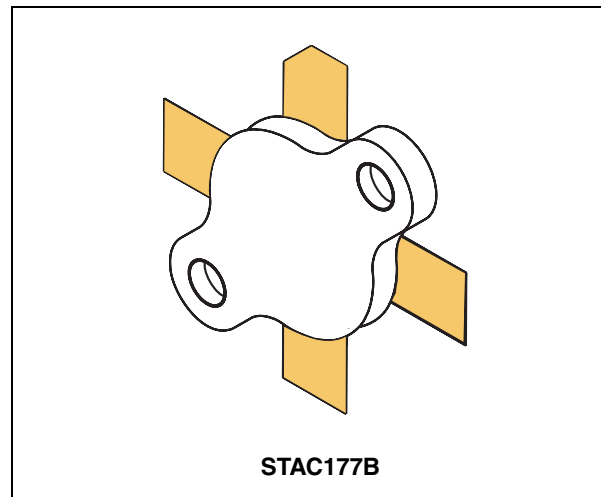


### Features

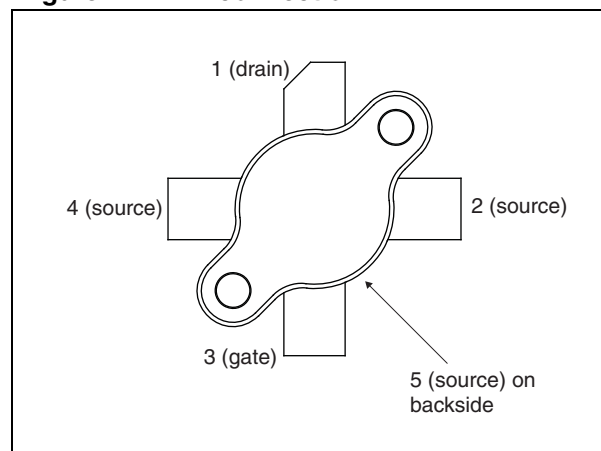
- High power capability
- $P_{OUT} = 350\text{ W min. with } 22\text{dB gain @ } 30\text{ MHz}$
- $P_{SAT} = 450\text{ W}$
- Low  $R_{DS(on)}$
- STAC air cavity packaging technology - STAC<sup>®</sup> package
- Gold metallization
- Excellent thermal stability
- Common source configuration

### 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

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

**Table 2. Absolute maximum rating**

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

1.  $T_{\text{j}} = 150^{\circ}\text{C}$

**Table 3. Thermal data**

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

## 2 Electrical characteristics

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

**Table 4. Static**

Symbol	Test conditions		Min.	Typ.	Max.	Unit
$V_{(BR)DSS}^{(1)}$	$V_{GS} = 0\text{ V}$	$I_{DS} = 200\text{ mA}$	130			V
$I_{DSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 50\text{ V}$			200	$\mu\text{A}$
$I_{GSS}$	$V_{GS} = 20\text{ V}$	$V_{DS} = 0\text{ V}$			500	nA
$V_{GS(Q)}^{(2)}$	$V_{DS} = 10\text{ V}$	$I_D = 250\text{ mA}$			see table below	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}$	$I_D = 20\text{ A}$			2	V
$G_{FS}^{(2)}$	$V_{DS} = 10\text{ V}$	$I_D = 10\text{ A}$	see table below			mho
$C_{ISS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 50\text{ V}$		830		pF
$C_{OSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 50\text{ V}$		470		pF
$C_{RSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 50\text{ V}$		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
$P_{OUT}$	$V_{DD} = 50\text{ V}$	$I_{DQ} = 250\text{ mA}$ $f = 30\text{ MHz}$	350	450		W
$G_{PS}$	$V_{DD} = 50\text{ V}$	$I_{DQ} = 250\text{ mA}$ $P_{OUT} = 350\text{ W}$ $f = 30\text{ MHz}$	22	25		dB
$h_D$	$V_{DD} = 50\text{ V}$	$I_{DQ} = 250\text{ mA}$ $P_{OUT} = 350\text{ W}$ $f = 30\text{ MHz}$	60	65		%
Load Mismatch	$V_{DD} = 50\text{ V}$	$I_{DQ} = 250\text{ mA}$ $P_{OUT} = 350\text{ W}$ $f = 30\text{ MHz}$ 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

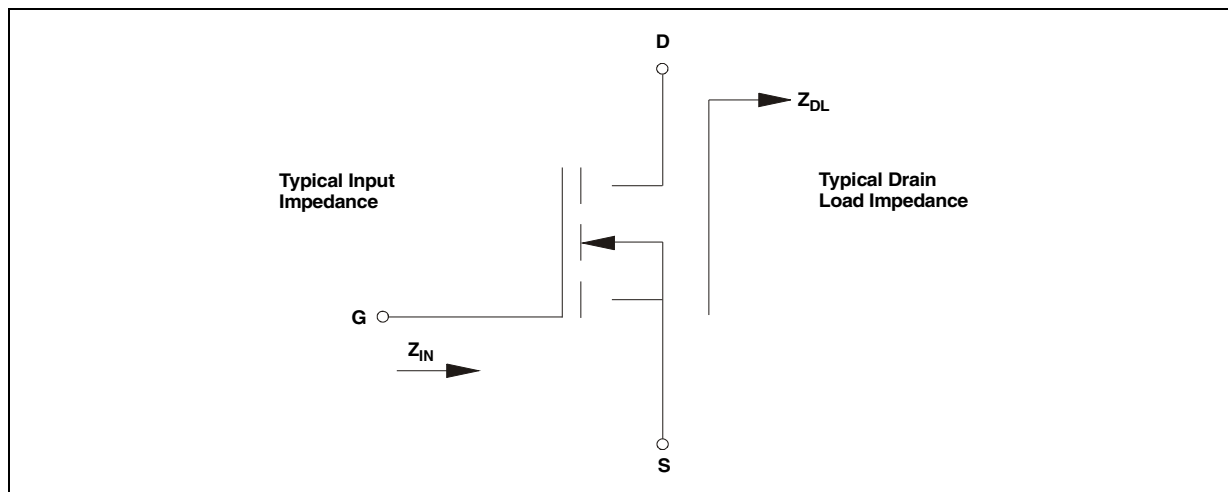
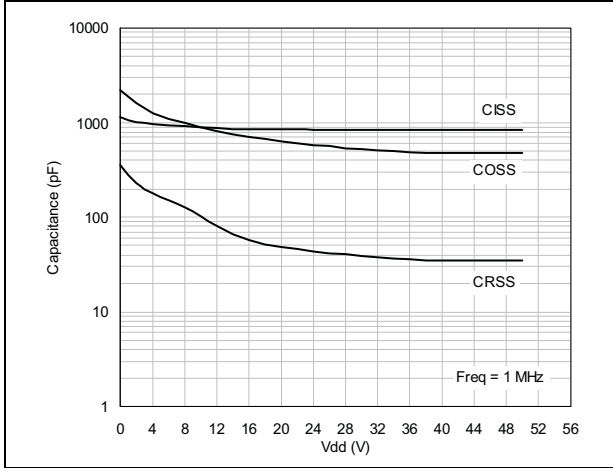


Table 8. Impedance data

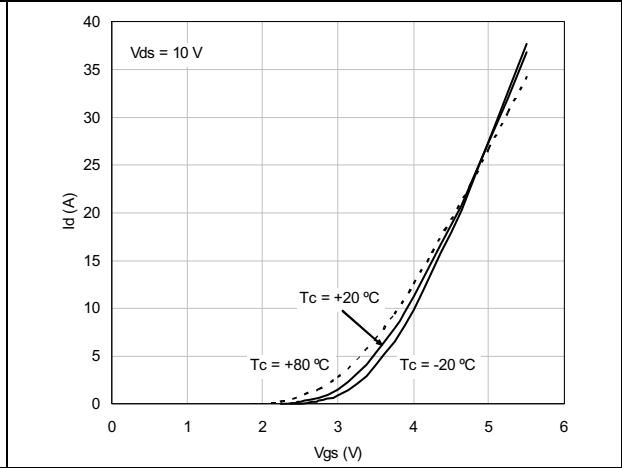
f	$Z_{IN}$ ( $\Omega$ )	$Z_{DL}$ ( $\Omega$ )
30 MHz	$1.3 - j 2.9$	$3.1 + j 2.3$
108 MHz	$1.4 - j 2.4$	$1.9 + j 1.4$
175 MHz	$1.4 - j 2.2$	$1.7 + j 1.6$

# 4 Typical performance

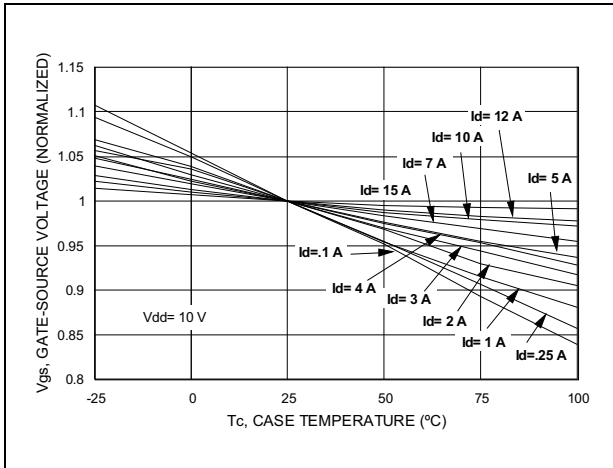
**Figure 3. Capacitance vs drain voltage**



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



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



## 5 Package mechanical data

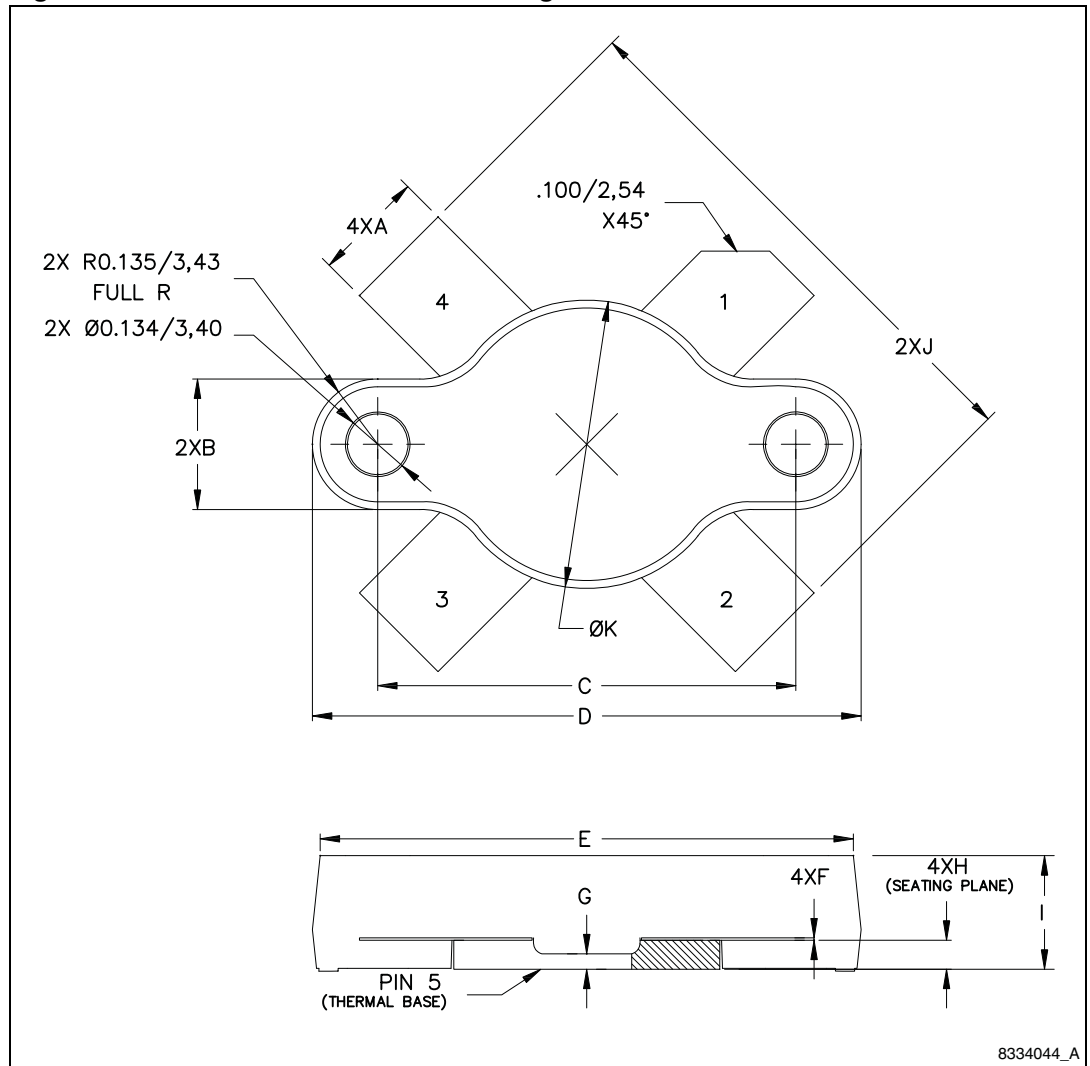
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK is an ST trademark.

**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

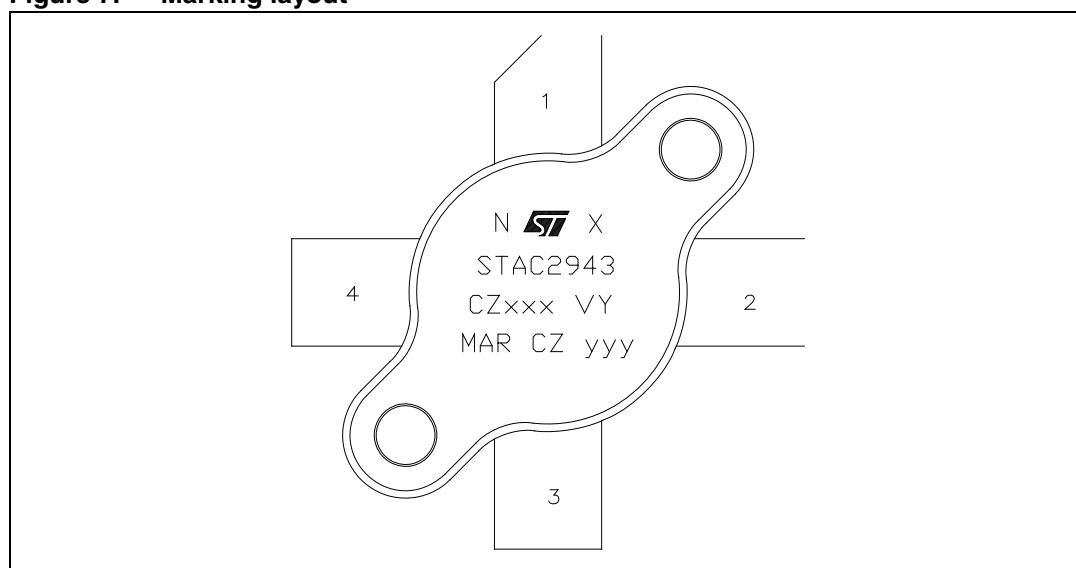


## 6 Marking, packing and shipping specifications

**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.

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