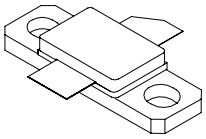
PD20015C

RF power transistor, LdmoST family

Features

- Excellent thermal stability
- Common source configuration
- P_{OUT} = 15 W with 11 dB gain @ 2 GHz / 13.6 V
- BeO free package
- ESD protection
- In compliance with the 2002/95/EC european directive



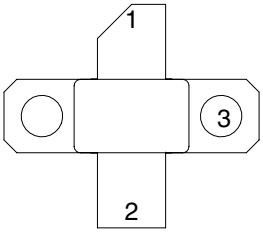
M243
Epoxy sealed

Description

The PD20015C is a common source N-channel, enhancement-mode lateral field-effect RF power transistor. It is designed for high gain, broadband commercial and industrial applications. It operates at 13.6 V in common source mode at frequencies of up to 2 GHz. PD20015C boasts the excellent gain, linearity and reliability of ST's latest LDMOS technology.

PD20015C's superior linearity performance makes it an ideal solution for mobile application.

Figure 1. Pin connection



1. Drain
2. Gate
3. Source

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Contents

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1 Electrical data

1.1 Maximum ratings

T_{CASE} = 25 °C

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	40	V
V_{GS}	Gate-source voltage	- 0.5 to 15	V
I_D	Drain current	7	A
P_{DISS}	Power dissipation (@ T_C = 70 °C)	93	W
T_J	Max. operating junction temperature	200	°C
T_{STG}	Storage temperature	-65 to +150	°C

1.2 Thermal data

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Junction - case thermal resistance	1.4	°C/W

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2 Electrical characteristics

T_{CASE} = +25 °C

2.1 Static

Table 4. Static

Symbol	Test conditions			Min.	Typ.	Max.	Unit
I_{DSS}	V_{GS} = 0 V	V_{DS} = 25 V		-		1	µA
I_{GSS}	V_{GS} = 5 V	V_{DS} = 0 V		-		1	µA
$V_{GS(Q)}$	V_{DS} = 10 V	I_D = 350 mA		-	4.2		V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 1 A		-	270	310	mV
C_{ISS}	V_{GS} = 0 V	V_{DS} = 12.5 V	f = 1 MHz	-	49		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 12.5 V	f = 1 MHz	-	35		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 12.5 V	f = 1 MHz	-	1.0		pF

2.2 Dynamic

Table 5. Dynamic

Symbol	Test conditions		Min.	Typ.	Max.	Unit
P3dB	V_{DD} = 13.6 V, I_{DQ} = 350 mA	f = 2 GHz		23	-	W
G_P	V_{DD} = 13.6 V, I_{DQ} = 350 mA, P_{OUT} = 15 W, f = 2 GHz		10	11	-	dB
h_D	V_{DD} = 13.6 V, I_{DQ} = 350 mA, P_{OUT} = P3dB, f = 2 GHz		45	53	-	%
Load mismatch	V_{DD} = 15.5 V, I_{DQ} = 350 mA, P_{OUT} = 20 W, f = 2 GHz All phase angles		20:1		-	VSWR

2.3 ESD protection characteristics

Table 6. ESD protection characteristics

Test conditions	Class
Human body model	2
Machine model	M3

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3 Typical performance

Figure 2. Capacitances vs drain voltage

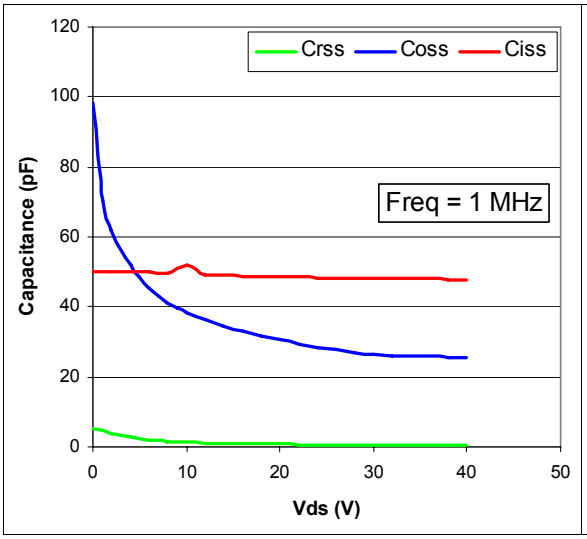

Figure 3. DC output characteristics

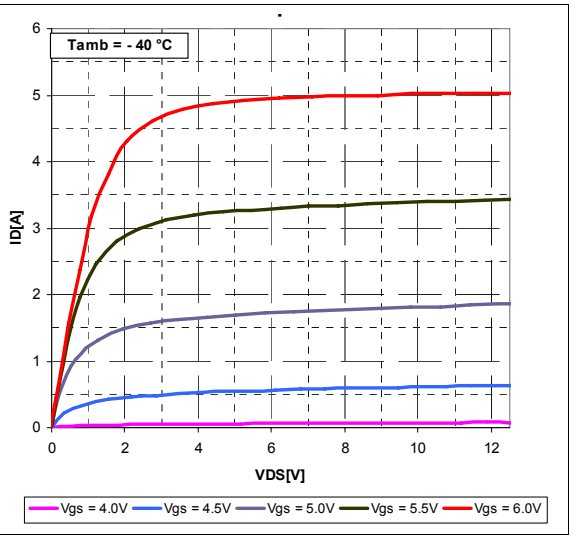

Figure 4. DC output characteristics

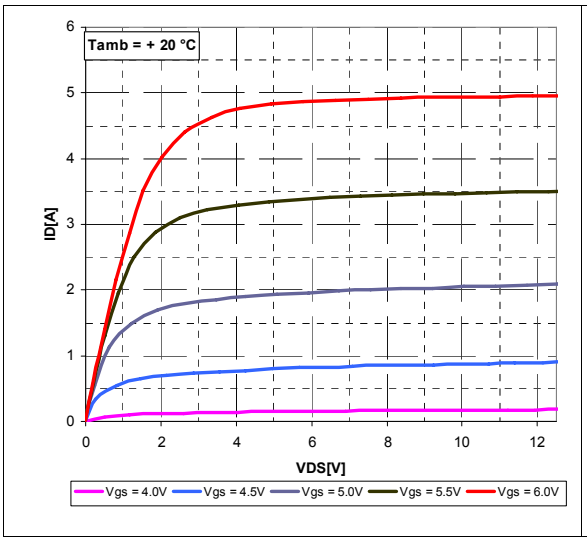

Figure 5. DC output characteristic

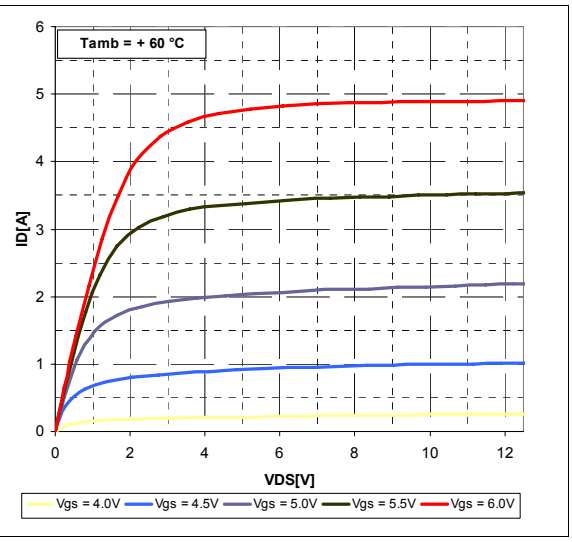

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Figure 6. Gain and efficiency vs Pout

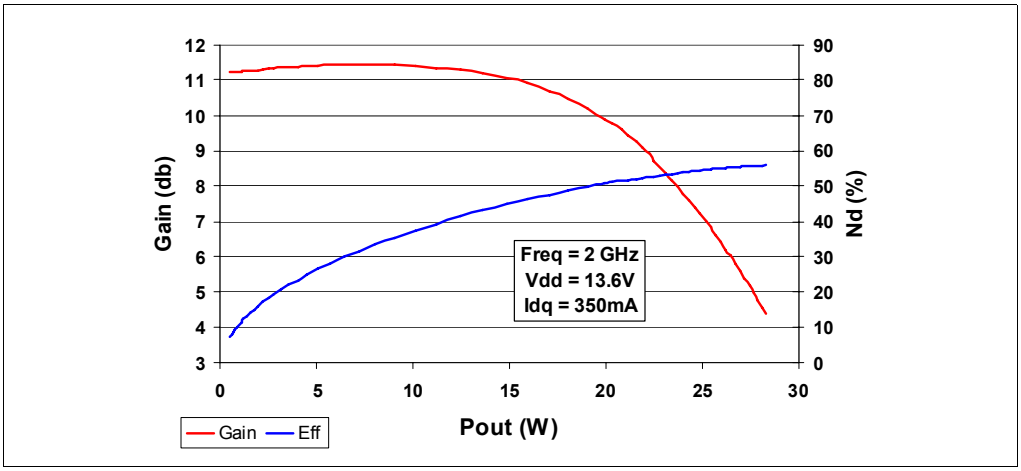
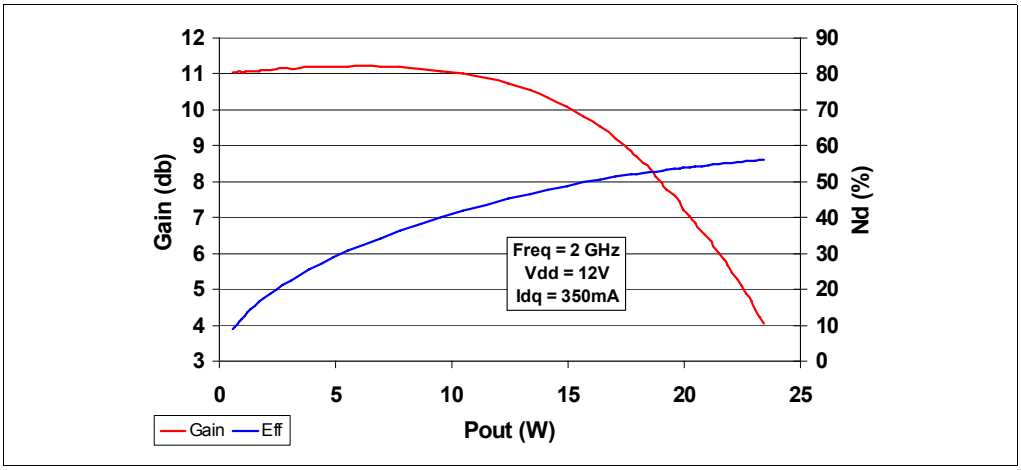


Figure 7. Gain and efficiency vs Pout



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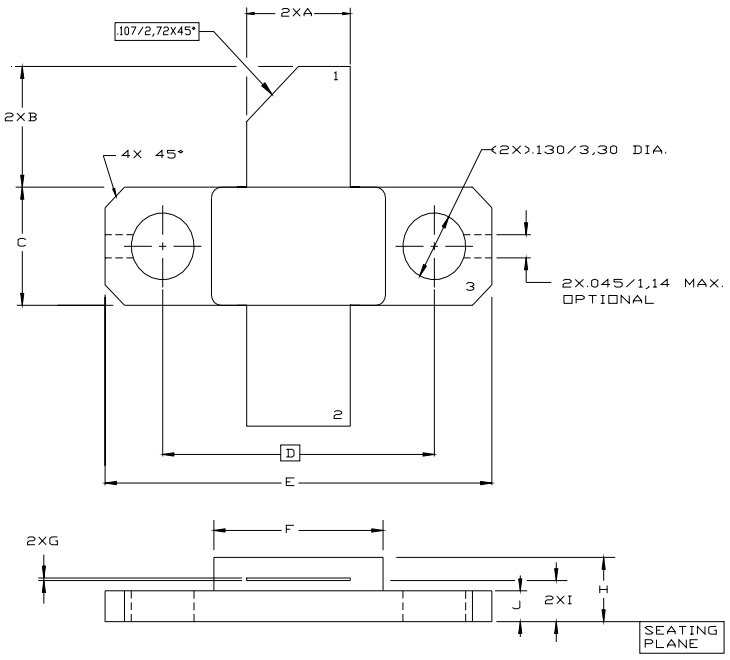
4 Package mechanical data

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.

Table 7. M243 (0.230 x 0.360 2L N/HERM W/FLG) mechanical data

Dim.	mm.			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	5.21		5.72	0.205		0.225
B	5.46		6.48	0.215		0.255
C	5.59		6.10	0.220		0.240
D		14.27			0.562	
E	20.07		20.57	0.790		0.810
F	8.89		9.40	0.350		0.370
G	0.10		0.15	0.004		0.006
H	3.18		4.45	0.125		0.175
I	1.83		2.24	0.072		0.088
J	1.27		1.78	0.050		0.070

Figure 8. Package dimensions



Controlling dimension: Inches 1022142E

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5 Revision history

Table 8. Document revision history

Date	Revision	Changes
16-Nov-2007	1	Initial release.
14-Apr-2009	2	Updated *Table 4 on page 4*

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