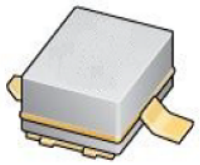
10 W, 28 V RF Power LDMOS transistor from HF to 1.6 GHz



MM

Features

Order code	F_{REQ}	V_{DD}	P_{OUT} (typ.)	Gain	N_D
ST16060	930 MHz	28 V	12 W	21 dB	63%

- High efficiency and linear gain operations
- Integrated ESD protection
- Large positive and negative gate / source voltage range
- In compliance with the 2002/95/EC European directive

Applications

- Telecom and wideband communication
- Industrial, scientific and medical
- Avionics

Description

The ST16010 is a 10 W, 28 V LDMOS transistor designed for wideband radio, Avionics and ISM applications at frequencies up to 1.6 GHz.

Product status link
ST16010

Product summary	
Order code	ST16010
Marking	ST16010
Package	MM

1 Electrical ratings

Table 1. Absolute maximum ratings

Symbol	Parameter	Value	Unit
BV_{DSS}	Drain-source voltage	90	V
V_{GS}	Gate-source voltage	-8 / +10	V
V_{DD}	Drain voltage operating voltage	32	V
T_{STG}	Storage temperature range	-65 to +150	°C
T_J	Junction temperature	+200	°C

Table 2. Thermal data

Symbol	Parameter	Value	Unit
$R_{thj\text{-}case}$	Thermal resistance junction-case, T_J = +200 °C, DC test	3	°C/W

Table 3. ESD protection

Symbol	Parameter	Class
HBM	Human body model (per JESD22-A114)	2

2 Electrical characteristics

(T_C= 25 °C unless otherwise specified).

Table 4. Static (per side)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source breakdown voltage	V_{GS}= 0 V, I_D= 1 mA	90			V
I_{DSS}	Zero-gate voltage drain current	V_{GS}= 0 V, V_{DS}= 75 V			1	µA
I_{GSS}	Gate-body leakage current	V_{DS}= 0 V, V_{GS}= 10 V			250	nA
$V_{GS(th)}$	Gate threshold voltage	V_{DS}= 10 V, I_D= 50 µA		2.1		V
$V_{DS(on)}$	Static drain-source on-resistance	V_{GS}= 1 V, I_D= 0.1 A		0.11		V
G_{fs}	Transconductance	V_{DS}= 10 V, I_D= 1 A		1		S
C_{iss}	Common source input capacitance	V_{GS}= 0 V, V_{DD}= 28 V, F_{REQ} = 1 MHz		15		pF
C_{oss}	Common source output capacitance			5.7		
C_{rss}	Common source feedback capacitance			0.4		

Table 5. Dynamic

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
P_{OUT}	Output power	V_{DD}= 28 V, I_{DQ} = 0.1 A, F_{REQ} = 930 MHz, P_{in} = 0.095 W, PW = 10 µs, DC = 10%	-	12	-	W
Gain	Power gain		-	21	-	dB
Efficiency	Drain efficiency		-	63		%
IMD3	3rd order intermodulation		-	TBD	-	dBc
VSWR	Load mismatch	@ P_{OUT} = 10 W all phases	-	20:1	-	

Table 6. Dynamic

Frequency (MHz)	Input impedance Z_{IN}	Drain load impedance Z_{DL}
700	TBD	TBD
1000		
1500		
2000		
2500		
3000		
3600		

2.1 Electrical characteristics (curves)

Figure 1. Power gain and efficiency versus output power (f =930MHz, V_{DD}= 28V, I_{DQ}= 0.1A)

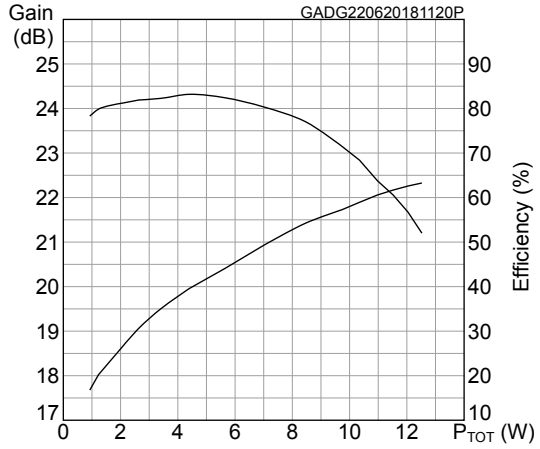


Figure 2. Capacitances versus drain - source voltage

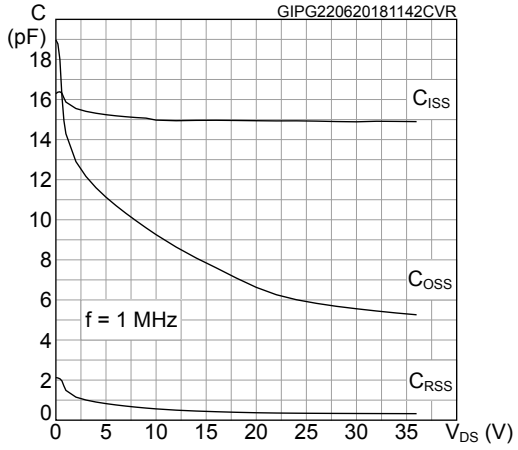
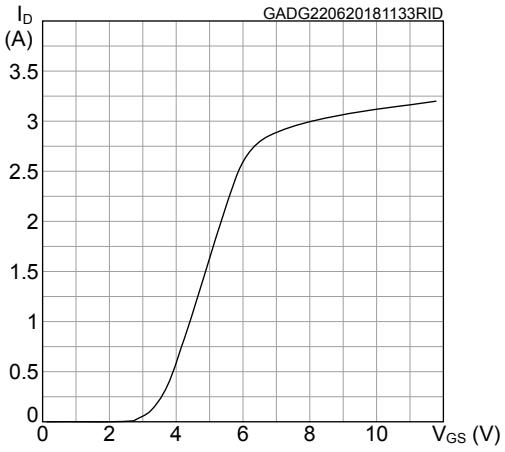
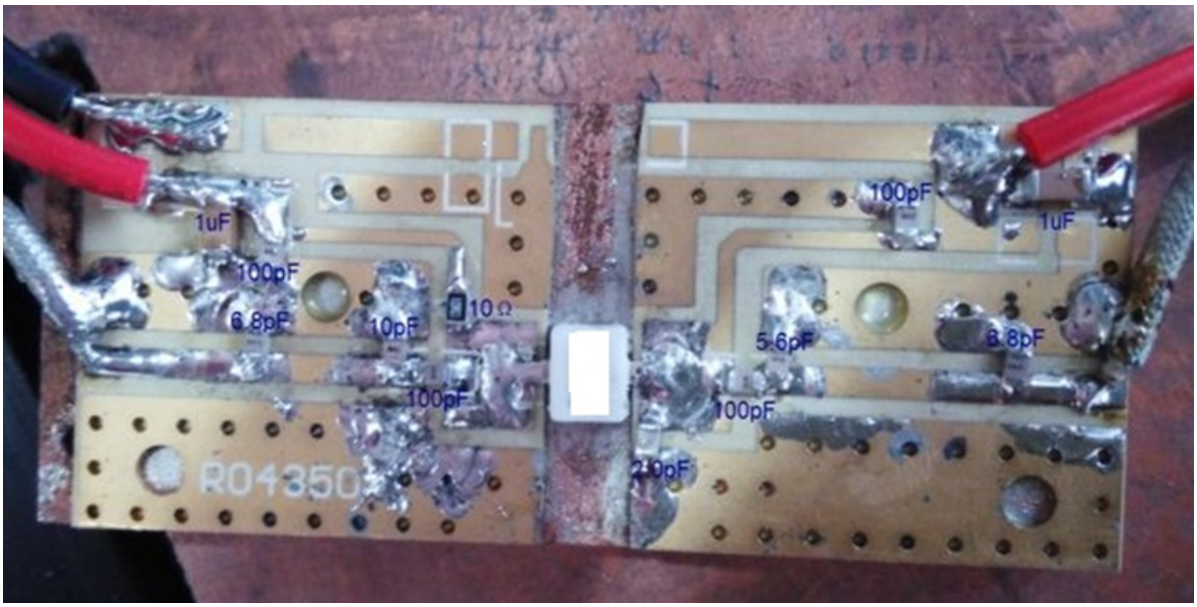


Figure 3. Drain - source current versus gate - source voltage (V_{DS} = 10V)



3 Test circuits

Figure 4. Circuit layout



4 Package information

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.

4.1 0.2x0.16 2L gull wing MM package information

Figure 5. 0.2x0.16 2L gull wing MM package outline

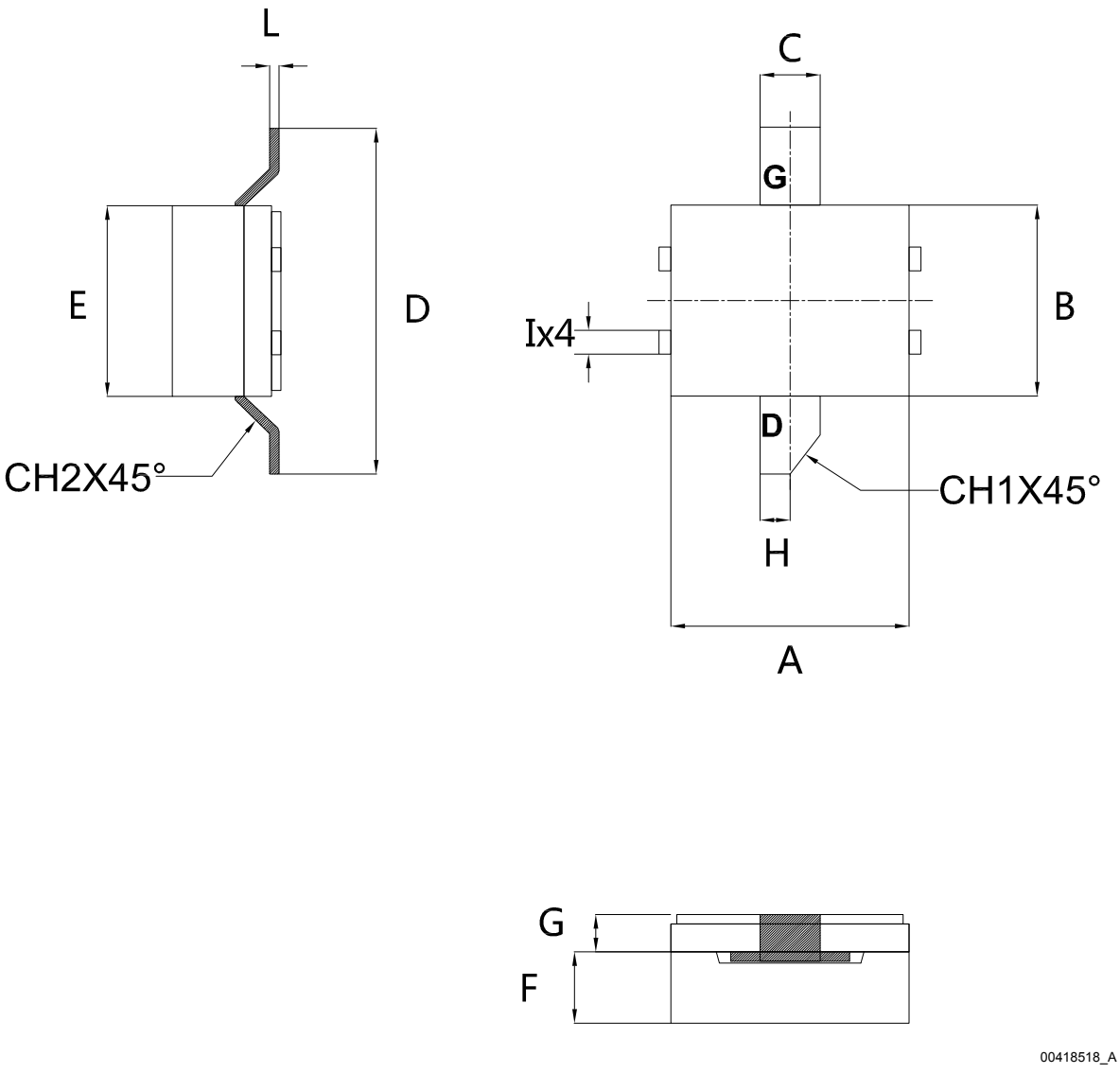


Table 7. 0.2x0.16 2L gull wing MM package mechanical data

Dim.	mm		
	Min.	Typ.	Max.
A	3.81	5.080	6.35
B	3.937	4.064	4.191
C	1.152	1.279	1.406
D	7.237	7.364	7.491
E	0.178	0.203	0.228
F	1.397	1.524	1.651
G	0.655	0.792	0.919
H	0.521	0.639	0.766
I	0.381	0.508	0.636
CH1		0.639	
CH2			0.762

Revision history

Table 8. **Document revision history**

Date	Version	Changes
22-Jun-2018	1	Initial release.
11-Oct-2018	2	Updated features in cover page.

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