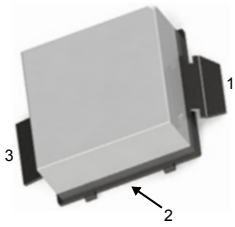
ST36015

Datasheet

20 W, 28 V, 0.7 to 3.6 GHz RF power LDMOS transistor



E2

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

Features

Order code	Frequency	V_{DD}	P_{OUT}	Gain	Efficiency
ST36015	3450 MHz	28 V	20 W	12.4 dB	42%

- 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

- Telecom and wideband communication
- Industrial, scientific and medical (ISM)

Description

The ST36015 is a 20 W, 28 V, internally matched LDMOS transistor designed for cellular base stations and ISM applications in the frequency range from 0.7 to 3.6 GHz.

Product status link
ST36015

Product summary	
Order code	ST36015
Marking	ST36015
Package	E2
Packing	Tape and reel 13"
Base/bulk quantity	300/300

1 Electrical ratings

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

Symbol	Parameter	Value	Unit
V_{DS}	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_{thJC}(1)	Thermal resistance, junction-to-case	2	°C/W

1. *T_C = 80 °C, T_J = 200 °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 JS002-2014)	C3

2 Electrical characteristics

T_C = 25 °C unless otherwise specified.

Table 4. Static

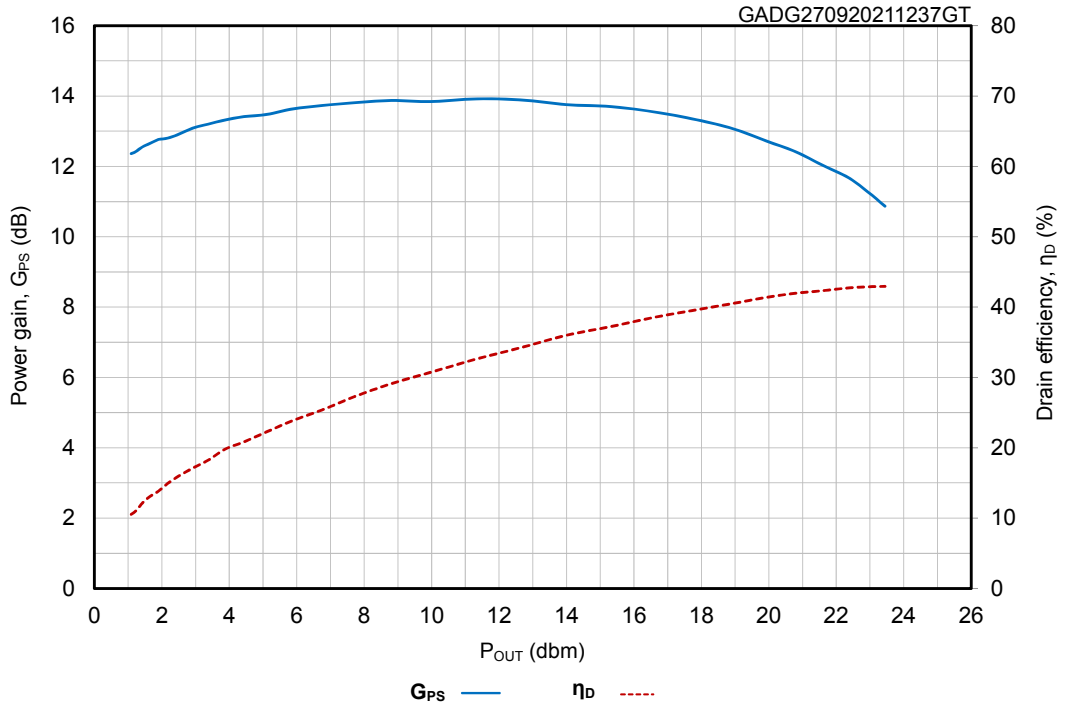
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	V_{GS} = 0 V, I_D = 100 µA	65			V
I_{DSS}	Zero-gate voltage drain current	V_{GS} = 0 V, V_{DS} = 28 V			1	µA
		V_{GS} = 0 V, V_{DS} = 50 V			1	
I_{GSS}	Gate-body leakage current	V_{GS} = -6/10 V, V_{DS} = 0 V			±100	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = 28 V, I_D = 600 µA	1.5		2.5	V
$V_{DS(on)}$	Static drain-source on-voltage	V_{GS} = 10 V, I_D = 200 mA			0.25	V
$I_{DS(on)}$	Static drain-source on-current	V_{GS} = 10 V, V_{DS} = 100 mV			2.5	A
$R_{DS(on)}$	Drain-source on-state resistance	V_{GS} = 10 V, I_D = 0.18 A			1	Ω
		V_{GS} = 10 V, I_D = 0.75 A			1	
C_{ISS}	Common source input capacitance	V_{GS} = 0 V, V_{DD} = 28 V, f = 1 MHz		37		pF
C_{RSS}	Common source feedback capacitance			0.3		pF
C_{OSS}	Common source output capacitance			8.4		pF

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	Output power	V_{DD} = 28 V, I_{DQ} = 10 mA, f = 3450 MHz, pulse width = 10 µs, DC = 10%	-	20		W
G_{PS}	Power gain		-	12.4		dB
η_D	Drain efficiency		-	42		%
VSWR	Load mismatch	P_{OUT} = 20 W, all phases	-		10:1	

3 Typical performance

Figure 1. **Power gain and drain efficiency vs output power at 3450 MHz**



4 Test circuits

Figure 2. **Test circuit photo**

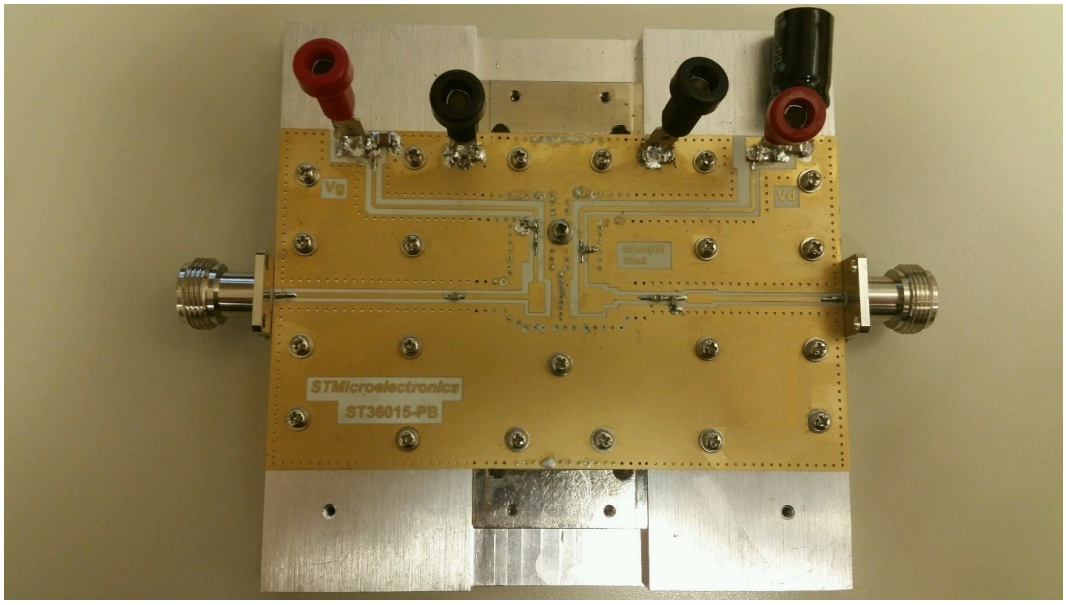
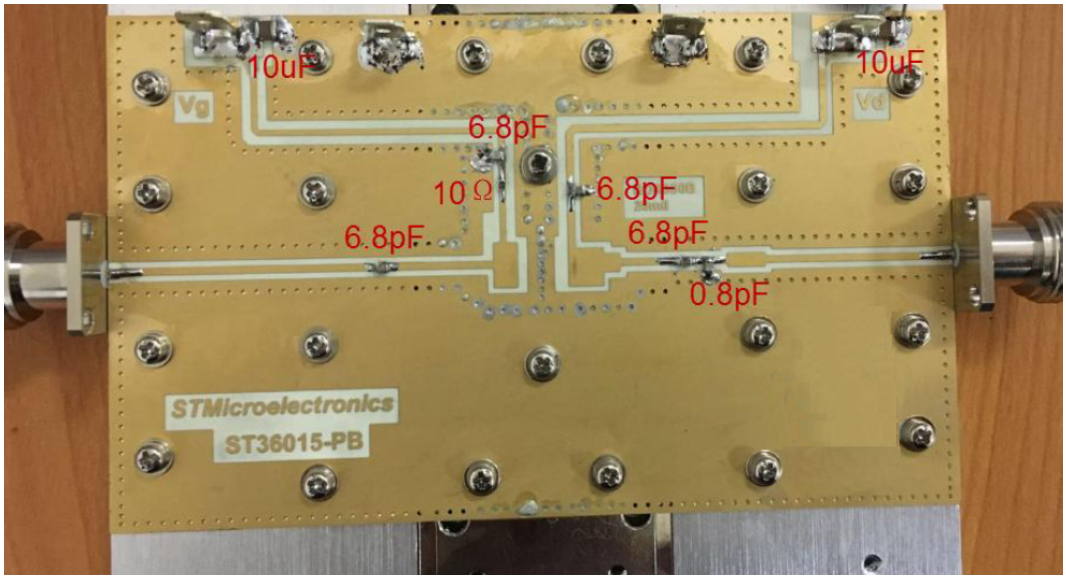


Figure 3. **Test circuit components**



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 E2 package information

Figure 4. **E2 package outline**

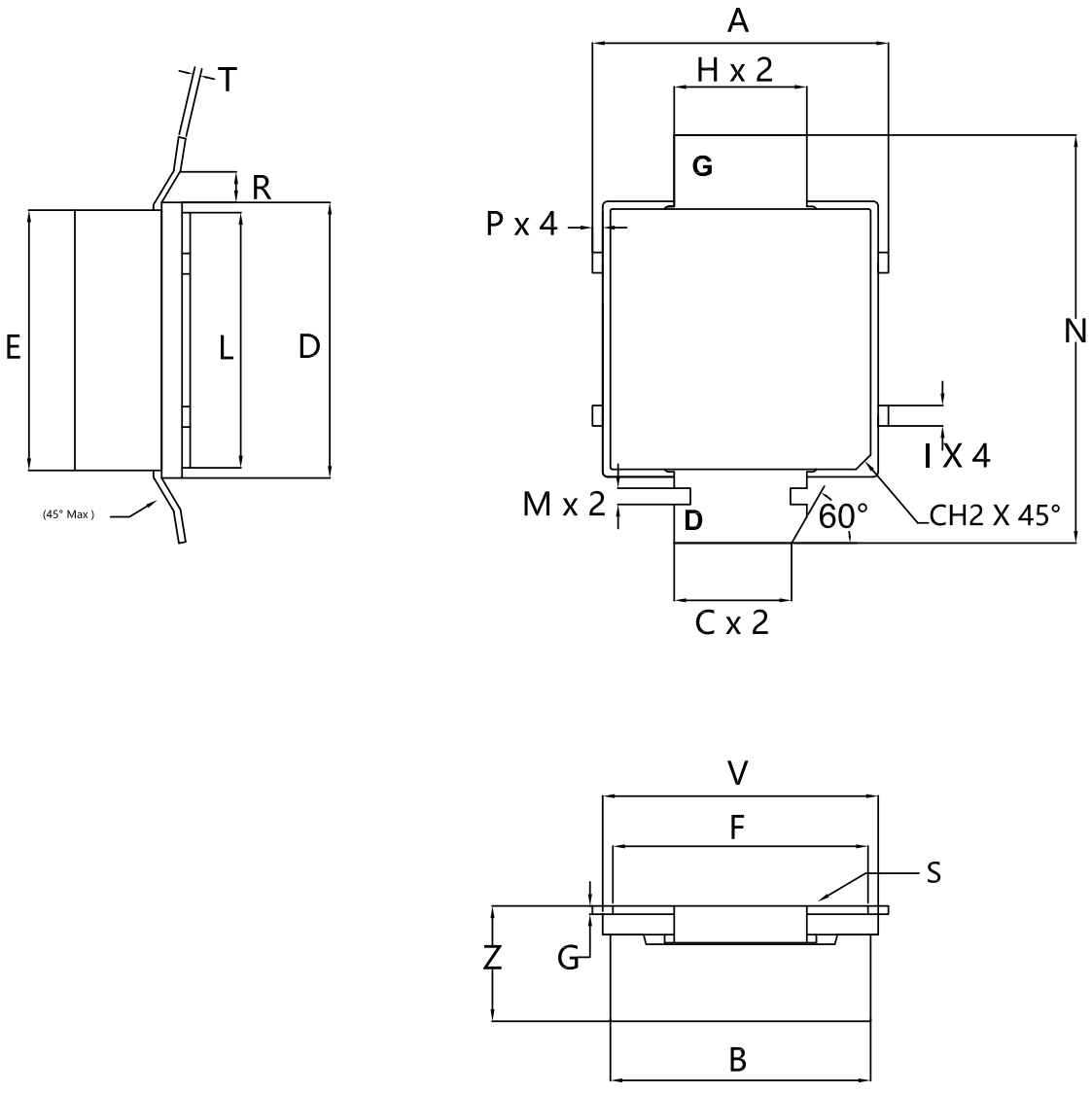
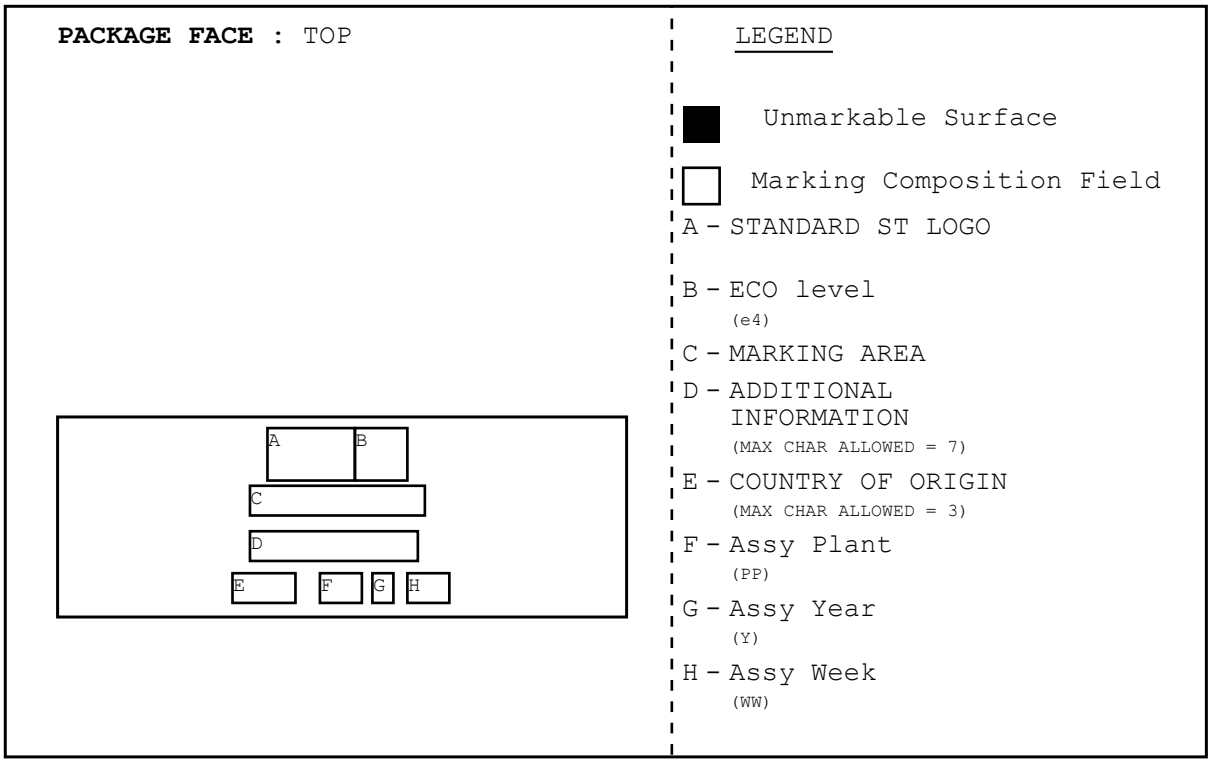


Table 6. **E2 mechanical data**

Symbol	Millimetres		
	Min.	Typ.	Max.
A			7.37
B	6.35	6.48	6.60
C	2.84	2.92	3.0
D	6.78	6.86	6.94
E	6.35	6.48	6.61
F	6.10	6.35	6.60
G	0.18	0.20	0.23
H	3.23	3.30	3.38
I	0.43	0.51	0.59
L	6.27	6.35	6.43
M	0.33	0.41	0.49
N	10.03	10.16	10.29
P			0.25
R	0.76		1.02
T	0.13	0.18	0.23
V	6.78	6.86	6.94
Z	2.49	2.87	3.25
CH2		0.51	

5.2 Marking information

Figure 5. **Marking composition**



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Revision history

Table 7. **Document revision history**

Date	Revision	Changes
12-Sep-2018	1	Initial release
02-Oct-2018	2	Added *Section 3 Circuit layout*.
08-Sep-2020	3	Updated *Section Product status / summary* , *Table 5* and *Section 4.1 E2 package information*.
27-Sep-2021	4	Updated Description in cover page. Updated Section 1 Electrical ratings. Updated Section 2 Electrical characteristics. Updated Figure 1. Power gain and drain efficiency vs output power at 3450 MHz. Added Section 5.2 Marking information. Minor text changes.

Contents