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# LET20045C

## 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.

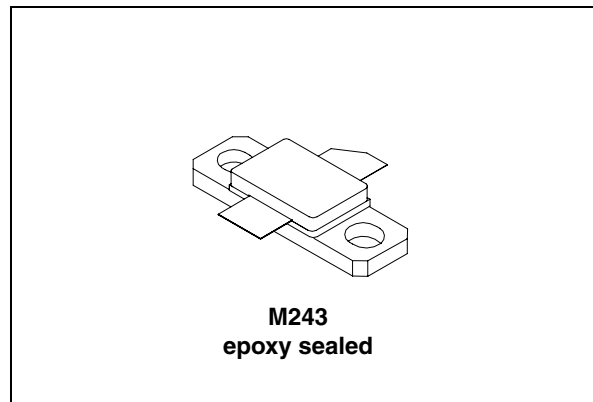


Figure 1. Pin out

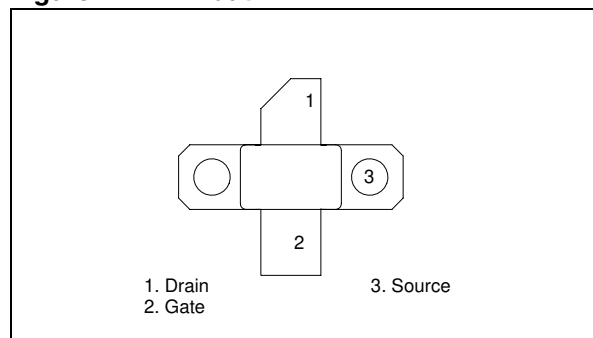


Table 1. Device summary

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

$T_C = 25\text{ °C}$

**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	$\mu\text{A}$
$I_{GSS}$	$V_{GS} = 5\text{ V}; V_{DS} = 0\text{ V}$			1	$\mu\text{A}$
$V_{GS(Q)}$	$V_{DS} = 28\text{ V}; I_D = 100\text{ mA}$	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

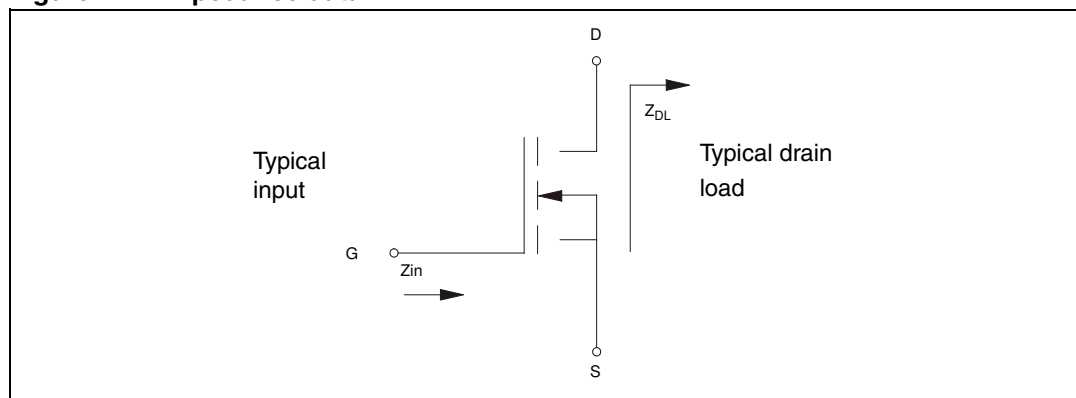
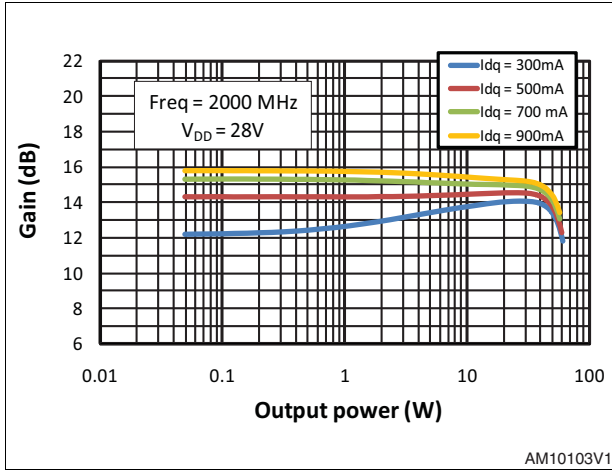


Table 6. Impedance data

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

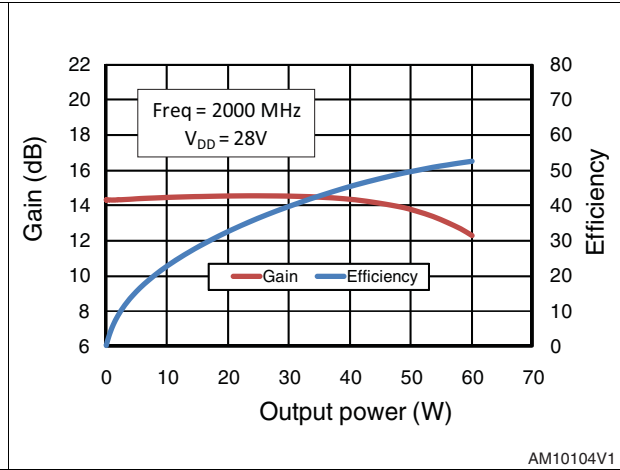
# 4 Typical performances

**Figure 3. Gain vs output power and bias current**



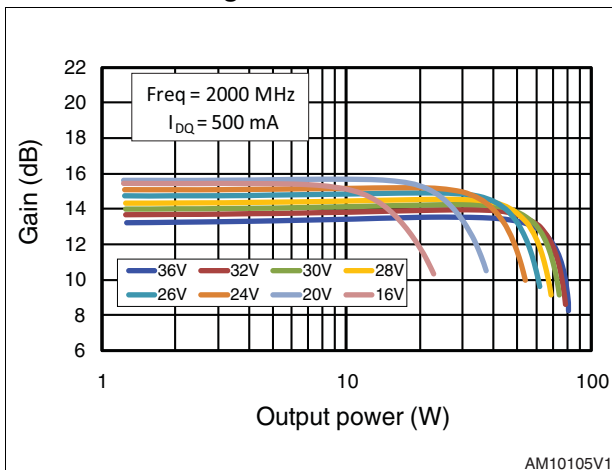
AM10103V1

**Figure 4. Gain and efficiency vs output power**



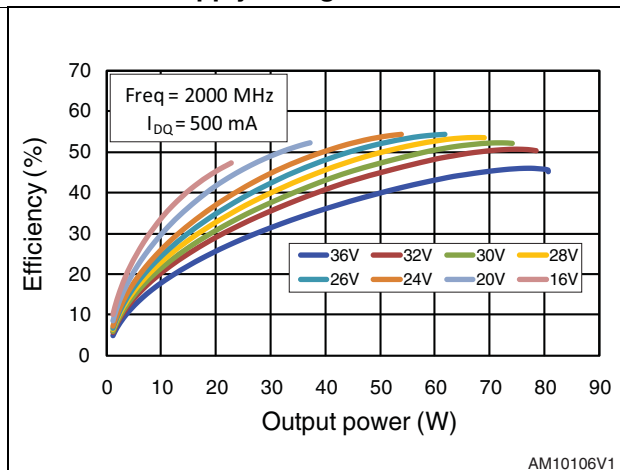
AM10104V1

**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

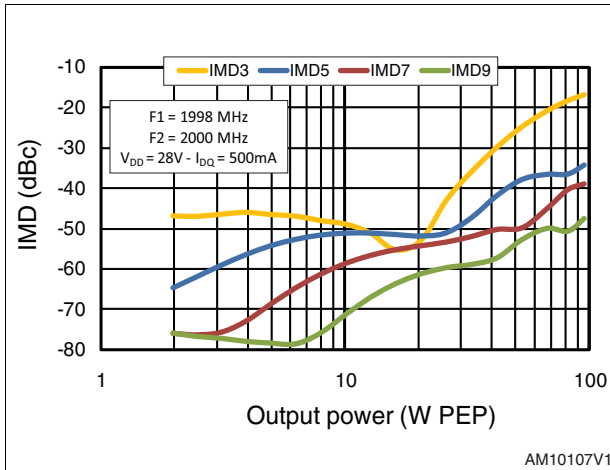


Figure 8. IMD vs output power @ 32 V

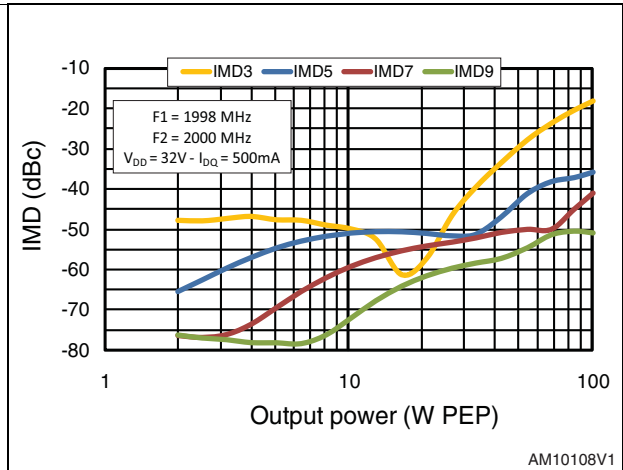


Figure 9. ACPR and efficiency vs output power @ 28 V

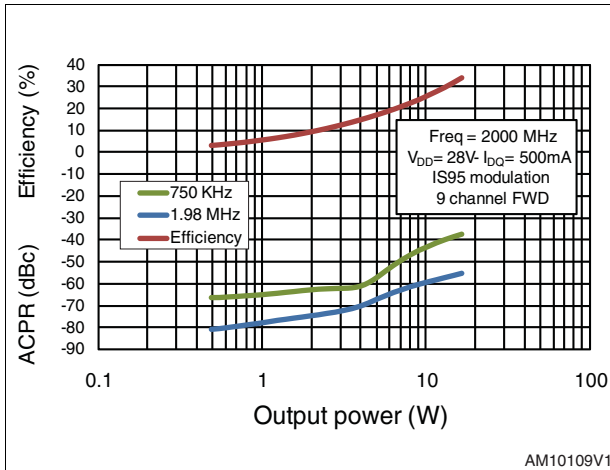
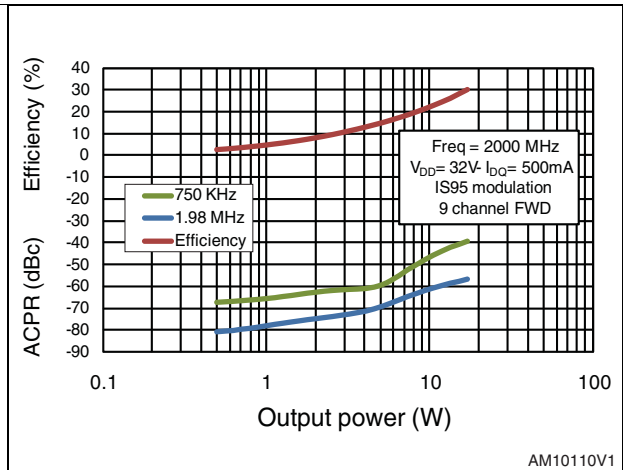


Figure 10. ACPR and efficiency vs output power @ 32 V



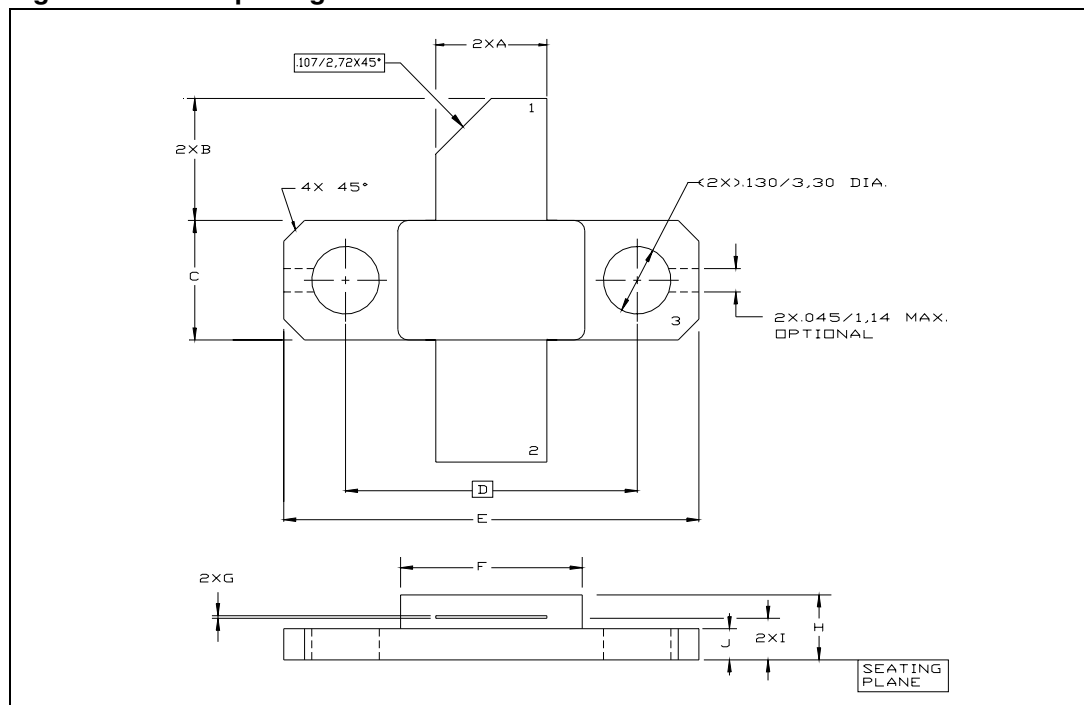
## 5 Package mechanical data

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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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