PRELIMINARY

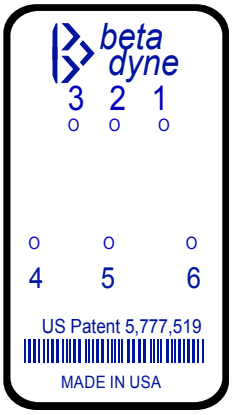
LN10022

Low-Noise 10W Dual DC/DC Converter

9-36 V_{IN} +/-12Vout @+/-333mA
A1 Pin Configiration

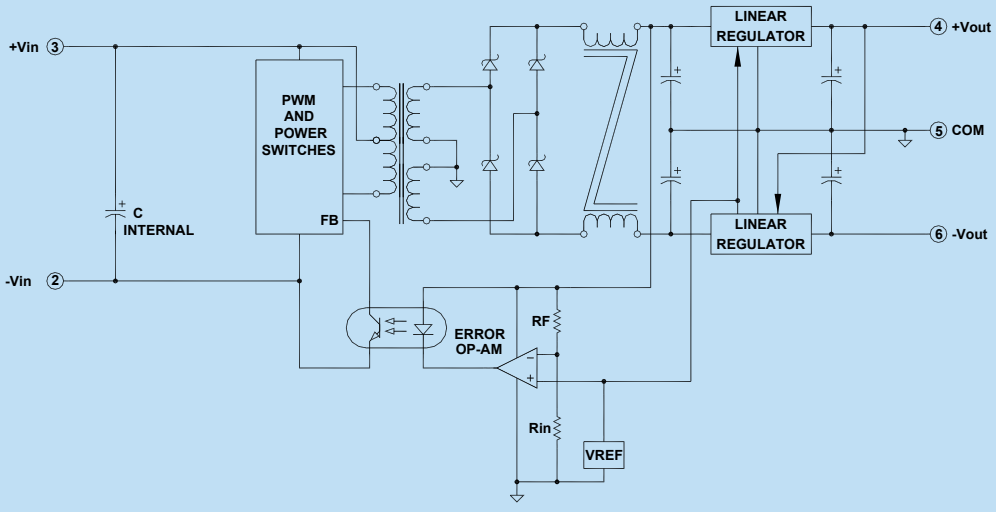
Key Features

- Six-sided shielding
- Soft start
- Dual output
- Short circuit protection
- 750µA off state current
- 250mV dropout linear regulators
- Dual output tracking linear regulator
- 5µS transient response
- Industry A1 pinouts



Functional Description

The LN10022 is a dual output, isolated DC/DC converter that accepts 9 to 36V_{IN}, and provides 12V_{OUT}@333mA and -12V_{OUT} @333mA.The converter's design is based on Beta Dyne's patents and offers low noise and an extended operating temperature range from -55°C to +85°C.



Typical Block Diagram of Dual Output Converter

Electrical Specifications

Unless otherwise specified, all parameters are given under typical +25°C with nominal input voltage and under full output load conditions.

INPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range		9	12	36	Vdc
No Load Input Current			TBD		mA
Full Load Input Current			TBD		mA
Input Filter	C				
Reverse Polarity Input Current	External series-blocking diode			12	A
Input Surge Current (20µS Spike)				10	A
Short Circuit Current Limit			150		% I_{IN}
Undervoltage Shutdown		4.5			Vdc
Off State Current			750		µA

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			+/-12		Vdc
Output Current			330		mAdc
Output Voltage Accuracy			±1	±1.5	%
Output Voltage Adjustment			3	±5	%
Voltage Balance, Dual[1]			±0.2	±0.5	%
Minimum Load[1]		10			% of FL
Ripple & Noise	See Figure 3		5	15	mV_{PP}
Line Regulation	Minimum V_{IN} to maximum V_{IN}		0.05	0.1	%
Load Regulation[2]			±1		%
Temperature Coefficient @ FL			0.02		%/°C of V_{OUT}
Transient Response Time (to within 0.5% of V_{OUT})	50% FL to FL to 50% FL, See Figure 1		5		µS
Short Circuit Protection	All outputs, by input current limiting				

[1] In applications where the $-V_{OUT}$ is loaded more than $+V_{OUT}$, a minimum load is required between $+V_{OUT}$ and GND. If the load is connected between $+V_{OUT}$ and $-V_{OUT}$, no minimum load is required.
[2] For dual converters if only the $-V_{OUT}$ is loaded. A 10% FL must be connected from $+V_{OUT}$ to Ground.

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			TBD		%
Isolation Voltage (1 min.)			1500		Vdc
Isolation Resistance			10^9		Ω
Isolation Capacitance			80		pF
Switching Frequency		300	320	333	kHz

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature, Industrial		-40		+75	°C
Storage Temperature Range		-55		+125	°C
Thermal Resistance			TBD		°C/W_{DISS}
Maximum Operating Case Temperature				105	°C
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
EMI/RFI	Six-sided continuous shielded metal case				
MTBF	per MIL-HNBK-217F (Ground benign, +25°C)		$1×10^6$		hours

PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	2.00×1.00×0.395 in. (50.80×25.40×10.03mm)				
Weight	1.04 oz. (30g)				
Case Material	Coated metal				
Shielding Connection	-Input (Pin 3)				

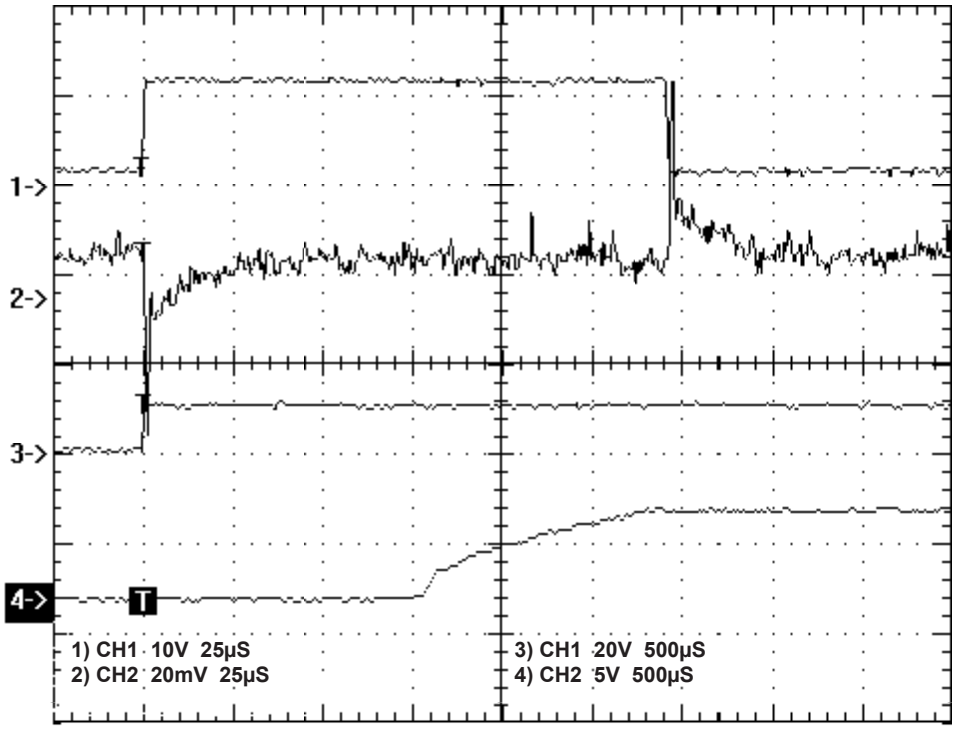


FIGURE 1. Transient response and turn on delay with soft start

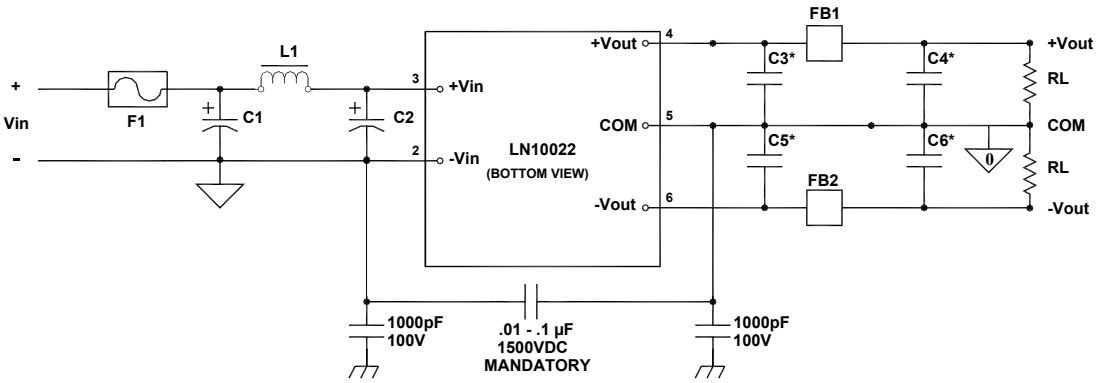
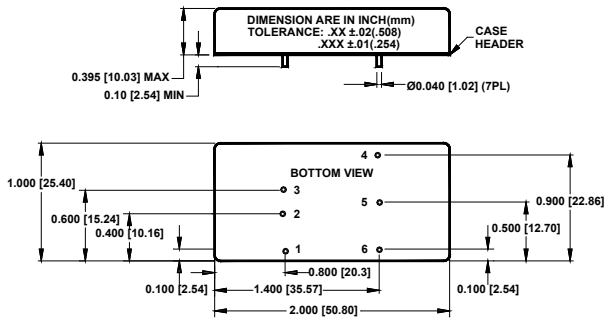


FIGURE 2. Typical connection diagram of Low-Noise 10W Dual DC/DC Converter
FB1,FB2=CMS2-5.6/3/4.8-4S2(Ferroxcube)

V_{IN}	F1 (A)	L1 (µH)	C1 (µF)	C2 (µF)	C3 - C6 (µF)
24	1	1	3.3@50V	22@50V	10

MECHANICAL SPECIFICATIONS



Pin	Function	
	SINGLE	***DUAL***
1	ON/OFF	ON/OFF
2	$-V_{IN}$	$-V_{IN}$
3	$+V_{IN}$	$+V_{IN}$
4	$+V_{OUT}$	$+V_{OUT}$
5	V_{OUT} ADJ	GND (COM)
6	GND	$-V_{OUT}$