Descriptions

Non-isolated & regulated 12A single output，POL power converter



RoHS

Features

- High efficiency up to 93%
- Operating ambient temperature range: -40℃ to +85℃
- Output short-circuit protection
- High-speed transient response
- Compact SMD package

Applications

- Communications
- Computer network industry
- Power distributed architecture, workstations, servers, LANs / WANs and provide high current with fast transient response for high-speed chips such as FPGA, DSP, and ASIC

Selection Guide

Certification	Part No.①	Input Voltage (VDC)		Output		Efficiency(%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max.②	Voltage(VDC)③ (Range)	Current (A) Min./Max.		
--	DNPT12-12P(N)	12 (4.5~14)	15	0.6-5.5	0/12	90/93	1000

Notes:

① "P" indicates that the ON/OFF pin is positive logic control, "N" indicates that the ON/OFF pin is negative logic control;

②When the output voltage is 3.3VDC, ensure that the input and output pressure difference is at least 3VDC;

③Exceeding the maximum input voltage may cause permanent damage;

④The default output voltage is 0.6VDC, which can be adjusted to 1.2VDC, 1.5VDC, 2.5VDC, 3.3VDC, 5VDC. See Trim instructions for specific output voltage adjustment;

⑤Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	Nominal input voltage		--	5377/50	--	mA
	Start-up Voltage①			--	--	4.5	VDC
	Reverse Polarity Input			Avoid / Not protected			
	Hot Plug			Unavailable			
	Input Filter			Capacitance filter			
	Ctrl (ON/OFF)②	Module on	DNPT12-12P (Positive logic)	ON/OFF pin open or pulled high (2V ~ Vin)			
			DNPT12-12N (Negative logic)	ON/OFF pin open or pulled low to GND (0 ~ 0.8VDC)			
		Module off	DNPT12-12P (Positive logic)	ON/OFF pin pulled low to GND (0 ~ 0.8VDC)			
			DNPT12-12N (Negative logic)	ON/OFF pin pulled high (2V ~ Vin)			
		Input current when off		--	--	1	mA
Output Specifications	Voltage Accuracy	Full load, nominal input voltage	external TRIM resistance accuracy within 0.1%	--	--	±2	%
			other	--	--	±3	
	Linear Deviation	Full load, input voltage range		--	--	±30	mV
	Load Deviation	Nominal input, 10% -100% load		--	--	±30	
	Ripple & Noise③	20MHz bandwidth, nominal input, 10% -100% load		--	40	--	mVp-p
	Trim			0.6	--	5.5	VDC
	Sense			--	--	0.5	V
	Transient Response Deviation	Nominal input, 75%-100%-75%load step change, measurement method, Co=107K*2 // 47uF		--	±100	--	mV
	Temperature Coefficient	Full load		--	--	±0.4	%/℃
	Short-circuit Protection	Nominal input		Continuous, self-recovery			
General Specifications	Operating Temperature	See Fig. 1		-40	--	+85	℃
	Storage Temperature			-55	--	+125	
	Storage Humidity	Non-condensing		5	--	95	%RH
	Reflow Soldering Temperature			Peak temp. Tc ≤245℃, maximum duration time ≤60s over 217℃. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
	Switching Frequency	Full load, nominal input voltage input		--	700	--	kHz
	MTBF	MIL-HDBK-217F@25℃		5000	--	--	k hours
Mechanical Specifications	Dimensions	20.30 x 11.40 x 8.70 mm					
	Weight	3.0g (Typ.)					
	Cooling Method	Nature convection or forced convection					

Notes:
①When the output voltage is 5VDC, the maximum starting voltage is 8VDC;
②The ON/OFF pin voltage is referenced to GND, ON/OFF external is recommended to add ESD devices and 1nF/50V/0603 ceramic capacitors;
③Ripple & noise test needs to be connected to 107K*2 // 47uF ceramic capacitors;
④Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

Characteristic Curve

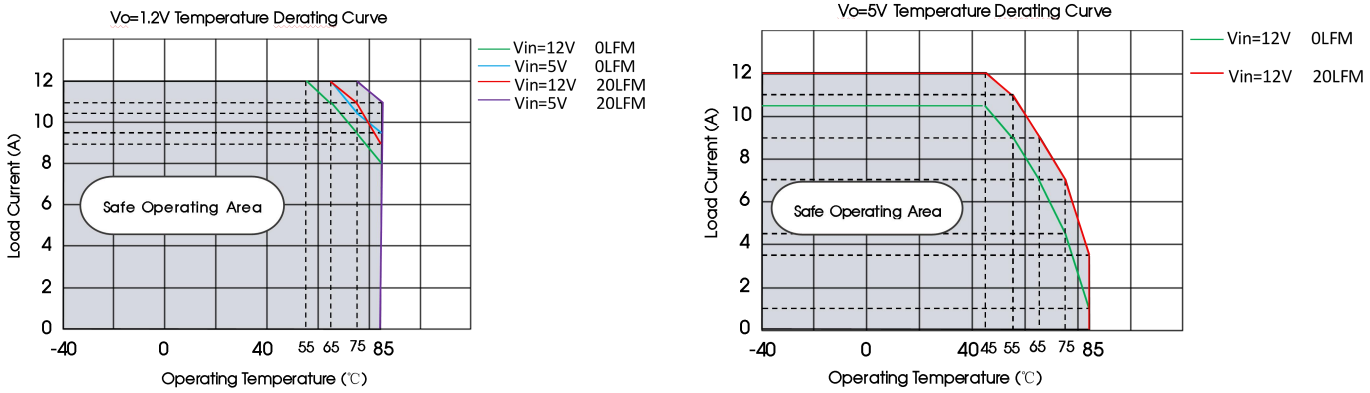
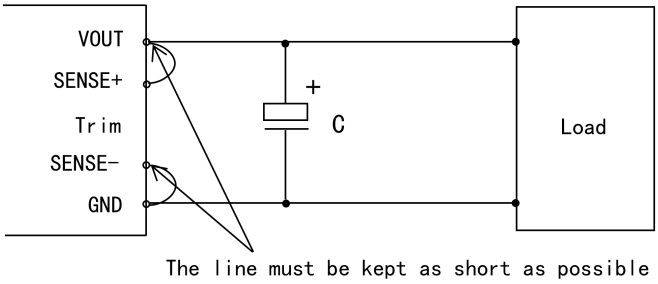


Fig. 1

Remote Sense Application

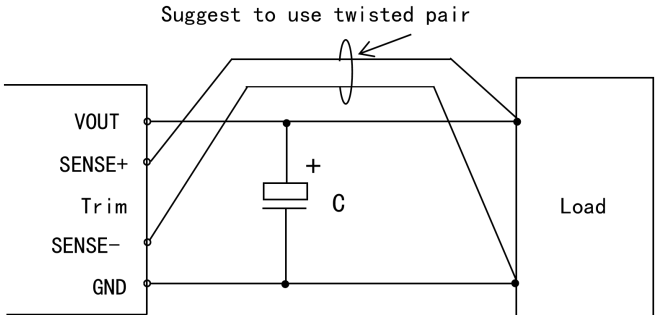
1. Remote Sense Application



Notes:

1. If the sense function is not used for remote regulation the user must connect the SENSE+ to VOUT and SENSE- to GND at the DC-DC converter pins and will compensate for voltage drop across pins only;
2. The connections between sense lines and their respective power lines must be kept as short as possible, otherwise they may be picking up noise, interference and/or causing unstable operation of the power module.

2.Remote Sense Connection used for Compensation



Notes:

1. Using remote sense with long wires may cause unstable output, please contact technical support if long wires must be used;
2. We recommend using adequate cross section for PCB-track layout and/or cables to connect the power supply module to the load in order to keep the voltage drop below 0.3V and to make sure the power supply's output voltage remains within the specified range;
3. Note that large wire impedance may cause oscillation of the output voltage and/or increased ripple. Consult technical support or factory for further advice of sense operation.

3. PGD Application

DNPT12-12P(N) provide an open-drain PGD signal to indicate that the output voltage is within the regulation limits. The PGD signal will be deasserted to a low state if the output voltage going ±10% outside the set-point value.

Design Reference

1. Trim function for output voltage adjustment (open if unused)

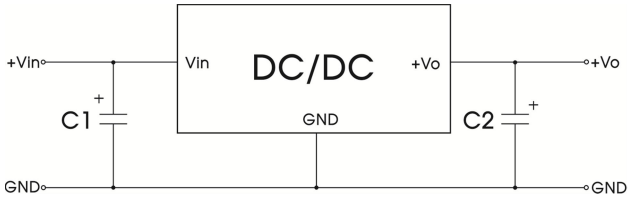


Fig.2

Table 1

Part No.	C1	C2
DNPT12-12P(N)	220μF/35V+100uF/ 35V+22uF/50V	100uF/25V+22uF/25V

Notes:

1. Polymer capacitors (C1 and C2) is required and should be connected close to the pin terminal, to ensure the stability of the converter;
2. To reduce the output ripple furtherly, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
3. Refer to Table 1 for C1 and C2 capacitor values;
4. Converter cannot be used for hot swap and with output in parallel.

2. Trim Function for Output Voltage Adjustment

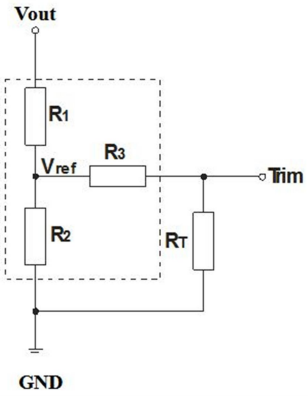


Fig. 3 TRIM resistor connection
(dashed line shows internal resistor network)

Table 2

Vo (VDC)	R_T (kΩ)
0.6	Open
1.2	12
1.5	8
1.8	6
2.5	3.789
3.3	2.7
5	1.636

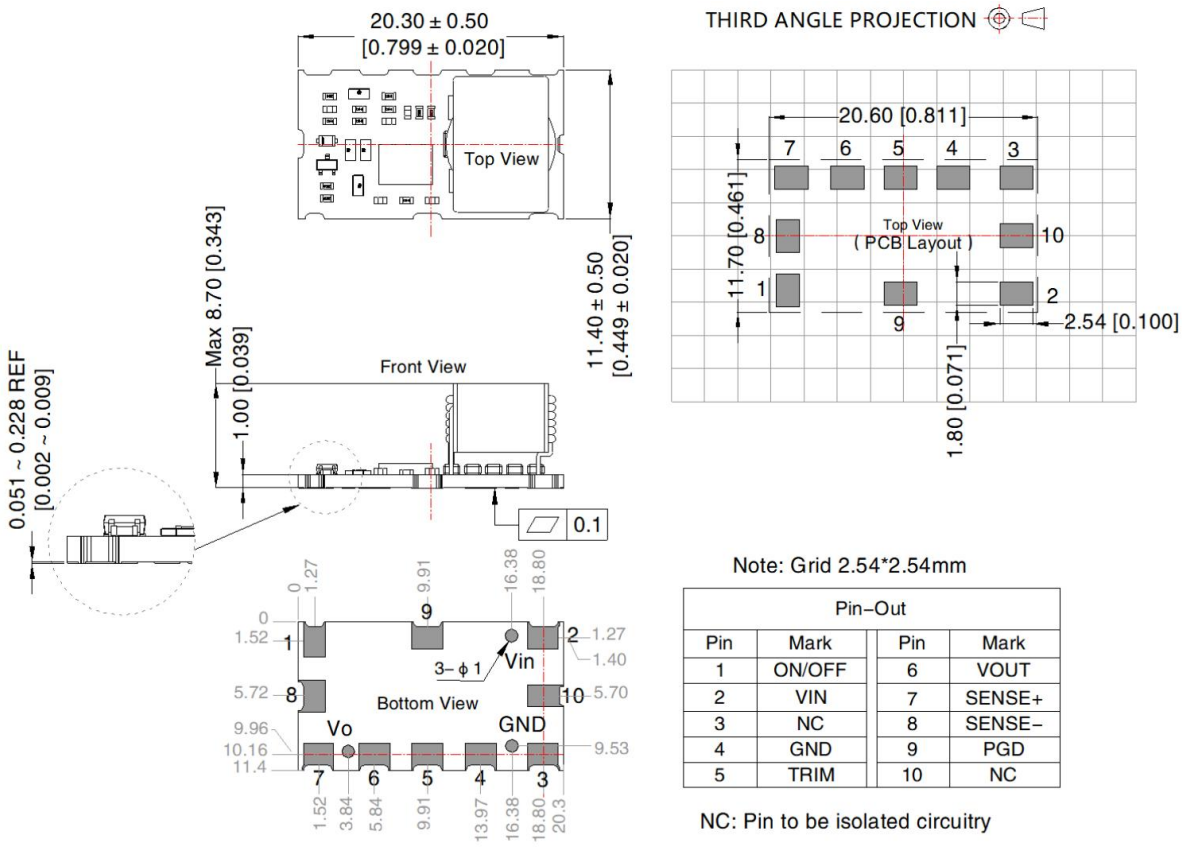
Trim resistance calculation formula:

$$R_T(k\Omega) = \frac{7.2}{V_O - 0.6}$$

Notes:

1. RT : Resistance of Trim; Vo: The trim up voltage;
2. If RT = ∞ or Trim pin open, Vo = 0.6 VDC.

Dimensions and Recommended



Note: Grid 2.54*2.54mm

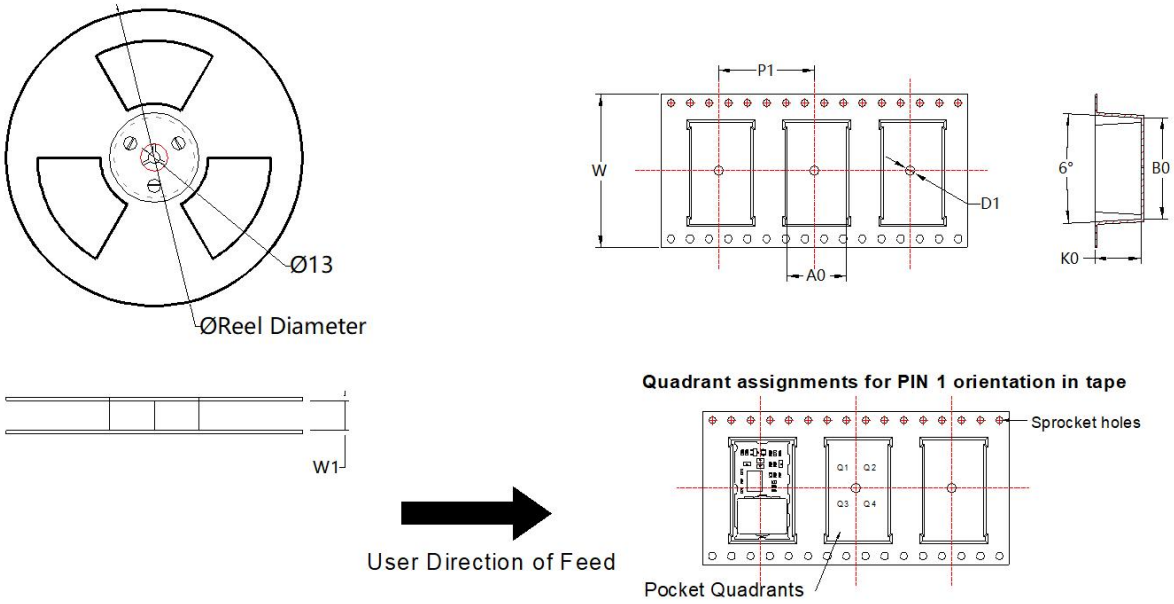
Pin-Out			
Pin	Mark	Pin	Mark
1	ON/OFF	6	VOUT
2	VIN	7	SENSE+
3	NC	8	SENSE-
4	GND	9	PGD
5	TRIM	10	NC

NC: Pin to be isolated circuitry

PIN1,4,5,6,8,9 dimension：2.4*1.65mm
PIN2,3,7 dimension：2.286*1.65mm

Note:
Unit: mm[inch]
General tolerances: ± 0.25[± 0.010]
The layout of the device is for reference only,
please refer to the actual product

Standard Dimension



Package Type	Pin	MPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SMD	10	300	330.0	32	12.35	21.25	9.7	20	32	Q1

Notes:

1. The maximum capacitive load offered were tested at input voltage range and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.