IT2100M

Overview
Low cost SMD TCXO using an analogue IC for compensation and Enable/Disable pin for efficient power managament.

Description
The IT2100M employs an analogue IC for the oscillator and 5th order temperature compensation circuit in a 2.1 x 1.7mm size package. The device can be palced in power down mode through a single input pin. During standard operation, power consumption is minimized by operating down to a supply voltage of 1.8V. The IT2100M's low power consumption, small footprint and powerful compensation method makes it a TCXO ideally suited for demanding GPS mobile applications.

Recommended Applications
Handset, GPS, PDA, PCMCIA CDPD cards, LBS Handset, Consumer Products, PND, WiFi, WiMAX/WLAN, Communications, Other.

Features
Excellent phase noise performance
Height less than 0.8mm
Low Startup drift rate
Operates at 1.8V supply
Power Down Mode
Standard temperature stability choices are ±0.5ppm and ±2.00ppm

IT2100M Specifications

1.0 Specification References

1.1	Model Description	IT2100M (Preliminary)
1.2	RoHS Compliant	Yes

2.0 Frequency Characteristics

	Parameter	Test Condition	Value	Units
2.1	Frequency range	Frequency range available	13 to 40	MHz
2.2	Frequency calibration	Offset from nominal frequency measured at 25°C ±2°C	1 max	±ppm
2.3	Reflow shift	Two consecutive reflows at the attached reflow profile after 1 hour relaxation at 25°C	1 max	±ppm
2.4	Frequency stability over temperature	Reference to the midpoint between minimum and maximum frequency value over the specified temperature range (Note 1, 2)	0.5 to 2	±ppm
2.5	Temperature range	The operating temperature range over which the frequency stability is measured (Note 3)	-30 to 85	°C
2.6	Frequency slope	Minimum of 1 frequency reading every 2°C, over the operating temperature range (Note 1, 4)	0.05 to 1	ppm/°C
2.7	Static temperature hysteresis	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C	0.6 max	ppm
2.8	Supply voltage stability	Supply voltage varied ±5% at 25°C (Note 4)		±ppm
2.9	Load sensitivity	±10% load change	0.2 max	±ppm
2.10	Long term stability	Frequency drift over 1 year (Note 4)	2 max	±ppm

3.0 Power Supply

	Parameter	Test Condition	Value	Units
3.1	Supply voltage	Nominal supply voltage range (Note 5)	1.7 to 3	V
3.2	Current	At maximum supply voltage (Note 6)	1.5 max	mA
3.3	Stand-by current	Typical value	1	uA

4.0 Oscillator Output

	Parameter	Test Condition	Value	Units
4.1	Output waveform	DC coupled clipped sinewave (Note 7)		
4.2	Output voltage level	At minimum supply voltage (Note 6)	0.8	V
4.3	Output load resistance	Refer to test circuit	9.5 to 10.5	kOhm
4.4	Output load capacitance	Refer to test circuit	9.5 to 10.5	pF
4.5	Startup amplitude	90% of specified output level (Note 8)	500 max	us
4.6	Startup frequency	Within ±0.5ppm of steady state. Typical time for 26.0MHz is 1.5ms (Note		

5.0 Power Down Mode (Enable/Disable)

	Parameter	Test Condition	Value	Units
5.1	Power down	RF disabled	0 to 0.2	Vcc
5.2	Normal operating mode	RF enabled	0.8 to 1.1	Vcc
5.3	Frequency startup from power down	Typical time to be within ±0.5ppm of steady state for 26.0MHz is 1.5ms		
5.4	Power down delay	Delay prior to oscillator power down	2.5 to 10	ms

6.0 SSB Phase Noise

	Parameter	Test Condition	Value	Units
6.1	SSB phase noise power density at 1Hz offset	Typical values for a 26.0MHz oscillator at 25°C	-67 max	dBc/Hz
6.2	SSB phase noise power density at 10Hz offset	Typical values for a 26.0MHz oscillator at 25°C	-92 max	dBc/Hz
6.3	SSB phase noise power density at 100Hz offset	Typical values for a 26.0MHz oscillator at 25°C	-115 max	dBc/Hz
6.4	SSB phase noise power density at 1KHz offset	Typical values for a 26.0MHz oscillator at 25°C	-135 max	dBc/Hz
6.5	SSB phase noise power density at 10KHz offset	Typical values for a 26.0MHz oscillator at 25°C	-148 max	dBc/Hz
6.6	SSB phase noise power density at 100KHz offset	Typical values for a 26.0MHz oscillator at 25°C	-151 max	dBc/Hz

7.0 Environmental

	Parameter	Test Condition
7.1	Shock	Half sinewave acceleration of 100G peak amplitude for 6ms duration, 3 cycles each plain.
7.2	Humidity	After 48 hours at 85°C ±2°C 85% relative humiduty non-condensing
7.3	Thermal shock	Exposed at -40°C for 30 minutes then to 85°C for 30 minutes repeatedly for a period of 5 days
7.4	Vibration	10G RMS from 30Hz t0 1500Hz random in each of the 3 axis for 4 hours; total of 12 hours
7.5	Storage temperature	-40 to 85°C

8.0 Marking

	Parameter	Test Condition
8.1	Type	Engraved
8.2	Line 1	R and Product code
8.3	Line 2	Pin 1 and Date code

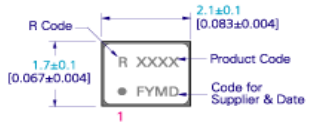
9.0 Manufacturing Information

	Parameter	Test Condition
9.1	Reflow	Solder reflow process as per attached profile
9.2	Packaging description	Refer to packaging information

10.0 Specification Notes

	Parameter	Test Condition
10.1	Note 1	A maximum frequency stability over the temperature is required to be specified. Standard options are ±0.5ppm, ±1ppm, ±1.5ppm and ±2.5ppm
10.2	Note 2	Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents on the oscillator can lead to short term frequency drift
10.3	Note 3	The operating temperature range needs to be specified. The extremes for this model are -40 and 85°C
10.4	Note 4	The maximum value is the specification. A minimum value, if present indicates the best specification available
10.5	Note 5	The unit will operate on any voltage between minimum and maximum values
10.6	Note 6	Specified for load stated in 4.3 and 4.4 at 25°C
10.7	Note 7	External AC-Coupling capacitor required. 1nF or greater recommended
10.8	Note 8	Startup parameters depends on crystal oscillation frequency starts up faster

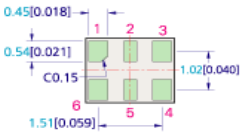
MODEL DRAWING



TOP VIEW

SIDE VIEW

END VIEW

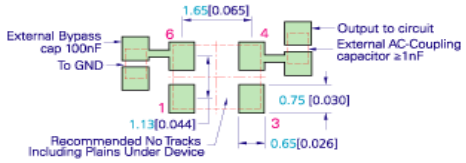


BOTTOM VIEW

PIN CONNECTIONS	
1	NC
2	ENABLE / $\overline{\text{DISABLE}}$ *
3	GND
4	OUTPUT
5	NC
6	VCC

NOTE:
* Connect to VCC or floating to enable TCXO.

RECOMMENDED PAD LAYOUT



TOP VIEW

TITLE: IT2100M MODEL	FILENAME: CAT498	REVISION: A	Tolerances: XX ±0.5, X.X ±0.2, X.XX ±0.10, X.XXX ±0.05, X° ±1.0°, Hole ±0.10
RELATED DRAWING:		DATE: 10-Sep-08	
		SCALE: 10 : 1	
		Millimetres [inch]	

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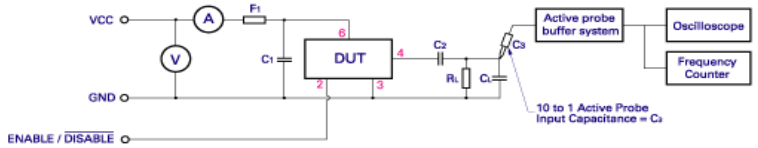

C_1: 100nF
C_2: ≥ 1nF
R_L: 10K
$C_T = C_L + C_S$ (C_S - Oscilloscope probe capacitance)
C_T as stated in OSCILLATOR OUTPUT section
F_1: A ferrite bead or a resistor between 22Ω ~ 47Ω recommended.

TITLE: IT2100M SERIES TEST CIRCUIT	FILENAME: CAT499	REVISION: A	
RELATED DRAWINGS:		DATE: 10-Sep-08	
		SCALE: NTS	
		Millimetres [inch]	

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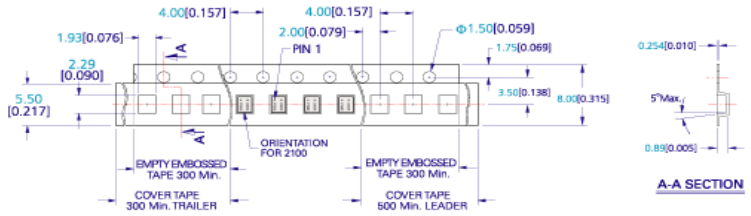
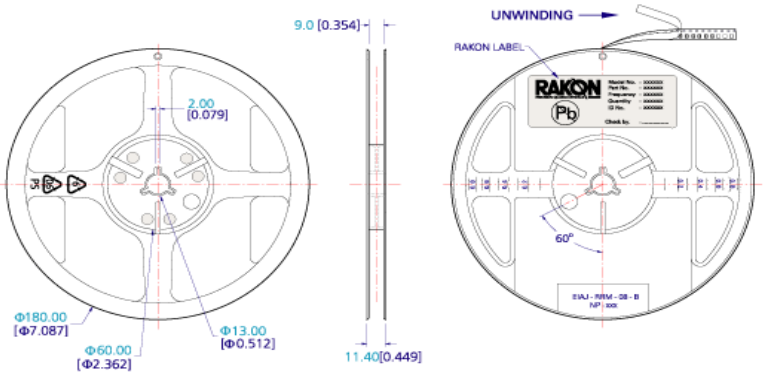


TAPE DETAIL SCALE 2 : 1



REEL DETAIL SCALE 1 : 2.5

NOTE:
1. Φ180mm REEL STANDARD PACKING QUANTITY IS 3000 OSCILLATORS PER REEL.

TITLE: 2100 SERIES TAPE & REEL	FILENAME: CAT461	REVISION: A	Tolerances: XX ±0.5, X.X ±0.2, X.XX ±0.10, X.XXX ±0.06, X° ±1.0°, Hole ±0.10
RELATED DRAWINGS:		DATE: 04-Sep-08	
		SCALE: See Above	
		Millimetres [inch]	

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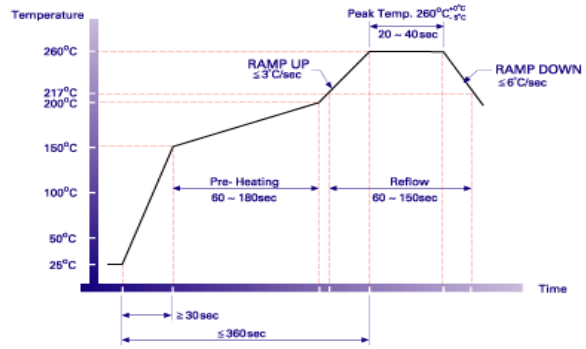

NOTE:
The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon TCXO is determined by the solder paste manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown above.

TITLE: 2200 SERIES Pb-FREE REFLOW	FILENAME: CAT423	REVISION: A
RELATED DRAWINGS:		DATE: 15-Dec-06
		SCALE: NTS
		Millimetres [inch]

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