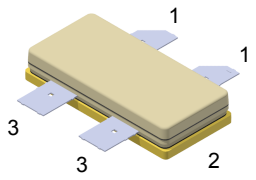
STAC4932F

Datasheet

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



STAC780-4F

Pin connection	
Pin	**Connection**
1	Drain
2	Source (bottom side)
3	Gate

Features

Order code	Frequency	V_{DD}	P_{OUT}	Gain	Efficiency
STAC4932F	123 MHz	100 V	1000 W	26 dB	60 %

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

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 STAC4932F benefits from the latest generation of efficient, patent-pending package technology, otherwise known as STAC.

Product status link
STAC4932F

Product summary	
Order code	STAC4932F
Marking	STAC4932F
Package	STAC780-4F
Packing	Box
Base / Bulk qty	20 / 80

1 Electrical data

1.1 Maximum ratings

Table 1. Absolute maximum ratings (T_{CASE} = 25 °C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain source voltage (V_{GS} = 0 V, T_J = 150 °C)	200	V
V_{DGR}	Drain-gate voltage (RGS = 1 MΩ)	200	V
V_{GS}	Gate-source voltage	±20	V
T_J	Maximum operating junction temperature	200	°C
T_{STG}	Storage temperature range	-65 to +150	°C

1.2 Thermal data

Table 2. Thermal data (1ms, 10%)

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

1.3 ESD protection characteristics

Table 3. ESD protection

Symbol	Test Methodology	Class
HBM	Human Body Model (per JESD22-A114)	2

2 Electrical characteristics

T_{CASE} = +25 °C (unless otherwise specified)

2.1 Static

Table 4. Static

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain - source Breakdown voltage	V_{GS} = 0 V, I_{DS} = 100 mA, T_J = 150 °C	200	250		V
I_{DSS}	Zero gate voltage drain leakage current	V_{GS} = 0 V, V_{DS} = 100 V			1	mA
I_{GSS}	Gate - source leakage current	V_{GS} = 20 V, V_{DS} = 0 V			250	nA
V_{TH}	Gate - source threshold voltage	I_{DS} = 250 mA	2		4	V
$V_{DS(ON)}$	Drain - source on voltage	V_{GS} = 10 V, I_D = 10 A			3.6	V
G_{FS}	Forward transconductance	V_{DS} = 10 V, I_D = 2.5 A		6		S
C_{ISS}	Input capacitance	V_{GS} = 0 V, V_{DS} = 100 V, f = 1 MHz		570		pF
C_{OSS}	Ouput capacitance			134		pF
C_{RSS}	Reverse transfer capacitance			8		pF

2.2 Dynamic

Table 5. Dynamic (1)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	Output power		1000	1200	-	W
η_D	Drain efficiency	P_{OUT} = 1000 W		60	-	%
G_{ps}	Power gain	P_{OUT} = 1000 W		26	-	dB

1. *V_{DD} = 100 V, I_{DQ} = 2 x 250 mA, f = 123 MHz, PW 1ms, DC = 10%*

3 Impedance

Figure 1. Current conventions

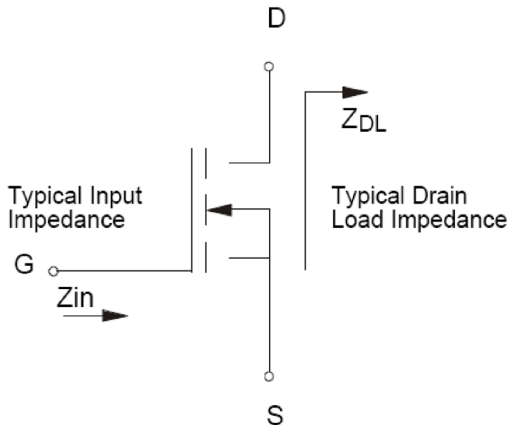


Table 6. Impedance data

Freq. (MHz)	Z_{IN} (Ω)	Z_{DL}(Ω)
123	TBD	7.63 + j 2.92

Note: Measured gate-to-gate and drain-to-drain, respectively (balanced configuration).

4 Typical performance

Figure 2. **Safe operating area**

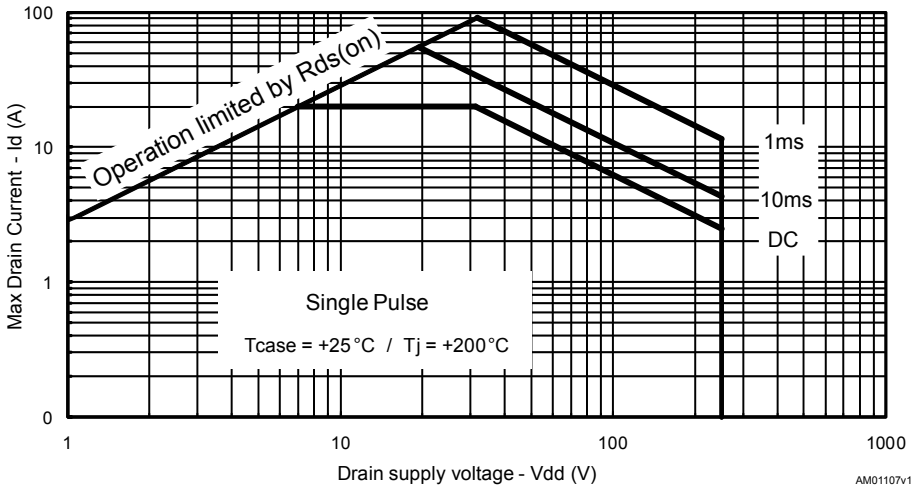


Figure 3. **Transient thermal impedance**

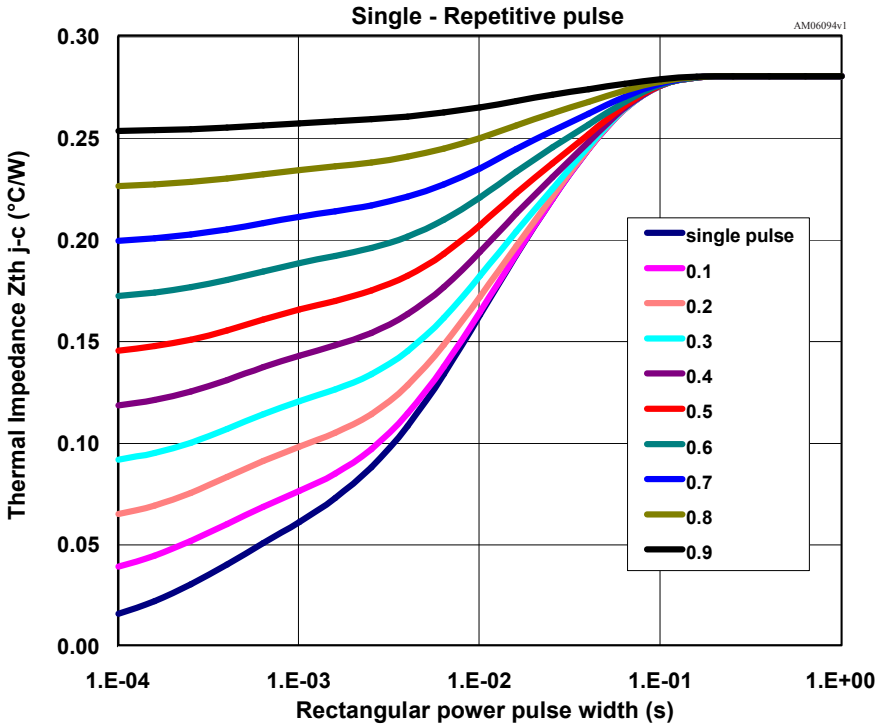


Figure 4. **Transient thermal model**

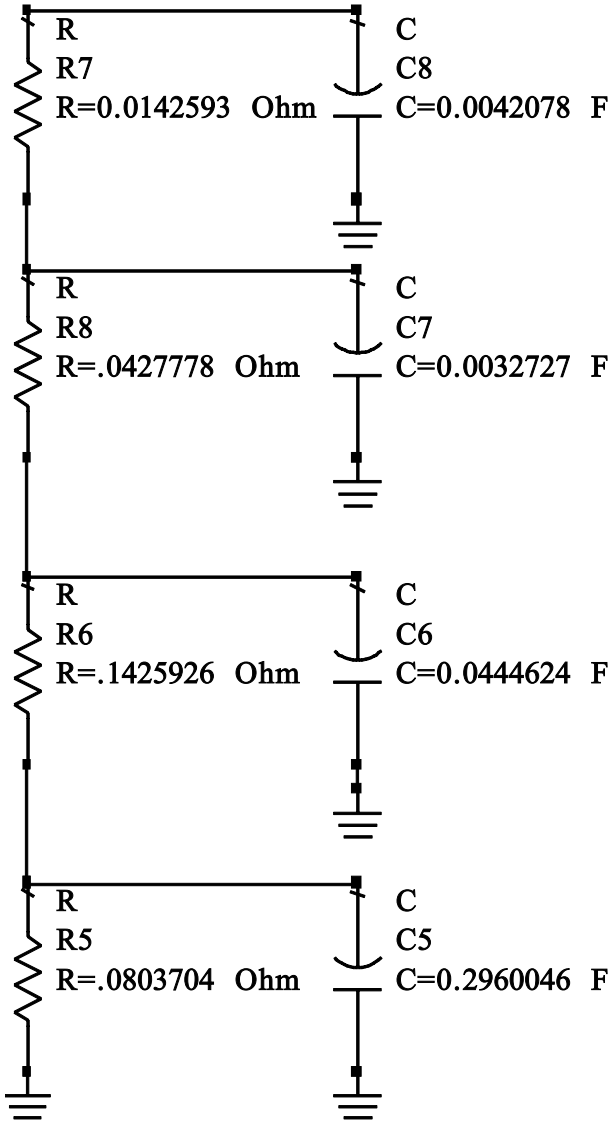


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Figure 5. **Power gain versus output power**

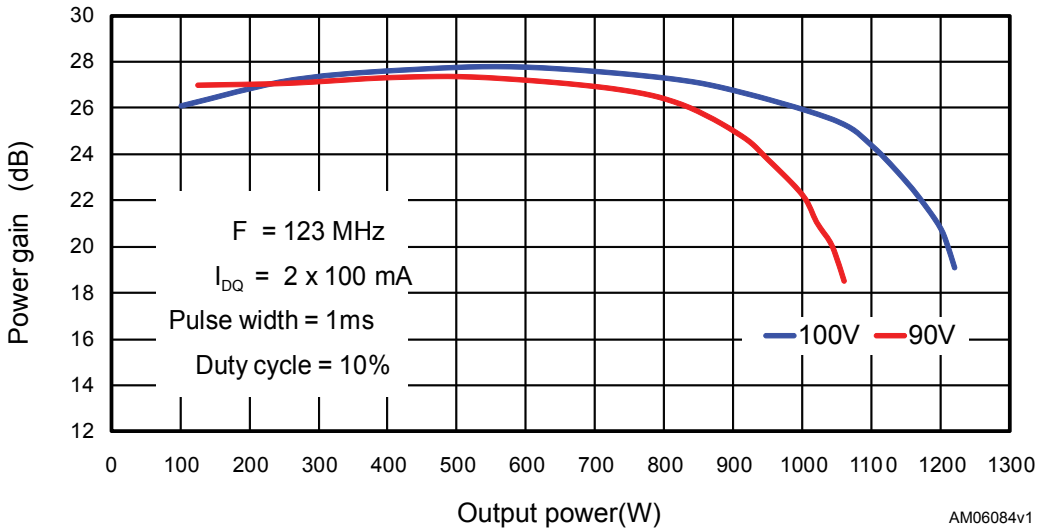
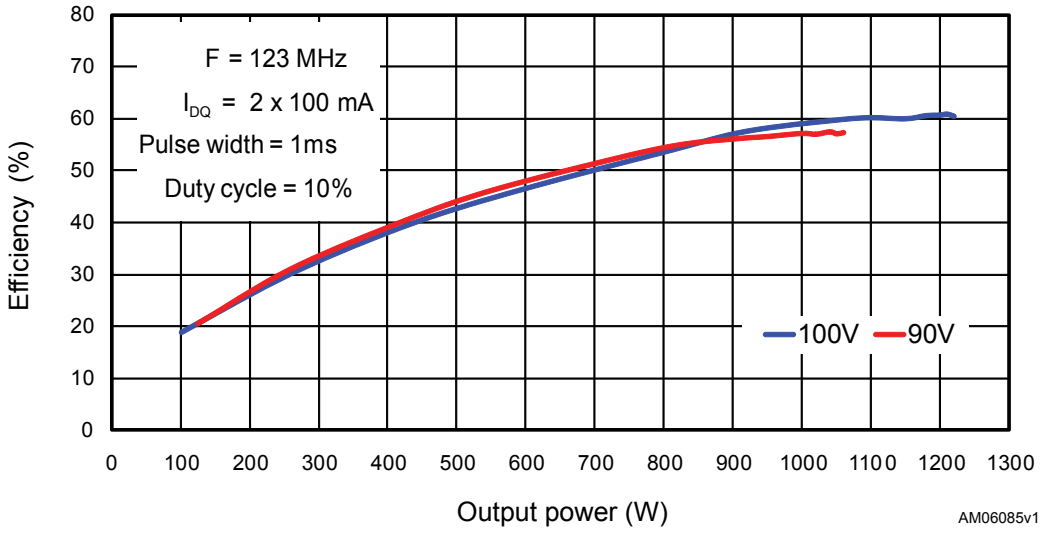


Figure 6. **Efficiency versus output power**

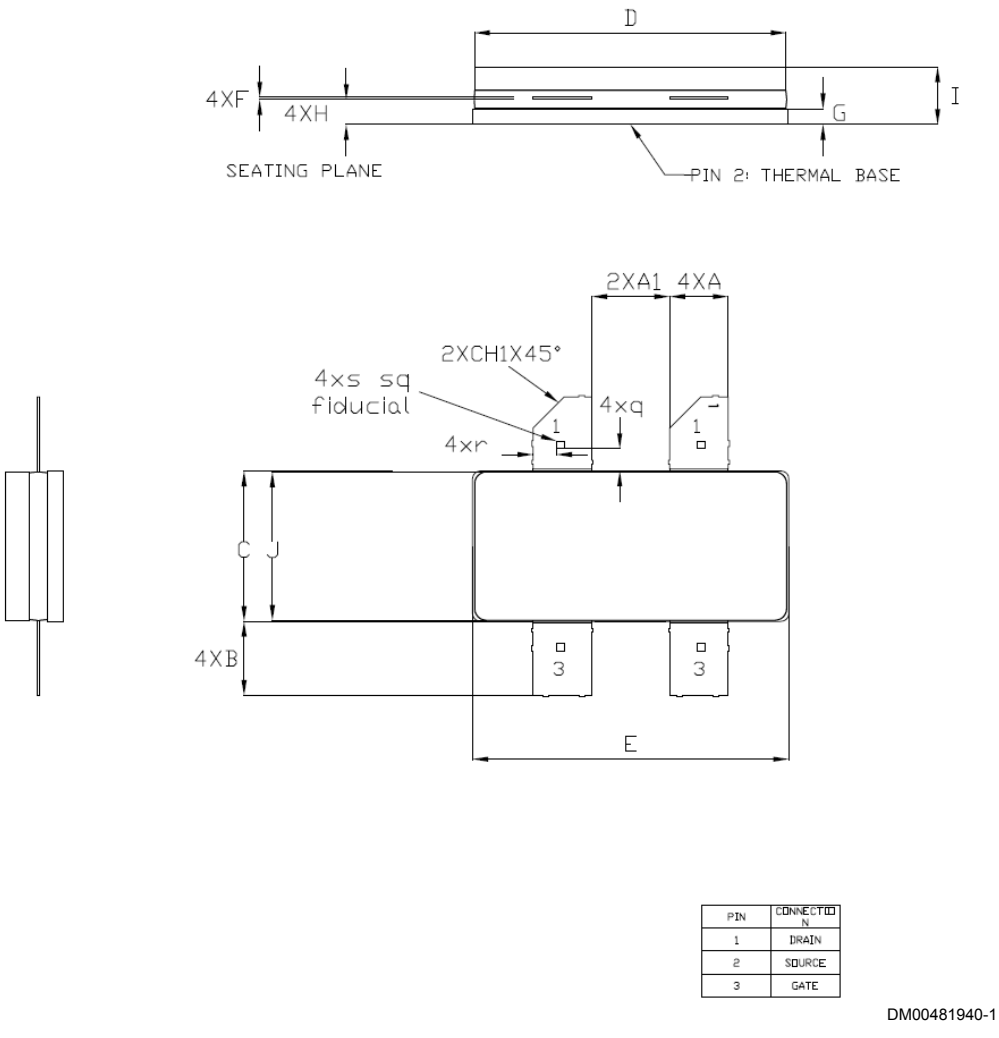


5 Package information

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.

5.1 STAC780-4F package information

Figure 7. STAC780-4F package outline



PIN	CONNECTION
1	DRAIN
2	SOURCE
3	GATE

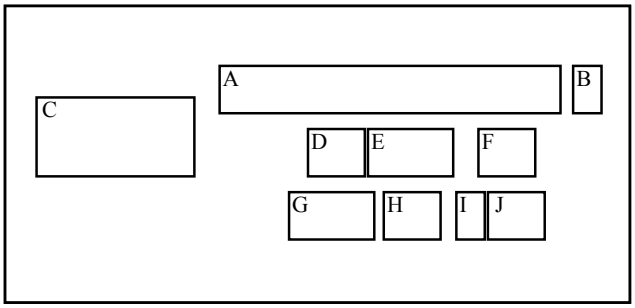
DM00481940-1

Table 7. **STAC780-4F mechanical data**

Ref.	Milimeters		
	Min.	Typ.	Max.
A	3.76		3.86
A1	5.03		5.13
B	4.57		5.08
C	9.65		9.91
D	20.17		20.37
E	20.45		20.70
F	0.11		0.17
G	0.97		1.14
H	1.52		1.70
I	3.18		4.32
J	9.52		9.78
q		1.37	
r		1.52	
s		0.51	
CH1		2.03	

5.2 Marking information

PACKAGE FACE TOP



LEGEND

Marking Composition Field

A - MARKING AREA

B - ADDITIONAL INFORMATION
(MAX CHAR ALLOWED = 1)

C - STANDARD ST LOGO

D - Assy Plant
(PP)

E - FE Sequence
(nnn)

F - Diffusion Traceability Plant
(WX)

G - COUNTRY OF ORIGIN
(MAX CHAR ALLOWED = 3)

H - Test and Finishing Plant
(TF)

I - Assy Year
(Y)

J - Assy Week
(WW)

Revision history

Table 8. **Document revision history**

Date	Version	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.
10-Apr-2020	4	Updated package information. Added Section 1.3 ESD protection characteristics.

Contents

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Authorized Distributor

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STAC4932F