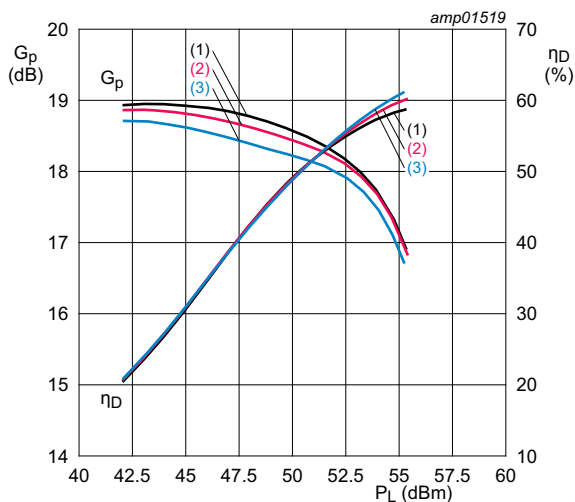
$V_{DS} = 48 \text{ V}$; $I_{Dq} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$.

- (1) $f = 791 \text{ MHz}$
- (2) $f = 805 \text{ MHz}$
- (3) $f = 821 \text{ MHz}$

Fig 6. Peak-to-average power ratio as a function of output power; typical values

7.4.3 2-Carrier W-CDMA

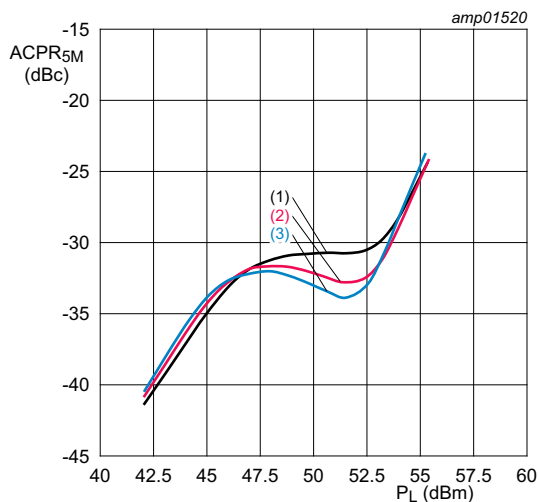
Test signal: 3GPP test model 1; 1 to 64 DPCH (46 % clipping); PAR = 9.9 dB at 0.01 % probability on CCDF per carrier.



$V_{DS} = 48 \text{ V}$; $I_{DQ} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$.

- (1) $f = 791 \text{ MHz}$
- (2) $f = 805 \text{ MHz}$
- (3) $f = 821 \text{ MHz}$

Fig 7. Power gain and drain efficiency as function of output power; typical values

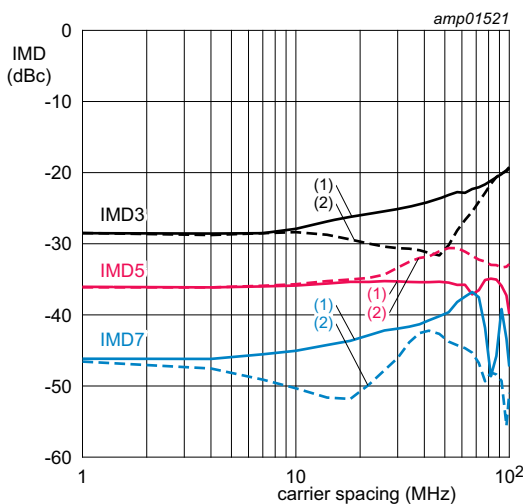


$V_{DS} = 48 \text{ V}$; $I_{DQ} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$.

- (1) $f = 791 \text{ MHz}$
- (2) $f = 805 \text{ MHz}$
- (3) $f = 821 \text{ MHz}$

Fig 8. Adjacent channel power ratio (5 MHz) as a function of output power; typical values

7.4.4 2-Tone VBW

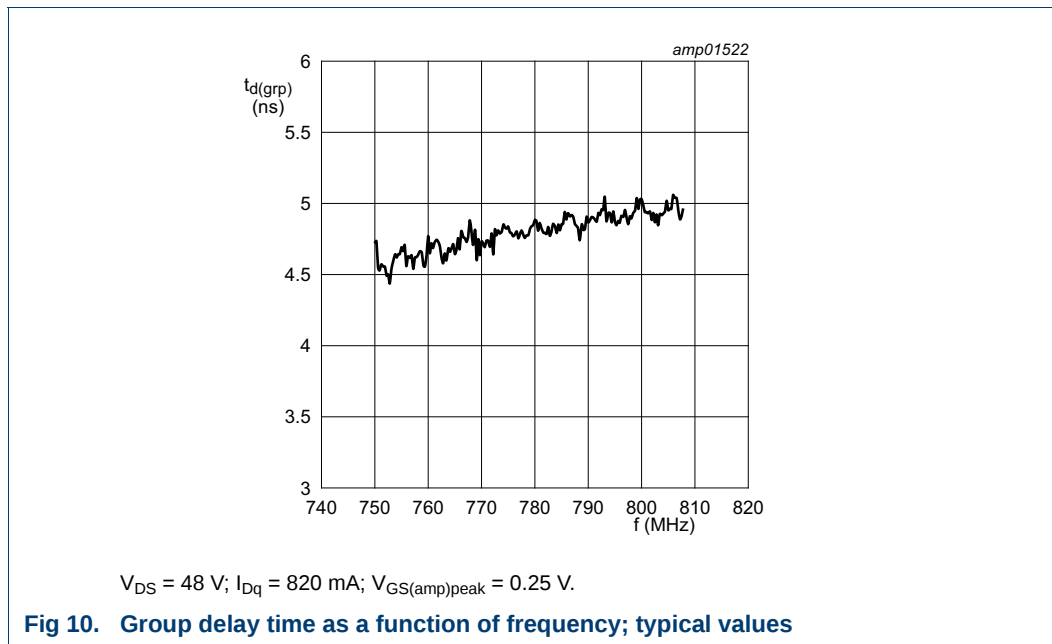


$V_{DS} = 48 \text{ V}$; $I_{DQ} = 820 \text{ mA}$; $V_{GS(amp)peak} = 0.25 \text{ V}$.

- (1) IMD low
- (2) IMD high

Fig 9. VBW capability

7.4.5 Group delay



8. Package outline

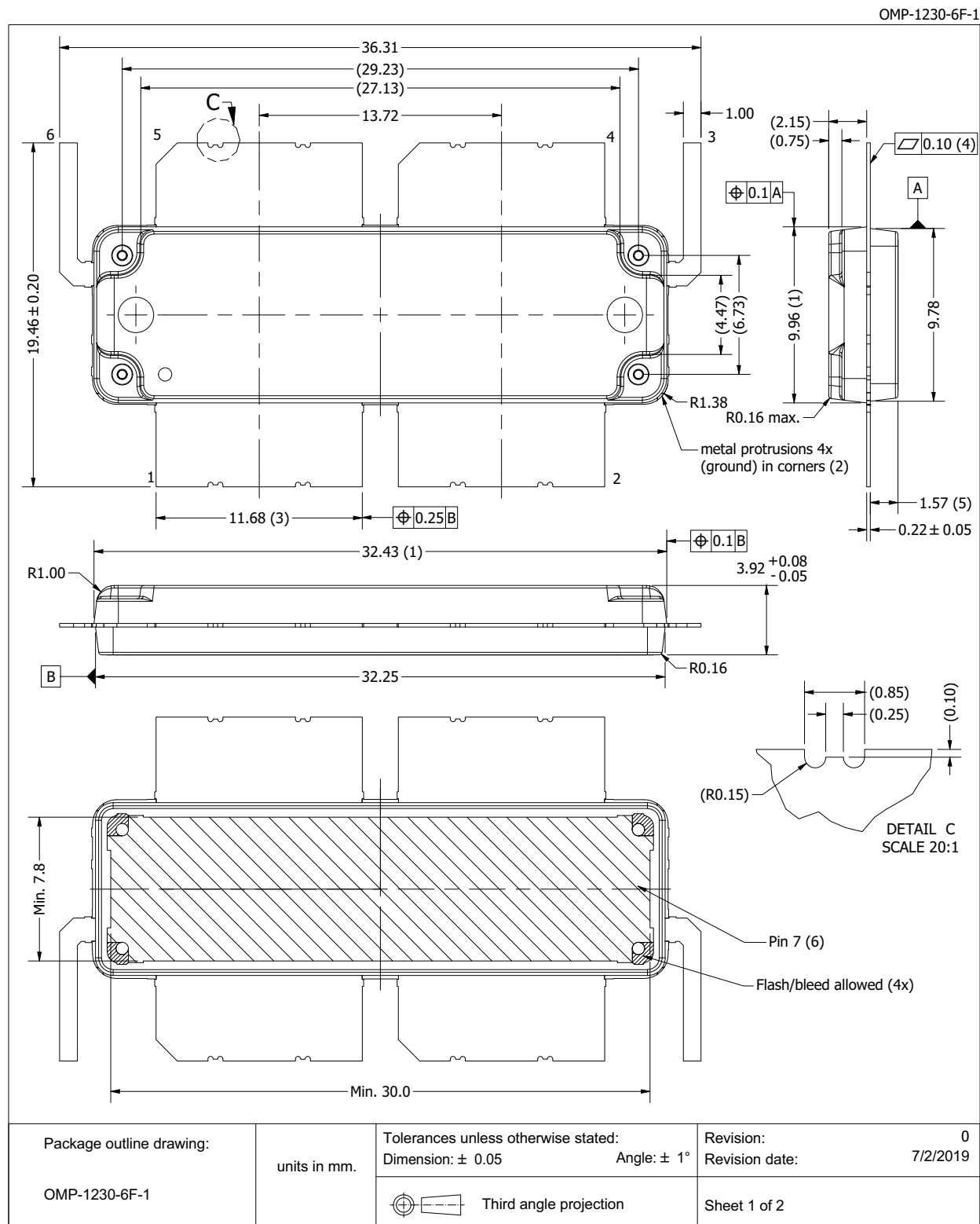


Fig 11. Package outline OMP-1230-6F-1 (sheet 1 of 2)

OMP-1230-6F-1

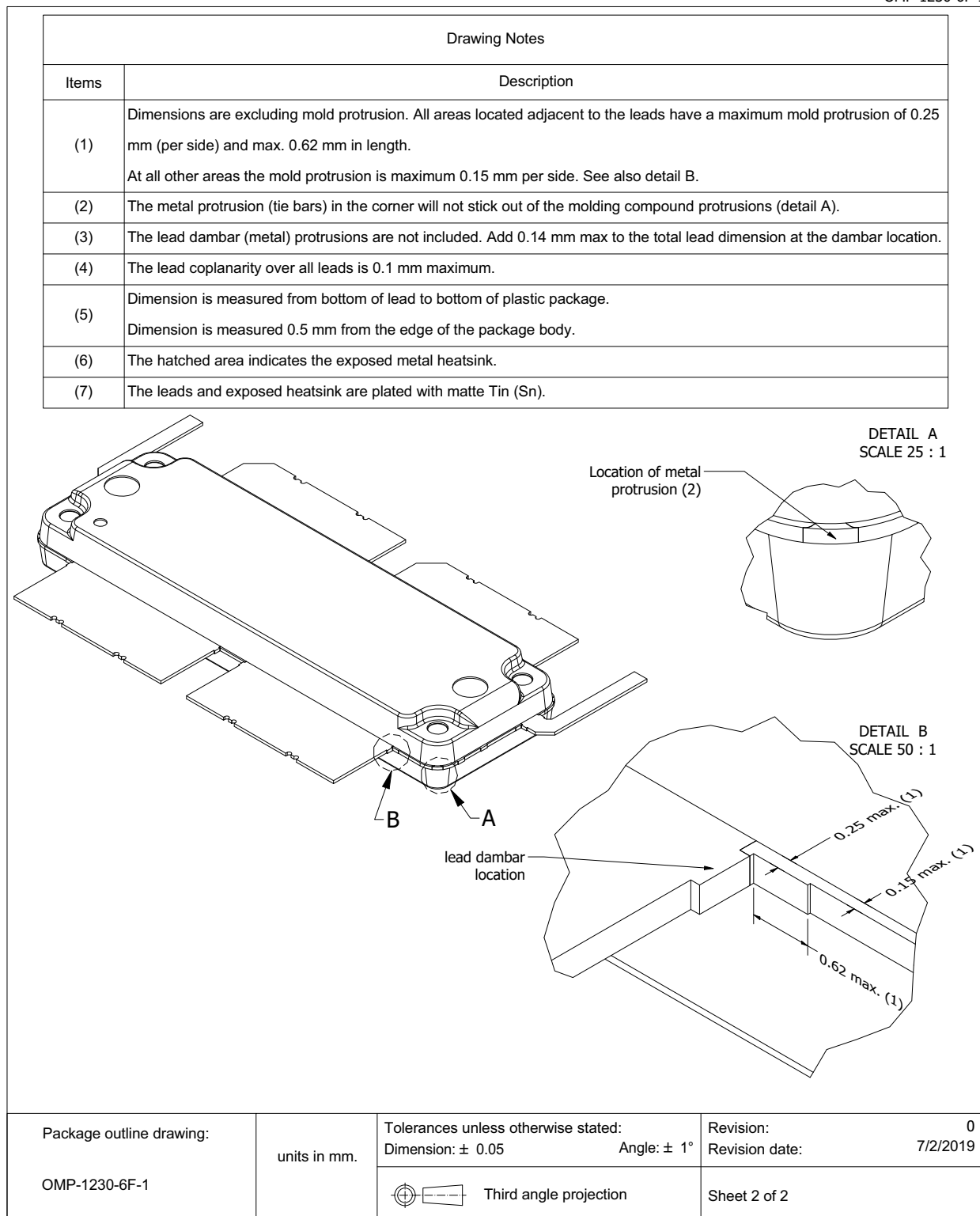


Fig 12. Package outline OMP-1230-6F-1 (sheet 2 of 2)

9. Handling information

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

Table 15. ESD sensitivity

ESD model	Class
Charged Device Model (CDM); According to ANSI/ESDA/JEDEC standard JS-002	C3 [1]
Human Body Model (HBM); According to ANSI/ESDA/JEDEC standard JS-001	2 [2]

[1] CDM classification C3 is granted to any part that passes after exposure to an ESD pulse of 1000 V.

[2] HBM classification 2 is granted to any part that passes after exposure to an ESD pulse of 2000 V.

10. Abbreviations

Table 16. Abbreviations

Acronym	Description
3GPP	3rd Generation Partnership Project
AM	Amplitude Modulation
CCDF	Complementary Cumulative Distribution Function
CW	Continuous Wave
DPCH	Dedicated Physical Channel
ESD	ElectroStatic Discharge
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
MTF	Median Time to Failure
OBO	Output Back Off
PAR	Peak-to-Average Ratio
PM	Phase Modulation
RoHS	Restriction of Hazardous Substances
SMD	Surface Mounted Device
VBW	Video BandWidth
VSWR	Voltage Standing Wave Ratio
W-CDMA	Wideband Code Division Multiple Access

11. Revision history

Table 17. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLP9H10S-850AVT v.1	20220525	Product data sheet	-	-

12. Legal information

12.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.ampleon.com>.

12.2 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.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Ampleon sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between Ampleon and its customer, unless Ampleon and customer have explicitly agreed otherwise in writing. An agreement according to which the functions and qualities of Ampleon products exceed those described in the Product data sheet is invalid.

12.3 Disclaimers

Maturity — After the relevant product(s) have passed the Release Gate in Ampleon's release process, Ampleon will confirm the final version in writing.

Limited warranty and liability — Ampleon uses its best efforts to keep the information in this document accurate and reliable. However, Ampleon gives no representations or warranties, expressed or implied, as to the accuracy or completeness of such information and assumes no liability for the consequences of the use of such information. Ampleon is not liable for content provided by an external information source.

In no event and irrespective of the legal basis (contract, tort (including negligence) statutory liability, misrepresentation, indemnity or any other area of law) shall Ampleon be liable for any indirect, incidental, punitive, special or consequential damages (including but without limitation loss of profit or revenue, loss of use or loss of production, loss of data, cost of capital, cost of substitute goods, property damage external to the Ampleon products and any damage, expenditure or loss arising out of such damage, business interruption, costs related to the removal or replacement of any products or rework charges) or any of the foregoing suffered by any third party.

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 change information including but without limitation specifications and product descriptions published in this document at any time and without notice. This document supersedes and replaces all information regarding these products 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. Insofar as a customer or another party nevertheless uses Ampleon products unlawfully for such purposes, Ampleon and its suppliers are not liable for any damages.

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 is not liable 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 shall provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

Ampleon is not liable 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 and shall do 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 is not liable in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not guaranteed. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — Ampleon products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.ampleon.com/terms>, unless otherwise agreed in a valid written individual agreement. In the event of signing an individual agreement the terms and conditions of the respective agreement shall apply. Ampleon hereby expressly objects to and rejects the validity of customer's terms and conditions regarding the purchase of Ampleon products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

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.

Non-automotive qualified products — Unless this data sheet expressly states that this specific Ampleon product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. Ampleon is not liable for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer breaches this and uses the products for design and use in automotive applications in accordance with automotive specifications and standards, (a) Ampleon gives no warranty, representation

or other guarantees of any kind with respect to such automotive applications, use and specifications, and (b) such use is solely and exclusively at customer's own risk, and (c) customer fully indemnifies Ampleon against any and all liability, damages or failed product claims, including against third parties, arising out of customer's design and use of the product for automotive applications.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

12.4 Trademarks

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

13. Contact information

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

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

14. Contents

1	Product profile	1
1.1	General description	1
1.2	Features and benefits	2
1.3	Applications	2
2	Pinning information	2
3	Ordering information	2
4	Limiting values	2
5	Thermal characteristics	3
6	Characteristics	3
7	Test information	4
7.1	Ruggedness in Doherty operation	4
7.2	Impedance information	4
7.3	Test circuit	7
7.4	Graphical data	8
7.4.1	Pulsed CW	8
7.4.2	1-Carrier W-CDMA	9
7.4.3	2-Carrier W-CDMA	10
7.4.4	2-Tone VBW	10
7.4.5	Group delay	11
8	Package outline	12
9	Handling information	14
10	Abbreviations	14
11	Revision history	14
12	Legal information	15
12.1	Data sheet status	15
12.2	Definitions	15
12.3	Disclaimers	15
12.4	Trademarks	16
13	Contact information	16
14	Contents	17

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

© Ampleon Netherlands B.V. 2022.

All rights reserved.

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

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

Date of release: 25 May 2022

Document identifier: BLP9H10S-850AVT