

### Features

- AEC-Q100 with extended temperature range (-55°C to 125°C)
- Frequencies between 115.2 MHz and 137 MHz accurate to 6 decimal points
- 100% pin-to-pin drop-in replacement to quartz-based XO
- Excellent total frequency stability as low as ±20 ppm
- Industry best G-sensitivity of 0.1 PPB/G
- Low power consumption of 3.8 mA typical at 1.8V
- LVCMOS/LVTTL compatible output
- Industry-standard packages: 2.0 x 1.6, 2.5 x 2.0, 3.2 x 2.5, 5.0 x 3.2, 7.0 x 5.0 mm x mm
- RoHS and REACH compliant, Pb-free, Halogen-free and Antimony-free

### Applications

- Automotive, extreme temperature and other high-rel electronics
- Infotainment systems, collision detection devices, and in-vehicle networking
- Powertrain control



### Electrical Characteristics

All Min and Max limits are specified over temperature and rated operating voltage with 15 pF output load unless otherwise stated. Typical values are at 25°C and nominal supply voltage.

**Table 1. Electrical Characteristics**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
<b>Frequency Range</b>						
Output Frequency Range	f	115.20	–	137	MHz	Refer to <a href="#">Table 13</a> and <a href="#">Table 14</a> for the exact list of supported frequencies
<b>Frequency Stability and Aging</b>						
Frequency Stability	F <sub>stab</sub>	-20	–	+20	ppm	Inclusive of Initial tolerance at 25°C, 1st year aging at 25°C, and variations over operating temperature, rated power supply voltage and load (15 pF ±10%).
		-25	–	+25	ppm	
		-30	–	+30	ppm	
		-50	–	+50	ppm	
<b>Operating Temperature Range</b>						
Operating Temperature Range (ambient)	T <sub>use</sub>	-40	–	+85	°C	Industrial, AEC-Q100 Grade 3
		-40	–	+105	°C	Extended Industrial, AEC-Q100 Grade 2
		-40	–	+125	°C	Automotive, AEC-Q100 Grade 1
		-55	–	+125	°C	Extended Temperature, AEC-Q100
<b>Supply Voltage and Current Consumption</b>						
Supply Voltage	V <sub>dd</sub>	1.62	1.8	1.98	V	All voltages between 2.25V and 3.63V including 2.5V, 2.8V, 3.0V and 3.3V are supported. Contact <a href="#">SiTime</a> for 1.5V support
		2.25	–	3.63	V	
Current Consumption	I <sub>dd</sub>	–	6	8	mA	No load condition, f = 125 MHz, V <sub>dd</sub> = 2.25V to 3.63V
		–	4.9	6	mA	No load condition, f = 125 MHz, V <sub>dd</sub> = 1.62V to 1.98V
<b>LVCMOS Output Characteristics</b>						
Duty Cycle	DC	45	–	55	%	
Rise/Fall Time	Tr, Tf	–	1.5	3	ns	V <sub>dd</sub> = 2.25V - 3.63V, 20% - 80%
		–	1.5	2.5	ns	V <sub>dd</sub> = 1.8V, 20% - 80%
Output High Voltage	VOH	90%	–	–	V <sub>dd</sub>	IOH = -4 mA (V <sub>dd</sub> = 3.0V or 3.3V) IOH = -3 mA (V <sub>dd</sub> = 2.8V and V <sub>dd</sub> = 2.5V) IOH = -2 mA (V <sub>dd</sub> = 1.8V)
Output Low Voltage	VOL	–	–	10%	V <sub>dd</sub>	IOL = 4 mA (V <sub>dd</sub> = 3.0V or 3.3V) IOL = 3 mA (V <sub>dd</sub> = 2.8V and V <sub>dd</sub> = 2.5V) IOL = 2 mA (V <sub>dd</sub> = 1.8V)
<b>Input Characteristics</b>						
Input High Voltage	VIH	70%	–	–	V <sub>dd</sub>	Pin 1, OE
Input Low Voltage	VIL	–	–	30%	V <sub>dd</sub>	Pin 1, OE
Input Pull-up Impedence	Z <sub>in</sub>	–	100	–	kΩ	Pin 1, OE logic high or logic low
<b>Startup and Resume Timing</b>						
Startup Time	T <sub>start</sub>	–	–	5	ms	Measured from the time V <sub>dd</sub> reaches its rated minimum value
Enable/Disable Time	T <sub>oe</sub>	–	–	130	ns	f = 115.20 MHz. For other frequencies, T <sub>oe</sub> = 100 ns + 3 * cycles
<b>Jitter</b>						
RMS Period Jitter	T <sub>jitt</sub>	–	1.6	2.5	ps	f = 125 MHz, 2.25V to 3.63V
		–	1.8	3	ps	f = 125 MHz, 1.8V
Peak-to-peak Period Jitter	T <sub>pk</sub>	–	12	20	ps	f = 125 MHz, V <sub>dd</sub> = 2.5V, 2.8V, 3.0V or 3.3V
		–	14	30	ps	f = 125 MHz, V <sub>dd</sub> = 1.8V
RMS Phase Jitter (random)	T <sub>phj</sub>	–	0.7	–	ps	f = 125 MHz, Integration bandwidth = 900 kHz to 7.5 MHz
		–	1.5	–	ps	f = 125 MHz, Integration bandwidth = 12 kHz to 20 MHz

### Dimensions and Patterns

Package Size – Dimensions (Unit: mm) <sup>[11]</sup>	Recommended Land Pattern (Unit: mm) <sup>[12]</sup>
<p><b>2.0 x 1.6 x 0.75 mm</b></p>	
<p><b>2.5 x 2.0 x 0.75 mm</b></p>	
<p><b>3.2 x 2.5 x 0.75 mm</b></p>	
<p><b>5.0 x 3.2 x 0.75 mm</b></p>	

**Notes:**

- Top marking: Y denotes manufacturing origin and XXXX denotes manufacturing lot number. The value of "Y" will depend on the assembly location of the device.
- A capacitor of value 0.1  $\mu$ F or higher between Vdd and GND is required.

## Dimensions and Patterns

Package Size – Dimensions (Unit: mm) <sup>[11]</sup>	Recommended Land Pattern (Unit: mm) <sup>[12]</sup>
<p><b>7.0 x 5.0 x 0.90 mm</b></p>	

**Notes:**

11. Top marking: Y denotes manufacturing origin and XXXX denotes manufacturing lot number. The value of "Y" will depend on the assembly location of the device.
12. A capacitor of value 0.1  $\mu$ F or higher between Vdd and GND is required.