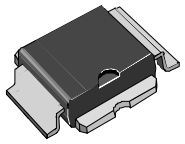
LET9045

RF power transistor, LdmoST plastic family N-channel enhancement-mode lateral MOSFETs

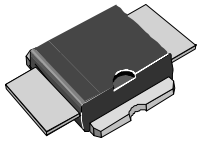
Preliminary data

Features

- Excellent thermal stability
- Common source configuration
- P_{OUT} = 45 W with 18.5 dB gain @ 960 MHz / 28 V
- Plastic package
- ESD protection
- In compliance with the 2002/95/EC european directive



PowerSO-10RF (formed lead)



PowerSO-10RF (straight lead)

Description

The LET9045 is a common source N-Channel, enhancement-mode lateral Field-Effect RF power transistor. It is designed for high gain, broadband commercial and industrial applicatios. It operates at 28 V in common source mode at frequencies of up to 1 GHz. LET9045 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. LET9045'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/rf/ (look for application note AN1294).

Figure 1. Pin connection

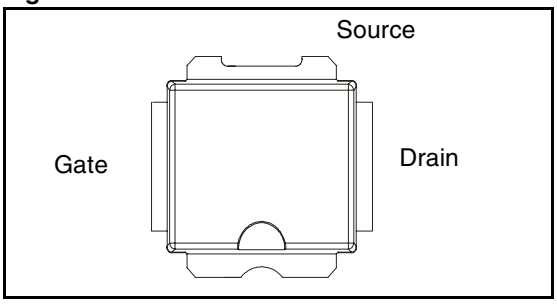


Table 1. Device summary

Order codes	Packages	Packaging
LET9045	PowerSO-10RF (formed lead)	Tube
LET9045S	PowerSO-10RF (straight lead)	Tube
LET9045TR	PowerSO-10RF (formed lead)	Tape and reel
LET9045STR	PowerSO-10RF (straight lead)	Tape and reel

Contents

1 Electrical data

1.1 Maximum ratings

T_{CASE} = 25 °C

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	80	V
V_{GS}	Gate-source voltage	-0.5 to +15	V
I_D	Drain current	9	A
P_{DISS}	Power dissipation (@ T_C = 70 °C)	79	W
T_J	Max. operating junction temperature	165	°C
T_{STG}	Storage temperature	-65 to +150	°C

1.2 Thermal data

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Junction - case thermal resistance	1.2	°C/W

2 Electrical characteristics

T_{CASE} = + 25 °C

2.1 Static

Table 4. Static

Symbol	Test conditions			Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	V_{GS} = 0V	I_D = 1 mA		80			V
I_{DSS}	V_{GS} = 0V	V_{DS} = 28 V				1	µA
I_{GSS}	V_{GS} = 5 V	V_{DS} = 0 V				1	µA
$V_{GS(Q)}$	V_{DS} = 28 V	I_D = 300 mA		2.0		5.0	V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 3 A				1.2	V
G_{FS}	V_{DS} = 10 V	I_D = 3 A		2.5			mho
C_{ISS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		59		pF
C_{OSS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		28		pF
C_{RSS}	V_{GS} = 0V	V_{DS} = 28 V	f = 1 MHz		0.8		pF

2.2 Dynamic

Table 5. Dynamic

Symbol	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	V_{DD} = 28 V, I_{DQ} = 300 mA, P_{IN} = 1 W, f = 960 MHz	45	59	-	W
G_{PS}	V_{DD} = 28 V, I_{DQ} = 300 mA, P_{IN} = 1 W, f = 960 MHz	16.5	17.5		dB
h_D	V_{DD} = 28 V, I_{DQ} = 300 mA, P_{IN} = 1 W, f = 960 MHz	60	65		%
Load mismatch	V_{DD} = 28 V, I_{DQ} = 300 mA, P_{IN} = 1 W, f = 960 MHz All phase angles	10:1			VSWR

2.3 ESD protection characteristics

Table 6. ESD protection characteristics

Test conditions	Class
Human body model	2
Machine model	M3

2.4 Moisture sensitivity level

Table 7. Moisture sensitivity level

Test conditions	Rating
J-STD-020B	MSL 3

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

Table 8. 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: Resin protrusions not included (max value: 0.15 mm per side)

Figure 2. Package dimensions

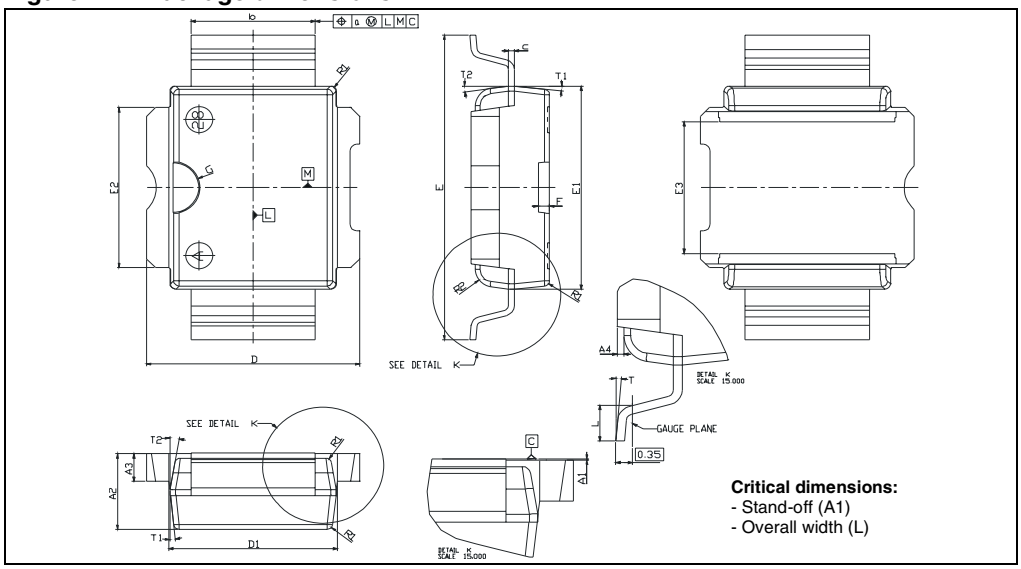


Table 9. PowerSO-10RF straight lead mechanical data

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

Figure 3. Package dimensions

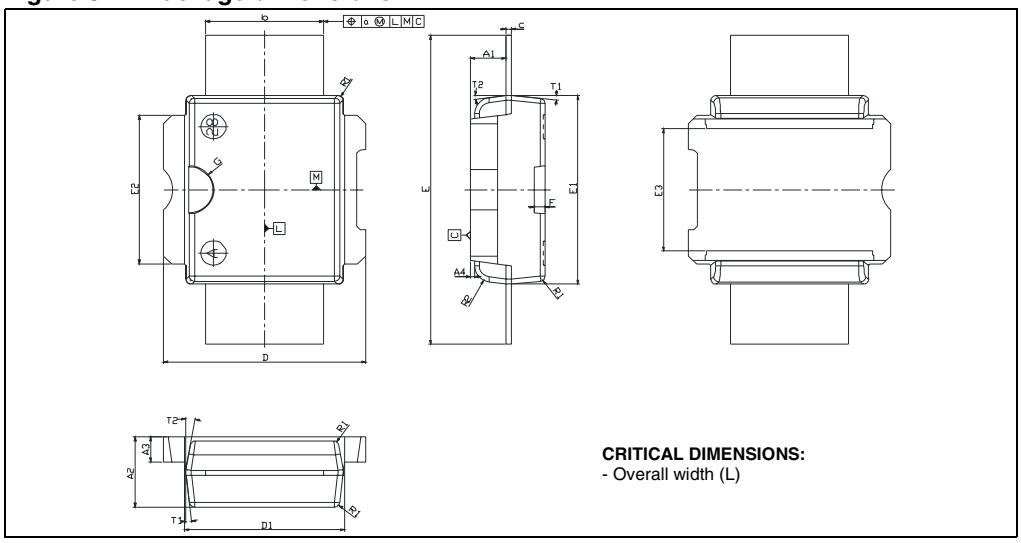


Figure 4. Tube information

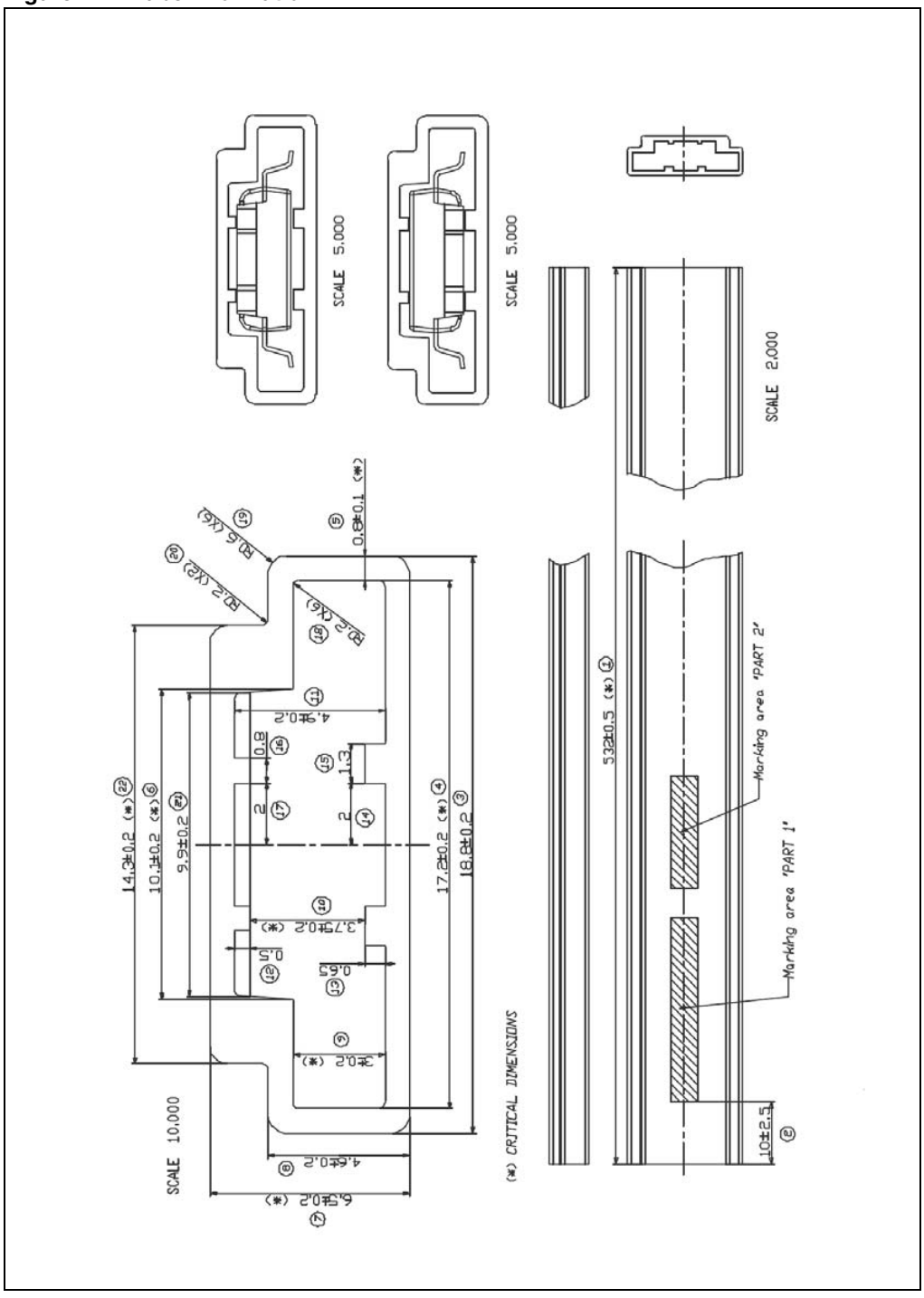
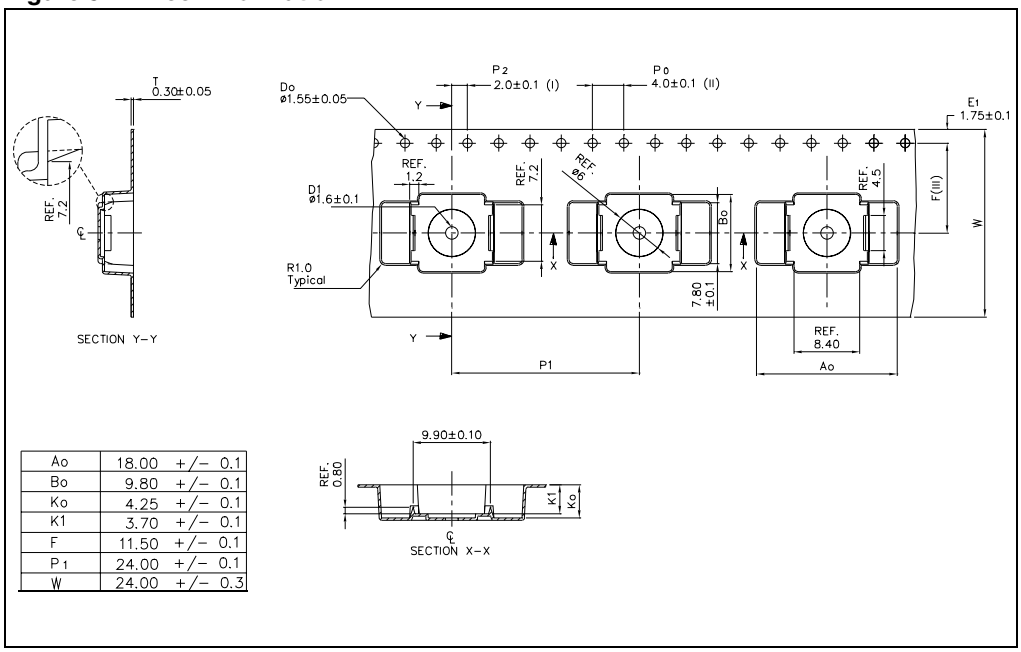


Figure 5. Reel information



Ao	18.00	+/−	0.1
Bo	9.80	+/−	0.1
Ko	4.25	+/−	0.1
K1	3.70	+/−	0.1
F	11.50	+/−	0.1
P1	24.00	+/−	0.1
W	24.00	+/−	0.3

4 Revision history

Table 10. Document revision history

Date	Revision	Changes
10-Apr-2009	1	Initial release

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