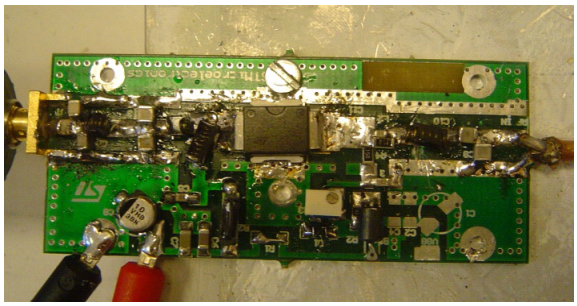
DB-55015-165

RF POWER amplifier using 1 x PD55015 N-Channel enhancement-mode lateral MOSFETs

General feature

- Excellent thermal stability
- Frequency: 155 - 165 MHz
- Supply voltage: 20V
- Output power: 30W
- Power gain: 14.7 ± 0.3 dB
- Efficiency: 60% - 72%
- Load mismatch: 20:1
- Beo free amplifier



Mechanical specification:
L = 60 mm, W = 30 mm

Description

The DB-55015-165 is a common source N-Channel Enhancement-Mode Lateral Field Effect RF power amplifier designed for VHF Marine Radio applications.

Order Code

- DB-55015-165

Contents

1 Electrical data

1.1 Maximum ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V_{DD}	Supply voltage	24	V
I_D	Drain current	3	A
P_{DISS}	Power dissipation	25	W
T_{CASE}	Operating case temperature	-20 to +85	°C
T_A	Max. ambient temperature	55	°C

2 Electrical characteristics

T_A = +25 °C, V_{DD} = 20V, I_{DQ} = 150 mA

Table 2. Electrical specification

Symbol	Test conditions	Min.	Typ.	Max.	Unit
Freq	Frequency range	155		165	MHz
P_{OUT}			30		W
Gain	@ P_{OUT} = 30W		14.7		dB
ND	@ P_{OUT} = 30W	60			%
Gain Flatness	@ P_{OUT} = 30W			±0.3	dB
H2	2^{ND} Harmonic @ P_{OUT} = 30W		-29	-25	dBc
H3	3^{RD} Harmonic @ P_{OUT} = 30W		-52	-50	dBc
VSWR	Load mismatch all phases @ P_{OUT} = 30W			20:1	

3 Typical performance

Figure 1. P_{OUT} vs. pin & frequency

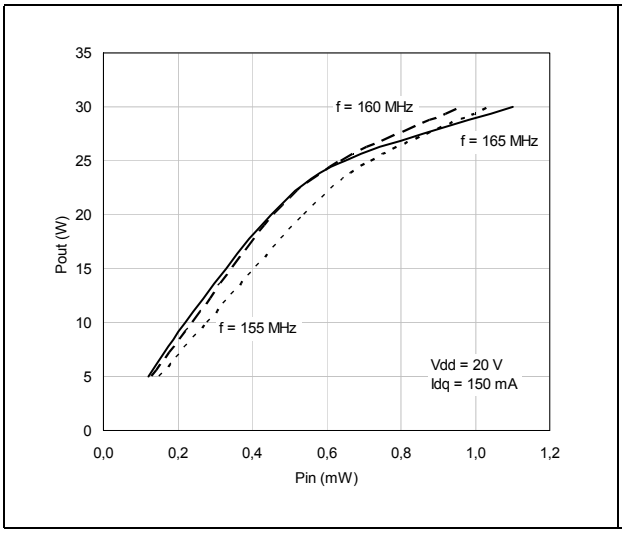


Figure 2. Efficiency vs. P_{OUT} & frequency

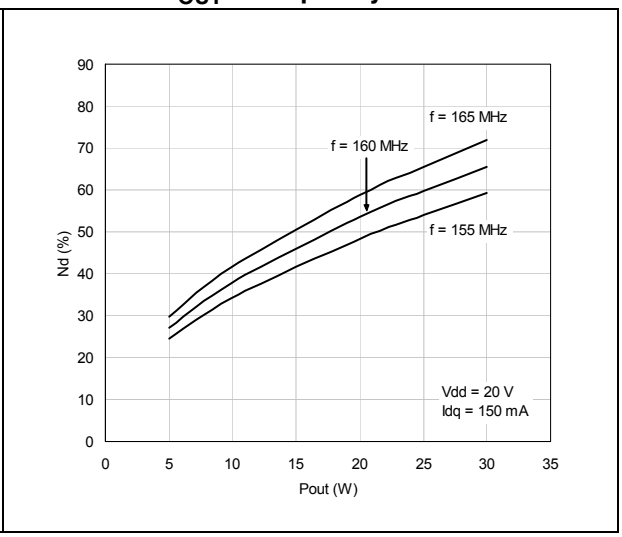


Figure 3. Gain vs. P_{OUT} & frequency

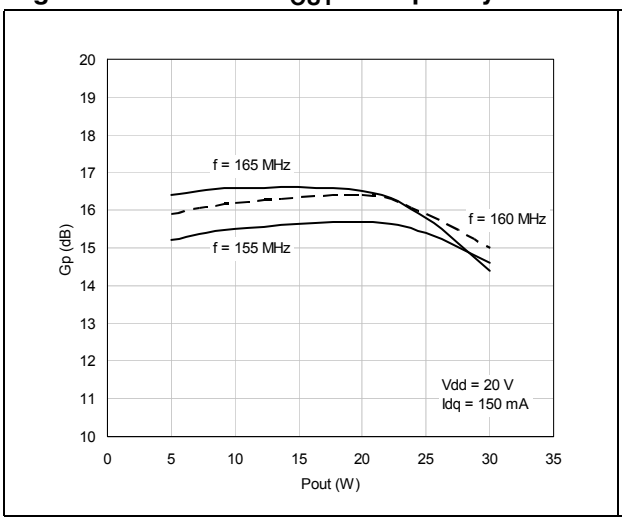


Figure 4. Harmonics vs. frequency

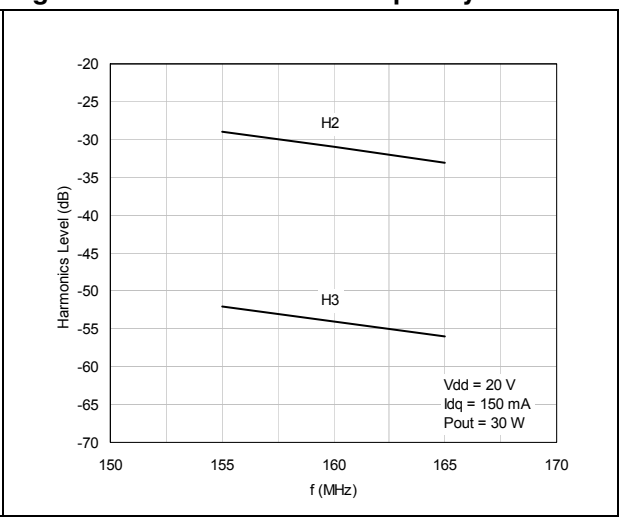


Figure 5. P_{OUT} & current vs. drain voltage

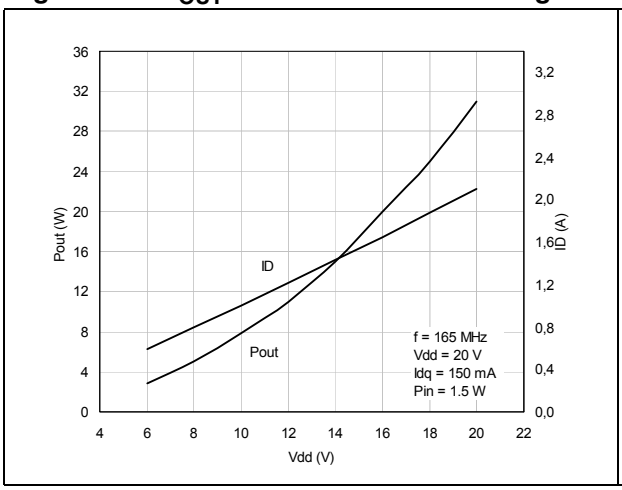


Figure 6. P_{OUT} & current vs. drain voltage

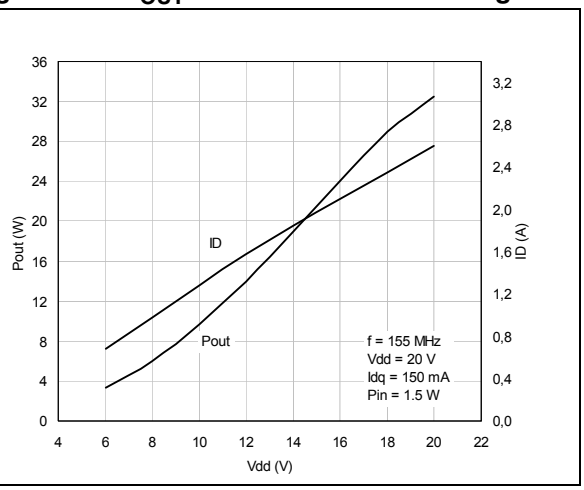


Figure 7. P_{OUT} vs. pin & frequency

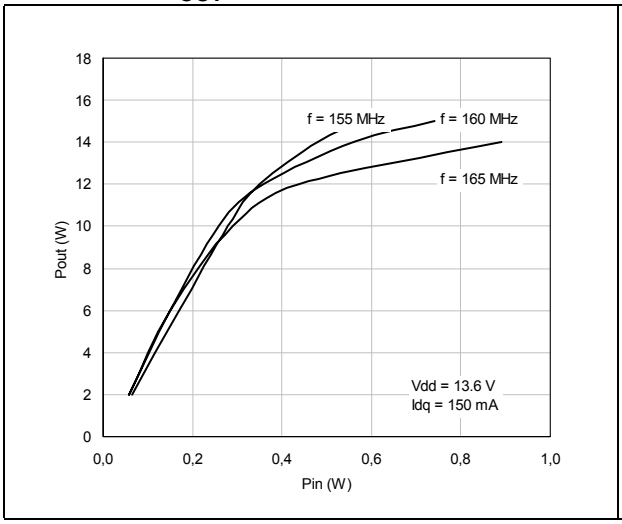


Figure 8. Efficiency vs. P_{OUT} & frequency

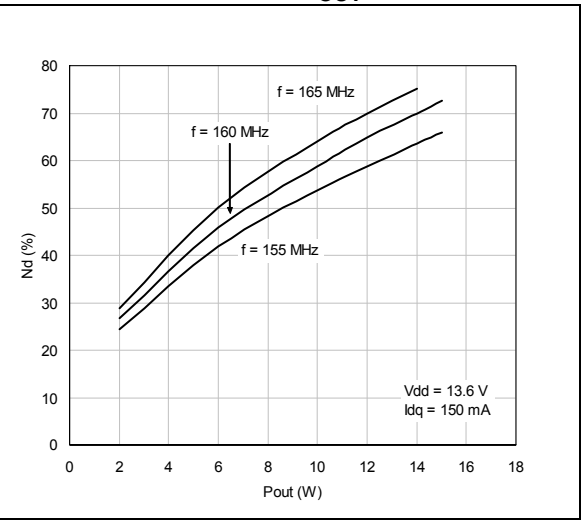


Figure 9. Gain vs. P_{OUT} & frequency

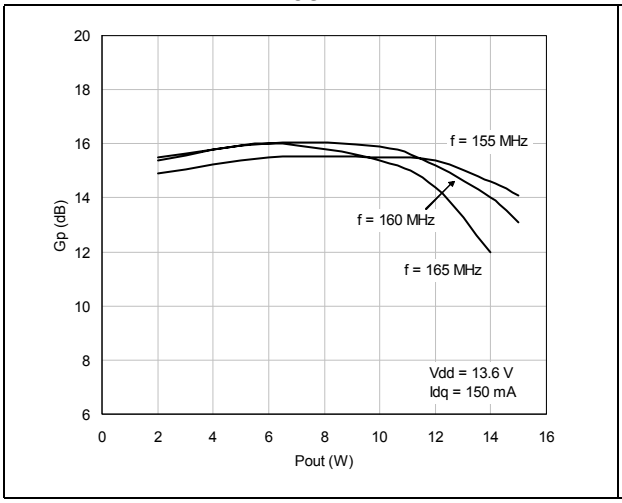
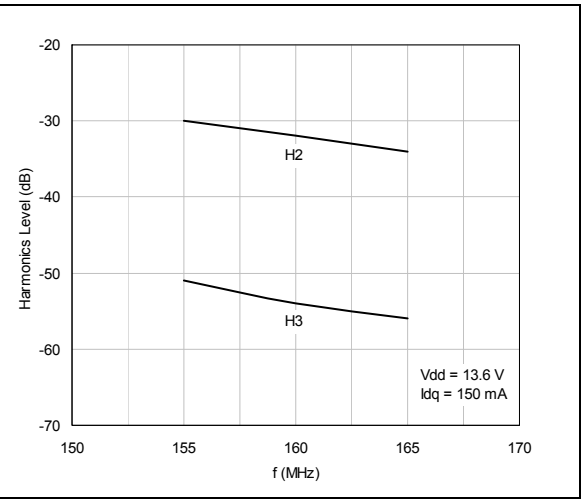
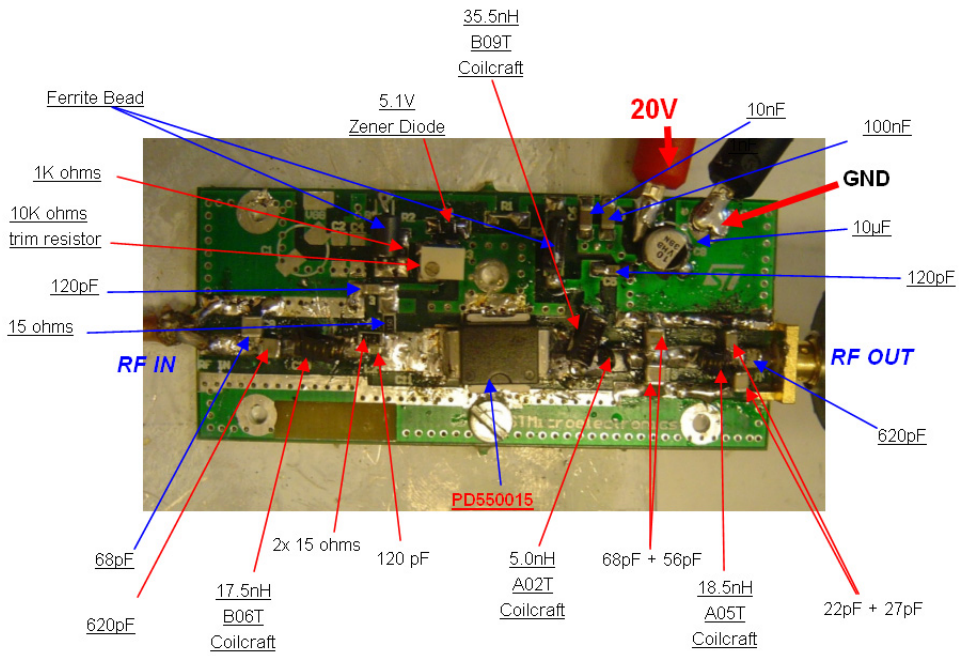


Figure 10. Harmonics vs. frequency



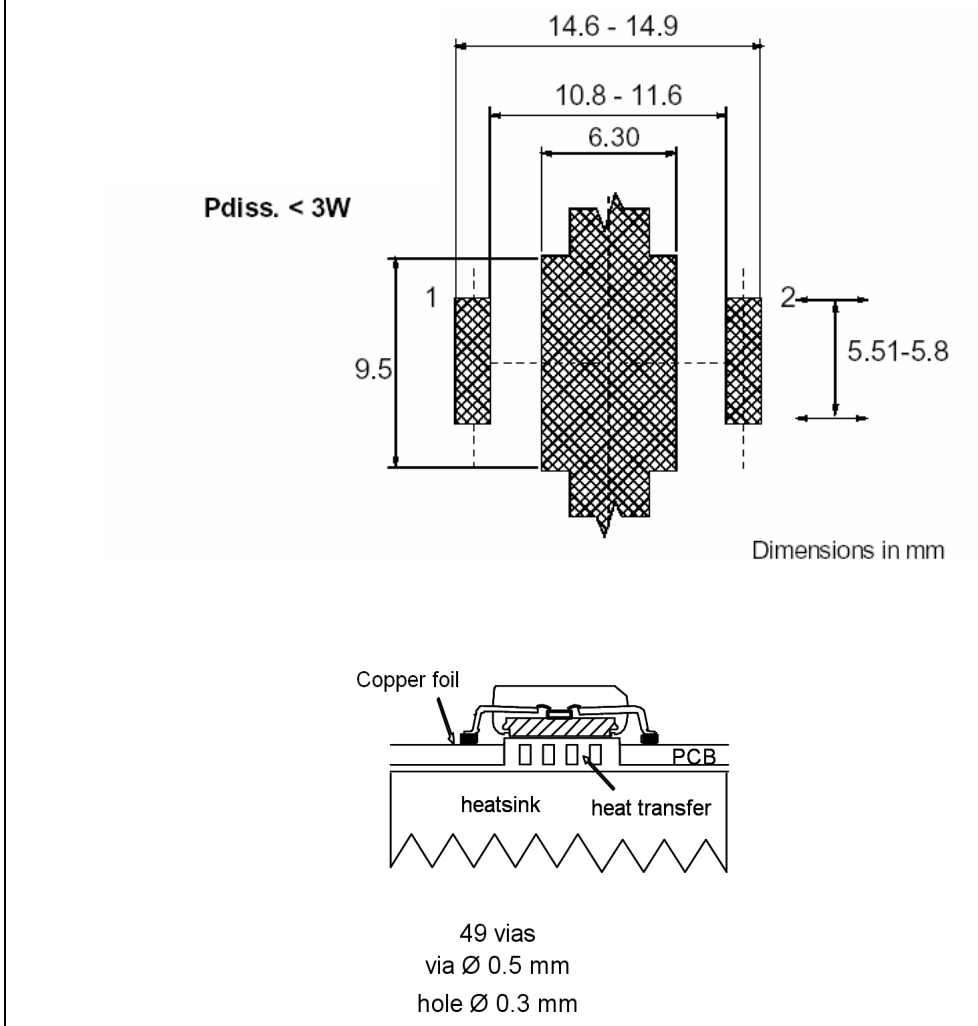
4 Circuit layout

Figure 11. Circuit layout



5 Mounting indications

Figure 12. PowerSO-10 Mounting indications



6 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

Table 3. PowerSO-10RF Formed lead (Gull Wing) Mechanical data

Dim.	mm.			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A1	0	0.05	0.1	0.	0.0019	0.0038
A2	3.4	3.5	3.6	0.134	0.137	0.142
A3	1.2	1.3	1.4	0.046	0.05	0.054
A4	0.15	0.2	0.25	0.005	0.007	0.009
a		0.2			0.007	
b	5.4	5.53	5.65	0.212	0.217	0.221
c	0.23	0.27	0.32	0.008	0.01	0.012
D	9.4	9.5	9.6	0.370	0.374	0.377
D1	7.4	7.5	7.6	0.290	0.295	0.298
E	13.85	14.1	14.35	0.544	0.555	0.565
E1	9.3	9.4	9.5	0.365	0.37	0.375
E2	7.3	7.4	7.5	0.286	0.292	0.294
E3	5.9	6.1	6.3	0.231	0.24	0.247
F		0.5			0.019	
G		1.2			0.047	
L	0.8	1	1.1	0.030	0.039	0.042
R1			0.25			0.01
R2		0.8			0.031	
T	2 deg	5 deg	8 deg	2 deg	5 deg	8 deg
T1		6 deg			6 deg	
T2		10 deg			10 deg	

Note: Resin protrusions not included (max value: 0.15 mm per side)

Package dimensions

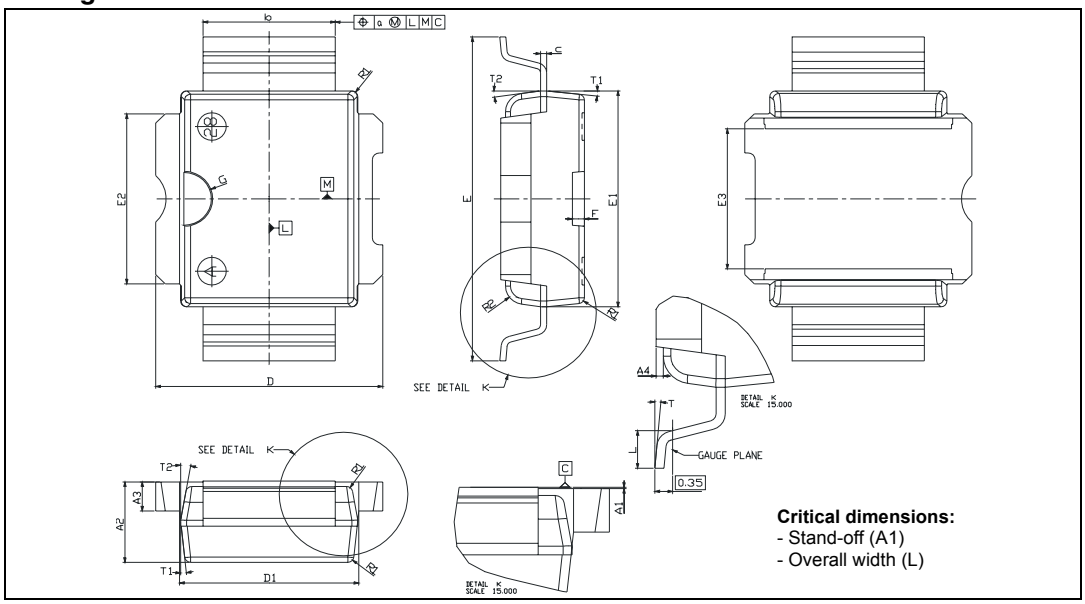
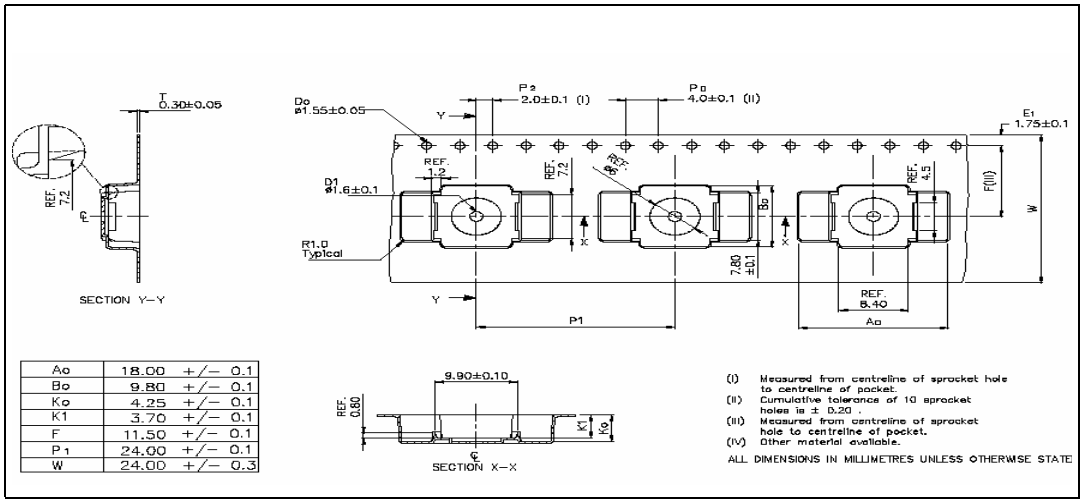


Figure 13. PowerSO-10RF Tape & reel



Ao	18.00	+/– 0.1
Bo	9.80	+/– 0.1
Ko	4.25	+/– 0.1
K1	3.70	+/– 0.1
F	11.50	+/– 0.1
P1	24.00	+/– 0.1
W	24.00	+/– 0.3

7 Revision history

Table 4. Revision history

Date	Revision	Changes
12-Dec-2006	1	Initial release.

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