

General Description

The TQP7M9106 is targeted for use as a driver amplifier in wireless infrastructure where high linearity, medium power, and high efficiency are required. The device is an excellent candidate for transceiver line cards and high power amplifiers in current and next generation multi-carrier 3G / 4G base stations.

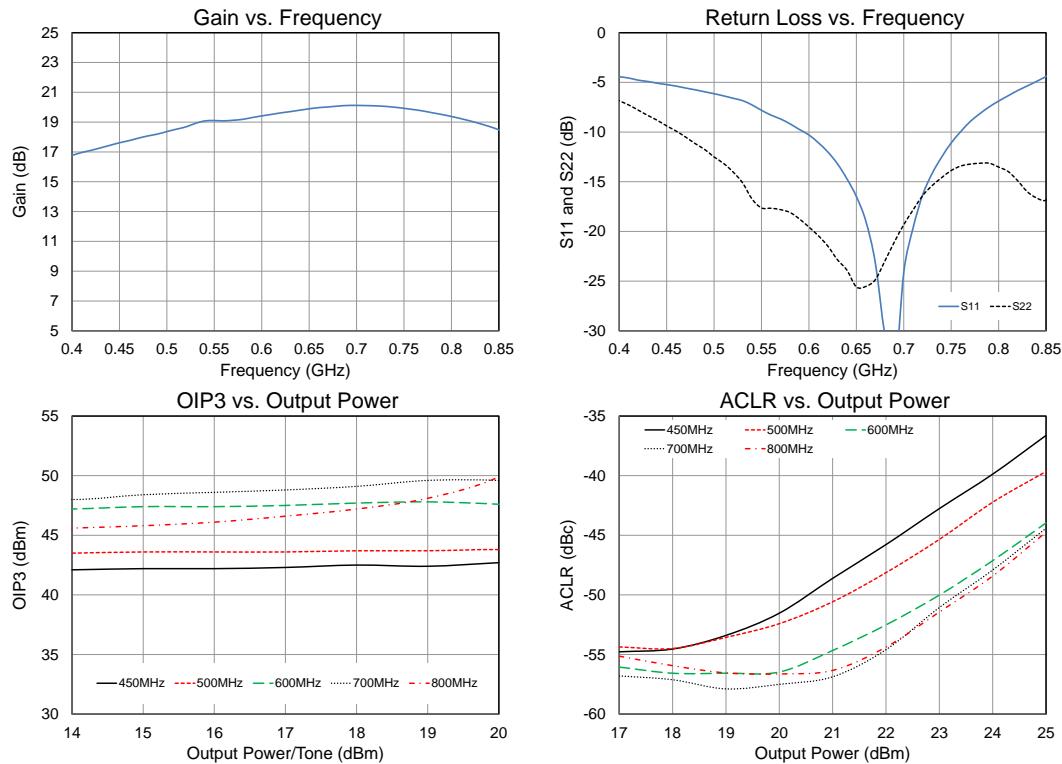
This application note describes a reference design and evaluation board optimized for operation over the 450-800MHz frequency band.

Typical Performance 450-800 MHz

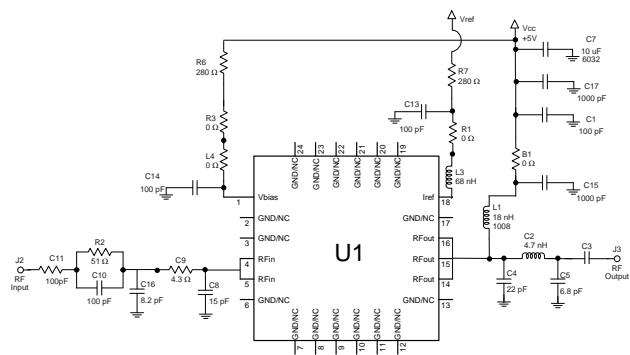
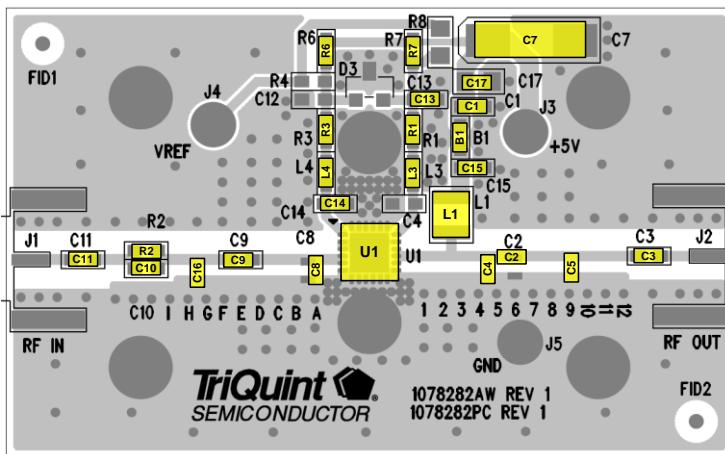
Test Conditions: $V_{CC}=+5$ V, Temp.= $+25^{\circ}\text{C}$, 50Ω System

Parameter	Typical Value					Units
Frequency	450	525	600	700	800	MHz
Gain	17.6	18.6	19.4	20	19.3	dB
Input Return Loss	-5.5	-6.6	-10	-24	-6.8	dB
Output Return Loss	-9.3	-14	-19	-19	-13.5	dB
Output P1dB	+30.7	+31.8	+32.9	+32.6	+33	dBm
Output IP3 $P_{out} = +17$ dBm/tone, $\Delta f = 1$ MHz	+42.3	+44.5	+47.5	+48.8	+46.6	dBm
WCDMA Channel Power ACLR = -50 dBc	+21	+21.5	+23	+23.5	+23.5	dBm
Quiescent Collector Current, I_{CQ}	455					mA

Performance Plots



Evaluation Board



Notes:

1. Components shown on the silkscreen but not on the schematic are not used.
2. $0\ \Omega$ resistor can be replaced with copper trace in the target application layout.
3. To power down the device, voltage can be applied to V_{ref} to control I_{ref} by placing resistor R8 and removing R7.
4. All components are of 0603 size unless stated on the schematic.
5. L3 is critical for device linearity performance.
6. Critical component placement locations:
 - Distance between U1 (left edge) to C8 (right edge): 53 mil
 - Distance between U1 (left edge) to C9 (right edge): 242 mil
 - Distance between U1 (left edge) to C16 (right edge): 375 mil
 - Distance between U1 (right edge) to C4 (left edge): 235 mil
 - Distance between U1 (right edge) to C2 (right edge): 288 mil
 - Distance between U1 (right edge) to C5 (right edge): 460 mil

Bill of Material

Reference Des.	Value	Description	Manuf.	Part Number
n/a	n/a	Printed Circuit Board	TriQuint	
U1	n/a	2W High Linearity Amplifier	TriQuint	TQP7M9106
C15, C17	1000 pF	CAP, 0603, 5%, 50V, NPO	various	
C1, C10, C11, C13, C14	100 pF	CAP, 0603, 5%, 50V, NPO	various	
C3, C4	22 pF	CAP, 0603, 5%, 50V, NPO/COG	various	
C5	6.8 pF	CAP, 0603, 1%	various	
C8	15 pF	CAP, 0603, 1%	various	
C16	8.2 pF	CAP, 0603	various	
C7	10 uF	CAP, 6032, 20%, 50V, Tantalum	various	
R6, R7	280 Ω	RES, 0603, 1%, 1/16W, Chip	various	
C9	4.3 Ω	RES, 0603, 1%, 1/10W, Chip	various	
B1, R1, L4, R3	0 Ω	RES, 0603, 5%, 1/16W, Chip	various	
L3	68 nH	IND, 0603, 5%	TOKO	LL1608-68NXJL
L1	18 nH	IND, 1008, 5%	Coilcraft	1008HQ-18NXJL
C2	4.7 nH	IND, 0603, 5%	Toko	LL1608-FSL4N7J