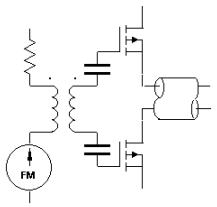


iCSA-100T-1-4 / iCSA-100T-2-4

Single/Dual Output Synthesizer and Amplifier

ISOMET

1626

Description

The *iCSA*- range are compact programmable frequency drivers designed around a direct digital synthesizer (DDS) and class-A power amplifiers. These modules offer a wide variety of frequency generation and signal control options at output powers up to 1W. Applications include dual-axis and beam-steered deflectors, frequency shifting and tuneable filters.

The iCSA- functions are controlled via high-speed USB-II, (RS485 option available). MS Windows10/11 GUI, Python support and a comprehensive C++ SDK are all provided. The SDK defines all the function calls that are possible on the iCSA- module and allows the system integrator to quickly and efficiently develop application software at a high level of abstraction.

DIRECT Mode

The iCSA- outputs are controlled directly from the host PC.
All output parameters can be set independently. The tuning rate is limited by the host PC interface.

Available Functions:

- Single tone (static frequency) output.
- Zero to Max Amplitude control.
- 0-360° phase shift between outputs
- Differential frequency offset between the outputs

EXTENDED TONE (Sweep) Mode

Frequency sweep parameters are configured at the host PC and downloaded directly to the DDS chip. A single trigger (via PC or external input) initiates the sweep. The increment step value and step duration are user programmable.

Available Functions:

- Up or Down
- Dwell or No dwell at completion

The sweep mode offers the fastest frequency scan capability, with a minimum dwell time of 8nsec per frequency increment. In contrast to IMAGE mode, the amplitude and phase values remain constant.

IMAGE Mode

The iCSA- outputs are controlled from “Image” data programmed into 32Mx8 internal memory. This memory can store a single image >100K frequency points with different frequency/amplitude at each output.
The stored image points each comprise of 16-bit Frequency, 10-bit Amplitude, 14-bit Phase and 2-bit synchronous IO. Output data is addressed in sequence under the control of external or internally generated trigger and clock signals. The RF signal responds to a new data set at each valid update clock. The minimum dwell time per frequency point is 0.2usec. The user can specify trigger, clock, repeat, and output delay functions. The IO bits are user programmable and output synchronously with the frequency points.

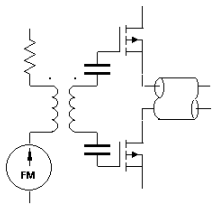
The image mode is highly flexible and allows fast continuous data throughput. A key advantage of this mode is that each frequency point may be modified by preloaded compensation data (LUT). This provides an efficient method of applying phase control and/or amplitude calibration to the downloaded image data. Active phase steering across the multiple RF outputs is the basis for Isomet (acoustic) beam steered AO deflectors. Amplitude compensation enhances uniformity of the scan pattern intensity.

Local Tone Buffer

Similar to the Image mode except the data is limited to 256 separately programmable frequency, amplitude and phase points. All points may be addressed randomly from software control or hardware via 8-bit external port. Data addressing is not clocked. Outputs change value immediately after a new buffer address is applied. Maximum update rate in this mode >900KHz.
This data can be stored in non-volatile memory.

ISOMET CORP, 10342 Battleview Parkway, Manassas, VA 20109, USA.
Tel: (703) 321 8301 Fax: (703) 321 8546
E-mail: ISOMET@ ISOMET.COM ***Web Page: WWW.ISOMET.COM***

Quality Assured.
In-house: RF & Digital design
Software Development
OEM manufacture



iCSA-100T-1-4 / iCSA-100T-2-4

Single/Dual Output Synthesizer and Amplifier

ISOMET

1626

Specification

Output 3dB bandwidth frequency range:	60 - 130MHz
(Synthesizer maximum frequency range:	10 - 210MHz)
Outputs, iCSA-xxT-1-4:	Single outputs, phase continuous
iCSA-xxT-2-4:	Dual independent outputs, phase continuous
Maximum frequency resolution:	32bit fundamental, 16bit SDK limit
Frequency settling (Image mode):	< 100nsec
Max. output rate (Image mode):	Configuration dependent, 3MHz - 5MHz
Frequency stability (internal reference clock):	+/- 2.5ppm
Phase control:	+/- 180deg differential between outputs (iCSA-xxT-2-1)
Maximum Power per output:	> 4W at 100MHz, 24Vdc supply
Output power flatness:	< +/- 1dB per octave, with no amplitude programming
Harmonics:	> 20dBc
RF On:Off contrast ratio:	> 40dBc (using external analog modulation inputs)
	> 60dBc (using data control)
Peak power adjustment range:	>35dB via digital potentiometers
Amplitude resolution (Image/Tone data):	10bit full range, zero to set peak power level.
External asynchronous modulation input(s):	0-5V or 0-1V (option), full range, zero to set peak power level. *Configurable: common or channel scoped, override or disable control.*
DC Supply:	+24V nominal @ <1.5A, (Input voltage range +12V to +24V)
Communications:	USB II, RS485 (option).
External Clock, Trigger Inputs:	5V tolerant LVTTL compatible. SMB connectors
Memory capacity:	100K frequency data points, single 'Image'
Auxiliary I/O - Synchronous:	2bits SDIO, 2x DAC outputs
- Asynchronous:	4bits GPIO

Optional Features	Model (x = 1 or 2):
RS485 serial	iCSA-100T-x-4-R
0-1V external modulation	iCSA-100T-x-4-V

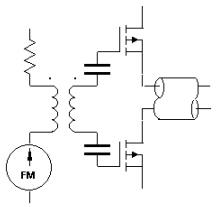
Associated models:

iCSL-, 10-210MHz, 1mW output	see separate data sheet:	iCSL-1, -2
Controller 'Pro', 10MB memory, multi-image:	see separate data sheet:	iMS2-P or iMS4-P
Higher Frequency, dual output, 40-400MHz:	see separate data sheet:	iMS2-HF

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

ISOMET CORP, 10342 Battleview Parkway, Manassas, VA 20109, USA.
Tel: (703) 321 8301 Fax: (703) 321 8546
E-mail: ISOMET@ ISOMET.COM ***Web Page: WWW.ISOMET.COM***

Quality Assured.
In-house: RF & Digital design
Software Development
OEM manufacture

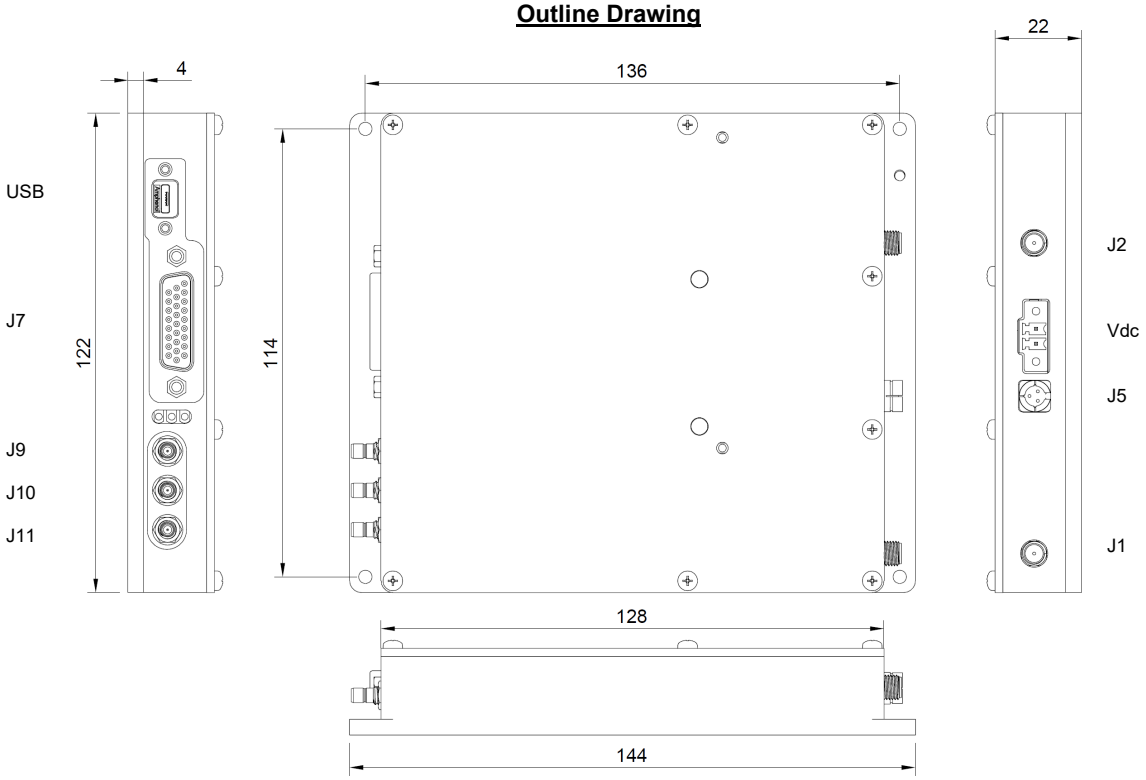


iCSA-100T-1-4 / iCSA-100T-2-4

Single/Dual Output Synthesizer and Amplifier

1626

Outline Drawing



MOUNT TO HEAT CONDUCTING SURFACE

Connector Summary

All digital I/O signals are ESD protected to IEC6100-4-2 and include EMI suppression.

Ident	Type	Description
J1, J2	SMA	RF outputs
J5	3-way Binder 719 series	Interlock
J7	26-way High density female D-type	Control
J9	SMB	Gate input
J10	SMB	Trigger input / output
J11	SMB	Clock input / output
USB	mini-B	USB II/III
Vdc	3.81mm Pheonix	12-24Vdc voltage input

ALL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE
ISOMET CORP, 10342 Battleview Parkway, Manassas, VA 20109, USA.
Tel: (703) 321 8301 Fax: (703) 321 8546
E-mail: ISOMET@ ISOMET.COM ***Web Page: WWW.ISOMET.COM***

Quality Assured.
In-house: RF & Digital design
Software Development
OEM manufacture