

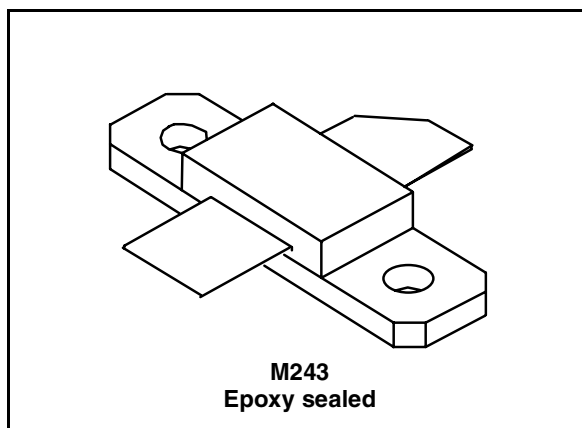
## RF power transistor, LdmoST family

### Features

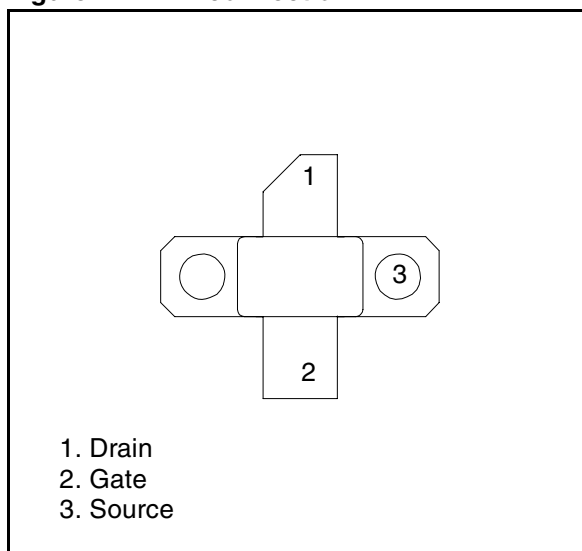
- Excellent thermal stability
- Common source configuration
- $P_{OUT} = 35\text{ W}$  with 14.5 dB gain @ 945 MHz / 13.6 V
- BeO-free ceramic package
- ESD protection
- In compliance with the 2002/95/EC european directive

### Description

The PD85035C 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 1 GHz. PD85035C boasts the excellent gain, linearity and reliability of ST's latest LDMOS technology. PD85035C's superior linearity performance makes it an ideal solution for car mobile radio.



**Figure 1. Pin connection**



**Table 1. Device summary**

Part number	Package	Packaging
PD85035C	M243	Box

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# 1 Electrical data

## 1.1 Maximum ratings

Table 2. Absolute maximum ratings ( $T_{CASE} = 25\text{ °C}$ )

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	8	A
$P_{DISS}$	Power dissipation (@ $T_C = 70\text{ °C}$ )	108	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	1.2	°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	$\mu\text{A}$
$I_{\text{GSS}}$	$V_{\text{GS}} = 20\text{ V}$	$V_{\text{DS}} = 0\text{ V}$			1	$\mu\text{A}$
$V_{\text{GS(Q)}}$	$V_{\text{DS}} = 10\text{ V}$	$I_{\text{D}} = 350\text{ mA}$		3.9		V
$V_{\text{DS(ON)}}$	$V_{\text{GS}} = 10\text{ V}$	$I_{\text{D}} = 3\text{ A}$		0.64	0.7	V
$C_{\text{ISS}}$	$V_{\text{GS}} = 0\text{ V}$	$V_{\text{DS}} = 12.5\text{ V}$	$f = 1\text{ MHz}$	76		pF
$C_{\text{OSS}}$	$V_{\text{GS}} = 0\text{ V}$	$V_{\text{DS}} = 12.5\text{ V}$	$f = 1\text{ MHz}$	45		pF
$C_{\text{RSS}}$	$V_{\text{GS}} = 0\text{ V}$	$V_{\text{DS}} = 12.5\text{ V}$	$f = 1\text{ MHz}$	1.4		pF

### 2.2 Dynamic

**Table 5. Dynamic**

Symbol	Test conditions		Min	Typ	Max	Unit
P3dB	$V_{\text{DD}} = 13.6\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$	$f = 945\text{ MHz}$	35		-	W
$G_{\text{P}}$	$V_{\text{DD}} = 13.6\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$ , $P_{\text{OUT}} = 15\text{ W}$ , $f = 945\text{ MHz}$		15	17.5		dB
$h_{\text{D}}$	$V_{\text{DD}} = 13.6\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$ , $P_{\text{OUT}} = P_{\text{3dB}}$ , $f = 945\text{ MHz}$		60	77		%
Load mismatch	$V_{\text{DD}} = 17\text{ V}$ , $I_{\text{DQ}} = 350\text{ mA}$ , $P_{\text{OUT}} = 50\text{ W}$ , $f = 945\text{ MHz}$ 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 Impedance

Figure 2. Current conventions

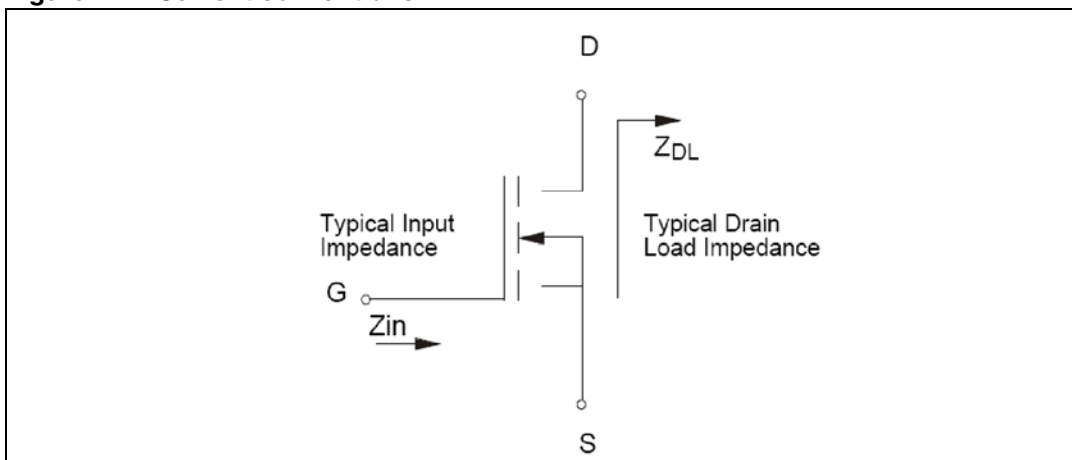


Table 7. Impedance data

Frequency (MHz)	$Z_{IN} (\Omega)$	$Z_{DL}(\Omega)$
945 MHz	$1.08 + j 2.05$	$2.14 + j 2.17$

# 4 Typical performances

Figure 3. Capacitances vs drain voltage

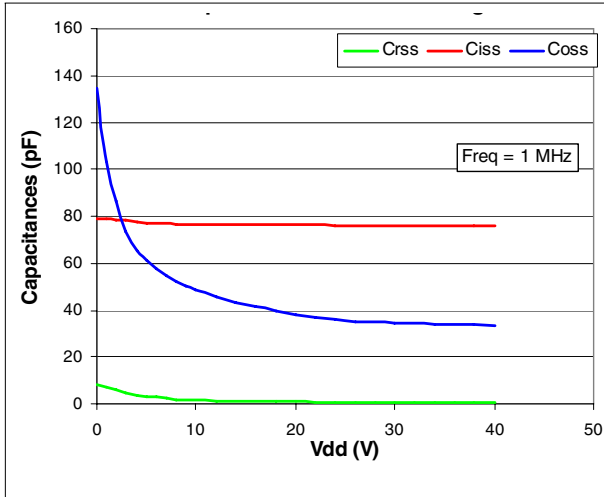


Figure 4. ID vs VGS

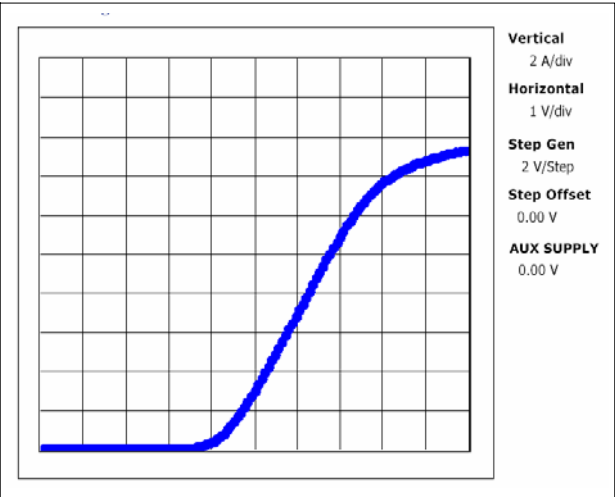


Figure 5. Threshold voltage

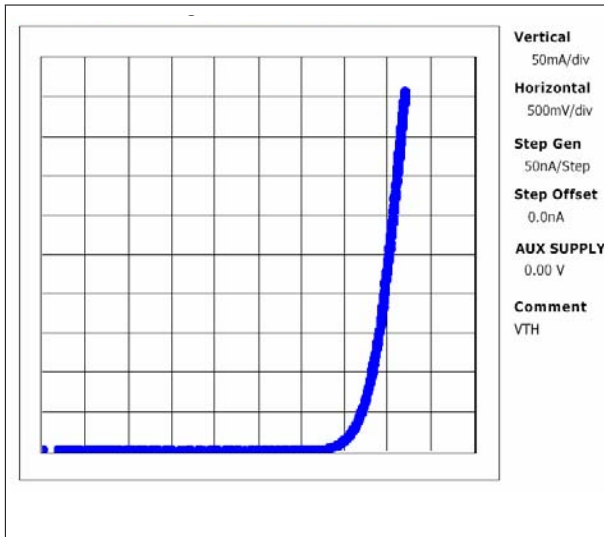


Figure 6. DC output characteristic

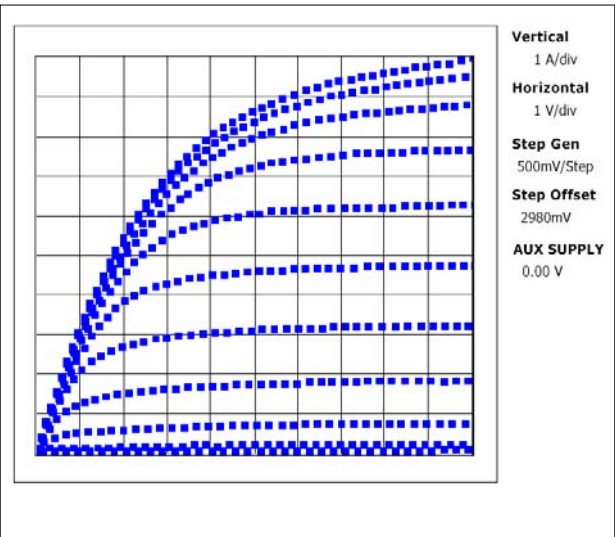


Figure 7. Gain vs output power and bias current

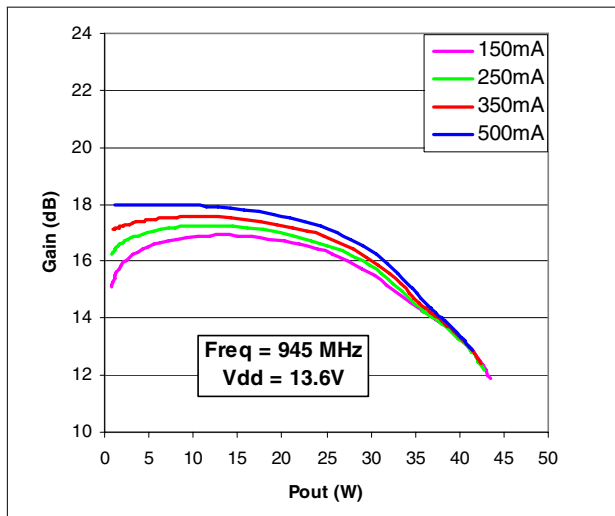


Figure 8. Pout and efficiency vs input power

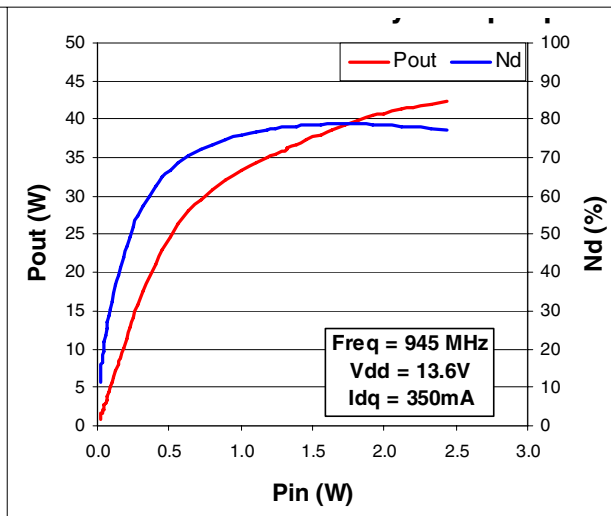


Figure 9. Pout and drain current vs supply voltage

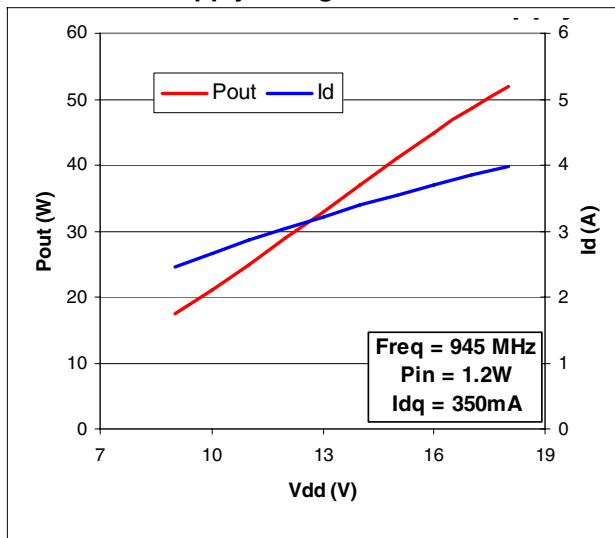
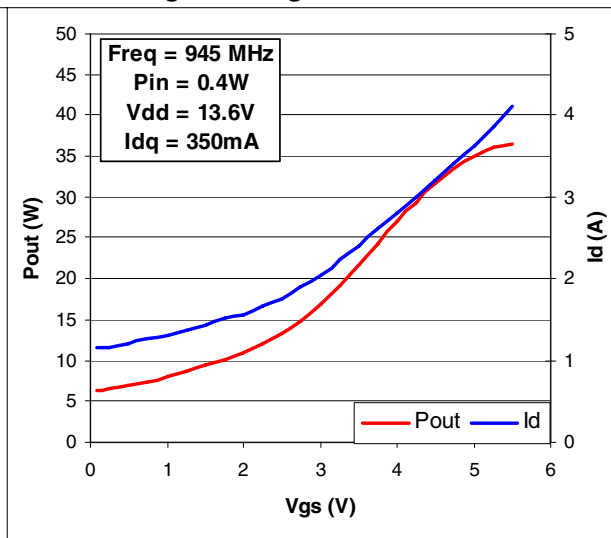


Figure 10. Pout and drain current vs gate voltage



## 5 Package mechanical data

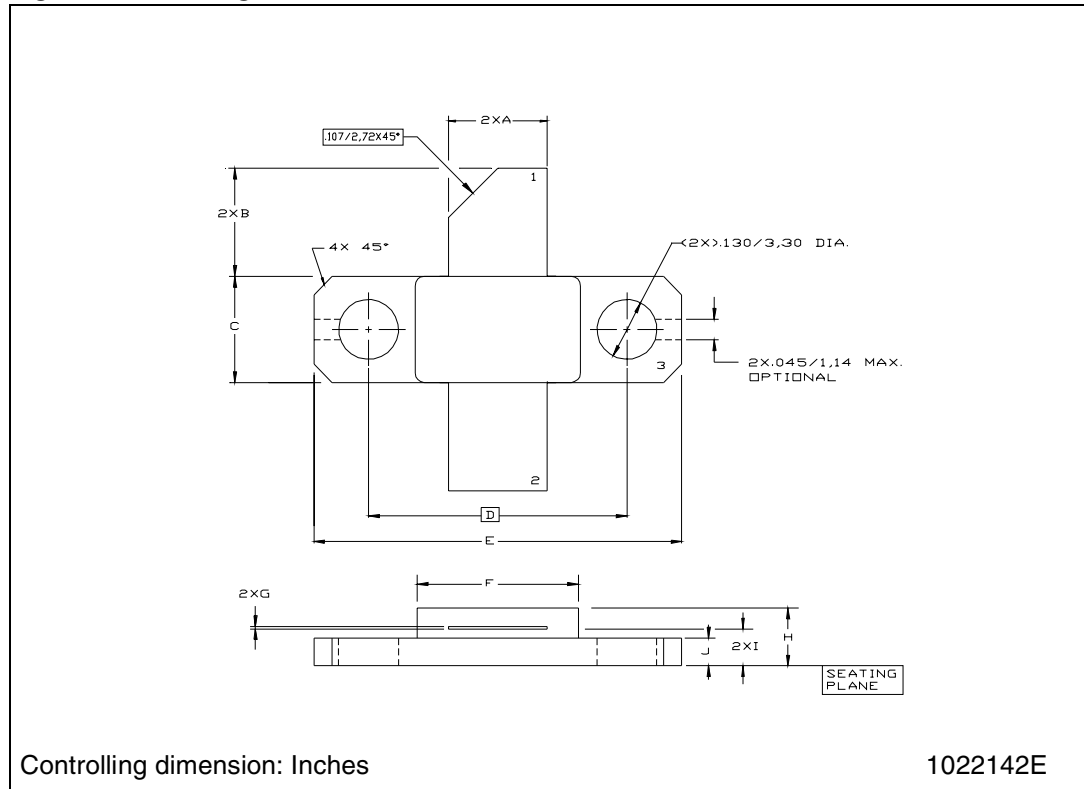
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK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



**Table 8. M243 (.230 x .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 11. Package dimensions**



## 6 Revision history

**Table 9. Document revision history**

<b>Date</b>	<b>Revision</b>	<b>Changes</b>
16-Nov-2007	1	Initial release
02-Jul-2009	2	Document status promoted from preliminary data to datasheet

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