STAP57100

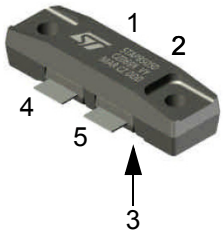
RF power transistor the LdmoST family

Preliminary Data

Features

- Excellent thermal stability
- Common source configuration push-pull
- P_{OUT} = 100 W with 14 dB gain @ 860 MHz
- ST advanced PowerSO-10RF - STAP package
- Load mismatch 10:1 all phases
- In compliance with the 2002/95/EC european directive

Figure 1. Pin connection



1, 2 Drain

3 Source

4, 5 Gate

Description

The STAP57100 is a common source N-channel enhancement-mode lateral field-effect RF power transistor designed for broadband commercial and industrial applications at frequencies up to 1.0 GHz. The STAP57100 is designed for high gain and broadband performance operating in common source mode at 28 V.

Table 1. Device summary

Order code	Package	Branding
STAP57100	STAP2	STAP57100

1 Electrical data

1.1 Maximum ratings

T_{CASE} = 25 °C

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	65	V
V_{GS}	Gate-source voltage	± 20	V
I_D	Drain current	14	A
P_{DISS}	Power dissipation (@ Tc = 70 °C)	190	W
T_J	Max. operating junction temperature	165	°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	0.50	°C/W

2 Electrical characteristics

T_{CASE} = +25 °C

2.1 Static

Table 4. Static (per side)

Symbol	Test conditions			Min	Typ	Max	Unit
$V_{(BR)DSS}$	V_{GS} = 0 V	I_{DS} = 1 mA		65			V
I_{DSS}	V_{GS} = 0 V	V_{DS} = 28 V				1	µA
I_{GSS}	V_{GS} = 20 V	V_{DS} = 0 V				1	µA
$V_{GS(Q)}$	V_{DS} = 28 V	I_D = 100 mA		2.0		4.0	V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 3 A			0.7	0.9	V
G_{FS}	V_{DS} = 10 V	I_D = 3 A			3		S
ΔV_{TH} (1)	I_D = 100 mA					100	mV
C_{ISS}	V_{GS} = 0 V	V_{DS} = 28 V	f = 1 MHz		83		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 28 V	f = 1 MHz		58		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 28 V	f = 1 MHz		3.0		pF

1. Absolute VGS difference between side 1 and side 2 of the device

2.2 Dynamic

Table 5. Dynamic

Symbol	Test conditions				Min	Typ	Max	Unit
P_{OUT}	V_{DD} = 28 V	I_{DQ} = 500 mA		f = 860MHz	100	120	-	W
G_{PS}	V_{DD} = 28 V	I_{DQ} = 500 mA	P_{OUT} = 100W	f = 860MHz	13	14	-	dB
h_D	V_{DD} = 28 V	I_{DQ} = 500 mA	P_{OUT} = 100W	f = 860MHz	50		-	%
Load mismatch	V_{DD} = 28 V All phase angles	I_{DQ} = 500 mA	P_{OUT} = 100W	f = 860MHz	10:1		-	VSWR

3 Impedance

Figure 2. Current conventions

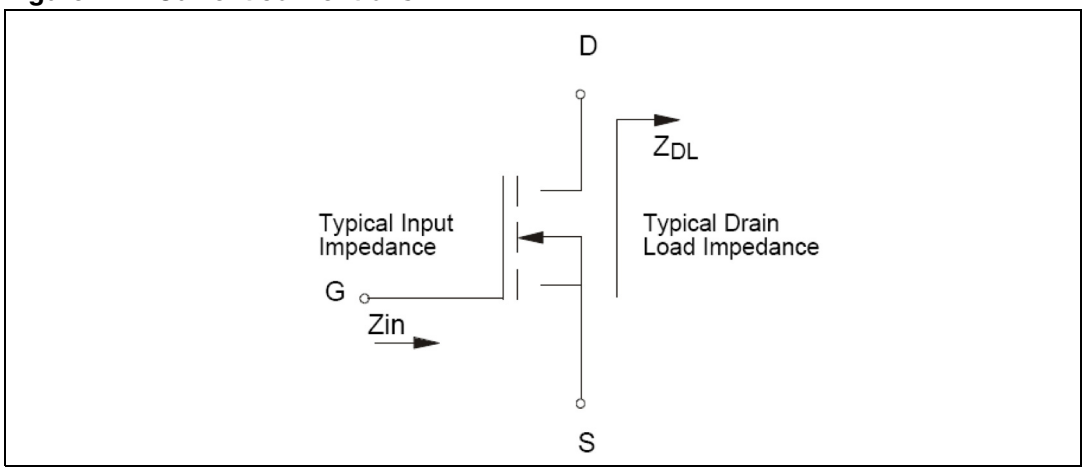


Table 6. Impedance data

Freq. (MHz)	Z_{IN} (Ω)	Z_{DL}(Ω)
890 MHz	1.3 + j 1.4	3.15 - j 2.0
925 MHz	1.1 + j 0.7	2.85 - j 2.9
960 MHz	1.2 + j 2.1	2.35 - j 4.9

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

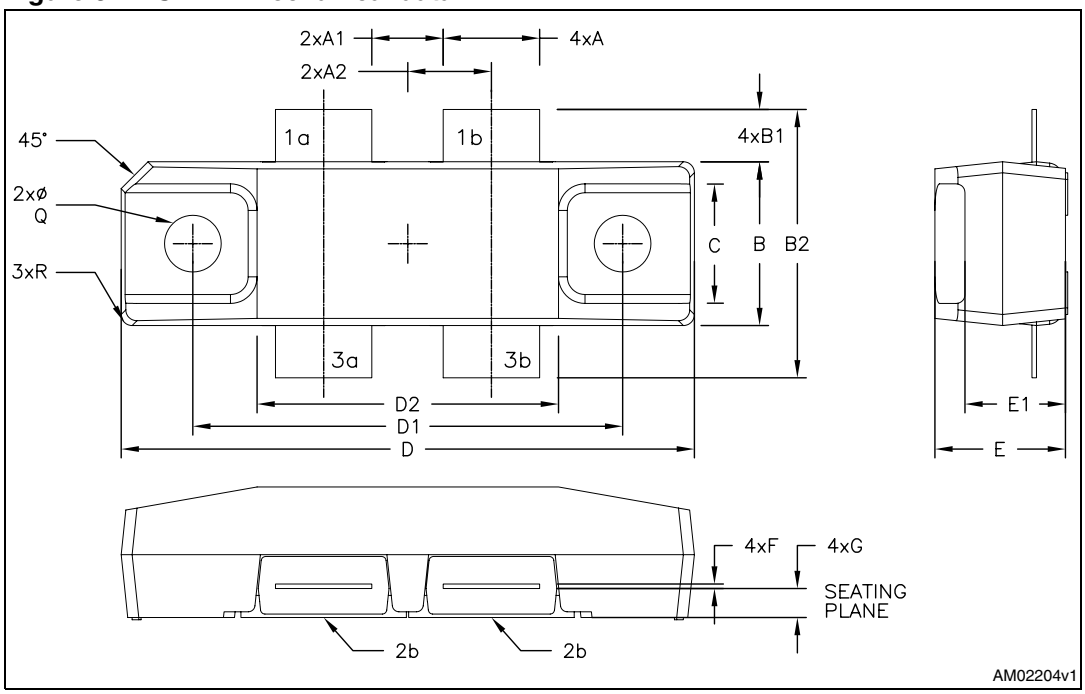
4 Package mechanical data

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. ECOPACK® is an ST trademark.

Table 7. STAP2 mechanical data

Dim	mm			inch		
	Min	Typ	Max	Min	Typ	Max
A	5.40		5.65	0.212		0.222
A1	3.89		4.29	0.153		0.169
A2	4.70		4.90	0.185		0.193
B	9.27		9.53	0.365		0.375
B1	2.90		3.10	0.114		0.122
B2	15.10		15.65	0.594		0.616
C	6.60		6.99	0.260		0.275
D	32.74		33.05	1.289		1.301
D1	24.51		24.82	0.965		0.977
D2	17.15		17.45	0.675		0.687
E	7.42		7.57	0.292		0.298
E1	5.69		5.84	0.224		0.230
F	0.21		0.31	0.008		0.012
G	1.62		1.68	0.064		0.068
Q	3.15		3.30	0.124		0.130
R	0.64			0.025		

Figure 3. STAP2 mechanical data



5 Revision history

Table 8. Document revision history

Date	Revision	Changes
08-Apr-2009	1	Initial release

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