STAC4932F

RF power transistors
HF/VHF/UHF N-channel MOSFETs

Preliminary data

Features

- Excellent thermal stability
- Common source push-pull configuration
- P_{OUT} = 1000 W min. (1200 W typ.) with 26 dB gain @ 123 MHz
- Pulse conditions: 1 msec - 10%
- In compliance with the 2002/95/EC European directive
- ST air cavity packaging technology - STAC® package

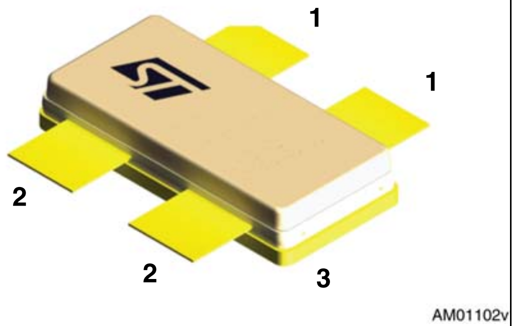
STAC244F
Air cavity

Description

The STAC4932F is a N-channel MOS field-effect RF power transistor. It is intended for 100 V pulse applications up to 250 MHz. This device is suitable for use in industrial, scientific and medical applications.

The STAC4932B benefits from the latest generation of efficient, patent-pending package technology, otherwise known as STAC®.

Figure 1. Pin connection



1. Drain
2. Gate
3. Source (Bottom side)

Table 1. Device summary

Order code	Marking	Package	Packaging
STAC4932F	STAC4932F	STAC244F	Plastic tray

Contents

1 Electrical data

1.1 Maximum ratings

Table 2. Absolute maximum ratings (T_{CASE} = 25°C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$[1]	Drain source voltage	200	V
V_{DGR}	Drain-gate voltage (R_{GS} = 1 MΩ)	200	V
V_{GS}	Gate-source voltage	±20	V
T_J	Max. operating junction temperature	200	°C
T_{STG}	Storage temperature	-65 to +150	°C

1. T_J = 150 °C

1.2 Thermal data

Table 3. Thermal data (1 msec - 10%)

Symbol	Parameter	Value	Unit
R_{thJC}	Junction - case thermal resistance	0.075	°C/W

2 Electrical characteristics

T_{CASE} = +25 °C

2.1 Static

Table 4. Static (per side)

Symbol	Test conditions			Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$[1]	V_{GS} = 0 V	I_{DS} = 100 mA		200	250		V
I_{DSS}	V_{GS} = 0 V	V_{DS} = 100 V				1	mA
I_{GSS}	V_{GS} = 20 V	V_{DS} = 0 V				250	nA
V_{TH}	I_D = 250 mA			2.0		4.0	V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 10 A				3.6	V
G_{FS}	V_{DS} = 10 V	I_D = 2.5 A			6		S
C_{ISS}	V_{GS} = 0 V	V_{DS} = 100 V	f = 1 MHz		570		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 100 V	f = 1 MHz		134		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 100 V	f = 1 MHz		8		pF

1. T_J = 150 °C

2.2 Dynamic

Table 5. Pulse / 1 mec - 10 %

Symbol	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	V_{DD} = 100 V, I_{DQ} = 2 x 250 mA, f = 123 MHz	1000	1200	-	W
h_D	V_{DD} = 100 V, I_{DQ} = 2 x 250 mA, P_{OUT} = 1000 W, f = 123 MHz		60	-	%
Gain	V_{DD} = 100 V, I_{DQ} = 2 x 250 mA, P_{OUT} = 1000 W, f = 123 MHz		26	-	dB

3 Impedance

Figure 2. Current conventions

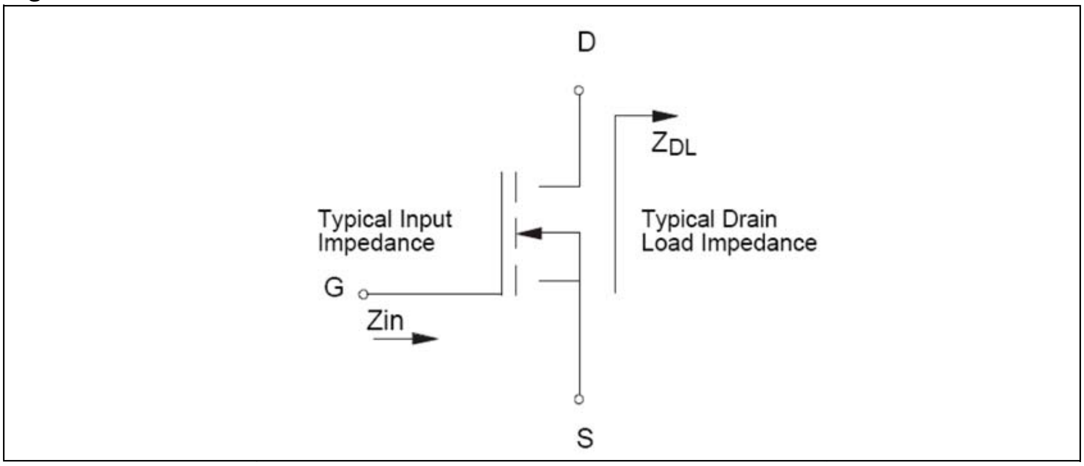


Table 6. Impedance data

Freq. (MHz)	Z_{IN} (Ω)	Z_{DL}(Ω)
123 MHz (Pulse)	TBD	TBD

Note: Measured gate to gate and drain to drain, respectively.

4 Typical performances

Figure 3. Maximum safe operating area

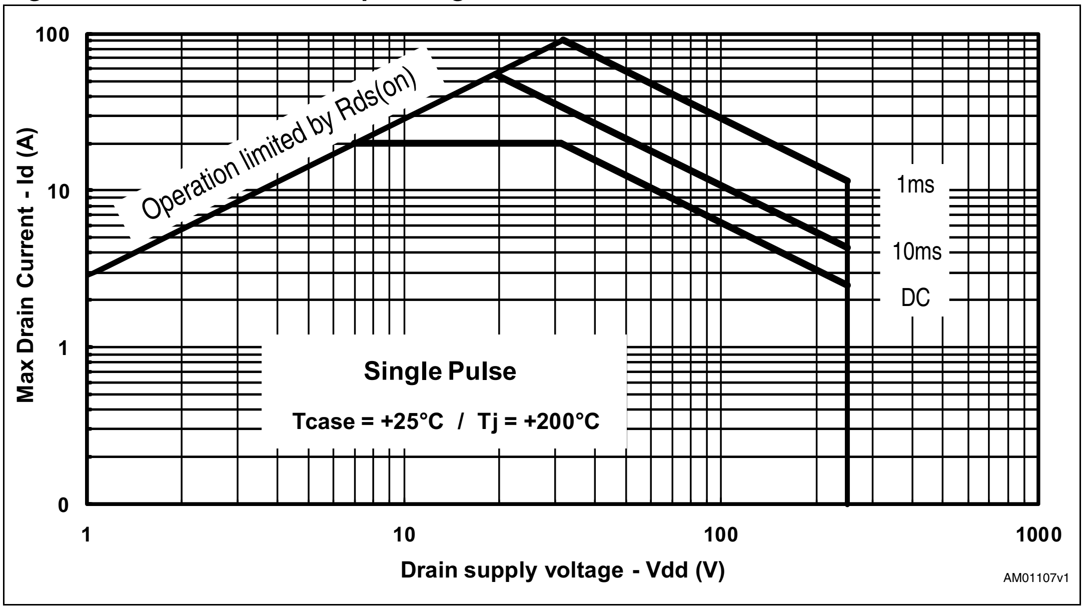


Figure 4. Transient thermal impedance

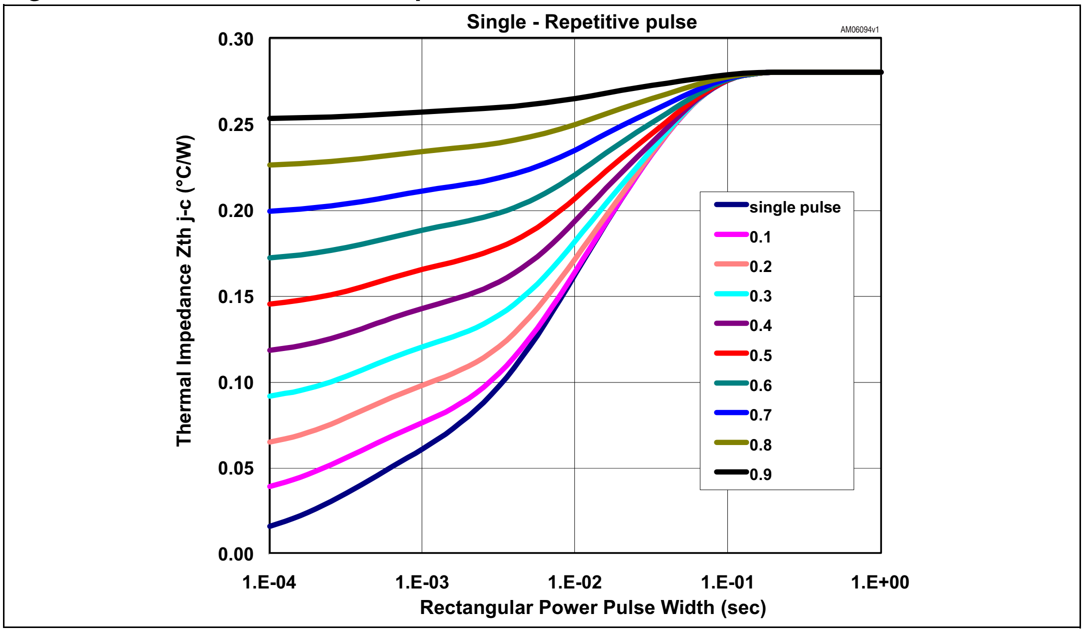


Figure 5. Transient thermal model

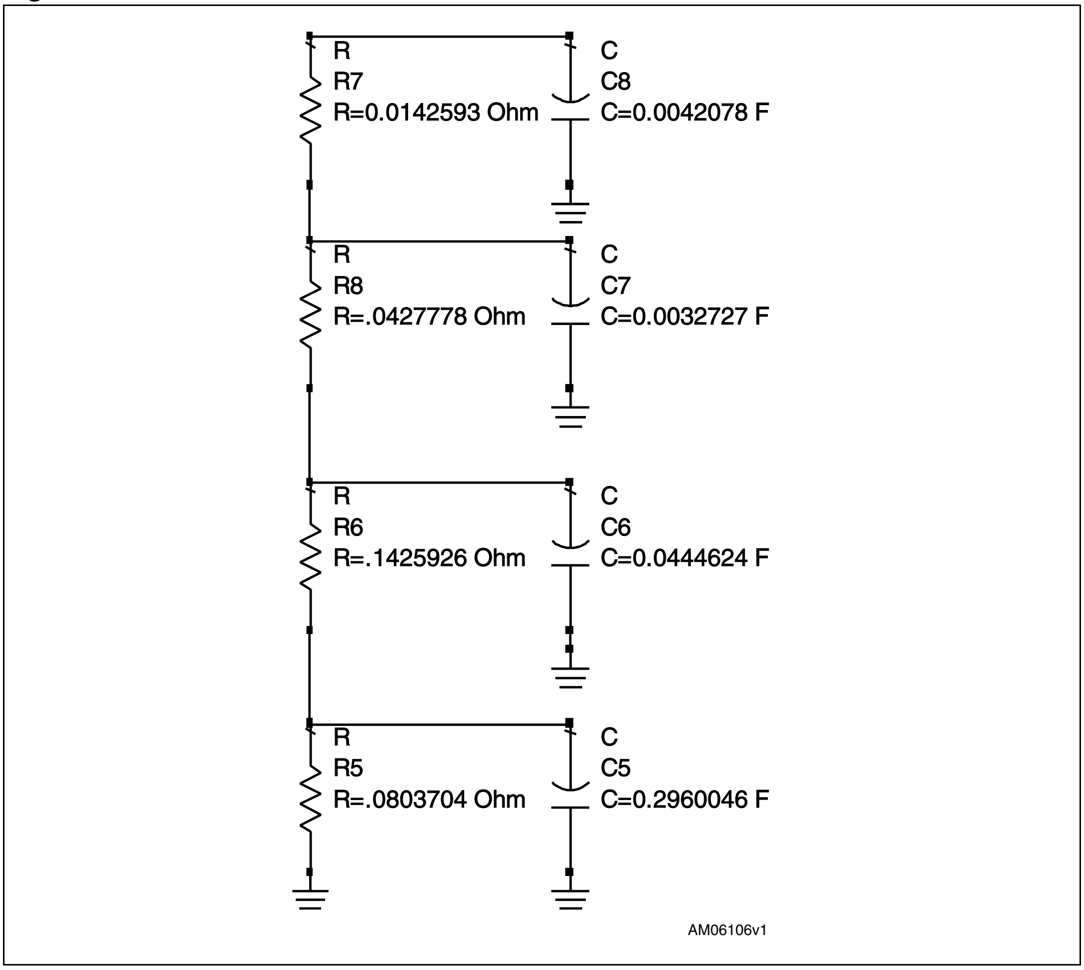


Figure 6. Power gain vs. output power

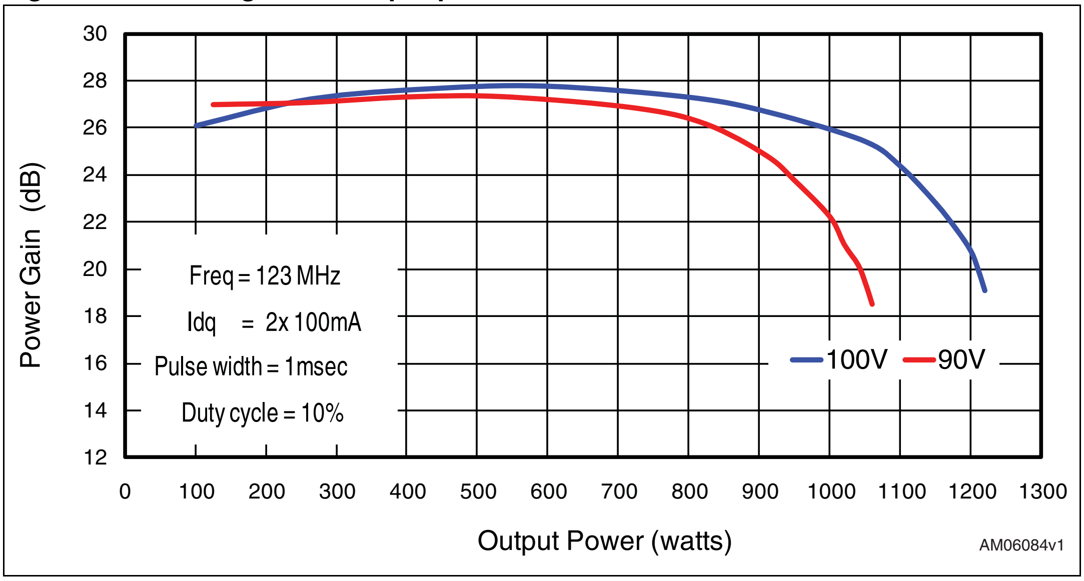
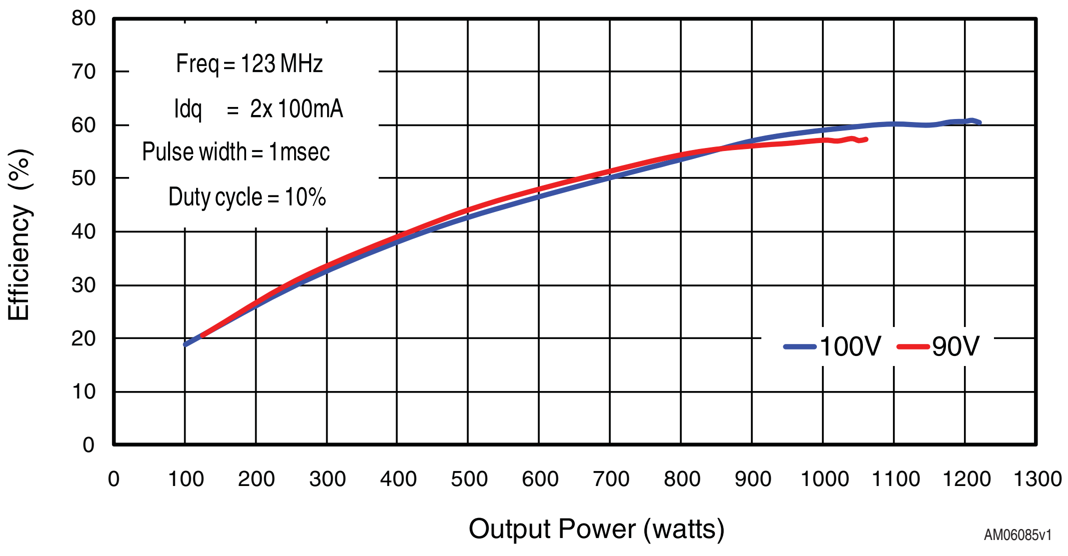


Figure 7. Efficiency vs. output power



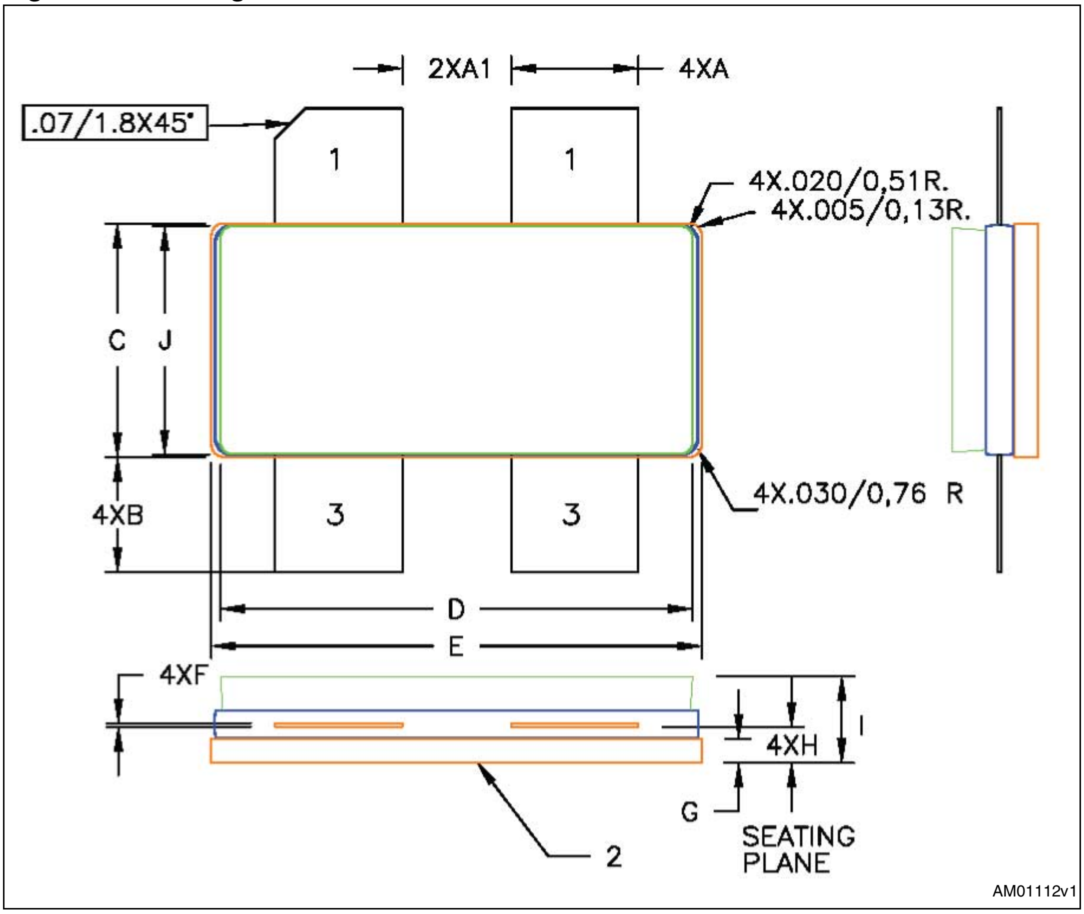
5 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

Table 7. STAC244F package dimensions

Dim.	mm.		Inch	
	Min	Max	Min	Max
A	5.10	5.59	200	220
A1	4.32	4.83	170	190
B	4.32	5.33	170	210
C	9.65	9.91	380	390
D	19.61	20.02	772	788
E	20.45	20.70	805	815
F	0.08	1.15	0.003	0.006
G	0.89	1.14	0.035	0.045
H	1.45	1.70	0.057	0.067
I	3.18	4.32	0.125	0.170
J	9.27	9.53	0.365	0.375

Figure 8. Package dimensions



6 Revision history

Table 8. Document revision history

Date	Revision	Changes
22-Feb-2010	1	First release.
03-Aug-2010	2	Updated description on cover page and *Table 3*.
02-Sep-2010	3	Updated *Figure 8*. Added *Figure 3*, *4* and *5*.

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