

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

Features

- Excellent thermal stability
- Common source configuration
- P_{OUT} (@ 28 V)= 54 W with 13.3 dB gain @ 2000 MHz
- P_{OUT} (@ 36 V)= 65 W with 12.5 dB gain @ 2000 MHz
- BeO free package
- In compliance with the 2002/95/EC European directive

Description

The LET20045C 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 2.0 GHz. The LET20045C 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.

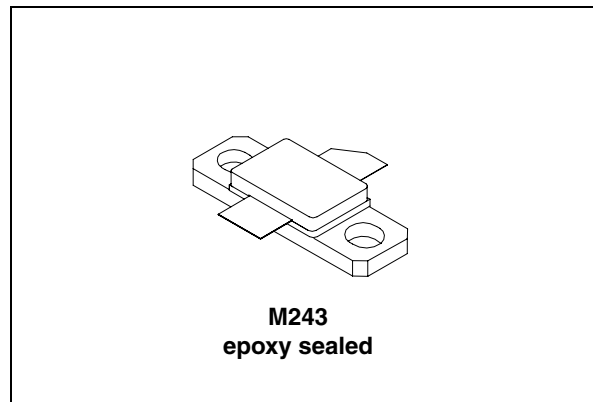


Figure 1. Pin out

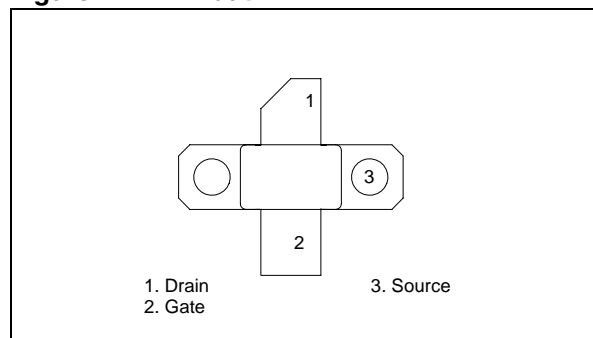


Table 1. Device summary

Order code	Package	Branding
LET20045C	M243	LET20045C

1 Maximum ratings

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

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	12	A
P_{DISS}	Power dissipation (@ $T_C = 70\text{ °C}$)	130	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	1.0	°C/W

2 Electrical characteristics

$T_C = 25\text{ }^\circ\text{C}$

Table 4. Static

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}; I_{DS} = 10\text{ mA}$	80			V
I_{DSS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$			1	μA
I_{GSS}	$V_{GS} = 5\text{ V}; V_{DS} = 0\text{ V}$			1	μA
$V_{GS(Q)}$	$V_{DS} = 28\text{ V}; I_D = 100\text{ mA}$	2.0		5.0	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}; I_D = 3\text{ A}$		0.8	1.2	V
G_{FS}	$V_{DS} = 10\text{ V}; I_D = 3\text{ A}$	2.5			mho
C_{ISS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$		77		pF
C_{OSS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$		39		pF
C_{RSS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$		1.2		pF

Table 5. Dynamic

Symbol	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	$V_{DD} = 28\text{ V}; I_{DQ} = 500\text{ mA}; P_{IN} = 2.5\text{ W}; f = 2000\text{ MHz}$	45	54	-	W
G_{PS}	$V_{DD} = 28\text{ V}; I_{DQ} = 500\text{ mA}; P_{IN} = 2.5\text{ W}; f = 2000\text{ MHz}$	12	13.3	-	dB
h_D	$V_{DD} = 28\text{ V}; I_{DQ} = 500\text{ mA}; P_{IN} = 2.5\text{ W}; f = 2000\text{ MHz}$	45	51	-	%
Load mismatch	$V_{DD} = 28\text{ V}; I_{DQ} = 500\text{ mA}; P_{IN} = 2.5\text{ W}; f = 2000\text{ MHz}$ All phase angles	10:1			VSWR

3 Impedance data

Figure 2. Impedance data

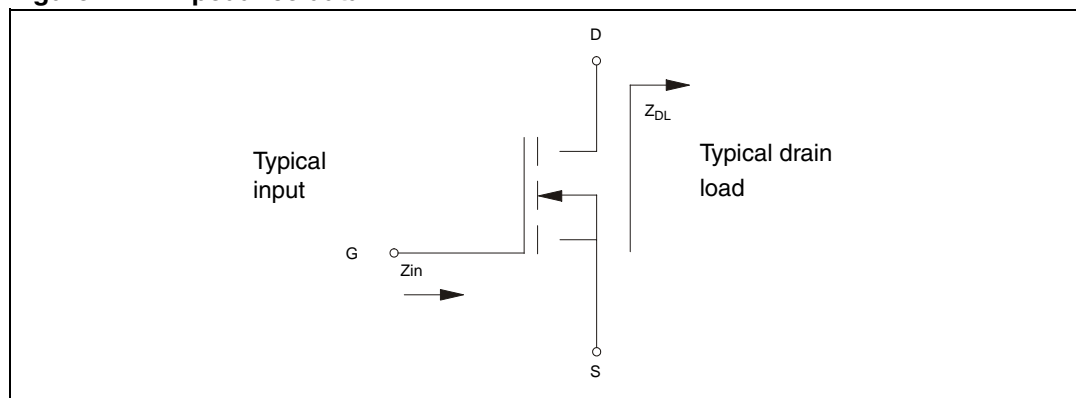
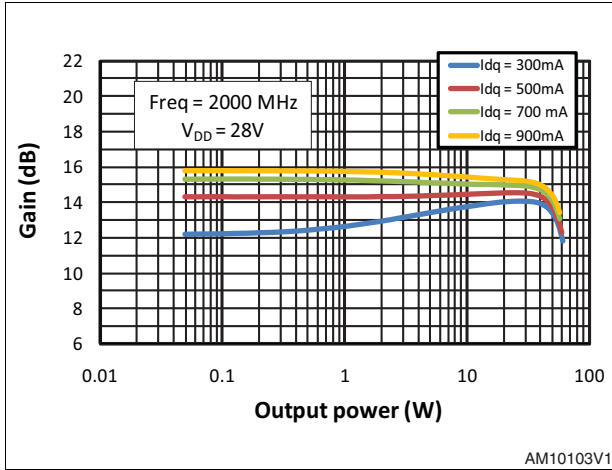


Table 6. Impedance data

Frequency	$Z_{IN} (\Omega)$	$Z_{DL} (\Omega)$
TBD	TBD	TBD

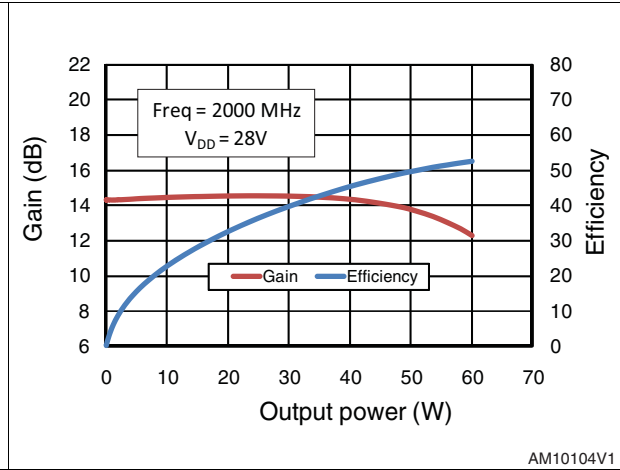
4 Typical performances

Figure 3. Gain vs output power and bias current



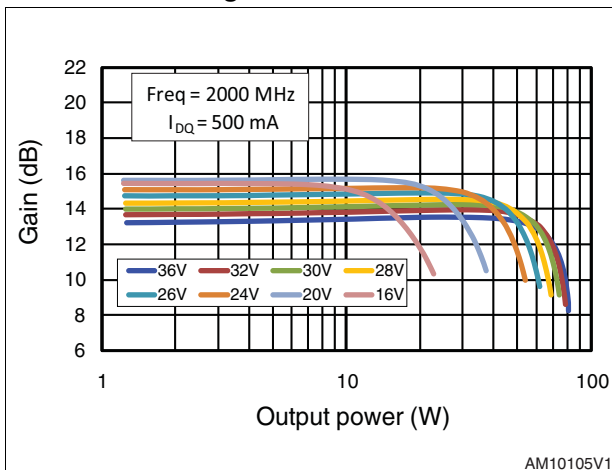
AM10103V1

Figure 4. Gain and efficiency vs output power



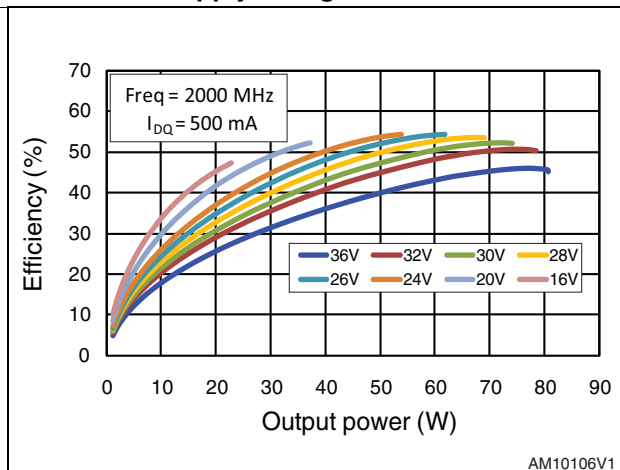
AM10104V1

Figure 5. Gain vs output power and supply voltage



AM10105V1

Figure 6. Efficiency vs output power and supply voltage



AM10106V1

Figure 7. IMD vs output power @ 28 V

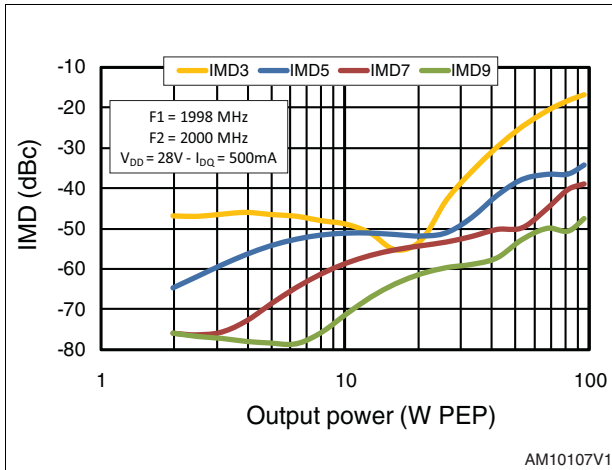


Figure 8. IMD vs output power @ 32 V

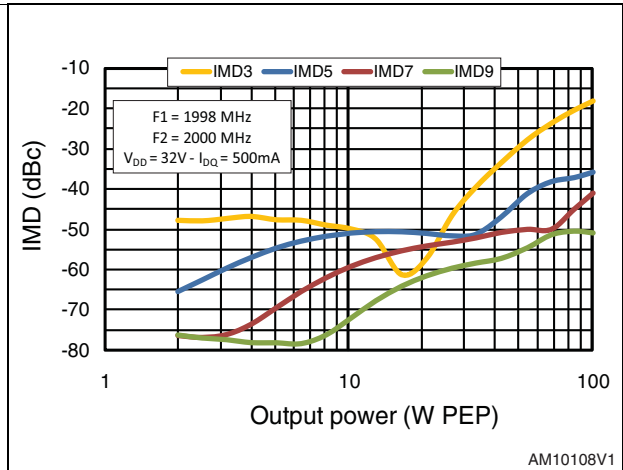


Figure 9. ACPR and efficiency vs output power @ 28 V

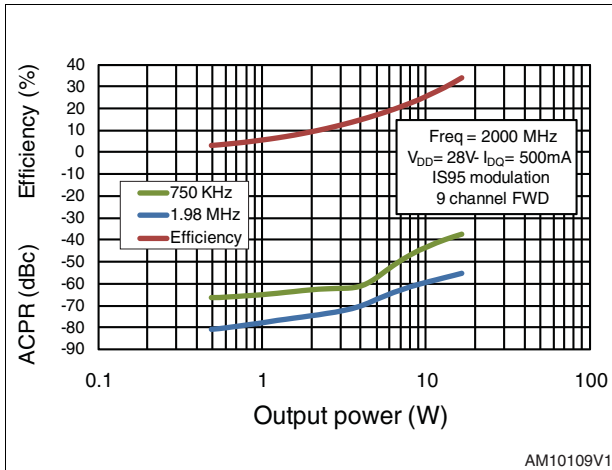
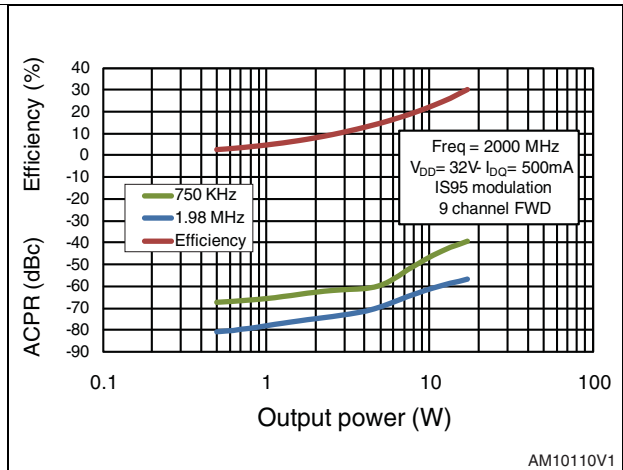


Figure 10. ACPR and efficiency vs output power @ 32 V



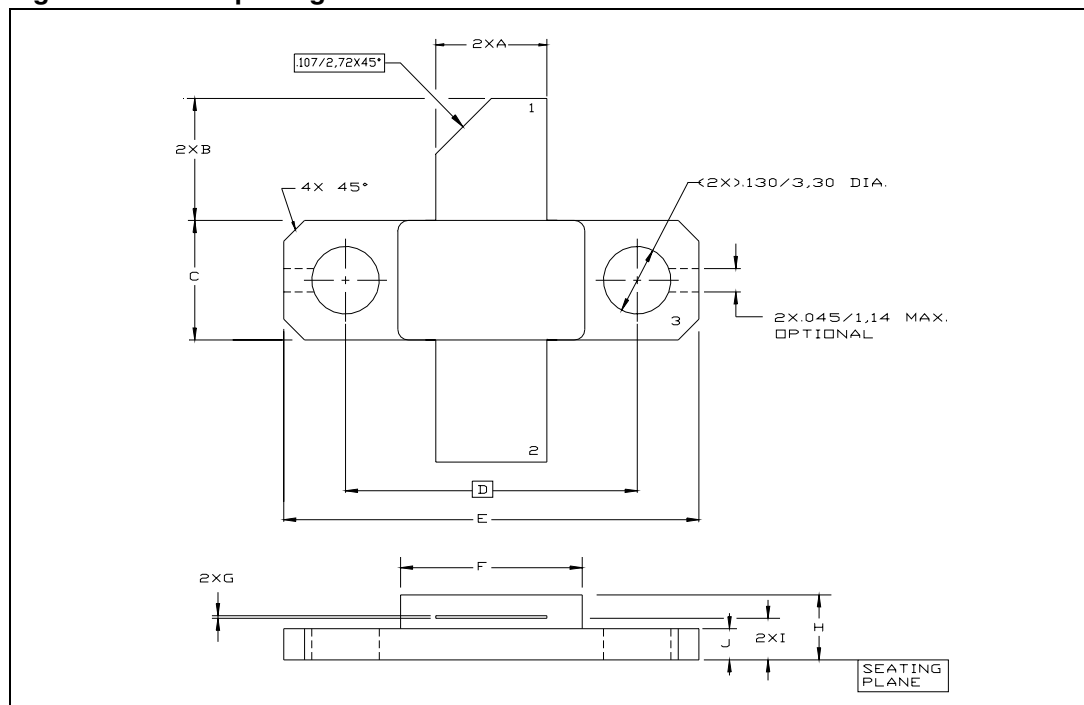
5 Package mechanical data

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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
19-Jul-2011	1	Initial release.

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