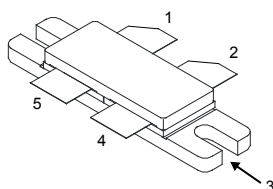


400 W, 50 V, 0.4 to 1 GHz RF power LDMOS transistor



B4E

Pin connection	
Pin	Connection
1	Drain A
2	Drain B
3	Source (bottom side)
4	Gate B
5	Gate A

Features

Order code	Frequency	V _{DD}	P _{OUT}	Gain	Efficiency
RF5L08350CB4	860 MHz	50 V	400 W	19 dB	61%

- High efficiency and linear gain operations
- Integrated ESD protection
- Internally matched for ease of use
- Large positive and negative gate/source voltage range
- In compliance with the European Directive 2002/95/EC

Applications

- Wideband lab amplifier from 0.4 to 1 GHz
- Digital UHF TV 470-860 MHz
- 650 MHz particle accelerator
- 915 MHz RF energy applications

Description

The **RF5L08350CB4** is a 400 W 50 V high-performance, internally matched LDMOS FET, designed for multiple applications over the frequency band 0.4 to 1 GHz.



Product status link
RF5L08350CB4

Product summary	
Order code	RF5L08350CB4
Marking	RF5L08350CB4
Package	B4E
Packing	Tape and reel 13"
Base/bulk quantity	120/120

1 Electrical data

1.1 Absolute ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	110	V
V_{GS}	Gate-source voltage	-8/+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

1.2 Thermal data

Table 2. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj-case}$	Junction-case thermal resistance	0.35	°C/W

Note: $T_{CASE} = +85\text{ °C}$, $T_J = +200\text{ °C}$, DC test.

1.3 ESD protection characteristics

Table 3. ESD protection

Symbol	Test methodology	Class
HBM	Human body model (per JESD22-A114)	2

2 Electrical characteristics

(T_{CASE} = 25 °C unless otherwise specified)

2.1 Static

Table 4. Static (per side)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V _{(BR)DSS}	Drain-source breakdown voltage	V _{GS} = 0 V, I _D = 100 μA	110			V
I _{DSS}	Zero-gate voltage drain current	V _{GS} = 0 V, V _{DS} = 50 V			1	μA
		V _{DS} = 0 V, V _{GS} = 90 V				
I _{GSS}	Gate-body leakage current	V _{DS} = 0 V, V _{GS} = 10 V			100	nA
		V _{GS} = -8 V, V _{DS} = 0 V				
V _{GS(th)}	Gate threshold voltage	V _{DS} = 50 V, I _D = 600 μA	1		3	V
V _{GS(Q)}	Gate quiescent voltage	V _{DS} = 1 V, I _D = 100 mA	2		5	
V _{DS(on)}	Static drain-source on-voltage	V _{GS} = 10 V, I _D = 5 A			1.4	
R _{DS(on)}	Drain-source on-state resistance	V _{GS} = 10 V, V _{DS} = 100 mV			1	Ω
I _{DS(on)}	Static drain-source on-current				2.5	A
C _{ISS}	Common source input capacitance	V _{GS} = 0 V, V _{DD} = 50 V, f = 1 MHz		TBD		pF
C _{RSS}	Common source feedback capacitance			TBD		
C _{OSS}	Common source output capacitance			TBD		

2.2 Dynamic

Table 5. Dynamic

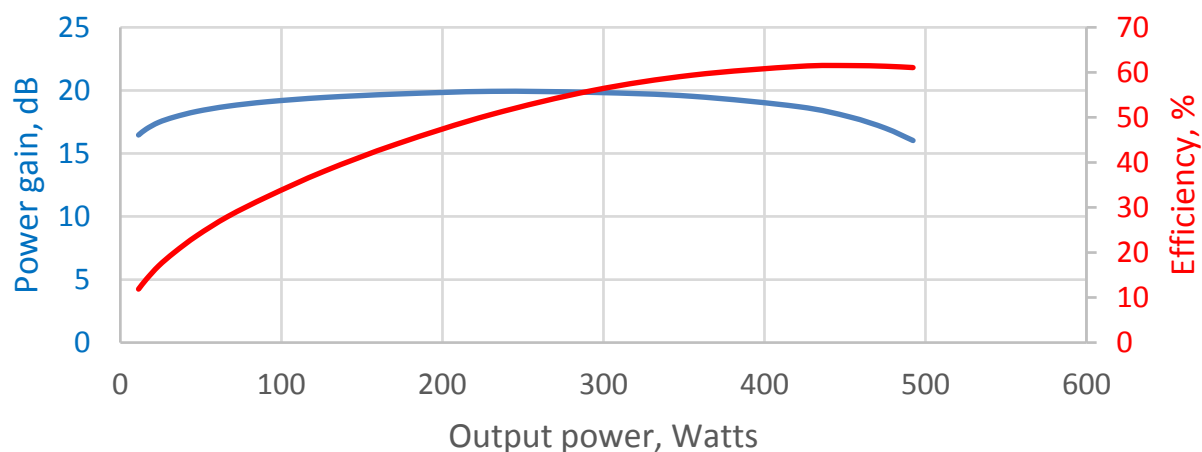
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
f	Frequency		400		1000	MHz
P _{OUT}	Output power	f = 860 MHz at 1dB compression point		400		W
G _{PS}	Power gain			19		dB
η _D	Drain efficiency			61		%
VSWR	Load mismatch	@ 400 W pulsed CW output power, all phases			10:1	

Note: V_{DD} = 50 V, I_{DQ} = 200 mA, pulsed CW, pulse width=100 μs, duty cycle=10%.

3 Typical performance

Table 6. Output power, power gain and drain efficiency vs input power (f= 860 MHz)

f (MHz)	P _{IN} (dBm)	P _{OUT} (dBm)	P _{OUT} (W)	I _{DS} (A)	G _{PS} (dB)	η _D (%)
860	24.1	40.5	11.3	1.9	16.5	11.9
860	25.1	42.1	16.1	2.3	16.9	14.1
860	26.3	43.8	23.8	2.8	17.5	17.0
860	27.4	45.3	33.6	3.4	17.9	20.0
860	28.4	46.8	47.5	4.0	18.3	23.7
860	29.5	48.3	66.9	4.8	18.8	28.0
860	30.5	49.6	91.6	5.6	19.1	32.5
860	31.6	51.0	126.6	6.7	19.4	38.0
860	32.6	52.4	172.0	7.8	19.7	44.1
860	33.7	53.6	230.2	9.1	19.9	50.6
860	34.8	54.7	293.5	10.5	19.8	56.0
860	36.0	55.5	355.3	12.0	19.5	59.4
860	37.5	56.3	421.1	13.7	18.7	61.3
860	38.7	56.6	452.8	14.7	17.9	61.5
860	39.8	56.8	475.4	15.5	17.0	61.4
860	40.9	56.9	492.3	16.1	16.0	61.1

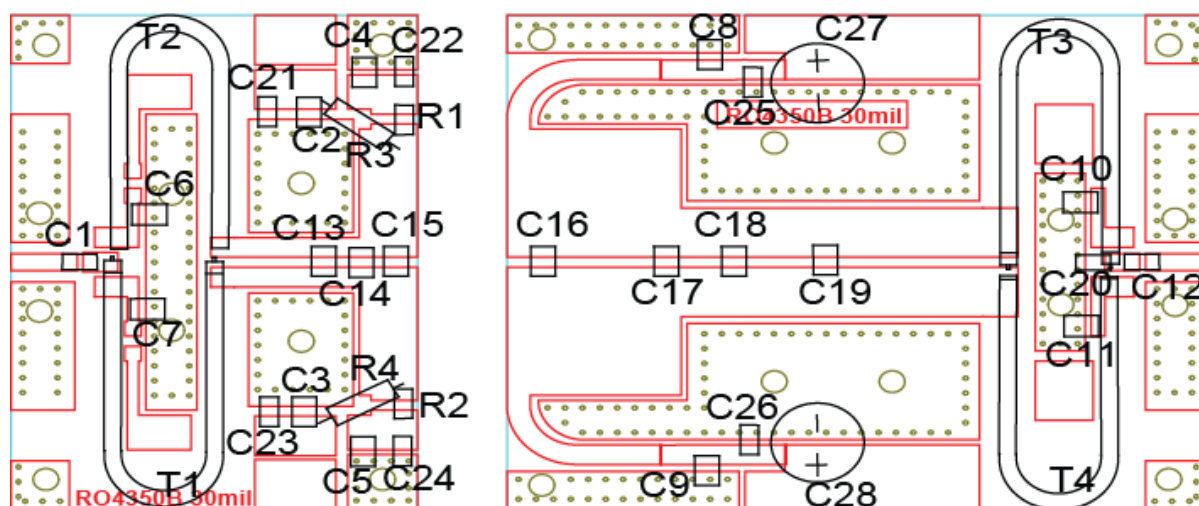
Figure 1. Power gain and efficiency vs output power (f= 860 MHz)


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Note: $V_{DD} = 50\text{ V}$, $I_{DQ} = 200\text{ mA}$, pulsed CW, pulse width = 100 μs , duty cycle = 10%

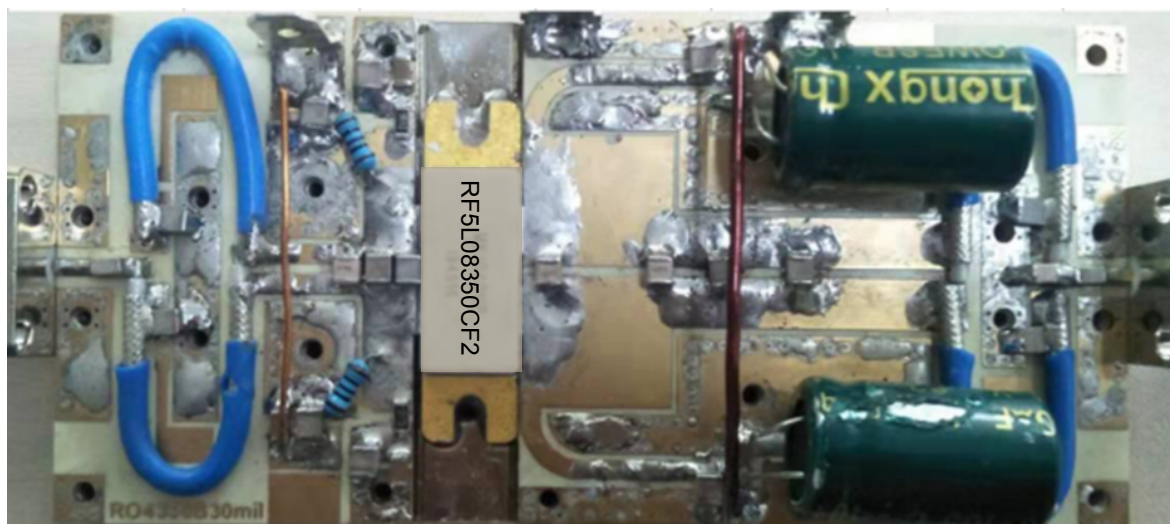
4 Test circuits

Figure 2. Test circuit layout



GADG040220201122SA

Figure 3. Test circuit photo (f= 860 MHz)



GADG250520201340SA

Table 7. Component list (f= 860 MHz)

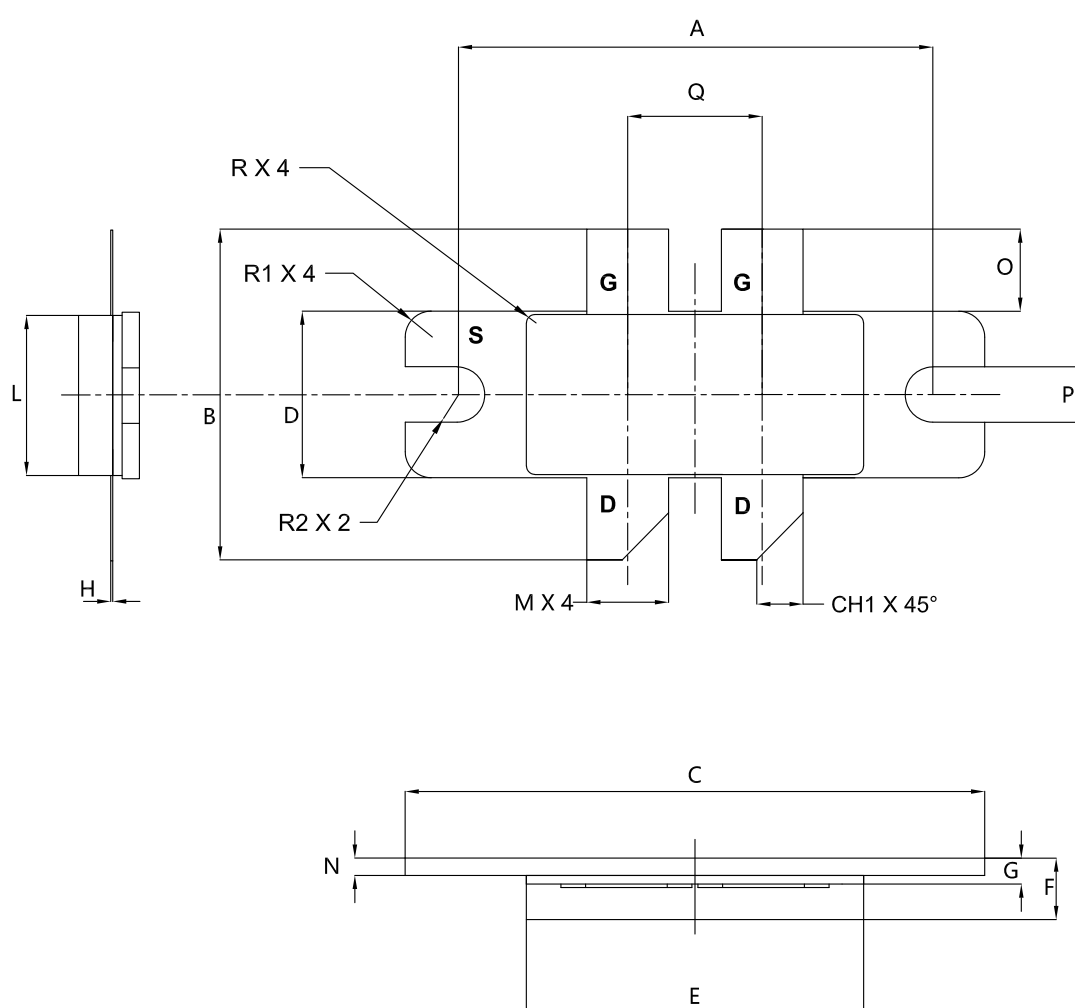
Component	Description	Model
C1, C12	47 pF	ATC800B
C13	1.5 pF	DLC70B
C14, C19	6.8 pF	ATC800B
C15	10 pF	ATC800B
C16, C17, C20	2.2 pF	DLC70B
C18	4.7 pF	ATC800B
C21, C26	10 μ F	100 V/10 μ F
C27, C28	470 μ F	63 V/470 μ F
R1, R2	9.1 Ω	1206
R3, R4	100 Ω	1 W/100 Ω
T1, T2, T3, T4	25 Ω , 50 mm	SF-086-25

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 B4E package information

Figure 4. B4E package outline



DM00418520_2

Table 8. B4E package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	27.81	27.94	28.07
B	18.93	19.43	19.93
C	33.91	34.04	34.17
D	9.65	9.78	9.91
E	19.56	19.81	20.06
F	3.23	3.61	3.99
G	1.40	1.53	1.66
H	0.07		0.15
L	9.20	9.40	9.60
M	4.67	4.80	4.93
N	0.89	1.02	1.15
O	4.70	4.83	4.96
P	3.13	3.26	3.39
Q	7.77	7.90	8.03
R		0.50	
R1		1.52	
R2		1.63	
CH1		2.72	

Revision history

Table 9. Document revision history

Date	Version	Changes
25-May-2020	1	First release.

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