

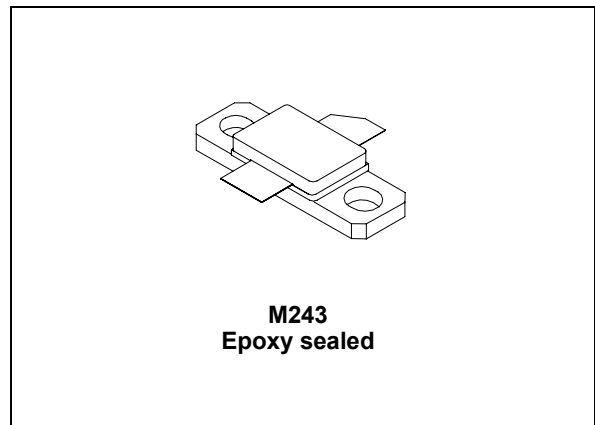
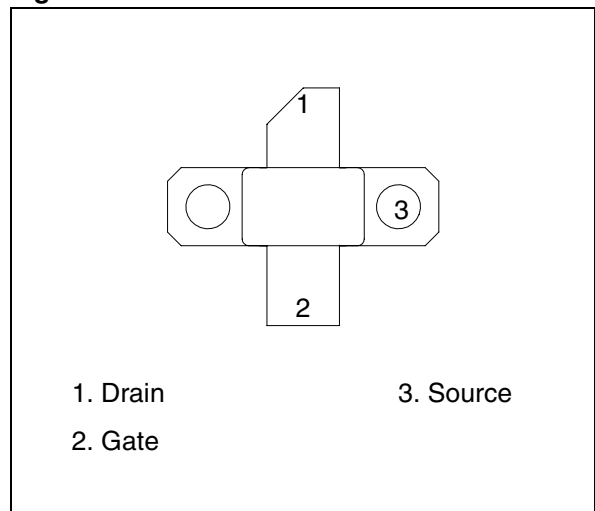
**RF power transistor, LdmoST family****Features**

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

**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**

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# 1 Electrical data

## 1.1 Maximum ratings

$T_{CASE} = 25\text{ °C}$

**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 (@ $T_C = 70\text{ °C}$ )	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

## 2 Electrical characteristics

$$T_{\text{CASE}} = +25\text{ }^{\circ}\text{C}$$

### 2.1 Static

**Table 4. Static**

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

### 2.2 Dynamic

**Table 5. Dynamic**

Symbol	Test conditions			Min.	Typ.	Max.	Unit
P3dB	$V_{\text{DD}} = 13.6\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$		$f = 2\text{ GHz}$		23	-	W
$G_{\text{P}}$	$V_{\text{DD}} = 13.6\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$ , $P_{\text{OUT}} = 15\text{ W}$ , $f = 2\text{ GHz}$			10	11	-	dB
$h_{\text{D}}$	$V_{\text{DD}} = 13.6\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$ , $P_{\text{OUT}} = \text{P3dB}$ , $f = 2\text{ GHz}$			45	53	-	%
Load mismatch	$V_{\text{DD}} = 15.5\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$ , $P_{\text{OUT}} = 20\text{ W}$ , $f = 2\text{ GHz}$ 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

### 3 Typical performance

Figure 2. Capacitances vs drain voltage

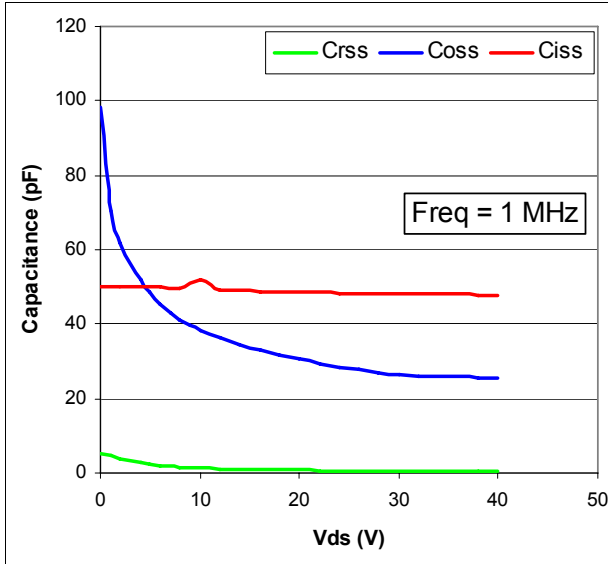


Figure 3. DC output characteristics

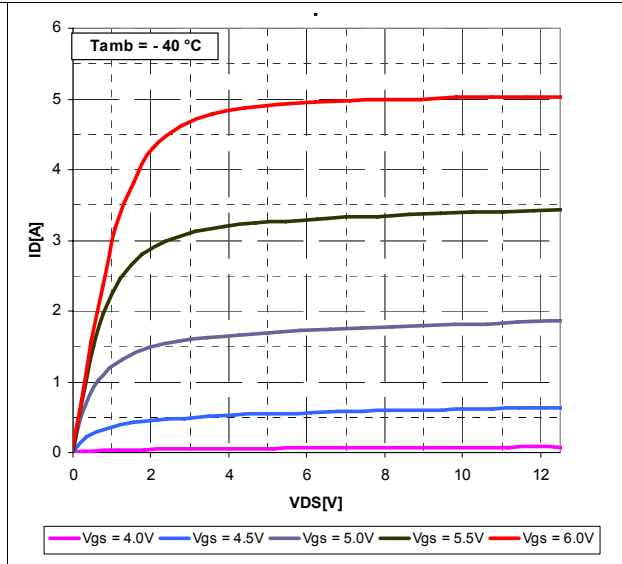


Figure 4. DC output characteristics

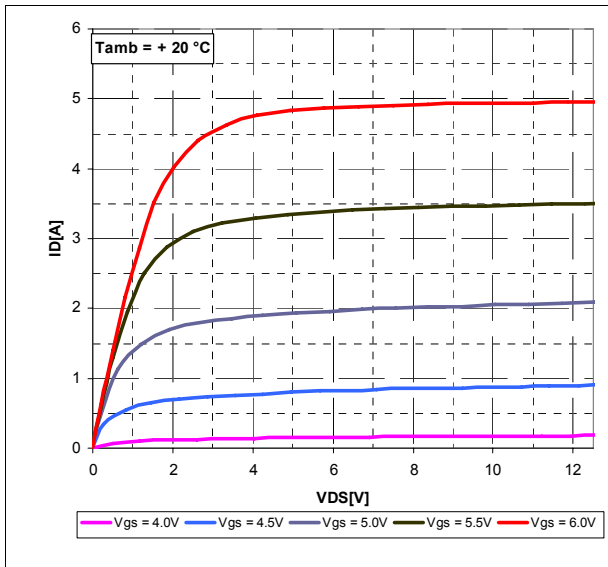


Figure 5. DC output characteristic

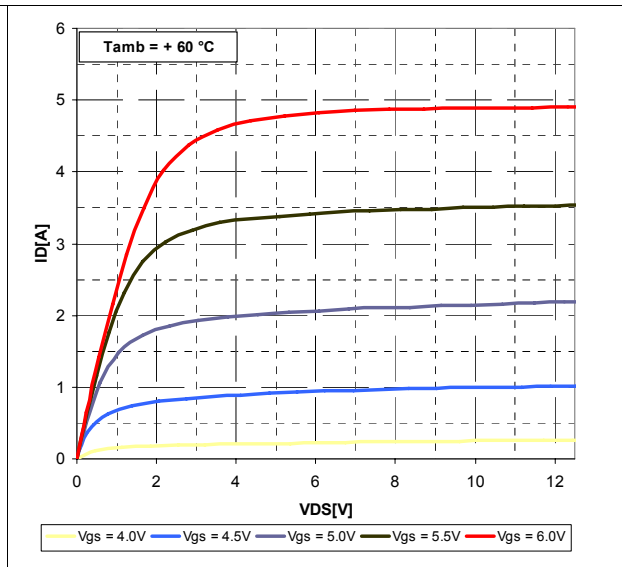


Figure 6. Gain and efficiency vs Pout

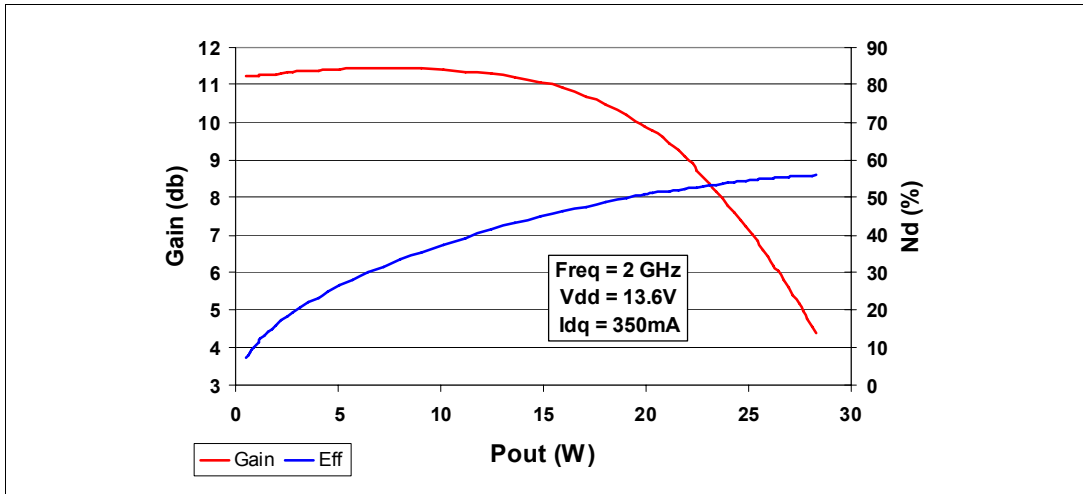
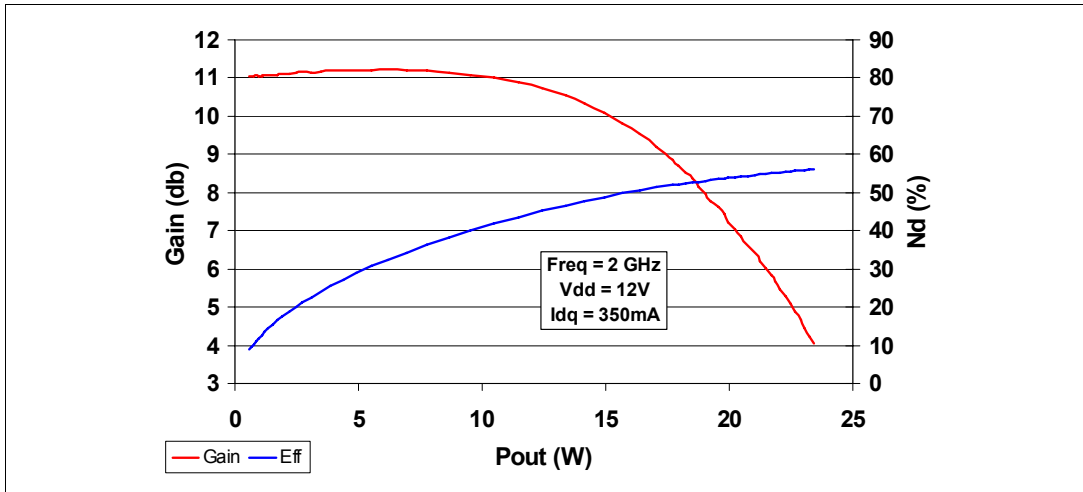


Figure 7. Gain and efficiency vs Pout



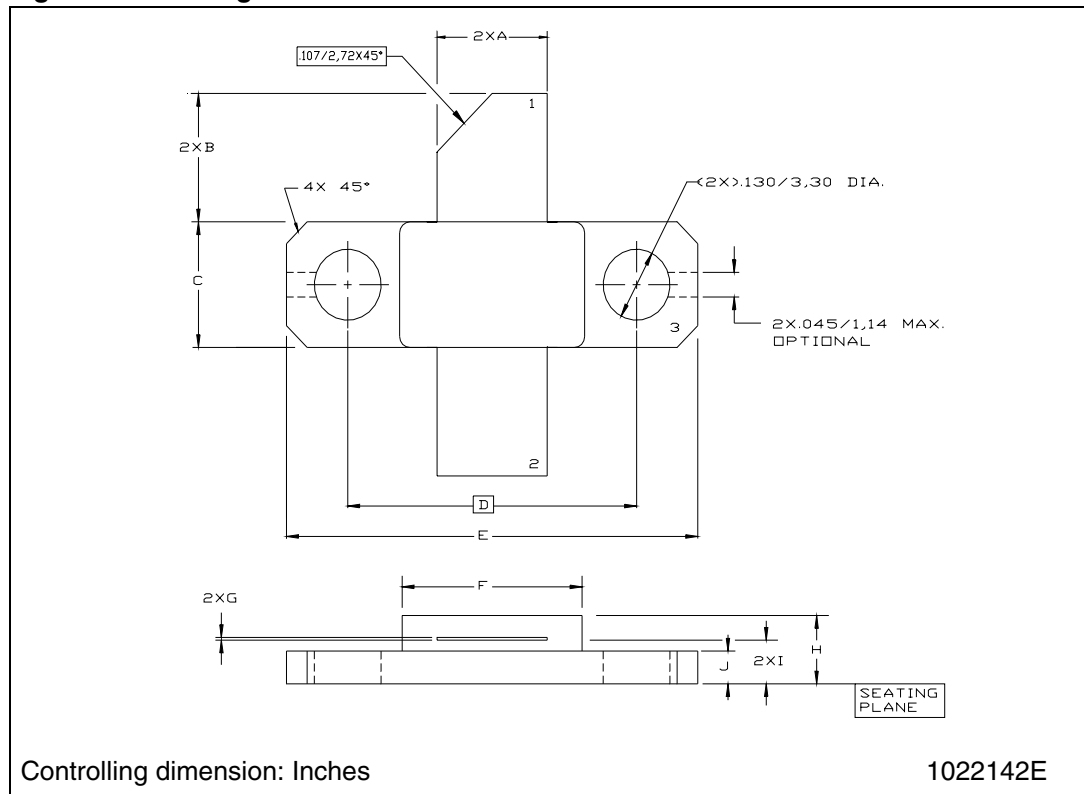
## 4 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> 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**



## 5 Revision history

**Table 8. Document revision history**

Date	Revision	Changes
16-Nov-2007	1	Initial release.
14-Apr-2009	2	Updated <a href="#">Table 4 on page 4</a>



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