

RQRA-0200-LPH

## 1.0 ELECTRICAL SPECIFICATIONS

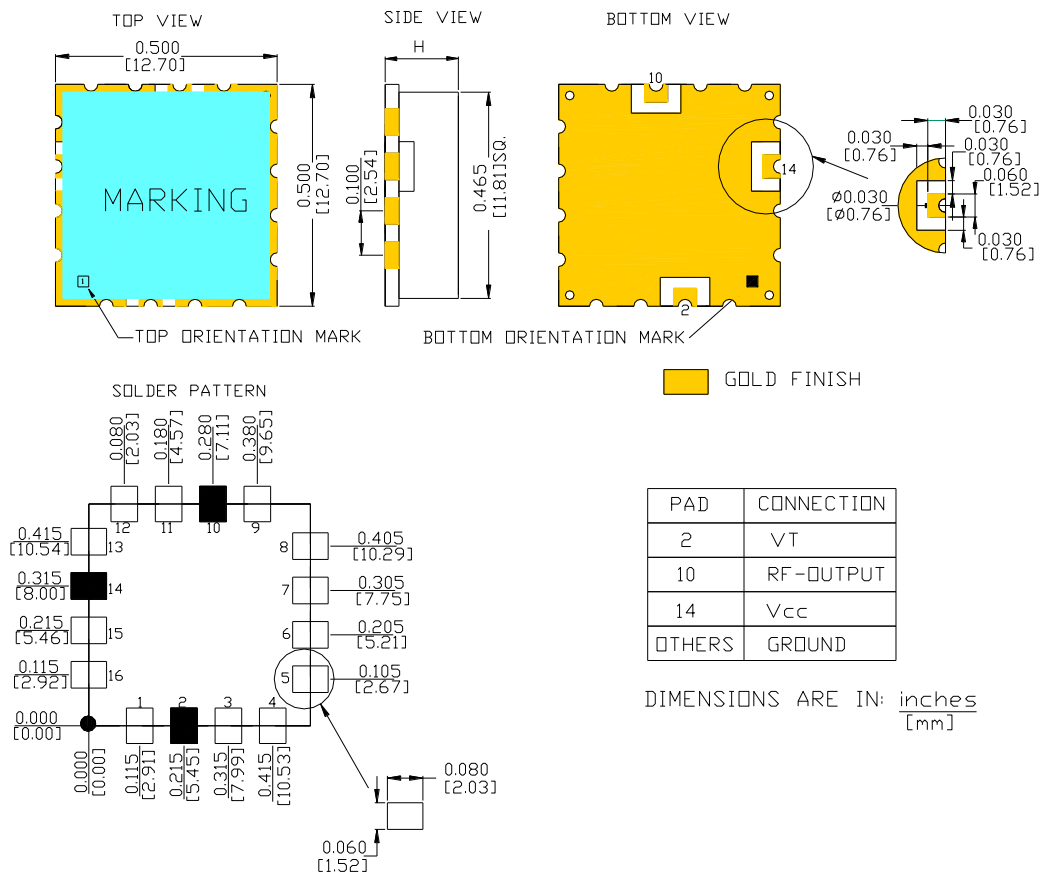
PARAMETER	CONDITION	SYMBOL	VALUE			UNIT
			Min.	Typ.	Max.	
Frequency Range	Vt=0~5.0V	fo(Vt)		200		MHz
Power Supply Voltage		Vcc	4.75	5.0	5.25	V
Tuning Voltage		Vt	0		5.0	V
Supply Current		Icc		18	35	mA
Tuning Sensitivity	Over Tuning Range	Kvo		0.8		MHz/V
Tuning Port Capacitance		Vt <sub>cap</sub>		330		pF
Modulation Bandwidth	@3dB BW	M <sub>BW</sub>		1000		kHz
Pushing	Over ±5 % Supply Variation	df/dVcc		0.1	0.2	MHz/V
Pulling <sup>1,2</sup>	@12dBr, all phases	df/dZL		0.5	1.0	MHz/p-p
Operating Temperature		Ta	-40		85	°C
Storage Temperature		Tstor	-45		90	°C
Maximum Limits Voltage	For V <sub>cc(abs)</sub>		-0.4		8.0	V
Moisture Sensitivity Level	MSL	JEDEC J-STD-2	1			
Termination Finish			Glass-reinforced laminate base and nickel-silver cover			
ESD Sensitivity	HBM	Human body model JESD22-A114		3		kV

## 2.0 OUTPUT CHARACTERISTICS

SINE-WAVE	PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
				Min	Typ.	Max	
	Output Power	Pw	Output termination 50Ω Vt=0~5.0V, Vcc=5.0V	7.0	9.0	11.0	dBm
	2 <sup>nd</sup> Harmonic Suppression	a(n*fo)			-30	-15	dBc
	3 <sup>rd</sup> Harmonic Suppression				-35	-15	
	Output Load	O <sub>CL</sub>		50		Ω	

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## 3.0 MECHANICAL DIMENSIONS AND PIN FUNCTIONING



$$H = \frac{0.236}{6.0} \text{ Max.}$$

■ Marking:

RQRA 0200-LPH 1 Date code
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## 4.0 PHASE NOISE

PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min	Typ	Max	
SSB Phase noise	$\Sigma(\Delta f)$	$\Delta f=1.0\text{kHz}$		-110	-105	dBc/Hz
		$\Delta f=10\text{kHz}$		-135	-130	
		$\Delta f=100\text{kHz}$		-155	-150	
		$\Delta f=1000\text{kHz}$		-160	-155	
		$\Delta f=10\text{MHz}$		-160	-155	

Typical Phase Noise Graph:



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## 5.0 COMMON SPECIFICATIONS

- 5.1 Load impedance is 50 Ohms.
- 5.2 Pulling is measured with 12dB return loss, all phases.
- 5.3 Package outline tolerances are typ.  $\pm 0.30\text{mm}$  /  $\pm 0.012$  inch if not stated differently on the drawing.
- 5.4 It is recommended to provide two bypass-capacitors (ceramic), from Vcc to Gnd,  $1\text{nF} \parallel 100\text{pF}$ .
- 5.5 Solder temperature (peak) is  $260^{\circ}\text{C}$  for 10-20 sec.

## 6.0 ENVIROMENTAL SPECIFICATIONS

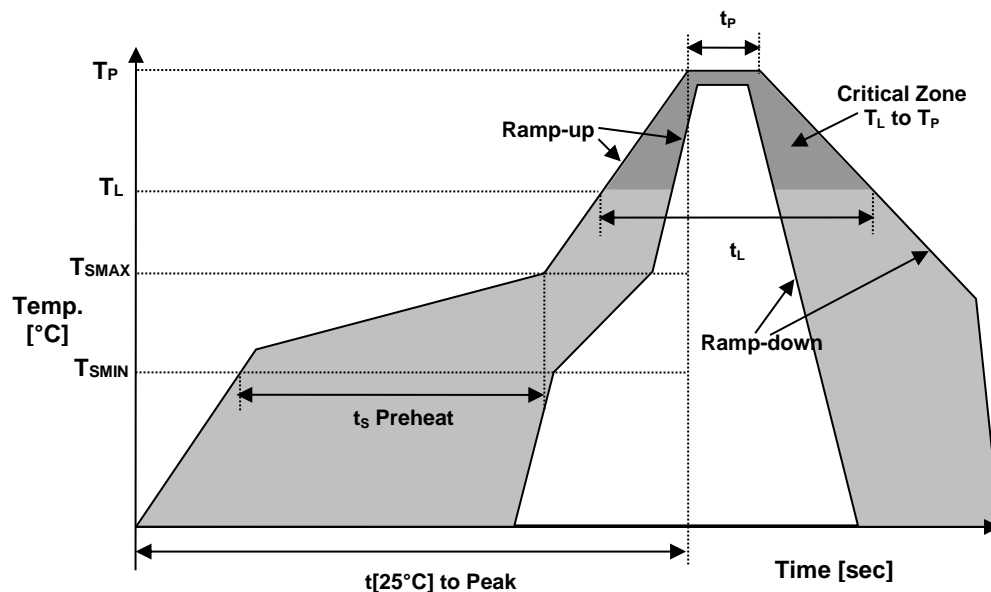
- 6.1. Storage Temperature Range:  $-45$  to  $+90^{\circ}\text{C}$  ambient
- 6.2. Operating Temperature Range:  $-40$  to  $+85^{\circ}\text{C}$  ambient
- 6.3. Operating Humidity: 15 to 100% relative humidity, non-condensing
- 6.4. Storage Humidity: 0 to 100% relative humidity, non-condensing
- 6.5. Operating Altitude: Up to 10,000 feet above sea level
- 6.6. Storage and Transport Altitude: Up to 50,000 feet above sea level

## 7.0 MECHANICAL- ELECTRICAL-ASSEMBLY PROCESS REQUIREMENTS

- 7.1. Mechanical and electrical performance specified in tables 1.0; 2.0; 3.0 and 4.0 should be met and exceeded the call out specification.
- 7.2. Module assembly process should be cleaned via an aqueous based system for normal SMT assembly processes.
- 7.3. The module internally and externally should be free off solder flux and residue from assembly processes.
- 7.4. High temperature solder such as SN95 or SN96 or equivalent should be used for internal construction of part.
- 7.5. When measuring the electrical performance, part must be completely dry, as any entrapped moisture will cause erroneous results.

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## 8.0 REFLOW PROFILE



		Recommended Solder Reflow Profile	
Temperature Min Preheat		$T_{SMIN}$	150°C
Temperature Max Preheat		$T_{SMAX}$	175°C
Time ( $T_{SMIN}$ to $T_{SMAX}$ )		$t_s$	60-180 sec.
Temperature		$T_L$	217°C
Peak Temperature		$T_P$	260°C
Ramp-up rate		$R_{UP}$	3°C/sec max.
Ramp-down rate		$R_{DOWN}$	6°C/sec max.
Time within 5°C of Peak Temperature		$t_p$	10-20 sec max.
Time $t[25^\circ\text{C}]$ to Peak Temperature		$t[25^\circ\text{C}]$ to Peak	480 sec.
Time		$t_L$	60-150 sec.

9.0 APPROVALS		
Eng. approval, date:	IM	11/20/2017
Created by, date:	MH	11/20/2017
Revision: A		

