

# BLP25M705

Broadband LDMOS driver transistor

Rev. 3 — 1 September 2015

AMPLEON

Product data sheet

## 1. Product profile

### 1.1 General description

A 5 W LDMOS power transistor for broadcast and industrial applications in the HF to 2500 MHz band.

Table 1. Application information

Test signal	f (MHz)	I <sub>DQ</sub> (mA)	V <sub>DS</sub> (V)	P <sub>L</sub> (W)	G <sub>p</sub> (dB)	η <sub>D</sub> (%)
Pulsed RF [1]	2450	50	28	5	15.8	41.4
CW	2450	65	28	5	16.4	50

[1] Measured at  $\delta = 10\%$ ,  $t_p = 12\ \mu\text{s}$ .

### 1.2 Features and benefits

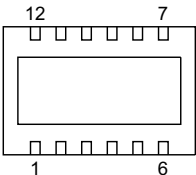
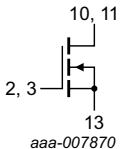
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- High power gain
- Designed for broadband operation (HF to 2500 MHz)
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

### 1.3 Applications

- Industrial, scientific and medical applications
- Broadcast transmitter applications

## 2. Pinning information

Table 2. Pinning

Pin	Description	Simplified outline	Graphic symbol
1, 4, 5, 6, 7, 8, 9, 12	n.c.	 <p>Transparent top view</p>	
2, 3	gate		
10, 11	drain		
13	source <a href="#">[1]</a>		

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BLP25M705	HVSON12	plastic thermal enhanced very thin small outline package; no leads; 12 terminals; body 6 × 4 × 0.85 mm	SOT1179-2

## 4. Limiting values

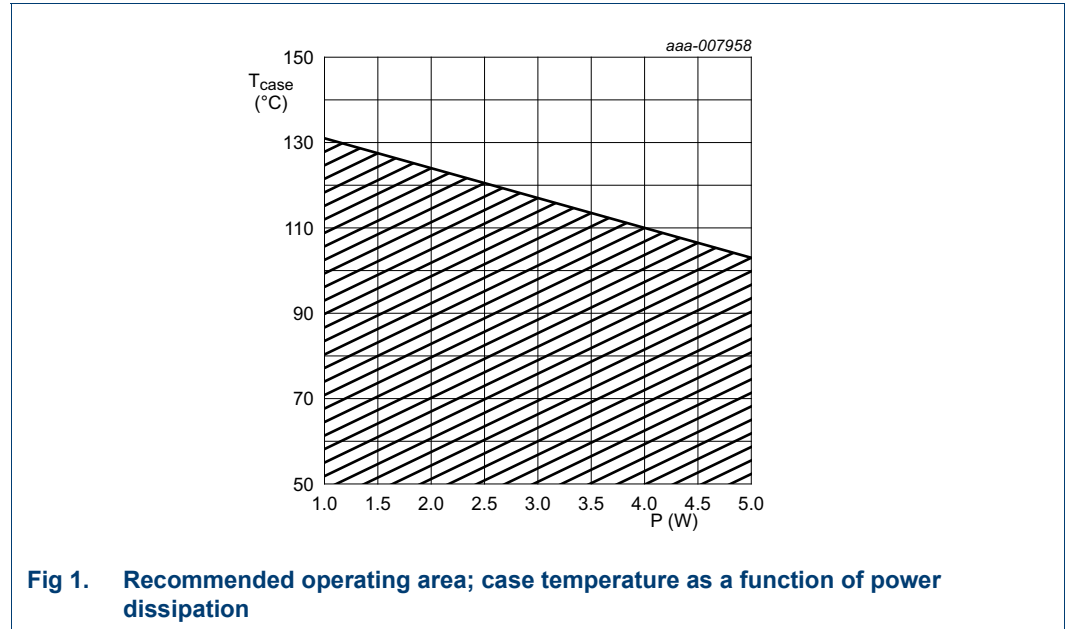
Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	drain-source voltage		-	65	V
$V_{GS}$	gate-source voltage		-0.5	+13	V
$T_{stg}$	storage temperature		-65	+150	°C
$T_j$	junction temperature		-	150	°C

## 5. Recommended operating conditions

See application note AN11198 for more details.



## 6. Thermal characteristics

**Table 5. Thermal characteristics**

Symbol	Parameter	Conditions	Typ	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	$T_{case} = 80\text{ °C}; P_L = 5\text{ W}$	[1]	6.4 K/W

[1]  $R_{th(j-c)}$  is measured under RF conditions.

## 7. Characteristics

**Table 6. DC characteristics**

$T_j = 25\text{ °C}$ ; per section unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	drain-source breakdown voltage	$V_{GS} = 0\text{ V}; I_D = 0.09\text{ mA}$	65	-	-	V
$V_{GS(th)}$	gate-source threshold voltage	$V_{DS} = 10\text{ V}; I_D = 9\text{ mA}$	1.5	1.9	2.3	V
$V_{GSq}$	gate-source quiescent voltage	$V_{DS} = 28\text{ V}; I_D = 55\text{ mA}$	1.45	2.0	2.55	V
$I_{DSS}$	drain leakage current	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$	-	-	1.4	$\mu\text{A}$
$I_{DSX}$	drain cut-off current	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; V_{DS} = 10\text{ V}$	-	1.6	-	A
$I_{GSS}$	gate leakage current	$V_{GS} = 11\text{ V}; V_{DS} = 0\text{ V}$	-	-	140	nA
$g_{fs}$	forward transconductance	$V_{DS} = 10\text{ V}; I_D = 9\text{ mA}$	-	80	-	mS
$R_{DS(on)}$	drain-source on-state resistance	$V_{GS} = V_{GS(th)} + 3.75\text{ V}; I_D = 315\text{ mA}$	-	2	-	$\Omega$

**Table 7. RF characteristics**

*Test signal: 1-tone pulsed;  $t_p = 50 \mu\text{s}$ ;  $\delta = 10 \%$ ;  $f = 2140 \text{ MHz}$ ; RF performance at  $V_{DS} = 28 \text{ V}$ ;  $I_{DQ} = 55 \text{ mA}$ ;  $T_{case} = 25 \text{ }^\circ\text{C}$ ; unless otherwise specified, in a production circuit.*

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$P_{L(AV)} = 1 \text{ W}$	15	16	-	dB
$\eta_D$	drain efficiency	$P_{L(AV)} = 1 \text{ W}$	20	23	-	%
$P_{L(1dB)}$	output power at 1 dB gain compression		5.5	-	-	W
$RL_{in}$	input return loss	$P_{L(AV)} = 1 \text{ W}$	-	-16	-12	dB

## 8. Test information

### 8.1 Ruggedness in class-AB operation

The BLP25M705 is capable of withstanding a load mismatch corresponding to  $VSWR = 10 : 1$  through all phases under the following conditions:  $V_{DS} = 28 \text{ V}$ ;  $I_{DQ} = 55 \text{ mA}$ ;  $P_L = 5 \text{ W (CW)}$ .

### 9. Package outline

HVSON12: plastic thermal enhanced very thin small outline package; no leads;  
12 terminals; body 4 x 6 x 0.85 mm

SOT1179-2

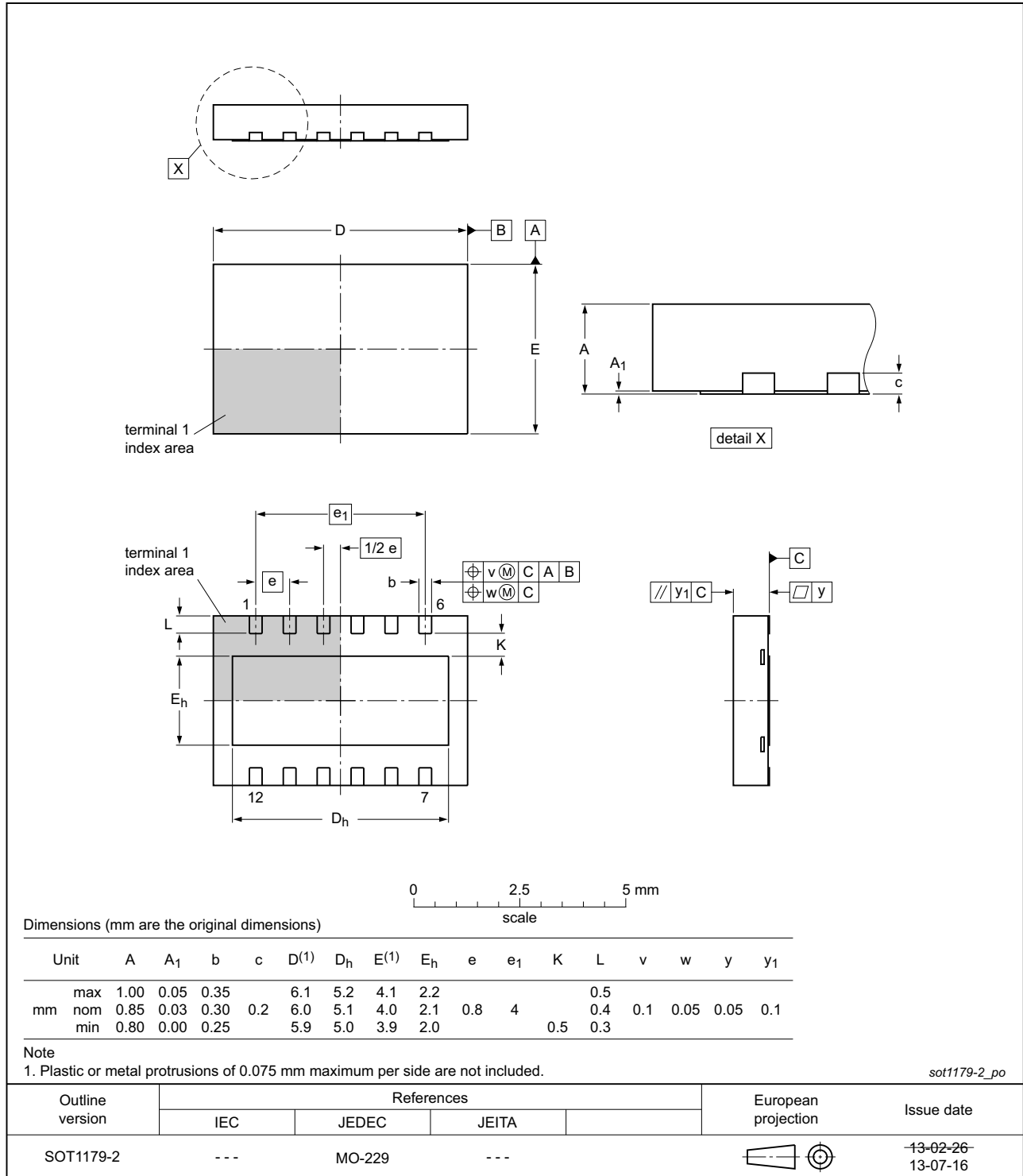


Fig 2. Package outline SOT1179-2 (HVSON12)

## 10. Handling information

### CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

## 11. Abbreviations

Table 8. Abbreviations

Acronym	Description
CW	Continuous Wave
ESD	ElectroStatic Discharge
HF	High Frequency
LDMOS	Laterally Diffused Metal-Oxide Semiconductor
VSWR	Voltage Standing-Wave Ratio

## 12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
BLP25M705#3	20150901	Product data sheet		BLP25M705 v.2
Modifications:	<ul style="list-style-type: none"> <li>The format of this document has been redesigned to comply with the new identity guidelines of Ampleon.</li> <li>Legal texts have been adapted to the new company name where appropriate.</li> </ul>			
BLP25M705 v.2	20150209	Product data sheet	-	BLP25M705 v.1
BLP25M705 v.1	20130815	Product data sheet	-	-

## 13. Legal information

### 13.1 Data sheet status

Document status <sup>[1][2]</sup>	Product status <sup>[3]</sup>	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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## 15. Contents

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<b>1</b>	<b>Product profile</b> . . . . .	<b>1</b>
1.1	General description . . . . .	1
1.2	Features and benefits . . . . .	1
1.3	Applications . . . . .	1
<b>2</b>	<b>Pinning information</b> . . . . .	<b>2</b>
<b>3</b>	<b>Ordering information</b> . . . . .	<b>2</b>
<b>4</b>	<b>Limiting values</b> . . . . .	<b>2</b>
<b>5</b>	<b>Recommended operating conditions</b> . . . . .	<b>3</b>
<b>6</b>	<b>Thermal characteristics</b> . . . . .	<b>3</b>
<b>7</b>	<b>Characteristics</b> . . . . .	<b>3</b>
<b>8</b>	<b>Test information</b> . . . . .	<b>4</b>
8.1	Ruggedness in class-AB operation . . . . .	4
<b>9</b>	<b>Package outline</b> . . . . .	<b>5</b>
<b>10</b>	<b>Handling information</b> . . . . .	<b>6</b>
<b>11</b>	<b>Abbreviations</b> . . . . .	<b>6</b>
<b>12</b>	<b>Revision history</b> . . . . .	<b>6</b>
<b>13</b>	<b>Legal information</b> . . . . .	<b>7</b>
13.1	Data sheet status . . . . .	7
13.2	Definitions . . . . .	7
13.3	Disclaimers . . . . .	7
13.4	Trademarks . . . . .	8
<b>14</b>	<b>Contact information</b> . . . . .	<b>8</b>
<b>15</b>	<b>Contents</b> . . . . .	<b>9</b>

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