Mtron™
Innovative RF Solutions

M640x Series, TCXO/VCTCXO

Features	Applications
Frequencies from 10 MHz to 400 MHz Featuring QiK Chip™ Technology Supports both TCXO and VCTCXO formats RF Output: LVPECL/LVDS/CML/CMOS Tight stability ±1ppm over -40°C to +85°C Wide operating temperature option available, -55°C to +125°C Operating Voltage: 1.8/2.5/3.3 V	Telecom / Datacom Industrial Controls Communications & Navigation Aerospace Defense

Electrical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Nominal Frequency	F_0	10 10		1400 135	MHz	LVPECL, LVDS, CML [1] CMOS

Frequency Stabilities

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Initial Accuracy		-1.0		+1.0	ppm	@+25°C
Frequency Stability	ΔF/F	See Ordering Information			ppm	(FMAX-FMIN)/2 [2]
vs. Supply Voltage			±0.40		ppm	5% voltage variation
vs. Load			±0.20		ppm	5% load variation
Aging		-1.0 -0.5		+1.0 +0.5	ppm ppm	1st year Per year after 1st year

RF Output

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Output Load		See Load Circuit Diagram on Page 4				LVPECL LVDS, CML CMOS
Symmetry	T_{DC}	45 45		55 55	% %	@ 50% of waveform (LVPECL, LVDS, CML) @ 50% VDD (CMOS)
Logic "1" Level	V_{OH}	VDD – 1.02 90% VDD			V	LVPECL Load CMOS Load
Logic "0" Level	V_{OL}			VDD - 1.63 10% VDD	V	LVPECL Load CMOS Load
Output Skew			20 15 20		ps ps ps	LVPECL CML LVDS

Differential Output Voltage		250	425	500	mV	LVDS Load
Common Mode Voltage			1.2		V	LVDS Output
Output Voltage Level		1.1	1.5	1.9	Vpk-pk	CML
Rise/Fall Time				0.35 5.0 7.0	ns ns ns	LVPECL, LVDS, CML CMOS @ 3.3 VDD CMOS @ 1.8 VDD
Startup Time				10	ms	
G-sensitivity			0.8		ppb/g	

Frequency Adjustment

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Control Voltage Range	Vc	0.18 0.25 0.30	0.90 1.25 1.65	1.62 2.25 3.00	V	@1.8 V supply @2.5 V supply @3.3 V supply
Absolute Pull Range			±5.0		ppm	VCTCXO only [3]
Linearity				10	%	
Input Impedance		500			kΩ	

Enable/Disable

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Enable/Disable Logic (Option B or G)	V_{DD}	80% V_{DD}		 0.35	V V	Output Enabled Output disabled to HIGH Z
Enable/Disable Logic (Option S or M)	I_{DD}	 80% V_{DD}		0.35	V V	Output Enabled Output disabled to HIGH Z

Operating Voltage and Current

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Operating Voltage	V_{DD}	3.135 2.375 1.710	3.300 2.500 1.800	3.465 2.625 1.890	V	M6400 M6401 M6402
Operating Current	I_{DD}			110 100 110 90	mA	LVPECL LVDS CML CMOS

Temperature

Parameter	Symbol	Min.	Typ.	Max.	Units	Conditions
Operating Temperature	OTR	See Ordering Information			°C	
Storage Temperature	STR	-55		+125	°C	

Notes

Note 1	Contact factory for frequencies over 400 MHz.
Note 2	Contact factory for less than ±1 ppm frequency stability.
Note 3	Contact factory for other tuning range options.

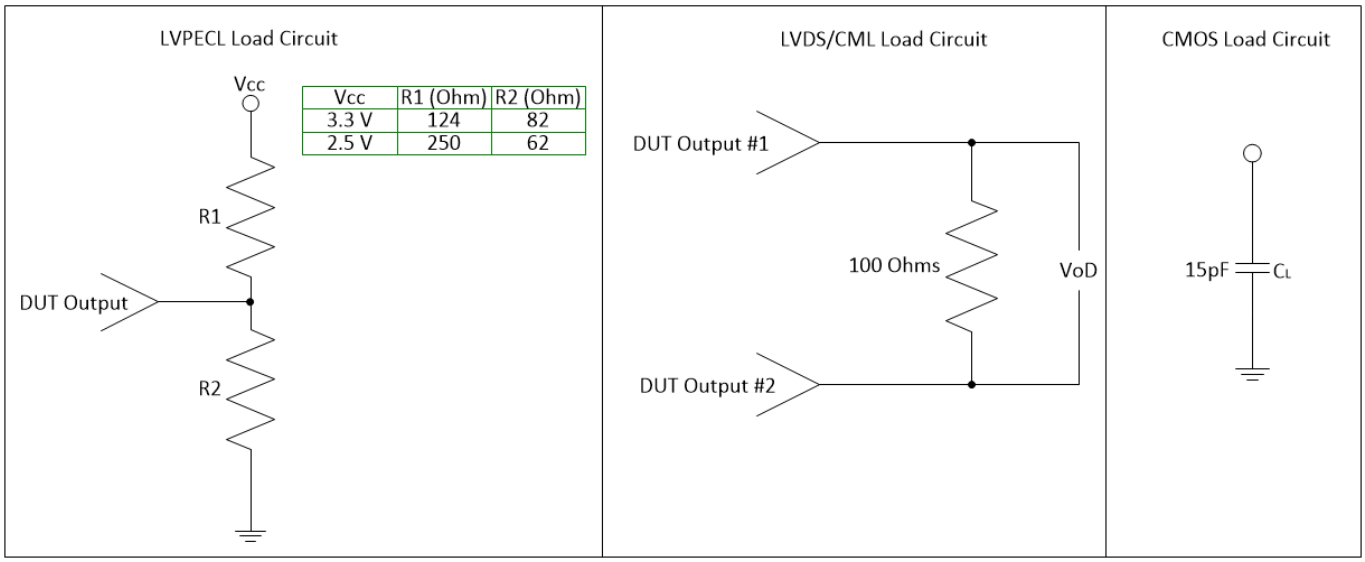
Temperature vs. Stability

	±0.5 ppm	±1.0 ppm	±2.0ppm	±4.6 ppm
-40°C to +85°C	Available	Available	Available	Available
-55°C to +105°C	Contact Factory	Contact Factory	Available	Available
-55°C to +125°C	Contact Factory	Contact Factory	Contact Factory	Available

Environmental Condition

Parameter	Conditions
Shock	MIL-STD-202, Method 213, Condition C
Vibration	MIL-STD-202, Method 201 & 204
Solderability	EIAJ-STD-002
Hermeticity	MIL-STD-202, Method 112, (1x10-8 atm. cc/s of Helium)
Thermal Shock	Per MIL-STD-883, Method 1011, Condition A
Thermal Cycle	MIL-STD-883, Method 1010, Condition B

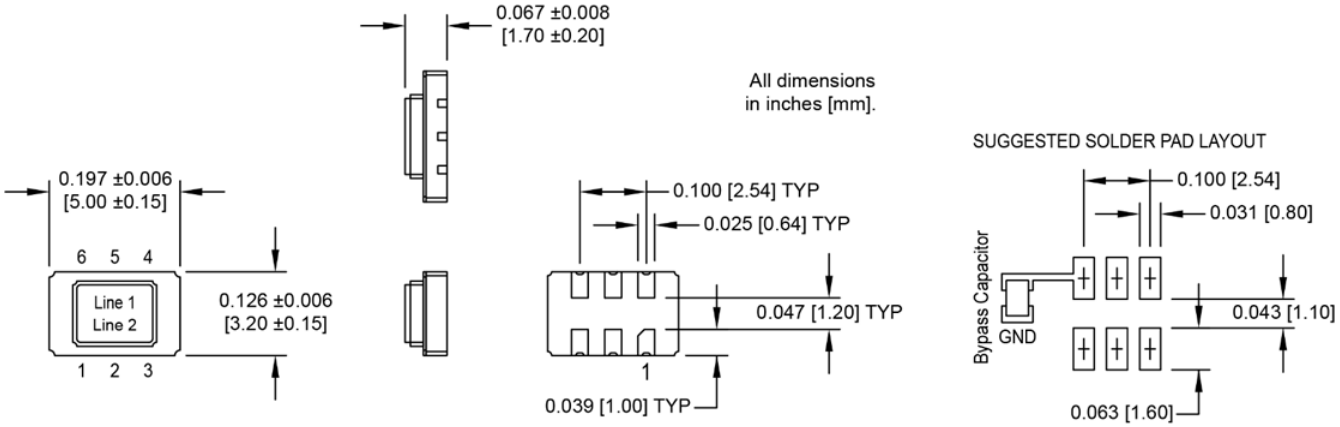
Load Circuit Diagrams



Mechanical and pin out information

Pad	Function
1	Enable/Disable, Voltage Control or N/C
2	Enable/Disable, Voltage Control or N/C
3	Ground
4	Output Q (LVPECL, LVDS, CML, CMOS)
5	Output $\bar{Q}$ (LVPECL, LVDS, CML)
6	Supply VDD+

Package Dimensions



Lead Free Solder Profile

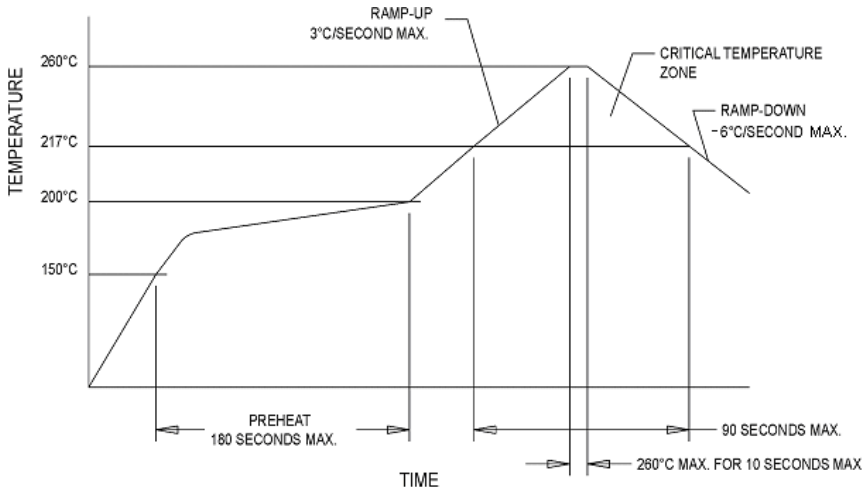
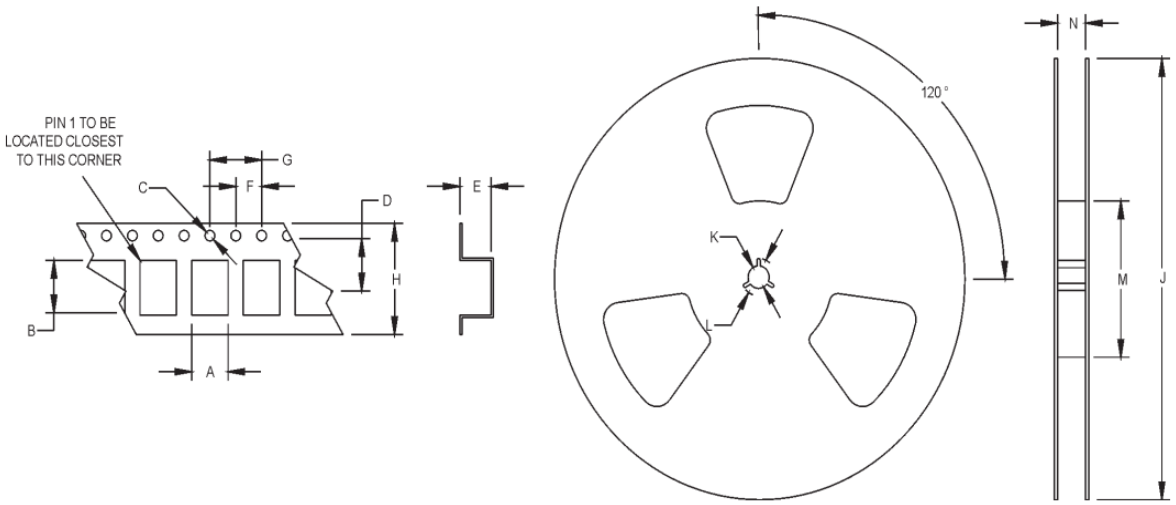


Figure 1

Tape and Reel Specifications

All units in mm



A	B	C	D	E	F	G	H	J	K	L	M
3.9	6.4	1.5	5.5		4	8	12	250	13	21	80

Ordering Information

M640 2 J B V P C 00.0000MHz

Product Series	
M6400	3.3 V
M6401	2.5 V
M6402	1.8 V

Temperature Range	
2	-40°C to +85°C
3	-55°C to +105°C
4	-55°C to +125°C

Stability	
G	± 0.5 ppm
J	± 1.0 ppm
K	± 2.0 ppm
L	± 4.6 ppm
E	± 10 ppm

Frequency (Customer specified)

Package/Lead Configuration	
C	Leadless Ceramic

Output Waveform	
P	LVPECL
L	LVDS
M	CML
C	CMOS

Output Type	
F	No Voltage Control (TCXO)
V	Voltage Control (VCTCXO)

Enable/Disable Function	
B	Enable High (Pad 1)
G	Enable High (Pad 2)
S	Enable Low (Pad 1)
M	Enable Low (Pad 2)
U	No Enable/Disable

Revision History

Date	Rev	Author	Details of Revision
04-11-25	0	AR	Initial Version