

High-Power Packaged GaAs FET

Description

The CLY2 is a high-breakdown voltage GaAs FET designed for PA driver applications in the 400 MHz to 3 GHz frequency range. It is ideal for portable PA applications in mobile phones and portable WLAN transceivers due to its easy matching and excellent linearity. The CLY2 exhibits +23.5 dBm output power with +3V V_{ds} at 1.8 GHz with an associated gain of 14.5 dB. Power added efficiencies to 55% are achievable.

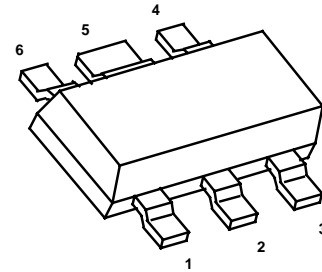
Features

- For frequencies up to 3 GHz
- Wide operating voltage range: 2 to 6 V
- P_{OUT} 23.5 dBm typical at V_D=3V, f=1.8GHz
- High efficiency: better than 55 %
- Nfmin 0.79 dB typical at 900 MHz
- Low Cost

Applications

- Power Amplifiers for WLAN transceivers
- Driver Amplifiers for WLAN or mobile phone basestations
- Low Noise Amplifier for basestations and antenna amplifiers

Package Outline, MW6



Pin Configuration:

- 1 & 6: Gate
- 2 & 5: Source
- 3 & 4: Drain

CLY2 Datasheet

Maximum Ratings

Parameter	Symbol	Values	Unit
Drain-source voltage	V_{DS}	9	V
Drain-gate voltage	V_{DG}	12	V
Gate-source voltage	V_{GS}	-6	V
Drain current	I_D	600	mA
Channel temperature	T_{Ch}	150	°C
Storage temperature	T_{stg}	-55...+150	°C
Total power dissipation ($T_s \leq 50$ °C) ¹⁾	P_{tot}	900	mW

Thermal Resistance

Channel-soldering point ¹⁾	R_{thChS}	≤ 110	K/W
---------------------------------------	-------------	------------	-----

¹⁾ T_s : Temperature at soldering point

Electrical Characteristics

($T_A = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	min	typ	max	Unit
Drain-source saturation current $V_{DS} = 3\text{ V}$ $V_{GS} = 0\text{ V}$	I_{DSS}	300	450	650	mA
Drain-source pinch-off current $V_{DS} = 3\text{ V}$ $V_{GS} = -3.8\text{ V}$	I_D	-	5	50	μA
Gate pinch-off current $V_{DS} = 3\text{ V}$ $V_{GS} = -3.8\text{ V}$	I_G	-	5	20	μA
Pinch-off Voltage $V_{DS} = 3\text{ V}$ $I_D = 50\mu\text{A}$	$V_{GS(p)}$	-3.8	-2.8	-1.8	V
Small Signal Gain*) $V_{DS} = 5\text{ V}$ $I_D = 180\text{ mA}$ $f = 1.8\text{ GHz}$ $P_{in} = -5\text{ dBm}$	G	-	15.5	-	dB
Small Signal Gain*) $V_{DS} = 3\text{ V}$ $I_D = 180\text{ mA}$ $f = 1.8\text{ GHz}$ $P_{in} = -5\text{ dBm}$	G	-	14.5	-	dB
Output Power $V_{DS} = 3\text{ V}$ $I_D = 180\text{ mA}$ $f = 1.8\text{ GHz}$ $P_{in} = 10\text{ dBm}$	P_O	22.5	23.5	-	dBm

CLY2 Datasheet

Electrical Characteristics (cont)

1dB-Compression Point $V_{DS} = 3\text{ V}$ $I_D = 180\text{ mA}$ $f = 1.8\text{ GHz}$	P_{1dB}	-	23.5	-	dBm
1dB-Compression Point $V_{DS} = 5\text{ V}$ $I_D = 180\text{ mA}$ $f = 1.8\text{ GHz}$	P_{1dB}	-	27.0	-	dBm
Power Added Efficiency $V_{DS} = 3\text{ V}$ $I_D = 180\text{ mA}$ $f = 1.8\text{ GHz}$ $P_{in} = 10\text{ dBm}$	PAE	-	55	-	%
Noise figure $V_{DS} = 3\text{ V}$ $I_D = 180\text{ mA}$ $f = 1.8\text{ GHz}$	NF		1.48		dB

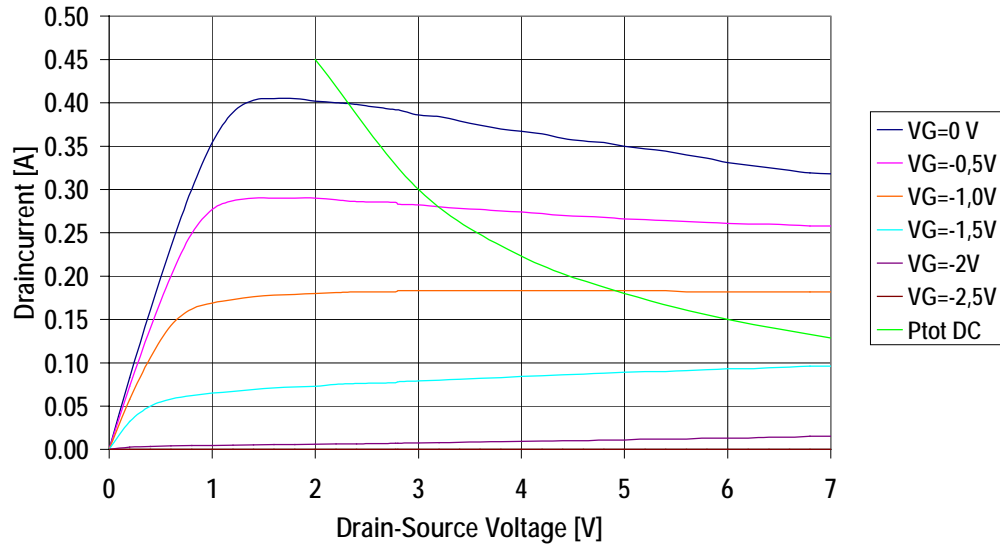
*) Matching conditions for maximum small signal gain (not identical with power matching conditions!)

**) Power matching conditions: $f=1.8\text{GHz}$:

Source Match: Γ_{ms} : MAG = 0.74, ANG 132°; Load Match: Γ_{ml} : ;MAG 0.61, ANG -153°

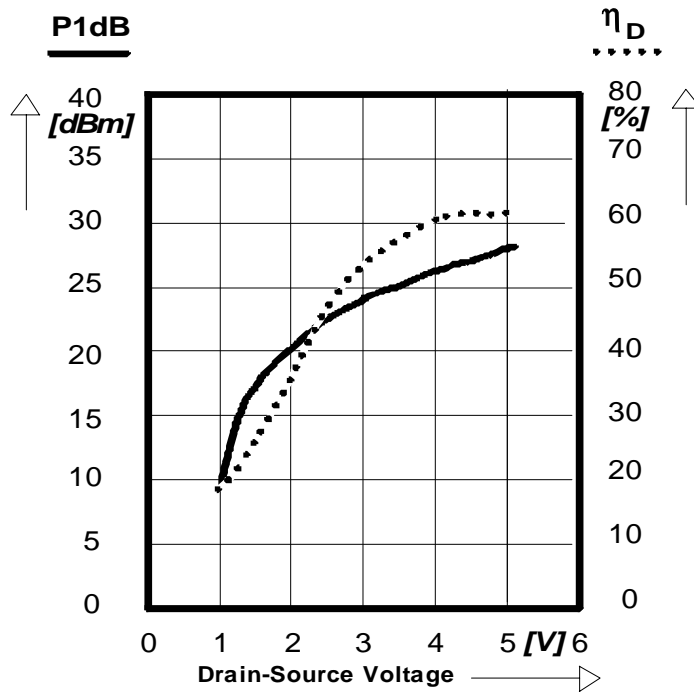
Electrical Characteristics (cont)

Output characteristics



Compression Power vs. Drain-Source Voltage

f = 1.8GHz; IDS = 0.5 Idss



Electrical Characteristics (cont)

Typical Common Source S-Parameters and noise data

$V_{DS} = 3 \text{ V}$

$I_D = 180 \text{ mA}$

$Z_0 = 50 \text{ } \Omega$

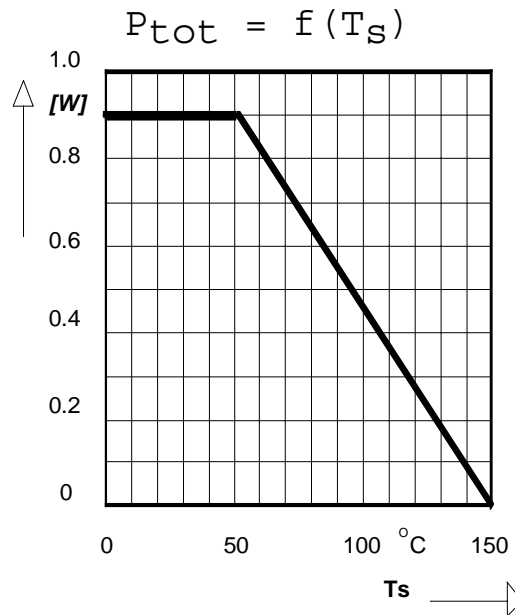
Freq. [GHz]	S11	<S11	S21	<S21	S12	<S12	S22	<S22
100	0.992	-13.3	10.120	170.7	0.008	101.1	0.115	-34.6
200	0.974	-26.4	9.778	162.6	0.014	74.1	0.140	-57.5
300	0.950	-38.6	9.278	154.7	0.021	74.0	0.171	-72.3
400	0.922	-49.5	8.683	147.8	0.025	68.0	0.200	-82.0
500	0.896	-59.1	8.042	141.8	0.031	64.8	0.226	-89.1
600	0.871	-67.1	7.444	137.0	0.033	63.0	0.248	-93.8
700	0.849	-74.0	6.880	132.5	0.036	60.6	0.267	-96.9
800	0.828	-79.9	6.373	129.1	0.038	60.2	0.284	-98.8
900	0.813	-85.0	5.900	125.9	0.039	59.1	0.299	-100.1
1,000	0.800	-89.2	5.485	123.4	0.041	59.5	0.312	-100.4
1,100	0.790	-92.6	5.110	121.3	0.041	59.4	0.323	-100.5
1,200	0.780	-95.5	4.780	119.3	0.043	60.2	0.335	-100.0
1,300	0.773	-97.7	4.498	117.7	0.043	61.6	0.345	-99.3
1,400	0.766	-99.6	4.225	116.2	0.044	62.3	0.354	-98.2
1,500	0.760	-100.9	3.987	115.3	0.045	64.1	0.364	-97.1
1,600	0.754	-102.0	3.769	114.4	0.045	65.9	0.372	-95.7
1,700	0.751	-102.7	3.588	113.6	0.045	67.7	0.380	-94.3
1,800	0.748	-103.3	3.426	112.9	0.046	70.0	0.388	-92.6
1,900	0.743	-103.5	3.268	112.3	0.046	71.8	0.397	-90.9
2,000	0.741	-103.8	3.119	111.7	0.047	74.525	0.404	-89.2

f	F_{min}	Γ_{opt}		R_n	r_n
GHz	dB	MAG	ANG	Ω	-
0.9	0.79	0.564	61	13.4	0.267
1.8	1.47	0.585	99	13.6	0.272

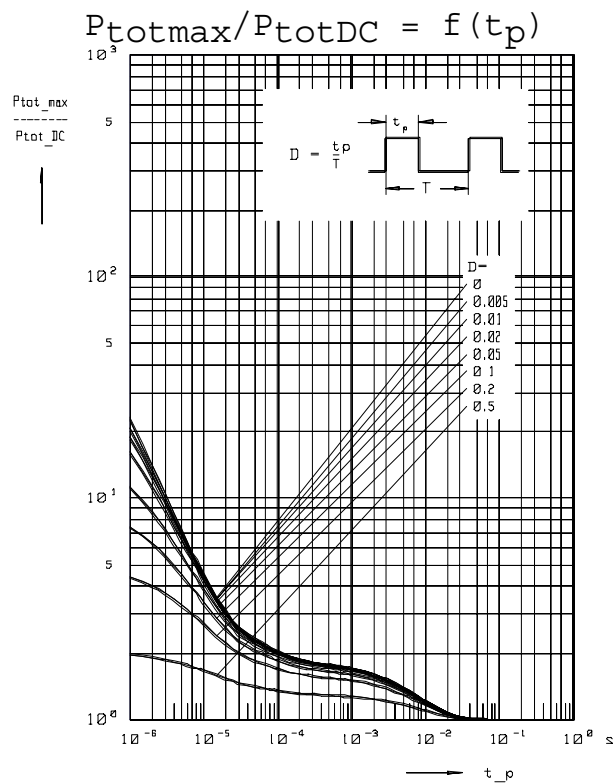
Additional S-Parameter and noise data available on data disc!

Electrical Characteristics (cont)

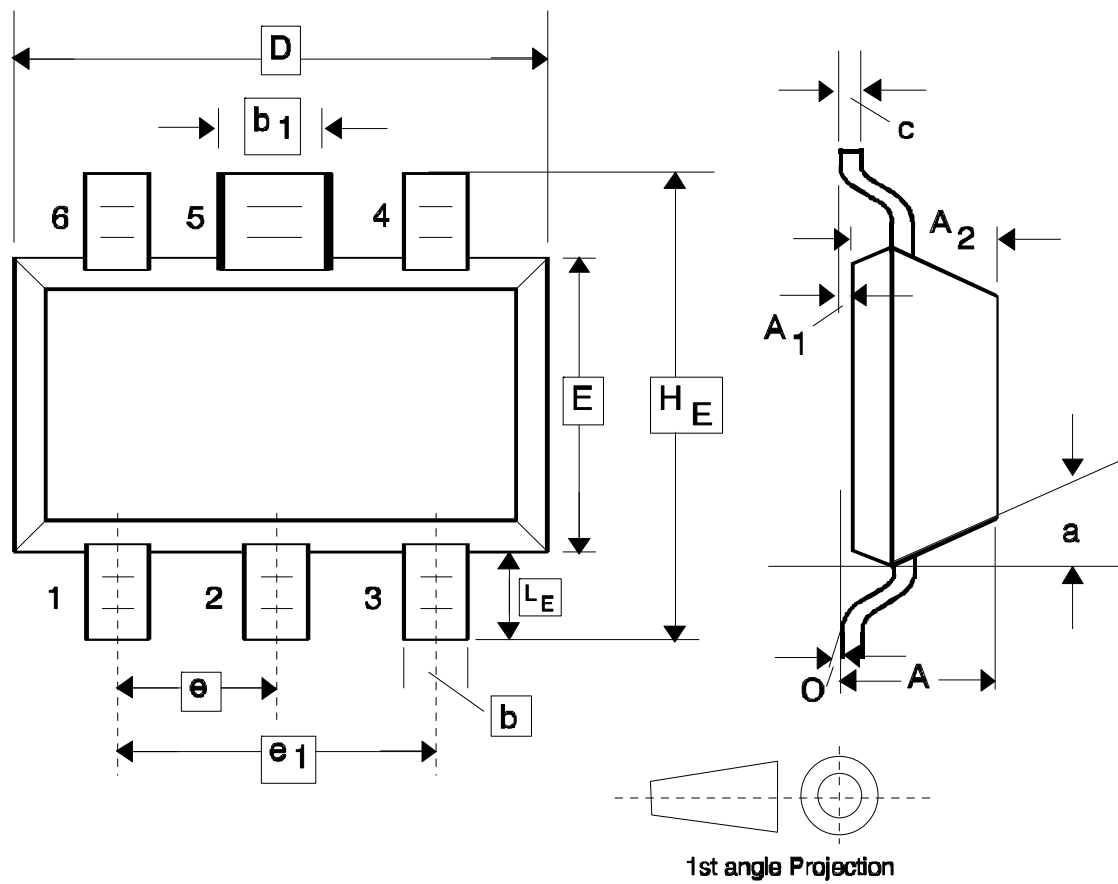
Total Power Dissipation



Permissible Pulse Load



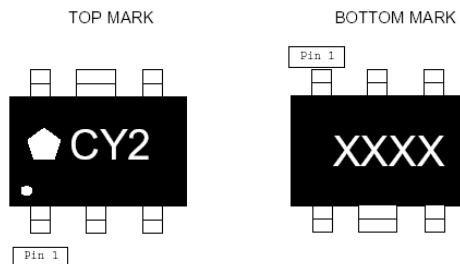
Package Dimensions



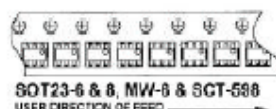
Dim.	min.	nom.	max.	Gradient	Remark
A			1.1		
A ₁			0.1		
A ₂			1.0		
b		0.3			
b ₁		0.6			
c	0.08		0.15		
D	2.8		3.0		
E	1.2		1.4		
e		0.95			
e ₁		1.9			
H _E			2.6		
L _E			0.6		
a				max 10°	1
q				2°...30°	

CLY2 Datasheet

Package Marking



Package Orientation on Reel



Ordering Information

Type	Marking	Pin Configuration						Package 1)
		1	2	3	4	5	6	
CLY 2	CY2	G	S	D	D	S	G	MW 6

Additional Information

This part is compliant with RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

The part is rated Moisture Sensitivity Level 1 at 260°C per JEDEC standard IPC/JEDEC J-STD-020.

ESD: **E**lectro**s**tatic **d**ischarge sensitive device. Observe handling Precautions.

For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: www.triquint.com Tel: (503) 615-9000

Email: info_wireless@tqs.com Fax: (503) 615-8902

For technical questions and additional information on specific applications:

Email: info_wireless@tqs.com

The information provided herein is believed to be reliable; TriQuint assumes no liability for inaccuracies or omissions. TriQuint assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party.

TriQuint does not authorize or warrant any TriQuint product for use in life-support devices and/or systems.

Copyright © 2005 TriQuint Semiconductor, Inc. All rights reserved.

