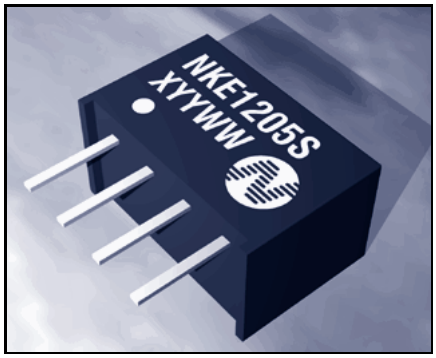
NKE SERIES

Isolated Sub-Miniature 1W Single Output DC-DC Converters



FEATURES

- New Sub-Miniature SIP Package Style
- 3kVDC Isolation
- Efficiency to 80%
- Wide Temperature performance at full 1 Watt load, –40°C to 85°C
- Increased Power Density to 1.95W/cm³
- UL 94V-0 Package Material
- Footprint 0.69cm²
- Single Isolated Output
- Industry Standard Pinout
- 5V & 12V Input
- 5V, 9V, 12V and 15V Output
- No Heatsink Required
- Internal SMD Construction
- Fully Encapsulated with Toroidal Magnetics
- No External Components Required
- MTTF up to 2.9 Million hours
- Custom Solutions Available
- No Electrolytic or Tantalum Capacitors

DESCRIPTION

The NKE sub-miniature series of DC-DC Converters is particularly suited to isolating and/or converting DC power rails. A smaller package size, improved efficiency, lower output ripple and 3kVDC isolation capability through state of the art packaging and improved technology. The galvanic isolation allows the device to be configured to provide an isolated negative rail in systems where only positive rails exist. The wide temperature range guarantees startup from –40°C and full 1 watt output at 85°C.

SELECTION GUIDE

	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance	MTTF[1]
Order Code	(V)	(V)	(mA)	(mA)	(%)	(pF)	kHrs
NKE0505S	5	5	200	289	69	30	2414
NKE0509S	5	9	111	260	77	37	1173
NKE0512S	5	12	83	256	78	33	633
NKE0515S	5	15	66	250	80	40	360
NKE1205S	12	5	200	117	71	33	620
NKE1209S	12	9	111	108	77	48	488
NKE1212S	12	12	83	107	78	55	360
NKE1215S	12	15	66	104	80	52	252

i When operated **without** additional external load capacitance, the output voltage of the devices is guaranteed to be within 95% of its steady state value within 100ms after the input voltage has reached 95% of its steady state value, **irrespective of the rise time of the input voltage**.

ii When operated **with** additional external load capacitance the rise time of the input voltage will determine the maximum external capacitance value for guaranteed start up. The slower the rise time of the input voltage the greater the maximum value of the additional external capacitance for reliable start up.

INPUT CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Voltage Range	Continuous operation, 5V input types	4.5	5	5.5	V
	Continuous operation, 12V input types	10.8	12	13.2	
Reflected Ripple Current			26	48	mA p-p

OUTPUT CHARACTERISTICS

Parameter	Conditions	TYP	MAX	Units
Rated Power[2]	T_A = –40°C to 85°C		1	W
Voltage Set Point Accuracy	See tolerance envelope			
Line regulation	High V_{IN} to low V_{IN}	1.0	1.2	%/%
Load Regulation[3]	10% load to rated load, 5V output types	14	15	%
	10% load to rated load, 9V output types	9	10	
	10% load to rated load, 12V output types	7.5	9.5	
	10% load to rated load, 15V output types	7.0	8.5	
Ripple and Noise	BW=DC to 20MHz, 5V output types	85	110	mV p-p
	BW=DC to 20MHz, 9V output types	60	75	
	BW=DC to 20MHz, 12V output types	50	65	
	BW=DC to 20MHz, 15V output types	40	55	

ABSOLUTE MAXIMUM RATINGS

Short circuit duration[4]	1 second
Internal power dissipation	450mW
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V_{in}, NKE05 types	7V
Input voltage V_{in}, NKE12 types	15V

1 Calculated using MIL-HDBK-217F with nominal input voltage at full load.
2 See derating curve.
3 12V input types have typically 3% less load regulation change.
4 Supply voltage must be discontinued at the end of the short circuit duration.
All specifications typical at T_A=25°C, nominal input voltage and rated output current unless otherwise specified.

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ISOLATION CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Isolation Test Voltage	Flash tested for 1 second	3000			VDC
Resistance	Viso=500VDC		10		GΩ

GENERAL CHARACTERISTICS

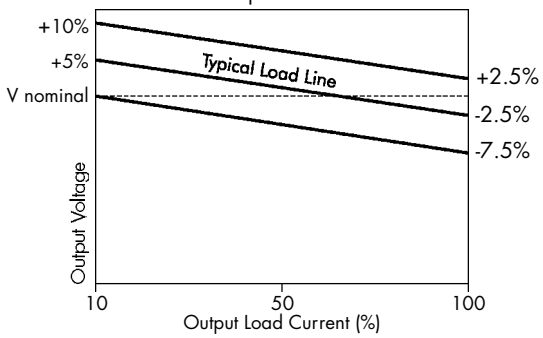
Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	5V input types		110		kHz
	12V input types		145		

TEMPERATURE CHARACTERISTICS

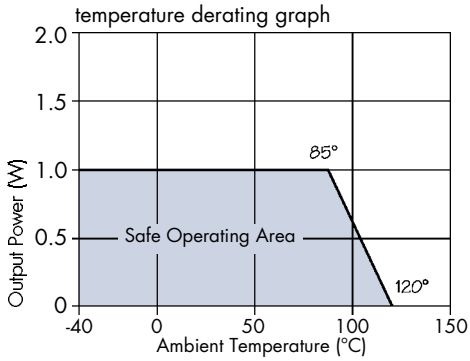
Parameter	Conditions	MIN	TYP	MAX	Units
Specification	All output types	-40		85	°C
Storage		-50		130	°C
Case Temperature above ambient	5V output types			41	°C
	All other output types			32	
Cooling	Free air convection				

PERFORMANCE CHARACTERISTICS

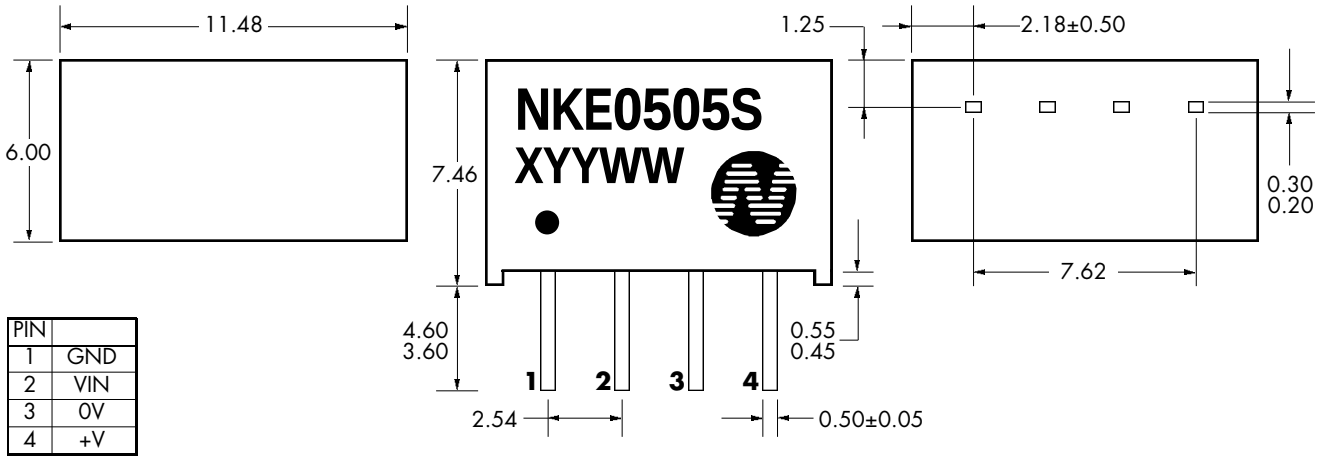
tolerance envelope



temperature derating graph



MECHANICAL DIMENSIONS



PIN	
1	GND
2	VIN
3	0V
4	+V

Weight: 1.3g

All dimensions in mm XX.XX ±0.25mm. All pins on a 2.54mm pitch and within ±0.25mm of true position.

Instructions for use are available from www.dc-dc.com

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