

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.

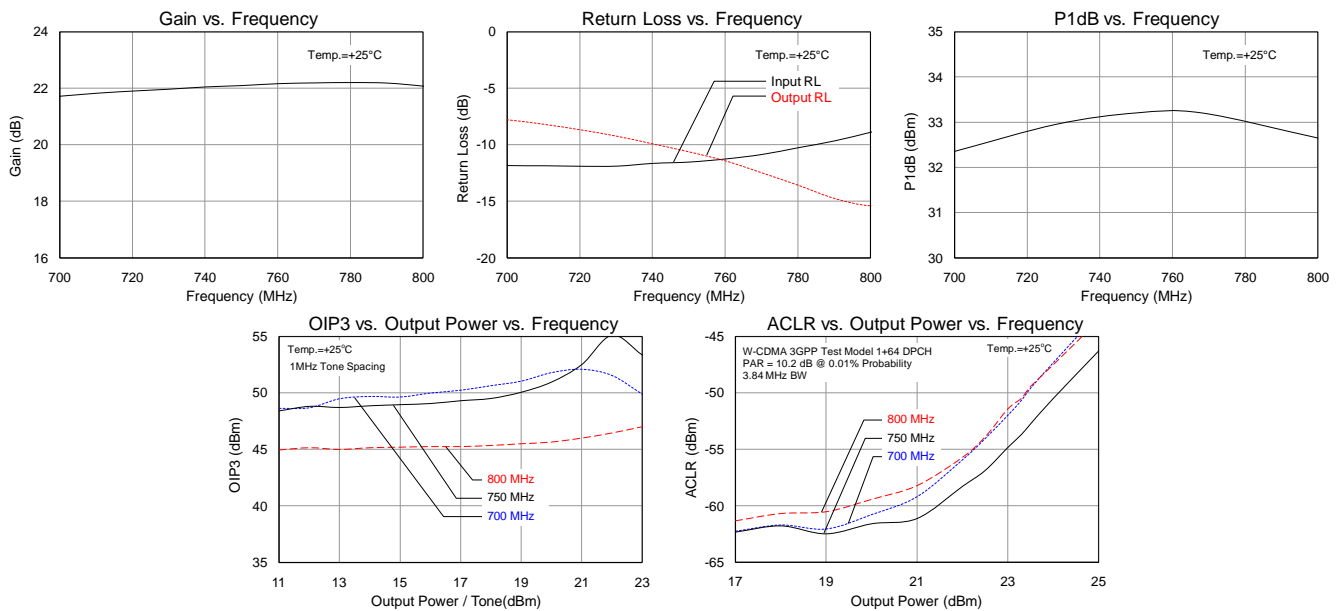
This application note describes a reference design and evaluation board optimized for operation over the 700-800 MHz frequency band.

Typical Performance 700-800 MHz

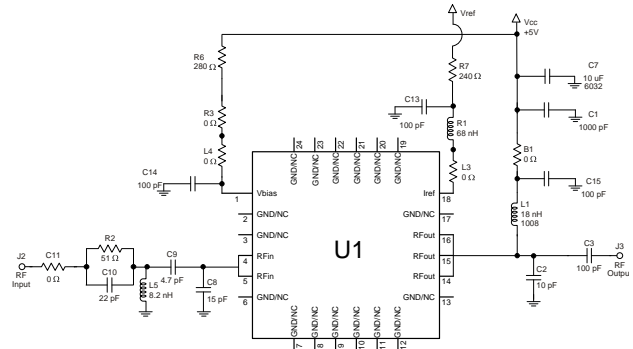
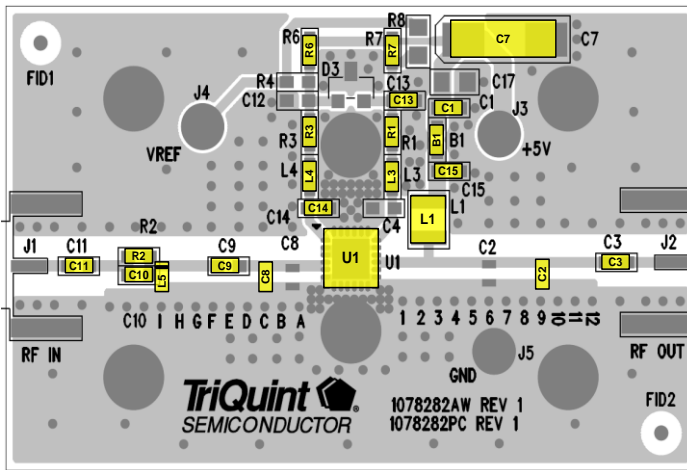
Test Conditions: $V_{CC}=+5\text{ V}$, $\text{Temp.}=+25^{\circ}\text{C}$, 50Ω System

Parameter	Conditions	Typical Value			Units
Frequency		700	750	800	MHz
Gain		21.5	22	22	dB
Input Return Loss		-11.5	-11.5	-9	dB
Output Return Loss		-8	-10.5	-15	dB
Output P1dB		+32.3	+33.1	+32.5	dBm
Output IP3	$P_{out}= +17\text{ dBm/ tone, } \Delta f= 1\text{ MHz}$	+50	+49	+45	dBm
WCDMA Channel Power	ACLR = -50 dBc	+23.5	+24	+23.5	dBm
Quiescent Collector Current, I_{CC}		455			mA

Performance Plots



Evaluation Board



Notes:

1. Components shown on the silkscreen but not on the schematic are not used.
2. 0 Ω 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} by placing resistor R8 and removing R7.
4. All components are of 0603 size unless stated on the schematic.
5. R1 is critical for device linearity performance.
6. Critical component placement locations:
 - Distance between U1 (left edge) to C8 (right edge): 147 mil
 - Distance between U1 (left edge) to C9 (right edge): 244 mil
 - Distance between U1 (left edge) to L5 (right edge): 445 mil
 - Distance between U1 (right edge) to C2 (left edge): 454 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
C1	1000 pF	CAP, 0603, 5%, 50V, NPO	various	
C3, C13, C14, C15	100 pF	CAP, 0603, 5%, 50V, NPO	various	
C10	22 pF	CAP, 0603, 5%, 50V, NPO/COG	various	
C8	15 pF	CAP, 0603, ± 0.05 pF, ACCU-P, 50V	AVX	06035J150GBSTR
C2	10 pF	CAP, 0603, 2%, ACCU-P, 50V	AVX	06035J100GBSTR
C9	4.7 pF	CAP, 0603, ± 0.05 pF, ACCU-P, 50V	AVX	06035J4R7ABSTR
C7	10 uF	CAP, 6032, 20%, 50V, Tantalum	various	
R6	280 Ω	RES, 0603, 1%, 1/16W. CHIP.	various	
R7	240 Ω	RES, 0603, 1%, 1/10W, Chip	various	
R2	51 Ω	RES, 0603, 5%, 1/16W, Chip	various	
B1, L3, L4, R3, C11	0 Ω	RES, 0603, 5%, 1/16W, Chip	various	
R1	68 nH	IND, 0603, 5%	various	
L1	18 nH	IND, 1008, 5%, Ceramic	Coilcraft	1008HQ-18NXJL
L5	8.2 nH	IND, 0603, 5%	Toko	LL1608-FSL8N2J