



# 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
- $P_{OUT} = 120\text{ W}$  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.

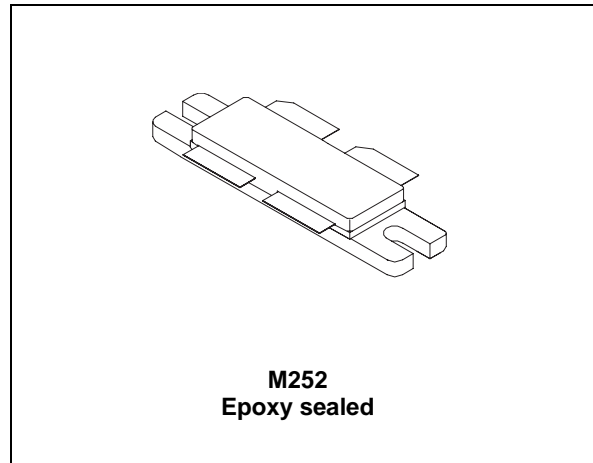


Figure 1. Pin connection

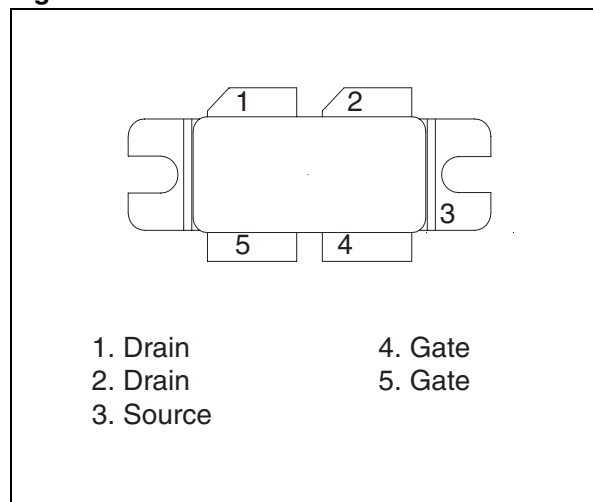


Table 1. Device summary

Order code	Package	Branding
LET9120M	M252	LET9120M

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# 1 Electrical data

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

## 1.2 Thermal data

Table 3. Thermal data

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

## 2 Electrical characteristics

$$T_{\text{CASE}} = +25\text{ }^{\circ}\text{C}$$

### 2.1 Static

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

Symbol	Test conditions		Min	Typ	Max	Unit
$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0\text{ V}$	$I_{\text{DS}} = 10\text{ mA}$	80			V
$I_{\text{DSS}}$	$V_{\text{GS}} = 0\text{ V}$	$V_{\text{DS}} = 28\text{ V}$			1	$\mu\text{A}$
$I_{\text{GSS}}$	$V_{\text{GS}} = 5\text{ V}$	$V_{\text{DS}} = 0\text{ V}$			1	$\mu\text{A}$
$V_{\text{GS(Q)}}$	$V_{\text{DS}} = 28\text{ V}$	$I_{\text{D}} = 100\text{ mA}$	2.0		5.0	V
$V_{\text{DS(ON)}}$	$V_{\text{GS}} = 10\text{ V}$	$I_{\text{D}} = 3\text{ A}$		0.9	1.2	V
$G_{\text{FS}}$	$V_{\text{DS}} = 10\text{ V}$	$I_{\text{D}} = 3\text{ A}$	2.5			mho
$C_{\text{OSS}}$	$V_{\text{GS}} = 0\text{ V}$	$V_{\text{DS}} = 28\text{ V}$		29		pF

Note: Device is internally input matched.

### 2.2 Dynamic

**Table 5. Dynamic**

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

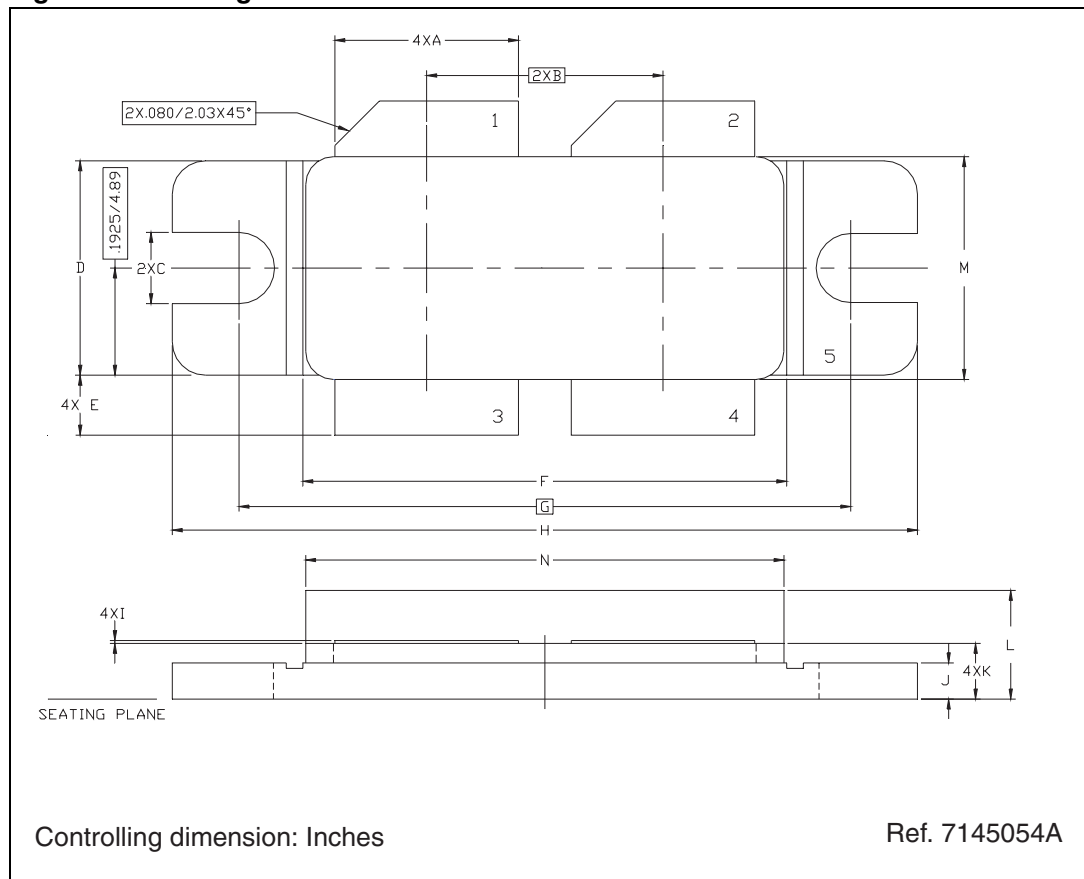
### 3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> 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**



## 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 <a href="#">Table 4: Static (per section)</a> .

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