

# BLF888A; BLF888AS

## UHF power LDMOS transistor

Rev. 5 — 4 November 2013

Product data sheet

## 1. Product profile

### 1.1 General description

A 600 W LDMOS RF power transistor for broadcast transmitter applications and industrial applications. The excellent ruggedness of this device makes it ideal for digital and analog transmitter applications.

**Table 1. Application information**

RF performance at  $V_{DS} = 50$  V unless otherwise specified.

| Mode of operation                                                                  | f<br>(MHz)                  | $P_{L(AV)}$<br>(W) | $P_{L(M)}$<br>(W) | $G_p$<br>(dB) | $\eta_D$<br>(%) | IMD3<br>(dBc) | IMD <sub>shldr</sub><br>(dBc) | PAR<br>(dB)             |
|------------------------------------------------------------------------------------|-----------------------------|--------------------|-------------------|---------------|-----------------|---------------|-------------------------------|-------------------------|
| <b>RF performance in a common source narrowband test circuit</b>                   |                             |                    |                   |               |                 |               |                               |                         |
| CW                                                                                 | 650                         | -                  | 600               | 20            | 67              | -             | -                             | -                       |
| CW (42 V)                                                                          | 650                         | -                  | 500               | 20            | 69              | -             | -                             | -                       |
| 2-tone, class-AB                                                                   | $f_1 = 860$ ; $f_2 = 860.1$ | 250                | -                 | 21            | 46              | -32           | -                             | -                       |
| pulsed, class-AB <a href="#">[1]</a>                                               | 860                         | -                  | 600               | 20            | 58              | -             | -                             | -                       |
| DVB-T (8k OFDM)                                                                    | 858                         | 110                | -                 | 21            | 31              | -             | -32 <a href="#">[2]</a>       | 8.2 <a href="#">[3]</a> |
|                                                                                    | 858                         | 125                | -                 | 21            | 32.5            | -             | -30 <a href="#">[2]</a>       | 8.0 <a href="#">[3]</a> |
| <b>RF performance in a common source 470 MHz to 860 MHz broadband test circuit</b> |                             |                    |                   |               |                 |               |                               |                         |
| DVB-T (8k OFDM)                                                                    | 858                         | 110                | -                 | 20            | 30              | -             | -32 <a href="#">[2]</a>       | 8.0 <a href="#">[3]</a> |
|                                                                                    | 858                         | 120                | -                 | 20            | 31              | -             | -31 <a href="#">[2]</a>       | 7.8 <a href="#">[3]</a> |

[1] Measured at  $\delta = 10$  %;  $t_p = 100$   $\mu$ s.

[2] Measured [dBc] with delta marker at 4.3 MHz from center frequency.

[3] PAR (of output signal) at 0.01 % probability on CCDF; PAR of input signal = 9.5 dB at 0.01 % probability on CCDF.

### 1.2 Features and benefits

- Excellent ruggedness ( $V_{SWR} \geq 40 : 1$  through all phases)
- Optimum thermal behavior and reliability,  $R_{th(j-c)} = 0.15$  K/W
- Suitable for CW UHF and ISM applications
- High power gain
- High efficiency
- Designed for broadband operation (470 MHz to 860 MHz)
- Internal input matching for high gain and optimum broadband operation
- Excellent reliability
- Easy power control
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

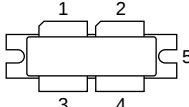
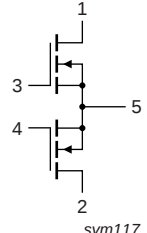
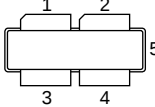
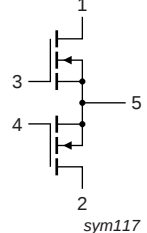


### 1.3 Applications

- Communication transmitter applications in the UHF band
- Industrial applications in the UHF band

## 2. Pinning information

Table 2. Pinning

| Pin                 | Description | Simplified outline                                                                   | Graphic symbol                                                                       |
|---------------------|-------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| BLF888A (SOT539A)   |             |                                                                                      |                                                                                      |
| 1                   | drain1      |   |   |
| 2                   | drain2      |                                                                                      |                                                                                      |
| 3                   | gate1       |                                                                                      |                                                                                      |
| 4                   | gate2       |                                                                                      |                                                                                      |
| 5                   | source      |                                                                                      |                                                                                      |
| <a href="#">[1]</a> |             |                                                                                      |                                                                                      |
| BLF888AS (SOT539B)  |             |                                                                                      |                                                                                      |
| 1                   | drain1      |  |  |
| 2                   | drain2      |                                                                                      |                                                                                      |
| 3                   | gate1       |                                                                                      |                                                                                      |
| 4                   | gate2       |                                                                                      |                                                                                      |
| 5                   | source      |                                                                                      |                                                                                      |
| <a href="#">[1]</a> |             |                                                                                      |                                                                                      |

[1] Connected to flange.

## 3. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                |         |
|-------------|---------|----------------------------------------------------------------|---------|
|             | Name    | Description                                                    | Version |
| BLF888A     | -       | flanged balanced ceramic package;<br>2 mounting holes; 4 leads | SOT539A |
| BLF888AS    | -       | earless flanged balanced ceramic package;<br>4 leads           | SOT539B |

## 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 |            | -    | 110  | V    |
| $V_{GS}$  | gate-source voltage  |            | -0.5 | +11  | V    |
| $T_{stg}$ | storage temperature  |            | -65  | +150 | °C   |
| $T_j$     | junction temperature | [1]        | -    | 225  | °C   |

[1] Continuous use at maximum temperature will affect the reliability, for details refer to the on-line MTF calculator.

## 5. Thermal characteristics

**Table 5. Thermal characteristics**

| Symbol        | Parameter                                | Conditions                                             | Typ      | Unit |
|---------------|------------------------------------------|--------------------------------------------------------|----------|------|
| $R_{th(j-c)}$ | thermal resistance from junction to case | $T_{case} = 80\text{ °C}$ ; $P_{L(AV)} = 125\text{ W}$ | [1] 0.15 | K/W  |

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

## 6. 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   | $V_{GS} = 0\text{ V}$ ; $I_D = 2.4\text{ mA}$                          | [1] 110 | -   | -   | V    |
| $V_{GS(th)}$  | gate-source threshold voltage    | $V_{DS} = 10\text{ V}$ ; $I_D = 240\text{ mA}$                         | [1] 1.4 | 1.9 | 2.4 | V    |
| $I_{DSS}$     | drain leakage current            | $V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$                         | -       | -   | 2.8 | μA   |
| $I_{DSX}$     | drain cut-off current            | $V_{GS} = V_{GS(th)} + 3.75\text{ V}$ ;<br>$V_{DS} = 10\text{ V}$      | -       | 36  | -   | A    |
| $I_{GSS}$     | gate leakage current             | $V_{GS} = 10\text{ V}$ ; $V_{DS} = 0\text{ V}$                         | -       | -   | 280 | nA   |
| $R_{DS(on)}$  | drain-source on-state resistance | $V_{GS} = V_{GS(th)} + 3.75\text{ V}$ ;<br>$I_D = 8.5\text{ A}$        | [1] -   | 143 | -   | mΩ   |
| $C_{iss}$     | input capacitance                | $V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$ ;<br>$f = 1\text{ MHz}$ | [2] -   | 220 | -   | pF   |
| $C_{oss}$     | output capacitance               | $V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$ ;<br>$f = 1\text{ MHz}$ | -       | 74  | -   | pF   |
| $C_{rss}$     | reverse transfer capacitance     | $V_{GS} = 0\text{ V}$ ; $V_{DS} = 50\text{ V}$ ;<br>$f = 1\text{ MHz}$ | -       | 1.2 | -   | pF   |

[1]  $I_D$  is the drain current.

[2] Capacitance values without internal matching.

**Table 7. RF characteristics**

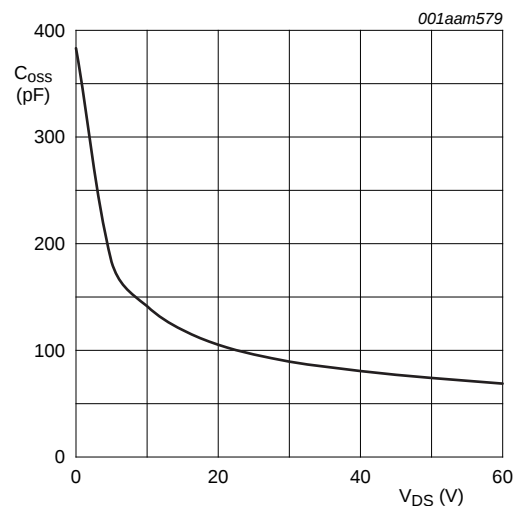
RF characteristics in NXP production narrowband test circuit;  $T_{case} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

| Symbol                           | Parameter                              | Conditions                                          | Min | Typ | Max | Unit |
|----------------------------------|----------------------------------------|-----------------------------------------------------|-----|-----|-----|------|
| <b>2-Tone, class-AB</b>          |                                        |                                                     |     |     |     |      |
| $V_{DS}$                         | drain-source voltage                   |                                                     | -   | 50  | -   | V    |
| $I_{DQ}$                         | quiescent drain current                |                                                     | [1] | 1.3 | -   | A    |
| $P_{L(AV)}$                      | average output power                   | $f_1 = 860\text{ MHz};$<br>$f_2 = 860.1\text{ MHz}$ | 250 | -   | -   | W    |
| $G_p$                            | power gain                             | $f_1 = 860\text{ MHz};$<br>$f_2 = 860.1\text{ MHz}$ | 20  | 21  | -   | dB   |
| $\eta_D$                         | drain efficiency                       | $f_1 = 860\text{ MHz};$<br>$f_2 = 860.1\text{ MHz}$ | 42  | 46  | -   | %    |
| IMD3                             | third-order intermodulation distortion | $f_1 = 860\text{ MHz};$<br>$f_2 = 860.1\text{ MHz}$ | -   | -32 | -28 | dBc  |
| <b>DVB-T (8k OFDM), class-AB</b> |                                        |                                                     |     |     |     |      |
| $V_{DS}$                         | drain-source voltage                   |                                                     | -   | 50  | -   | V    |
| $I_{DQ}$                         | quiescent drain current                |                                                     | [1] | 1.3 | -   | A    |
| $P_{L(AV)}$                      | average output power                   | $f = 858\text{ MHz}$                                | 110 | -   | -   | W    |
| $G_p$                            | power gain                             | $f = 858\text{ MHz}$                                | 20  | 21  | -   | dB   |
| $\eta_D$                         | drain efficiency                       | $f = 858\text{ MHz}$                                | 28  | 31  | -   | %    |
| IMD <sub>shldr</sub>             | intermodulation distortion shoulder    | $f = 858\text{ MHz}$                                | [2] | -32 | -28 | dBc  |
| PAR                              | peak-to-average ratio                  | $f = 858\text{ MHz}$                                | [3] | 8.2 | -   | dB   |

[1]  $I_{DQ}$  for total device.

[2] Measured [dBc] with delta marker at 4.3 MHz from center frequency.

[3] PAR (of output signal) at 0.01 % probability on CCDF; PAR of input signal = 9.5 dB at 0.01 % probability on CCDF.



$V_{GS} = 0\text{ V}; f = 1\text{ MHz}.$

**Fig 1. Output capacitance as a function of drain-source voltage; typical values per section**

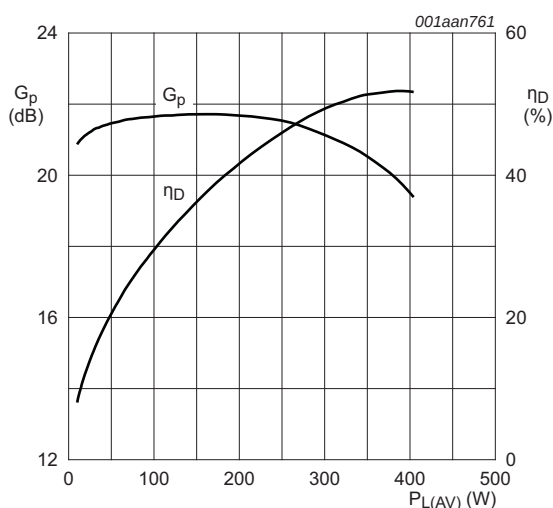
## 6.1 Ruggedness in class-AB operation

The BLF888A and BLF888AS are capable of withstanding a load mismatch corresponding to  $V_{SWR} \geq 40 : 1$  through all phases under the following conditions:  $V_{DS} = 50$  V;  $f = 860$  MHz at rated power.

## 7. Application information

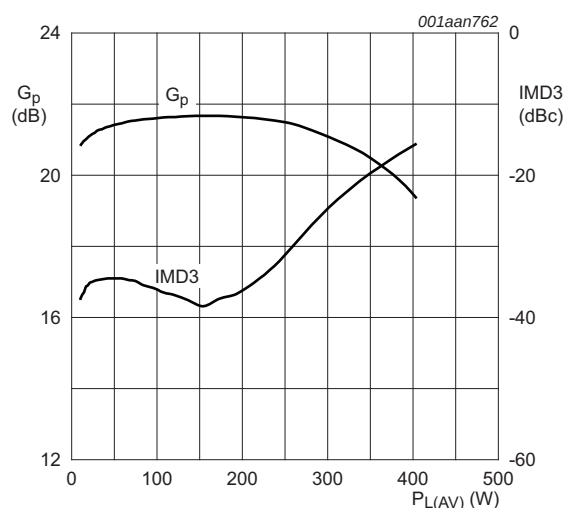
### 7.1 Narrowband RF figures

#### 7.1.1 2-Tone



$V_{DS} = 50$  V;  $I_{DQ} = 1.3$  A; measured in a common source narrowband 860 MHz test circuit.

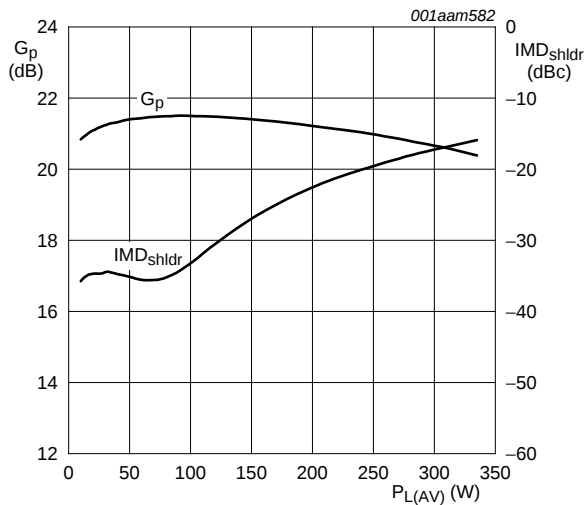
**Fig 2.** 2-Tone power gain and drain efficiency as function of load power; typical values



$V_{DS} = 50$  V;  $I_{DQ} = 1.3$  A; measured in a common source narrowband 860 MHz test circuit.

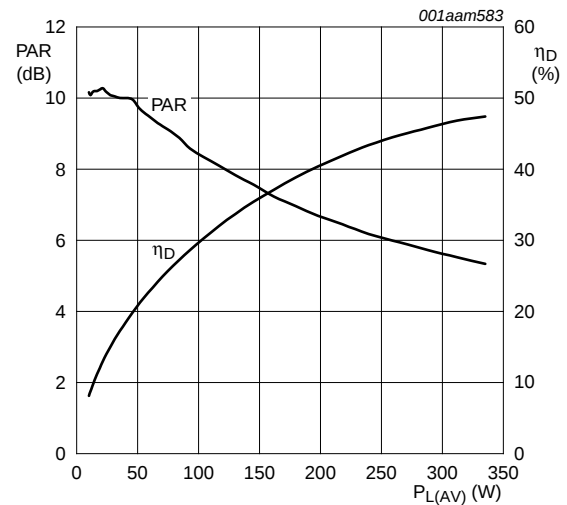
**Fig 3.** 2-Tone power gain and third order intermodulation distortion as load power; typical values

## 7.1.2 DVB-T



$V_{DS} = 50$  V;  $I_{DQ} = 1.3$  A; measured in a common source narrowband 860 MHz test circuit.

**Fig 4. DVB-T power gain and intermodulation distortion shoulder as function of load power; typical values**

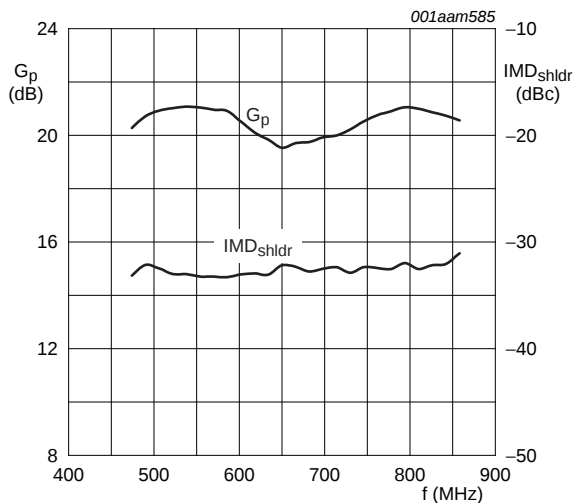


$V_{DS} = 50$  V;  $I_{DQ} = 1.3$  A; measured in a common source narrowband 860 MHz test circuit.

**Fig 5. DVB-T peak-to-average ratio and drain efficiency as function of load power; typical values**

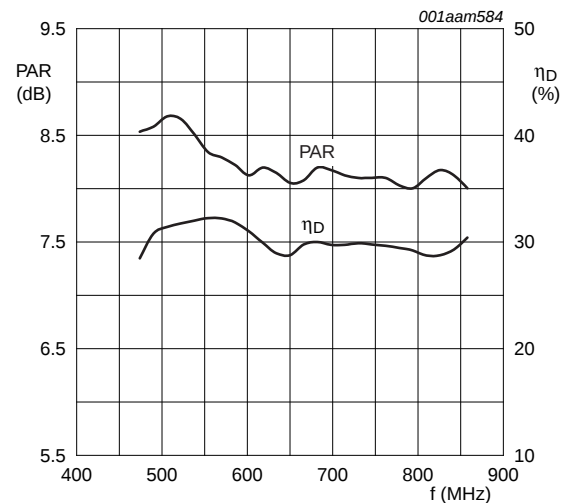
## 7.2 Broadband RF figures

### 7.2.1 DVB-T



$P_{L(AV)} = 110$  W;  $V_{DS} = 50$  V;  $I_{DQ} = 1.3$  A; measured in a common source broadband test circuit as described in [Section 8](#).

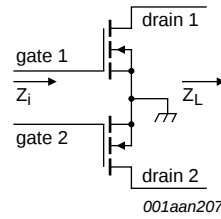
**Fig 6. DVB-T power gain and intermodulation distortion shoulder as a function of frequency; typical values**



$P_{L(AV)} = 110$  W;  $V_{DS} = 50$  V;  $I_{DQ} = 1.3$  A; measured in a common source broadband test circuit as described in [Section 8](#).

**Fig 7. DVB-T peak-to-average ratio and drain efficiency as function of frequency; typical values**

### 7.3 Impedance information



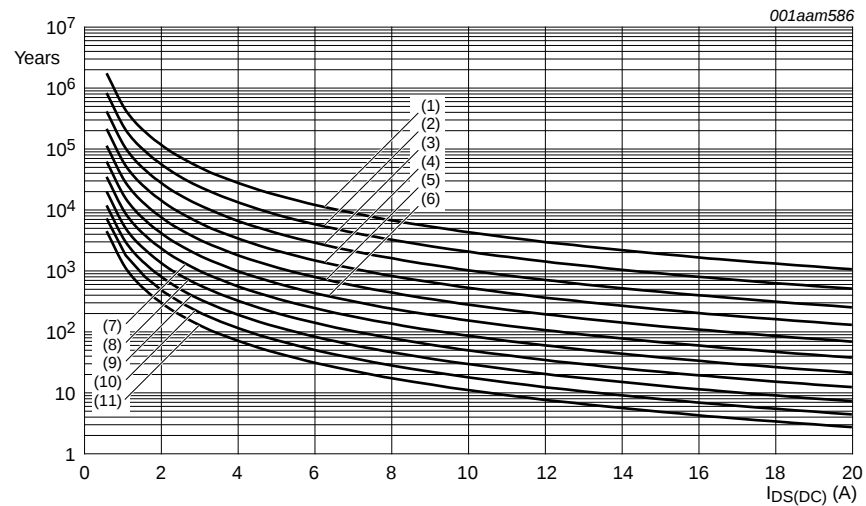
**Fig 8. Definition of transistor impedance**

**Table 8. Typical push-pull impedance**

Simulated  $Z_i$  and  $Z_L$  device impedance; impedance info at  $V_{DS} = 50\text{ V}$  and  $P_{L(AV)} = 110\text{ W}$  (DVB-T).

| f<br>MHz | $Z_i$<br>$\Omega$ | $Z_L$<br>$\Omega$ |
|----------|-------------------|-------------------|
| 300      | $0.617 - j1.715$  | $4.989 + j1.365$  |
| 325      | $0.635 - j1.355$  | $4.867 + j1.424$  |
| 350      | $0.655 - j1.026$  | $4.741 + j1.472$  |
| 375      | $0.677 - j0.721$  | $4.614 + j1.511$  |
| 400      | $0.702 - j0.435$  | $4.486 + j1.540$  |
| 425      | $0.731 - j0.164$  | $4.357 + j1.559$  |
| 450      | $0.762 + j0.096$  | $4.228 + j1.570$  |
| 475      | $0.798 + j0.347$  | $4.100 + j1.573$  |
| 500      | $0.839 + j0.592$  | $4.974 + j1.567$  |
| 525      | $0.884 + j0.833$  | $3.850 + j1.554$  |
| 550      | $0.936 + j1.072$  | $3.728 + j1.534$  |
| 575      | $0.995 + j1.310$  | $3.608 + j1.508$  |
| 600      | $1.063 + j1.549$  | $3.492 + j1.475$  |
| 625      | $1.141 + j1.791$  | $3.378 + j1.437$  |
| 650      | $1.230 + j2.037$  | $3.268 + j1.394$  |
| 675      | $1.334 + j2.289$  | $3.161 + j1.347$  |
| 700      | $1.456 + j2.548$  | $3.057 + j1.295$  |
| 725      | $1.599 + j2.814$  | $2.957 + j1.239$  |
| 750      | $1.768 + j3.090$  | $2.860 + j1.180$  |
| 775      | $1.971 + j3.376$  | $2.676 + j1.118$  |
| 800      | $2.214 + j3.671$  | $2.677 + j1.053$  |
| 825      | $2.510 + j3.975$  | $2.591 + j0.985$  |
| 850      | $2.873 + j4.282$  | $2.508 + j0.915$  |
| 875      | $3.320 + j4.584$  | $2.428 + j0.843$  |
| 900      | $3.875 + j4.865$  | $2.351 + j0.770$  |
| 925      | $4.562 + j5.095$  | $2.277 + j0.695$  |
| 950      | $5.409 + j5.223$  | $2.206 + j0.618$  |
| 975      | $6.426 + j5.166$  | $2.138 + j0.540$  |
| 1000     | $7.587 + j4.807$  | $2.073 + j0.461$  |

## 7.4 Reliability



TTF (0.1 % failure fraction).

The reliability at pulsed conditions can be calculated as follows:  $TTF (0.1 \%) \times 1 / \delta$ .

- (1)  $T_j = 100 \text{ }^{\circ}\text{C}$
- (2)  $T_j = 110 \text{ }^{\circ}\text{C}$
- (3)  $T_j = 120 \text{ }^{\circ}\text{C}$
- (4)  $T_j = 130 \text{ }^{\circ}\text{C}$
- (5)  $T_j = 140 \text{ }^{\circ}\text{C}$
- (6)  $T_j = 150 \text{ }^{\circ}\text{C}$
- (7)  $T_j = 160 \text{ }^{\circ}\text{C}$
- (8)  $T_j = 170 \text{ }^{\circ}\text{C}$
- (9)  $T_j = 180 \text{ }^{\circ}\text{C}$
- (10)  $T_j = 190 \text{ }^{\circ}\text{C}$
- (11)  $T_j = 200 \text{ }^{\circ}\text{C}$

**Fig 9. BLF888A; BLF888AS electromigration ( $I_{DS(DC)}$ , total device)**

## 8. Test information

**Table 9. List of components**

For test circuit, see [Figure 10](#), [Figure 11](#) and [Figure 12](#).

| Component          | Description                       | Value                 | Remarks                                               |
|--------------------|-----------------------------------|-----------------------|-------------------------------------------------------|
| B1, B2             | semi rigid coax                   | 25 $\Omega$ ; 49.5 mm | UT-090C-25 (EZ 90-25)                                 |
| C1                 | multilayer ceramic chip capacitor | 12 pF                 | [1]                                                   |
| C2, C3, C4, C5, C6 | multilayer ceramic chip capacitor | 8.2 pF                | [1]                                                   |
| C7                 | multilayer ceramic chip capacitor | 6.8 pF                | [2]                                                   |
| C8                 | multilayer ceramic chip capacitor | 2.7 pF                | [2]                                                   |
| C9                 | multilayer ceramic chip capacitor | 2.2 pF                | [2]                                                   |
| C10, C13, C14      | multilayer ceramic chip capacitor | 100 pF                | [3]                                                   |
| C11, C12           | multilayer ceramic chip capacitor | 10 pF                 | [2]                                                   |
| C15, C16           | multilayer ceramic chip capacitor | 4.7 $\mu$ F, 50 V     | Kemet C1210X475K5RAC-TU or capacitor of same quality. |
| C17, C18, C23, C24 | multilayer ceramic chip capacitor | 100 pF                | [2]                                                   |
| C19, C20           | multilayer ceramic chip capacitor | 10 $\mu$ F, 50 V      | TDK C570X7R1H106KT000N or capacitor of same quality.  |
| C21, C22           | electrolytic capacitor            | 470 $\mu$ F; 63 V     |                                                       |
| C30                | multilayer ceramic chip capacitor | 10 pF                 | [4]                                                   |
| C31                | multilayer ceramic chip capacitor | 9.1 pF                | [4]                                                   |
| C32                | multilayer ceramic chip capacitor | 3.9 pF                | [4]                                                   |
| C33, C34, C35      | multilayer ceramic chip capacitor | 100 pF                | [4]                                                   |
| C36, C37           | multilayer ceramic chip capacitor | 4.7 $\mu$ F, 50 V     | TDK C4532X7R1E475MT020U or capacitor of same quality. |
| L1                 | microstrip                        | -                     | [5] (W $\times$ L) 15 mm $\times$ 13 mm               |
| L2                 | microstrip                        | -                     | [5] (W $\times$ L) 5 mm $\times$ 26 mm                |
| L3, L32            | microstrip                        | -                     | [5] (W $\times$ L) 2 mm $\times$ 49.5 mm              |
| L4                 | microstrip                        | -                     | [5] (W $\times$ L) 1.7 mm $\times$ 3.5 mm             |
| L5                 | microstrip                        | -                     | [5] (W $\times$ L) 2 mm $\times$ 9.5 mm               |
| L30                | microstrip                        | -                     | [5] (W $\times$ L) 5 mm $\times$ 13 mm                |
| L31                | microstrip                        | -                     | [5] (W $\times$ L) 2 mm $\times$ 11 mm                |
| L33                | microstrip                        | -                     | [5] (W $\times$ L) 2 mm $\times$ 3 mm                 |
| R1, R2             | wire resistor                     | 10 $\Omega$           |                                                       |
| R3, R4             | SMD resistor                      | 5.6 $\Omega$          | 0805                                                  |
| R5, R6             | wire resistor                     | 100 $\Omega$          |                                                       |
| R7, R8             | potentiometer                     | 10 k $\Omega$         |                                                       |

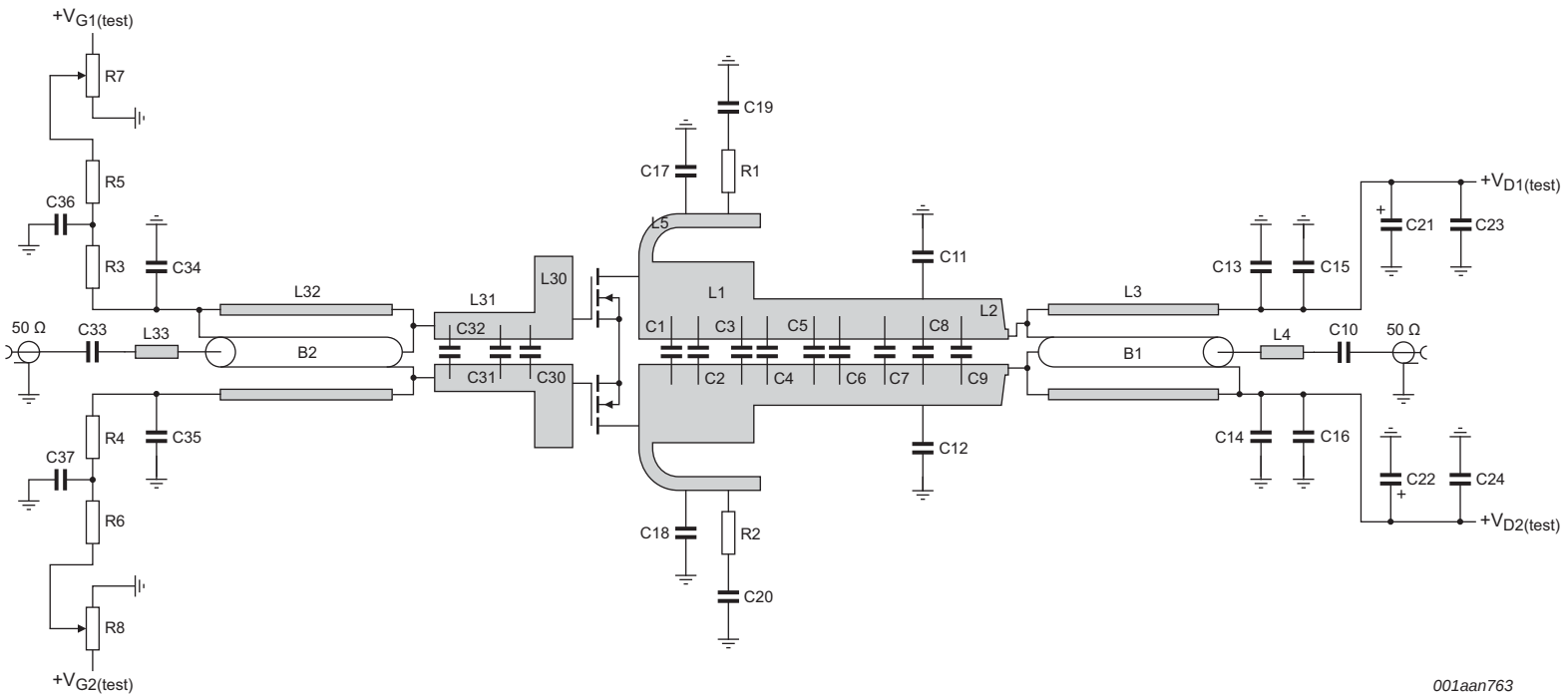
[1] American technical ceramics type 800R or capacitor of same quality.

[2] American technical ceramics type 800B or capacitor of same quality.

[3] American technical ceramics type 180R or capacitor of same quality.

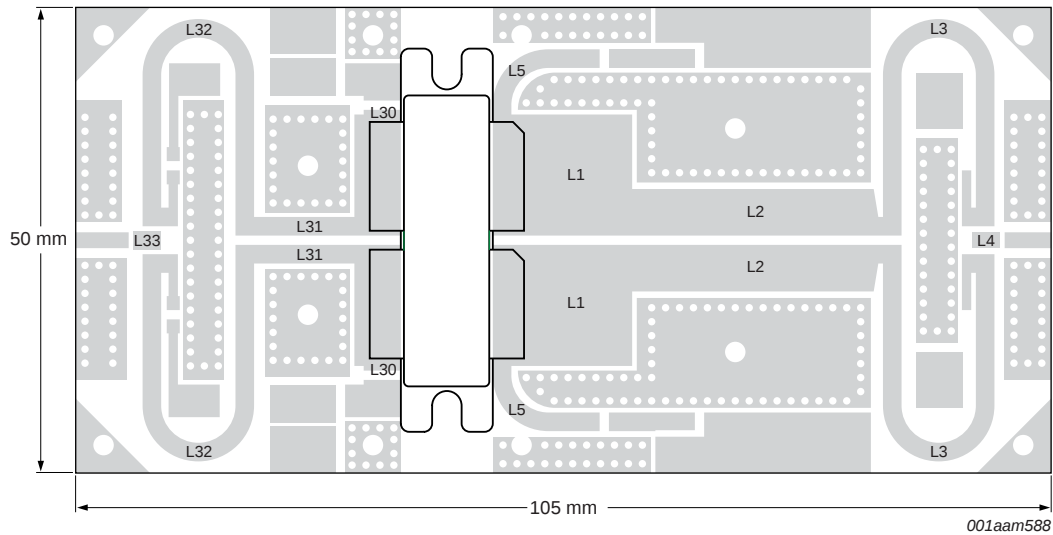
[4] American technical ceramics type 100A or capacitor of same quality.

[5] Printed-Circuit Board (PCB): Taconic RF35;  $\epsilon_r = 3.5$  F/m; height = 0.762 mm; Cu (top/bottom metallization); thickness copper plating = 35  $\mu$ m.



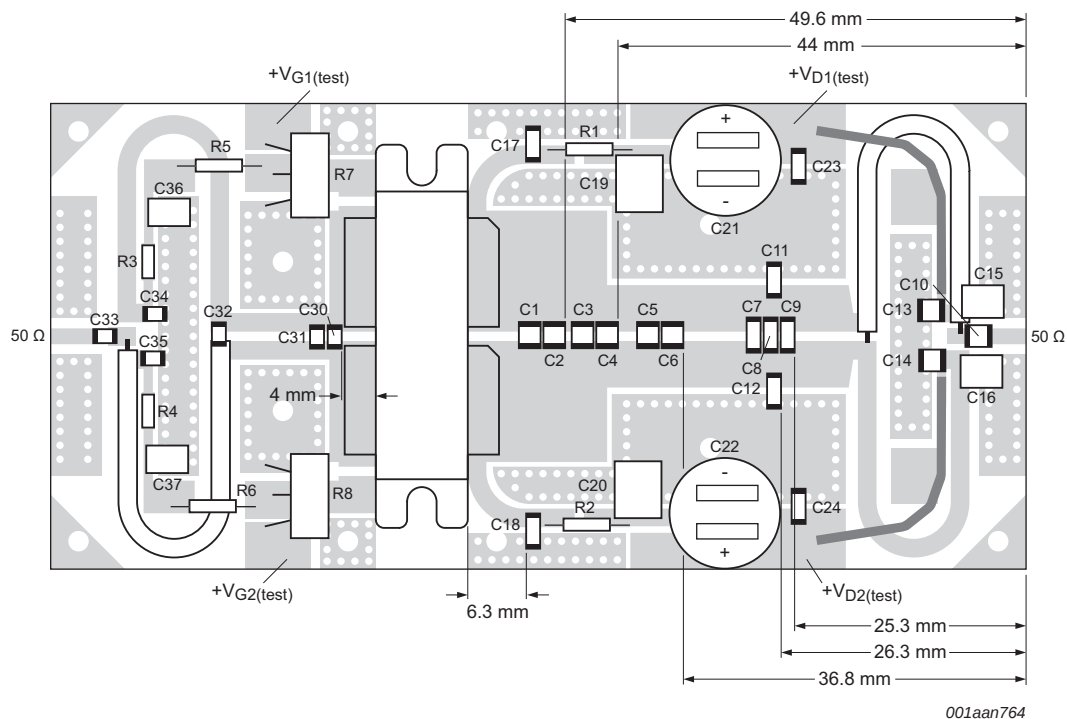
See [Table 9](#) for a list of components.

**Fig 10. Class-AB common source broadband amplifier;  $V_{D1(test)}$ ,  $V_{D2(test)}$ ,  $V_{G1(test)}$  and  $V_{G2(test)}$  are drain and gate test voltages**



See [Table 9](#) for a list of components.

**Fig 11. Printed-Circuit Board (PCB) for class-AB common source amplifier**



See [Table 9](#) for a list of components.

**Fig 12. Component layout for class-AB common source amplifier**

## 9. Package outline

Flanged balanced ceramic package; 2 mounting holes; 4 leads

SOT539A

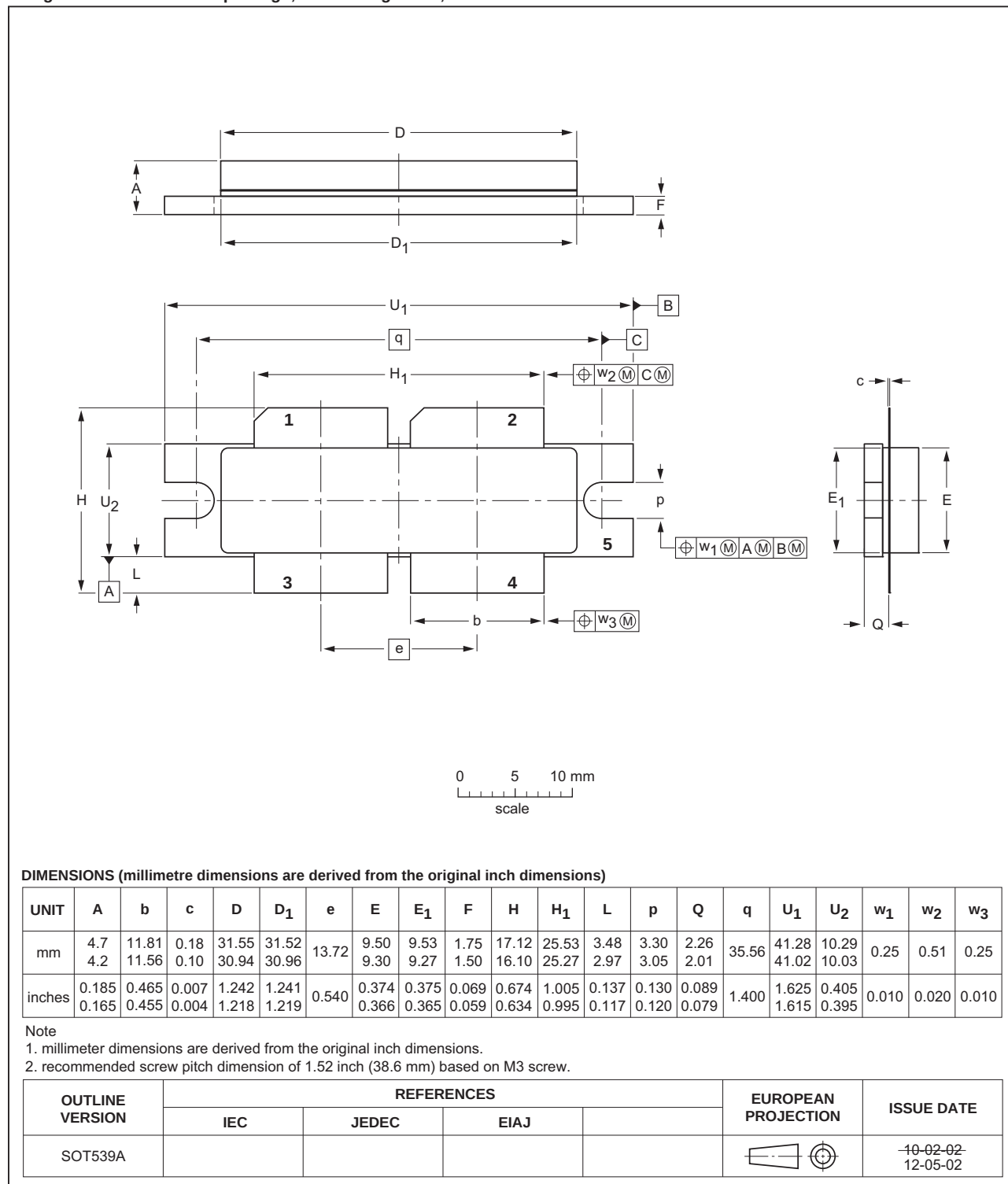


Fig 13. Package outline SOT539A

Earless flanged balanced ceramic package; 4 leads

SOT539B

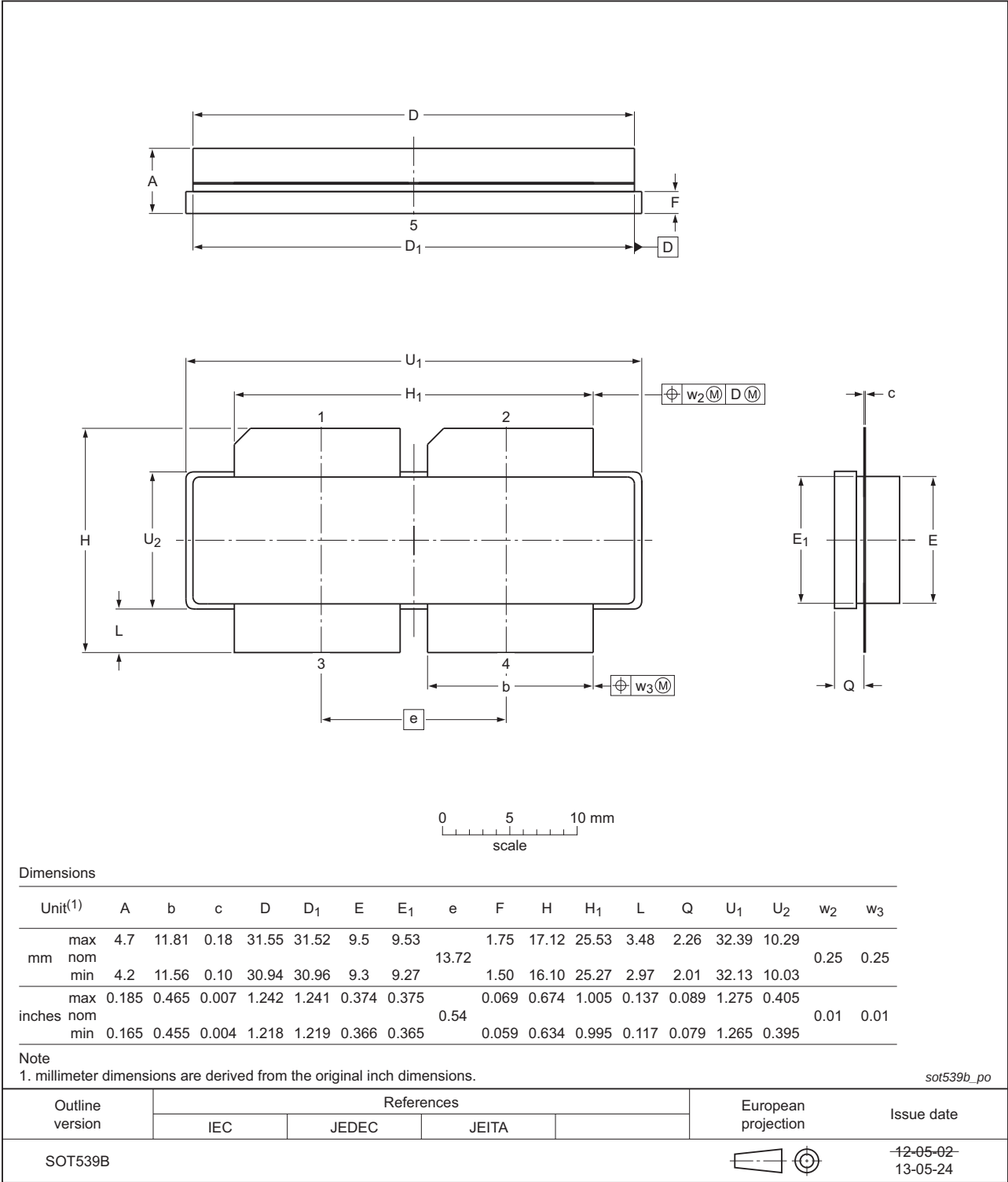


Fig 14. Package outline SOT539B

## 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 10. Abbreviations**

| Acronym | Description                                    |
|---------|------------------------------------------------|
| CCDF    | Complementary Cumulative Distribution Function |
| CW      | Continuous Wave                                |
| DVB     | Digital Video Broadcast                        |
| DVB-T   | Digital Video Broadcast - Terrestrial          |
| ISM     | Industrial, Scientific and Medical             |
| LDMOS   | Laterally Diffused Metal-Oxide Semiconductor   |
| MTF     | Median Time to Failure                         |
| OFDM    | Orthogonal Frequency Division Multiplexing     |
| PAR     | Peak-to-Average power Ratio                    |
| SMD     | Surface Mounted Device                         |
| UHF     | Ultra High Frequency                           |
| VSWR    | Voltage Standing-Wave Ratio                    |

## 12. Revision history

**Table 11. Revision history**

| Document ID                                                                                                                                                                                                                                                                        | Release date | Data sheet status      | Change notice | Supersedes           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------|---------------|----------------------|
| BLF888A_BLF888AS v.5                                                                                                                                                                                                                                                               | 20131104     | Product data sheet     | -             | BLF888A_BLF888AS v.4 |
| Modifications:                                                                                                                                                                                                                                                                     |              |                        |               |                      |
| <ul style="list-style-type: none"> <li>• <a href="#">Table 1 on page 1</a>: table updated.</li> <li>• <a href="#">Section 1.2 on page 1</a>: list item 'Suitable for CW UHF and ISM applications' added.</li> <li>• <a href="#">Section 4 on page 3</a>: table updated.</li> </ul> |              |                        |               |                      |
| BLF888A_BLF888AS v.4                                                                                                                                                                                                                                                               | 20130712     | Product data sheet     | -             | BLF888A_BLF888AS v.3 |
| BLF888A_BLF888AS v.3                                                                                                                                                                                                                                                               | 20110830     | Product data sheet     | -             | BLF888A_BLF888AS v.2 |
| BLF888A_BLF888AS v.2                                                                                                                                                                                                                                                               | 20110301     | Preliminary data sheet | -             | BLF888A_BLF888AS v.1 |
| BLF888A_BLF888AS v.1                                                                                                                                                                                                                                                               | 20100921     | Objective 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".

[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.nxp.com>.

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