# LET9120M

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

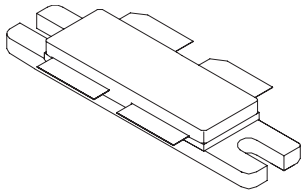
**Preliminary data**

## Features

- Excellent thermal stability
- Common source configuration push-pull
- $P_{OUT}$ = 120 W with 18 dB gain @ 860 MHz
- Internal input matching
- BeO-free package

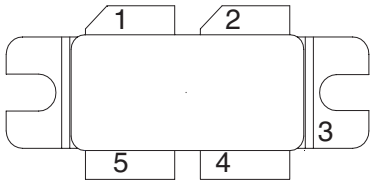
## Description

The LET9120M 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.



**M252**
**Epoxy sealed**

**Figure 1. Pin connection**




1. Drain
2. Drain
3. Source
4. Gate
5. Gate

**Table 1. Device summary**

| Order code | Package | Branding |
|---|---|---|
| LET9120M | M252 | LET9120M |

# Contents

# 1 Electrical data

## 1.1 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 | ±20 | V |
| $I_D$ | Drain current | 18 | A |
| $P_{DISS}$ | Power dissipation (@ Tc = 70°C) | 217 | W |
| $T_J$ | Max. operating junction temperature | 200 | °C |
| $T_{STG}$ | Storage temperature | -65 to +150 | °C |

## 1.2 Thermal data

**Table 3. Thermal data**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{thJC}$ | Junction - case thermal resistance | 0.6 | °C/W |

# 2 Electrical characteristics

$T_{CASE}$ = +25 °C

## 2.1 Static

**Table 4. Static (per section)**

| 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 | | | 0.9 | 1.2 | V |
| $G_{FS}$ | $V_{DS}$ = 10 V | $I_D$ = 3 A | | 2.5 | | | mho |
| $C_{OSS}$ | $V_{GS}$ = 0 V | $V_{DS}$ = 28 V | f = 1 MHz | | 29 | | pF |

*Note: Device is internally input matched.*

## 2.2 Dynamic

**Table 5. Dynamic**

| Symbol | Test conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| $P_{OUT}$ | $V_{DD}$ = 32 V $I_{DQ}$ = 400 mA f = 860 MHz | 120 | | - | W |
| $G_{PS}$ | $V_{DD}$ = 32 V $I_{DQ}$ = 400 mA $P_{OUT}$ = 120 W f = 860 MHz | 16 | 18 | | dB |
| $\eta_D$ | $V_{DD}$ = 32 V $I_{DQ}$ = 400 mA $P_{OUT}$ = 120 W f = 860 MHz | 50 | 65 | | % |

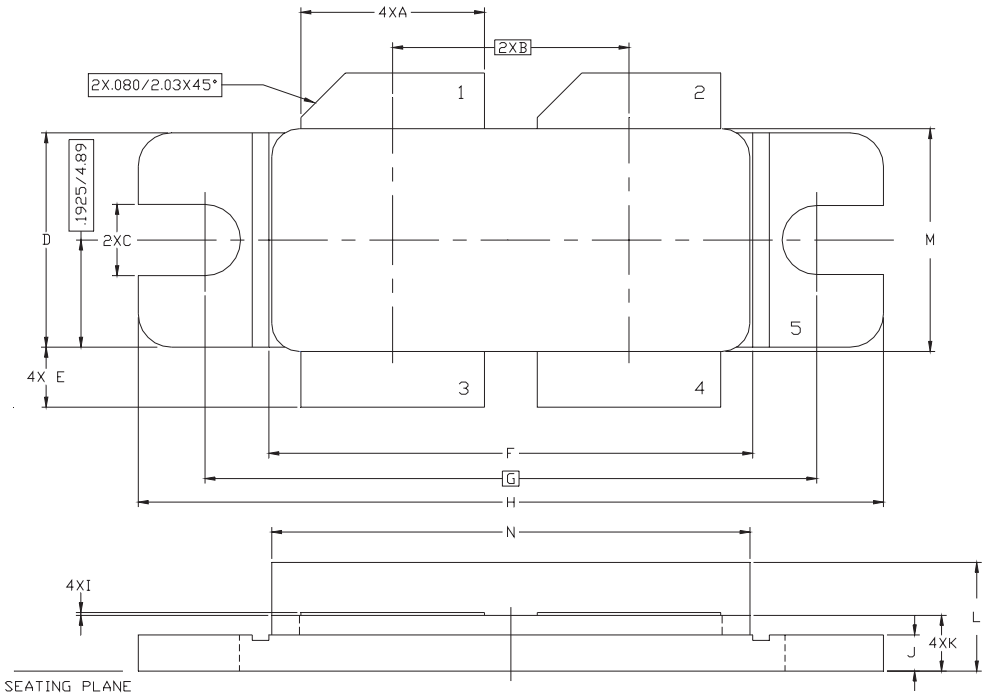
# 3 Package mechanical data

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 6. M252 (.400 x .860 4L BAL N/HERM W/FLG) mechanical data**

| Dim. | mm. | | | inch | | |
|---|---|---|---|---|---|---|
| | Min | Typ | Max | Min | Typ | Max |
| A | 8.13 | | 8.64 | .320 | | .340 |
| B | | 10.80 | | | .425 | |
| C | 3.00 | | 3.30 | .118 | | .130 |
| D | 9.65 | | 9.91 | .380 | | .390 |
| E | 2.16 | | 2.92 | .085 | | .115 |
| F | 21.97 | | 22.23 | .865 | | .875 |
| G | | 27.94 | | | 1.100 | |
| H | 33.91 | | 34.16 | 1.335 | | 1.345 |
| I | 0.10 | | 0.15 | .004 | | .006 |
| J | 1.52 | | 1.78 | .060 | | .070 |
| K | 2.36 | | 2.74 | .093 | | .108 |
| L | 4.57 | | 5.33 | .180 | | .210 |
| M | 9.96 | | 10.34 | .392 | | .407 |
| N | 21.64 | | 22.05 | .852 | | .868 |

**Figure 2. Package dimensions**




Controlling dimension: Inches

Ref. 7145054A

# 4 Revision history

Table 7. Document revision history

| Date | Revision | Changes |
|---|---|---|
| 10-Nov-2009 | 1 | First Issue. |
| 11-Feb-2010 | 2 | Changed test condition for $V_{(BR)DSS}$ in *Table 4: Static (per section)*. |

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