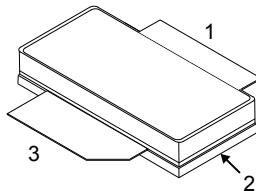


75 W, 28 V, 3.1 to 3.6 GHz RF power LDMOS transistor


B2

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

Features

Order code	Frequency	V _{DD}	P _{OUT}	Gain	Efficiency
RF2L36075CF2	3500 MHz	28 V	75 W	12.5 dB	45%

- 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
- Excellent thermal stability, low HCI drift
- In compliance with the european directive 2002/95/EC

Applications

- Telecom
- S-Band radar

Description

The RF2L36075CF2 is a 75 W internally matched LDMOS transistor designed for multicarrier WCDMA/PCS/DCS/LTE base stations and S-Band radar applications in the frequency range from 3.1 to 3.6 GHz. It can be used in class AB, B or C for all typical cellular base station modulation formats.



Product status link
RF2L36075CF2

Product summary	
Order code	RF2L36075CF2
Marking	2L36075
Package	B2
Packing	Tape and reel 13"
Base / Bulk qty	120/120

1 Electrical ratings

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

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	60	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	0.35	°C/W

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

Table 3. ESD protection

Symbol	Parameter	Class
HBM	Human body model (according to ANSI/ESDA/JEDEC JS001-2017)	1B
CDM	Charge device model (according to ANSI/ESDA/JEDEC JS-002-2014)	C3

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	$V_{GS} = 0\text{ V}, I_{DS} = 100\text{ }\mu\text{A}$	60			V
I_{DSS}	Zero-gate voltage drain 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-body leakage current	$V_{GS} = -6/10\text{ V}, V_{DS} = 0\text{ V}$			± 100	nA
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = 1\text{ V}, I_{DS} = 600\text{ }\mu\text{A}$	1.75		2.50	V
		$V_{DS} = 28\text{ V}, I_{DS} = 600\text{ }\mu\text{A}$				
$V_{GS(Q)}$	Gata quiescent voltage	$V_{DS} = 1\text{ V}, I_{DS} = 600\text{ mA}$		3		V
$V_{DS(on)}$	Static drain-source on-voltage	$V_{GS} = 10\text{ V}, I_{DS} = 800\text{ mA}$	30		170	mV
		$V_{GS} = 10\text{ V}, I_{DS} = 3.5\text{ A}$	150		750	
$I_{DS(on)}$	Static drain-source on-current	$V_{GS} = 10\text{ V}, V_{DS} = 100\text{ mV}$			2.5	A
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS} = 10\text{ V}, I_{DS} = 800\text{ mA}$			1	Ω
		$V_{GS} = 10\text{ V}, I_{DS} = 3.5\text{ A}$				

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
f	Frequency		3100		3500	MHz
P_{OUT}	Output power	f = 3500 MHz, 1 dB compression point		75		W
G_{PS}	Power gain			12.5		dB
η_D	Drain efficiency			45		%
VSWR	Load mismatch	at 10 W WCDMA Output Power			10:1	

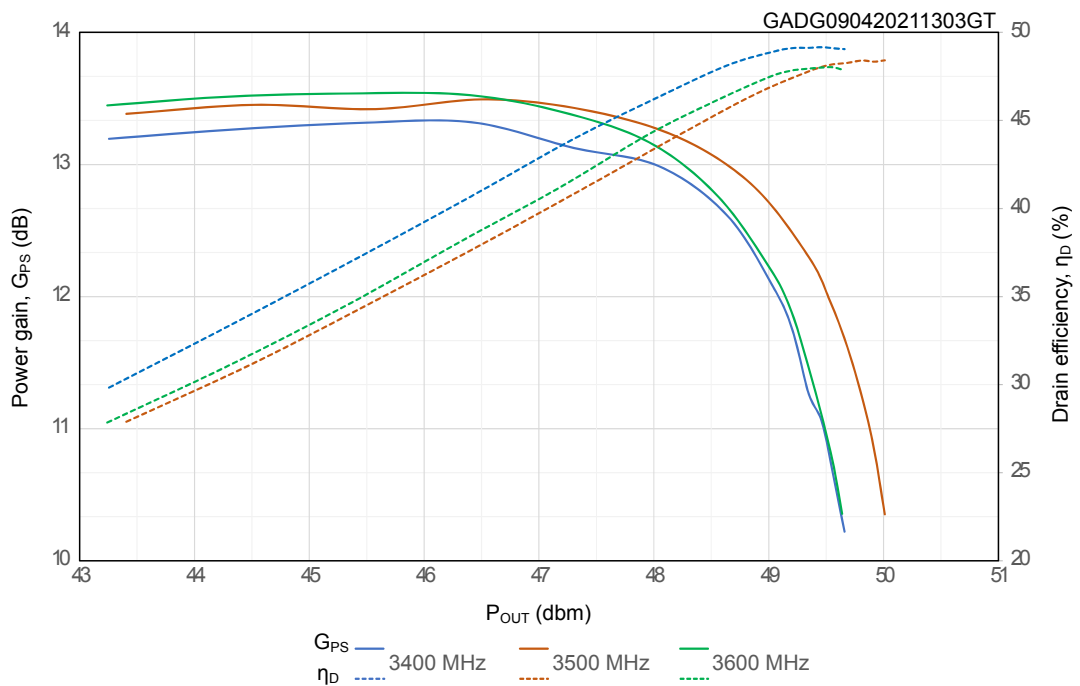
Note: $V_{DD} = 28\text{ V}, I_{DQ} = 600\text{ mA},$ pulsed CW, $PW = 10\text{ }\mu\text{s},$ duty cycle = 10%.

3 Typical performance

3.1 Pulsed CW performance

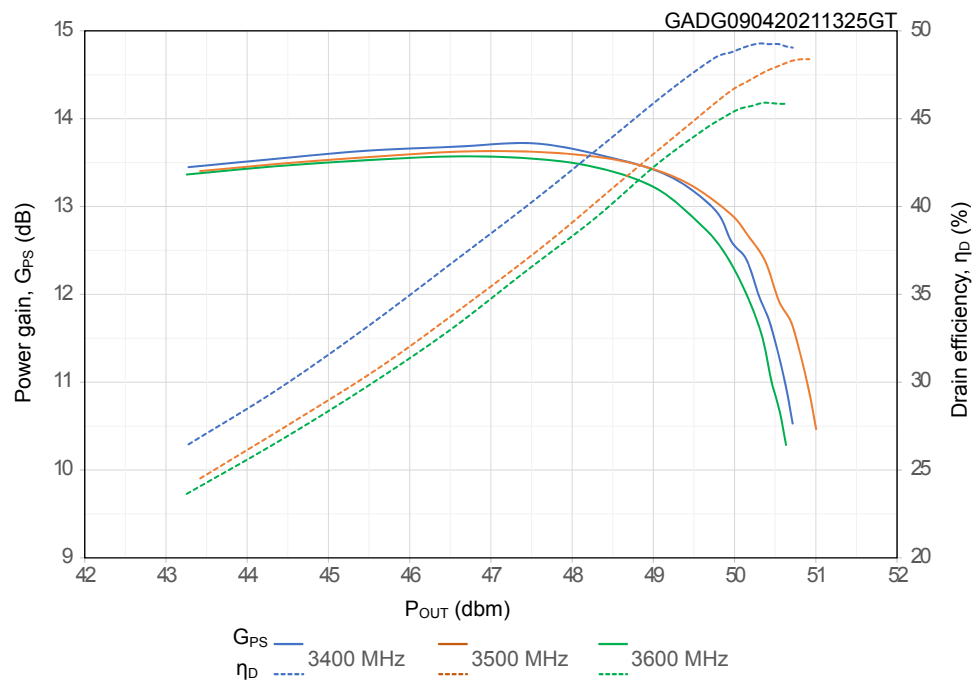
Table 6. Typical performance vs frequency

f (MHz)	$G_{PS}@P_{1dB}$ (dB)	P_{1dB} (dBm)	$\eta_D @P_{1dB}$ (%)	P_{3dB} (dBm)	$\eta_D @P_{3dB}$ (%)
3400	12.3	48.3	46.3	50	49
3500	12.5	48.8	44.7	49.6	47
3600	12.5	48.2	42.8	49.3	48

Figure 1. Power gain and drain efficiency vs output power over 3400-3600 MHz band ($V_{DD} = 28 V$)


Note: $I_{DQ} = 600 mA$, pulse width = 10 μs , duty cycle = 10%.

Figure 2. Power gain and drain efficiency vs output power over 3400-3600 MHz band ($V_{DD} = 32\text{ V}$)

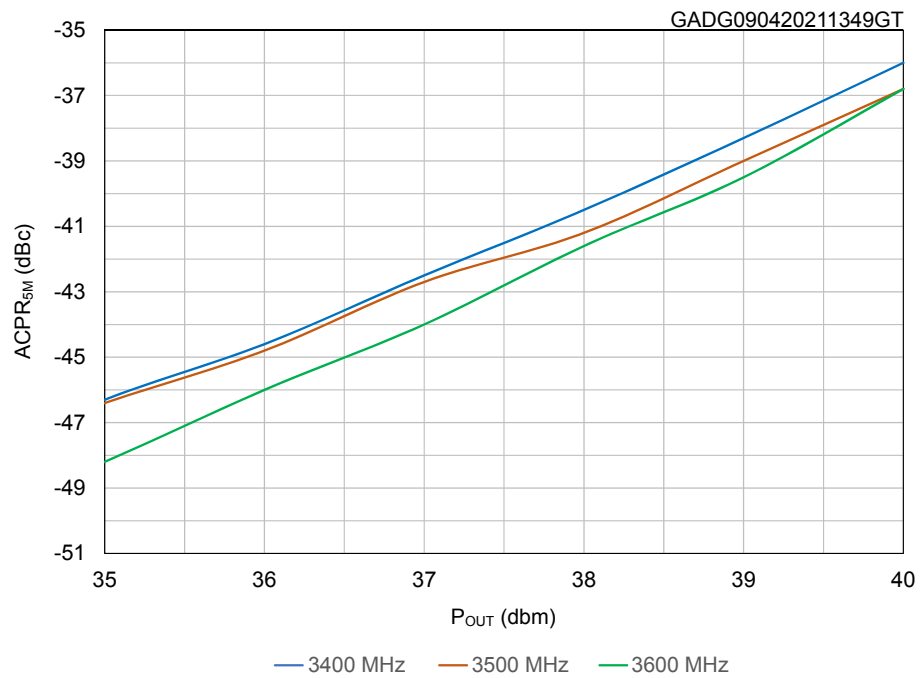


Note: $I_{DQ} = 600\text{ mA}$, pulse width = $10\ \mu\text{s}$, duty cycle = 10%.

3.2 WCDMA performance

Table 7. Typical Single-Carrier W-CDMA performance

P _{OUT, avg} (dBm)	ACPR _{5M} (dBc)		
	3400 MHz	3500 MHz	3600 MHz
33	-50.4	-50.2	-52.0
34	-48.4	-48.1	-50.2
35	-46.3	-46.4	-48.2
36	-44.6	-44.8	-46.0
37	-42.5	-42.7	-44.0
38	-40.5	-41.2	-41.6
39	-38.3	-39.0	-39.5
40	-36.0	-36.8	-36.8

Figure 3. ACPR_{5M} vs output power over 3400-3600 MHz band


Note: $V_{DD} = 28\text{ V}$, $I_{DQ} = 600\text{ mA}$, WCDMA signal: 3GPP test model 1; 1 to 64 DPCH; channel bandwidth = 3.84 MHz, PAR = 10.5 dB at 0.01% probability on CCDF.

4 Test circuits

Figure 4. Test circuit layout (over 3400 – 3600 MHz band)

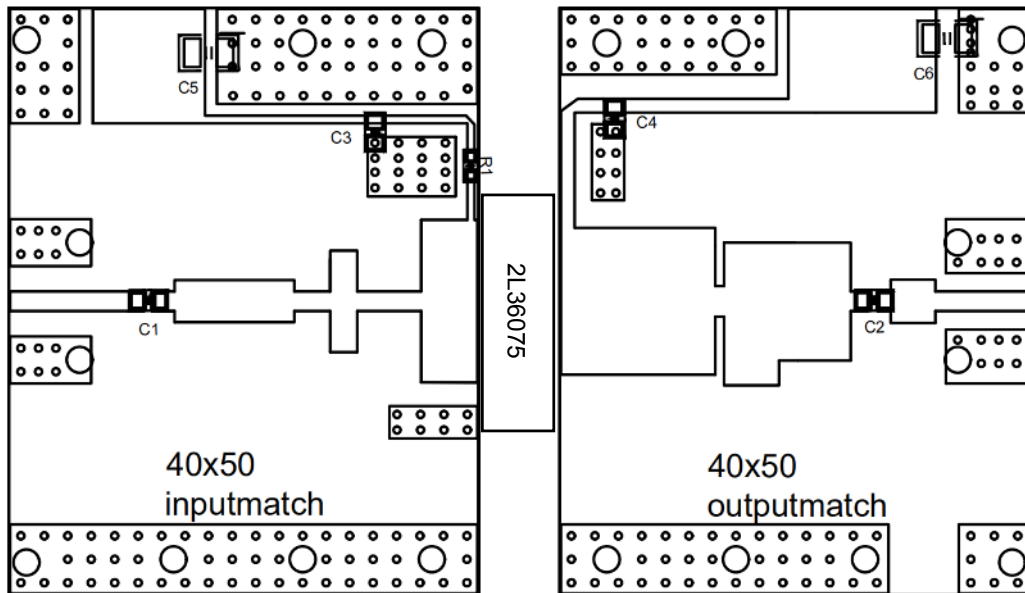


Figure 5. Test circuit photo (over 3400 - 3600 MHz band)

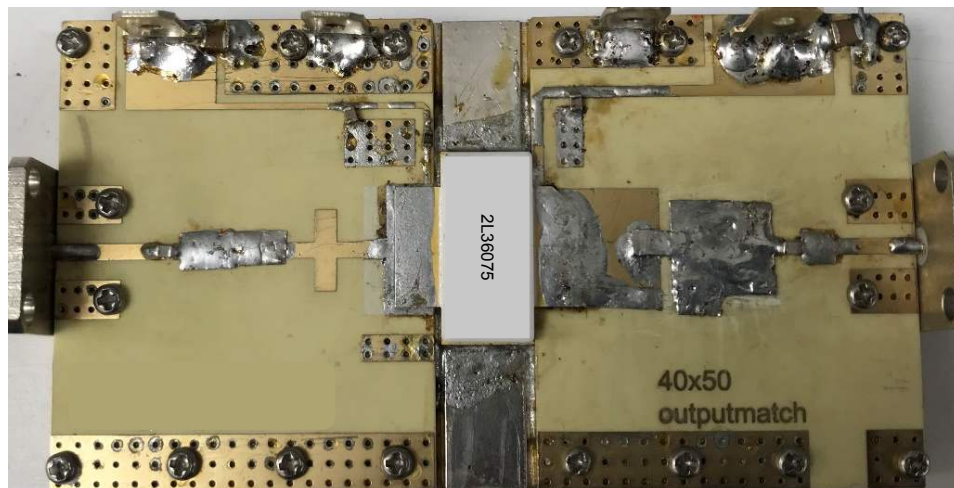


Table 8. Components list

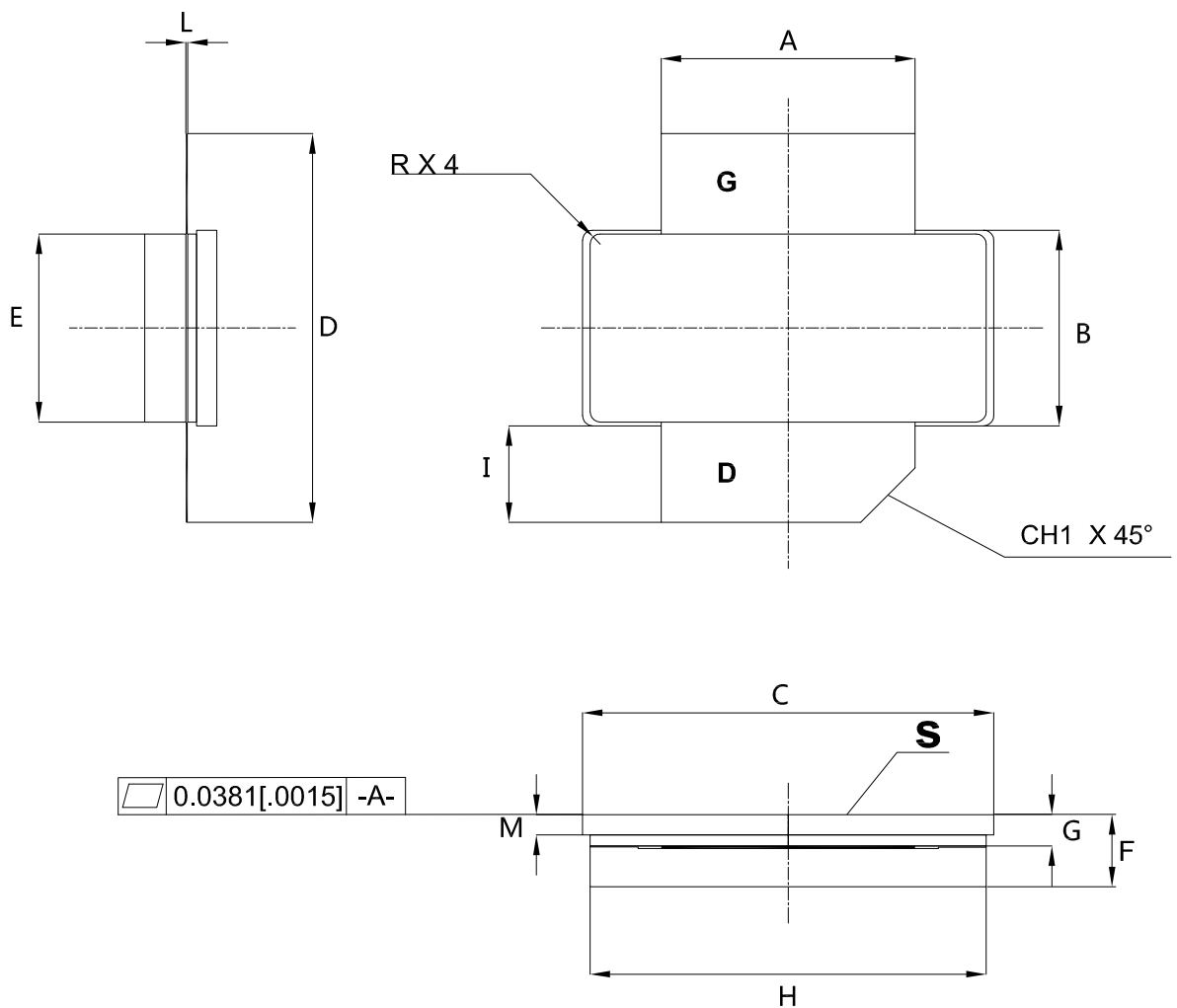
Component	Value	Size	Reference
C1, C2, C3, C4	6.8 pF	0805	ATC600F
C5, C6	10 μ F	1210	ceramic multilayer capacitor
R1	10 Ω	0603	chip resistor
PCB	0.508 mm (0.020") thick, $\epsilon_r = 3.48$, Rogers RO4350B, 1 oz. copper		

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 B2 package information

Figure 6. B2 package outline



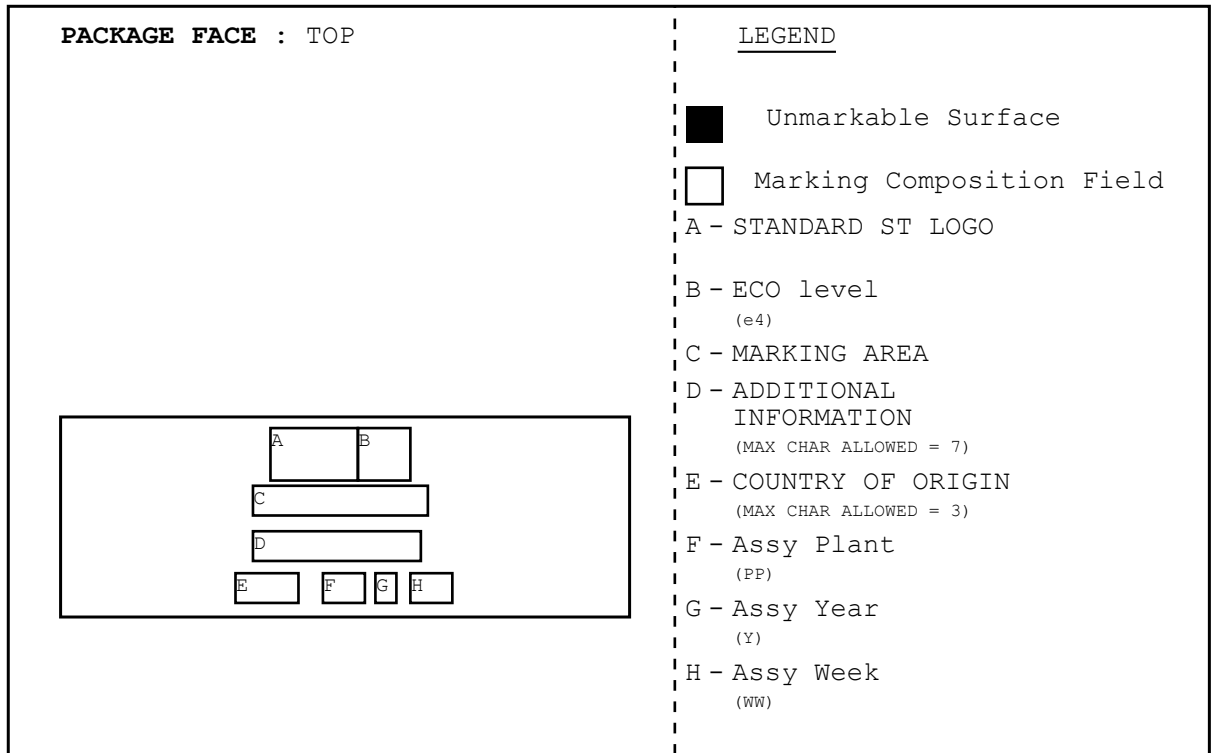
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Table 9. B2 mechanical data

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	

5.2 Marking information

Figure 7. Marking composition



GADG040220211644GT

Revision history

Table 10. Document revision history

Date	Version	Changes
09-Jun-2020	1	Initial release
14-Apr-2021	2	Updated Features and Device summary in cover page. Updated Section 1 Electrical ratings. Updated Section 2 Electrical characteristics. Updated Figure 1. Power gain and drain efficiency vs output power over 3400-3600 MHz band ($V_{DD} = 28\text{ V}$). Added Figure 2. Power gain and drain efficiency vs output power over 3400-3600 MHz band ($V_{DD} = 32\text{ V}$). Updated Figure 3. $ACPR_{5M}$ vs output power over 3400-3600 MHz band. Updated Section 4 Test circuits. Added Section 5.2 Marking information. Minor text changes.

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