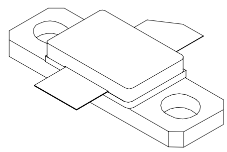
# LET9060C

## 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)= 60 W with 18 dB gain @ 945 MHz
- $P_{OUT}$ (@ 36 V)= 90 W with 18 dB gain @ 945 MHz
- BeO free package
- In compliance with the 2002/95/EC European directive



**M243**
**epoxy sealed**

## Description

The LET9060C 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 1.0 GHz. The LET9060C is designed for high gain and broadband performance operating in common source mode at 28 V. It is ideal for base station applications requiring high linearity.

**Figure 1. Pin out**

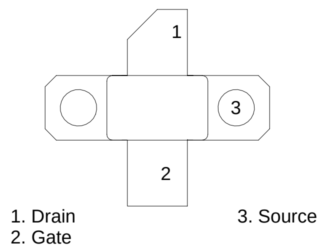



**Table 1. Device summary**

| Order code | Package | Branding |
|---|---|---|
| LET9060C | M243 | LET9060C |

# 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 | 12 | A |
| $P_{DISS}$ | Power dissipation (@ $T_C$ = 70 °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 °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 |
| $I_{GSS}$ | $V_{GS}$ = 5 V; $V_{DS}$ = 0 V | | | 1 | µA |
| $V_{GS(Q)}$ | $V_{DS}$ = 28 V; $I_D$ = 100 mA | 2.0 | | 5.0 | V |
| $V_{DS(ON)}$ | $V_{GS}$ = 10 V; $I_D$ = 3 A | | 0.8 | 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 | | 77 | | pF |
| $C_{OSS}$ | $V_{GS}$ = 0 V; $V_{DS}$ = 28 V; f = 1 MHz | | 39 | | pF |
| $C_{RSS}$ | $V_{GS}$ = 0 V; $V_{DS}$ = 28 V; f = 1 MHz | | 1.2 | | pF |

**Table 5. Dynamic**

| Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| $P_{OUT}$ | $V_{DD}$ = 28 V; $I_{DQ}$ = 400 mA; $P_{IN}$ = 1.5 W; f = 945 MHz | 60 | 75 | - | W |
| $G_{PS}$ | $V_{DD}$ = 28 V; $I_{DQ}$ = 400 mA; $P_{OUT}$ = 60 W; f = 945 MHz | 16 | 18 | - | dB |
| $h_D$ | $V_{DD}$ = 28 V; $I_{DQ}$ = 400 mA; $P_{IN}$ = 1.5 W; f = 945 MHz | 60 | 70 | - | % |
| Load mismatch | $V_{DD}$ = 35 V; $I_{DQ}$ = 400 mA; $P_{OUT}$ = 100 W; f = 945 MHz All phase angles | | 20:1 | | VSWR |

# 3 Impedance data

**Figure 2. Impedance data**

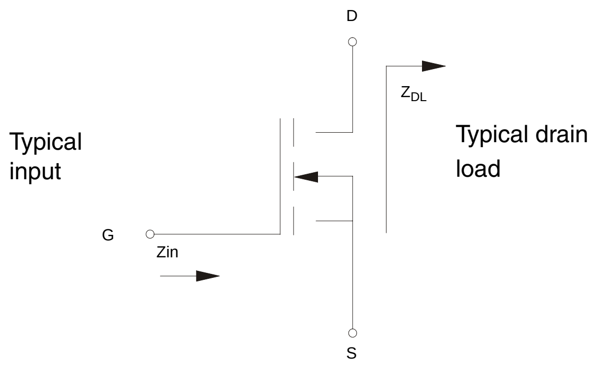



**Table 6. Impedance data**

| Frequency | $Z_{IN}$ (Ω) | $Z_{DL}$ (Ω) |
|---|---|---|
| 945 | 0.34 - j 0.31 | 2.78 + j 0.66 |

# 4 Typical performances

**Figure 3. Gain vs output power freq = 945 MHz, Vdd = 28 V**

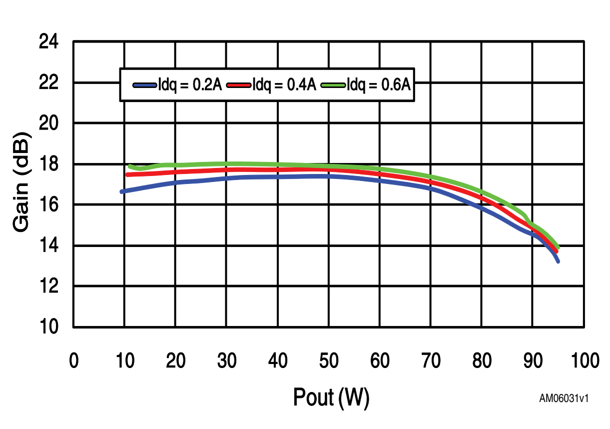



**Figure 4. Gain and efficiency vs output power, freq = 945 MHz, Vdd = 28 V, Idq = 0.4 A**

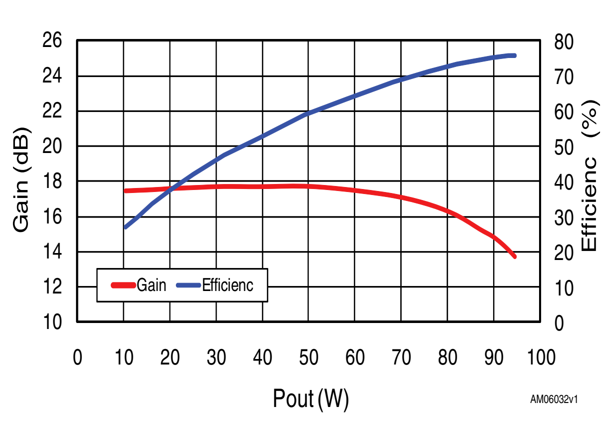



**Table 7. Gain vs output power, freq = 945 MHz, Idq = 0.4 A**

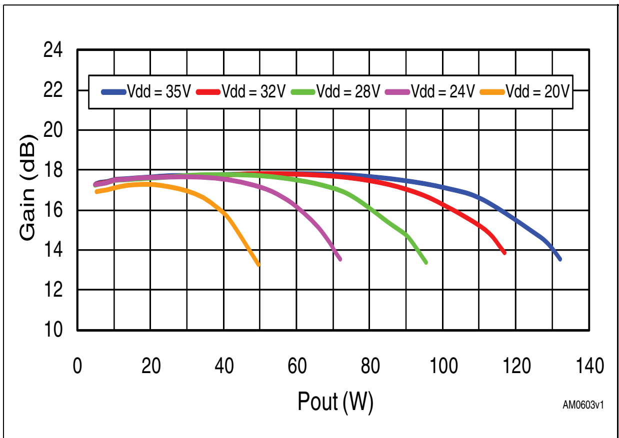



**Figure 5. Gain and efficiency vs output power, freq = 945 MHz, Vdd = 35 V, Idq = 0.4 A**

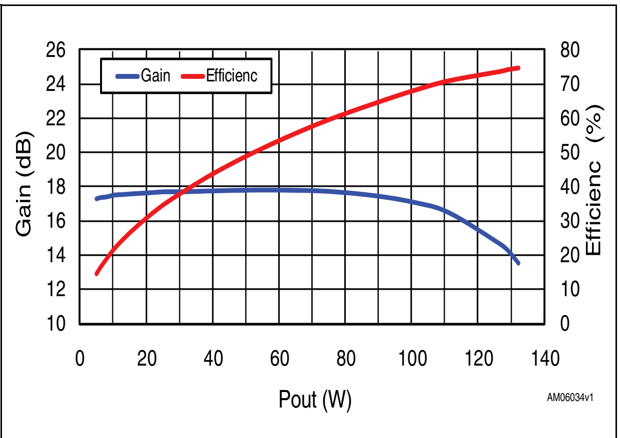


**Table 8. Output power vs supply voltage freq = 945 MHz, Idq = 0.4 A**

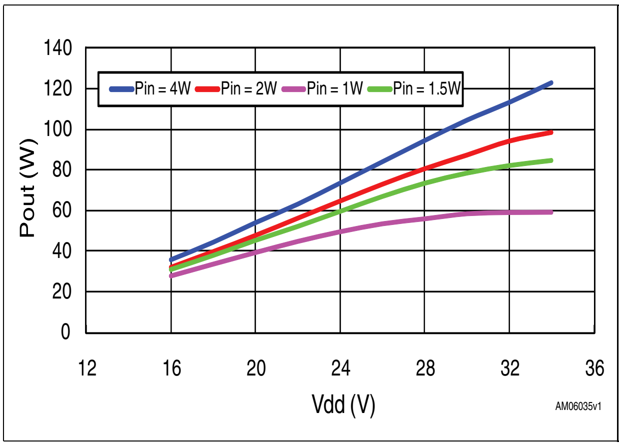
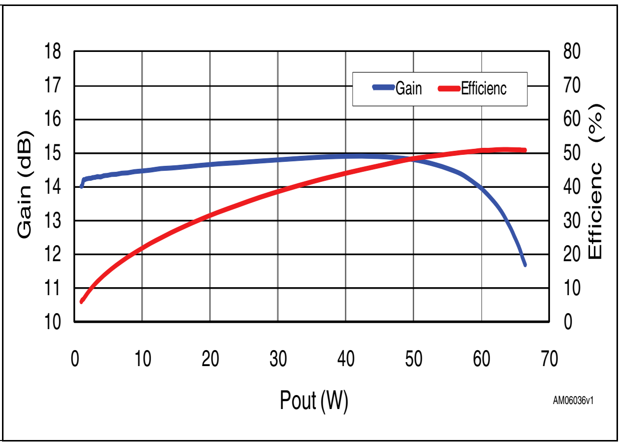



**Figure 6. Gain and efficiency vs output power, freq = 1850 MHz, Vdd = 28 V, Idq = 0.4 A**



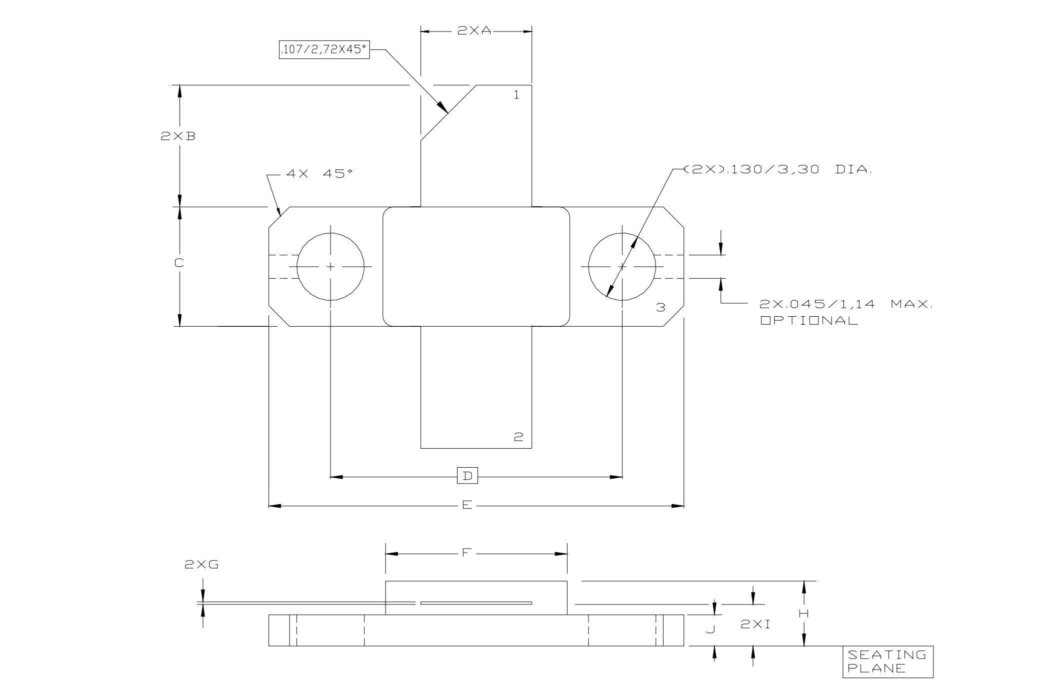
# 5 Package mechanical data

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 9. 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 7. M243 package dimensions**



# 6 Revision history

**Table 10. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 25-Nov-2009 | 1 | Initial release. |
| 11-Feb-2010 | 2 | Changed test condition for $V_{(BR)DSS}$ in *Table 4: Static*. |
| 04-Apr-2011 | 3 | Updated features on cover page. |

**Please Read Carefully:**