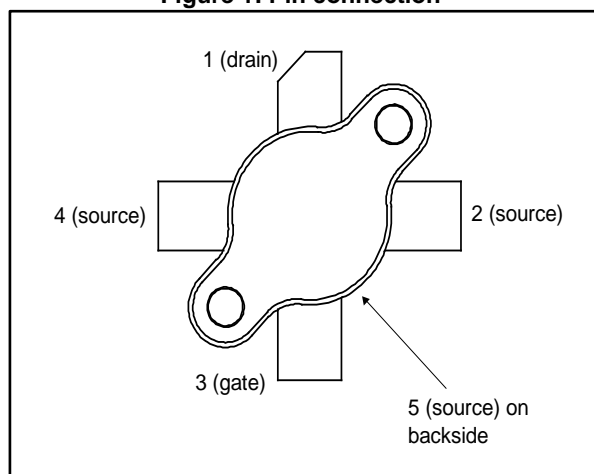


Figure 1: Pin connection



Description

The STAC250V2-500E uses the latest RF Power SuperDMOS technology specially designed for 150 V and 250 V industrial RF power Class-C, D and E generators such as PECVD, plasma sputtering, flat panel and solar cell manufacturing equipment. The STAC250V2-500E benefits from the latest generation of STAC® air cavity packaging, which exhibits a 25% lower thermal resistance compared to equivalent ceramic packages.

Table 1: Device summary

Order code	Marking	Package	Packaging
STAC250V2-500E	250V2-500 ⁽¹⁾	STAC177B	Plastic tray

Notes:

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

Features

- Operating frequency up to 27 MHz
- $P_{OUT} = 600\text{ W typ. with } 23\text{ dB gain @ } 13.56\text{ MHz/250 V}$
- Designed for Class-C, D and E operation
- $V_{(BR)DSS} > 900\text{ V}$
- Housed in STAC® package, using air cavity packaging technology
- In compliance with the 2002/95/EC1 European Directive

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1 Electrical data

1.1 Maximum ratings

($T_{CASE} = 25\text{ °C}$)

Table 2: Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	900	V
V_{GS}	Gate-source voltage	± 20	V
T_J	Max. operating junction temperature	200	°C
T_{STG}	Storage temperature	-65 to +150	°C

1.2 Thermal data

Table 3: Thermal data

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

2 Electrical characteristics

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

2.1 Static

Table 4: Static

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	$I_{DS} = 250\text{ }\mu\text{A}$	900			V
I_{DSS}	$V_{GS} = 0\text{ V}; V_{DS} = 750\text{ V}$			1	μA
I_{GSS}	$V_{GS} = 20\text{ V}; V_{DS} = 0\text{ V}$			1	μA
V_{TH}	$I_D = 250\text{ }\mu\text{A}$	3	4.7	6	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}; I_D = 7\text{ A}$		4.2	5	V
G_{FS}	$V_{DS} = 7\text{ V}; I_D = 3.5\text{ A}$		4.4		S
C_{ISS}	$V_{GS} = 0\text{ V}; V_{DS} = 150\text{ V}; f = 1\text{ MHz}$		980		pF
C_{OSS}	$V_{GS} = 0\text{ V}; V_{DS} = 150\text{ V}; f = 1\text{ MHz}$		140		pF
C_{RSS}	$V_{GS} = 0\text{ V}; V_{DS} = 150\text{ V}; f = 1\text{ MHz}$		1		pF

2.2 Dynamic

Frequency = 13.56 MHz Class-C

Table 5: Dynamic

Symbol	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	$V_{DD} = 150\text{ V}, P_{IN} = 3.5\text{ W}$	450	500	-	W
	$V_{DD} = 250\text{ V}, P_{IN} = 2.5\text{ W}$	450	600	-	
Gain	$V_{DD} = 150\text{ V}, P_{IN} = 3.5\text{ W}$		21.5	-	dB
	$V_{DD} = 250\text{ V}, P_{IN} = 2.5\text{ W}$		23.5	-	
Efficiency	$V_{DD} = 150\text{ V}, P_{OUT} = 3.5\text{ W}$	70	78	-	%
	$V_{DD} = 250\text{ V}, P_{OUT} = 2.5\text{ W}$		75	-	%
Load mismatch	$V_{DD} = 150\text{ V}, P_{OUT} = 450\text{ W}$		10:1 ⁽¹⁾ 65:1	-	VSWR
	$V_{DD} = 250\text{ V}, P_{OUT} = 450\text{ W}$		3:1 20:1 ⁽¹⁾	-	

Notes:

⁽¹⁾Under pulse conditions: 1 ms - 10%.

3 Impedance data

Figure 2: Impedance data

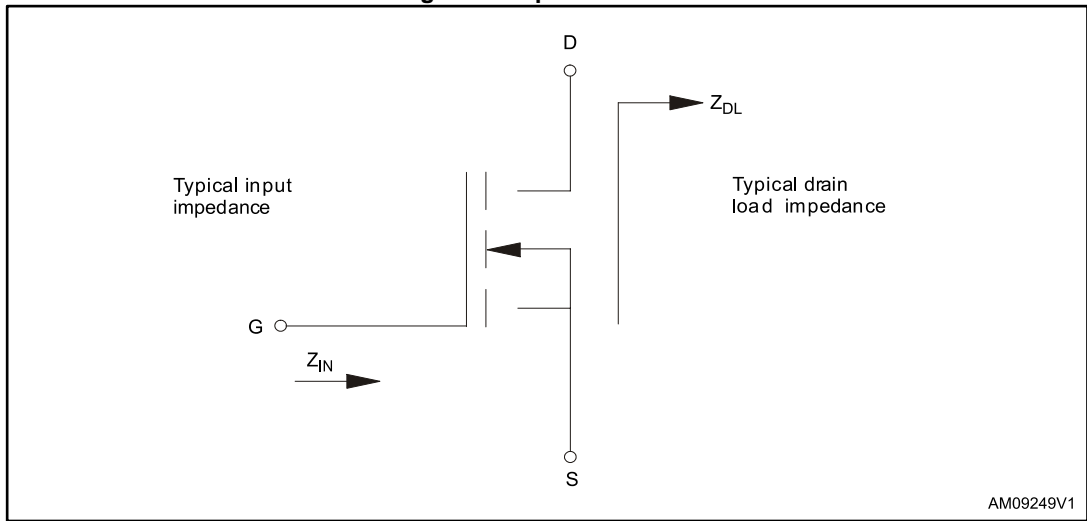


Table 6: Impedance values

Frequency (MHz)	Z_{in}	Z_{dl}
13.56	TBD	TBD

4 Typical performance

Figure 3: Capacitance vs. drain-source voltage

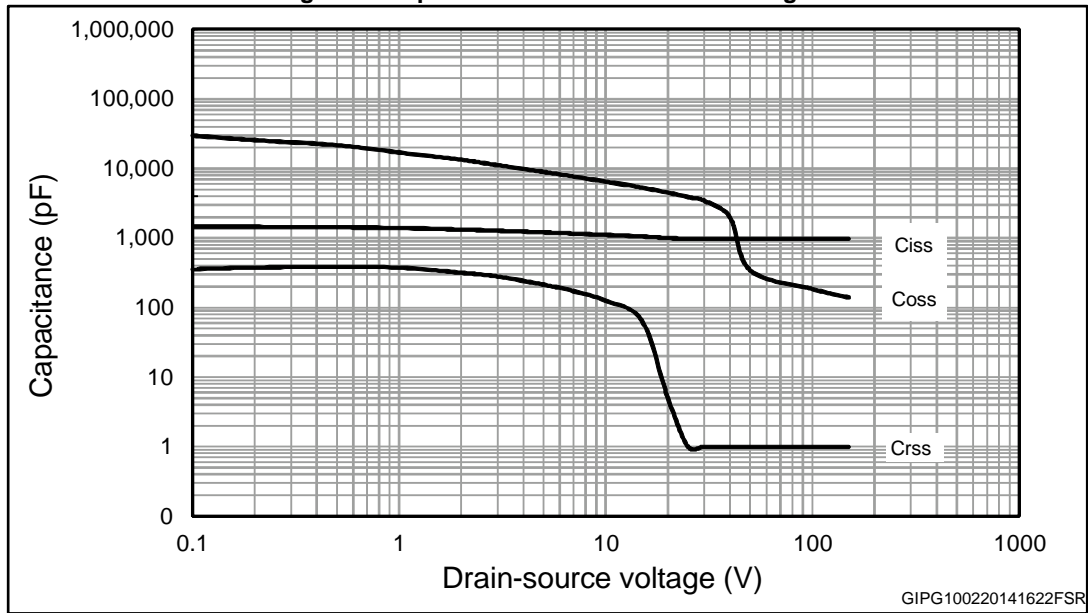


Figure 4: Gain and efficiency vs. output power @ 150 V

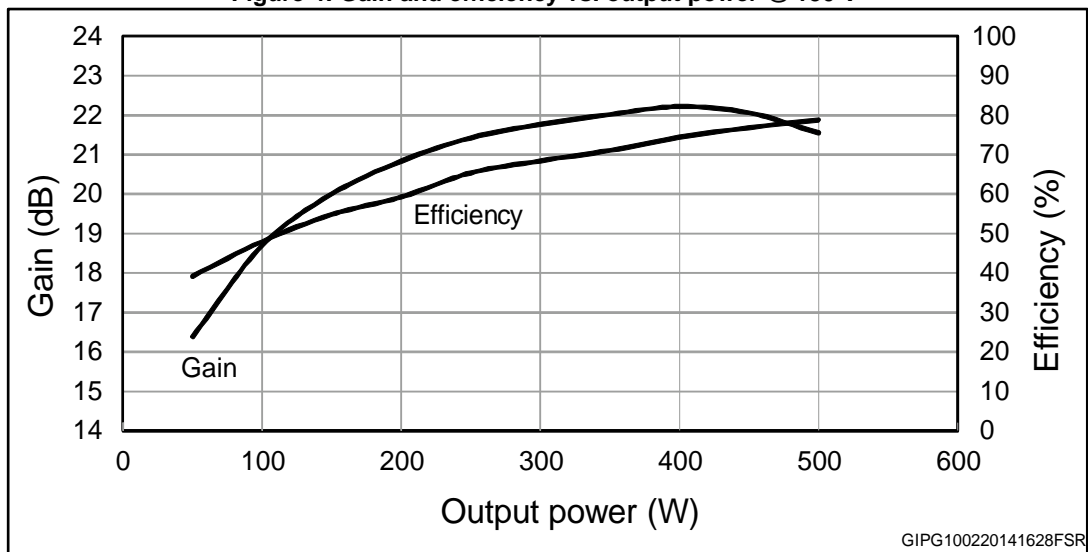
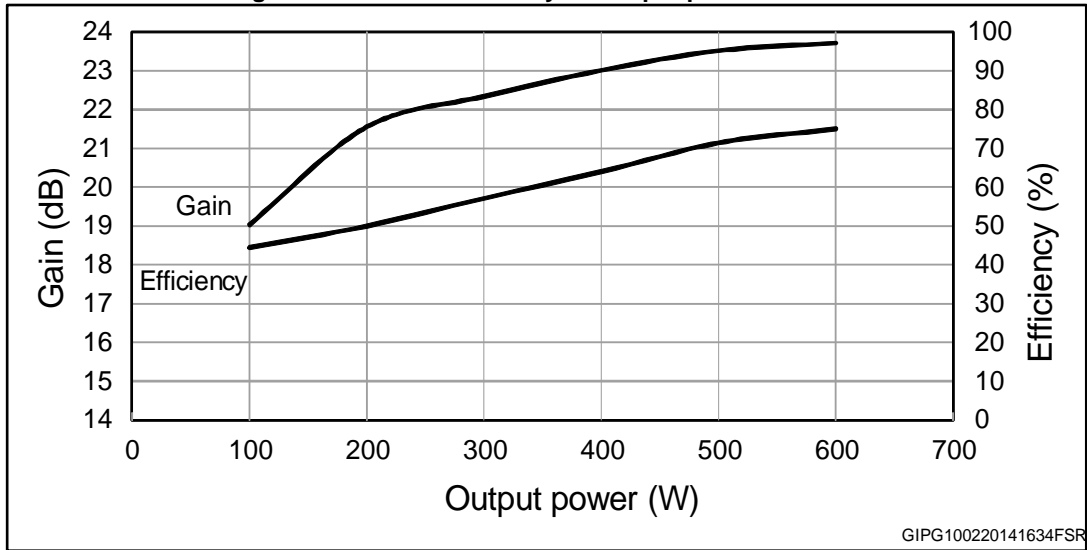


Figure 5: Gain and efficiency vs. output power @ 250 V



Dim.	mm		
	Min.	Typ.	Max.
D	28.70		28.96
E		28.02	
F	0.10		0.15
G		0.81	
H	1.45		1.70
I	5.79		6.15
J	27.43		28.45
K	15.01		15.27

6 Marking, packing and shipping specifications

Table 8: Packing and shipping specifications

Order code	Packaging	Pieces per tray	Dry pack humidity	Lot code
STAC250V2-500E	Plastic tray	25	< 10%	Not mixed

Figure 7: Marking layout

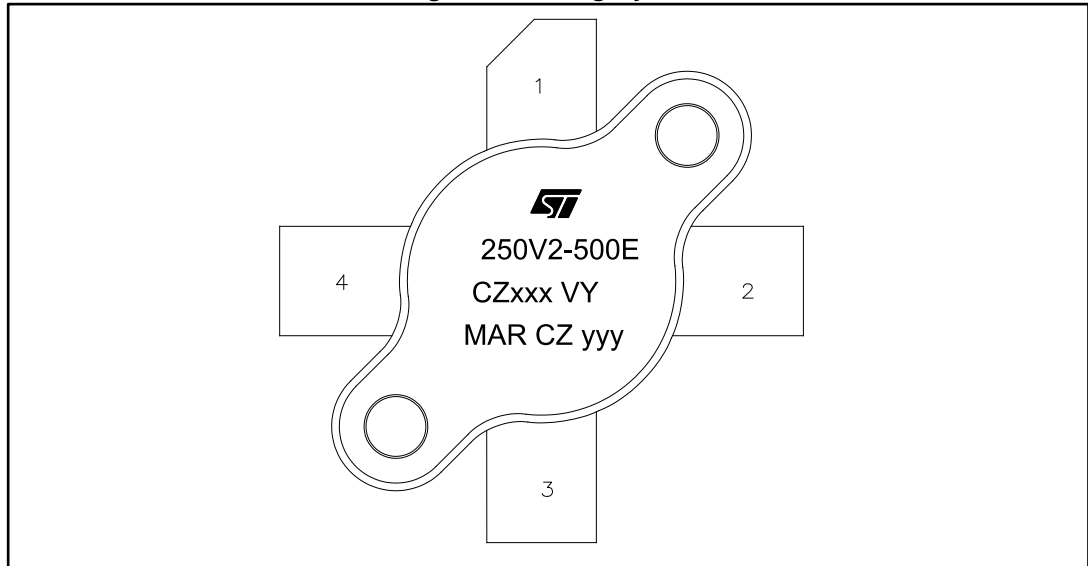


Table 9: Marking specifications

Symbol	Description
CZ	Assembly plant
xxx	Last 3 digits 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 10: Document revision history

Date	Revision	Changes
14-Mar-2014	1	Initial release.
04-Aug-2014	2	Modified title in cover page. Updated Table 4: "Static" Minor text change
15-Sep-2014	3	Document status promoted from preliminary to production data.
10-Nov-2014	4	Updated title and features in cover page.

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