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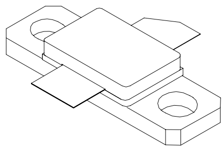
LET20030C

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

Preliminary data

Features

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



M243
epoxy sealed

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

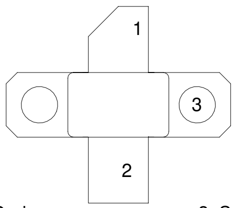


Table 1. Device summary

Order code	Package	Branding
LET20030C	M243	LET20030C

This is preliminary information on a new product now in development or undergoing evaluation. Details are subject to change without notice.

1 Maximum ratings

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

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	80	V
V_{GS}	Gate-source voltage	-0.5 to +15	V
I_D	Drain current	9	A
P_{DISS}	Power dissipation (@ T_C = 70 °C)	108	W
T_J	Max. operating junction temperature	200	°C
T_{STG}	Storage temperature	-65 to +150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{th(JC)}$	Junction-case thermal resistance	1.2	°C/W

2 Electrical characteristics

T_C = 25 °C

Table 4. Static

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	V_{GS} = 0 V; I_{DS} = 10 mA	80			V
I_{DSS}	V_{GS} = 0 V; V_{DS} = 28 V			1	µA
I_{GSS}	V_{GS} = 20 V; V_{DS} = 0 V			1	µA
$V_{GS(Q)}$	V_{DS} = 28 V; I_D = 300 mA	2.0		5.0	V
$V_{DS(ON)}$	V_{GS} = 10 V; I_D = 3 A		0.9	1.2	V
G_{FS}	V_{DS} = 10 V; I_D = 3 A	2.5			mho
C_{ISS}	V_{GS} = 0 V; V_{DS} = 28 V; f = 1 MHz		58		pF
C_{OSS}	V_{GS} = 0 V; V_{DS} = 28 V; f = 1 MHz		29		pF
C_{RSS}	V_{GS} = 0 V; V_{DS} = 28 V; f = 1 MHz		0.8		pF

Table 5. Dynamic

Symbol	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	V_{DD} = 28 V; I_{DQ} = 400 mA; P_{IN} = 2 W; f = 2000 MHz	30	45	-	W
G_{PS}	V_{DD} = 28 V; I_{DQ} = 400 mA; P_{IN} = 2 W; f = 2000 MHz	12.5	13.9	-	dB
h_D	V_{DD} = 28 V; I_{DQ} = 400 mA; P_{IN} = 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

3 Impedance data

Figure 2. Impedance data

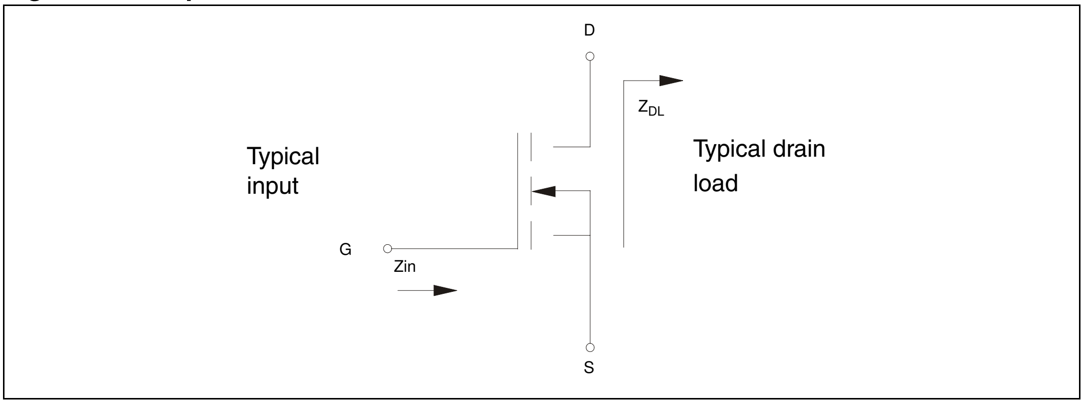


Table 6. Impedance data

Frequency	Z_{IN} (Ω)	Z_{DL} (Ω)
1800	TBD	TBD
1900	TBD	TBD
2000	TBD	TBD

4 Typical performances

Figure 3. Gain vs output power and bias current

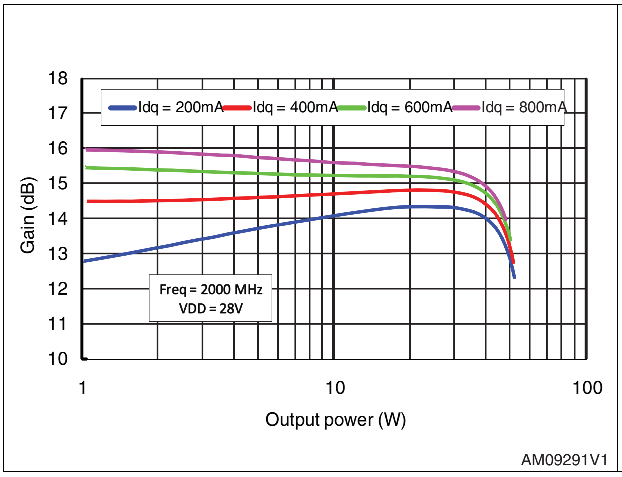


Figure 4. Gain and efficiency vs output power

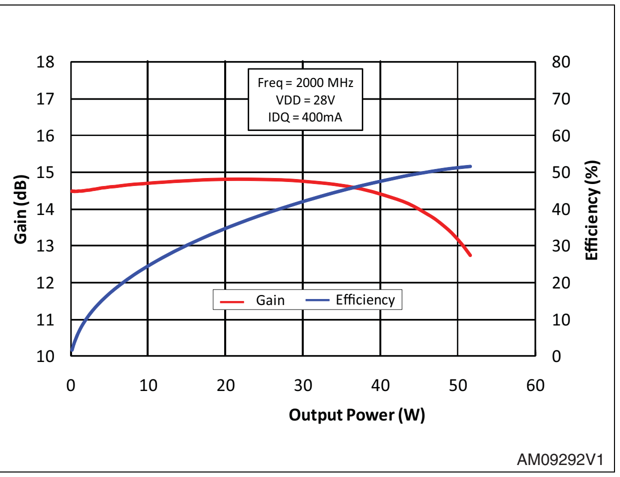


Figure 5. Gain vs output power and supply voltage

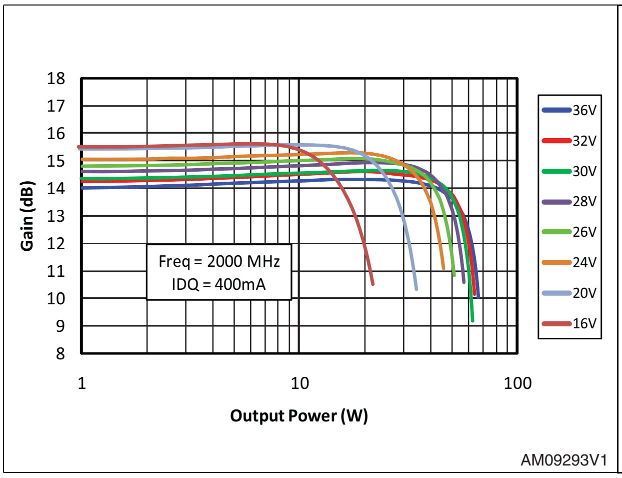


Figure 6. Efficiency vs output power supply voltage

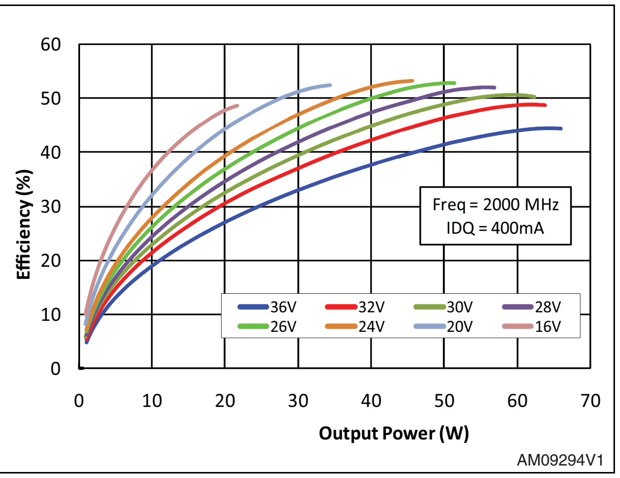


Figure 7. IMD vs output power @ V_{DD} = 28V

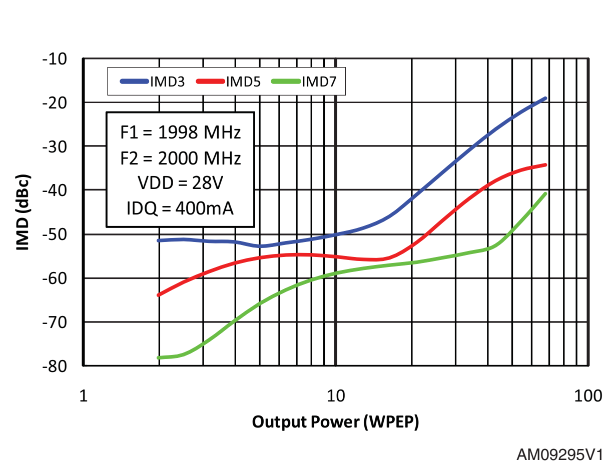


Figure 8. IMD vs output power @ V_{DD} = 32V

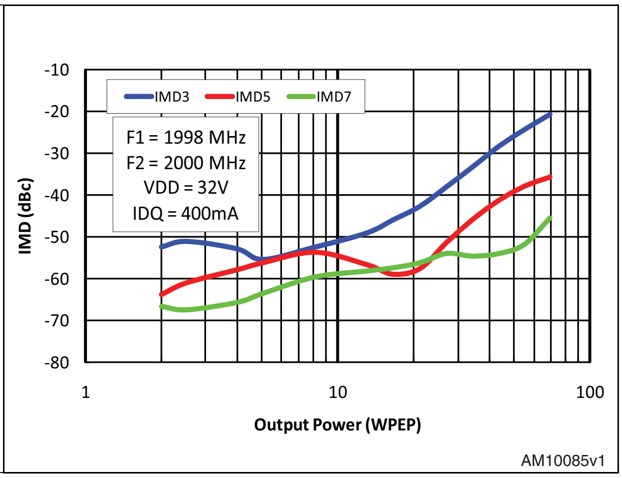


Figure 9. ACPR and efficiency vs output power @ V_{DD} = 28V

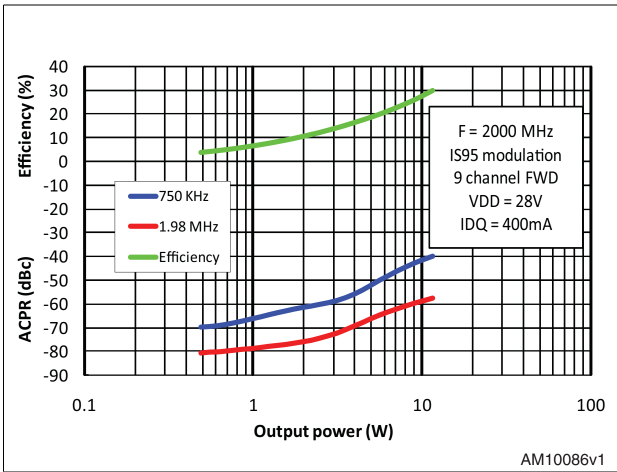
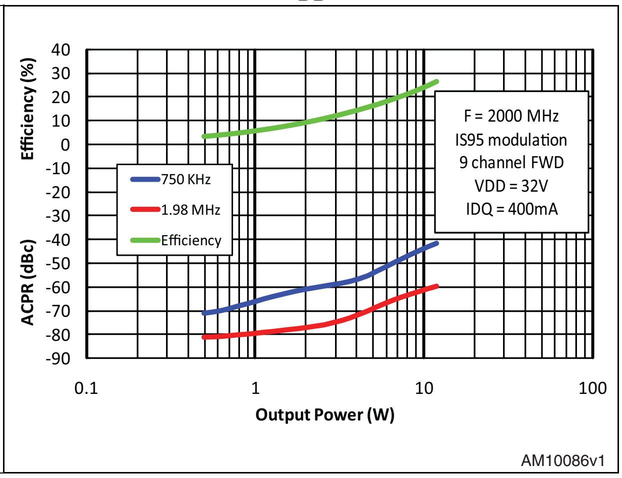


Figure 10. ACPR and efficiency vs output power @ V_{DD} = 32V



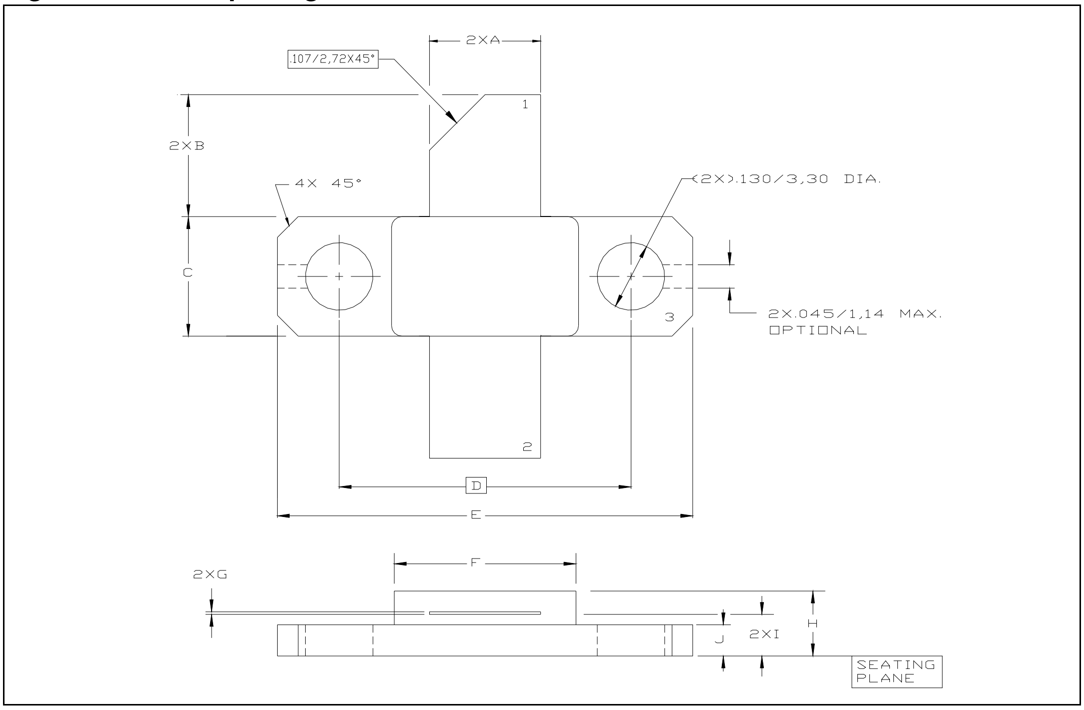
5 Package mechanical data

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 (.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		6.1	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
H	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

Figure 11. M243 package dimensions



6 Revision history

Table 8. Document revision history

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