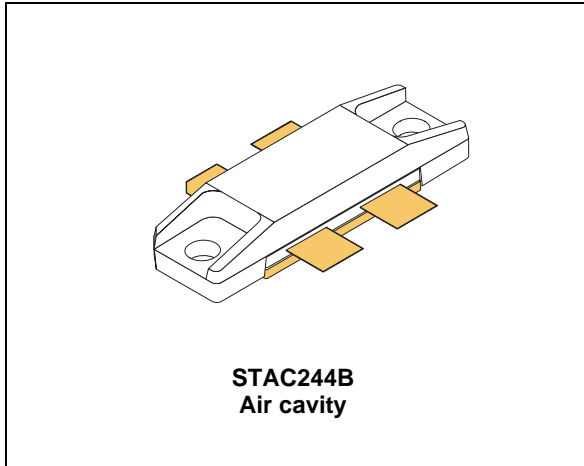


## HF/VHF/UHF RF power N-channel MOSFETs

Datasheet - production data



### Features

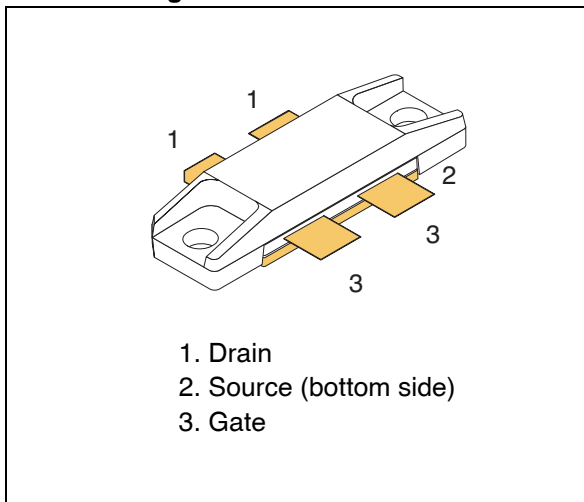
- Gold metallization
- Excellent thermal stability
- Common source push-pull configuration
- $P_{OUT} = 300\text{ W min. with } 20\text{ dB gain @ } 175\text{ MHz}$
- In compliance with the 2002/95/EC European directive
- ST air cavity packaging technology - STAC™ package

### Description

The STAC2932B is a gold metallized N-channel MOS field-effect RF power transistor, intended for use in 50 V DC large signal applications up to 250 MHz.

The STAC2932B benefits from the latest generation of efficient, patent-pending package technology, otherwise known as STAC™.

**Figure 1. Pin connection**



**Table 1. Device summary**

Order code	Marking	Base qty.	Package	Packaging
STAC2932BW	STAC2932 <sup>(1)</sup>	20	STAC244B	Tray

1. For more details please refer to [Chapter 7: Marking, packing and shipping specifications](#).

# Contents

<b>1</b>	<b>Electrical data</b> .....	<b>3</b>
1.1	Maximum ratings .....	3
1.2	Thermal data .....	3
<b>2</b>	<b>Electrical characteristics</b> .....	<b>4</b>
2.1	Static .....	4
2.2	Dynamic .....	4
<b>3</b>	<b>Impedance</b> .....	<b>5</b>
<b>4</b>	<b>Typical performance</b> .....	<b>6</b>
<b>5</b>	<b>Test circuit</b> .....	<b>8</b>
<b>6</b>	<b>Package mechanical data</b> .....	<b>10</b>
<b>7</b>	<b>Marking, packing and shipping specifications</b> .....	<b>12</b>
<b>8</b>	<b>Revision history</b> .....	<b>13</b>



# 1 Electrical data

## 1.1 Maximum ratings

( $T_{CASE} = 25\text{ °C}$ )

**Table 2. Absolute maximum ratings**

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}^{(1)}$	Drain-source voltage	125	V
$V_{DGR}$	Drain-gate voltage ( $R_{GS} = 1\text{ M}\Omega$ )	125	V
$V_{GS}$	Gate-source voltage	$\pm 20$	V
$I_D$	Drain current	40	A
$P_{DISS}$	Power dissipation	625	W
$T_J$	Max. operating junction temperature	200	$^{\circ}\text{C}$
$T_{STG}$	Storage temperature	-65 to +150	$^{\circ}\text{C}$

1.  $T_J = 150\text{ °C}$

## 1.2 Thermal data

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJC}$	Junction - case thermal resistance	0.28	$^{\circ}\text{C/W}$

## 2 Electrical characteristics

$T_{CASE} = +25\text{ °C}$

### 2.1 Static

Table 4. Static (per side)

Symbol	Test conditions			Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$	$I_{DS} = 100\text{ mA}$		125			V
$I_{DSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 50\text{ V}$				50	$\mu\text{A}$
$I_{GSS}$	$V_{GS} = 20\text{ V}$	$V_{DS} = 0\text{ V}$				250	nA
$V_{GS(Q)}$	$V_{DS} = 10\text{ V}$	$I_D = 250\text{ mA}$		1.5	2.5	4.0	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}$	$I_D = 10\text{ A}$				3.0	V
$G_{FS}$	$V_{DS} = 10\text{ V}$	$I_D = 5\text{ A}$		5			S
$C_{ISS}$	$V_{GS} = 0\text{ V}$ $V_{DS} = 50\text{ V}$ $f = 1\text{ MHz}$				468		pF
$C_{OSS}$					206		pF
$CRSS$					16		pF

### 2.2 Dynamic

Table 5. Dynamic

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$P_{OUT}$	$V_{DD} = 50\text{ V}$ , $I_{DQ} = 2 \times 250\text{ mA}$ , $P_{IN} = 4\text{ W}$ , $f = 175\text{ MHz}$	300	390		W
$h_D$	$V_{DD} = 50\text{ V}$ , $I_{DQ} = 2 \times 250\text{ mA}$ , $P_{IN} = 4\text{ W}$ , $f = 175\text{ MHz}$	55	68		%

### 3 Impedance

Figure 2. Current conventions

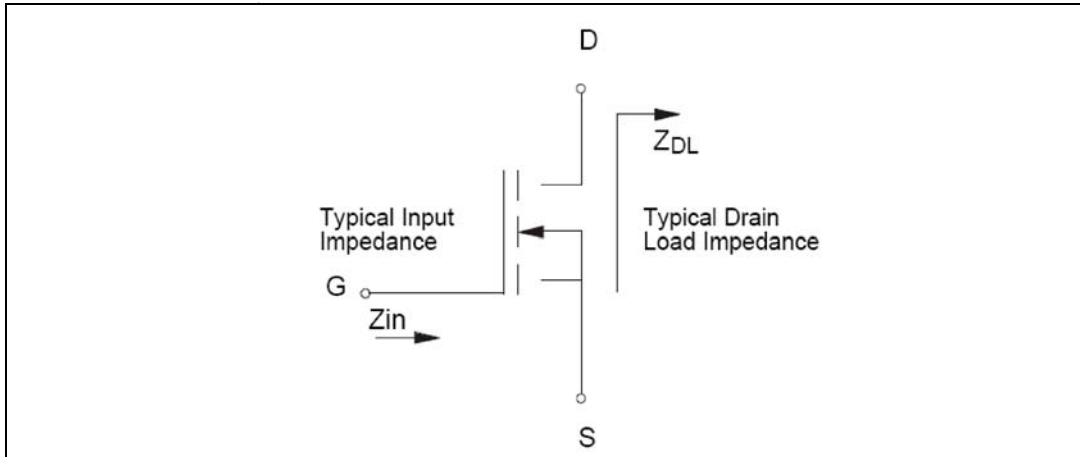


Table 6. Impedance data

Freq. (MHz)	Z <sub>IN</sub> (Ω)	Z <sub>DL</sub> (Ω)
175 MHz	2.0 - j2.0	3.5 + j5.2

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

# 4 Typical performance

Figure 3. Capacitances vs drain supply voltage    Figure 4. Output power vs drain supply voltage

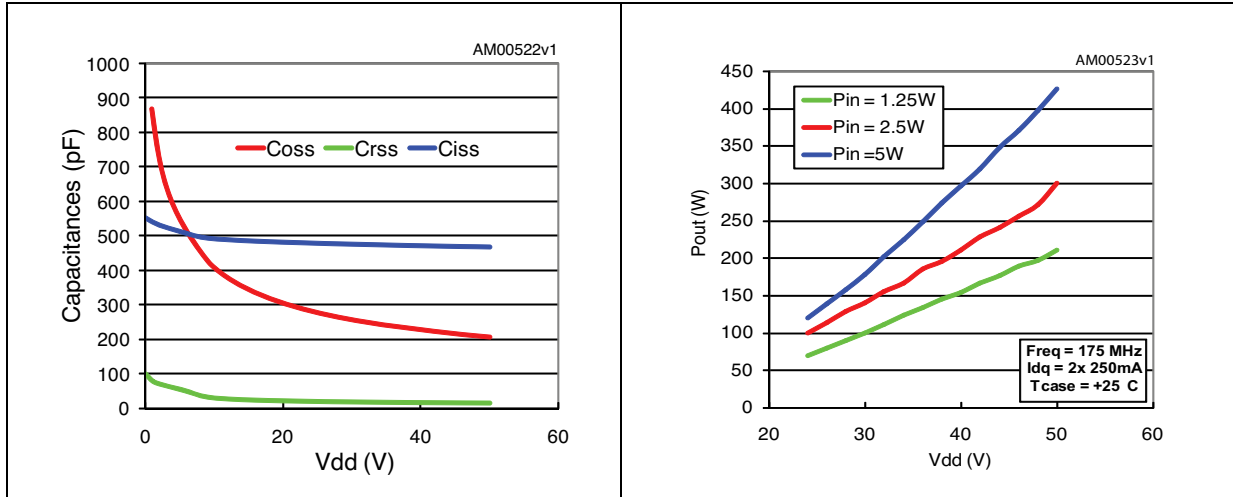


Figure 5. Output power vs gate voltage

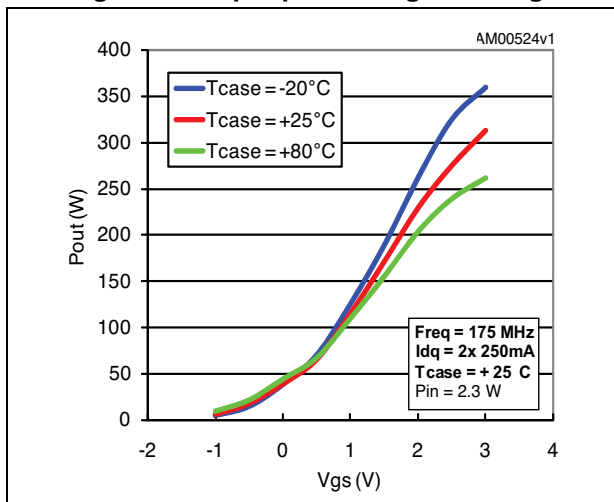


Figure 6. Output power vs input power

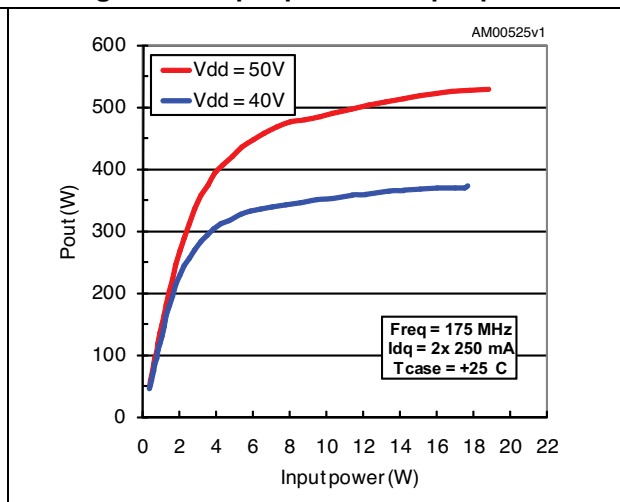


Figure 7. Output power vs input power and case temperature

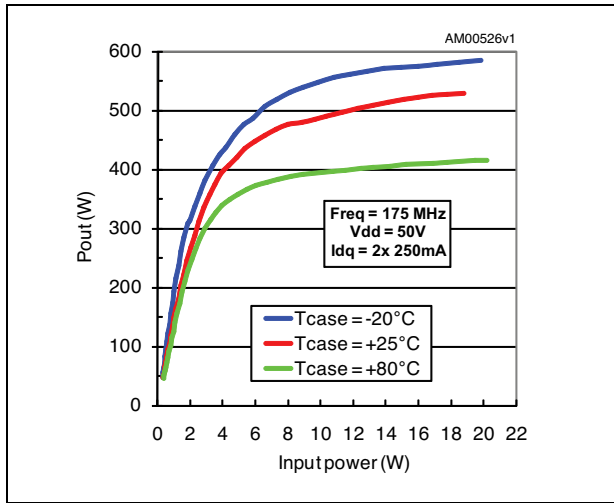
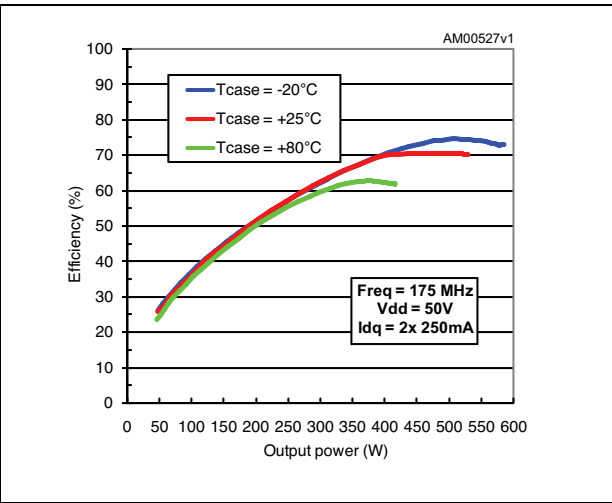


Figure 8. Efficiency vs output power and case temperature



# 5 Test circuit

Figure 9. 175 MHz test circuit schematic (production test circuit)

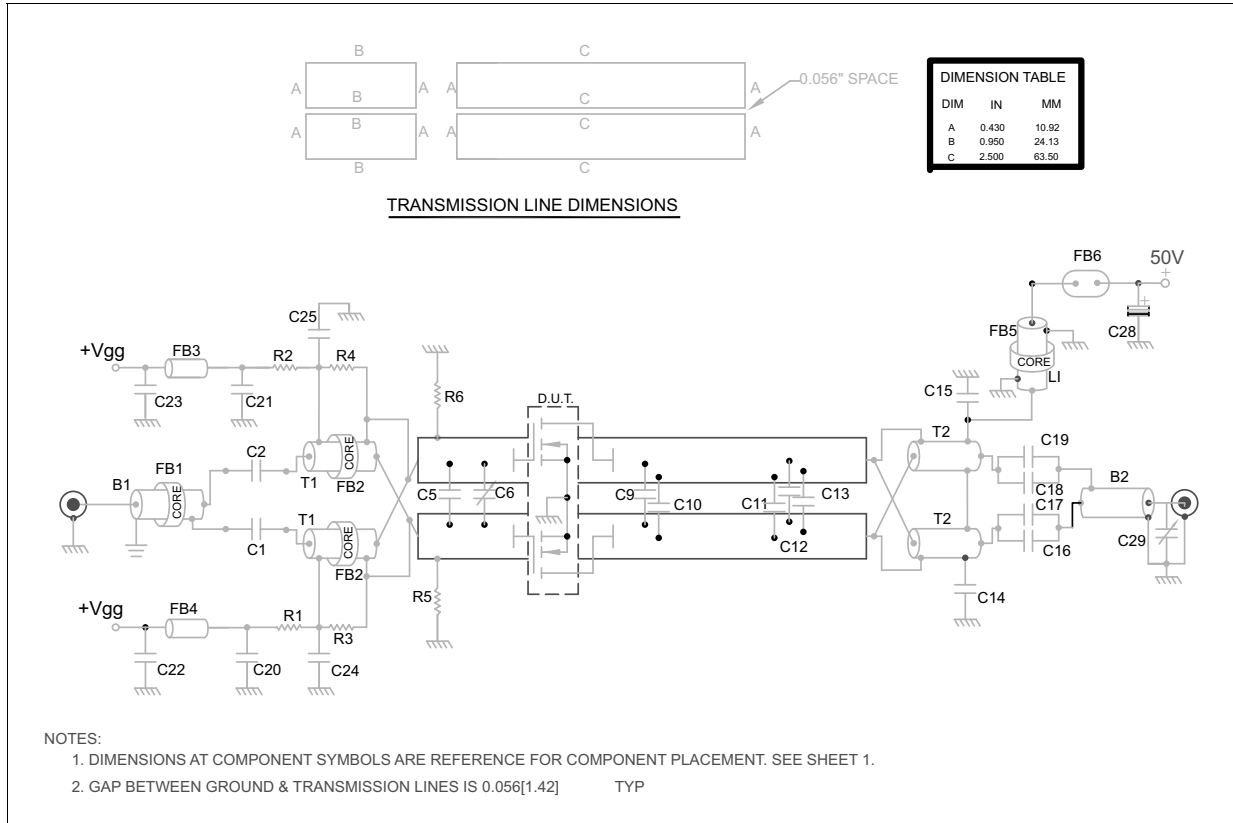


Table 7. 175 MHz test circuit part list

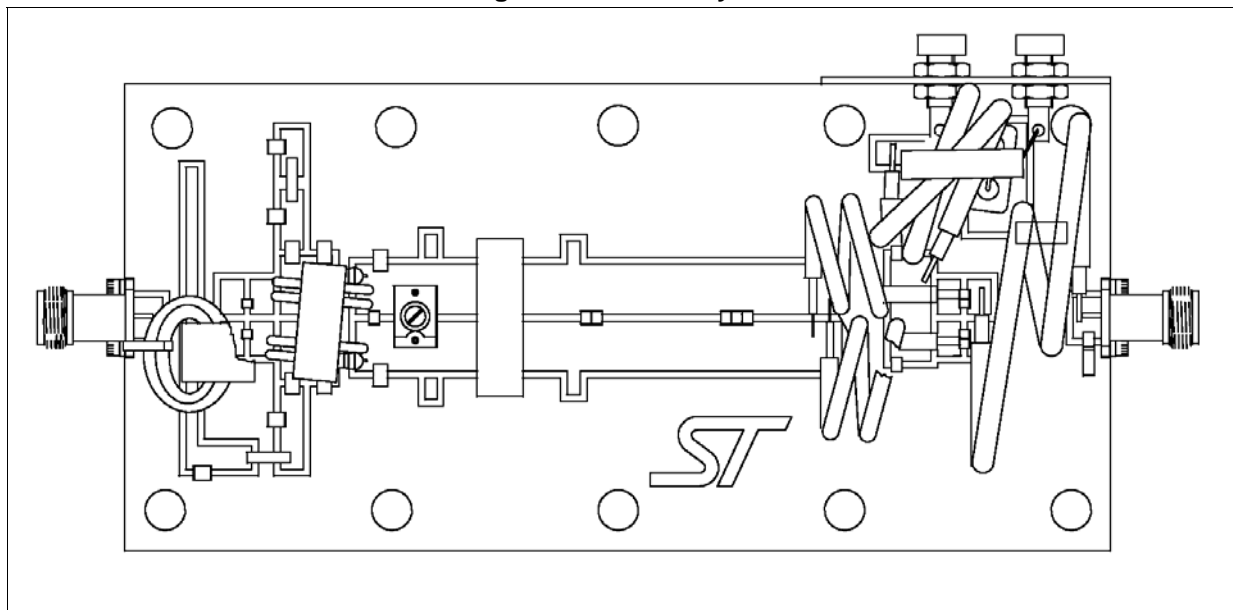
Component	Description
C1, C2, C14, C15, C24, C25	1200 pF ATC 700B chip capacitor
C5	75 pF ATC 100B chip capacitor
C6	ST406 variable capacitor
C9, C10	47 pF ATC 100B chip capacitor
C11, C12, C13	43 pF ATC 100B chip capacitor
C16, C18	470 pF ATC 100B chip capacitor
C17, C19, C20, C21	10,000 pF ATC 200B chip capacitor
C22, C23	0.1 μF 200 V chip capacitor
C28	10 μF 100 V electrolytic capacitor
C29	0.8 - 8 pF variable capacitor
R1, R2, R5, R6	430 Ω, 1/2 W chip resistor



Table 7. 175 MHz test circuit part list (continued)

Component	Description
R3, R4	270 Ω 1/2 W axial lead resistor
B1	RG-316 50 Ω 11.8" thru ferrite toroidal
B2	RG-142 50 Ω 11.8"
T1	4:1, RG-316 25 Ω, 5.9", 2 turns thru ferrite core
T2	1:4, 25 Ω semi-rigid cable, OD.141", 5.9"
L1	λ/4 inductor, RG-142 50 Ω, 11.8", 3 turns thru ferrite toroid
FB1,FB5	Ferrite toroidal
FB2, FB6	Multi-aperture core
FB3, FB4	Surface mount ferrite bead
PCB	Rogers ultralam 2000, Er 2.55, 0.060"

Figure 10. Circuit layout



## 6 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](http://www.st.com). ECOPACK is an ST trademark.

Figure 11. STAC244B mechanical data drawing

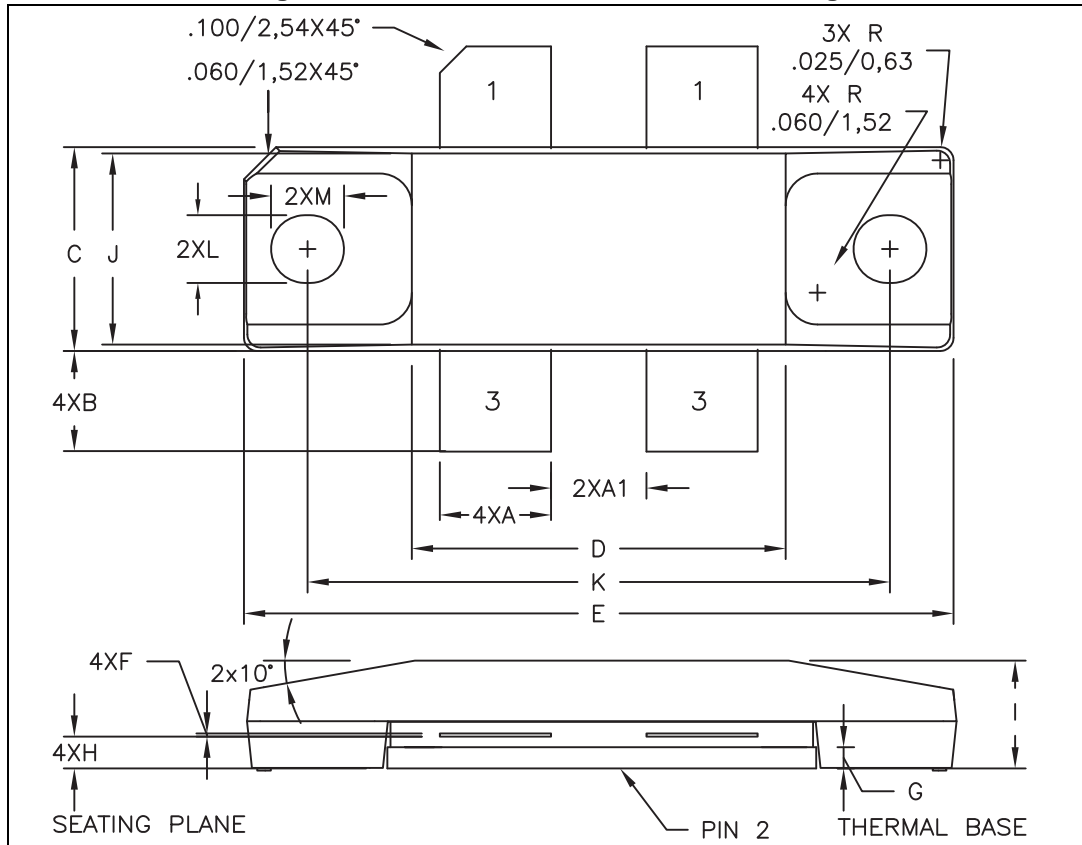


Table 8. STAC244B mechanical data

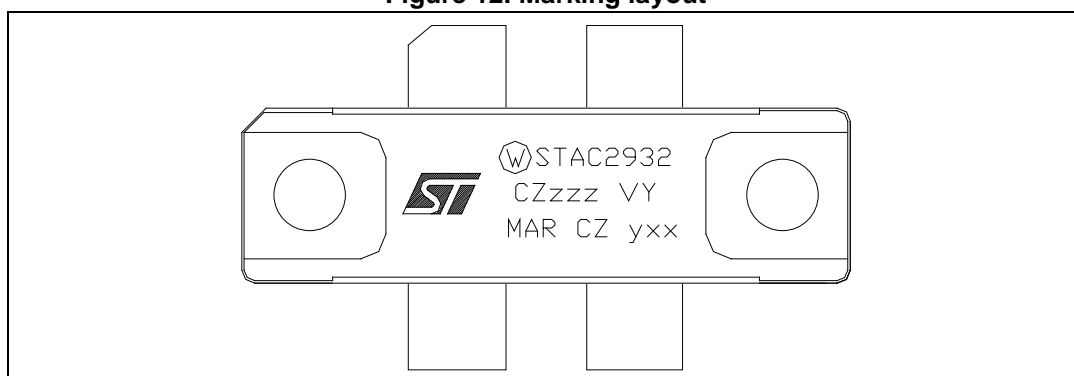
Dim.	mm		
	Min.	Typ.	Max.
A	5.08		5.59
A1	4.32		4.83
B	4.32		5.33
C	9.65		9.91
D	17.78		18.08
E	33.88		34.19
F	0.10		0.15
G		1.02	
H	1.45		1.70
I	4.83		5.33
J	9.27		9.52
K	27.69		28.19
L	3.12	3.23	3.33
M	3.35	3.45	3.56

## 7 Marking, packing and shipping specifications

**Table 9. Packing and shipping specifications**

Order code	Packaging	Pcs per tray	Dry pack humidity	Lot code
STAC2932BW	Tray	20	< 10 %	Not mixed

**Figure 12. Marking layout**



**Table 10. Marking specifications**

Symbol	Description
W	Wafer process code
CZ	Assembly plant
xxx	Last 3 digit of diffusion lot
VY	Diffusion plant
MAR	Country of origin
CZ	Test and finishing plant
y	Assembly year
yy	Assembly week

## 8 Revision history

Table 11. Document revision history

Date	Revision	Changes
20-Mar-2009	1	First release.
29-Jun-2010	2	Updated features and description on cover page.
12-Aug-2011	3	Update figures on coverpage and <a href="#">Section 6: Package mechanical data</a> . Inserted <a href="#">Section 7: Marking, packing and shipping specifications</a> . Minor text changes.
05-Sep-2011	4	Update L and M dimensions <a href="#">Table 8 on page 11</a> .
12-Jan-2012	5	Minor text changes to improve readability.
27-Jan-2014	6	Modified pin labeling in <a href="#">Figure 1: Pin connection</a> .

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**ST PRODUCTS ARE NOT DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER'S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR "AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL" INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2014 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)