

# BLM7G1822S-20PB; BLM7G1822S-20PBG

LDMOS 2-stage power MMIC

Rev. 6 — 28 September 2018

AMPLEON

Product data sheet

## 1. Product profile

### 1.1 General description

The BLM7G1822S-20PB(G) is a dual section, 2-stage power MMIC using Ampleon's state of the art GEN7 LDMOS technology. This multiband device is perfectly suited as general purpose driver or small cell final in the frequency range from 1805 MHz to 2170 MHz. Available in gull wing or straight lead outline.

**Table 1. Performance**

Typical RF performance at  $T_{case} = 25\text{ }^{\circ}\text{C}$ ;  $I_{Dq1} = 27\text{ mA}$ ;  $I_{Dq2} = 76\text{ mA}$ .

Test signal: 3GPP test model 1; 64 DPCH; PAR = 9.9 dB at 0.01% probability on CCDF; per section unless otherwise specified in a class-AB production circuit.

| Test signal           | f      | V <sub>DS</sub> | P <sub>L(AV)</sub> | G <sub>p</sub> | $\eta_D$ | ACPR <sub>5M</sub> |
|-----------------------|--------|-----------------|--------------------|----------------|----------|--------------------|
|                       | (MHz)  | (V)             | (W)                | (dB)           | (%)      | (dBc)              |
| single carrier W-CDMA | 2167.5 | 28              | 2                  | 32.3           | 23       | -41                |

### 1.2 Features and benefits

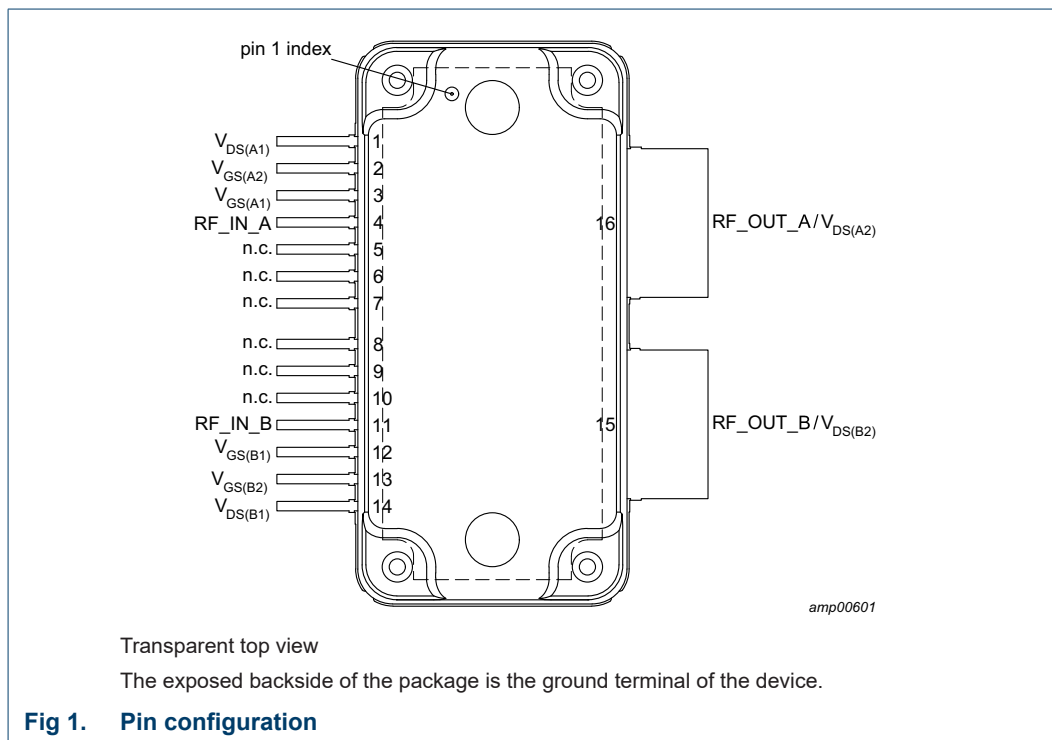
- Designed for broadband operation (frequency 1805 MHz to 2170 MHz)
- High section-to-section isolation enabling multiple combinations
- Integrated temperature compensated bias
- Biasing of individual stages is externally accessible
- Integrated ESD protection
- Excellent thermal stability
- High power gain
- On-chip matching for ease of use
- For RoHS compliance see the product details on the Ampleon website

### 1.3 Applications

- RF power MMIC for multi-carrier and multi-standard GSM, W-CDMA and LTE base stations in the 1805 MHz to 2170 MHz frequency range. Possible circuit topologies are the following as also depicted in [Section 8.1](#):
  - ◆ Dual section or single ended
  - ◆ Doherty
  - ◆ Quadrature combined
  - ◆ Push-pull

## 2. Pinning information

### 2.1 Pinning



### 2.2 Pin description

Table 2. Pin description

| Symbol       | Pin | Description                             |
|--------------|-----|-----------------------------------------|
| $V_{DS(A1)}$ | 1   | drain-source voltage of driver stage A1 |
| $V_{GS(A2)}$ | 2   | gate-source voltage of final stage A2   |
| $V_{GS(A1)}$ | 3   | gate-source voltage of driver stage A1  |
| RF_IN_A      | 4   | RF input section A                      |
| n.c.         | 5   | not connected                           |
| n.c.         | 6   | not connected                           |
| n.c.         | 7   | not connected                           |
| n.c.         | 8   | not connected                           |
| n.c.         | 9   | not connected                           |
| n.c.         | 10  | not connected                           |
| RF_IN_B      | 11  | RF input section B                      |
| $V_{GS(B1)}$ | 12  | gate-source voltage of driver stage B1  |
| $V_{GS(B2)}$ | 13  | gate-source voltage of final stage B2   |
| $V_{DS(B1)}$ | 14  | drain-source voltage of driver stage B1 |

Table 2. Pin description ...continued

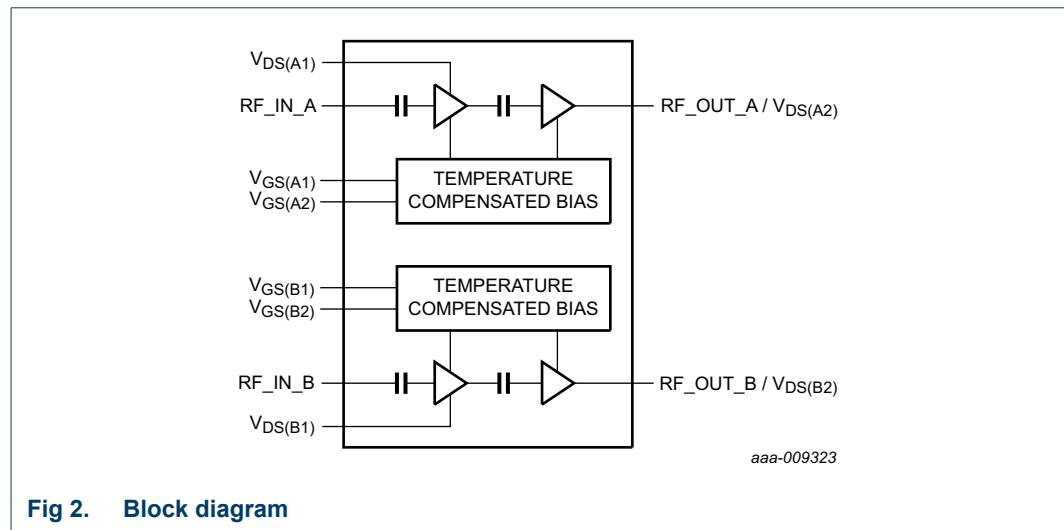
| Symbol                 | Pin    | Description                                                  |
|------------------------|--------|--------------------------------------------------------------|
| RF_OUT_B/ $V_{DS(B2)}$ | 15     | RF output section B / drain-source voltage of final stage B2 |
| RF_OUT_A/ $V_{DS(A2)}$ | 16     | RF output section A / drain-source voltage of final stage A2 |
| GND                    | flange | RF ground                                                    |

### 3. Ordering information

Table 3. Ordering information

| Type number      | Package |                                                          |           |
|------------------|---------|----------------------------------------------------------|-----------|
|                  | Name    | Description                                              | Version   |
| BLM7G1822S-20PB  | -       | plastic, heatsink small outline package; 16 leads (flat) | SOT1211-3 |
| BLM7G1822S-20PBG | -       | plastic, heatsink small outline package; 16 leads        | SOT1212-3 |

### 4. Block diagram



### 5. 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 | [1]        | -    | 225  | °C   |
| $T_{case}$ | case temperature     |            | -    | 150  | °C   |

[1] Continuous use at maximum temperature will affect the reliability. For details refer to the online MTF calculator.

## 6. Thermal characteristics

**Table 5. Thermal characteristics**

Measured for total device.

| Symbol        | Parameter                                | Conditions                                                          | Value | Unit |
|---------------|------------------------------------------|---------------------------------------------------------------------|-------|------|
| $R_{th(j-c)}$ | thermal resistance from junction to case | final stage; $T_{case} = 90\text{ °C}$ ; $P_L = 3.56\text{ W}$ [1]  | 1.9   | K/W  |
|               |                                          | driver stage; $T_{case} = 90\text{ °C}$ ; $P_L = 3.56\text{ W}$ [1] | 6.2   | K/W  |

[1] When operated with a CW signal.

## 7. Characteristics

**Table 6. DC characteristics**

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

| Symbol                   | Parameter                                          | Conditions                                               | Min | Typ     | Max | Unit          |
|--------------------------|----------------------------------------------------|----------------------------------------------------------|-----|---------|-----|---------------|
| <b>Final stage</b>       |                                                    |                                                          |     |         |     |               |
| $V_{(BR)DSS}$            | drain-source breakdown voltage                     | $V_{GS} = 0\text{ V}$ ; $I_D = 150.8\text{ }\mu\text{A}$ | 65  | -       | -   | V             |
| $V_{GSq}$                | gate-source quiescent voltage                      | $V_{DS} = 28\text{ V}$ ; $I_D = 76\text{ mA}$            | 1.5 | 2       | 2.5 | V             |
|                          |                                                    | $V_{DS} = 28\text{ V}$ ; $I_D = 76\text{ mA}$ [1]        | 1.7 | 2.65    | 3.6 | V             |
| $\Delta I_{Dq}/\Delta T$ | quiescent drain current variation with temperature | $-40\text{ °C} \leq T_{case} \leq +85\text{ °C}$ [1]     | -   | $\pm 1$ | -   | %             |
| $I_{DSS}$                | drain leakage current                              | $V_{GS} = 0\text{ V}$ ; $V_{DS} = 28\text{ V}$           | -   | -       | 1.4 | $\mu\text{A}$ |
| $I_{DSX}$                | drain cut-off current                              | $V_{GS} = 5.55\text{ V}$ ; $V_{DS} = 10\text{ V}$        | -   | 2.8     | -   | A             |
| $I_{GSS}$                | gate leakage current                               | $V_{GS} = 1.0\text{ V}$ ; $V_{DS} = 0\text{ V}$          | -   | -       | 140 | nA            |
| <b>Driver stage</b>      |                                                    |                                                          |     |         |     |               |
| $V_{(BR)DSS}$            | drain-source breakdown voltage                     | $V_{GS} = 0\text{ V}$ ; $I_D = 30.16\text{ }\mu\text{A}$ | 65  | -       | -   | V             |
| $V_{GSq}$                | gate-source quiescent voltage                      | $V_{DS} = 28\text{ V}$ ; $I_D = 27\text{ mA}$            | 1.6 | 2.1     | 2.6 | V             |
|                          |                                                    | $V_{DS} = 28\text{ V}$ ; $I_D = 27\text{ mA}$ [2]        | 1.9 | 2.85    | 3.8 | V             |
| $\Delta I_{Dq}/\Delta T$ | quiescent drain current variation with temperature | $-40\text{ °C} \leq T_{case} \leq +85\text{ °C}$ [2]     | -   | $\pm 1$ | -   | %             |
| $I_{DSS}$                | drain leakage current                              | $V_{GS} = 0\text{ V}$ ; $V_{DS} = 28\text{ V}$           | -   | -       | 1.4 | $\mu\text{A}$ |
| $I_{DSX}$                | drain cut-off current                              | $V_{GS} = 5.55\text{ V}$ ; $V_{DS} = 10\text{ V}$        | -   | 0.55    | -   | A             |
| $I_{GSS}$                | gate leakage current                               | $V_{GS} = 1.0\text{ V}$ ; $V_{DS} = 0\text{ V}$          | -   | -       | 140 | nA            |

[1] In production circuit with 1105  $\Omega$  gate feed resistor.

[2] In production circuit with 765  $\Omega$  gate feed resistor.

**Table 7. RF Characteristics**

Typical RF performance at  $T_{case} = 25\text{ }^{\circ}\text{C}$ ;  $V_{DS} = 28\text{ V}$ ;  $I_{Dq1} = 27\text{ mA}$ ;  $I_{Dq2} = 76\text{ mA}$ ;  $P_{L(AV)} = 2\text{ W}$ . Per section unless otherwise specified, measured in an Ampleon wideband  $f = 1807.5\text{ MHz}$  to  $2167.5\text{ MHz}$  straight lead production circuit.

| Symbol                                 | Parameter                                          | Conditions                                                   | Min  | Typ  | Max  | Unit |
|----------------------------------------|----------------------------------------------------|--------------------------------------------------------------|------|------|------|------|
| Test signal: single carrier W-CDMA [1] |                                                    |                                                              |      |      |      |      |
| G <sub>p</sub>                         | power gain                                         | f = 1807.5 MHz                                               | -    | 34   | -    | dB   |
|                                        |                                                    | f = 2167.5 MHz                                               | 30.8 | 32.3 | 33.8 | dB   |
| η <sub>D</sub>                         | drain efficiency                                   | f = 1807.5 MHz                                               | -    | 22   | -    | %    |
|                                        |                                                    | f = 2167.5 MHz                                               | 20   | 23   | -    | %    |
| RL <sub>in</sub>                       | input return loss                                  | f = 2167.5 MHz                                               | -    | −19  | −10  | dB   |
| ACPR <sub>5M</sub>                     | adjacent channel power ratio (5 MHz)               | f = 1807.5 MHz                                               | -    | −41  | -    | dBc  |
|                                        |                                                    | f = 2167.5 MHz                                               | -    | −41  | −37  | dBc  |
| PAR <sub>O</sub>                       | output peak-to-average ratio                       | f = 1807.5 MHz                                               | -    | 8.4  | -    | dB   |
|                                        |                                                    | f = 2167.5 MHz                                               | 7.2  | 8.4  | -    | dB   |
| ΔI <sub>Dq</sub> /ΔT                   | quiescent drain current variation with temperature | T = −40 °C to +85 °C                                         |      |      |      |      |
|                                        |                                                    | final stage I <sub>Dq</sub> ;<br>gate feed resistor = 1105 Ω | -    | ±1   | -    | %    |
|                                        |                                                    | driver stage I <sub>Dq</sub> ;<br>gate feed resistor = 765 Ω | -    | ±1   | -    | %    |
| Test signal: CW [2]                    |                                                    |                                                              |      |      |      |      |
| Δφ <sub>s21</sub>                      | phase response difference                          | between sections                                             | −10  | -    | +10  | deg  |
| Δ s <sub>21</sub>   <sup>2</sup>       | insertion power gain difference                    | between sections                                             | −0.5 | -    | +0.5 | dB   |

[1] 3GPP test model 1; 64 DPCH; PAR = 9.9 dB at 0.01% probability on CCDF.

[2]  $f = 2170\text{ MHz}$ .

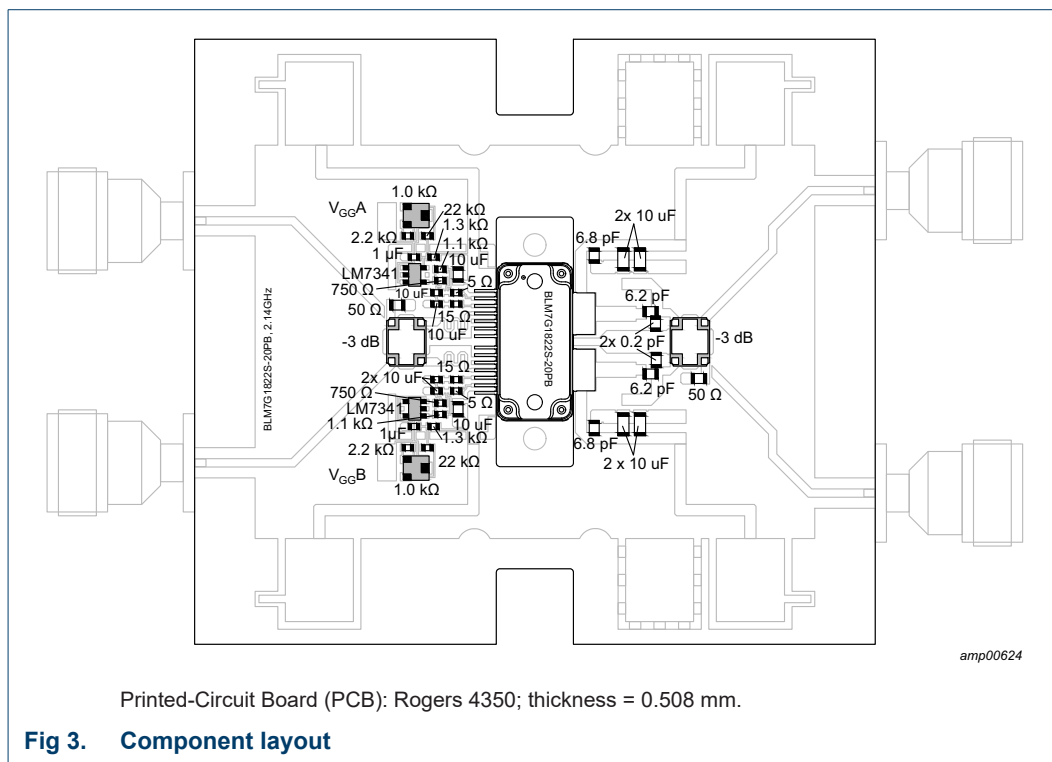
## 8. Application information

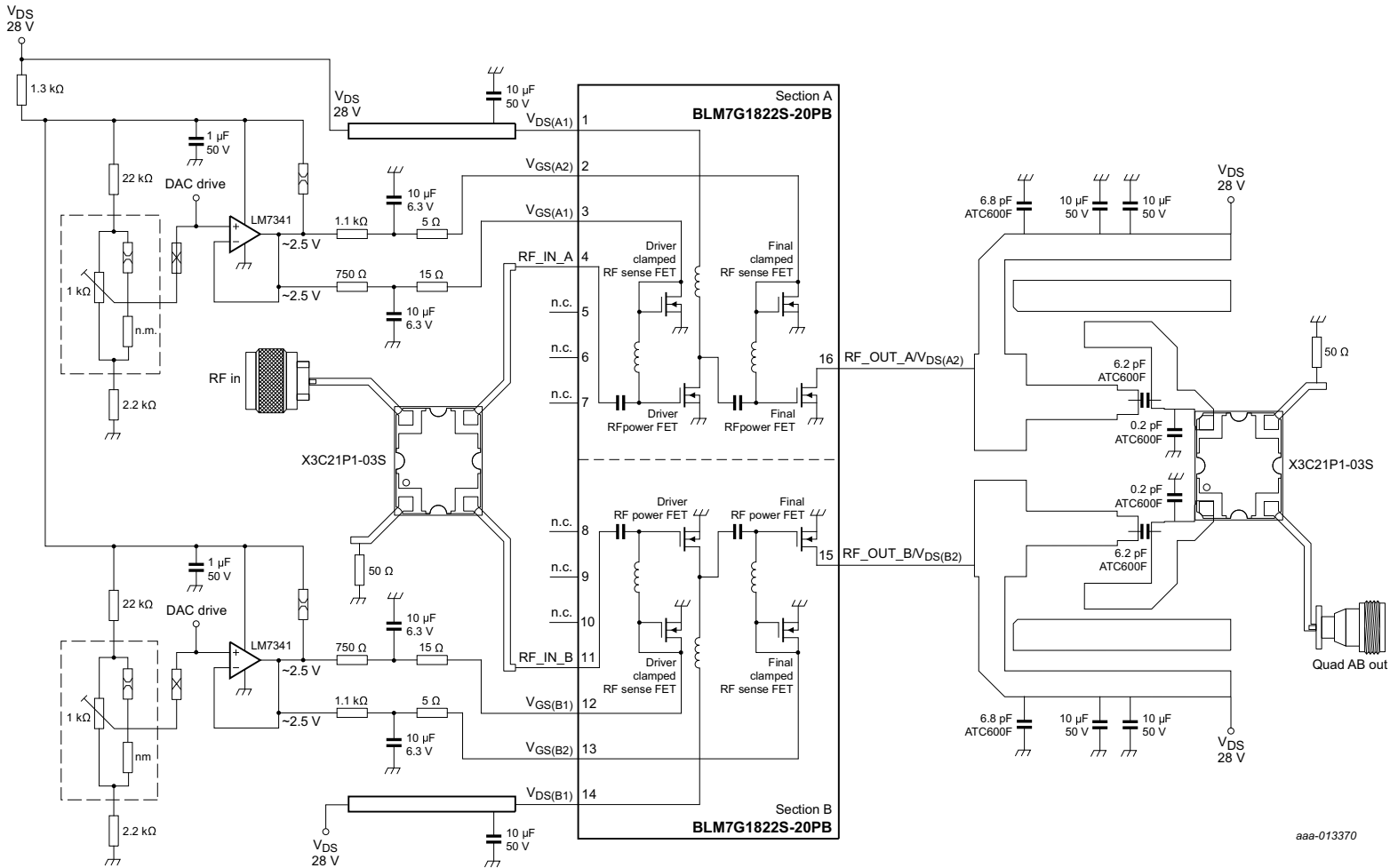
**Table 8. Typical performance**

Test signal: 1-tone CW; RF performance at  $T_{case} = 25\text{ }^{\circ}\text{C}$ ;  $V_{DS} = 28\text{ V}$ ;  $I_{Dq1} = 45\text{ mA}$  (both sections);  $I_{Dq2} = 140\text{ mA}$  (both sections) unless otherwise specified, measured in an Ampleon  $f = 2110\text{ MHz}$  to  $2170\text{ MHz}$  straight lead class AB application circuit (see [Figure 3](#) for the component layout and [Figure 4](#) for the electrical schematic).

| Symbol              | Parameter                             | Conditions                                                                        | Min | Typ  | Max | Unit                   |
|---------------------|---------------------------------------|-----------------------------------------------------------------------------------|-----|------|-----|------------------------|
| $P_{L(1dB)}$        | output power at 1 dB gain compression | $f = 2140\text{ MHz}$                                                             | -   | 43.5 | -   | dBm                    |
| $P_{L(3dB)}$        | output power at 3 dB gain compression | $f = 2140\text{ MHz}$                                                             | -   | 44.1 | -   | dBm                    |
| $\eta_D$            | drain efficiency                      | at $P_{L(1dB)}$ ; $f = 2140\text{ MHz}$                                           | -   | 47.6 | -   | %                      |
| $G_p$               | power gain                            | $P_{L(AV)} = 1.585\text{ W}$ ; $f = 2140\text{ MHz}$                              | -   | 31.5 | -   | dB                     |
| $B_{video}$         | video bandwidth                       | 2-tone CW; $P_{L(AV)} = 1.585\text{ W}$ ;<br>$f = 2140\text{ MHz}$                | -   | 170  | -   | MHz                    |
| $G_{flat}$          | gain flatness                         | over a frequency range of 60 MHz;<br>$P_{L(AV)} = 1.585\text{ W}$                 | -   | 0.4  | -   | dB                     |
| $\Delta G/\Delta T$ | gain variation with temperature       | $f = 2140\text{ MHz}$                                                             | -   | 0.03 | -   | dB/ $^{\circ}\text{C}$ |
| $ s_{12} ^2$        | isolation                             | between sections A and B;<br>$P_{L(AV)} = 1.585\text{ W}$ ; $f = 2140\text{ MHz}$ | [1] | 28.5 | -   | dB                     |
| K                   | Rollett stability factor              | $T = -40\text{ }^{\circ}\text{C}$ ; $f = 0.1\text{ GHz}$ to $3\text{ GHz}$        | -   | >1   | -   |                        |

[1] Measured on dual section evaluation board  $I_{Dq1} = 40\text{ mA}$  (both sections);  $I_{Dq2} = 150\text{ mA}$  (both sections).

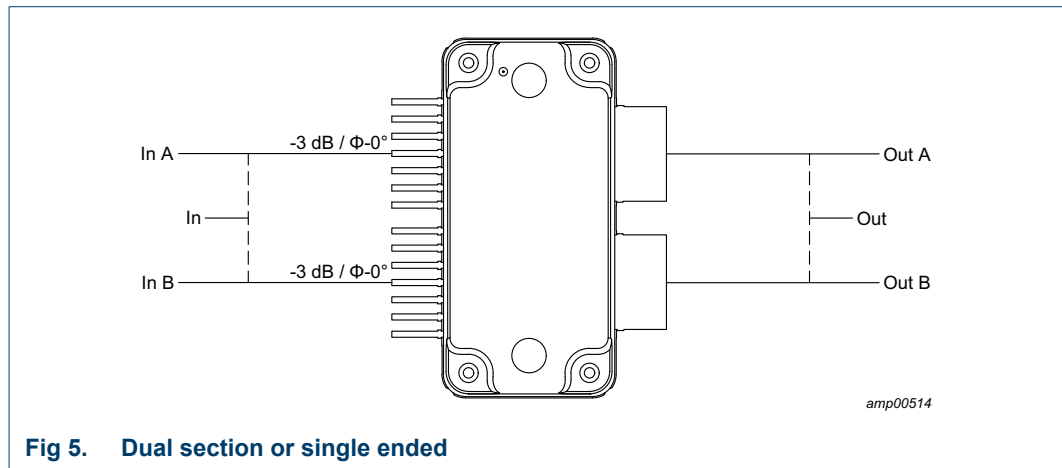




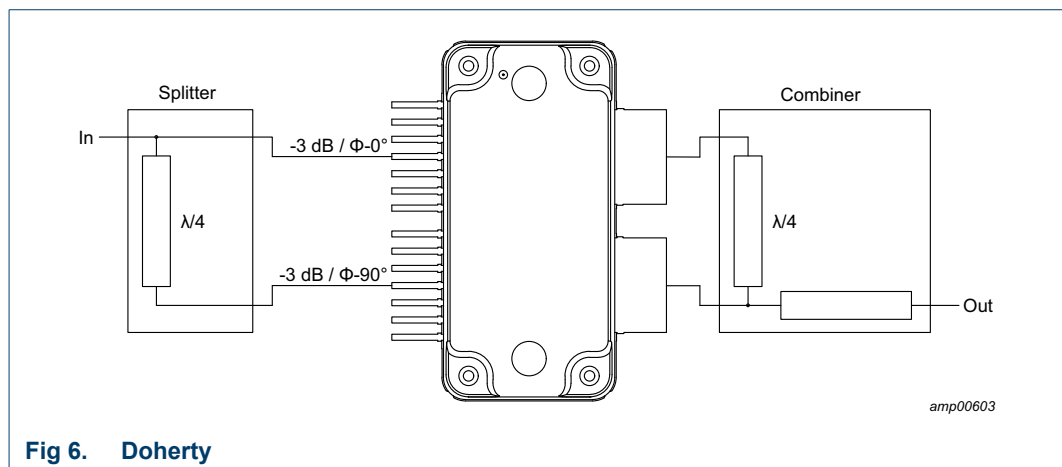
aaa-013370

Fig 4. Electrical schematic

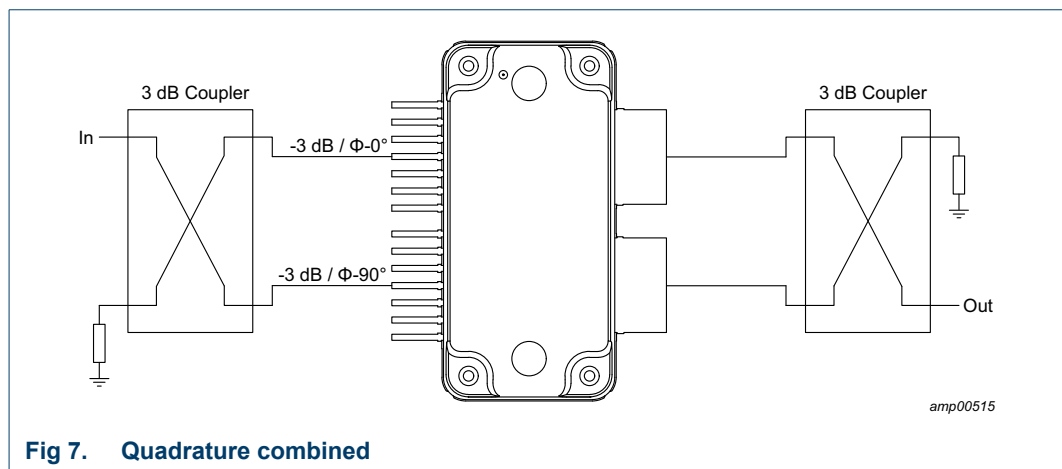
## 8.1 Possible circuit topologies



**Fig 5. Dual section or single ended**



**Fig 6. Doherty**



**Fig 7. Quadrature combined**



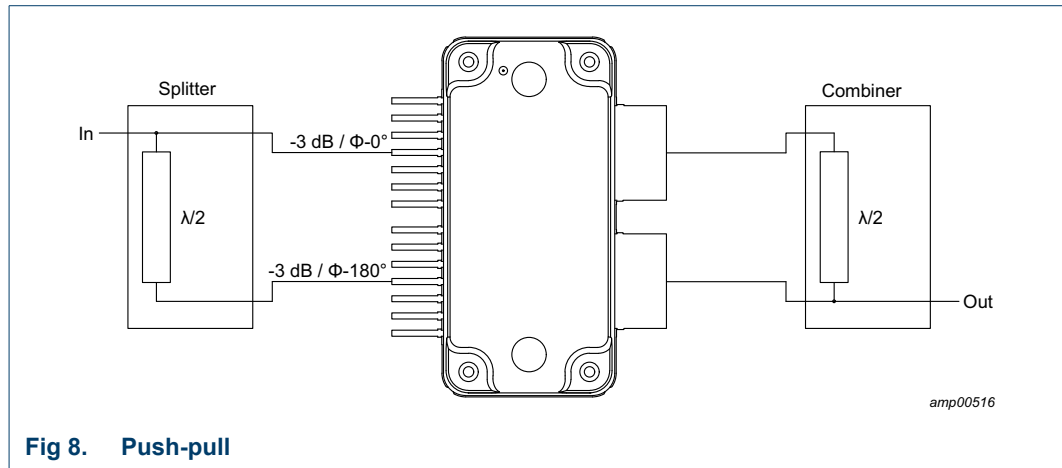


Fig 8. Push-pull

## 8.2 Ruggedness in class-AB operation

The BLM7G1822S-20PB and BLM7G1822S-20PB(G) are capable of withstanding a load mismatch corresponding to VSWR = 10 : 1 through all phases under the following conditions:  $V_{DS} = 32$  V;  $I_{DQ1} = 20$  mA (per section);  $I_{DQ2} = 75$  mA (per section);  $P_i = 16$  dBm (CW and corresponding to  $P_{L(3dB)}$  under  $Z_S = 50 \Omega$  load);  $f = 2140$  MHz.

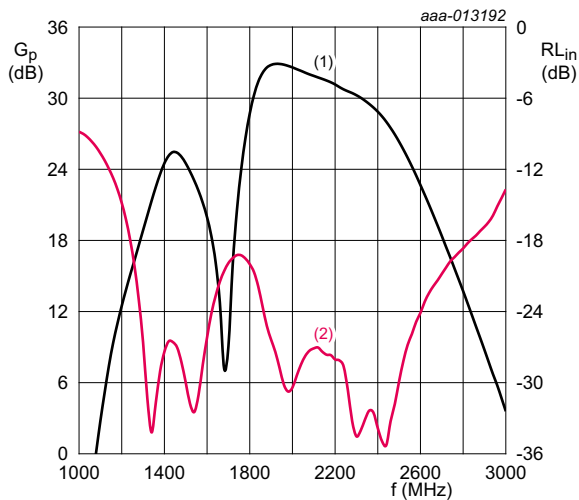
## 8.3 Impedance information

**Table 9. Typical impedance at 3 dB compression point**

Measured load-pull data per section; test signal: pulsed CW;  $T_{case} = 25^\circ\text{C}$ ;  $V_{DS} = 28$  V;  $I_{DQ1} = 20$  mA;  $I_{DQ2} = 65$  mA;  $t_p = 100 \mu\text{s}$ ;  $\delta = 10\%$ ;  $Z_S = 50 \Omega$ . Typical values unless otherwise specified.

| f<br>(MHz)                | tuned for maximum output power |                      |                |                     |                              | tuned for maximum efficiency |                      |                |                     |                              |
|---------------------------|--------------------------------|----------------------|----------------|---------------------|------------------------------|------------------------------|----------------------|----------------|---------------------|------------------------------|
|                           | $Z_L$<br>( $\Omega$ )          | $G_{p(max)}$<br>(dB) | $P_L$<br>(dBm) | $\eta_{add}$<br>(%) | AM-PM<br>conversion<br>(deg) | $Z_L$<br>( $\Omega$ )        | $G_{p(max)}$<br>(dB) | $P_L$<br>(dBm) | $\eta_{add}$<br>(%) | AM-PM<br>conversion<br>(deg) |
| <b>BLM7G1822S-20PB</b>    |                                |                      |                |                     |                              |                              |                      |                |                     |                              |
| 1700                      | 15.3 – j14.5                   | 33.2                 | 42.7           | 50.6                | 8.3                          | 28.5 – j20.2                 | 34.6                 | 41.6           | 56.5                | 9.2                          |
| 1800                      | 16.3 – j11.7                   | 32.9                 | 42.7           | 50.8                | 6.3                          | 31.3 – j8.60                 | 34.1                 | 41.6           | 57.1                | 7.0                          |
| 1900                      | 16.1 – j9.70                   | 32.1                 | 42.8           | 50.8                | 6.1                          | 26.5 – j0.01                 | 33.3                 | 41.7           | 57.3                | 6.9                          |
| 2000                      | 15.5 – j8.10                   | 31.5                 | 42.8           | 50.1                | 6.1                          | 21.0 + j2.20                 | 32.6                 | 42.0           | 56.4                | 7.3                          |
| 2100                      | 14.4 – j6.90                   | 31.5                 | 42.9           | 50.0                | 6.9                          | 15.6 + j2.00                 | 32.9                 | 42.1           | 55.8                | 8.6                          |
| 2200                      | 13.7 – j6.60                   | 31.7                 | 42.7           | 49.8                | 8.5                          | 12.3 + j1.20                 | 33.0                 | 41.6           | 54.3                | 9.6                          |
| 2300                      | 12.8 – j6.80                   | 31.4                 | 42.5           | 49.1                | 10.6                         | 10.0 + j0.10                 | 32.5                 | 41.3           | 53.6                | 10.3                         |
| <b>BLM7G1822S-20PB(G)</b> |                                |                      |                |                     |                              |                              |                      |                |                     |                              |
| 1700                      | 15.8 – j16.1                   | 33.5                 | 42.5           | 52.9                | 9.2                          | 28.9 – j21.8                 | 35.1                 | 41.6           | 57.9                | 11.1                         |
| 1800                      | 16.5 – j13.8                   | 32.9                 | 42.5           | 51.2                | 7.7                          | 30.6 – j11.6                 | 34.2                 | 41.6           | 56.8                | 8.4                          |
| 1900                      | 16.7 – j12.4                   | 32.2                 | 42.5           | 50.2                | 7.2                          | 27.9 – j4.64                 | 33.5                 | 41.7           | 55.9                | 7.8                          |
| 2000                      | 16.3 – j9.74                   | 31.7                 | 42.5           | 51.2                | 7.3                          | 20.4 + j0.45                 | 32.7                 | 41.7           | 55.6                | 9.0                          |
| 2100                      | 15.6 – j8.61                   | 31.5                 | 42.6           | 52.0                | 9.5                          | 15.9 + j0.68                 | 32.6                 | 41.7           | 56.5                | 11.8                         |
| 2200                      | 14.6 – j8.87                   | 31.3                 | 42.5           | 49.7                | 10.3                         | 12.7 – j0.44                 | 32.4                 | 41.6           | 53.8                | 12.1                         |
| 2300                      | 13.4 – j9.32                   | 30.5                 | 42.4           | 48.2                | 12.8                         | 10.7 – j1.98                 | 31.7                 | 41.6           | 53.7                | 13.2                         |

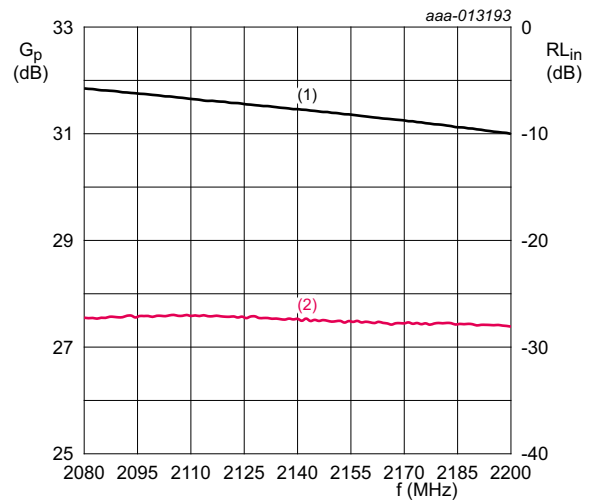
## 8.4 Graphs



$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ ;  $V_{\text{DS}} = 28\text{ V}$ ;  $I_{\text{DQ1}} = 22\text{ mA}$ ;  $I_{\text{DQ2}} = 70\text{ mA}$ ;  $P_L = 1.585\text{ W}$ . Per section.

- (1) magnitude of  $G_p$
- (2) magnitude of  $RL_{\text{in}}$

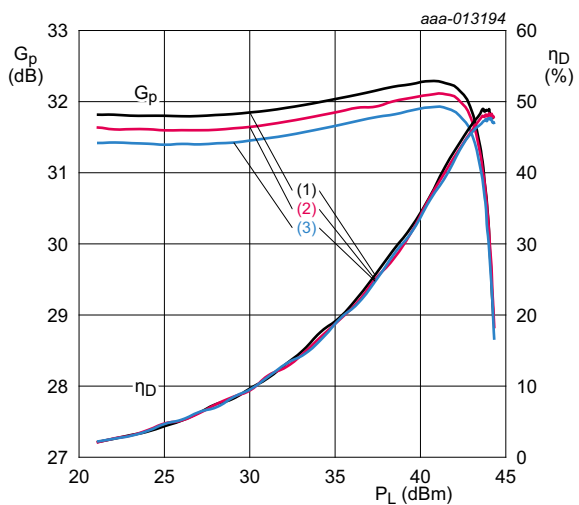
**Fig 9. Wideband power gain and input return loss as function of frequency; typical values**



$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ ;  $V_{\text{DS}} = 28\text{ V}$ ;  $I_{\text{DQ1}} = 22\text{ mA}$ ;  $I_{\text{DQ2}} = 70\text{ mA}$ ;  $P_L = 1.585\text{ W}$ . Per section.

- (1) magnitude of  $G_p$
- (2) magnitude of  $RL_{\text{in}}$

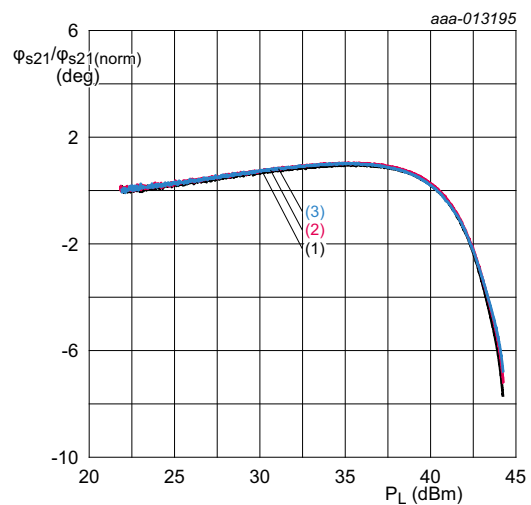
**Fig 10. In-band power gain and input return loss as function of frequency; typical values**



$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ ;  $V_{\text{DS}} = 28\text{ V}$ ;  $I_{\text{DQ1}} = 22\text{ mA}$ ;  $I_{\text{DQ2}} = 70\text{ mA}$ . Per section.

- (1)  $f = 2110\text{ MHz}$
- (2)  $f = 2140\text{ MHz}$
- (3)  $f = 2170\text{ MHz}$

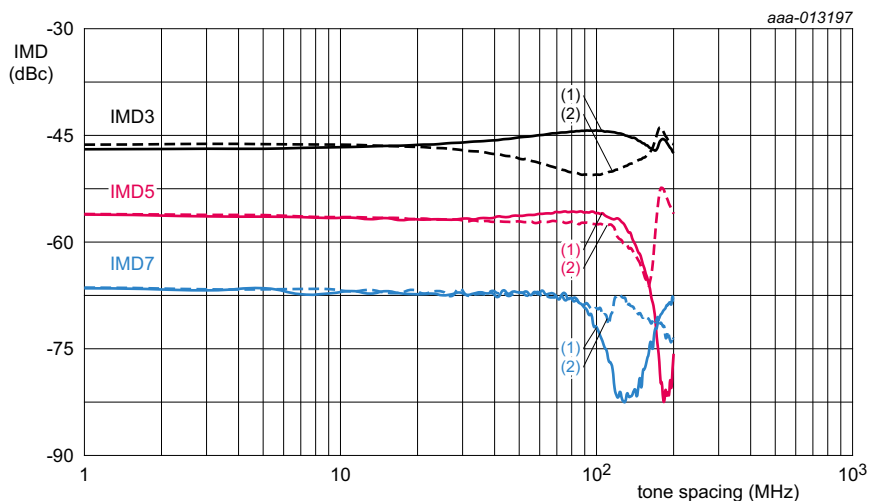
**Fig 11. Power gain and drain efficiency as function of output power; typical values**



Normalized at  $P_L = 22\text{ dBm}$ ;  $T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ ;  $V_{\text{DS}} = 28\text{ V}$ ;  $I_{\text{DQ1}} = 22\text{ mA}$ ;  $I_{\text{DQ2}} = 70\text{ mA}$ . Per section.

- (1)  $f = 2110\text{ MHz}$
- (2)  $f = 2140\text{ MHz}$
- (3)  $f = 2170\text{ MHz}$

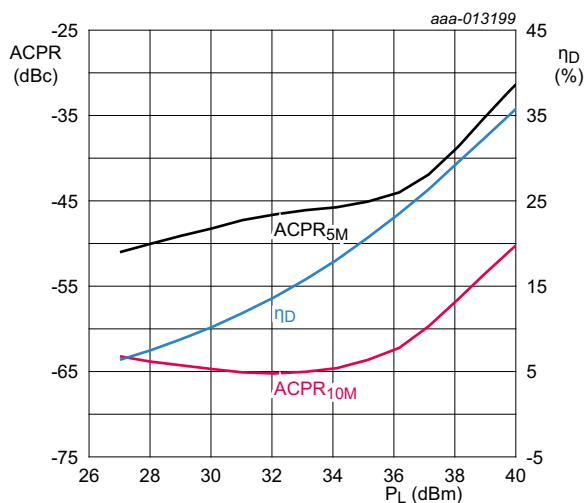
**Fig 12. Normalized phase response as a function of output power; typical values**



$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ ;  $V_{\text{DS}} = 28\text{ V}$ ;  $I_{\text{DQ1}} = 22\text{ mA}$ ;  $I_{\text{DQ2}} = 70\text{ mA}$ ;  $f = 2140\text{ MHz}$ ; 2-tone CW;  $P_{\text{L(AV)}} = 0.25\text{ W}$ . Per section.

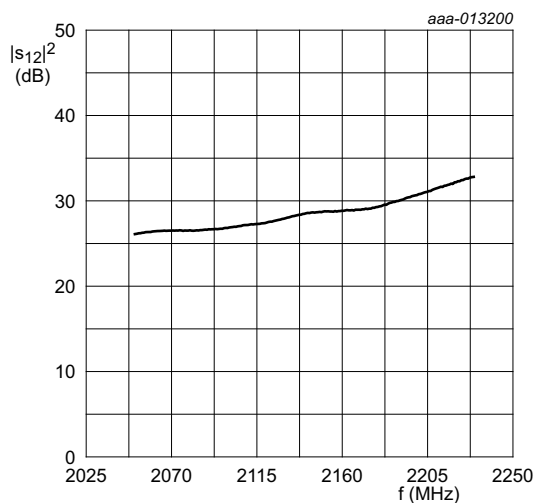
- (1) IMD low
- (2) IMD high

**Fig 13. Intermodulation distortion as a function of tone spacing; typical values**



$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ ;  $V_{\text{DS}} = 28\text{ V}$ ;  $I_{\text{DQ1}} = 22\text{ mA}$ ;  $I_{\text{DQ2}} = 70\text{ mA}$ ;  
 $f = 2140\text{ MHz}$ ; 1-carrier W-CDMA; test model 1;  
 $\text{PAR} = 7.2\text{ dB}$  at 0.01 % probability on CCDF. Per section.

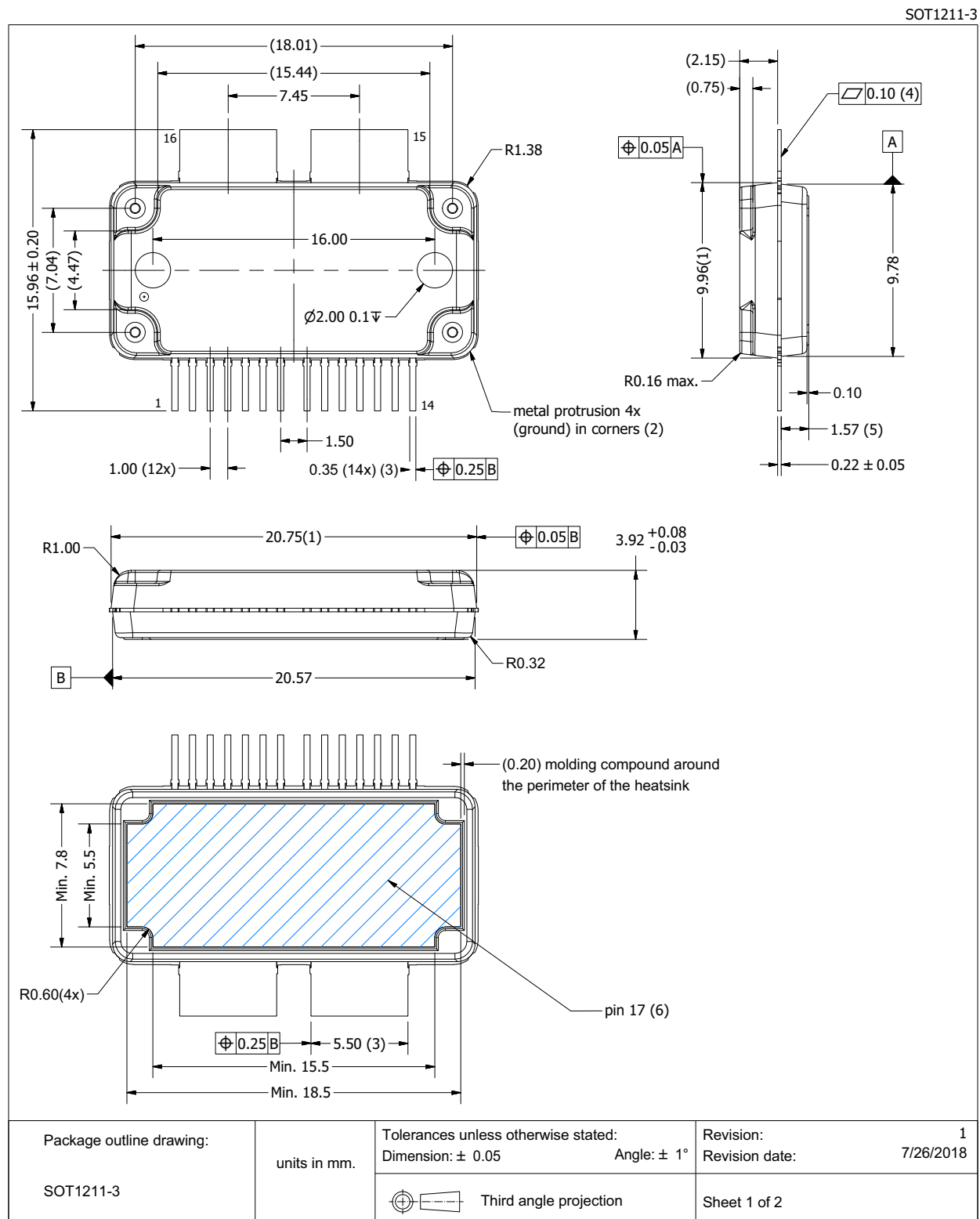
**Fig 14. Adjacent channel power ratio and drain efficiency as function of output power; typical values**



$T_{\text{case}} = 25\text{ }^{\circ}\text{C}$ ;  $V_{\text{DS}} = 28\text{ V}$ ;  $I_{\text{DQ1}} = 20\text{ mA}$ ;  $I_{\text{DQ2}} = 75\text{ mA}$ .  
 Per section. Measured on evaluation board.

**Fig 15. Isolation as a function of frequency; typical values**

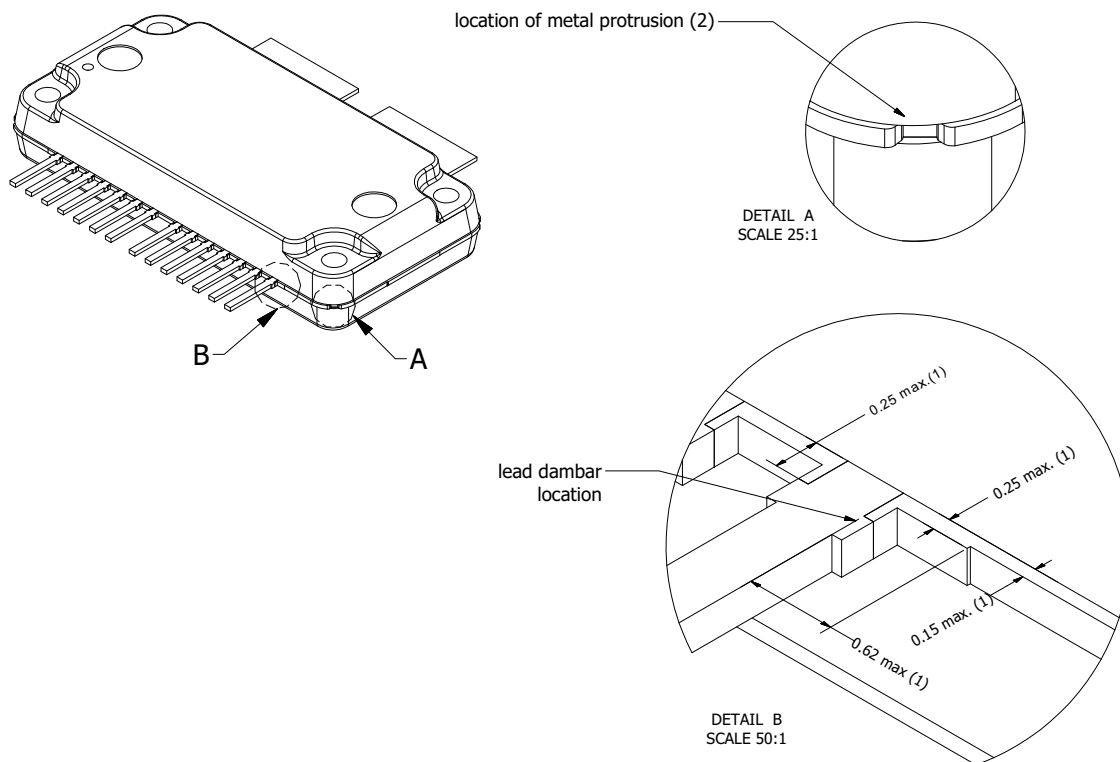
## 9. Package outline



**Fig 16. Package outline SOT1211-3 (sheet 1 of 2)**

SOT1211-3

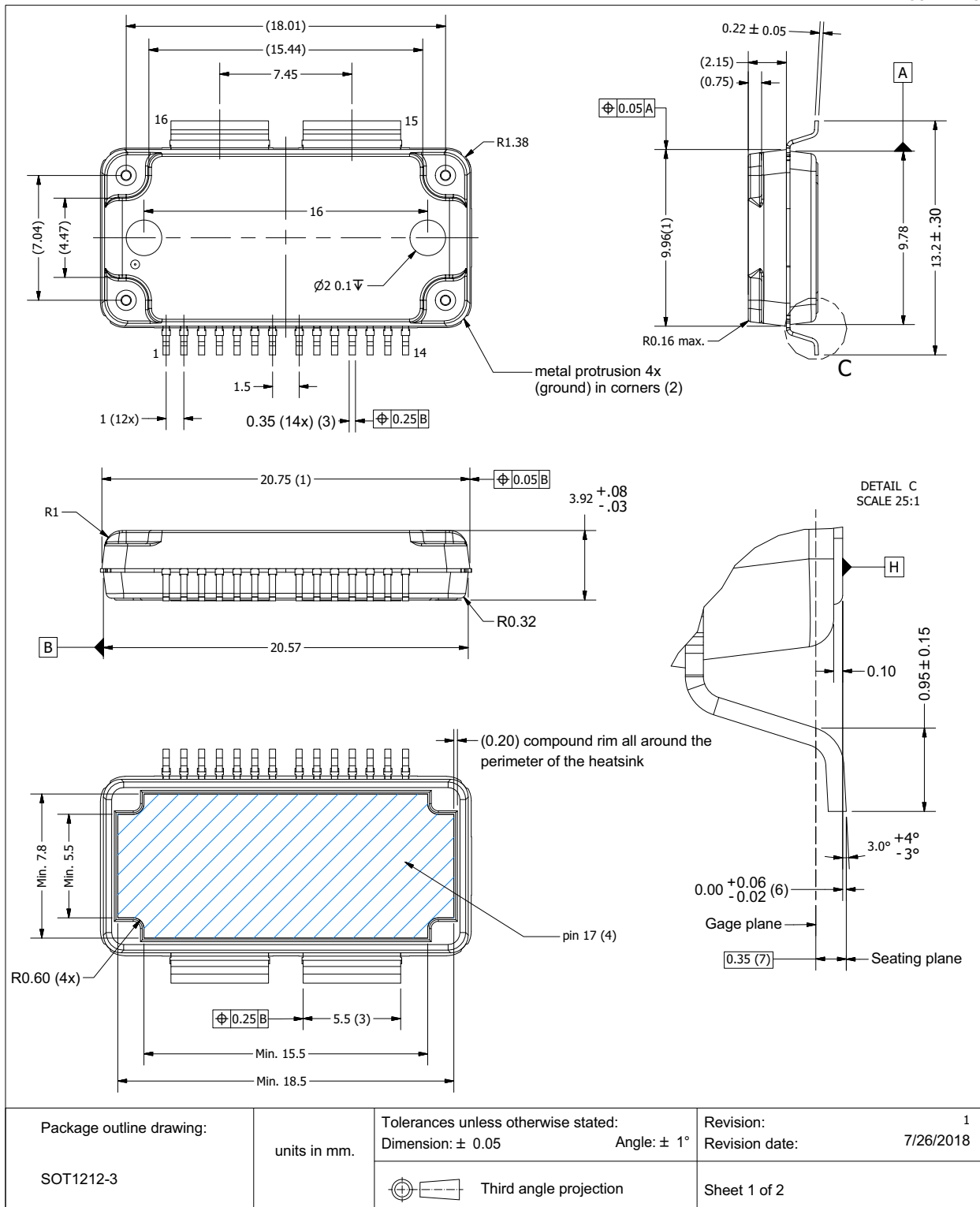
| Drawing Notes |                                                                                                                                                                                                                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Items         | Description                                                                                                                                                                                                                                                                                                   |
| (1)           | Dimensions are excluding mold protrusion. Areas located adjacent to the leads have a maximum mold protrusion of 0.25 mm (per side) and 0.62 mm max. in length. In between the 14 leads the protrusion is 0.25 mm. max. At all other areas the mold protrusion is maximum 0.15 mm per side. See also detail B. |
| (2)           | The metal protrusion (tie bars) in the corner will not stick out of the molding compound protrusions (detail A).                                                                                                                                                                                              |
| (3)           | The lead dambar (metal) protrusions are not included. Add 0.14 mm max to the total lead dimension at the dambar location.                                                                                                                                                                                     |
| (4)           | The lead coplanarity over all leads is 0.1 mm maximum.                                                                                                                                                                                                                                                        |
| (5)           | Dimension is measured 0.5 mm from the edge of the top package body.                                                                                                                                                                                                                                           |
| (6)           | The hatched area indicates the exposed metal heatsink.                                                                                                                                                                                                                                                        |
| (7)           | The leads and exposed heatsink are plated with matte Tin (Sn).                                                                                                                                                                                                                                                |



|                          |              |                                                                                                            |                                         |
|--------------------------|--------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Package outline drawing: | units in mm. | Tolerances unless otherwise stated:<br>Dimension: $\pm 0.05$                                               | Revision: 1<br>Revision date: 7/26/2018 |
| SOT1211-3                |              |  Third angle projection | Sheet 2 of 2                            |

Fig 17. Package outline SOT1211-3 (sheet 2 of 2)

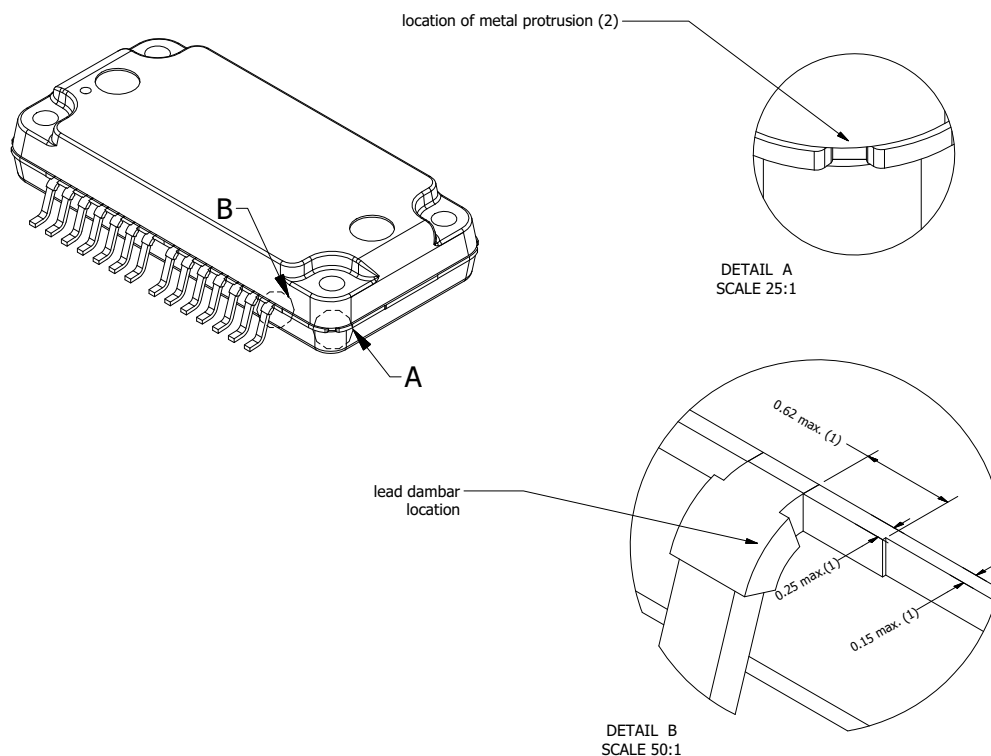
SOT1212-3



**Fig 18. Package outline SOT1212-3 (sheet 1 of 2)**

SOT1212-3

| Drawing Notes |                                                                                                                                                                                                                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Items         | Description                                                                                                                                                                                                                                                                                                  |
| (1)           | Dimensions are excluding mold protrusion. Areas located adjacent to the leads have a maximum mold protrusion of 0.25 mm (per side) and 0.62 mm max. in length. In between the 14 leads the protrusion is 0.25 mm max. At all other areas the mold protrusion is maximum 0.15 mm per side. See also detail B. |
| (2)           | The metal protrusion (tie bars) in the corner will not stick out of the molding compound protrusions (detail A).                                                                                                                                                                                             |
| (3)           | The lead dambar (metal) protrusions are not included. Add 0.14 mm max to the total lead dimension at the dambar location.                                                                                                                                                                                    |
| (4)           | The hatched area indicated the exposed heatsink.                                                                                                                                                                                                                                                             |
| (5)           | The leads and exposed heatsink are plated with matte Tin (Sn).                                                                                                                                                                                                                                               |
| (6)           | Dimension is measured with respect to the bottom of the heatsink Datum H. Positive value means that the bottom of the heatsink is higher than the bottom of the lead.                                                                                                                                        |
| (7)           | Gage plane (foot length) to be measured from the seating plane.                                                                                                                                                                                                                                              |



|                          |              |                                                                                                            |                                         |
|--------------------------|--------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| Package outline drawing: | units in mm. | Tolerances unless otherwise stated:<br>Dimension: $\pm 0.05$ Angle: $\pm 1^\circ$                          | Revision: 1<br>Revision date: 7/26/2018 |
| SOT1212-3                |              |  Third angle projection | Sheet 2 of 2                            |

Fig 19. Package outline SOT1212-3 (sheet 2 of 2)

## 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.

**Table 10. ESD sensitivity**

| ESD model                                                                | Class                  |
|--------------------------------------------------------------------------|------------------------|
| Charged Device Model (CDM); According to ANSI/ESDA/JEDEC standard JS-002 | C1 <a href="#">[1]</a> |
| Human Body Model (HBM); According to ANSI/ESDA/JEDEC standard JS-001     | 1A <a href="#">[2]</a> |

[1] CDM classification C1 is granted to any part that passes after exposure to an ESD pulse of 250 V.

[2] HBM classification 1A is granted to any part that passes after exposure to an ESD pulse of 250 V.

## 11. Abbreviations

**Table 11. Abbreviations**

| Acronym | Description                                    |
|---------|------------------------------------------------|
| AM      | Amplitude Modulation                           |
| 3GPP    | 3rd Generation Partnership Project             |
| CCDF    | Complementary Cumulative Distribution Function |
| CW      | Continuous Wave                                |
| DPCH    | Dedicated Physical CHannel                     |
| ESD     | ElectroStatic Discharge                        |
| GEN7    | Seventh Generation                             |
| GSM     | Global System for Mobile Communications        |
| LDMOS   | Laterally Diffused Metal Oxide Semiconductor   |
| LTE     | Long Term Evolution                            |
| MMIC    | Monolithic Microwave Integrated Circuit        |
| MTF     | Median Time to Failure                         |
| PAR     | Peak-to-Average Ratio                          |
| PM      | Phase Modulation                               |
| RoHS    | Restriction of Hazardous Substances            |
| VSWR    | Voltage Standing-Wave Ratio                    |
| W-CDMA  | Wideband Code Division Multiple Access         |



## 12. Revision history

Table 12. Revision history

| Document ID                 | Release date                                                                                                             | Data sheet status    | Change notice | Supersedes                  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------|---------------|-----------------------------|
| BLM7G1822S-20PB_S-20PBG v.6 | 20180928                                                                                                                 | Product data sheet   |               | BLM7G1822S-20PB_S-20PBG v.5 |
| Modifications               | <ul style="list-style-type: none"> <li><a href="#">Section 9 on page 12</a>: package outline versions updated</li> </ul> |                      |               |                             |
| BLM7G1822S-20PB_S-20PBG v.5 | 20180227                                                                                                                 | Product data sheet   |               | BLM7G1822S-20PB_S-20PBG v.4 |
| BLM7G1822S-20PB_S-20PBG v.4 | 20150901                                                                                                                 | Product data sheet   |               | BLM7G1822S-20PB_S-20PBG v.3 |
| BLM7G1822S-20PB_S-20PBG v.3 | 20150701                                                                                                                 | Product data sheet   | -             | BLM7G1822S-20PB_S-20PBG v.2 |
| BLM7G1822S-20PB_S-20PBG v.2 | 20140626                                                                                                                 | Objective data sheet | -             | BLM7G1822S-20PB_S-20PBG v.1 |
| BLM7G1822S-20PB_S-20PBG v.1 | 20131219                                                                                                                 | 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.ampleon.com>.

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