

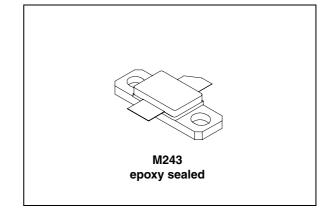
#### **LET20030C**

# RF power transistor from the LdmoST family of N-channel enhancement-mode lateral MOSFETs

Preliminary data

#### **Features**

- Excellent thermal stability
- Common source configuration
- P<sub>OUT</sub> (@28 V) = 45 W with 13.9 dB gain @ 2000 MHz
- P<sub>OUT</sub> (@36 V) = 53 W with 13.3 dB gain @ 2000 MHz
- BeO free package
- In compliance with the 2002/95/EC European directive



#### **Description**

The LET20030C is a common source N-channel enhancement-mode lateral field-effect RF power transistor designed for broadband commercial and industrial applications at frequencies up to 2 GHz. The LET20030C is designed for high gain and broadband performance operating in common source mode at 36 V. It is ideal for base station applications requiring high linearity.

Figure 1. Pin out

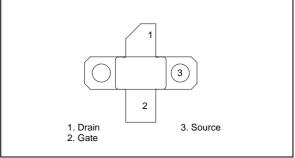


Table 1. Device summary

Order code	Package	Branding
LET20030C	M243	LET20030C

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Maximum ratings LET20030C

# 1 Maximum ratings

Table 2. Absolute maximum ratings ( $T_{CASE} = 25 \,^{\circ}C$ )

Symbol	Parameter	Value	Unit
V <sub>(BR)DSS</sub>	Drain-source voltage	80	V
$V_{GS}$	Gate-source voltage	-0.5 to +15	V
I <sub>D</sub>	Drain current	9	Α
P <sub>DISS</sub>	Power dissipation (@ T <sub>C</sub> = 70 °C)	108	W
TJ	Max. operating junction temperature	200	°C
T <sub>STG</sub>	Storage temperature	-65 to +150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R <sub>th(JC)</sub>	Junction-case thermal resistance	1.2	°C/W

### 2 Electrical characteristics

T<sub>C</sub> = 25 °C

Table 4. Static

Symbol	Test conditions	Min.	Тур.	Max.	Unit
V <sub>(BR)DSS</sub>	$V_{GS} = 0 \text{ V}; I_{DS} = 10 \text{ mA}$	80			V
I <sub>DSS</sub>	V <sub>GS</sub> = 0 V; V <sub>DS</sub> = 28 V			1	μА
I <sub>GSS</sub>	$V_{GS} = 20 \text{ V}; V_{DS} = 0 \text{ V}$			1	μΑ
V <sub>GS(Q)</sub>	V <sub>DS</sub> = 28 V; I <sub>D</sub> = 300 mA	2.0		5.0	V
V <sub>DS(ON)</sub>	$V_{GS} = 10 \text{ V}; I_D = 3 \text{ A}$		0.9	1.2	V
G <sub>FS</sub>	$V_{DS} = 10 \text{ V}; I_D = 3 \text{ A}$	2.5			mho
C <sub>ISS</sub>	V <sub>GS</sub> = 0 V; V <sub>DS</sub> = 28 V; f = 1 MHz		58		pF
C <sub>OSS</sub>	V <sub>GS</sub> = 0 V; V <sub>DS</sub> = 28 V; f = 1 MHz		29		pF
C <sub>RSS</sub>	V <sub>GS</sub> = 0 V; V <sub>DS</sub> = 28 V; f = 1 MHz		0.8		pF

Table 5. Dynamic

Symbol	Test conditions	Min.	Тур.	Max.	Unit
P <sub>OUT</sub>	V <sub>DD</sub> = 28 V; I <sub>DQ</sub> = 400 mA; P <sub>IN</sub> = 2 W; f = 2000 MHz	30	45	-	W
G <sub>PS</sub>	$V_{DD} = 28 \text{ V}; I_{DQ} = 400 \text{ mA}; P_{IN} = 2 \text{ W}; f = 2000 \text{ MHz}$	12.5	13.9	-	dB
h <sub>D</sub>	V <sub>DD</sub> = 28 V; I <sub>DQ</sub> = 400 mA; P <sub>IN</sub> = 2 W; f = 2000 MHz	45	50	-	%
Load mismatch	$V_{DD}$ = 28 V; $I_{DQ}$ = 400 mA; $P_{IN}$ = 2 W; f = 2000 MHz All phase angles	10:1		-	VSWR

Impedance data LET20030C

### 3 Impedance data

Figure 2. Impedance data

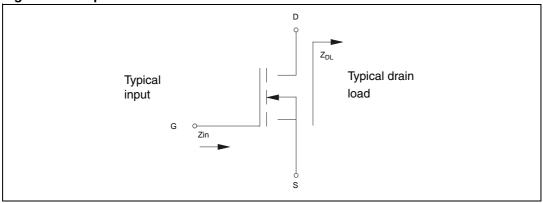


Table 6. Impedance data

Frequency	<b>Z</b> <sub>IN</sub> (Ω)	<b>Z</b> <sub>DL</sub> (Ω)
1800	TBD	TBD
1900	TBD	TBD
2000	TBD	TBD

### 4 Typical performances

Figure 3. Gain vs output power and bias current

Figure 4. Gain and efficiency vs output power

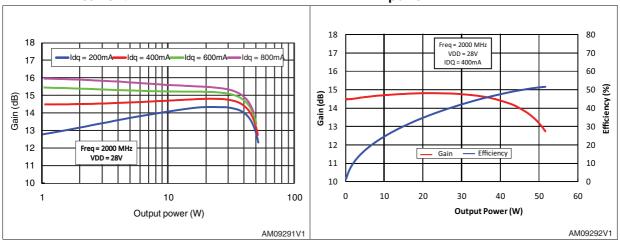


Figure 5. Gain vs output power and supply voltage

Figure 6. Efficiency vs output power supply voltage

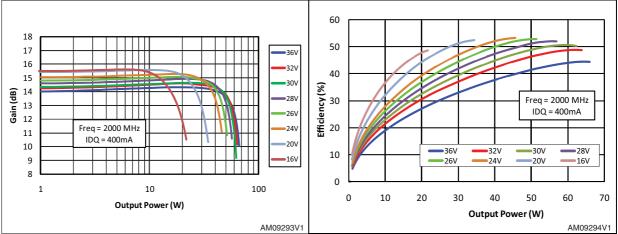


Figure 7. IMD vs output power @  $V_{DD}$  = 28V Figure 8. IMD vs output power @  $V_{DD}$  = 32V

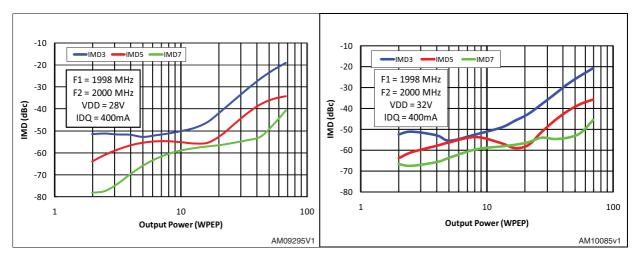
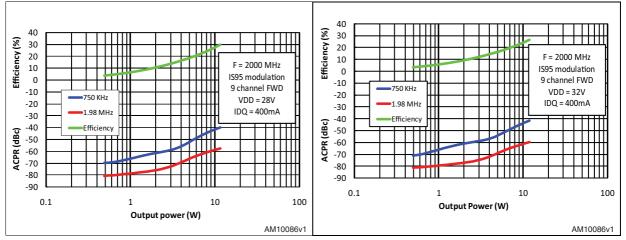


Figure 9. ACPR and efficiency vs output power @ V<sub>DD</sub> = 28V

Figure 10. ACPR and efficiency vs output power @ V<sub>DD</sub> = 32V



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### 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. ECOPACK<sup>®</sup> is an ST trademark.

Table 7. M243 (.230 x .360 2L N/HERM W/FLG) mechanical data

Dim	mm			inch		
Dim.	Min.	Тур	Max.	Min.	Тур	Max.
Α	5.21		5.72	0.205		0.225
В	5.46		6.48	0.215		0.255
С	5.59		6.1	0.22		0.24
D		14.27			0.562	
E	20.07		20.57	0.79		0.81
F	8.89		9.4	0.35		0.37
G	0.1		0.15	0.004		0.006
Н	3.18		4.45	0.125		0.175
I	1.83		2.24	0.072		0.088
J	1.27		1.78	0.05		0.07

2XB

4X 45\*

4X 45\*

C

2XA

AX 45\*

A

Figure 11. M243 package dimensions

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Revision history LET20030C

# 6 Revision history

Table 8. Document revision history

Date	Revision	Changes
11-Jul-2011	1	Initial release.

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