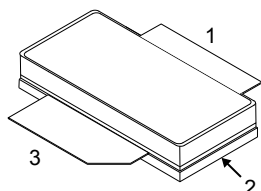


180 W, 32 V, 2.3 to 2.5 GHz RF power LDMOS transistor



B2

Pin connection	
Pin	Connection
1	Gate
2	Source (bottom side)
3	Drain

Features

Order code	Frequency	V _{DD}	P _{OUT}	Gain	Efficiency
ST24180	2350 MHz	32 V	180 W	15.3 dB	48%

- High efficiency and linear gain operations
- Integrated ESD protection
- Internal input matching for ease of use
- Large positive and negative gate/source voltage range for improved class C operation
- In compliance with the European Directive 2002/95/EC

Applications

- RF energy
- Industrial, scientific and medical (ISM)

Description

The ST24180 is a 180 W, internally-matched LDMOS FET designed for multiple uses, especially for RF energy applications such as cooking, heating and medical with frequencies from 2400 to 2500 MHz. It is qualified for operations requiring up to 32 V.



Product status link
ST24180

Product summary	
Order code	ST24180
Marking	ST24180
Package	B2
Packing	Tape and Reel 13"
Base / Bulk	120 / 120

1 Electrical ratings

Table 1. Absolute maximum ratings (+25 °C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	65	V
V_{GS}	Gate-source voltage	-6 to +10	V
V_{DD}	Drain supply voltage	32	V
T_{STG}	Storage temperature range	-65 to +150	°C
T_J	Maximum junction temperature	+200	°C

Table 2. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Junction-case thermal resistance $T_{CASE} = +85\text{ °C}$, $T_J = +200\text{ °C}$, DC test	0.35	°C/W

Table 3. ESD protection

Symbol	Parameter	Class
HBM	Human body model (according to JESD22-A114)	2

2 Electrical characteristics

($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

Table 4. Static

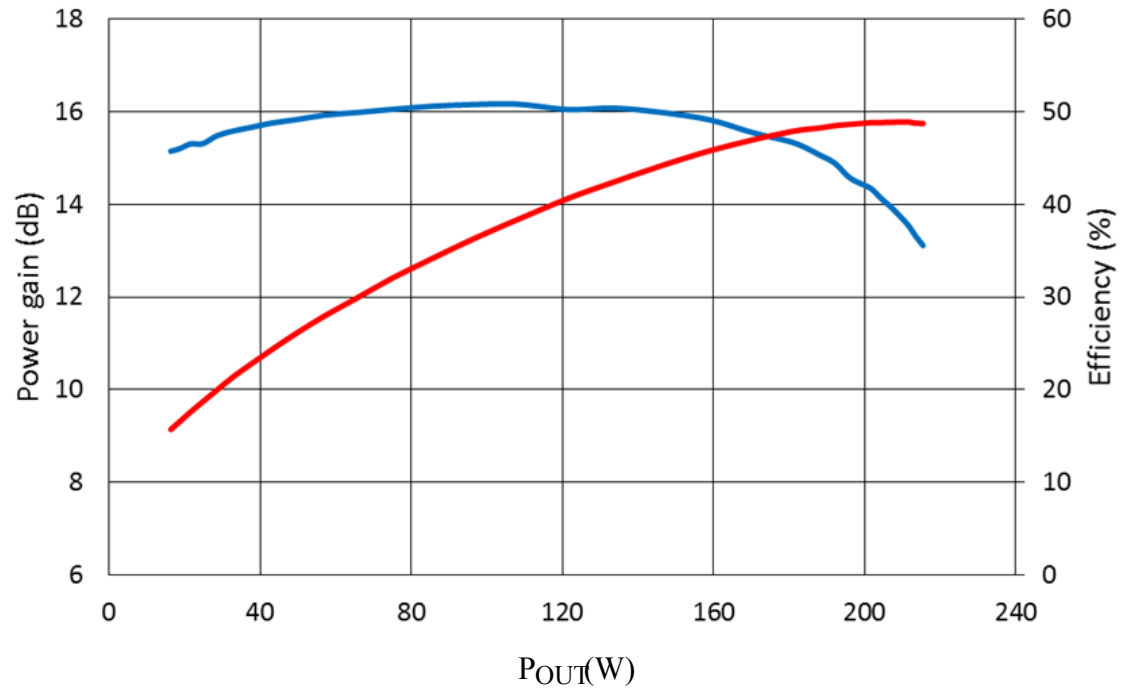
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	$V_{GS} = 0\text{ V}$, $I_D = 100\text{ }\mu\text{A}$	65			V
I_{DSS}	Zero-gate voltage drain current	$V_{GS} = 0\text{ V}$, $V_{DS} = 28\text{ V}$			1	μA
I_{GSS}	Gate-body leakage current	$V_{DS} = 0\text{ V}$, $V_{GS} = 10\text{ V}$			1	μA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = 28\text{ V}$, $I_D = 600\text{ }\mu\text{A}$	1.5		2.5	V
$V_{DS(on)}$	Static drain-source on-voltage	$V_{GS} = 10\text{ V}$, $I_D = 1.55\text{ A}$			0.22	V

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	Output power	$V_{DD} = 32\text{ V}$, $I_{DQ} = 0.8\text{ A}$, $f = 2350\text{ MHz}$, $PW = 10\text{ }\mu\text{s}$, $DC = 10\%$ (see Figure 1. Power gain and drain efficiency vs output power (at 2350 MHz) and Figure 3. Test circuit ($f =$ 2350 MHz))	-	180	-	W
Gain	Power gain		-	15.3	-	dB
Efficiency	Drain efficiency		-	48	-	%
VSWR	Load mismatch	$P_{OUT} = 180\text{ W}$, all phases	-		10:1	

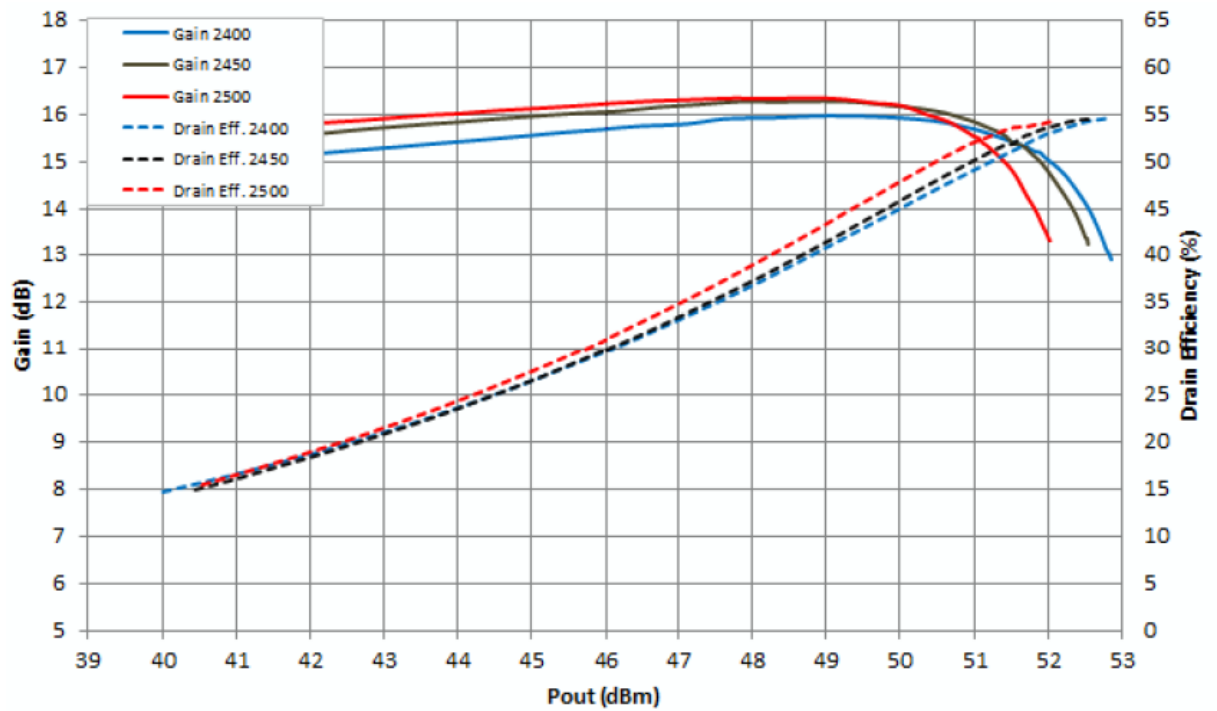
2.1 Electrical characteristics (curves)

Figure 1. Power gain and drain efficiency vs output power (at 2350 MHz)



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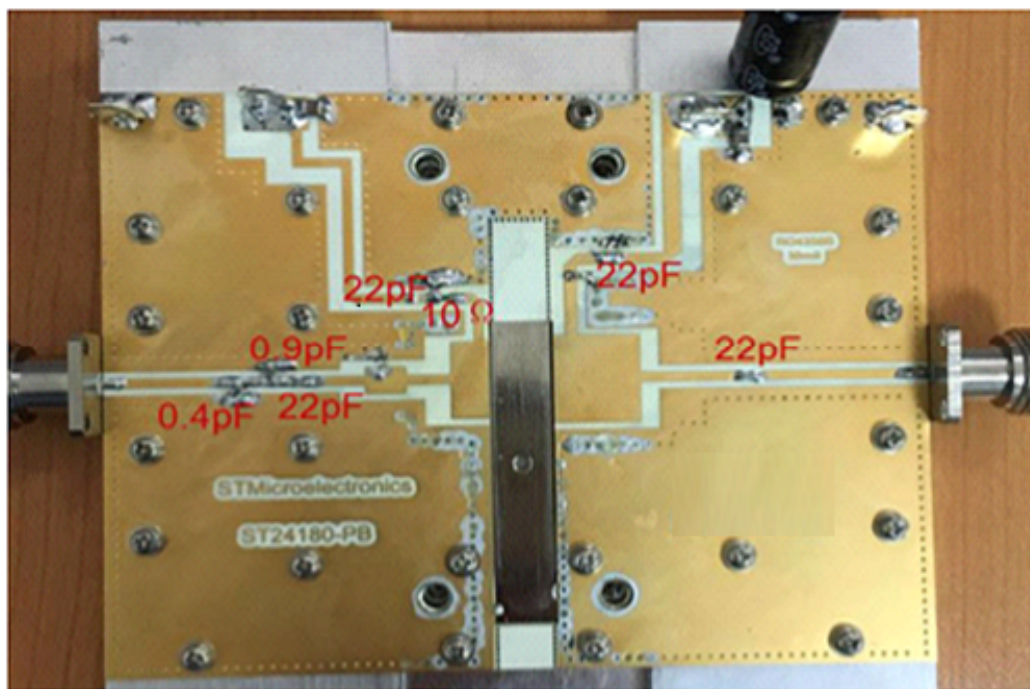
Note: $V_{DD} = 32\text{ V}$, $I_{DQ} = 800\text{ mA}$, pulse width = $10\text{ }\mu\text{s}$, duty cycle = 10%

Figure 2. Power gain and drain efficiency vs output power (2400 - 2500 MHz)


Note: $V_{DD} = 28\text{ V}$, $I_{DQ} = 800\text{ mA}$, pulse width = $10\text{ }\mu\text{s}$, duty cycle = 10%

3 Test circuits

Figure 3. Test circuit ($f = 2350$ MHz)

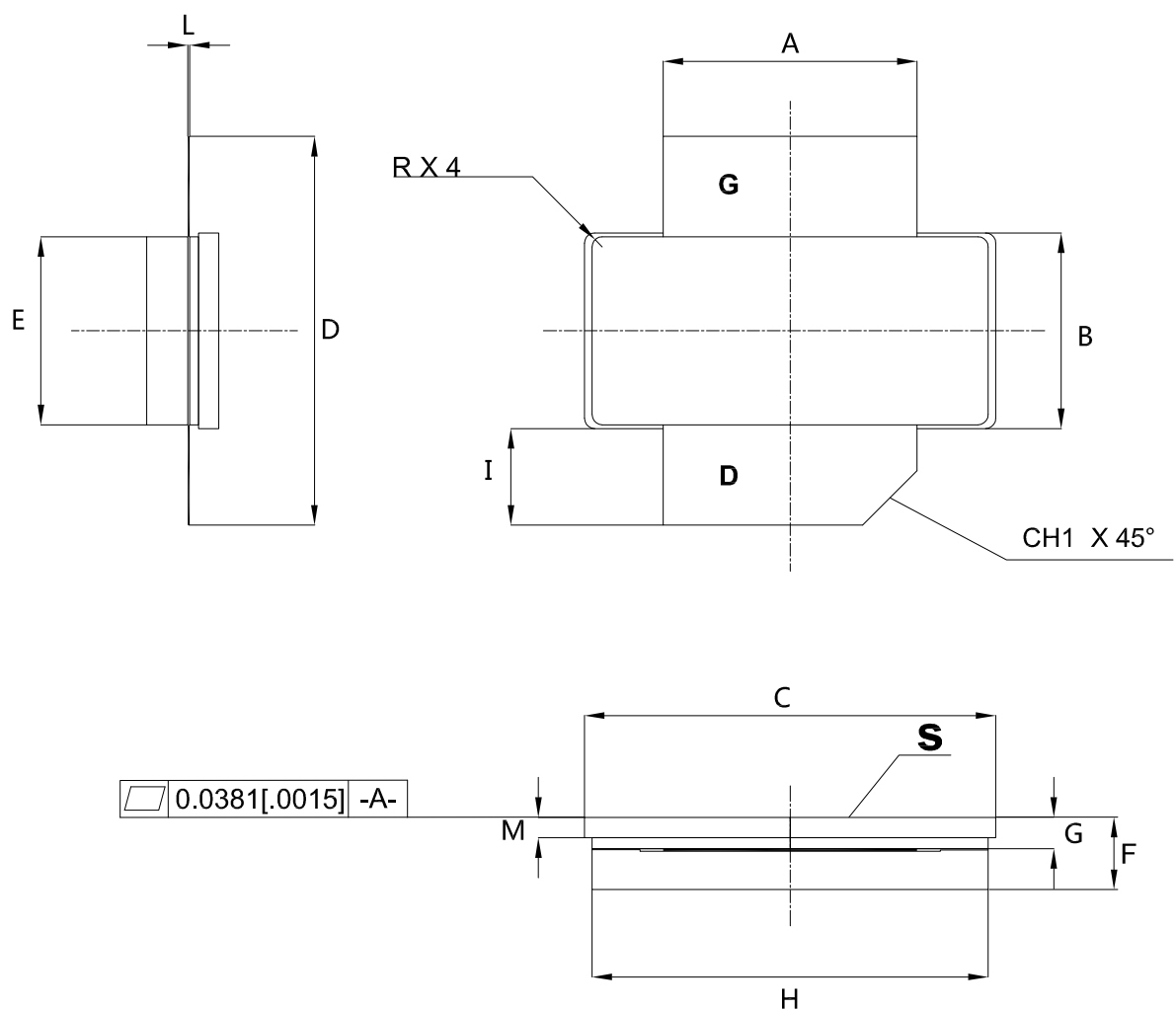


4 Package information

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.

4.1 B2 package information

Figure 4. B2 package outline



00418521_2

Table 6. B2 mechanical data

Symbol	Millimetres		
	Min	Typ	Max
A	12.57	12.7	12.83
B	9.65	9.78	9.91
C	20.44	20.57	20.70
D	19.31	19.44	19.57
E	9.27	9.40	9.53
F	3.23	3.61	3.99
G	1.44	1.57	1.70
H	19.68	19.81	19.94
I	4.70	4.83	4.96
L	0.07	0.10	0.15
M	0.89	1.02	1.15
CH1		2.72	
R		0.51	

Revision history

Table 7. Document revision history

Date	Version	Changes
01-Oct-2018	1	Initial release
16-Oct-2020	2	Updated Section Product status / summary, Table 5. Dynamic and Section 4.1 B2 package information.

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