STAP85035

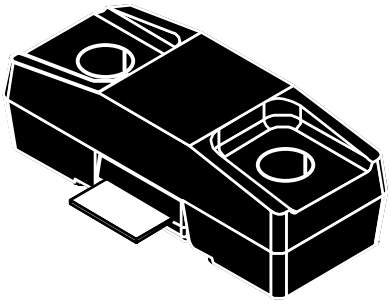
RF power transistor, LdmoST plastic family N-channel enhancement-mode lateral MOSFETs

Features

- Excellent thermal stability
- Common source configuration
- P_{OUT} = 35 W with 14.9 dB gain @ 870 MHz / 13.6 V
- Plastic package
- ESD protection
- In compliance with the 2002/95/EC European directive

Description

The STAP85035 is a common source N-channel, enhancement-mode lateral field-effect RF power transistor. It is designed for high gain, broadband commercial and industrial applications. It operates at 13.6 V in common source mode at frequencies of up to 1 GHz. STAP85035 boasts the excellent gain, linearity and reliability of ST's latest LDMOS technology mounted in STAP ST Advanced PowerSO-10RF package. STAP85035's superior linearity performance makes it an ideal solution for car mobile radio. The STAP plastic package was designed to offer high reliability and high power capability.
It has been specially optimized for RF needs and offers excellent RF performances and ease of assembly.



STAP1

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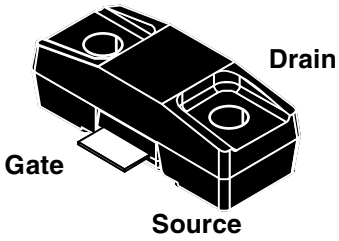
Figure 1. Pin connection



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Contents

1 Electrical data

1.1 Maximum ratings

Table 2. Absolute maximum ratings (T_{CASE} = 25 °C)

Symbol	Parameter	Value	Unit
$V_{(BR)DSS}$	Drain-source voltage	40	V
V_{GS}	Gate-source voltage	-0.5 to +15	V
I_D	Drain current	8	A
P_{DISS}	Power dissipation (@ T_C = 70 °C)	95	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	1.0	°C/W

2 Electrical characteristics

T_{CASE} = +25 °C

2.1 Static

Table 4. Static

Symbol	Test conditions			Min	Typ	Max	Unit
I_{DSS}	V_{GS} = 0 V	V_{DS} = 25 V				1	µA
I_{GSS}	V_{GS} = 5 V	V_{DS} = 0 V				1	µA
V_{TH}	I_D = 250 mA			2		5	V
$V_{DS(ON)}$	V_{GS} = 10 V	I_D = 3 A			0.64	0.7	V
C_{ISS}	V_{GS} = 0 V	V_{DS} = 12.5 V	f = 1 MHz		76		pF
C_{OSS}	V_{GS} = 0 V	V_{DS} = 12.5 V	f = 1 MHz		45		pF
C_{RSS}	V_{GS} = 0 V	V_{DS} = 12.5 V	f = 1 MHz		1.4		pF

2.2 Dynamic

Table 5. Dynamic

Symbol	Test conditions		Min	Typ	Max	Unit
P3dB	V_{DD} = 13.6 V, I_{DQ} = 350 mA	f = 870 MHz	35	40	-	W
G_P	V_{DD} = 13.6 V, I_{DQ} = 350 mA, P_{OUT} = 15 W, f = 870 MHz		15	17		dB
h_D	V_{DD} = 13.6 V, I_{DQ} = 350 mA, P_{OUT} = P3dB, f = 870 MHz		60	72		%
Load mismatch	V_{DD} = 17 V, I_{DQ} = 350 mA, P_{OUT} = 50 W, f = 870 MHz All phase angles		20:1			VSWR

2.3 ESD protection characteristics

Table 6. ESD protection characteristics

Test conditions	Class
Human body model	2
Machine model	M3

3 Impedance

Figure 2. Current conventions

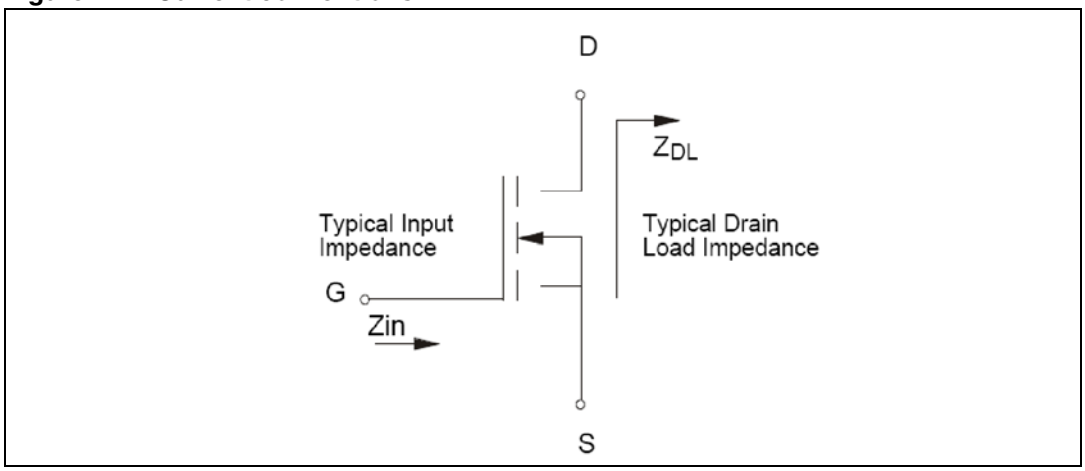


Table 7. Impedance data

Frequency (MHz)	Z_{IN} (Ω)	Z_{DL}(Ω)
870 MHz	0.57 + j 0.73	1.73 - j 0.15

4 Typical performances

Figure 3. Threshold voltage

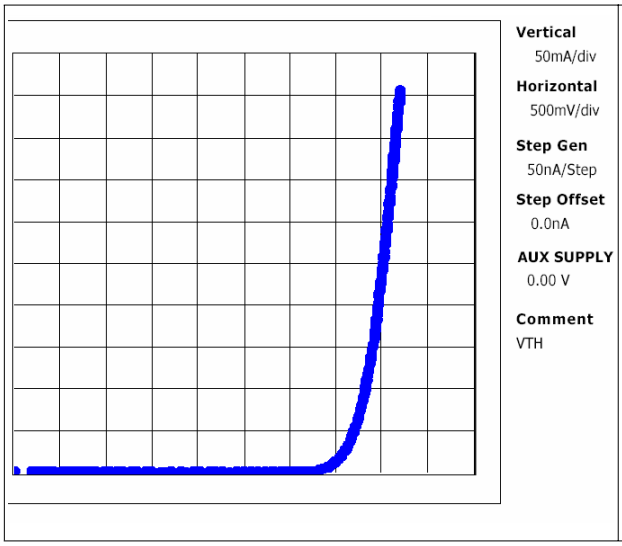


Figure 4. DC output characteristic

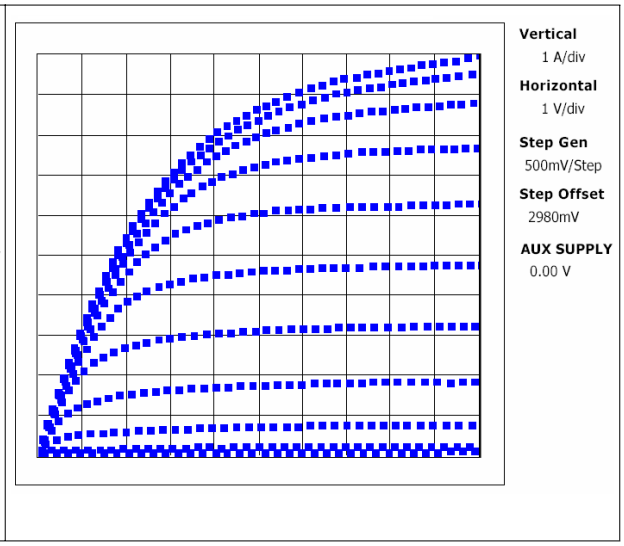


Figure 5. I_D vs V_{GS}

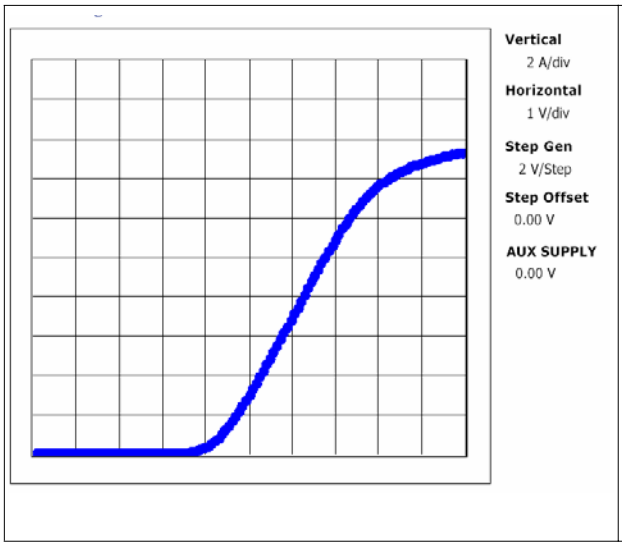


Figure 6. Capacitances vs voltage

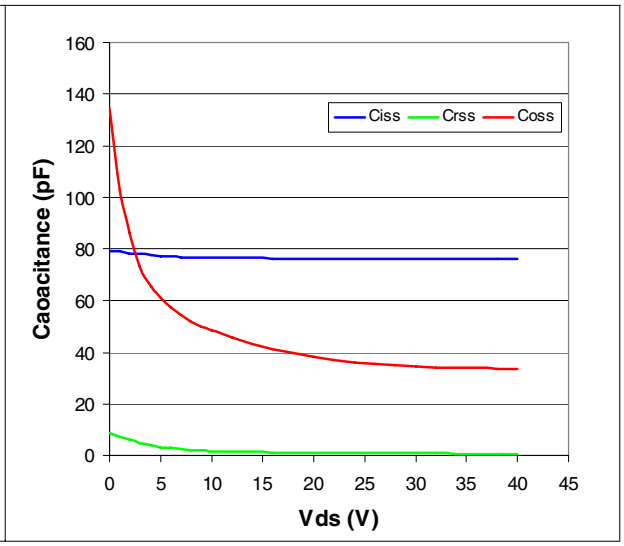


Figure 7. Pout and Id vs V_{GS}

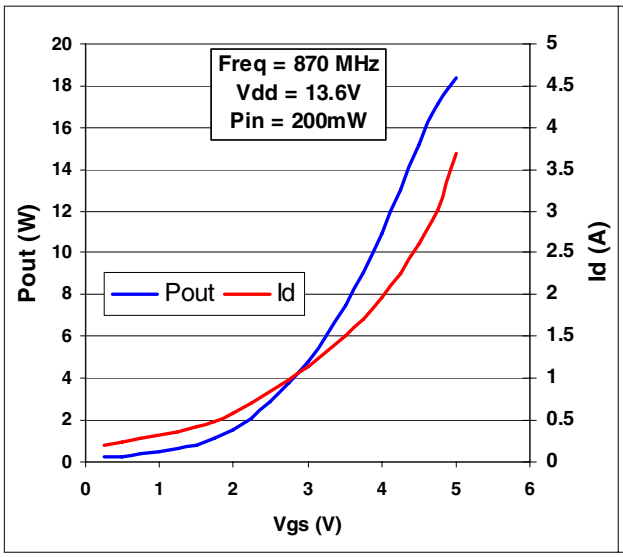


Figure 8. Pout and Id vs V_{GS}

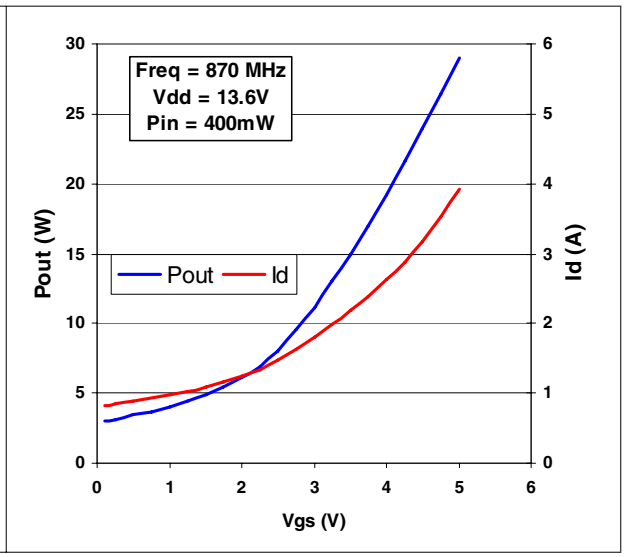


Figure 9. Gain vs Pout and bias current

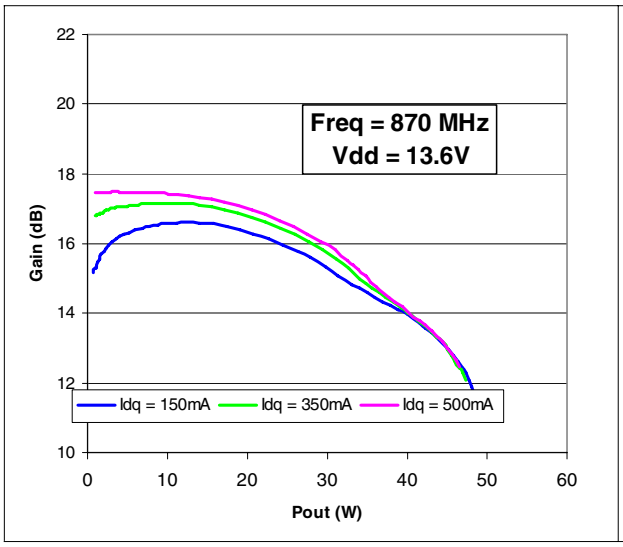


Figure 10. Gain and efficiency vs Pout

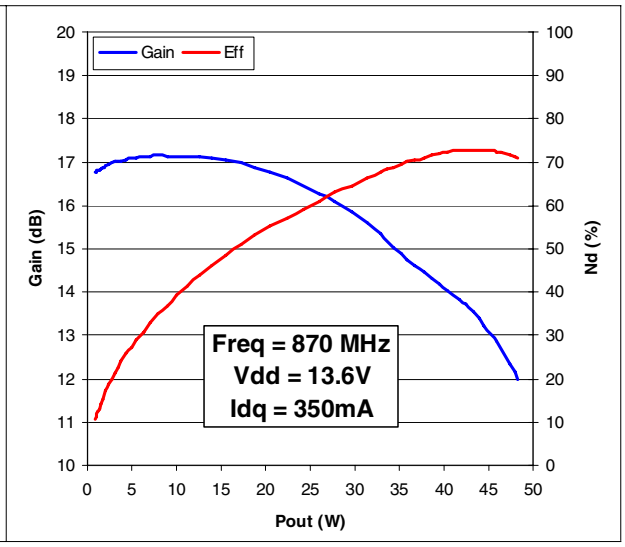


Figure 11. Pout and Id vs supply voltage

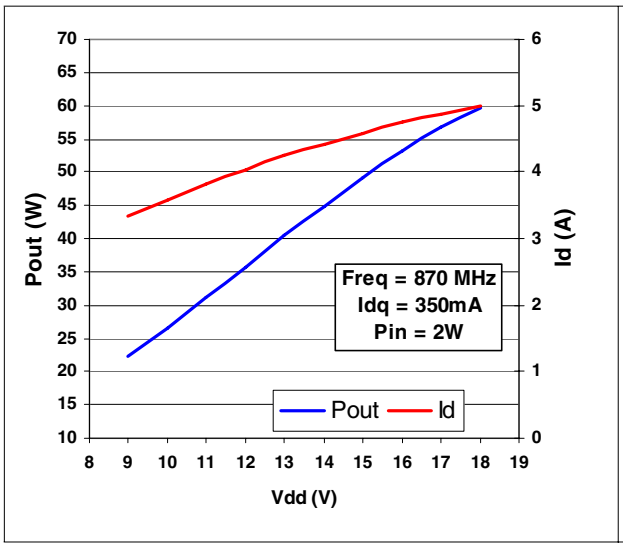
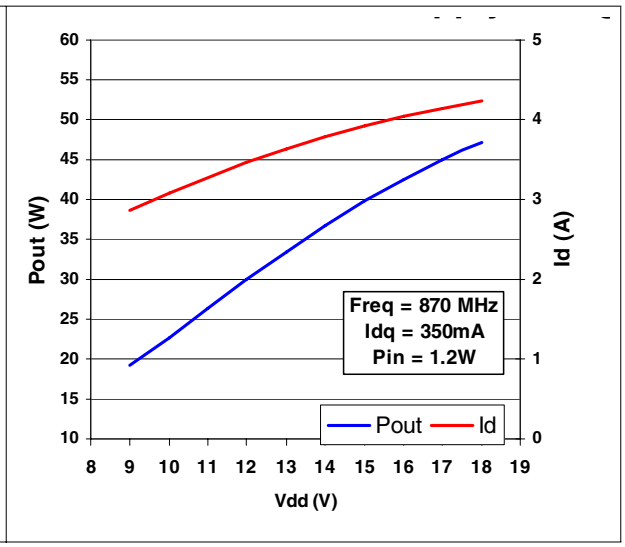


Figure 12. Pout and Id vs supply voltage



5 ECOPACK®

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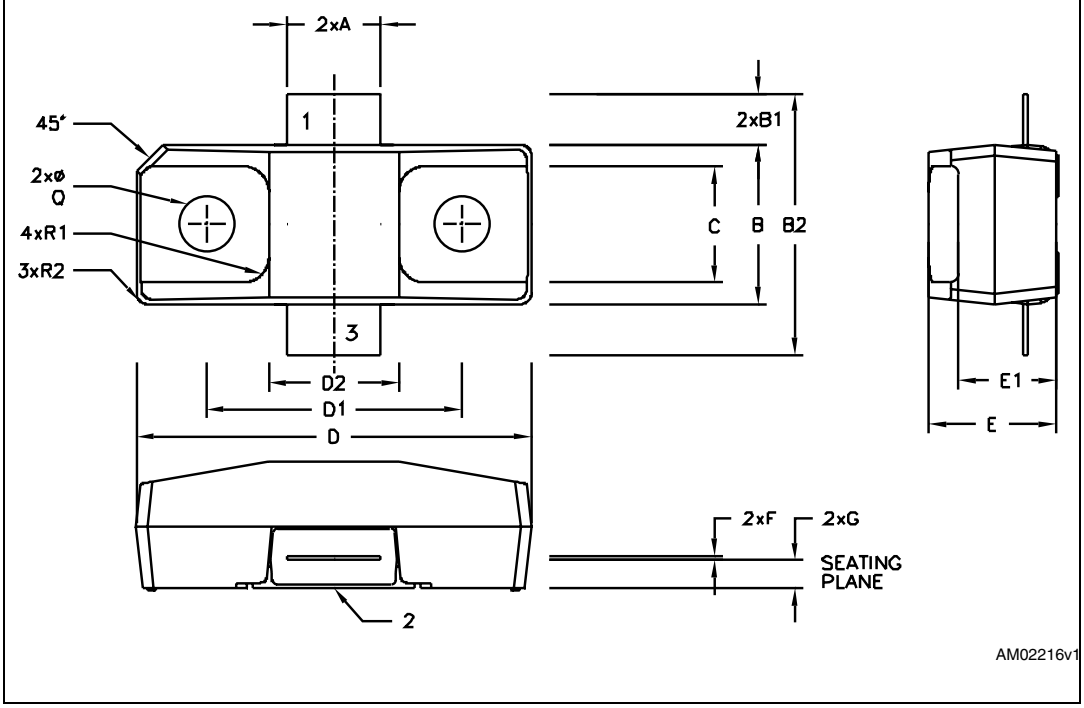
ECOPACK® is an ST trademark.

Table 8. STAP1 mechanical data

Dim.	mm.		Inch	
	Min	Max	Min	Max
A	5.40	5.65	0.212	0.222
B	9.27	9.53	0.365	0.375
B1	2.90	3.10	0.114	0.122
B2	15.10	15.65	0.594	0.616
C	6.60	6.99	0.260	0.275
D	23.11	23.42	0.910	0.922
D1	14.88	15.19	0.586	0.598
D2	7.52	7.82	0.296	0.308
E	7.42	7.57	0.292	0.298
E1	5.69	5.84	0.224	0.230
F	0.21	0.31	0.008	0.012
G	1.62	1.72	0.064	0.068
Q	3.15	3.30	0.124	0.130
R1	1.52		0.060	
R2	0.64		0.025	

Figure 13. Package dimensions



6 Revision history

Table 9. Document revision history

Date	Revision	Changes
01-Apr-2009	1	Initial release
07-Jul-2009	2	Deleted moisture sensitivity level table on page 4

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