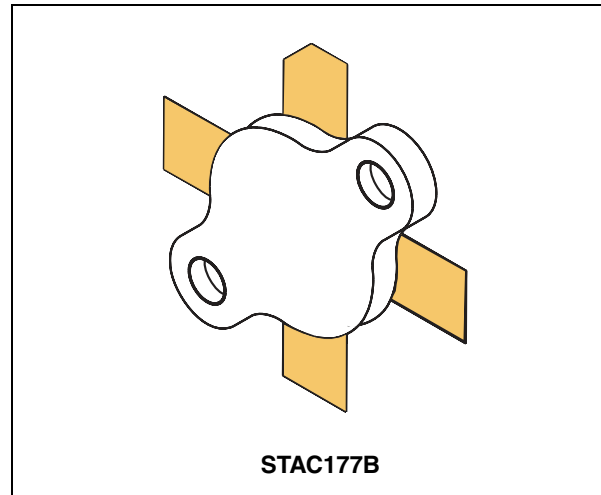


### Features

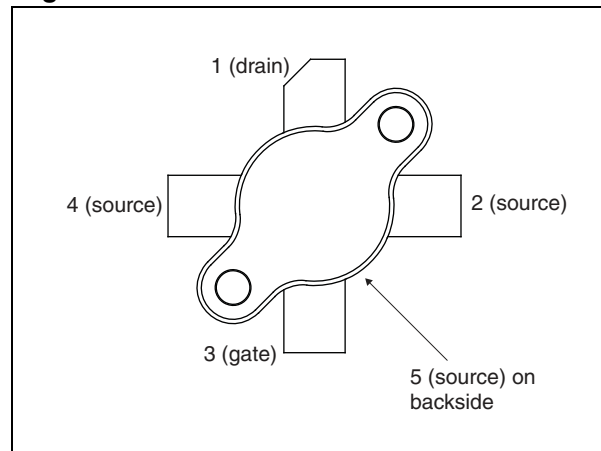
- High power capability
- $P_{OUT} = 350\text{ W}$  min. with 22dB gain @ 30 MHz
- $P_{SAT} = 450\text{ W}$
- Low  $R_{DS(on)}$
- STAC air cavity packaging technology - STAC<sup>®</sup> package
- Gold metallization
- Excellent thermal stability
- Common source configuration

### Description

The STAC2943 is a gold metallized N-channel MOS field-effect RF power transistor, intended for use in 50 V dc large signal applications up to 150 MHz. This device offers a 20% higher power saturation than the SD2933, and is ideal for ISM applications where reliability and ruggedness are critical factors.



**Figure 1. Pin connection**



**Table 1. Device summary**

Order code	Marking	Base qty.	Package	Packaging <sup>(1)</sup>
STAC2943	STAC2943 <sup>(1)</sup>	25 pcs	STAC177B	Plastic tray

1. For more details please refer to [Chapter 6: Marking, packing and shipping specifications](#).

## Contents

1	<b>Electrical data</b> .....	3
2	<b>Electrical characteristics</b> .....	4
3	<b>Impedance</b> .....	6
4	<b>Typical performance</b> .....	7
5	<b>Package mechanical data</b> .....	8
6	<b>Marking, packing and shipping specifications</b> .....	10
7	<b>Revision history</b> .....	11

# 1 Electrical data

( $T_{CASE} = 25^{\circ}C$ )

**Table 2. Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}^{(1)}$	Drain source voltage	130	V
$V_{DGR}$	Drain-gate voltage ( $R_{GS} = 1M\Omega$ )	130	V
$V_{GS}$	Gate-source voltage	$\pm 20$	V
$I_D$	Drain current	40	A
$P_{DISS}$	Power dissipation	795	W
$T_j$	Max. operating junction temperature	200	$^{\circ}C$
$E_{AS}$	Avalanche energy, single pulse ( $I_D = 53A$ , $800\mu H$ coil)	1100	mJ
$T_{STG}$	Storage temperature	-65 to +150	$^{\circ}C$

1.  $T_j = 150^{\circ}C$

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{thJC}$	Junction to case thermal resistance	0.22	$^{\circ}C/W$

## 2 Electrical characteristics

( $T_{CASE} = 25^{\circ}C$ )

**Table 4. Static**

Symbol	Test conditions		Min.	Typ.	Max.	Unit
$V_{(BR)DSS}^{(1)}$	$V_{GS} = 0 V$	$I_{DS} = 200 mA$	130			V
$I_{DSS}$	$V_{GS} = 0 V$	$V_{DS} = 50 V$			200	$\mu A$
$I_{GSS}$	$V_{GS} = 20 V$	$V_{DS} = 0 V$			500	nA
$V_{GS(Q)}^{(2)}$	$V_{DS} = 10 V$	$I_D = 250 mA$			see table below	V
$V_{DS(ON)}$	$V_{GS} = 10 V$	$I_D = 20 A$			2	V
$G_{FS}^{(2)}$	$V_{DS} = 10 V$	$I_D = 10 A$	see table below			mho
$C_{ISS}$	$V_{GS} = 0 V$	$V_{DS} = 50 V$		830		pF
$C_{OSS}$	$V_{GS} = 0 V$	$V_{DS} = 50 V$		470		pF
$C_{RSS}$	$V_{GS} = 0 V$	$V_{DS} = 50 V$		35		pF

- $T_J = 150^{\circ}C$
- $V_{GS}$  and  $G_{FS}$  sorts for each unit see [Table 6](#) and [Table 7](#).

**Table 5. Dynamic**

Symbol	Test conditions		Min.	Typ.	Max.	Unit
$P_{OUT}$	$V_{DD} = 50 V$	$I_{DQ} = 250 mA$ $f = 30 MHz$	350	450		W
$G_{PS}$	$V_{DD} = 50 V$	$I_{DQ} = 250 mA$ $P_{OUT} = 350 W$ $f = 30 MHz$	22	25		dB
$h_D$	$V_{DD} = 50 V$	$I_{DQ} = 250 mA$ $P_{OUT} = 350 W$ $f = 30 MHz$	60	65		%
Load Mismatch	$V_{DD} = 50 V$	$I_{DQ} = 250 mA$ $P_{OUT} = 350 W$ $f = 30 MHz$ All phase angles	3:1			VSWR

**Table 6.  $G_{FS}$  sorts**

Symbol	Value
A	10 - 10.99
B	11 - 11.99
C	12 - 12.99
D	13 - 13.99
E	14 - 14.99
F	15 - 15.99

Table 6.  $G_{FS}$  sorts (continued)

Symbol	Value
G	16 - 16.99
H	17 - 18

Table 7.  $V_{GS}$  sort

$V_{GS}$ sort	Value
1	1.5 - 2.0
2	2.0 - 2.5
3	2.5 - 3.0
4	3.0 - 3.5
5	3.5 - 4.0

### 3 Impedance

Figure 2. Impedance Data Schematic

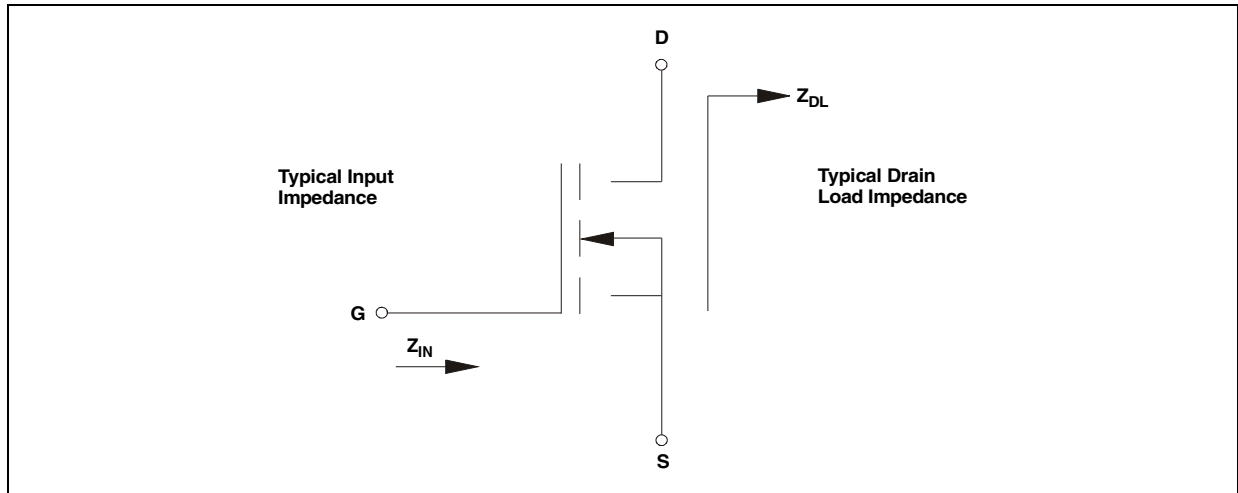
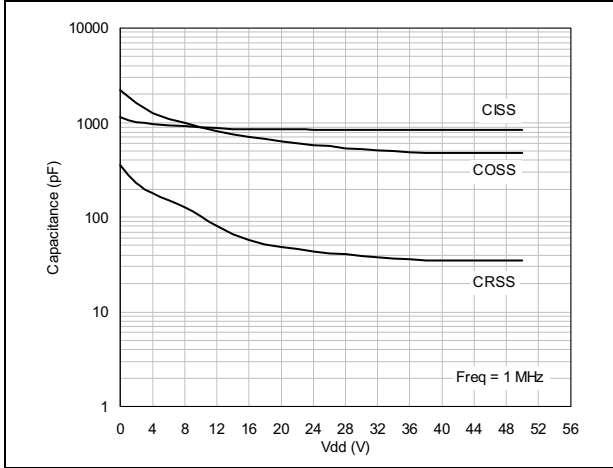


Table 8. Impedance data

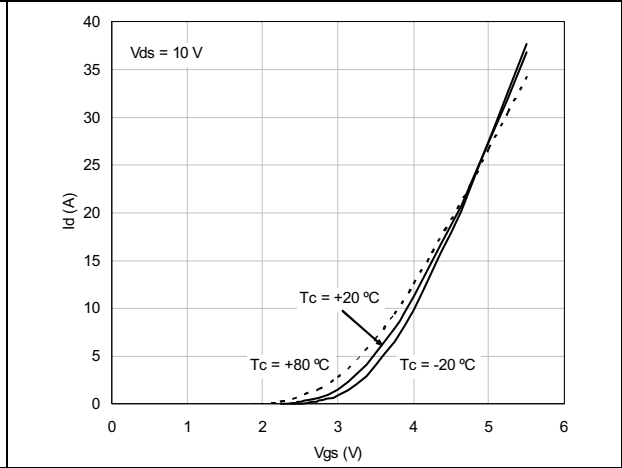
f	$Z_{IN}$ ( $\Omega$ )	$Z_{DL}$ ( $\Omega$ )
30 MHz	$1.3 - j 2.9$	$3.1 + j 2.3$
108 MHz	$1.4 - j 2.4$	$1.9 + j 1.4$
175 MHz	$1.4 - j 2.2$	$1.7 + j 1.6$

# 4 Typical performance

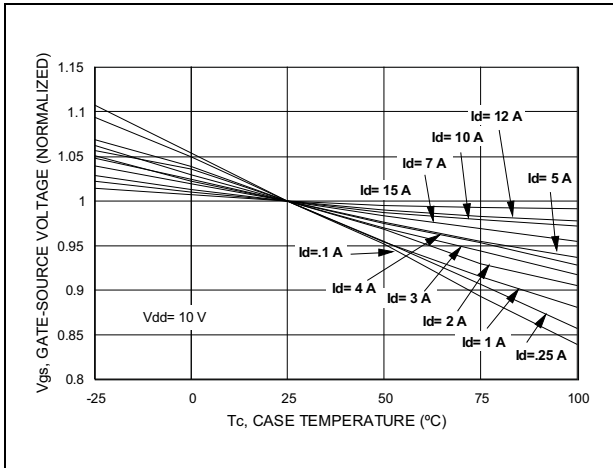
**Figure 3. Capacitance vs drain voltage**



**Figure 4. Drain current vs gate voltage**



**Figure 5. Gate-source voltage vs case temperature**



## 5 Package mechanical data

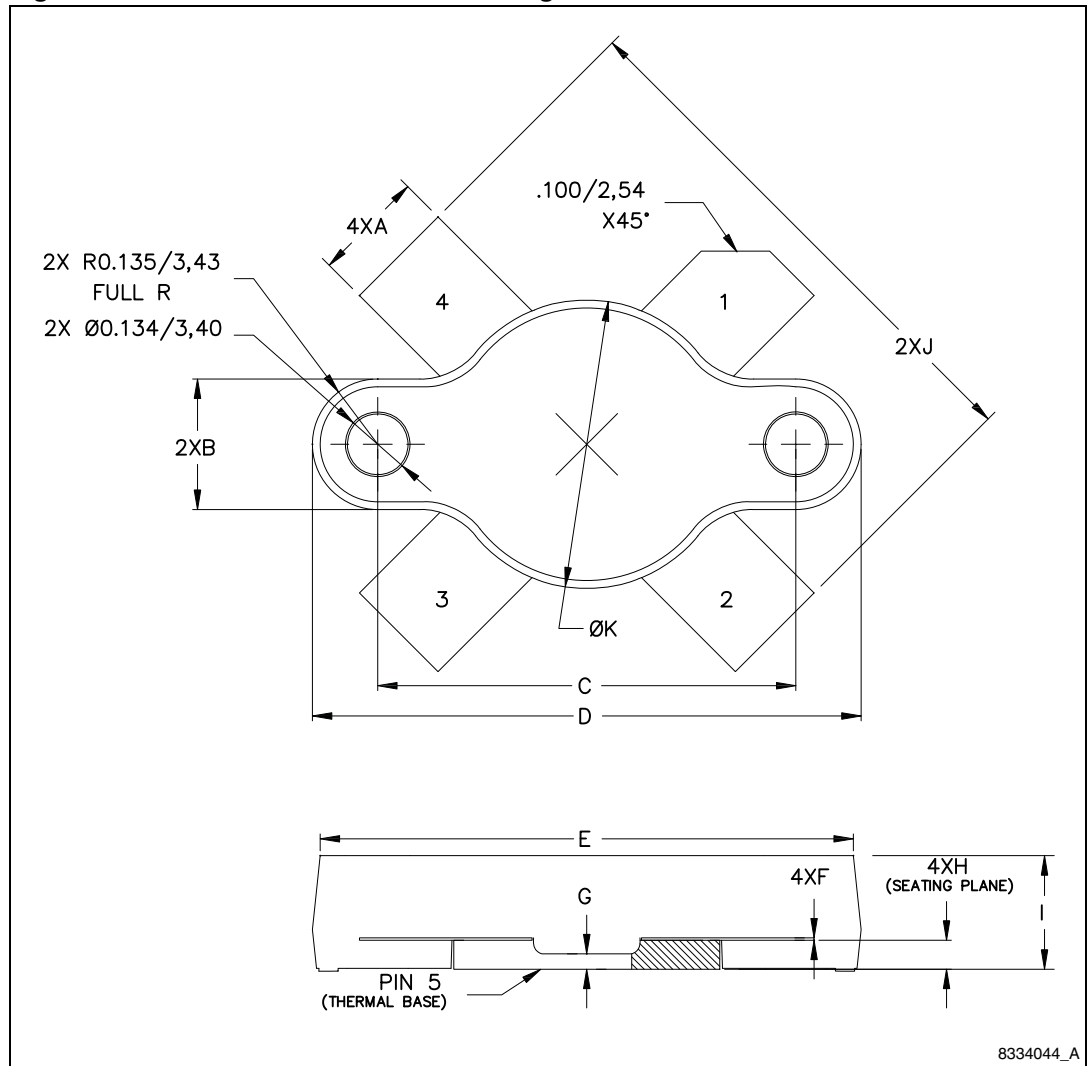
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK is an ST trademark.

**Table 9. STAC177B mechanical data**

Dim	mm			inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	5.72		5.97	0.225		0.235
B	6.73		6.99	0.265		0.275
C	21.84		22.10	0.860		0.870
D	28.70		28.96	1.130		1.140
E		28.02			1.103	
F	0.10		0.15	0.004		0.006
G		0.81			0.032	
H	1.45		1.70	0.057		0.067
I	5.79		6.15	0.228		0.242
J	27.43		28.45	1.080		1.120
K	15.01		15.27	0.591		0.601



Figure 6. STAC177B mechanical drawing

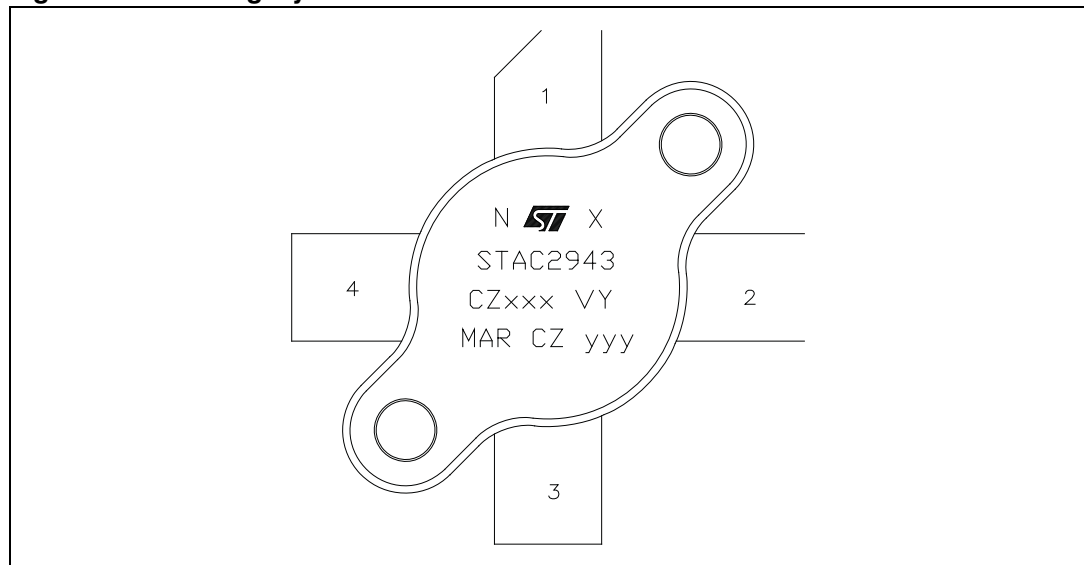


## 6 Marking, packing and shipping specifications

**Table 10. Packing and shipping specifications**

Order code	Packaging	Pcs per tray	Dry pack humidity	VGS and GFS code	Lot code
STAC2943	Plastic tray	25	< 10 %	Not mixed	Not mixed

**Figure 7. Marking layout**



**Table 11. Marking specifications**

Symbol	Description
N	V <sub>GS</sub> sort
X	G <sub>FS</sub> sort
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

## 7 Revision history

**Table 12. Document revision history**

Date	Revision	Description of Changes
16-Jan-2012	1	First Issue.

**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.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY TWO AUTHORIZED ST REPRESENTATIVES, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

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.

© 2012 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)