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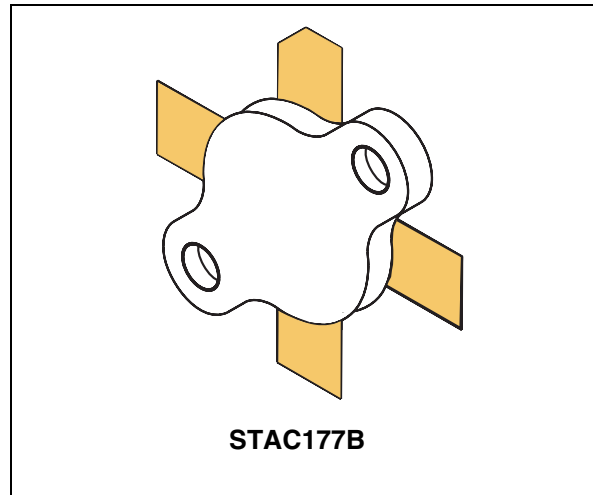


### Features

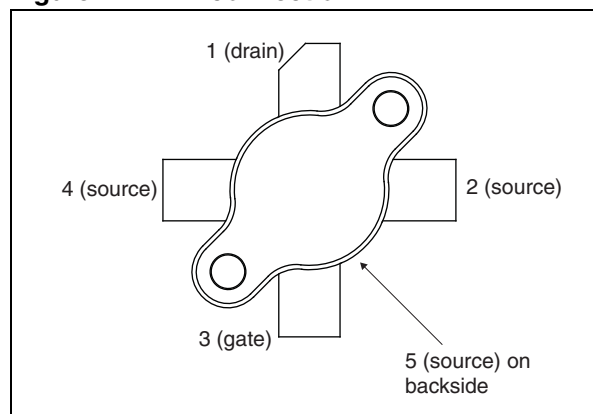
- Gold metallization
- Excellent thermal stability
- Common source configuration
- $P_{OUT} = 300\text{W}$  min. with 20dB gain @ 30 MHz
- STAC air cavity packaging technology - STAC<sup>®</sup> package

### Description

The STAC2933 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. Its special low thermal-resistance package makes it 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>
STAC2933	STAC2933 <sup>(1)</sup>	25 pcs	STAC177B	Plastic tray

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

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# 1 Electrical data

## 1.1 Maximum rating

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

**Table 2. Absolute maximum rating**

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	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	$^{\circ}C$
$T_{STG}$	Storage temperature	-65 to +150	$^{\circ}C$

## 1.2 Thermal data

**Table 3. Thermal data**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction -case thermal resistance	0.22	$^{\circ}C/W$

## 2 Electrical characteristics

T<sub>CASE</sub> = 25°C

**Table 4. Static**

Symbol	Test conditions			Min.	Typ.	Max.	Unit
V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V	I <sub>DS</sub> = 200 mA		130			V
I <sub>DSS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 50 V				100	μA
I <sub>GSS</sub>	V <sub>GS</sub> = 20 V	V <sub>DS</sub> = 0 V				500	nA
V <sub>GS(Q)</sub> <sup>(1)</sup>	V <sub>DS</sub> = 10 V	I <sub>D</sub> = 250 mA		see table below			V
V <sub>DS(ON)</sub>	V <sub>GS</sub> = 10 V	I <sub>D</sub> = 20 A				3	V
G <sub>FS</sub> <sup>(1)</sup>	V <sub>DS</sub> = 10 V	I <sub>D</sub> = 10 A		see table below			mho
C <sub>ISS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 50 V	f = 1 MHz		1000		pF
C <sub>OSS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 50 V	f = 1 MHz		372		pF
C <sub>RSS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 50 V	f = 1 MHz		29		pF

1. V<sub>GS</sub> and G<sub>FS</sub> sort for each unit.

**Table 5. Dynamic**

Symbol	Test conditions			Min.	Typ.	Max.	Unit
P <sub>OUT</sub>	V <sub>DD</sub> = 50 V	I <sub>DQ</sub> = 250 mA	f = 30 MHz	300	400		W
G <sub>PS</sub>	V <sub>DD</sub> = 50 V	I <sub>DQ</sub> = 250 mA	P <sub>OUT</sub> = 300 W f = 30 MHz	20	23.5		dB
h <sub>D</sub>	V <sub>DD</sub> = 50 V	I <sub>DQ</sub> = 250 mA	P <sub>OUT</sub> = 300 W f = 30 MHz	50	65		%
Load Mismatch	V <sub>DD</sub> = 50 V	I <sub>DQ</sub> = 250 mA	P <sub>OUT</sub> = 300 W f = 30 MHz All phase angles	3:1			VSWR

**Table 6. G<sub>FS</sub> sort**

G <sub>FS</sub> sort	Value	G <sub>FS</sub> sort	Value
A	10 - 10.99	E	14 - 14.99
B	11 - 11.99	F	15 - 15.99
C	12 - 12.99	G	16 - 16.99
D	13 - 13.99	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

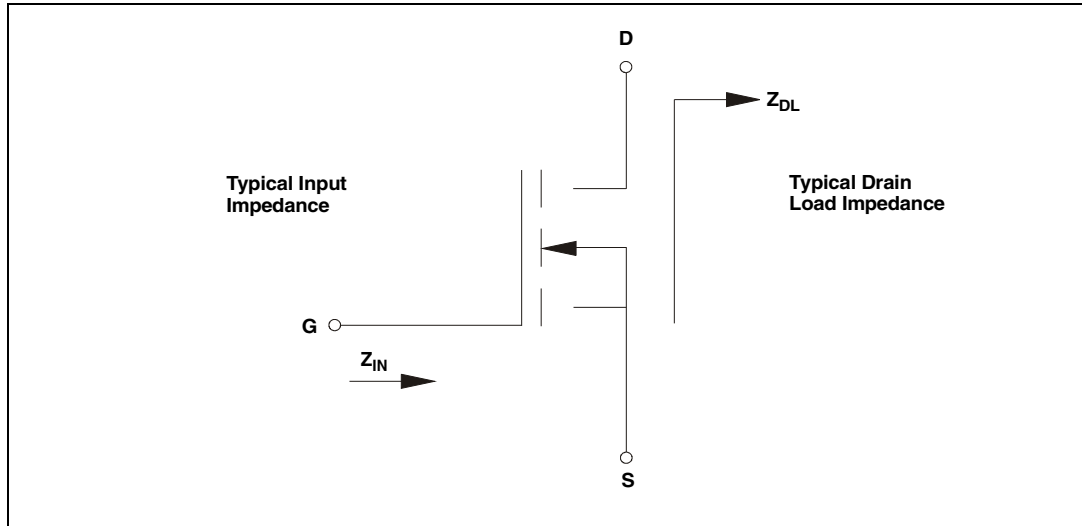


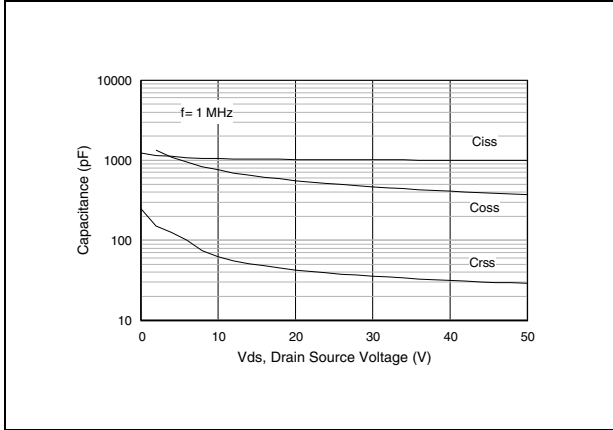
Table 8. Impedance data

FREQ	Z <sub>IN</sub> (Ω)	Z <sub>DL</sub> (Ω)
30 MHz	1.8 - j 0.2	2.8 + j 2.3
108 MHz	1.9 + j 0.2	1.6 + j 1.4
175 MHz	1.9 + j 0.3	1.5 + j 1.6

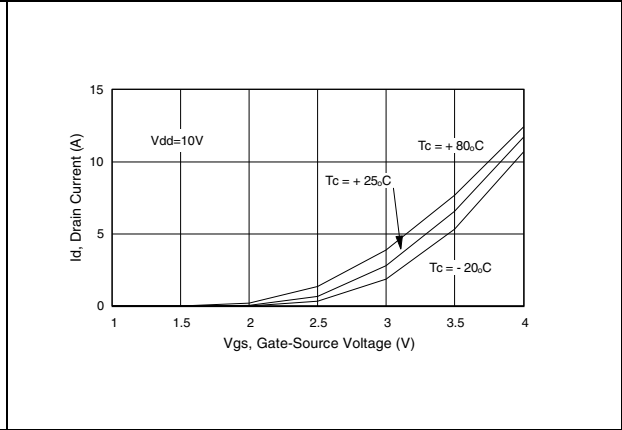


# 4 Typical performance

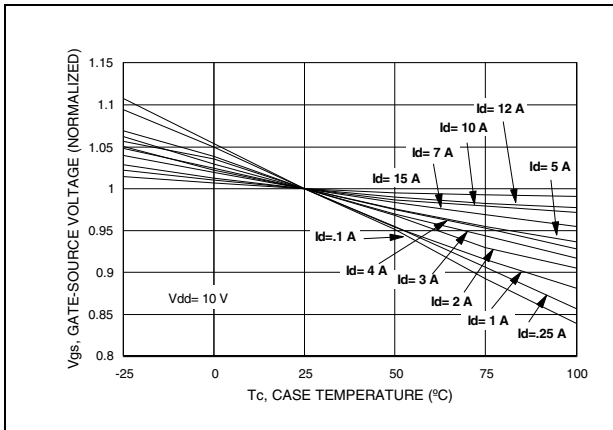
**Figure 3. Capacitance vs drain voltage**



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



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





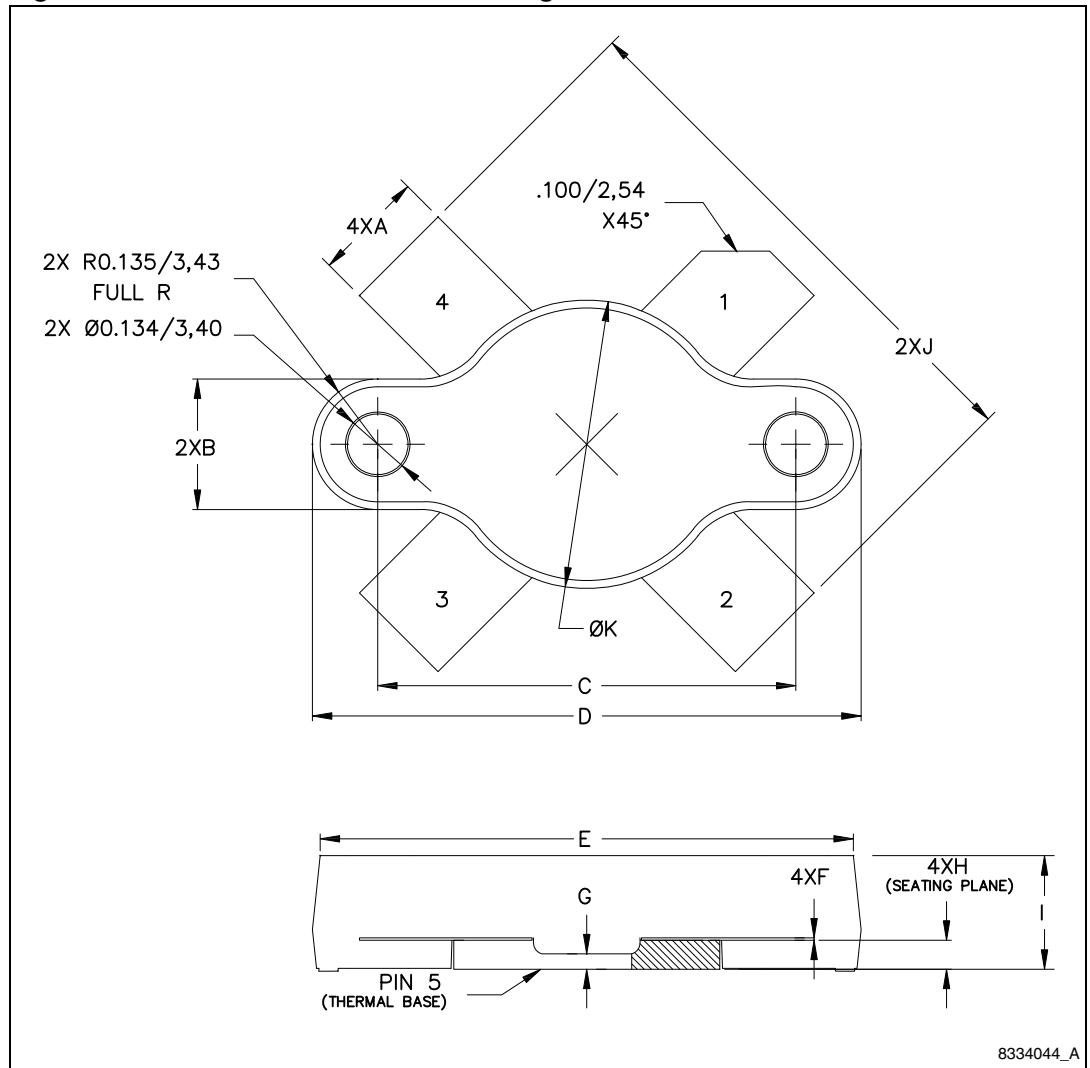
## 5 Package mechanical data

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

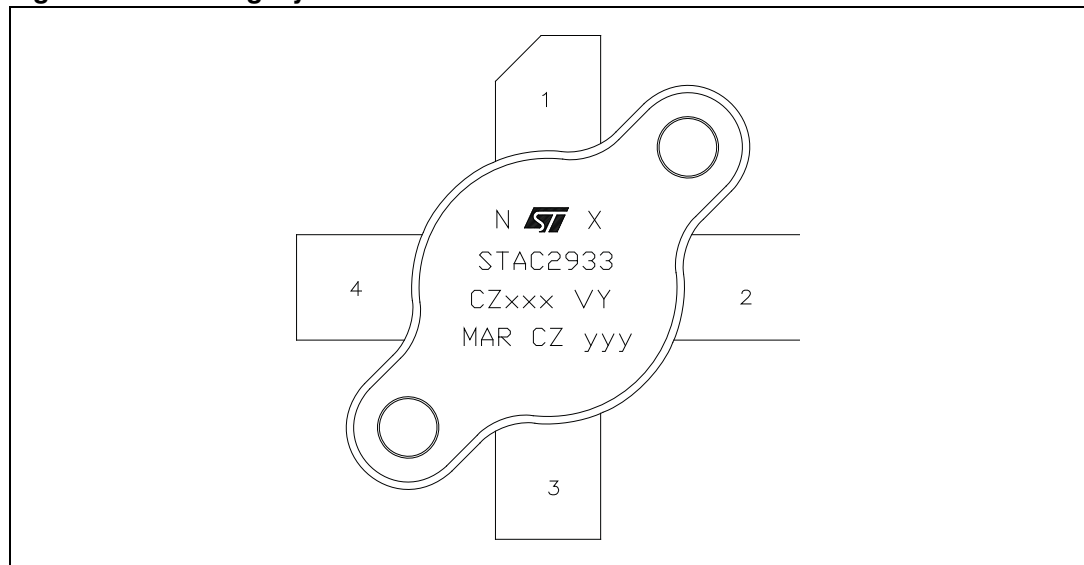


## 6 Marking, packing and shipping specifications

**Table 10. Packing and shipping specifications**

Order code	Packaging	Pcs per tray	Dry pack humidity	V <sub>GS</sub> and G <sub>FS</sub> code	Lot code
STAC2933	Plastic tray	25	< 10 %	Not mixed	Not mixed

**Figure 7. Marking layout**



**Table 11. Marking specifications**

Symbol	Description
X	G <sub>FS</sub> sort
N	V <sub>GS</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	Changes
16-Jan-2012	1	Initial release.

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