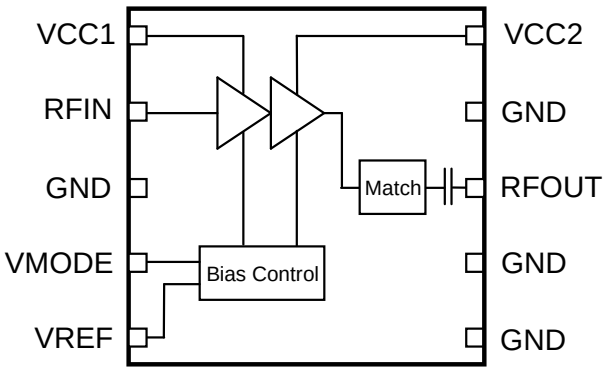
TQM7M6001

Final Data Sheet

3V IMT2100 WCDMA Power Amplifier Module

Functional Block Diagram



Product Description

Advanced compact 3V linear power amplifier module designed for mobile UMTS handset applications in IMT2100 band. The small size and high performance is achieved with high-reliability InGaP HBT technology. The module is fully integrated, providing a simple 50 Ohms interface on input and output ports. No external matching or bias components are required. Despite its very compact size, the module has exceptional efficiency and linearity. The module provides high/low output power modes and supports low power mode operation at reduced supply voltage.

Electrical Specifications

	IMT2100 band			
Parameter	**Min.**	**Typ.**	**Max.**	**Unit**
Frequency	1920		1980	MHz
Pout high mode[1]	27.5			dBm
PAE high mode [1]		40		%
Pout low mode [2]	16			dBm
PAE low mode [2]		20		%
ACPR 5MHz[1,2]		-40		dBc
ACPR 10MHz[1,2]		-50		dBc

Note 1: Test Conditions CDMA High Mode: V_{CC1}=3.4VDC, V_{CC2}=3.4VDC, V_{REF}=2.85VDC, V_{MODE}=low, Tc=25°C, Z_S=Z_L=50 Ohm, Pout = 27.5dBm

Note 2: Test Conditions CDMA Low Mode: V_{CC1}=3.4VDC, V_{CC2}=1.2VDC, V_{REF}=2.85VDC, V_{MODE}=high, Tc=25°C, Z_S=Z_L=50 Ohm, Pout = 16dBm

Features

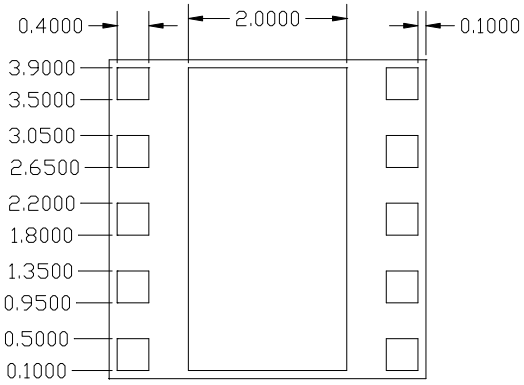
- Very compact size – 4 x 4 x 1.1mm³
- For 3G UMTS designs in IMT2100 band
- High/low output power modes
- High efficiency – high mode 40% typical
- Supports low collector voltage operation
- Low Vref of 2.85V nominal
- 10 pin package
- Positive supply voltage – 3.2 to 4.2 V
- 50 Ω input and output impedances
- High-reliability InGaP technology

Applications

- For 3G WCDMA designs in IMT2100 band

Package Style

4mm x 4mm LGA package (dimensions in mm):



3V IMT2100 WCDMA Power Amplifier Module

Absolute Maximum Ratings

Item #	Parameter	Symbol	Specification			Unit	Remarks
			Min.	Typ.	Max.		
1	DC Supply Voltage 1	V_{CC1}	-0.5		4.5	V	
2	DC Supply Voltage 2	V_{CC2}	-0.5		4.5	V	
3	Reference Voltage	V_{REF}	-0.5		3.5	V	
4	Mode Control Voltage	V_{MODE}	-0.5		3.5	V	
5	RF Input Power	P_{IN}			10	dBm	
6	Storage Temperature	T_S	-55		155	°C	

Note: The part may not survive all maximums applied simultaneously.

Operating Conditions

Item #	Parameter	Symbol	Specification			Unit	Remarks
			Min.	Typ.	Max.		
1	DC Supply Voltage 1	V_{CC1}	3.2	3.4	4.2	V	
2	DC Supply Voltage 2						
	High Power Mode	V_{CC2}	3.2	3.4	4.2	V	
	Low Power Mode	V_{CC2}	1.2		4.2	V	
3	Reference Voltage						
	PA on	V_{REF}	2.75	2.85	2.95	V	
	PA off	V_{REF}	0		0.5	V	
4	Mode Control Voltage						
	High Power Mode	V_{MODE}	0		0.5	V	
	Low Power Mode	V_{MODE}	2.5		3.0	V	
5	Operating Case Temperature	T_C	-30	25	85	°C	

DC Operating Parameters [1,2]

Item #	Parameter	Symbol	Specification			Unit	Remarks
			Min.	Typ.	Max.		
1	Idle Current						
	High Power Mode	$I_{Q,H}$		80		mA	
	Low Power Mode	$I_{Q,L}$		30		mA	
2	Reference Current	I_{REF}		3		mA	
3	Mode Control Current	I_{MODE}		100		μA	
4	Leackage Current	$I_{BATT,OFF}$			10	μA	$V_{CC1/2}$=High, V_{MODE}=Low, V_{REF}=Low

3V IMT2100 WCDMA Power Amplifier Module

WCDMA Electrical Characteristics in IMT2100 Band [1,2]

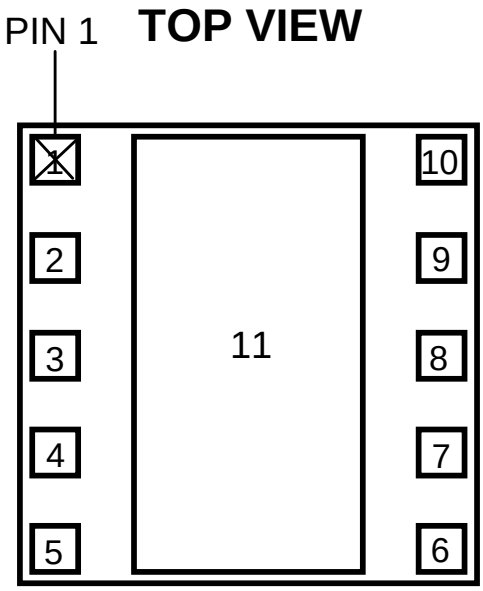
Item #	Parameter	Symbol	Specification			Unit	Remarks
			Min.	Typ.	Max.		
1	Operating Frequency	f	1920		1980	MHz	
2	Output Power						
	High Power Mode	$P_{OUT,H}$	27,5			dBm	
	Low Power Mode	$P_{OUT,L}$	16			dBm	
3	Gain						
	High Power Mode	G_H	25	27	31	dB	
	Low Power Mode (V_{CC2}=V_{BAT})	G_L	19	23	26	dB	
	Low Power Mode (V_{CC2}=1.2V)	G_L	18	21	24	dB	
4	Power Added Efficiency	PAE					
	High Power Mode			40		%	V_{CC2}=3.4V; P_{OUT}=27.5dBm
	Low Power Mode (V_{CC2}=V_{BAT})			10		%	V_{CC2}=3.4V; P_{OUT}=16dBm
	Low Power Mode (V_{CC2}=1.2V)			20		%	V_{CC2}=1.2V; P_{OUT}=16dBm
5	Adjacent Channel Power Ratio						measured in a 3.84 MHz bandwith
	±5MHz	ACPR1		-40		dBc	
	±10MHz	ACPR2		-50		dBc	
6	Harmonics						P_{OUT} ≤ 27.5dBm
		H2		-60		dBc	
		H3		-70		dBc	
7	Input Match			1.5:1		VSWR	Z_{IN} = 50Ohm
8	Noise Power in Rx band	N_{RX}		-140		dBm/Hz	2110-2170 MHz
9	Load Mismatch Stability		5:1			VSWR	all angles
	All Spurious < -70dBc						
10	Load Mismatch Ruggedness		10:1			VSWR	all angles, P_{IN} ≤ +5dBm
	No Damage						

Note 1: Test Conditions unless otherwise specified: V_{CC1}=3.4VDC, V_{CC2}=3.4VDC, V_{REF}=2.85VDC, Z_S=Z_L=50 Ohm, T_C = 25°C.

Note 2: TriQuint Test Board

3V IMT2100 WCDMA Power Amplifier Module

Pin Out and Assignments

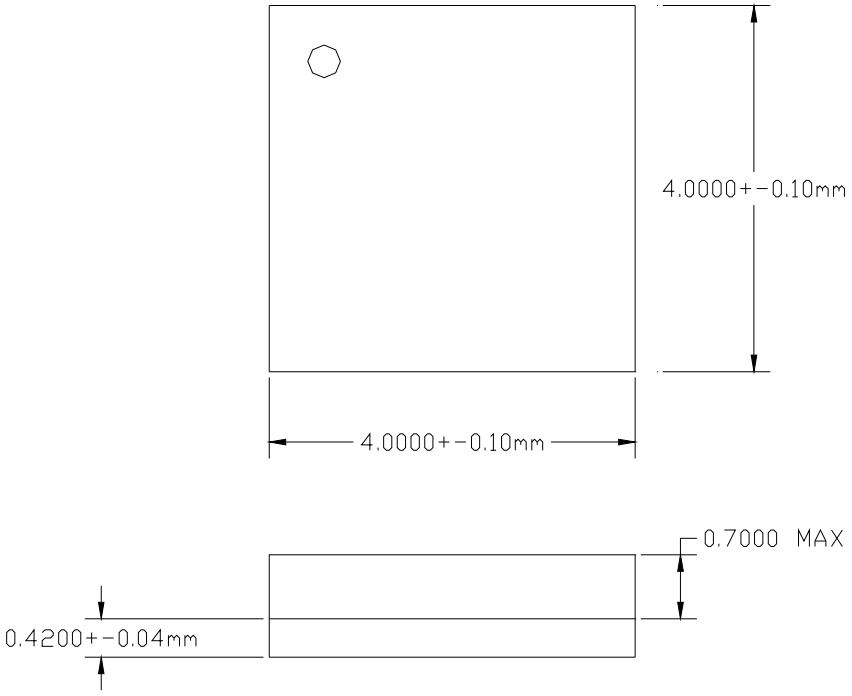


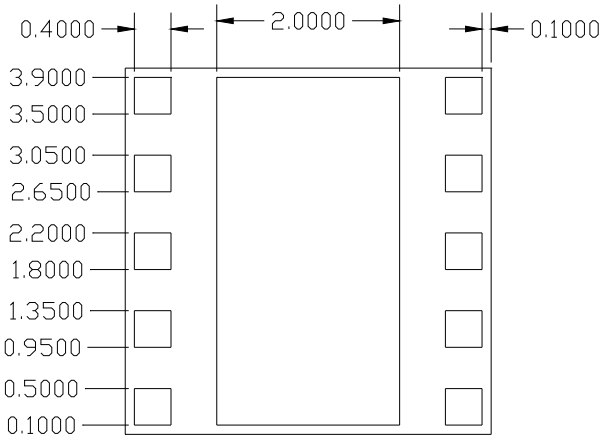
Pin #	Description	Function
1	V_{CC1}	Supply Voltage V_{CC1}
2	RF_{IN}	RF input (DC path to Ground, RF impedance 50 Ohms)
3	GND	Ground
4	V_{MODE}	Digital Control Signal for Output Power Mode Setting
5	V_{REF}	Reference Voltage, typ. 2.85V, ± 100mV
6	GND	Ground
7	GND	Ground
8	RF_{OUT}	RF output (DC decoupled, RF impedance 50 Ohms)
9	GND	Ground
10	V_{CC2}	Supply Voltage V_{CC2}
11	GND	Ground

3V IMT2100 WCDMA Power Amplifier Module

Packaging and Tape & Reel Information

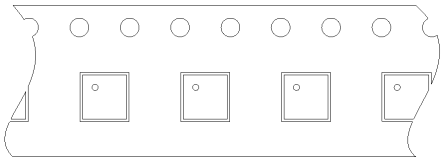
all dimensions in mm:





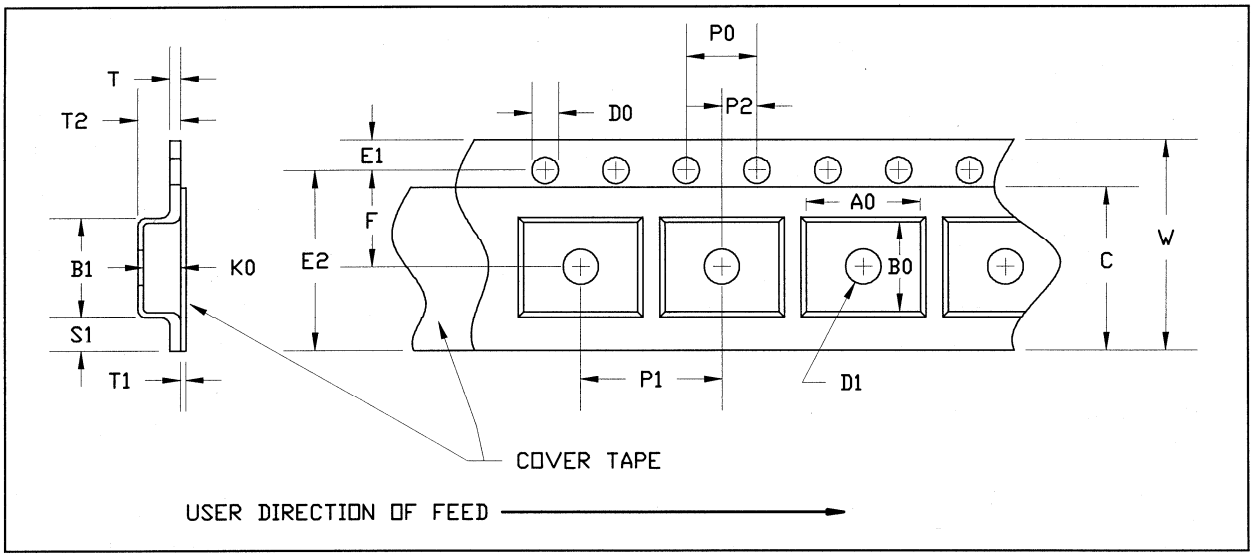
3V IMT2100 WCDMA Power Amplifier Module

Module Orientation:



→ user direction of feed

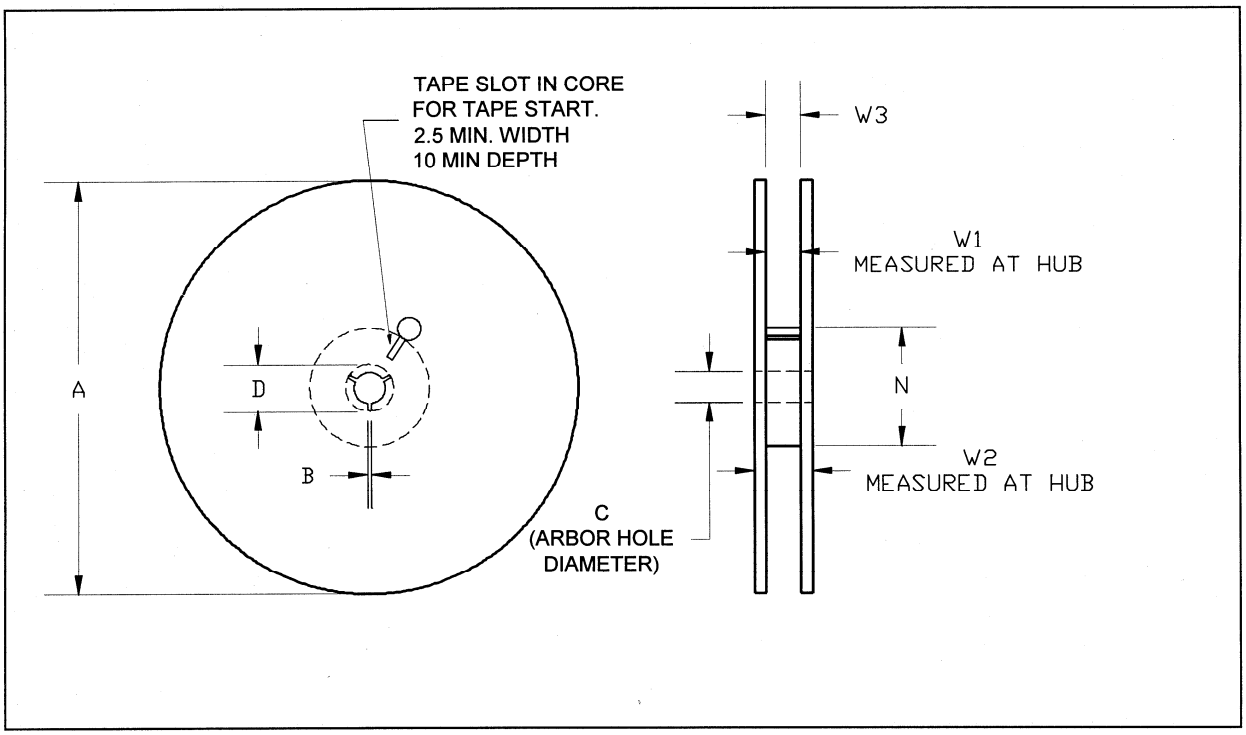
Carrier and Cover Tape Physical Dimensions:



PART	FEATURE	SYMBOL	SIZE (in)	SIZE (mm)
CAVITY	LENGTH	A0	0.171	4.35
	WIDTH	B0	0.171	4.35
	DEPTH	K0	0.071	1.80
	PITCH	P1	0.315	8.00
DISTANCE BETWEEN CENTERLINE	CAVITY TO PERFORATION LENGTH DIRECTION	P2	0.079	2.00
	CAVITY TO PERFORATION WIDTH DIRECTION	F	0.217	5.50
COVER TAPE	WIDTH	C	0.362	9.20
CARRIER TAPE	WIDTH	W	0.472	12.00

3V IMT2100 WCDMA Power Amplifier Module

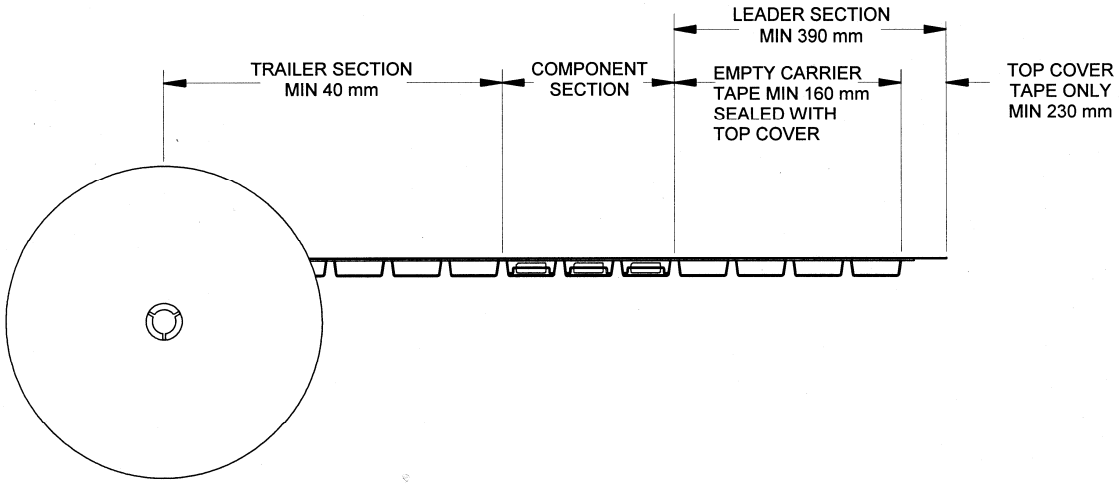
Reel Physical Dimensions:



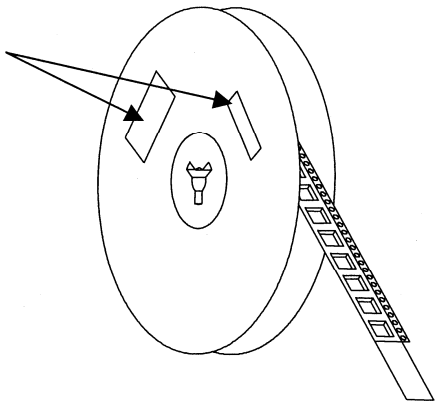
TQM7M6001			13" REEL	
PART	FEATURE	SYMBOL	SIZE (in)	SIZE (mm)
FLANGE	DIAMETER	A	12.992	330
	THICKNESS	W2	0.717	18.2
	SPACE BETWEEN FLANGE	W1	0.504	12.8
HUB	OUTER DIAMETER	N	4.016	102.0
	ARBOR HOLE DIAMETER	C	0.512	13.0
	KEY SLIT WIDTH	B	0.079	2.0
	KEY SLIT DIAMETER	D	0.787	20.0

3V IMT2100 WCDMA Power Amplifier Module

Completed Tape and Reel Assembly:



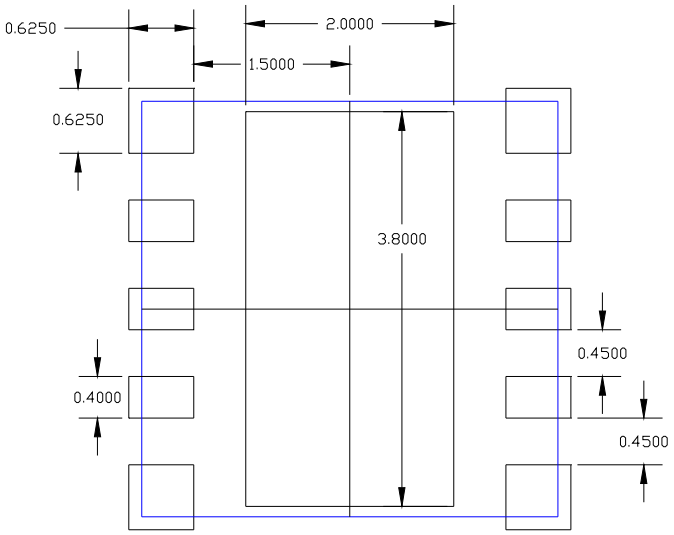
Product label, Mfg Label and ESD label are placed on the flange opposite to the sprockets in the carrier tape



3V IMT2100 WCDMA Power Amplifier Module

PC Board Layout recommendations

all dimensions in mm:



Additional Information [1]

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

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Email: info_wireless@tqs.com Fax: (+1)(503) 615-8902

For technical questions and additional information on specific applications:

Email: info_wireless@tqs.com

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