



## LET20015

### RF POWER TRANSISTORS

### *Ldmos Enhanced Technology in Plastic Package*

#### TARGET DATA

Designed for GSM / EDGE / IS-97 applications

- EXCELLENT THERMAL STABILITY
  - COMMON SOURCE CONFIGURATION
  - $P_{OUT} = 15\text{ W}$  with 11 dB gain @ 2000 MHz
  - ESD PROTECTION
  - IS-97 CDMA PERFORMANCES
- $P_{OUT} = 2.5\text{ W}$   
EFF. = 20 %

#### DESCRIPTION

The LET20015 is a common source N-Channel, enhancement-mode lateral Field-Effect RF power transistor. It is designed for high gain, broad band commercial and industrial applications. It operates at 26 V in common source mode at frequencies up to 2 GHz. LET20015 boasts the excellent gain, linearity and reliability of ST's latest LDMOS technology mounted in the first true SMD plastic RF power package, PowerSO-10RF. LET20015's superior linearity performance makes it an ideal solution for base station applications.

The PowerSO-10 plastic package, designed to offer high reliability, is the first ST JEDEC approved, high power SMD package. It has been specially optimized for RF needs and offers excellent RF performances and ease of assembly.

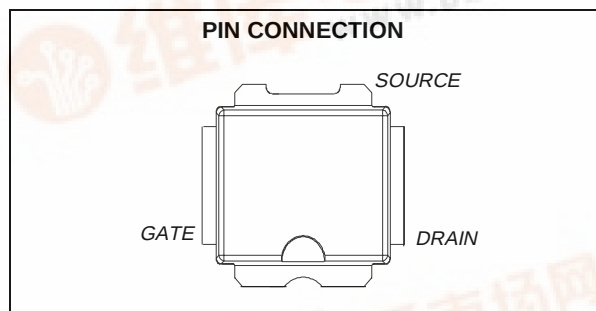
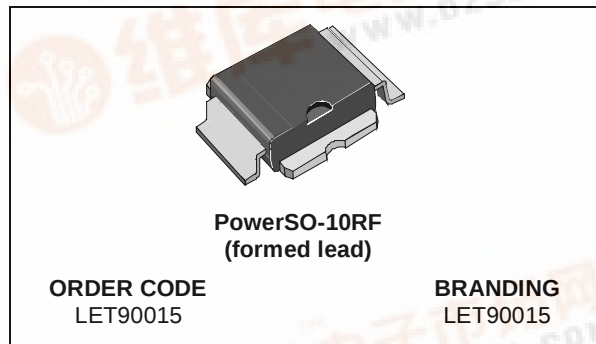
*Mounting recommendations are available in [www.st.com/rfl](http://www.st.com/rfl) (look for application note AN1294)*

#### ABSOLUTE MAXIMUM RATINGS ( $T_{CASE} = 25\text{ }^{\circ}\text{C}$ )

| Symbol        | Parameter                                                 | Value       | Unit               |
|---------------|-----------------------------------------------------------|-------------|--------------------|
| $V_{(BR)DSS}$ | Drain-Source Voltage                                      | 65          | V                  |
| $V_{GS}$      | Gate-Source Voltage                                       | -0.5 to +15 | V                  |
| $I_D$         | Drain Current                                             | 2           | A                  |
| $P_{DISS}$    | Power Dissipation (@ $T_c = 70\text{ }^{\circ}\text{C}$ ) | TBD         | W                  |
| $T_j$         | Max. Operating Junction Temperature                       | 165         | $^{\circ}\text{C}$ |
| $T_{STG}$     | Storage Temperature                                       | -65 to +175 | $^{\circ}\text{C}$ |

#### THERMAL DATA ( $T_{CASE} = 70\text{ }^{\circ}\text{C}$ )

|               |                                   |     |                      |
|---------------|-----------------------------------|-----|----------------------|
| $R_{th(j-c)}$ | Junction -Case Thermal Resistance | TBD | $^{\circ}\text{C/W}$ |
|---------------|-----------------------------------|-----|----------------------|



**LET20015****ELECTRICAL SPECIFICATION** ( $T_{CASE} = 25^{\circ}C$ )**STATIC**

| Symbol        | Test Conditions        |                        | Min. | Typ. | Max. | Unit          |
|---------------|------------------------|------------------------|------|------|------|---------------|
| $V_{(BR)DSS}$ | $V_{GS} = 0\text{ V}$  | $I_{DS} = 1\text{ mA}$ | 65   |      |      | V             |
| $I_{DSS}$     | $V_{GS} = 0\text{ V}$  | $V_{DS} = 26\text{ V}$ |      |      | 1    | $\mu\text{A}$ |
| $I_{GSS}$     | $V_{GS} = 5\text{ V}$  | $V_{DS} = 0\text{ V}$  |      |      | 1    | $\mu\text{A}$ |
| $V_{GS(Q)}$   | $V_{DS} = 26\text{ V}$ | $I_D = \text{TBD}$     | 2.5  |      | 5.0  | V             |
| $V_{DS(ON)}$  | $V_{GS} = 10\text{ V}$ | $I_D = 1\text{ A}$     |      | TBD  |      | V             |
| $G_{FS}$      | $V_{DS} = 10\text{ V}$ | $I_D = 1\text{ A}$     |      | TBD  |      | mho           |
| $C_{ISS}$     | $V_{GS} = 0\text{ V}$  | $V_{DS} = 26\text{ V}$ |      | TBD  |      | pF            |
| $C_{OSS}$     | $V_{GS} = 0\text{ V}$  | $V_{DS} = 26\text{ V}$ |      | TBD  |      | pF            |
| $C_{RSS}$     | $V_{GS} = 0\text{ V}$  | $V_{DS} = 26\text{ V}$ |      | TBD  |      | pF            |

| Symbol                                | Test Conditions                                               |                       |                                             | Min. | Typ. | Max. | Unit |
|---------------------------------------|---------------------------------------------------------------|-----------------------|---------------------------------------------|------|------|------|------|
| DYNAMIC (f = 2000 MHz)                |                                                               |                       |                                             |      |      |      |      |
| P <sub>1dB</sub>                      | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD |                                             | 15   |      |      | W    |
| G <sub>PS</sub>                       | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD | P <sub>OUT</sub> = 15 W                     | 11   | 13   |      | dB   |
| η <sub>D</sub>                        | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD | P <sub>OUT</sub> = 15 W                     | 45   | 50   |      | %    |
| IMD3 <sup>(1)</sup>                   | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD | P <sub>OUT</sub> = 15 W PEP                 |      | -32  | -28  | dBc  |
| Load mismatch                         | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD | P <sub>OUT</sub> = 15 W<br>ALL PHASE ANGLES |      |      | 10:1 | VSWR |
| DYNAMIC (f = 1930 - 1990 MHz)         |                                                               |                       |                                             |      |      |      |      |
| P <sub>OUT</sub> <sup>(2)</sup>       | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD |                                             | 10   | 15   |      | W    |
| G <sub>PS</sub>                       | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD | P <sub>OUT</sub> = 15 W                     | 11   | 13   |      | dB   |
| η <sub>D</sub> <sup>(2)</sup>         | V <sub>DD</sub> = 26 V                                        | I <sub>DQ</sub> = TBD | P <sub>OUT</sub> = 15 W                     | 40   | 45   |      | %    |
| P <sub>OUT(CDMA)</sub> <sup>(3)</sup> | 885 KHz < -47 dBc<br>1.25 MHz < -55 dBc<br>2.25 MHz < -55 dBc |                       |                                             |      | 2.5  |      | W    |
| η <sub>D(CDMA)</sub> <sup>(3)</sup>   | 885 KHz < -47 dBc<br>1.25 MHz < -55 dBc<br>2.25 MHz < -55 dBc |                       |                                             |      | 20   |      | %    |

(1)  $f_1 = 2000\text{ MHz}$ ,  $f_2 = 2000.1\text{ MHz}$ 

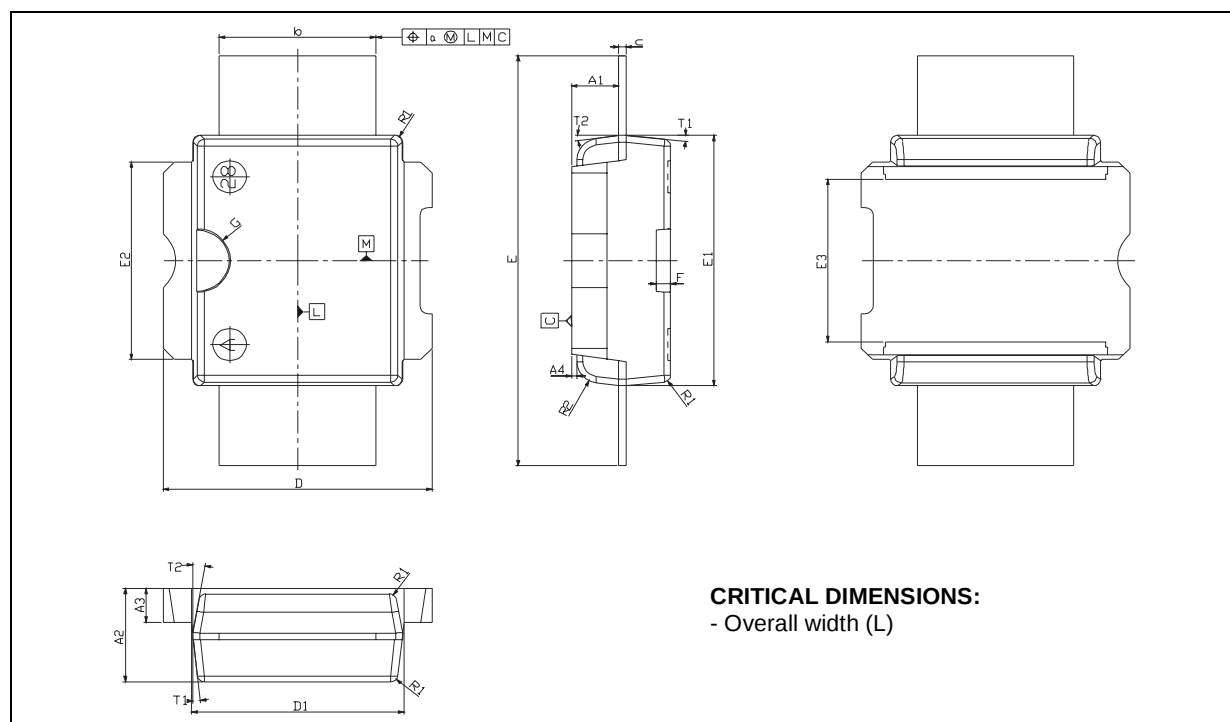
(2) 1 dB Compression point

(3) IS-97 CDMA Pilot, Sync, Paging, Traffic, Codes 8 Thru 13

**PowerSO-10RF Straight Lead MECHANICAL DATA**

| DIM. | mm    |        |       | Inch  |        |       |
|------|-------|--------|-------|-------|--------|-------|
|      | MIN.  | TYP.   | MAX   | MIN.  | TYP.   | MAX   |
| A1   | 1.62  | 1.67   | 1.72  | 0.064 | 0.065  | 0.068 |
| A2   | 3.4   | 3.5    | 3.6   | 0.134 | 0.137  | 0.142 |
| A3   | 1.2   | 1.3    | 1.4   | 0.046 | 0.05   | 0.054 |
| A4   | 0.15  | 0.2    | 0.25  | 0.005 | 0.007  | 0.009 |
| a    |       | 0.2    |       |       | 0.007  |       |
| b    | 5.4   | 5.53   | 5.65  | 0.212 | 0.217  | 0.221 |
| c    | 0.23  | 0.27   | 0.32  | 0.008 | 0.01   | 0.012 |
| D    | 9.4   | 9.5    | 9.6   | 0.370 | 0.374  | 0.377 |
| D1   | 7.4   | 7.5    | 7.6   | 0.290 | 0.295  | 0.298 |
| E    | 15.15 | 15.4   | 15.65 | 0.595 | 0.606  | 0.615 |
| E1   | 9.3   | 9.4    | 9.5   | 0.365 | 0.37   | 0.375 |
| E2   | 7.3   | 7.4    | 7.5   | 0.286 | 0.292  | 0.294 |
| E3   | 5.9   | 6.1    | 6.3   | 0.231 | 0.24   | 0.247 |
| F    |       | 0.5    |       |       | 0.019  |       |
| G    |       | 1.2    |       |       | 0.047  |       |
| R1   |       |        | 0.25  |       |        | 0.01  |
| R2   |       | 0.8    |       |       | 0.031  |       |
| T1   |       | 6 deg  |       |       | 6 deg  |       |
| T2   |       | 10 deg |       |       | 10 deg |       |

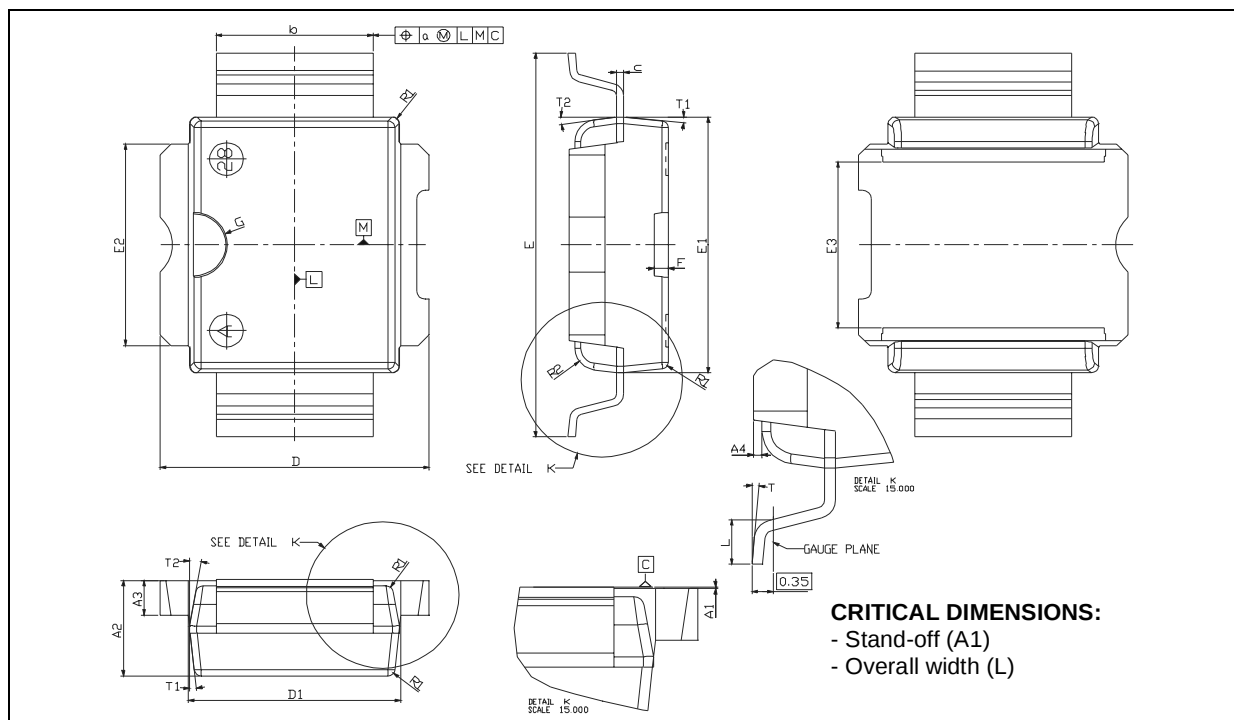
Note (1): Resin protrusions not included (max value: 0.15 mm per side)



## PowerSO-10RF Formed Lead (Gull Wing) MECHANICAL DATA

| DIM. | mm    |        |       | Inch  |        |        |
|------|-------|--------|-------|-------|--------|--------|
|      | MIN.  | TYP.   | MAX   | MIN.  | TYP.   | MAX    |
| A1   | 0     | 0.05   | 0.1   | 0.    | 0.0019 | 0.0038 |
| A2   | 3.4   | 3.5    | 3.6   | 0.134 | 0.137  | 0.142  |
| A3   | 1.2   | 1.3    | 1.4   | 0.046 | 0.05   | 0.054  |
| A4   | 0.15  | 0.2    | 0.25  | 0.005 | 0.007  | 0.009  |
| a    |       | 0.2    |       |       | 0.007  |        |
| b    | 5.4   | 5.53   | 5.65  | 0.212 | 0.217  | 0.221  |
| c    | 0.23  | 0.27   | 0.32  | 0.008 | 0.01   | 0.012  |
| D    | 9.4   | 9.5    | 9.6   | 0.370 | 0.374  | 0.377  |
| D1   | 7.4   | 7.5    | 7.6   | 0.290 | 0.295  | 0.298  |
| E    | 13.85 | 14.1   | 14.35 | 0.544 | 0.555  | 0.565  |
| E1   | 9.3   | 9.4    | 9.5   | 0.365 | 0.37   | 0.375  |
| E2   | 7.3   | 7.4    | 7.5   | 0.286 | 0.292  | 0.294  |
| E3   | 5.9   | 6.1    | 6.3   | 0.231 | 0.24   | 0.247  |
| F    |       | 0.5    |       |       | 0.019  |        |
| G    |       | 1.2    |       |       | 0.047  |        |
| L    | 0.8   | 1      | 1.1   | 0.030 | 0.039  | 0.042  |
| R1   |       |        | 0.25  |       |        | 0.01   |
| R2   |       | 0.8    |       |       | 0.031  |        |
| T    | 2 deg | 5 deg  | 8 deg | 2 deg | 5 deg  | 8 deg  |
| T1   |       | 6 deg  |       |       | 6 deg  |        |
| T2   |       | 10 deg |       |       | 10 deg |        |

Note (1): Resin protrusions not included (max value: 0.15 mm per side)



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