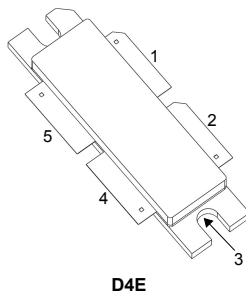


280 W, 28 V, 2.4 to 2.5 GHz RF power LDMOS transistor



D4E

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
RF2L24280CB4	2450 MHz	28 V	280 W	13 dB	60%

- High efficiency and linear gain operations
- Integrated ESD protection
- Internally matched pair transistors in push-pull configuration
- Large positive and negative gate-source voltage range for improved class C operation
- Excellent thermal stability, low HCI drift
- In compliance with the European directive 2002/95/EC

Applications

- Industrial, scientific and medical

Description

The **RF2L24280CB4** is a 280 W, internally matched LDMOS FET, designed for multiple use especially RF energy applications including cooking, heating and medical in the frequency range from 2.4 to 2.5 GHz. It is qualified up to 32 V operation.



Product status link

[RF2L24280CB4](#)

Product summary

Order code	RF2L24280CB4
Marking	2L24280
Package	D4E
Packing	Tray
Base/bulk quantity	20/100

1 Electrical ratings

Table 1. Absolute maximum ratings ($T_C = 25\text{ °C}$)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source voltage	65	V
V_{GS}	Gate-source voltage	-6 to 10	V
V_{DD}	Maximum operating 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
$R_{thJC}^{(1)}$	Thermal resistance, junction-to-case	0.2	°C/W

1. $T_C = 85\text{ °C}$, $T_J = 200\text{ °C}$, DC test.

Table 3. ESD protection

Symbol	Test methodology	Class
HBM	Human body model (according to ANSI/ESDA/JEDEC JS001-2017)	2
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	$V_{GS} = 0\text{ V}, I_{DS} = 100\ \mu\text{A}$	65	-		V
I_{DSS}	Zero gate voltage drain leakage current	$V_{GS} = 0\text{ V}, V_{DS} = 28\text{ V}$		-	1	μA
		$V_{GS} = 0\text{ V}, V_{DS} = 50\text{ V}$		-		
I_{GSS}	Gate-source leakage current	$V_{GS} = -6/10\text{ V}, V_{DS} = 0\text{ V}$		-	± 100	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = 28\text{ V}, I_{DS} = 600\ \mu\text{A}$	1.5	-	2.5	V
$V_{GS(Q)}$	Gate quiescent voltage	$V_{DS} = 2\text{ V}, I_{DS} = 20\text{ mA}$	0.8	-	2.7	V
$V_{DS(on)}$	Static drain-source on-voltage	$V_{GS} = 10\text{ V}, I_{DS} = 1\text{ A}$	60	-	120	mV
$I_{DS(on)}$	Static drain-source on-current	$V_{GS} = 10\text{ V}, V_{DS} = 100\text{ mV}$	0.5	-	1.5	A
$R_{DS(on)}$	Drain-source on-state resistance	$V_{GS} = 10\text{ V}, I_{DS} = 1\text{ A}$		-	1	Ω

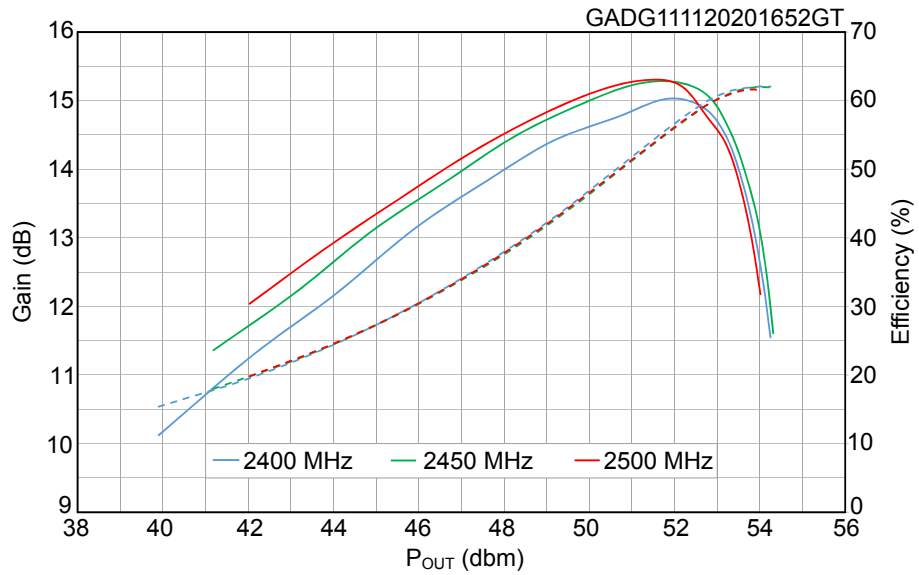
Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	Output power	$f = 2450\text{ MHz}, \text{pulsed CW},$ $2.5\text{ dB compression}$	-	280		W
G_{PS}	Power gain		-	13		dB
η_D	Drain efficiency		-	60		%
VSWR	Load mismatch	$P_{OUT} = 280\text{ W}, \text{all phases}$	-		10:1	

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

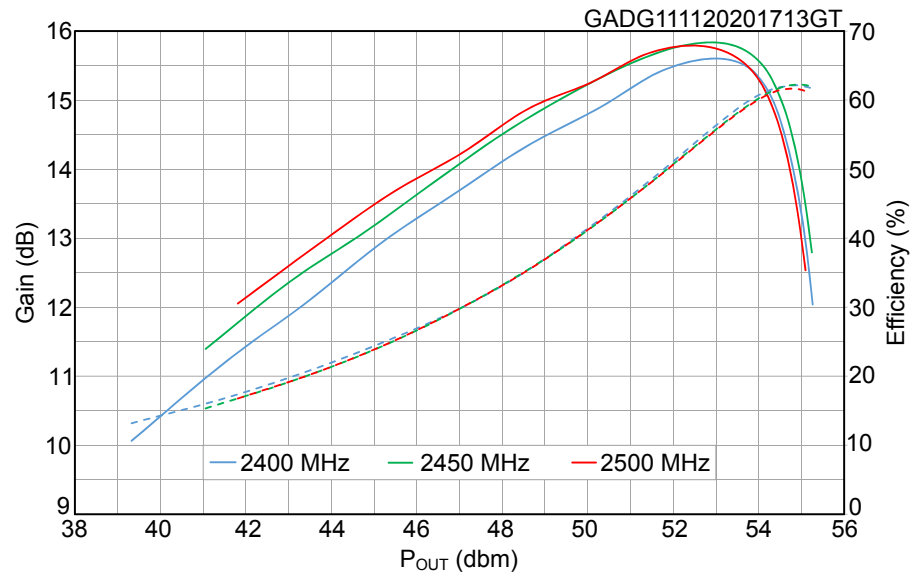
3 Typical performances

Figure 1. Power gain and drain efficiency vs output power at $V_{DD} = 28\text{ V}$



Note: $I_{DQ} = 10\text{ mA}$, pulse width = $10\text{ }\mu\text{s}$, duty cycle = 10%.

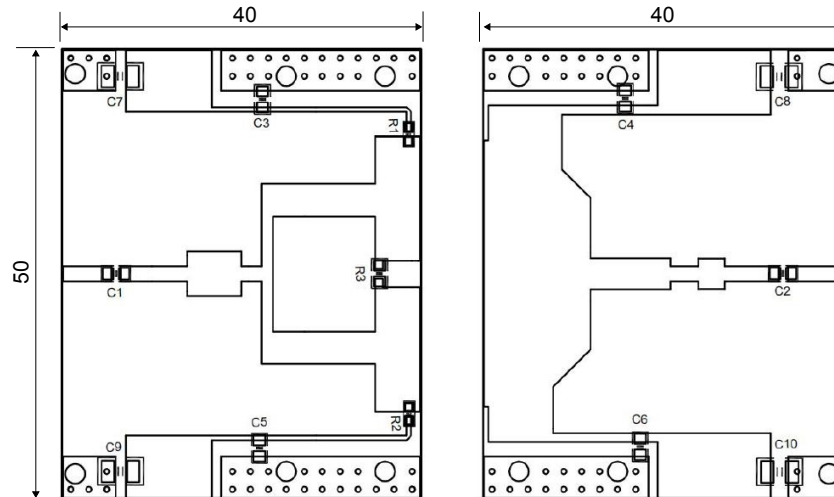
Figure 2. Power gain and drain efficiency vs output power at $V_{DD} = 32\text{ V}$



Note: $I_{DQ} = 10\text{ mA}$, pulse width = $10\text{ }\mu\text{s}$, duty cycle = 10%.

4 Test circuits

Figure 3. Test circuit layout (dimensions are in mm)

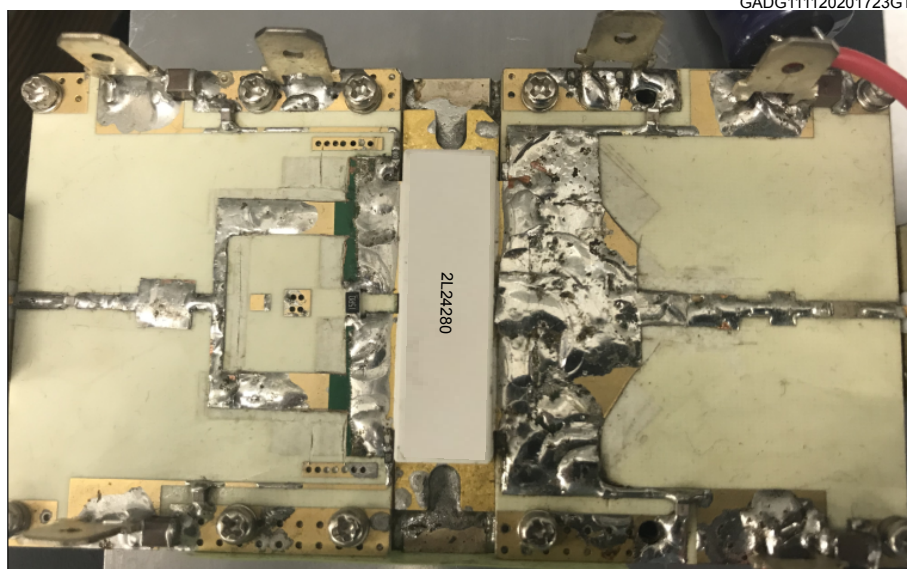


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Table 6. Components list

Component	Value	Size	Reference
C1, C2, C3, C4, C5, C6	6.8 pF	0805	ATC600F
C7, C8, C9, C10	10 μ F	1210	X7R
R1, R2	10 Ω	0603	
R3	15 Ω	1206	
PCB	0.762 mm (0.030") thick, $\epsilon_r = 3.48$, Rogers RO4350B		

Figure 4. Test circuit photo



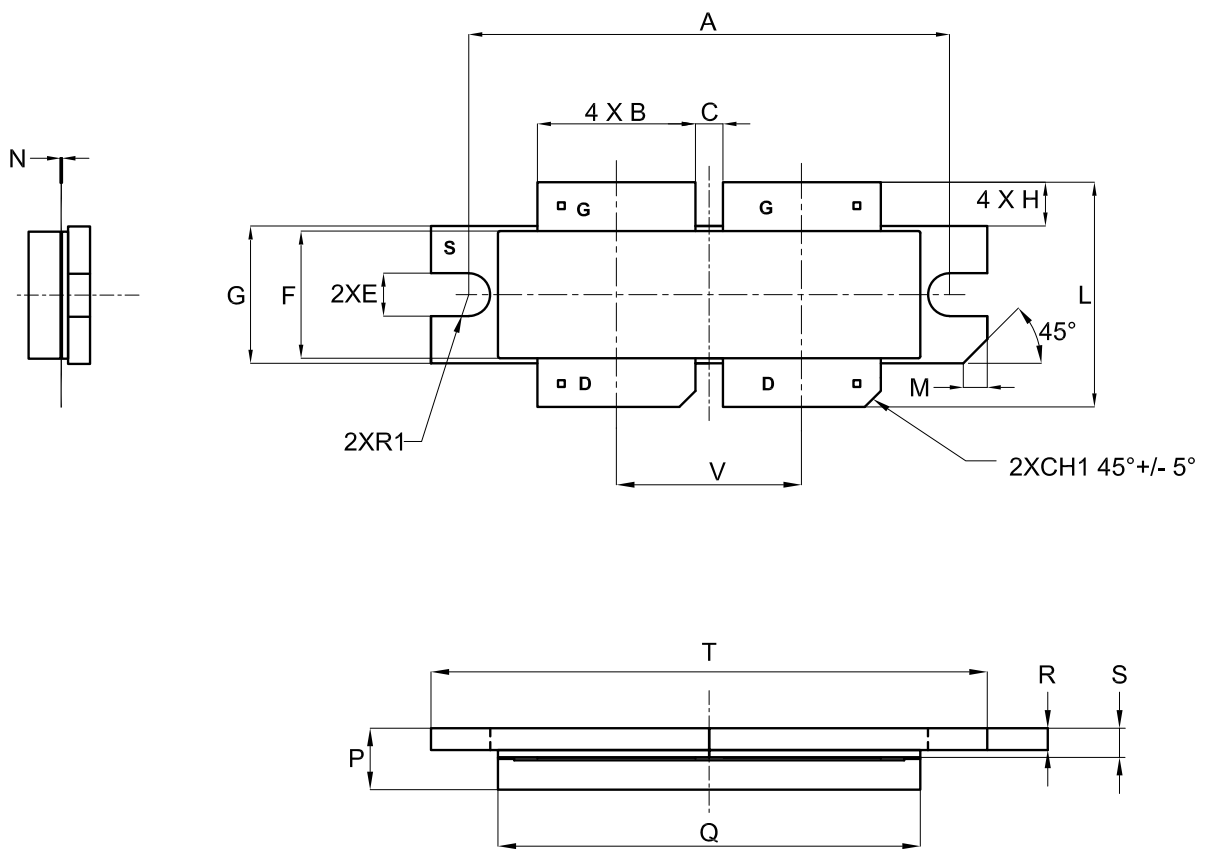
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5 Package information

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 D4E package information

Figure 5. D4E package outline



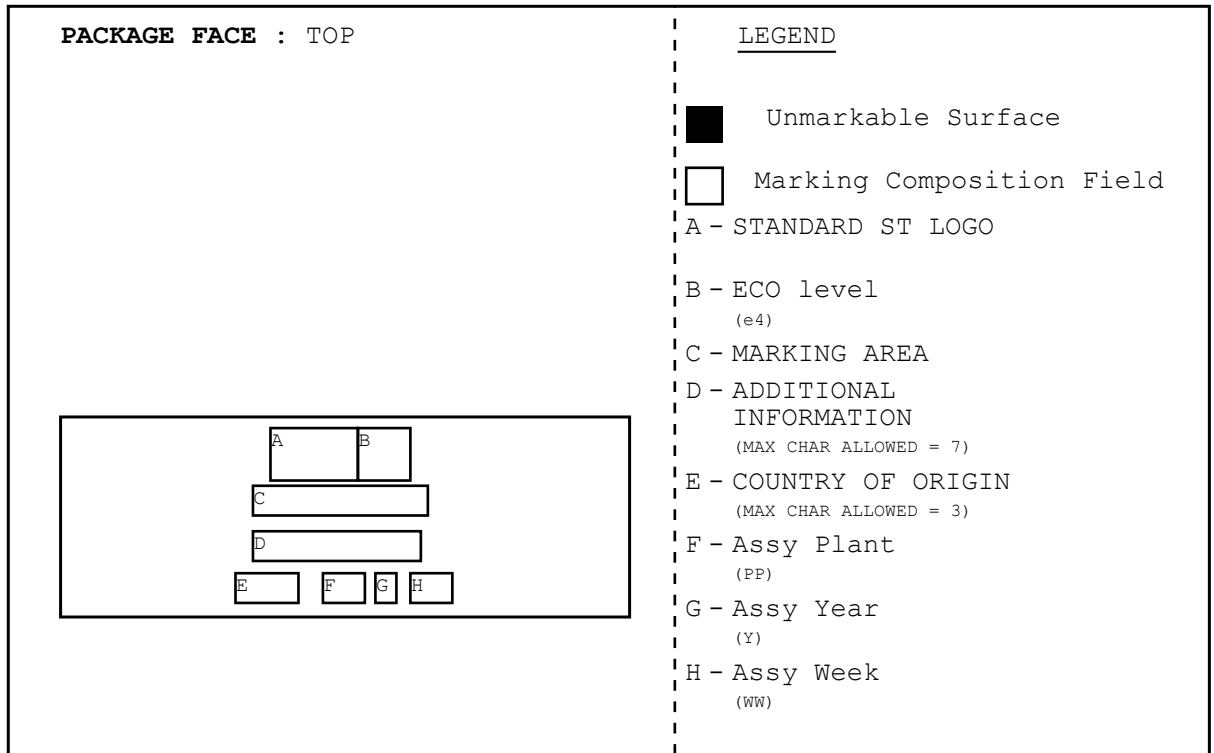
DM0066713_2

Table 7. D4E package mechanical data

Symbol	Millimeters		
	Min.	Typ.	Max.
A	35.44	35.56	35.68
B	11.56	11.68	11.80
C	1.92	2.04	2.16
E	3.06	3.18	3.30
F	9.25	9.40	9.50
G	10.04	10.16	10.28
H	5.72	5.85	3.48
L	16.11	16.62	17.13
M	1.51	1.78	2.05
N	0.10	0.13	0.16
P	4.17	4.55	4.93
Q	30.96	31.24	31.52
R	1.55	1.62	1.69
S	2.09	2.16	2.23
T	41.08	41.22	
V	13.60	13.72	13.84
R1		1.59	
CH1		1.19	

5.2 Marking information

Figure 6. Marking composition



GADG040220211644GT

Revision history

Table 8. Document revision history

Date	Revision	Changes
16-Nov-2020	1	First release.
09-Feb-2021	2	Updated <i>Features</i> and <i>Device summary</i> in cover page. Updated <i>Table 3. ESD protection</i> . Updated <i>Table 5. Dynamic</i> . Updated <i>Figure 3. Test circuit layout</i> and added <i>Table 6. Components list</i> . Minor text changes.
21-Sep-2021	3	Updated <i>Table 3. ESD protection</i> . Updated <i>Table 4. Static</i> . Minor text changes.

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