

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	I _{DQ}	V _{DS}	P _L	G _p	η _D
	(MHz)	(mA)	(V)	(W)	(dB)	(%)
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

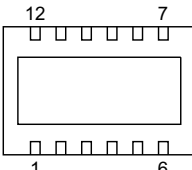
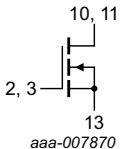
- Easy power control
- Integrated ESD protection
- Excellent ruggedness
- High efficiency
- Excellent thermal stability
- High power gain
- Designed for broadband operation (HF to 2500 MHz)
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)

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.	 Transparent top view	 aaa-007870
2, 3	gate		
10, 11	drain		
13	source ^[1]		

[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

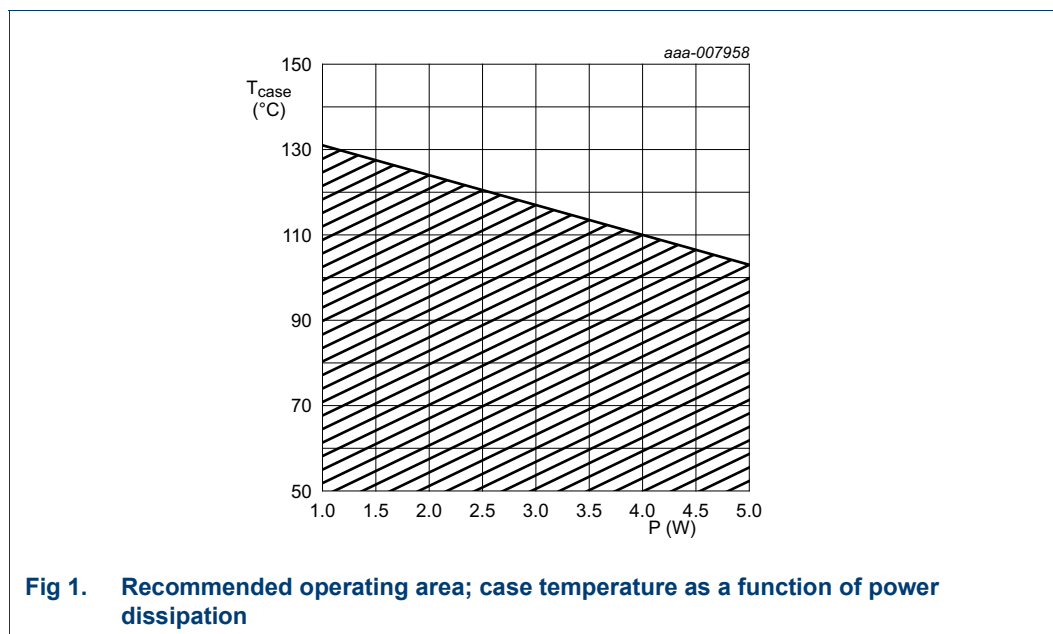
Table 4. Limiting values

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	μA
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	-	Ω

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
η_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

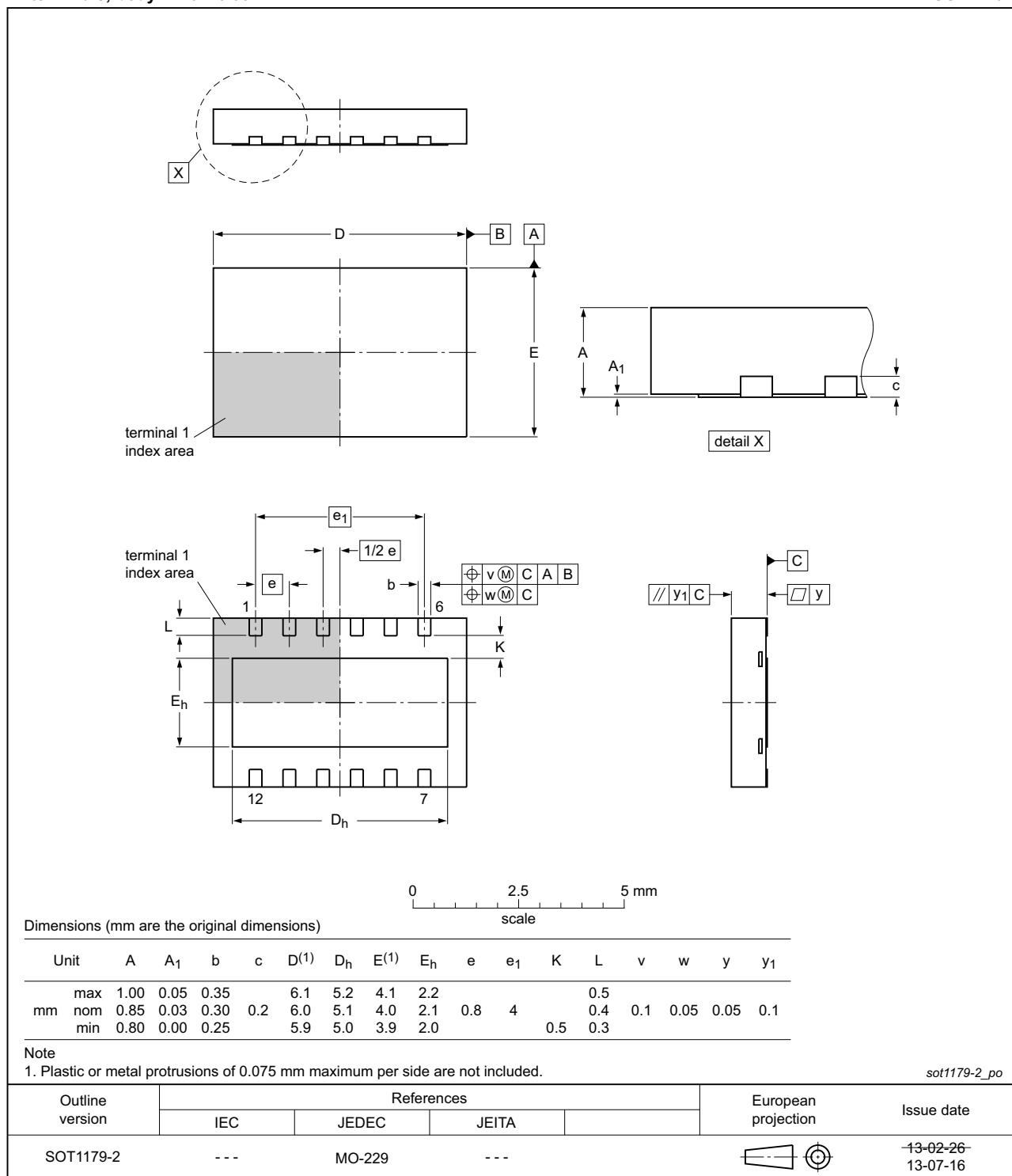


Fig 2. Package outline SOT1179-2 (HVSON12)

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:	- The format of this document has been redesigned to comply with the new identity guidelines of Ampleon. - Legal texts have been adapted to the new company name where appropriate.			
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 ^{[1][2]}	Product status ^[3]	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".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.ampleon.com>.

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