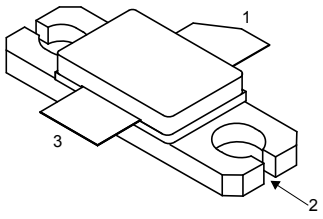
RF5L15030CB2

Datasheet

30 W, 50 V, HF to 1.5 GHz RF power LDMOS transistor



GXB

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

Features

Order code	Frequency	V_{DD}	P_{OUT}	Gain	Efficiency
RF5L15030CB2	1 GHz	50 V	30 W	23.5 dB	50%

- High efficiency and linear gain operations
- Integrated ESD protection
- Large positive and negative gate-source voltage range for improved class C operation
- In compliance with the European directive 2002/95/EC

Applications

- Industrial, scientific and medical from HF to 1.5 GHz
- FM and TV broadcast
- HV/VHF ground communications
- Avionics and L-band radar
- Wideband communications

Description

The RF5L15030CB2 is a 30 W, 50 V, LDMOS FET designed for applications in the frequency range from HF to 1.5 GHz. It can be used in class AB, B or C for all typical modulation formats.

Product status link
RF5L15030CB2

Product summary	
Order code	RF5L15030CB2
Marking	5L15030
Package	GXB
Packing	Tape and reel 13"
Base/bulk quantity	180/180

1 Electrical ratings

Table 1. Absolute maximum ratings (T_C = 25 °C)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	110	V
V_{GS}	Gate-source voltage	-8 to 10	V
V_{DD}	Maximum operating voltage	55	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_{thJC}(1)	Thermal resistance, junction-to-case	2.9	°C/W

1. *T_C = 85 °C , P_{OUT} = 30 W, DC test.*

Table 3. ESD protection

Symbol	Test methodology	Class
HBM	Human body model (according to ANSI/ESDA/JEDEC JS001-2017)	H2
CDM	Charge device model (according to ANSI/ESDA/JEDEC JS002-2014)	C3

2 Electrical characteristics

Table 4. Static

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	V_{GS} = 0 V, I_{DS} = 100 µA	110			V
I_{DSS}	Zero gate voltage drain leakage current	V_{GS} = 0 V, V_{DS} = 50 V			1	µA
		V_{GS} = 0 V, V_{DS} = 90 V				
I_{GSS}	Gate-source leakage current	V_{GS} = -8/10 V, V_{DS} = 0 V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = 50 V, I_{DS} = 600 µA	1		3	V
$V_{GS(Q)}$	Gate quiescent voltage	V_{DS} = 1 V, I_{DS} = 100 mA	2		5	V
$V_{DS(on)}$	Static drain-source on-voltage	V_{GS} = 10 V, I_{DS} = 1 A			1.1	V
$I_{DS(on)}$	Static drain-source on-current	V_{GS} = 10 V, V_{DS} = 0.1 V			2.5	A
$R_{DS(on)}$	Drain-source on-state resistance	V_{GS} = 10 V, V_{DS} = 0.1 V			1	Ω
C_{iss}	Common source input capacitance	V_{GS} = 0 V, V_{DD}= 50 V, f = 1 MHz		28		pF
C_{rss}	Common source feedback capacitance			0.4		pF
C_{oss}	Common source output capacitance			12		pF

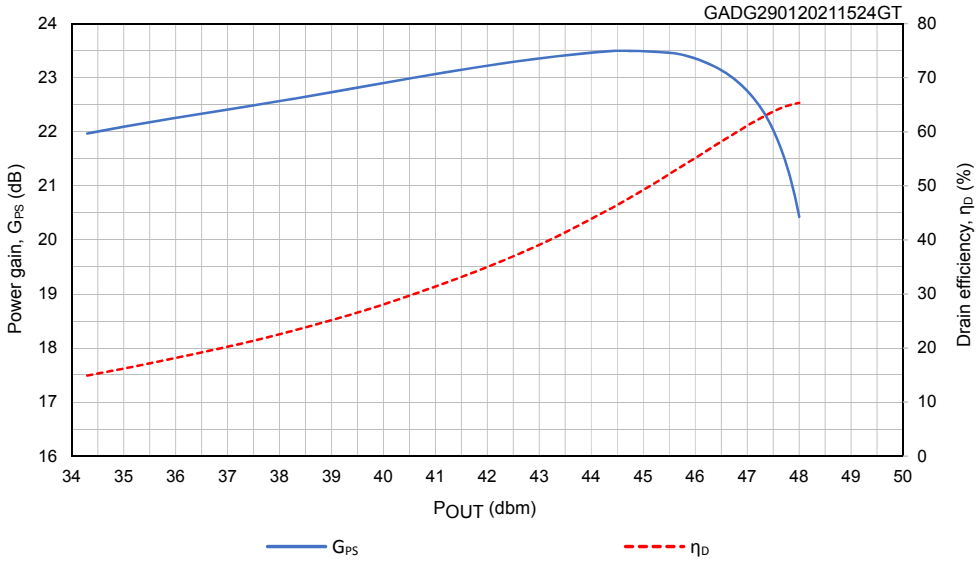
Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	Output power	f = 1 GHz	-	30		W
G_{PS}	Power gain		-	23.5		dB
η_D	Drain efficiency		-	50		%
VSWR	Load mismatch	P_{OUT} = 30 W, all phases	-		10:1	

Note: V_{DD} = 50 V, I_{DQ} = 0.1 A, pulsed CW, pulse width = 100 µs, duty cycle = 10%.

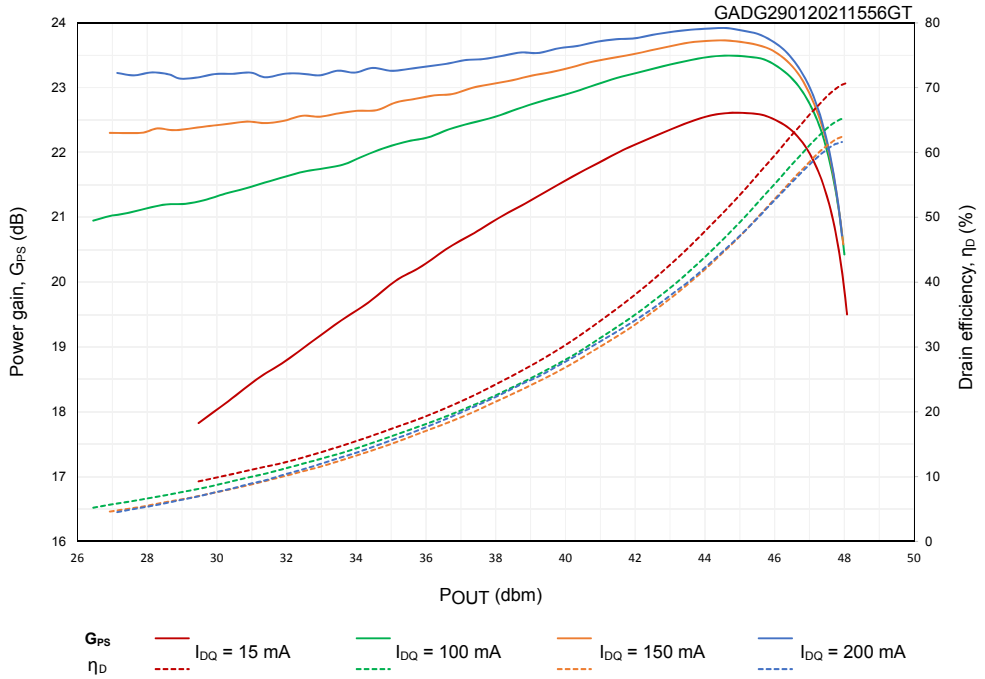
3 Typical performances

Figure 1. Power gain and drain efficiency versus output power (f = 1 GHz)



Note: V_{DD} = 50 V, I_{DQ} = 0.1 A, pulsed CW, pulse width = 100 µs, duty cycle = 10%.

Figure 2. Power gain and drain efficiency versus output power at different I_{DQ} (f = 1 GHz)



Note: V_{DD} = 50 V, pulsed CW, pulse width = 100 µs, duty cycle = 10%.

4 Test circuits

Figure 3. **Test circuit layout**

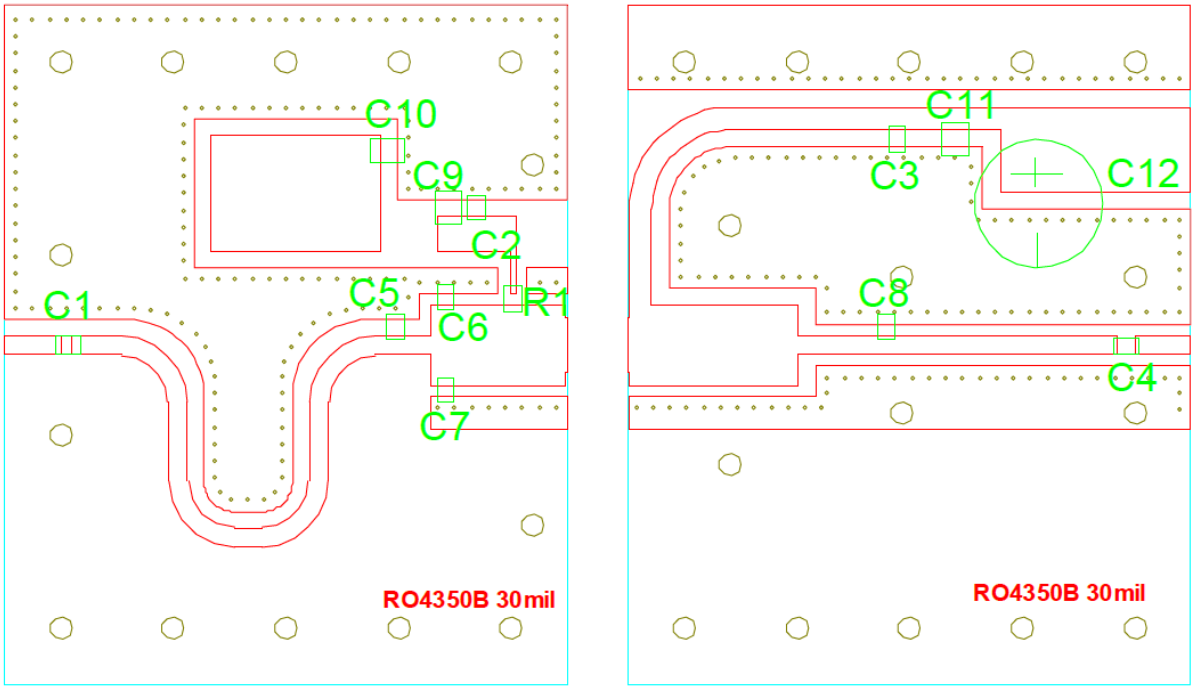


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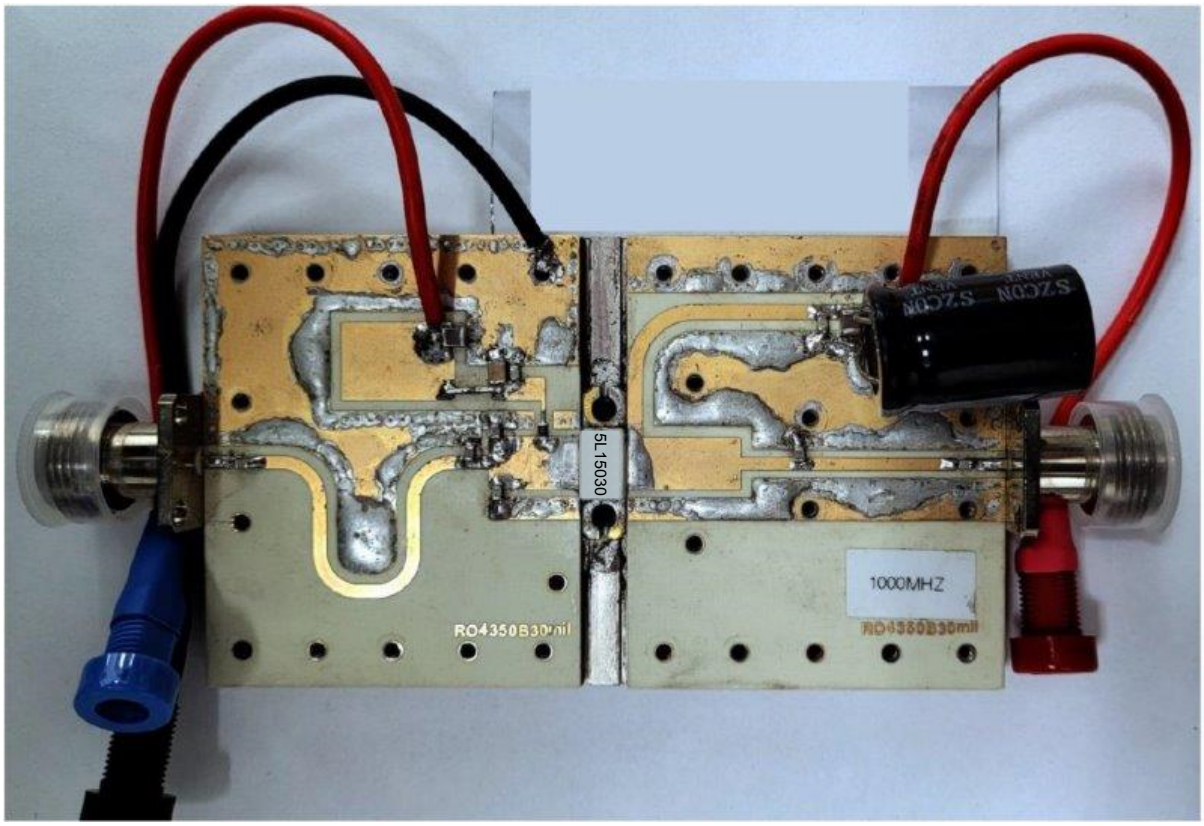
Table 6. **Components list**

Component	Value	Size	Reference
C1, C2, C3, C4	39 pF	0805	ATC600F
C5, C6, C7	8.2 pF	0805	ATC600F
C8	6.8 pF	0805	ATC600F
C9	10 nF	1210	
C10, C11	10 µF	1210	X7R
C12	1000 µF		Aluminium electrolytic capacitor
R1	15 Ω	0805	
PCB	0.762 mm (0.030") thick, εr = 3.48, Rogers RO4350B, 1 oz. copper		

Figure 4. **Test circuit photo**



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5 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.

5.1 GBX package information

Figure 5. GXB package outline

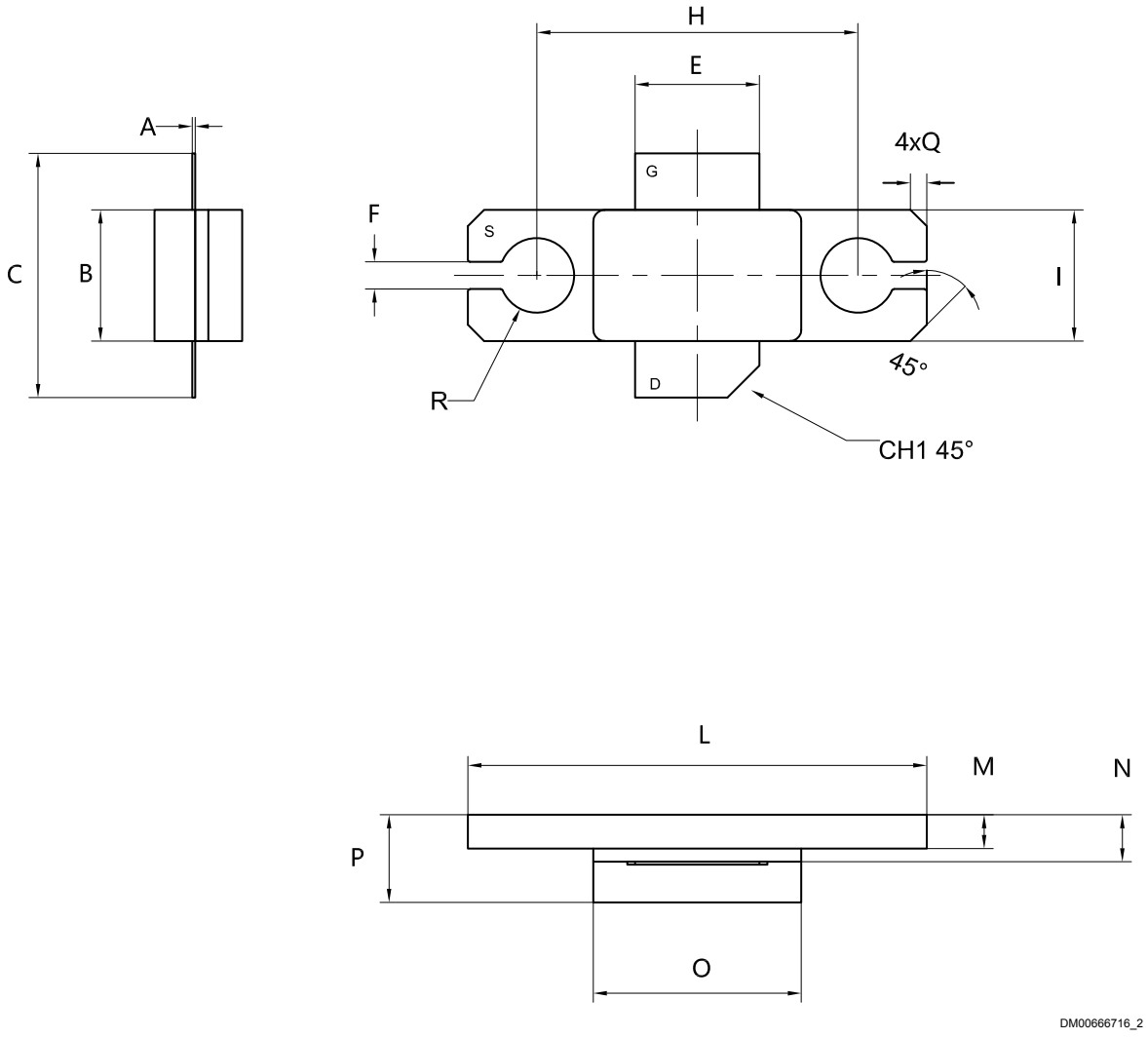
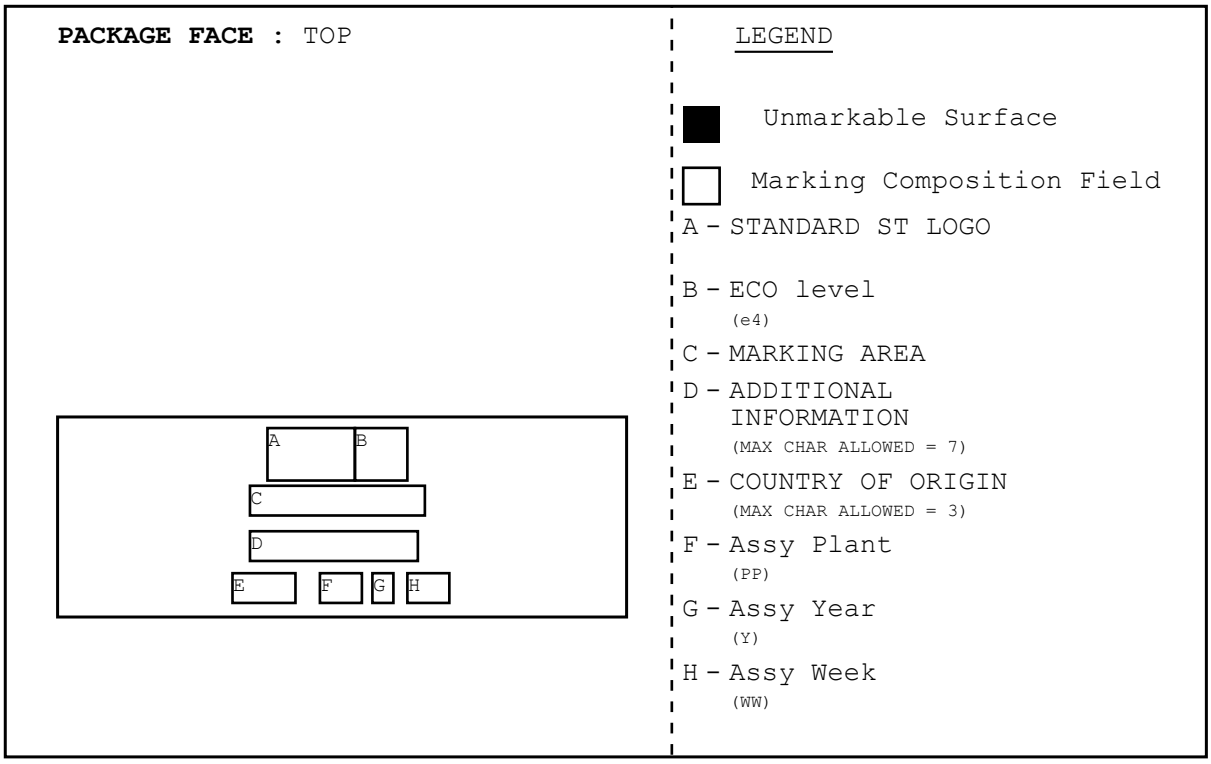


Table 7. **GXB package mechanical data**

Symbol	Millimeters		
	Min.	Typ.	Max.
A	0.11	0.13	0.15
B	5.75		5.80
C	10.30	10.80	11.30
E	5.45	5.50	5.55
F	1.15	1.20	1.25
H	14.15	14.20	14.25
I	5.75	5.80	5.85
L	20.25	20.30	20.35
M	1.45	1.50	1.55
N	2.03	2.08	2.13
O	9.15		9.20
P	3.78	3.88	4.18
Q	0.73	1.00	1.27
R	3.17	3.30	3.43
CH1		2.00	

5.2 Marking information

Figure 6. **Marking composition**



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Revision history

Table 8. **Document revision history**

Date	Revision	Changes
10-Feb-2021	1	First release.
28-Sep-2021	2	Updated Table 3. ESD protection. Updated Table 4. Static. Minor text changes.

Contents