LET16045C

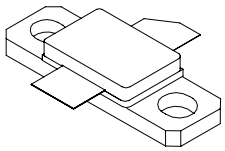
RF power transistor from the LdmoST family of n-channel enhancement-mode lateral MOSFETs

Features

- Excellent thermal stability
- Common source configuration
- P_{OUT} (@28 V) = 45 W with 16 dB gain @ 1600 MHz
- BeO free package
- In compliance with the 2002/95/EC European directive

Description

The LET16045C 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 1.6 GHz. The LET16045C is designed for high gain and broadband performance operating in common source mode at 28 V. It is ideal for INMARSAT satellite communications.



M243
epoxy sealed

Figure 1. Pin out

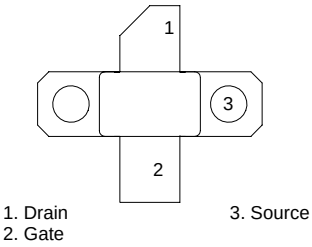


Table 1. Device summary

Order code	Package	Branding
LET16045C	M243	LET16045C

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)	100	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	1.3	°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			1.1	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	45	54	-	W
G_{PS}	V_{DD} = 28 V; I_{DQ} = 400 mA; P_{OUT} = 45 W	15	16		dB
h_D	V_{DD} = 28 V; I_{DQ} = 400 mA; P_{OUT} = 45 W	50	55		%
Load mismatch	V_{DD} = 28 V; I_{DQ} = 400 mA; P_{OUT} = 50 W; f = 1600 MHz All phase angles		20:1		VSWR

Table 6. Impedance data

Frequency (MHz)	Z source (Ω)	Z load (Ω)
1600	1.1 - j1.6	1.1 - j0.6

3 Typical performances

Figure 2. Gain and efficiency vs output power

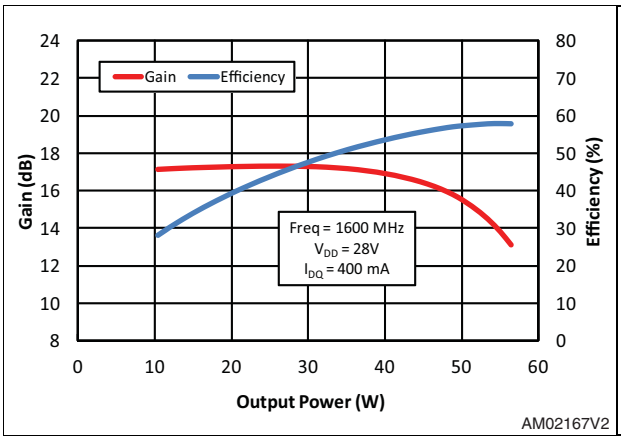


Figure 3. Gain vs ouptut power and bias current

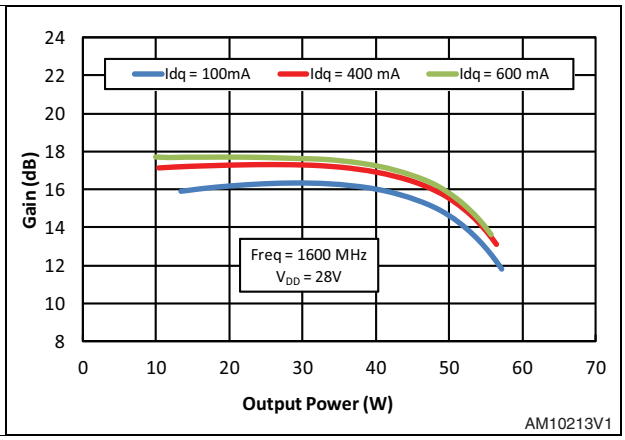
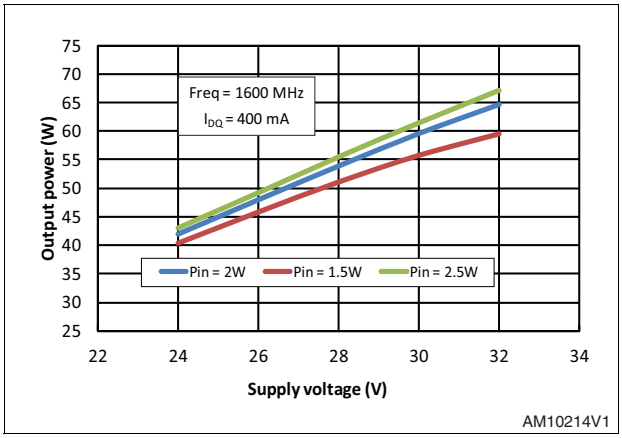


Figure 4. Ouptut power vs drain supply voltage



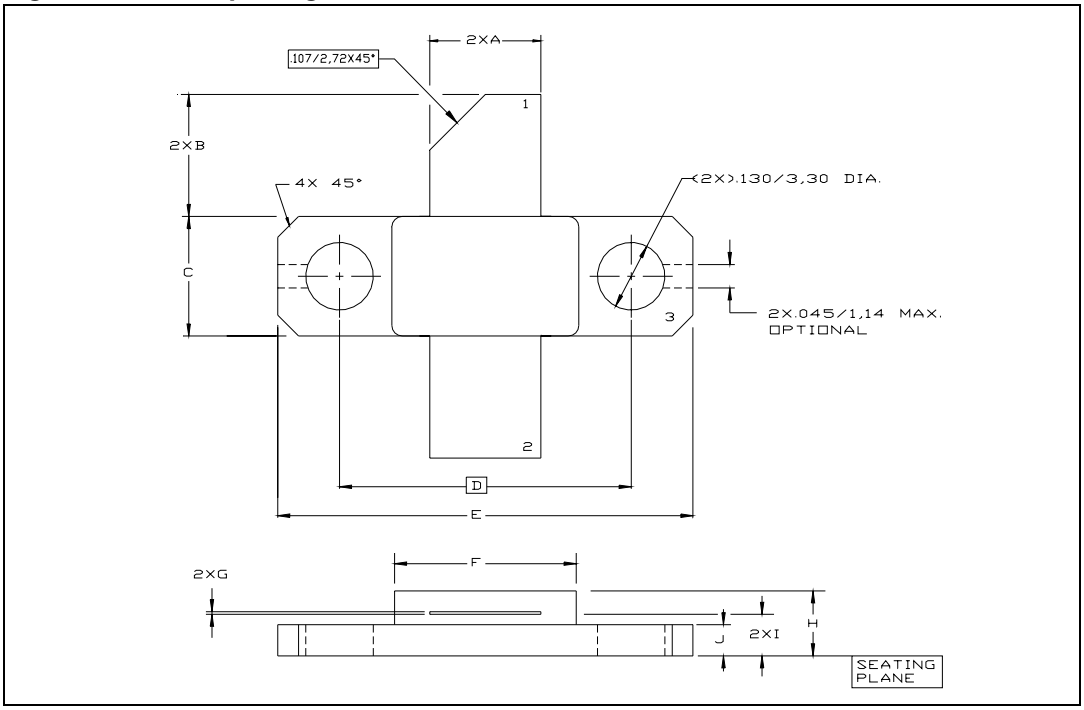
4 Package mechanical data

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 5. M243 package dimensions



5 Revision history

Table 8. Document revision history

Date	Revision	Changes
14-Sep-2011	1	Initial release.
04-Nov-2011	2	Updated *Table 3: Thermal data*, *Table 4: Static*, *Table 5: Dynamic* and *Figure 3: Gain vs ouptut power and bias current*. Inserted *Table 6: Impedance data* and *Figure 2: Gain and efficiency vs output power* and *Figure 4: Ouptut power vs drain supply voltage*.

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