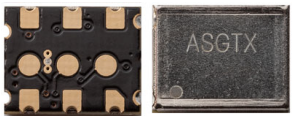
Configurable High Performance SMD TCXO/VCTCXO

ASGTX

ESD Sensitive | RoHS/RoHS II Compliant



9.0 x 7.0 x 2.24 mm

OVERVIEW:

ASGTX temperature compensated Crystal Oscillators are designed to accommodate a broad breadth of Precision TCXO requirements, without NRE and extended lead-times. This oscillator series is designed and manufactured by Abracon Corporation and is available to order from 1pc to high volume production quantities.

- **1-5 day quick-turn availability of a TCXO/VCTCXO with LVCMOS output, Any frequency between 10MHz & 250MHz**

  For example, if a reference oscillator requirement calls out 49.7521MHz; ±1.00 ppm TCXO/VCTCXO with **LVCMOS** output, ASGTX can be configured and shipped within 1-5 days and in most cases, same day if order is received before noon. Customers with low-to-mid annual volume requirements find it difficult to procure custom frequency TCXO/VCTXCO's without costly NRE charges and/or long lead-times (≥ 12 weeks).

- **1-5 day quick turn availability of a TCXO/VCTXCO requiring LVDS or LVPECL Differential output, Any frequency between 10MHz to 1.50GHz**

ASGTX is available with either **LVDS or LVPECL** output, from **10MHz to 1.50GHz**; at any desired frequency, such as 149.875MHz, 1.00GHz, 1.5GHz, etc. with as tight as ±1.00 ppm stability over temperature. No other solution in the marketplace currently offers such capability, especially in a small form-factor of 9.0x7.0x2.24 mm.

ASGTX is suitable for a wide variety of precision timing applications where TCXO/VCTXO's are typically employed. In addition, for high frequency LO requirements, traditionally customers have relied on SAW based oscillators. Such devices are only available at a few fixed frequencies, such as 915MHz, 1.0GHz, etc. They are typically in 9x14mm or bigger packages and vary as much as ±100 ppm over temperature.

Although ASGTX series will be slightly less favorable in phase noise performance compared to SAW based oscillators, it offers the following key advantages:

- ±1.00 ppm stability over -30ºC to +70ºC ***&*** ±2.00 ppm stability over -40ºC to +85ºC
- **Any carrier frequency** between 10MHz & 1.50GHz
- LVCMOS Output (10MHz to 250MHz) ***or*** LVDS / LVPECL Output (10MHz to 1.50GHz)
- Small form-factor of 9.0x7.0x2.24 mm
- No NRE or lead-time

FEATURES:

- 10MHz to 1.50GHz, any Carrier Frequency in differential mode (LVDS or LVPECL)
- 10MHz to 250MHz, any Carrier Frequency in LVCMOS mode
- -40ºC to +85ºC operating temperature range
- ±1.0ppm stability over -30ºC to +70ºC and ±2.0ppm stability over -40ºC to +85ºC
- Minimum guaranteed pull ability of ± 10ppm in VCTCXO mode
- Good Phase Noise, excellent Harmonics and Spurious content
- Guaranteed rms jitter of 1.80ps maximum @ 1.50GHz carrier
- Immediate availability, 5-day maximum lead-time for small quantities

APPLICATIONS:

- 40G & 100G Ethernet
- WiMax,
- LTE, BTS
- CATV, LAN, LMDS
- Point-to-Point communication networks

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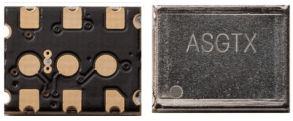
Pb RoHS/RoHS II Compliant



9.0 x 7.0 x 2.24 mm

KEY ELECTRICAL SPECIFICATIONS:

Parameters		Minimum	Typical	Maximum	Units	Notes
Frequency:	LVCMOS	10		250	MHz	
	LVDS	10		1500		
	LVPECL	10		1500		
Operating Temperature:		-40		+85	°C	
Storage Temperature:		-40		+85	°C	
Frequency Stability:						
Initial Set Tolerance		-1.50	≤±1.00	+1.50	ppm	1 hour after reflow
Stability over operating temperature*	-30°C to +70°C	-1.00		+1.00	ppm	Option "1"
	-40°C to +85°C **	-2.00		+2.00		Option "2"
Aging @ 25ºC after one year		-1.00		+1.00	ppm	
Supply Voltage (Vdd):		3.135	3.300	3.465	V	
Startup Time:				3	ms	
Control Voltage:		0	1.55	Vdd	V	In VCTCXO Mode
Frequency Pull:		±10			ppm	
Phase jitter RMS [$t_{jit(\phi)}$] (12kHz to 20MHz)			<1.00	1.80	ps	Frequency dependent

Notes

* ***Relative to measured frequency post reflow***

** ***Please contact Abracon for ±1.00 ppm frequency stability over -40°C to +85°C***

Key Electrical Specifications – LVCMOS

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (I_{dd}):				45	mA	Frequency dependent
Output Load:				15	pF	
Output Logic Level:	V_{OH}	0.9*V_{dd}			V	
	V_{OL}			0.1*V_{dd}	V	
Rise Time (Tr):				1000	ps	
Fall Time (Tf):				1000	ps	
Duty Cycle:		45		55	%	@1/2Vdd

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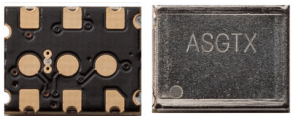

9.0 x 7.0 x 2.24 mm

Key Electrical Specifications – LVPECL

Parameters		Minimum	Typical	Maximum	Units	Notes
Supply Current (I_{dd})				60	mA	With typical LVPECL output termination
Output Logic Level	V_{OH}	V_{dd}-1.03		V_{dd}-0.60	V	
	V_{OL}	V_{dd}-1.85		V_{dd}-1.60	V	
Rise Time (Tr):				350	ps	
Fall Time (Tf):				350	ps	
Differential Duty Cycle:		45		55	%	ODC_{LVPECL}

Key Electrical Specifications – LVDS

Parameters	Minimum	Typical	Maximum	Units	Notes
Supply Current (I_{dd})			40	mA	With typical LVDS output termination
Differential Output Voltage (V_{OD})	175	350		mV	
V_{OD} Magnitude Change (ΔV_{OD})			50	mV	
Offset Voltage (V_{OS})		1.25		V	
V_{OS} Magnitude Change (ΔV_{OS})			50	mV	
Rise Time (Tr):			350	ps	
Fall Time (Tf):			450	ps	
Differential Duty Cycle:	45		55	%	ODC_{LVDS}

OPTIONS & PART IDENTIFICATION:

ASGTX- ☐ - ☐☐☐☐☐ MHz - ☐ - ☐

Output Type
C = LVCMOS
P = LVPECL
D = LVDS

Frequency in MHz
Please specify the Frequency in MHz e.g. 100.000 MHz

Freq. Stability
1 = ±1ppm over -30 to +70°C
2 = ±2ppm over -40 to +85°C

Packaging
Blank = Bulk (Qty < 250pcs)
T = 1000pcs/Reel
T2 = 250pcs/Reel

C = LVCMOS	Any Carrier Frequency between 10MHz minimum to 250MHz maximum
P = LVPECL	Any Carrier Frequency between 10MHz minimum to 1.50GHz maximum
D = LVDS	Any Carrier Frequency between 10MHz minimum to 1.50GHz maximum

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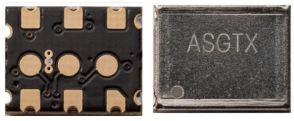
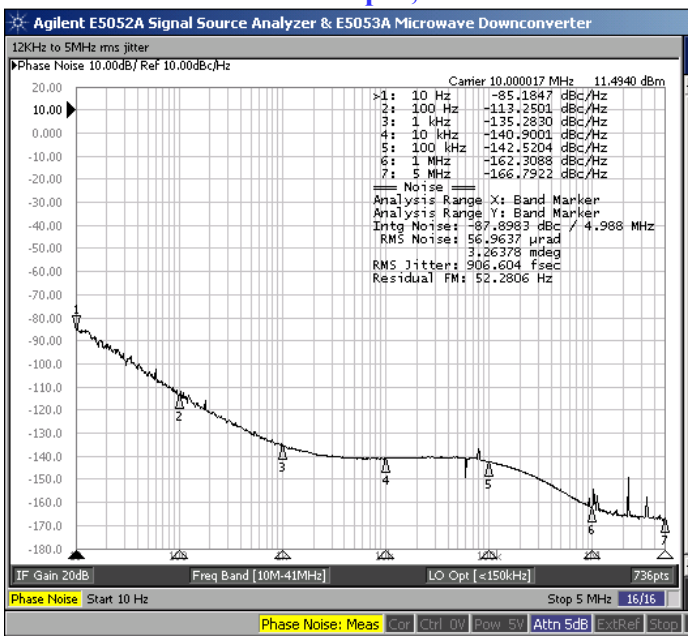


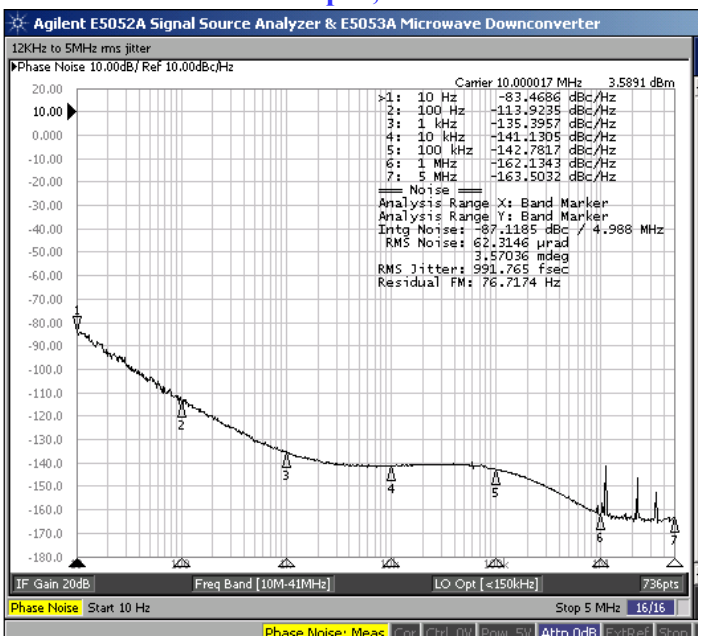
9.0 x 7.0 x 2.24 mm

TYPICAL PHASE NOISE & JITTER CHARACTERISTICS

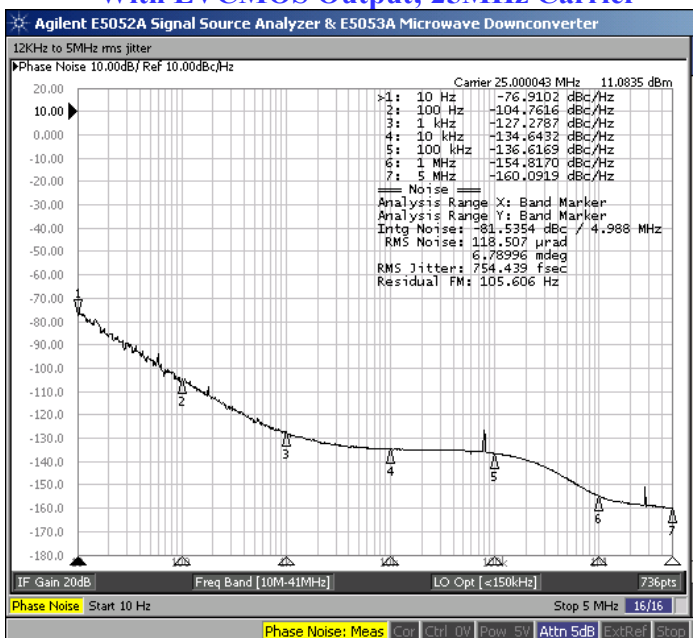
With LVCMOS Output; 10MHz Carrier



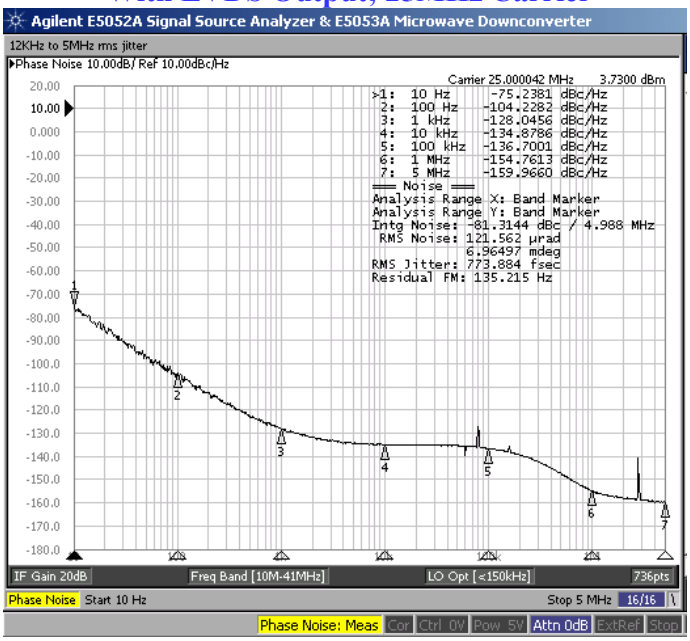
With LVDS Output; 10MHz Carrier



With LVCMOS Output; 25MHz Carrier



With LVDS Output; 25MHz Carrier



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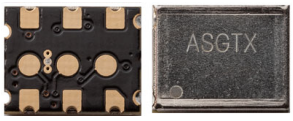
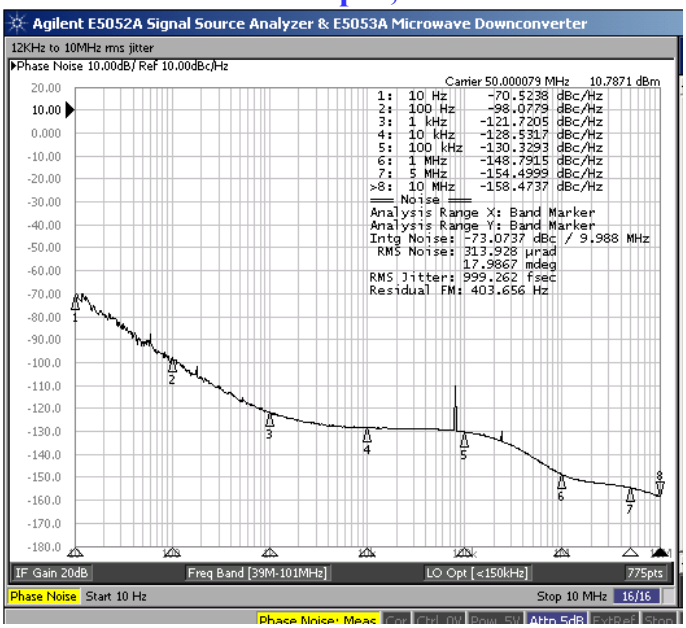


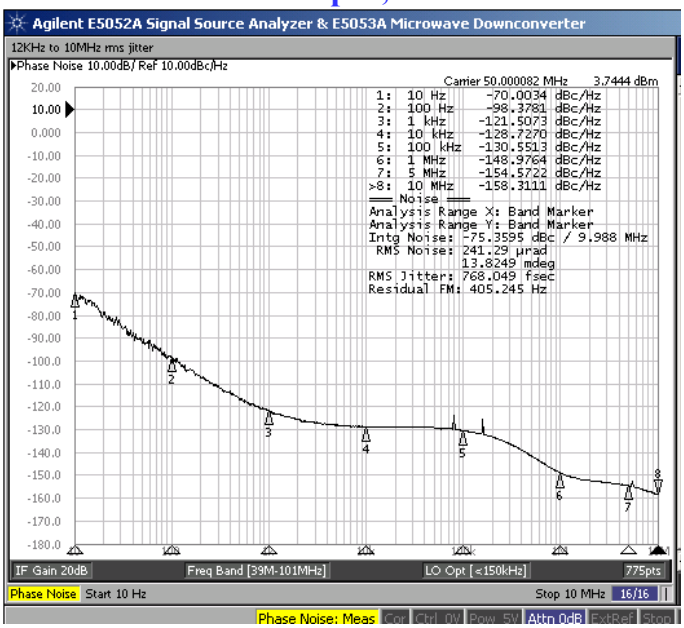
9.0 x 7.0 x 2.24 mm

TYPICAL PHASE NOISE & JITTER CHARACTERISTICS

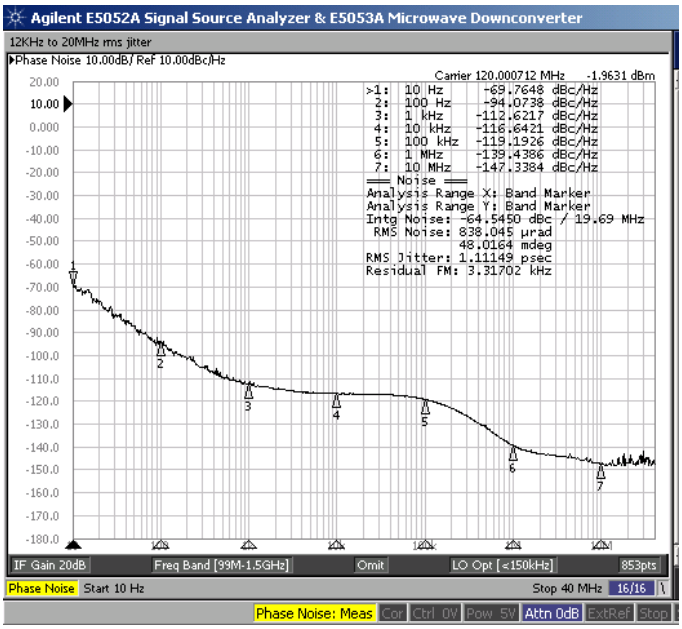
With LVCMOS Output; 50MHz Carrier



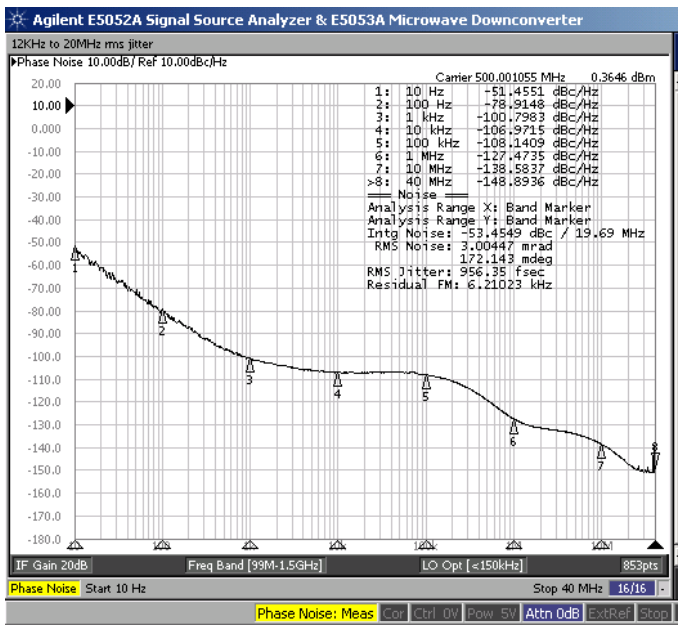
With LVDS Output; 50MHz Carrier



With LVCMOS Output; 120MHz Carrier



With LVPECL Output; 500MHz Carrier



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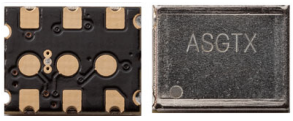
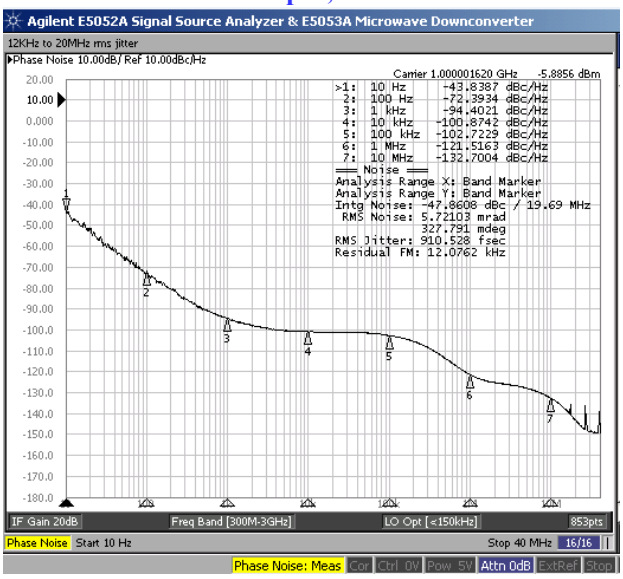


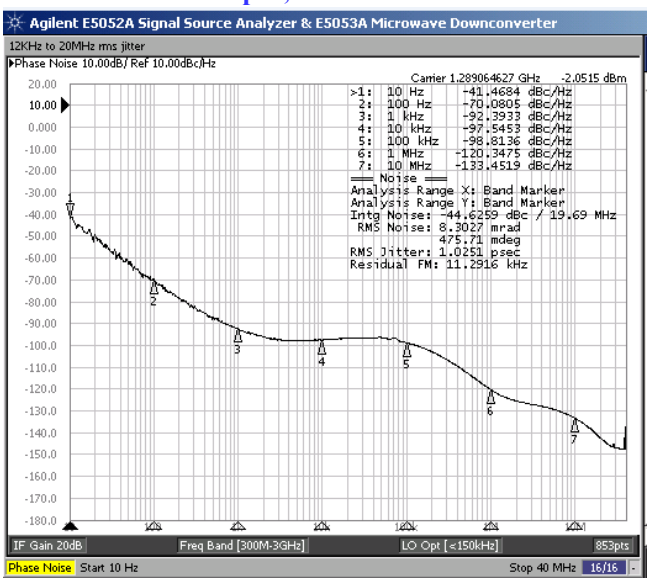
9.0 x 7.0 x 2.24 mm

TYPICAL PHASE NOISE & JITTER CHARACTERISTICS

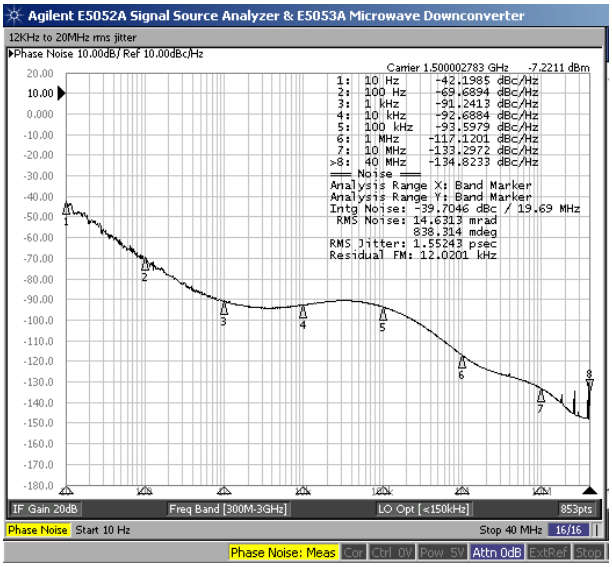
With LVDS Output; 1.00GHz Carrier



With LVDS Output; 1.2890625GHz Carrier



With LVDS Output; 1.50GHz Carrier



Carrier	RF Output	*rms* Phase Jitter	Integration Bandwidth
10.00MHz	LVDS	992 fs	12kHz to 5MHz
25.00MHz	LVDS	774 fs	12kHz to 5MHz
50.00MHz	LVDS	768 fs	12kHz to 10MHz
120.00MHz	LVCMOS	1.1 ps	12kHz to 20MHz
500.00MHz	LVPECL	956 fs	12kHz to 20MHz
1.00GHz	LVDS	911 fs	12kHz to 20MHz
1.2890625GHz	LVDS	1.03 ps	12kHz to 20MHz
1.50GHz	LVDS	1.55 ps	12kHz to 20MHz

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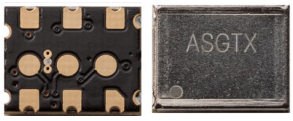
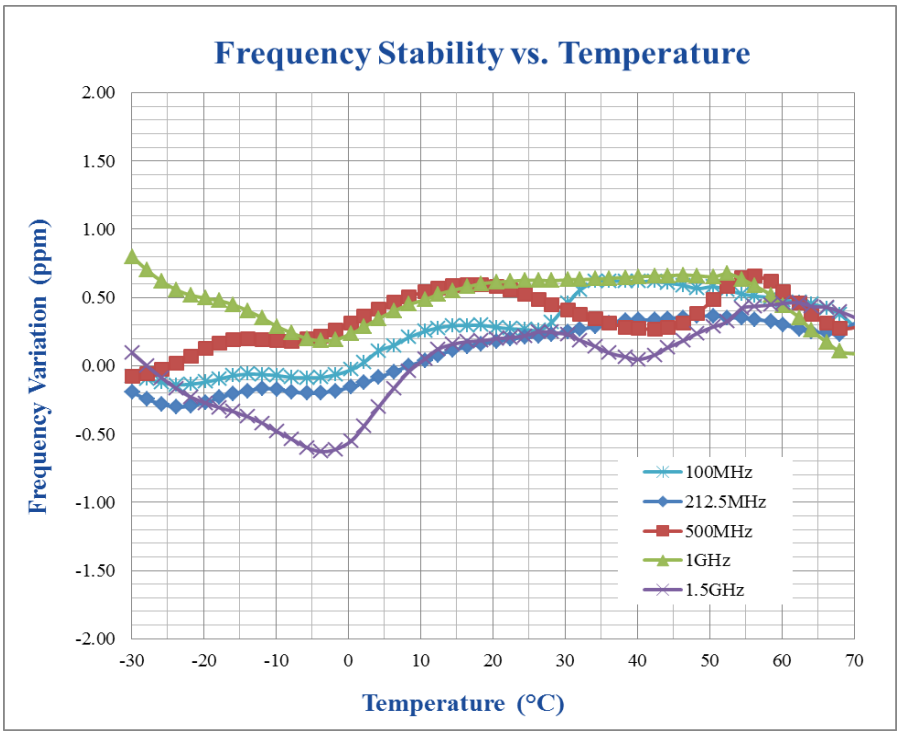
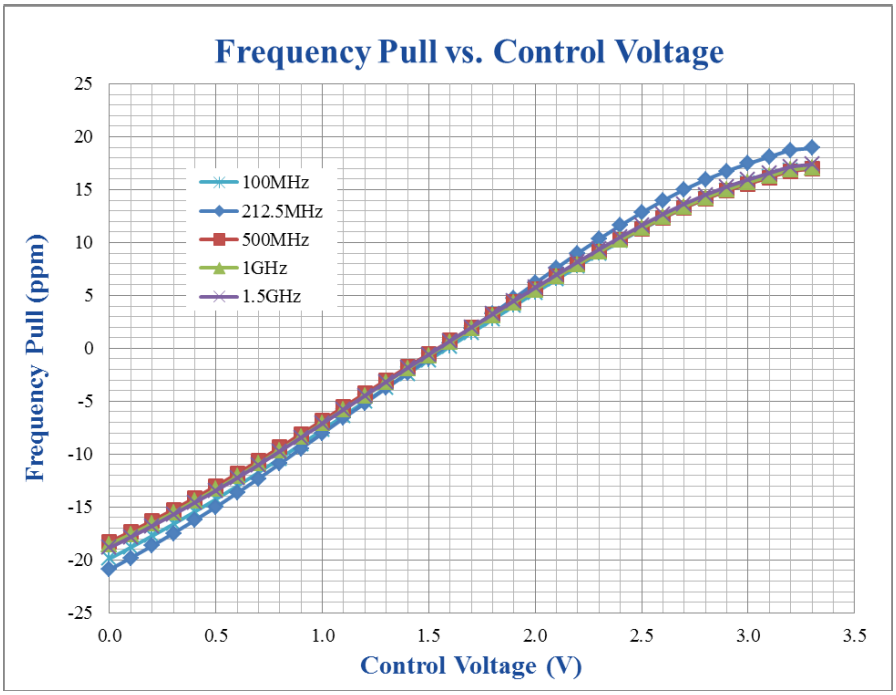


9.0 x 7.0 x 2.24 mm

FREQUENCY STABILITY VS. TEMPERATURE



FREQUENCY PULL VS. CONTROL VOLTAGE (VCTCXO MODE)



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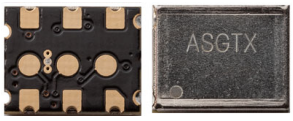
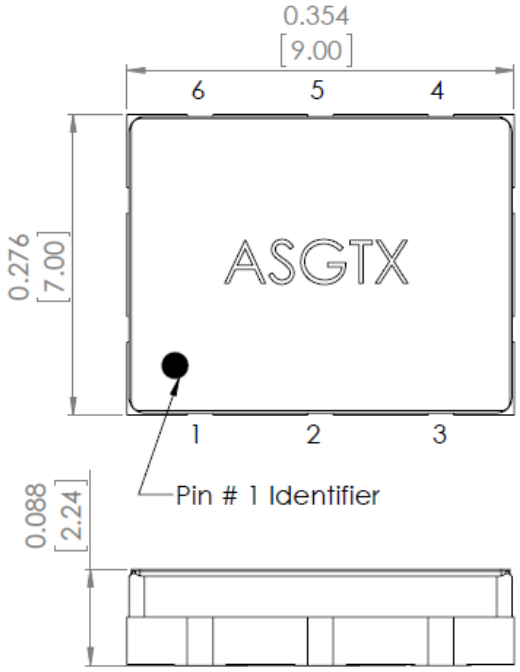


9.0 x 7.0 x 2.24 mm

OUTLINE DIMENSION:

LVCMOS output

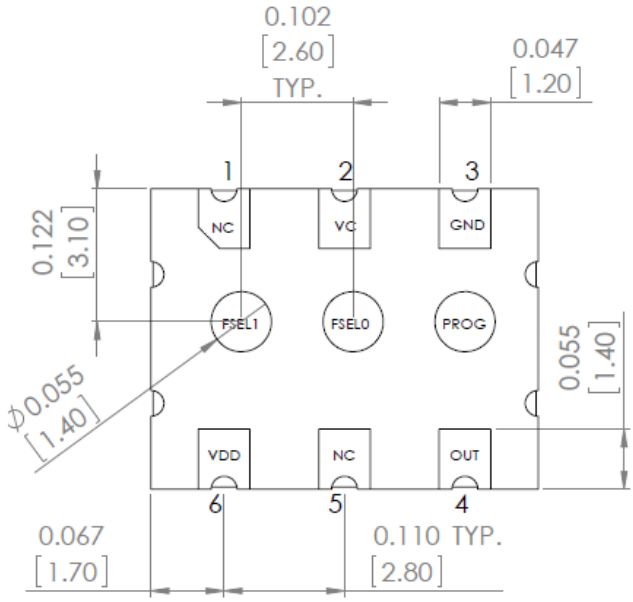


Pin #	Pin Description	
	TCXO	VCTCXO
1	N/C (1)	
2	By-Pass (2)	Vc (3)
3	GND	
4	RF Output	
5	N/C (1)	
6	Vdd	

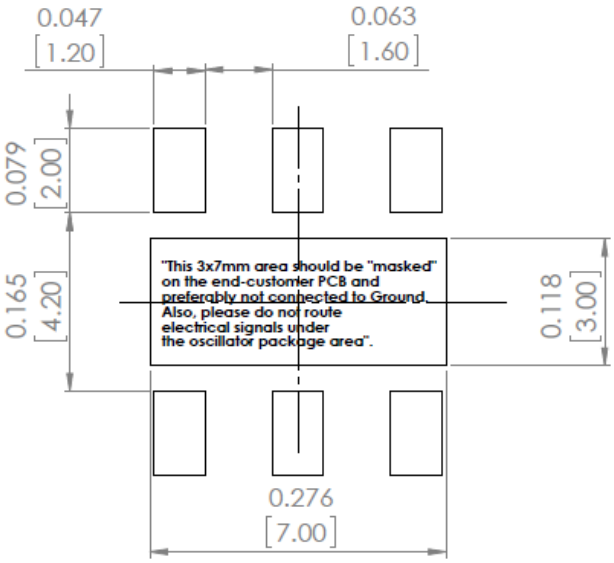
N/C (1) = Please leave these pins electrically floating on the end-PCB

By-Pass (2) = In TCXO configuration, it is recommended that a 1,000pF COG by-pass capacitor is connected between Pin#2 and GND

Vc (3) = Please connect external voltage to pull the oscillator frequency



Recommended Land Pattern



Dimensions: inches [mm]

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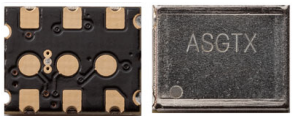

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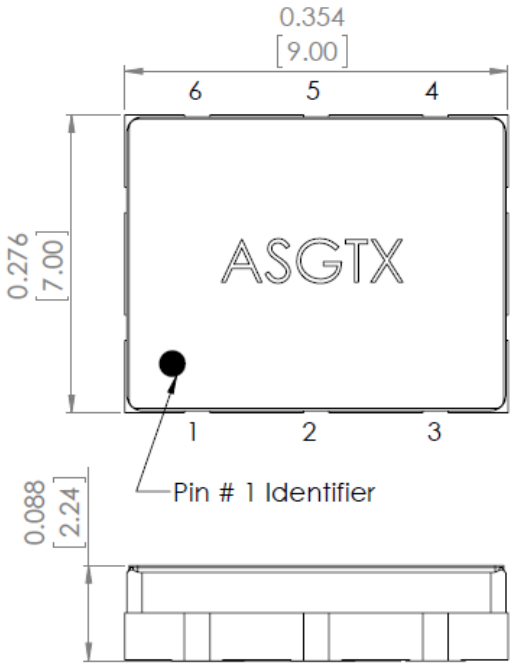
LVDS/LVPECL output

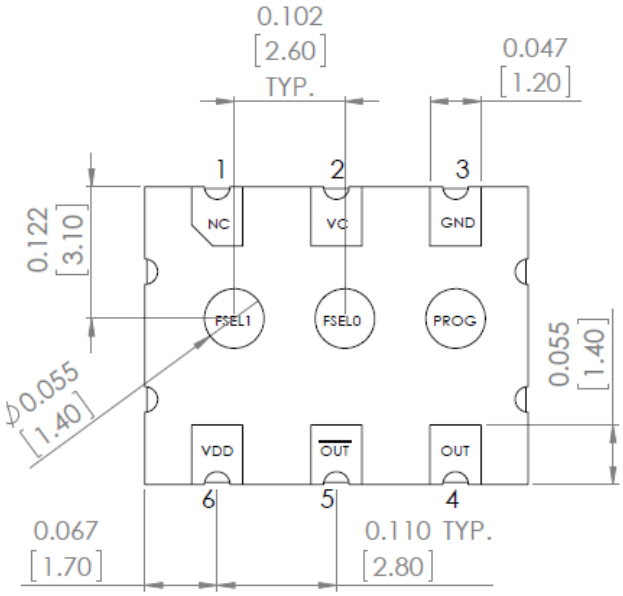


Pin #	Pin Description	
	TCXO	VCTCXO
1	N/C (1)	
2	By-Pass (2)	Vc (3)
3	GND	
4	RF Output	
5	Complimentary RF Output	
6	Vdd	

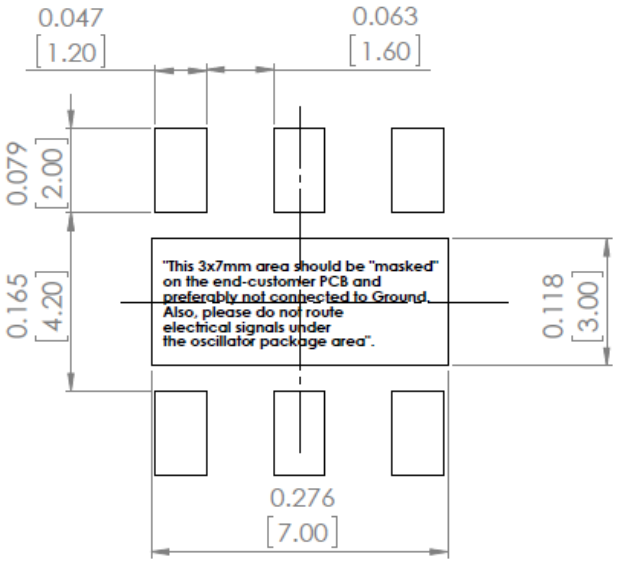
N/C (1) = Please leave this pin electrically floating on the end-PCB

By-Pass (2) = In TCXO configuration, it is recommended that a 1,000pF COG by-pass capacitor is connected between Pin#2 and GND

Vc (3) = Please connect external voltage to pull the oscillator frequency



Recommended Land Pattern



Dimensions: inches [mm]

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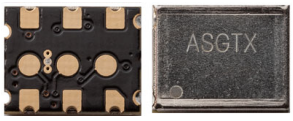
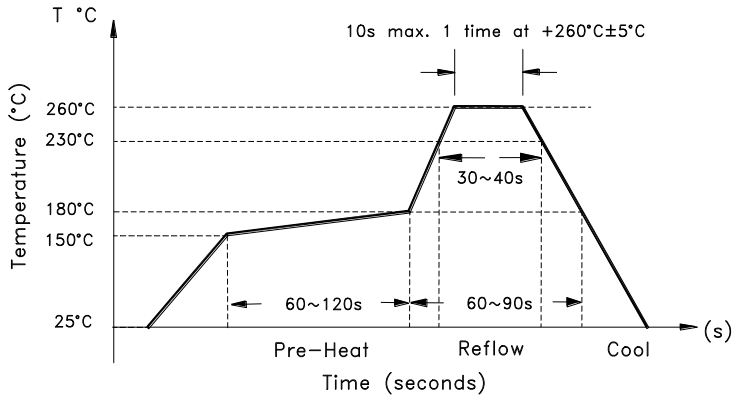


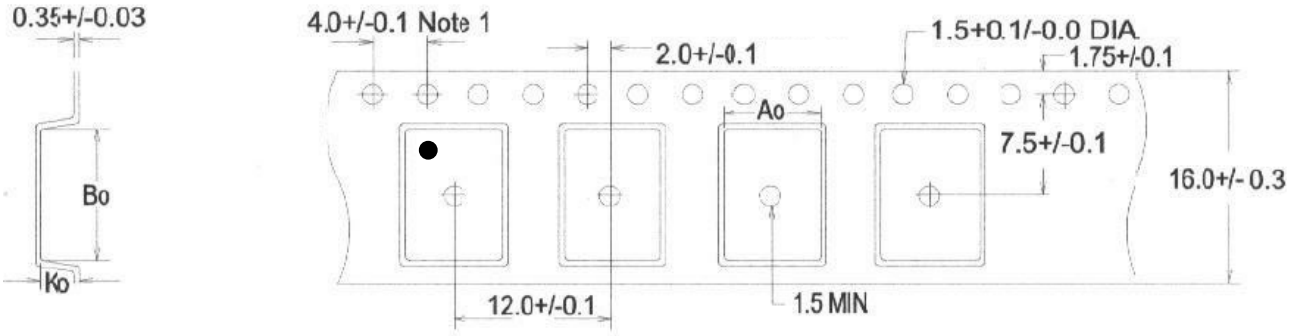
9.0 x 7.0 x 2.24 mm

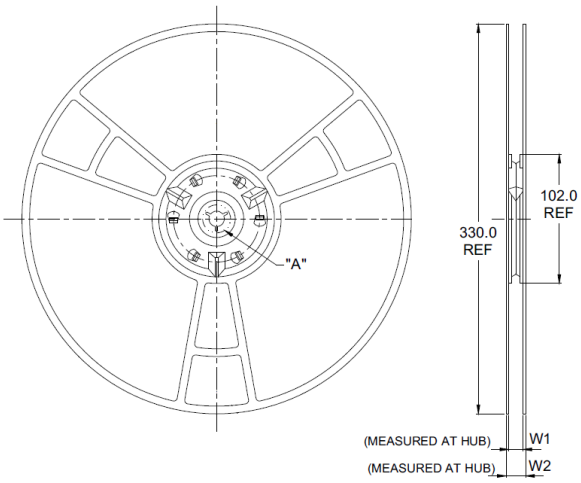
REFLOW PROFILE:

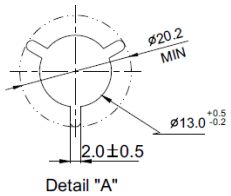


TAPE & REEL:

Packaging: 1000pcs/reel







A0	B0	K0
7.10±0.1	9.60±0.1	3.00±0.1

W1	W2
16.8+0.6/-0.4	22.2 max.

Dimensions: mm

ATTENTION: Abracon Corporation's products are COTS – Commercial-Off-The-Shelf products; suitable for Commercial, Industrial and, where designated, Automotive Applications. Abracon's products are not specifically designed for Military, Aviation, Aerospace, Life-dependant Medical applications or any application requiring high reliability where component failure could result in loss of life and/or property. For applications requiring high reliability and/or presenting an extreme operating environment, written consent and authorization from Abracon Corporation is required. Please contact Abracon Corporation for more information.

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