



DB-84008L-512

Demonstration board based on the PD84008L-E
for UHF 2-way radio

Features

- Excellent thermal stability
- Frequency: 380 - 512 MHz
- Supply voltage: 7.2 V
- Output power: > 6 W
- Power gain: 11.7 ± 0.5 dB
- Efficiency: 46 % - 71 %
- Load mismatch: 20:1 all phases
- BeO-free amplifier

Description

The DB-84008L-512 is a demonstration board using PD84008L-E LDMOS transistor and designed for UHF 2-way portable radio.

For additional informations on PD84008L-E please refer to its relevant datasheet.

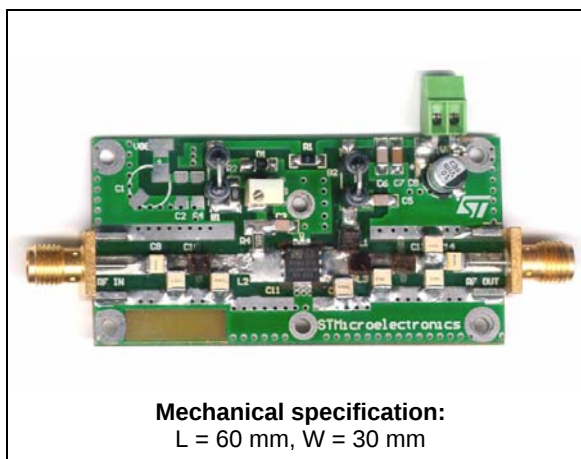


Table 1. Device summary

Order code
DB-84008L-512

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1 Electrical data

1.1 Maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DD}	Supply voltage	16	V
I_D	Drain current	2.5	A
T_{CASE}	Operating case temperature	-20 to +85	°C
T_A	Maximum ambient temperature	+55	°C

2 Electrical characteristics

$T_A = +25\text{ }^{\circ}\text{C}$, $V_{DD} = 7.2\text{ V}$, $I_{dq} = 200\text{ mA}$

Table 3. Electrical specification

Symbol	Test conditions	Min	Typ	Max	Unit
Freq	Frequency range	380		512	MHz
P_{OUT}	@ $P_{IN} = 27\text{ dBm}$	6			W
Gain	@ $P_{IN} = 27\text{ dBm}$		11.7 ± 0.5		dB
ND	@ $P_{IN} = 27\text{ dB}$		46 - 71		%
H2	2nd harmonic @ $P_{IN} = 27\text{ dB}$		-38 / -70		dBc
H3	3rd harmonic @ $P_{IN} = 27\text{ dB}$		-60 / -70		dBc
VSWR	Load mismatch all phases @ $P_{OUT} = 6\text{ W}$			20:1	

3 Impedance

Figure 1. Impedance graphic

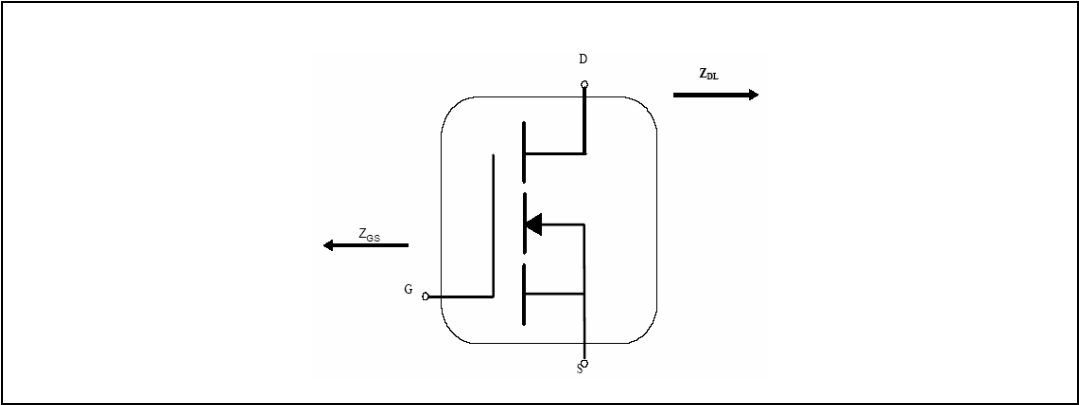


Table 4. Impedance data

F(MHz)	Z_{GS}	Z_{DL}
380	$3,3 + j6,2$	$2,2 - j0,7$
390	$3,6 + j6,7$	$2,2 - j0,4$
400	$4,1 + j7,1$	$2,2 - j0,1$
410	$4,6 + j7,4$	$2,2 + j0,2$
420	$5,3 + j7,5$	$2,2 + j0,5$
430	$6,2 + j7,3$	$2,3 + j0,8$
440	$6,8 + j6,6$	$2,4 + j1,0$
450	$7,0 + j5,4$	$2,4 + j1,3$
460	$6,4 + j4,2$	$2,6 + j1,5$
470	$5,2 + j3,6$	$2,7 + j1,6$
480	$3,9 + j3,7$	$2,8 + j1,7$
490	$2,8 + j4,2$	$2,9 + j1,8$
500	$2,1 + j4,9$	$3,0 + j1,9$
510	$1,6 + j5,6$	$3,1 + j1,8$
520	$1,3 + j6,3$	$3,2 + j1,7$

4 Typical performances

Figure 2. Outpower and efficiency vs. frequency (pin=27 dBm)

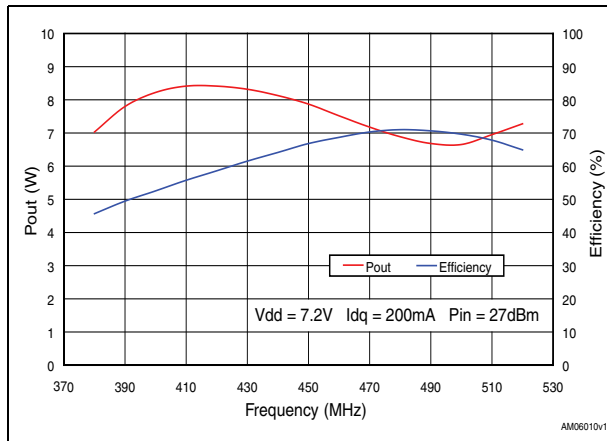


Figure 3. Output power and efficiency vs. frequency (pin=28 dBm)

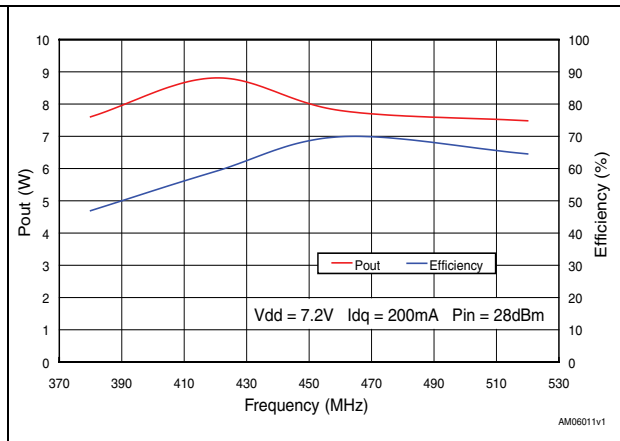


Figure 4. Gain vs. frequency

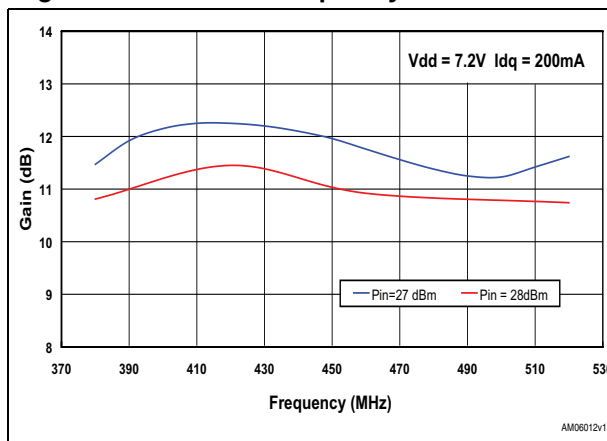


Figure 5. Gain vs. Pout

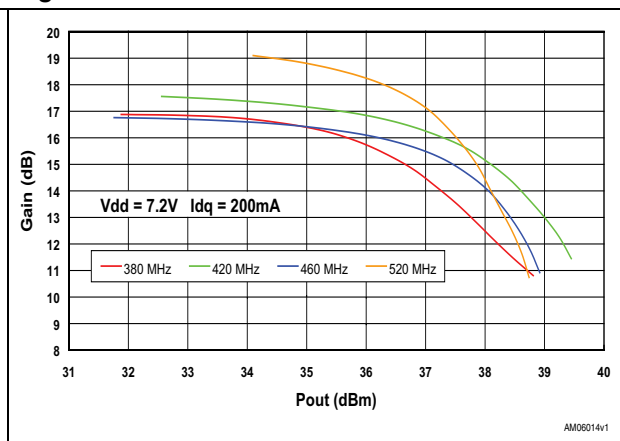


Figure 6. Input return loss vs. frequency

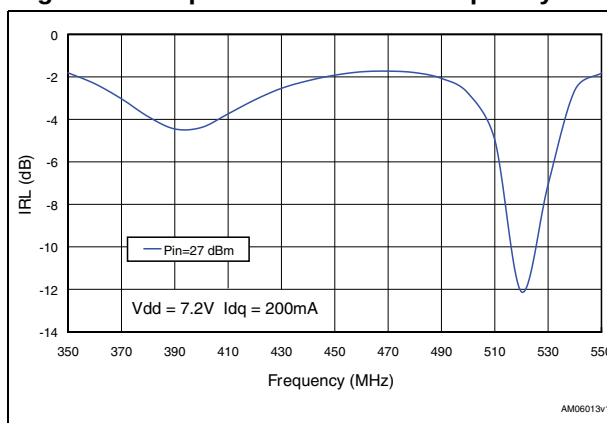


Figure 7. Drain current vs. output power

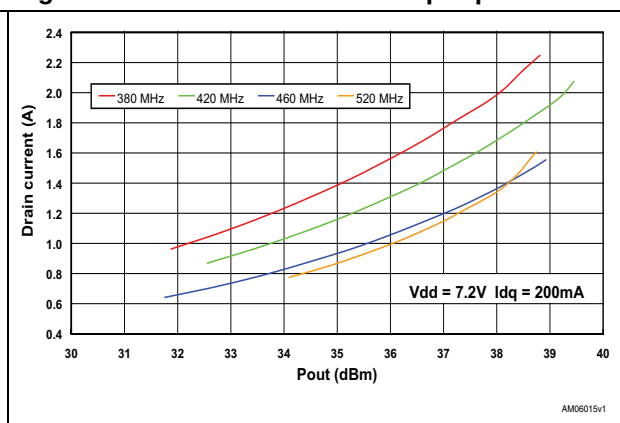
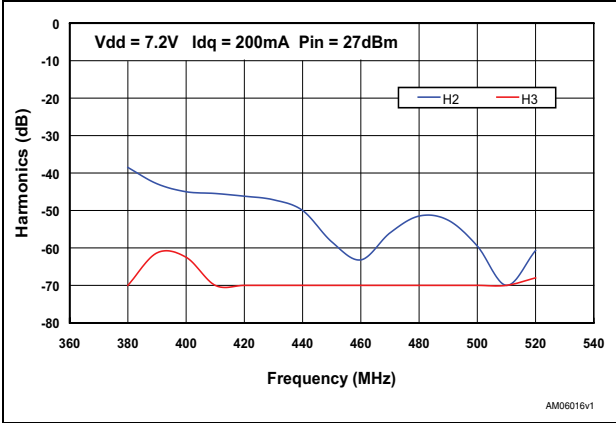


Figure 8. Harmonics vs. frequency



5 Test circuit

Figure 9. Test circuit schematic

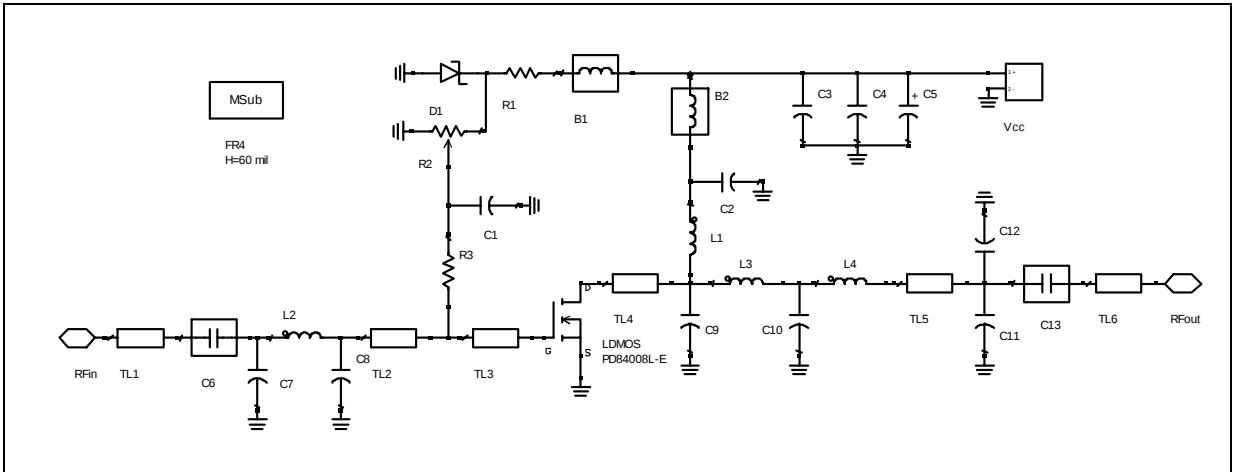


Table 5. Component part list

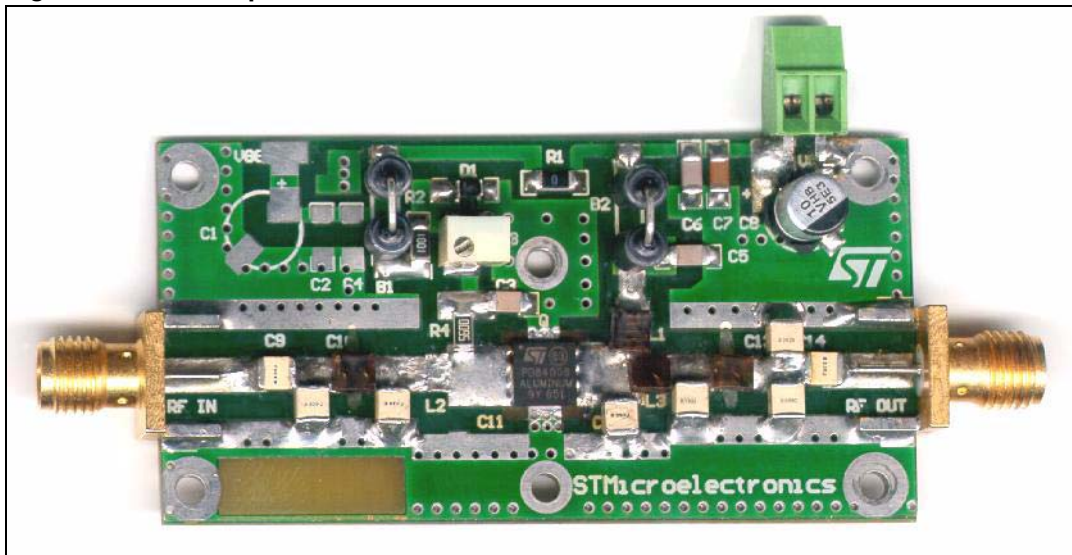
Component ID	Description	Value	Case size	Manufacturer	Part code
B1	Ferrite bead			PANASONIC	EXCELDRC35C
B2				PANASONIC	EXCELDRC35C
C1, C2	Capacitor	120 pF	1206	MURATA	GRM42-6 COG 121J 50_
C3		1 nF	1206	MURATA	GRM42-6 COG 102J 50
C4		100 nF	1206	MURATA	GRM42-6_X7R 104K 50_
C5		10 uF	SMT	PANASONIC	EEVHB1V100P
C6, C13		33 pF	100B	ATC	ATC 100B 330JW
C7		22 pF	100B	ATC	ATC 100B 220JW
C8		47 pF	100B	ATC	ATC 100B 470JW
C9		39 pF	100B	ATC	ATC 100B 390JW
C10		15 pF	100B	ATC	ATC 100B 150JW
C11		6.8 pF	100B	ATC	ATC 100B 6R8BW
C12		2.2 pF	100B	ATC	ATC 100B 2R2BW
D1	Zener diode	5.1 V	SOD110	PHILIPS	BZX284C5V1
L1	Inductor	18.5 nH		COILCRAFT	A05T
L2		5 nH		COILCRAFT	A02T
L3, L4		2.5 nH		COILCRAFT	A01T
R1	Resistor	1 KΩ	1206	TYCO ELECTRONICS	01623440-1

Table 5. Component part list (continued)

Component ID	Description	Value	Case size	Manufacturer	Part code
R2	Potentiometer	10 K Ω		BOURNS ELECTRONICS	3214W-1-103E
R3	Resistor	560 Ω	1206	BOURNS ELECTRONICS	
TL1	Transmission line	W=2.87 mm	L=7.4 mm		
TL2		W=2.87 mm	L=5.0 mm		
TL3		W=4.98 mm	L=4.8 mm		
TL4		W=4.98 mm	L=4.0 mm		
TL5		W=2.87 mm	L=1.5 mm		
TL6		W=2.87 mm	L=6.1 mm		
PD84008L	LDMOS			STMicroelectronics	PD84008L-E
Board	FR-4 THk=0.060" 2OZ Cu both sides				

6 Circuit photo

Figure 10. Circuit photo



7 Revision history

Table 6. Document revision history

Date	Revision	Changes
16-Nov-2009	1	Initial release

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