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LET9060

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

Preliminary data

Features

- Excellent thermal stability
- Common source configuration
- $P_{OUT} = 60\text{ W}$ with 17.2 dB gain @ 960 MHz / 28 V
- New RF plastic package

Description

The LET9060 is a common source N-channel, enhancement-mode lateral field-effect RF power MOSFET. It is designed for high gain, broadband, commercial and industrial applications. It operates at 28 V in common source mode at frequencies of up to 1 GHz. LET9060 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. LET9060'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.

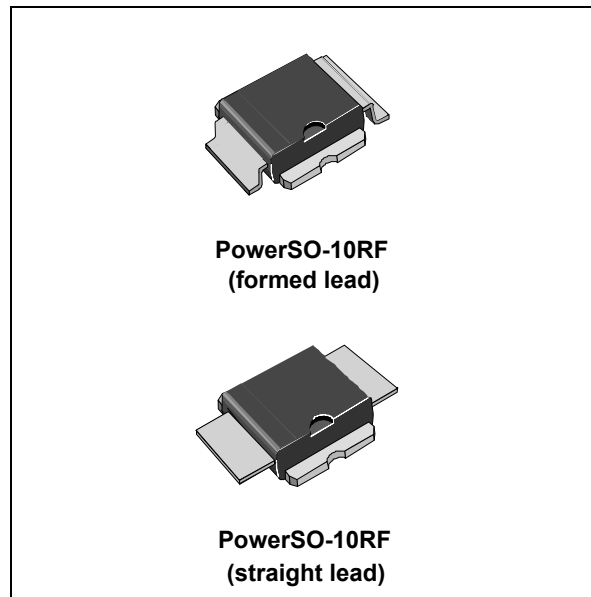


Figure 1. Pin connection

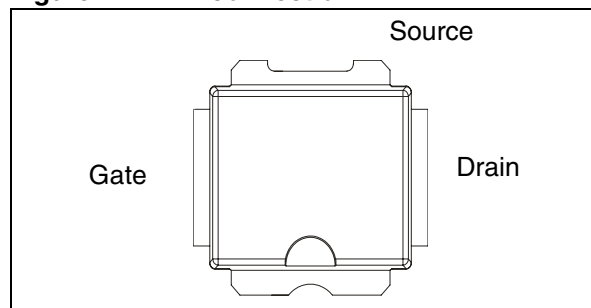


Table 1. Device summary

Order codes	Packages	Marking	Packaging
LET9060	PowerSO-10RF (formed lead)	LET9060	Tube
LET9060S	PowerSO-10RF (straight lead)	LET9060S	Tube
LET9060TR	PowerSO-10RF (formed lead)	LET9060	Tape and reel
LET9060STR	PowerSO-10RF (straight lead)	LET9060S	Tape and reel

1 Maximum ratings

$T_{CASE} = 25\text{ °C}$.

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	12	A
P_{DISS}	Power dissipation (@ $T_C = 70\text{ °C}$)	95	W
T_J	Max. operating junction temperature	165	°C
T_{STG}	Storage temperature	-65 to +150	°C

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R_{thJC}	Junction-case thermal resistance	1.0	°C/W

2 Electrical characteristics

$T_C = 25\text{ }^\circ\text{C}$

Table 4. Static

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}; I_{DS} = 10\text{ mA}$	80			V
I_{DSS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}$			1	μA
I_{GSS}	$V_{GS} = 5\text{ V}; V_{DS} = 0\text{ V}$			1	μA
$V_{GS(Q)}$	$V_{DS} = 28\text{ V}; I_D = 100\text{ mA}$	2.0		5.0	V
$V_{DS(ON)}$	$V_{GS} = 10\text{ V}; I_D = 3\text{ A}$		0.8	1.2	V
G_{FS}	$V_{DS} = 10\text{ V}; I_D = 3\text{ A}$	2.5			mho
C_{ISS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$		77		pF
C_{OSS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$		39		pF
C_{RSS}	$V_{GS} = 0\text{ V}; V_{DS} = 28\text{ V}; f = 1\text{ MHz}$		1.2		pF

Table 5. Dynamic

Symbol	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	$V_{DD} = 28\text{ V}; I_{DQ} = 300\text{ mA}; f = 960\text{ MHz}$	60	80	-	W
G_{PS}	$V_{DD} = 28\text{ V}; I_{DQ} = 300\text{ mA}; P_{OUT} = 60\text{ W}; f = 960\text{ MHz}$	16	17.2	-	dB
η_D	$V_{DD} = 28\text{ V}; I_{DQ} = 300\text{ mA}; P_{IN} = 2\text{ W}; f = 960\text{ MHz}$	60	70	-	%
Load mismatch	$V_{DD} = 28\text{ V}; I_{DQ} = 300\text{ mA}; P_{OUT} = 60\text{ W}; f = 960\text{ MHz}$ All phase angles		20:1		VSWR

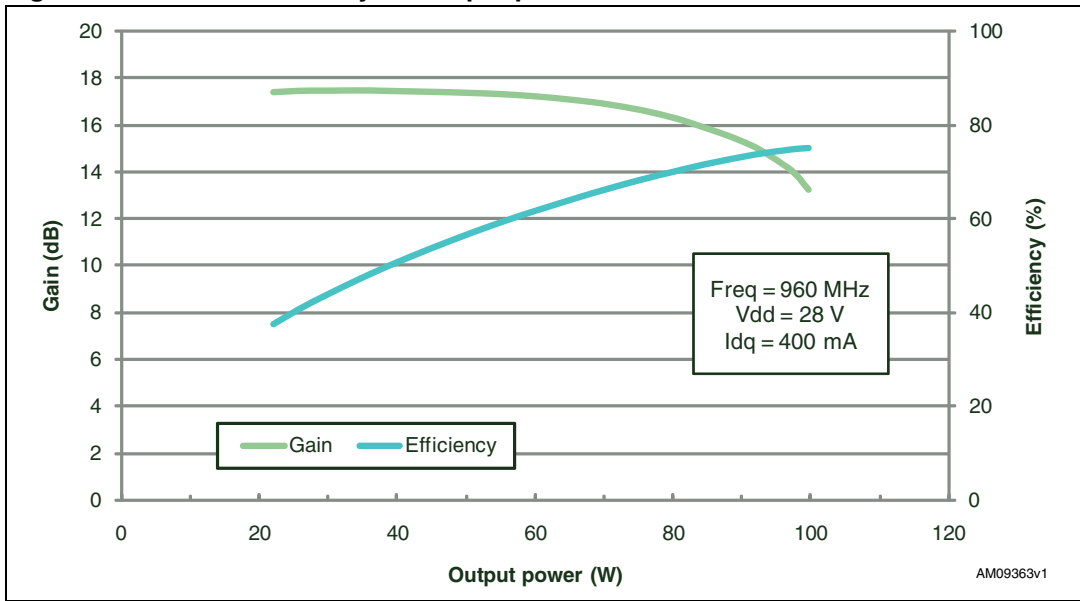
Table 6. ESD protection characteristics

Test conditions	Class
Human body model	2
Machine model	M3

Table 7. Moisture sensitivity level

Test conditions	Rating
J-STD-020B	MSL 3

Figure 2. Gain & efficiency vs. output power



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 3. Package dimensions

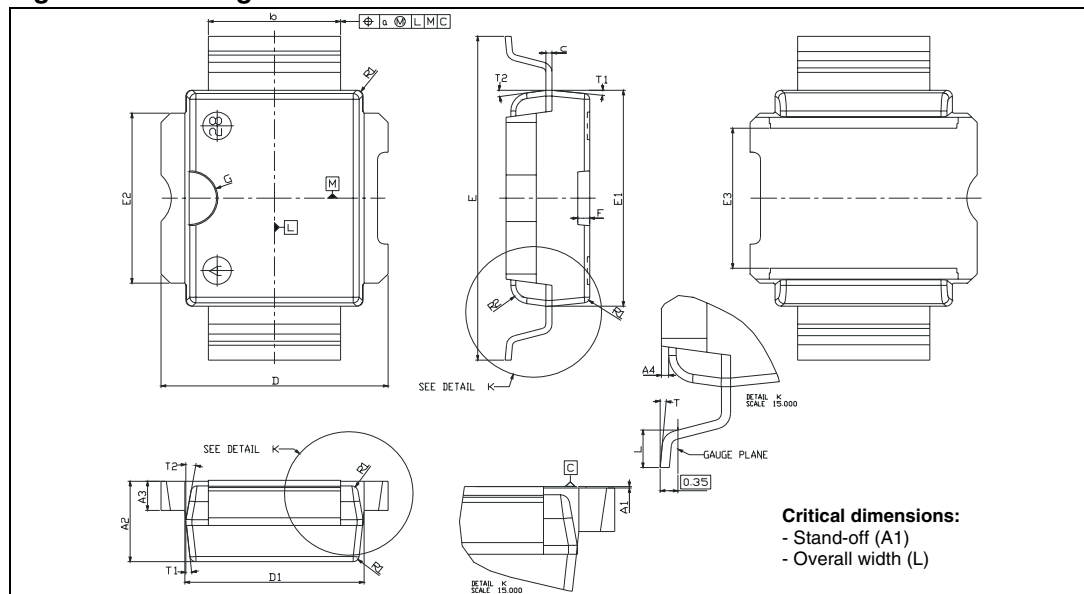


Table 9. PowerSO-10RF straight lead mechanical data

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 4. Package dimensions

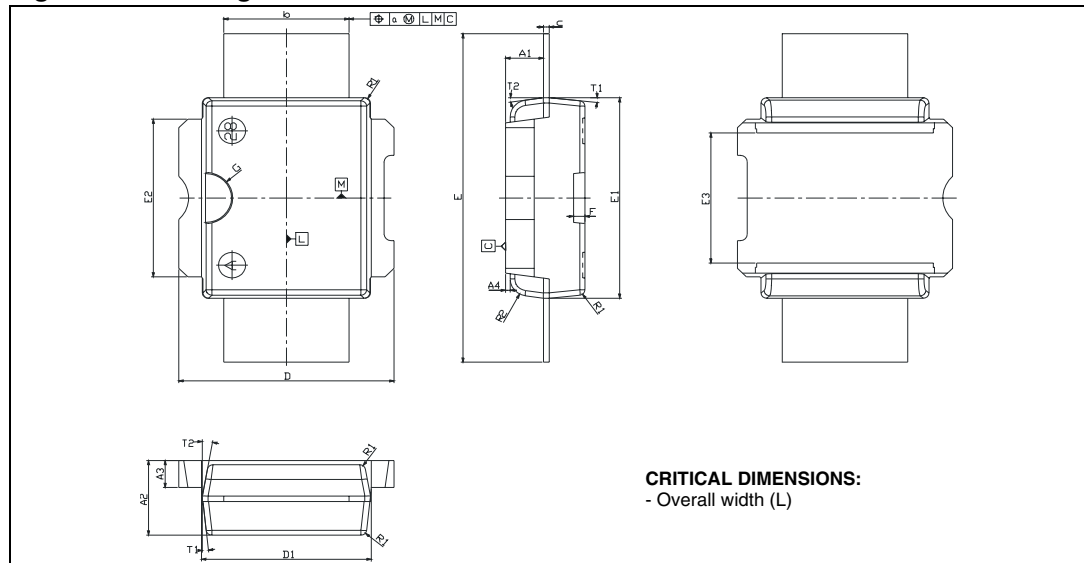


Figure 5. Tube information

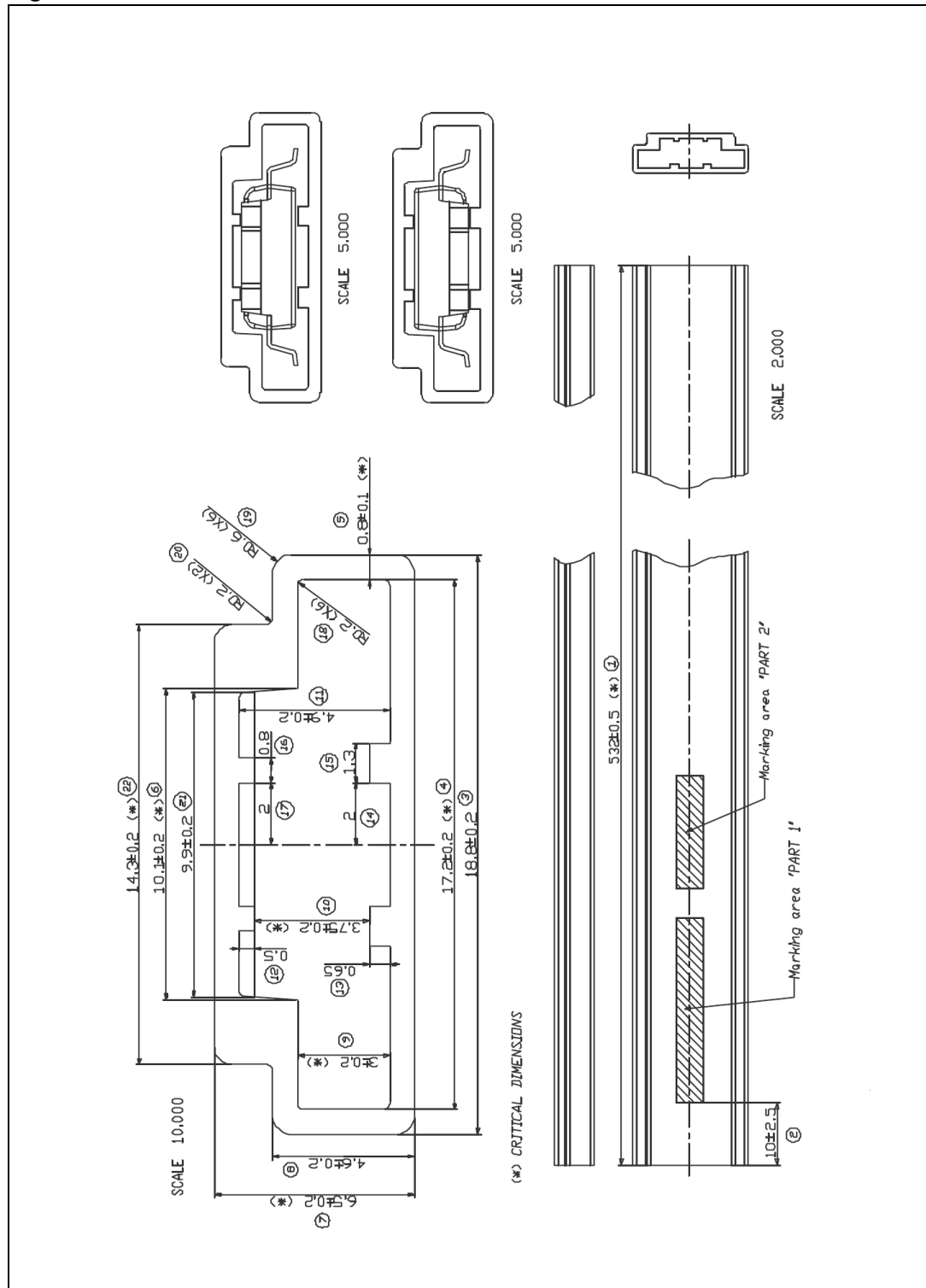
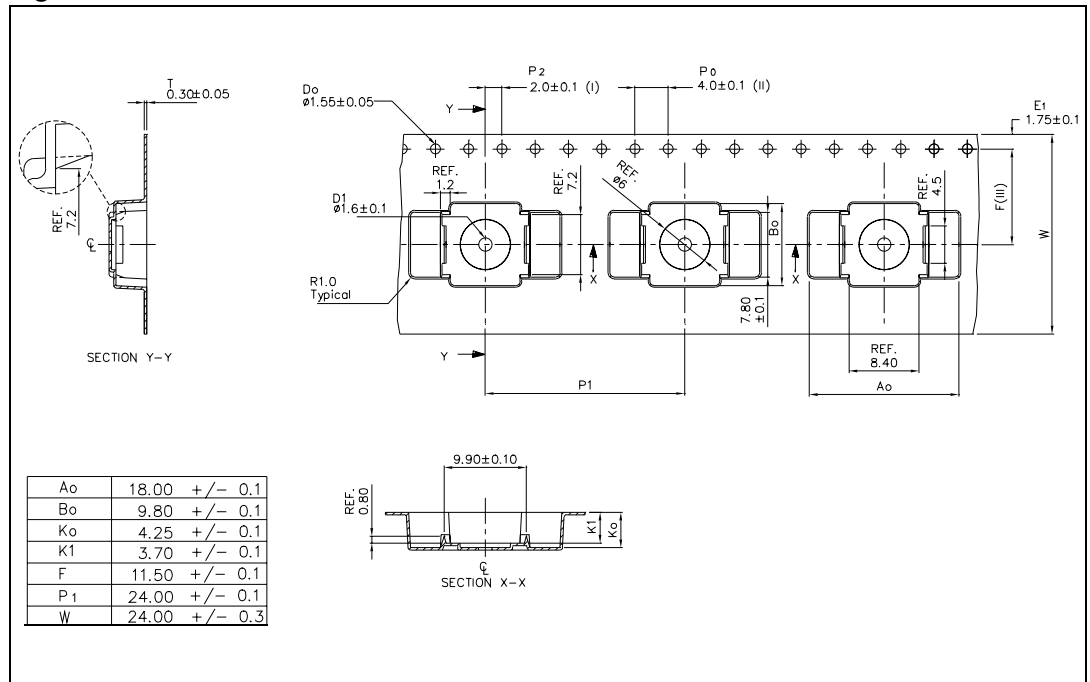


Figure 6. Reel information



4 Revision history

Table 10. Document revision history

Date	Revision	Changes
24-Feb-2011	1	Initial release.

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