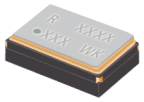
IT2200A

SMD Temperature Compensated Crystal Oscillators

Low cost SMD TCXO with voltage control option using an analogue IC for compensation. Frequencies ranging from 10MHz to 52MHz.



Product description

The I(V)T2200A employs an analogue IC for the oscillator and temperature compensation. 2.5mm x 2.0mm in size, the RSX-10 crystal is surface mounted on top of the ceramic IC carrier. The segregation of the crystal from the oscillator further improves the reliability of the product.

Applications

- Handset
- GPS
- PDA
- PCMCIA CDPD cards
- LBS Handset
- Consumer Products
- PND
- WiFi
- WiMAX/WLAN
- Communications
- Other

Features

Specifications

1.0 SPECIFICATION REFERENCES

Line	Parameter	Description
1.1	Model description	IT2200A / IVT2200A / IT2200AP / IT2200AQ
1.2	Reference number	
1.3	Rakon part number	
1.4	RoHS compliant	Yes

2.0 FREQUENCY CHARACTERISTICS

Line	Parameter	Test Condition	Value	Unit
2.1	Frequency	Frequency range available	10 to 52	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 as per attached profile after 1 hour recovery	±1 max	ppm
2.4	Temperature range	The operating temperature range over which the frequency stability is measured (Note 3)	-30 to 85	°C
2.5	Frequency stability over temperature	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range. Control voltage set to midpont of control voltage (Note 1, 2)	±0.5 to 2	ppm
2.6	Frequency slope	Minimum of 1 frequency reading every 2°C over the operating temperature range (Note 1, 2, 4)	0.05 to 1	ppm/°C
2.7	Static temperature hysteresis	Frequncy 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)	±0.1 max	ppm
2.9	Load sensitivity	±10% load change at 25°C	±0.2 max	ppm
2.10	Long term stability	Frequency drift over 1 year at 25°C (Note 4)	±1 max	ppm

3.0 POWER SUPPLY

Line	Parameter	Test Condition	Value	Unit
3.1	Supply voltage	Nominal supply voltage range (Note 5)	1.8 to 3.3	V
3.2	Current	At maximum supply voltage (Note 6)	2 max	mA

4.0 CONTROL VOLTAGE (VCO) OPTION

Line	Parameter	Test Condition	Value	Unit
4.1	Control voltage range Mode 1	The nominal control voltage value is midway between the minimum and maximum. Voltage control should not exceed the supply voltage +0.2 V or GND. Supply voltage ≤2.3 V.	0.3 to 1.5	V
4.2	Control voltage range Mode 2	The nominal control voltage value is midway between the minimum and maximum. Voltage control should not exceed the supply voltage +0.2 V or GND. Supply voltage >2.3 V.	0.4 to 2.4	V
4.3	Frequency tuning	Frequency shift from minimum to maximum control voltages (Note 7)	6 to 60	ppm
4.4	Port input impedance	Measured between Control voltage and GND pin	500	kΩ

5.0 OSCILLATOR OUTPUT

Line	Parameter	Test Condition	Value	Unit
5.1	Output waveform	DC coupled clipped sine-wave (Note 8)		
5.2	Output voltage level	At minimum supply voltage (Note 6)	0.8 min	V
5.3	Output load resistance	Refer to test circuit. Typical load 10 kΩ	9 to 11	kΩ
5.4	Output load capacitance	Refer to test circuit. Typical load 10pF	9 to 11	pF

6.0 POWER DOWN MODE (Enable/Disable Pin) – OPTION

Line	Parameter	Test Condition	Value	Unit
6.1	Power down	RF, Disabled (Minimum GND)	10 max	%Vcc
6.2	Normal operating mode	RF, Enabled (Maximum Vcc)	90 min	%Vcc

7.0 SSB PHASE NOISE

Line	Parameter	Test Condition	Value	Unit
7.1	SSB phase noise power density at 1Hz offset	Typical value for a 26MHz oscillator at 25°C	-64	dBc/Hz
7.2	SSB phase noise power density at 10Hz offset	Typical value for a 26MHz oscillator at 25°C	-92	dBc/Hz
7.3	SSB phase noise power density at 100Hz offset	Typical value for a 26MHz oscillator at 25°C	-115	dBc/Hz
7.4	SSB phase noise power density at 1kHz offset	Typical value for a 26MHz oscillator at 25°C	-135	dBc/Hz
7.5	SSB phase noise power density at 10kHz offset	Typical value for a 26MHz oscillator at 25°C	-149	dBc/Hz

8.0 ENVIRONMENTAL

Line	Parameter	Description
8.1	Shock	Half sinewave acceleration of 100G peak amplitude for 6ms duration, 3 cycles each plain
8.2	Humidity	After 48 hours at 85°C±2°C 85% relative humidity non-condensing
8.3	Thermal shock test	Exposed at -40°C for 30 minutes then 85°C for 30 minutes for a period of 5 days.
8.4	Vibration	10G RMS from 30 Hz to 1500 Hz Random in each of the 3 axis for 4 hours, totally 12 hours
8.5	Storage temperature	-40 to 85°C

9.0 MARKING

Line	Parameter	Description
9.1	Type	Engraved
9.2	Line 1	R and product code
9.3	Line 2	Pin 1, internal code and date code

10.0 MANUFACTURING INFORMATION

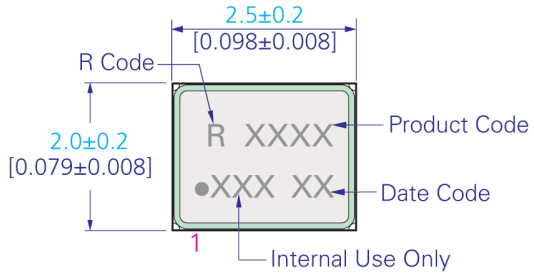
Line	Parameter	Description
10.1	Reflow	Solder reflow processes as per profile attached.
10.2	Packaging description	Tape and reel. Standard packing quantity is 3000 units per reel

11.0 SPECIFICATION NOTES

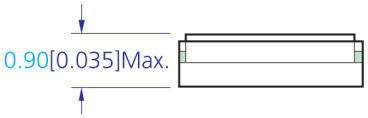
Line	Parameter	Description
11.1	Note 1	A maximum frequency stability over the temperature is requried to be specified. Standard options are ±0.5ppm, ±1.0ppm and ±2.5ppm
11.2	Note 2	Parts should be shielded from drafts causing unexpected thermal gradients. Temperatue changes due to ambient air currents on the oscillator can lead to short term frequency drift
11.3	Note 3	The operating temperature range needs to be specified. The extremes for this model are -40 to 85°C
11.4	Note 4	The maximum value is the specified. A minimum value, if present, indicates the best specification available
11.5	Note 5	The unit will operate on any voltage between the minimum and maximum values
11.6	Note 6	Specified for load stated in 5.3 and 5.4 at 25°C. Current consumption depends on crystal oscillation frequency. Higher frequency will result in higher current consumption and a drop in output voltage level
11.7	Note 7	The maximum frequency tuning range depends on the design frequency and the trimming sensitivity of the crystal. Linearity performance degrades if maximum frequency tuning setting is selected
11.8	Note 8	AC-Coupled outputs require an external capacitor, ≥ 1nF recommended

Drawing Name: I(V)T2200A Model Drawing

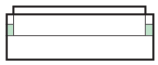
MODEL DRAWING



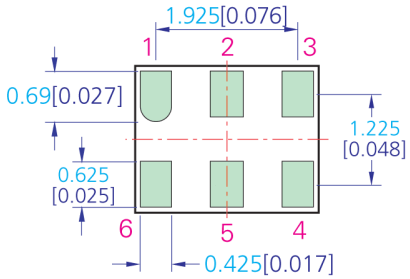
TOP VIEW



SIDE VIEW



END VIEW



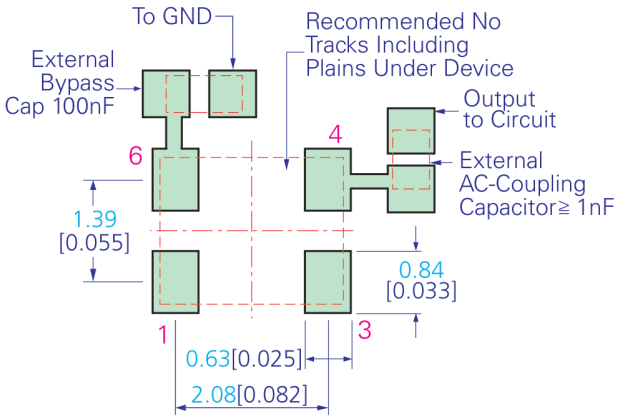
BOTTOM VIEW

PIN CONNECTION OPTIONS

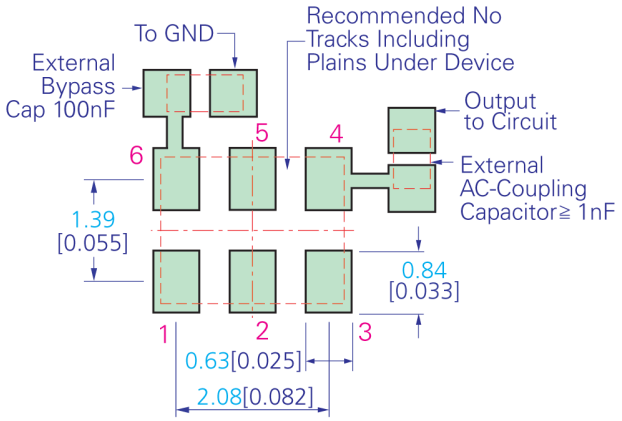
PIN	4 PAD			6 PAD
	IT22..A	IVT22..A	IT22..AP	IT22..AQ
1	NC	VCO	Enable/$\overline{\text{Disable}}$*	NC
2	NC	NC	NC	Enable/$\overline{\text{Disable}}$*
3	GND	GND	GND	GND
4	OUTPUT	OUTPUT	OUTPUT	OUTPUT
5	NC	NC	NC	NC
6	VCC	VCC	VCC	VCC

* Connect to VCC or floating to enable TCXO.

RECOMMENDED 4 PAD LAYOUT - TOP VIEW



RECOMMENDED 6 PAD LAYOUT - TOP VIEW



TITLE: I(V)T2200A MODEL

RELATED DRAWINGS:

FILENAME: CAT413

REVISION: F

DATE: 30-May-11

SCALE: 10 : 1

Millimetres [inch]

Tolerance:
XX =±0.5
X.X =±0.2
X.XX =±0.10
X.XXX =±0.05
X° =±1.0°
Hole =±0.10

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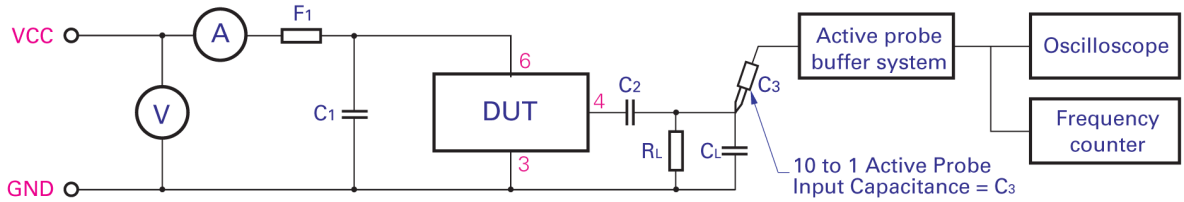
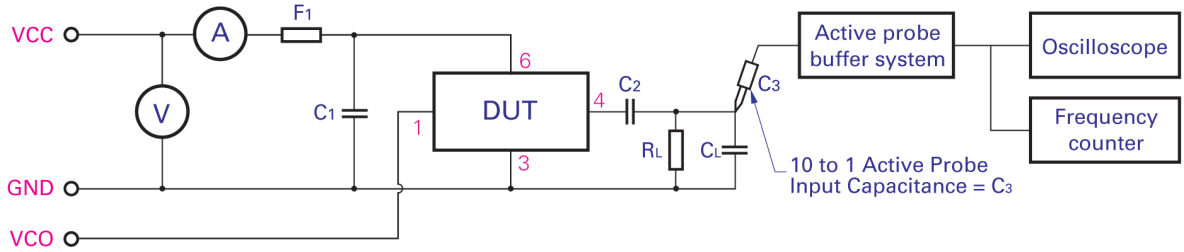
Drawing Name: I(V)T2200A Series Test Circuit

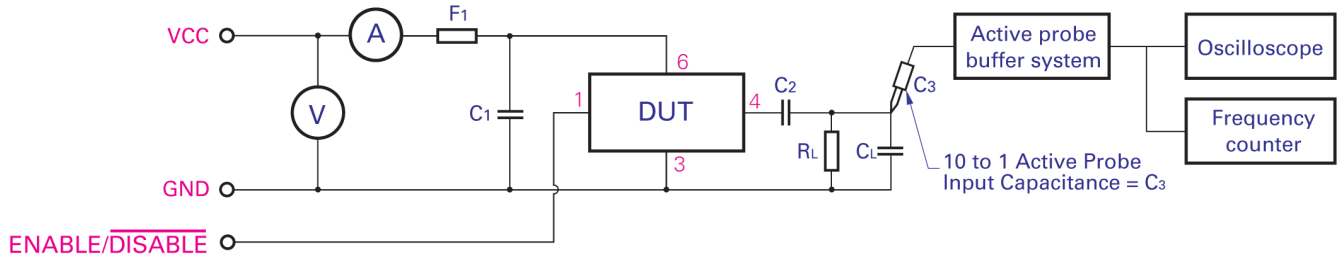
IT22..A TEST CIRCUIT :



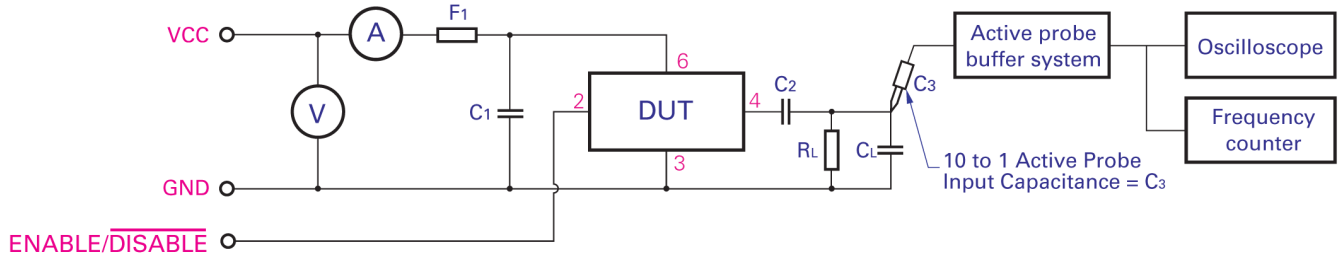
IVT22..A TEST CIRCUIT :



IT22..AP TEST CIRCUIT :



IT22..AQ TEST CIRCUIT :



C_1: 100nF C_2: ≧ 1nF R_L: 10K	$C_T = C_L + C_3$ (C_3 - Oscilloscope probe capacitance) C_T as stated in OSCILLATOR OUTPUT section F_1: A ferrite bead or a resistor between 22Ω ~ 47Ω recommended.

TITLE: I(V)T2200A SERIES TEST CIRCUIT

RELATED DRAWINGS:

FILENAME: CAT559

REVISION: B

DATE: 30-May-11

SCALE: NTS

Millimetres [inch]

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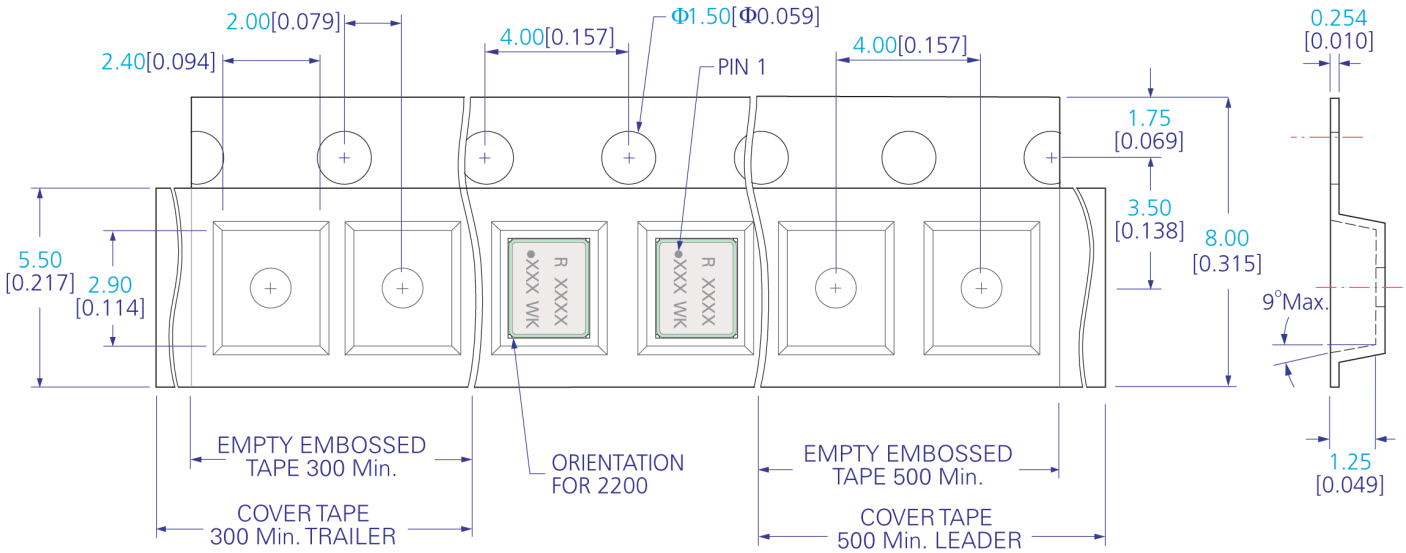
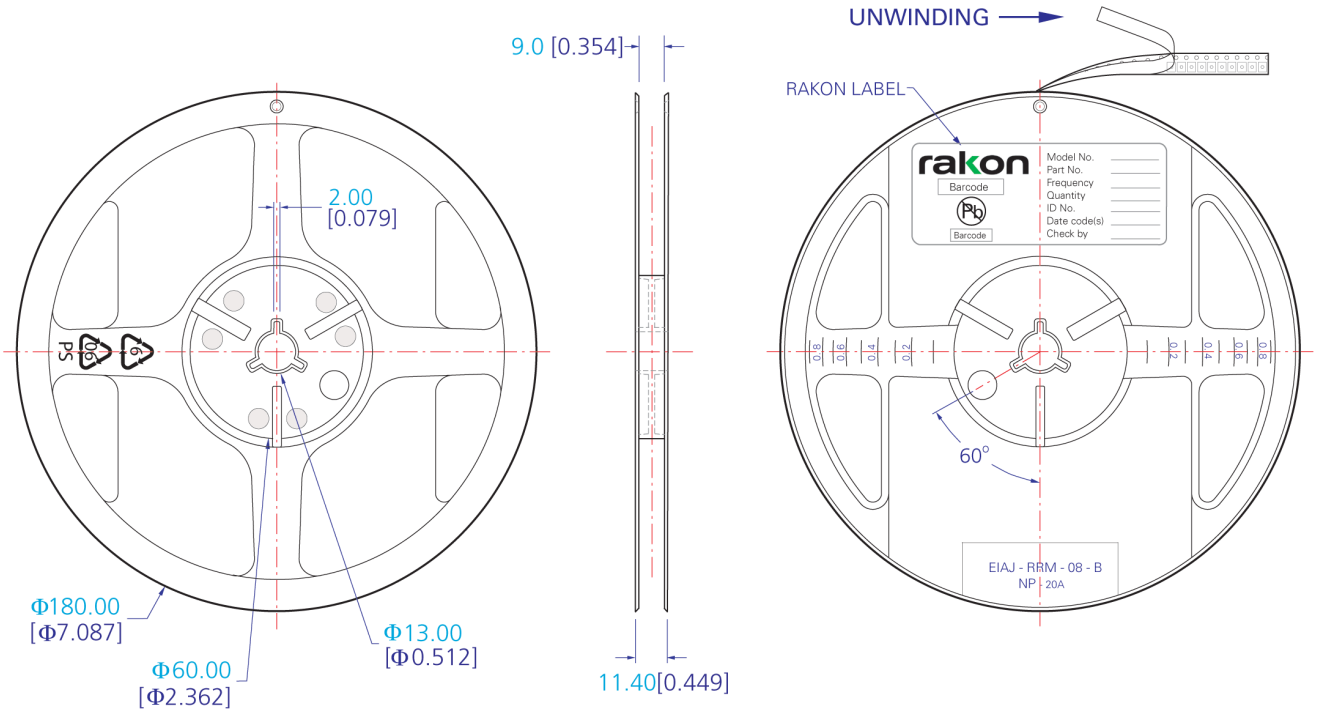
Drawing Name: 2200 Series Tape & Reel

TAPE DETAIL (SCALE 5 : 1)



REEL DETAIL (SCALE 1 : 2.5)



TITLE: 2200 SERIES TAPE & REEL	FILENAME: CAT422	Tolerance:
RELATED DRAWINGS:	REVISION: C	XX =±0.5
	DATE: 24-May-10	X.X =±0.2
	SCALE: See above	X.XX =±0.10
	Millimetres [inch]	X.XXX =±0.05
		X° =±1.0°
		Hole =±0.10

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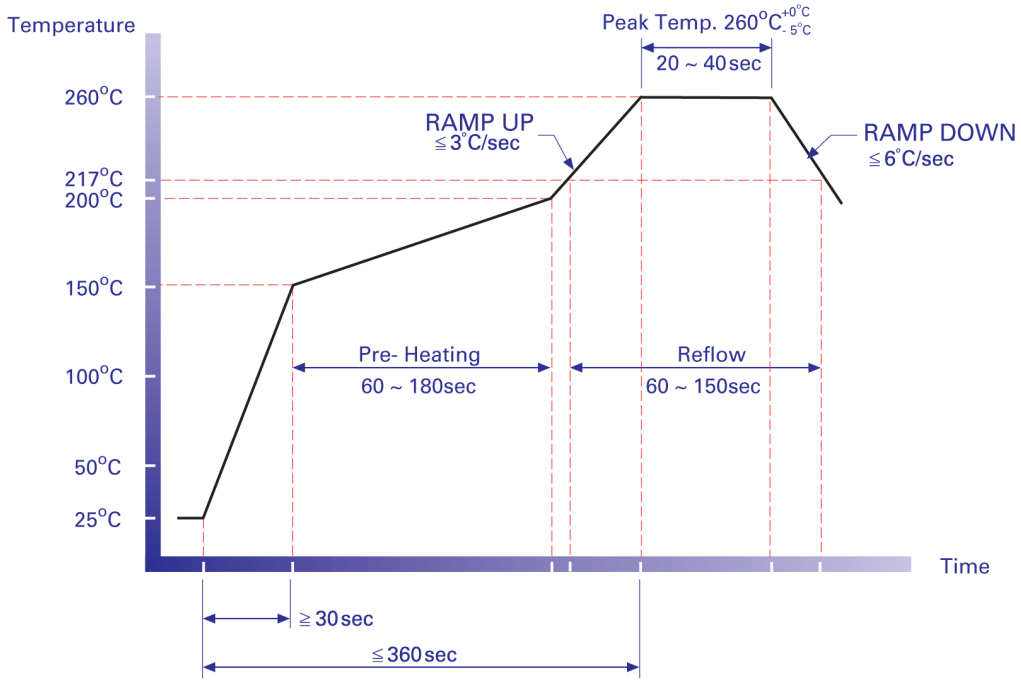
Drawing Name: Pb-Free Reflow



NOTE:

The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon products 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: Pb-FREE REFLOW	FILENAME: CAT541
RELATED DRAWINGS:	REVISION: B
	DATE: 07-Apr-10
	SCALE: NTS
	Millimetres [inch]

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