

**FEATURES**

- New Sub-Miniature SIP & DIP Styles
- 3kVDC Isolation
- Efficiency to 81%
- Wide Temperature performance at full 1 Watt load, -40°C to 85°C
- Increased Power Density to 1.95W/cm<sup>3</sup>
- UL 94V-0 Package Material
- Footprint 0.69cm<sup>2</sup>
- Single Isolated Output
- Industry Standard Pinout
- 3.3V, 5V & 12V Input
- 3.3V, 5V, 9V, 12V and 15V Output
- No Heatsink Required
- Internal SMD Construction
- Fully Encapsulated with Toroidal Magnetics
- No External Components Required
- MTF up to 2.4 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 <sup>1</sup>
OrderCode <sup>†</sup>	(V)	(V)	(mA)	(mA)	(%)	(pF)	kHrs
<b>NKE0303S</b>	3.3	3.3	303	400	75	30	1234
<b>NKE0305S</b>	3.3	5	200	400	76	35	632
<b>NKE0503S</b>	5	3.3	303	270	75	40	619
<b>NKE0505SE</b>	5	5	200	250	78	34	419
<b>NKE0505S</b>	5	5	200	289	69	28	2414
<b>NKE0509S</b>	5	9	111	266	75	29	1173
<b>NKE0512S</b>	5	12	83	260	77	30	633
<b>NKE0515S</b>	5	15	66	256	78	32	360
<b>NKE1205S</b>	12	5	200	117	71	35	620
<b>NKE1209S</b>	12	9	111	107	78	50	488
<b>NKE1212S</b>	12	12	83	105	79	57	360
<b>NKE1215S</b>	12	15	66	103	81	60	252

<sup>†</sup> For DIP package style replace suffix S with D, eg NKE0303D.  
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, 3.3V input types	2.97	3.3	3.63	V
	Continuous operation, 5V input types	4.5	5.0	5.5	
	Continuous operation, 12V input types	10.8	12.0	13.2	
Reflected Ripple Current			40	60	mA p-p

**OUTPUT CHARACTERISTICS**

Parameter	Conditions	TYP	MAX	Units
Rated Power <sup>2</sup>	T <sub>A</sub> = -40°C to 85°C		1	W
Voltage Set Point Accuracy	See tolerance envelope			
Line regulation	High V <sub>IN</sub> to low V <sub>IN</sub>	1.0	1.2	%/%
Load Regulation <sup>3</sup>	10% load to rated load, 3.3V output types	10	15	%
	10% load to rated load, 5V output types	12	15	
	10% load to rated load, 9V output types	7.5	10	
	10% load to rated load, 12V output types	6.5	9.5	
Ripple and Noise	10% load to rated load, 15V output types	6.0	8.5	mV p-p
	BW=DC to 20MHz, 3.3V output types	40	80	
	BW=DC to 20MHz, 5V output types	77	100	
	BW=DC to 20MHz, 9V output types	43	90	
	BW=DC to 20MHz, 12V output types	35	65	
	BW=DC to 20MHz, 15V output types	32	55	

**ABSOLUTE MAXIMUM RATINGS**

Short circuit duration <sup>4</sup>	1 second
Internal power dissipation	530mW
Lead temperature 1.5mm from case for 10 seconds	300°C
Input voltage V <sub>in</sub> NKE03 types	5.5V
Input voltage V <sub>in</sub> NKE05 types	7V
Input voltage V <sub>in</sub> 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<sub>A</sub>=25°C, nominal input voltage and rated output current unless otherwise specified.

# NKE SERIES

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

### ISOLATION CHARACTERISTICS

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

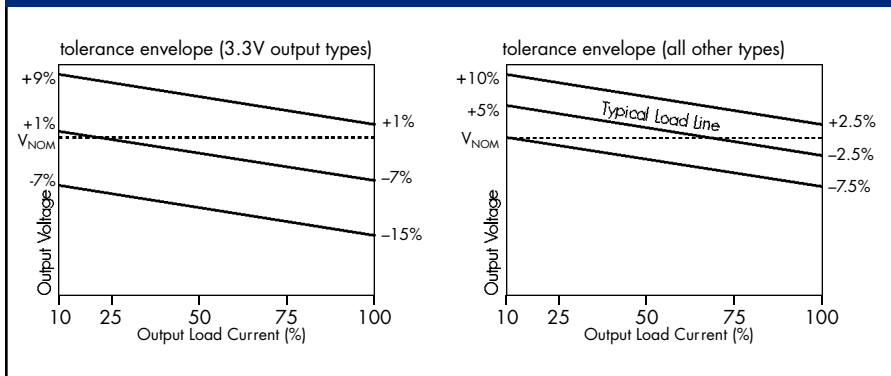
### GENERAL CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Switching Frequency	All input types		115		kHz

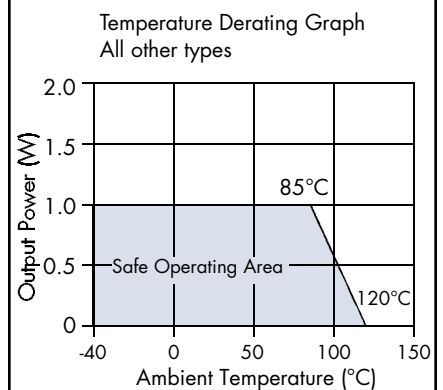
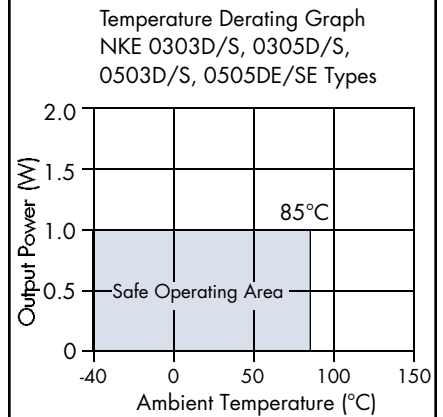
### TEMPERATURE CHARACTERISTICS

Parameter	Conditions	MIN	TYP	MAX	Units
Specification	All output types	-40		85	°C
Storage		-50		130	°C
Case Temperature above ambient	0505D/S, 1205D/S			41	°C
	All other output types			32	°C
Cooling	Free air convection				

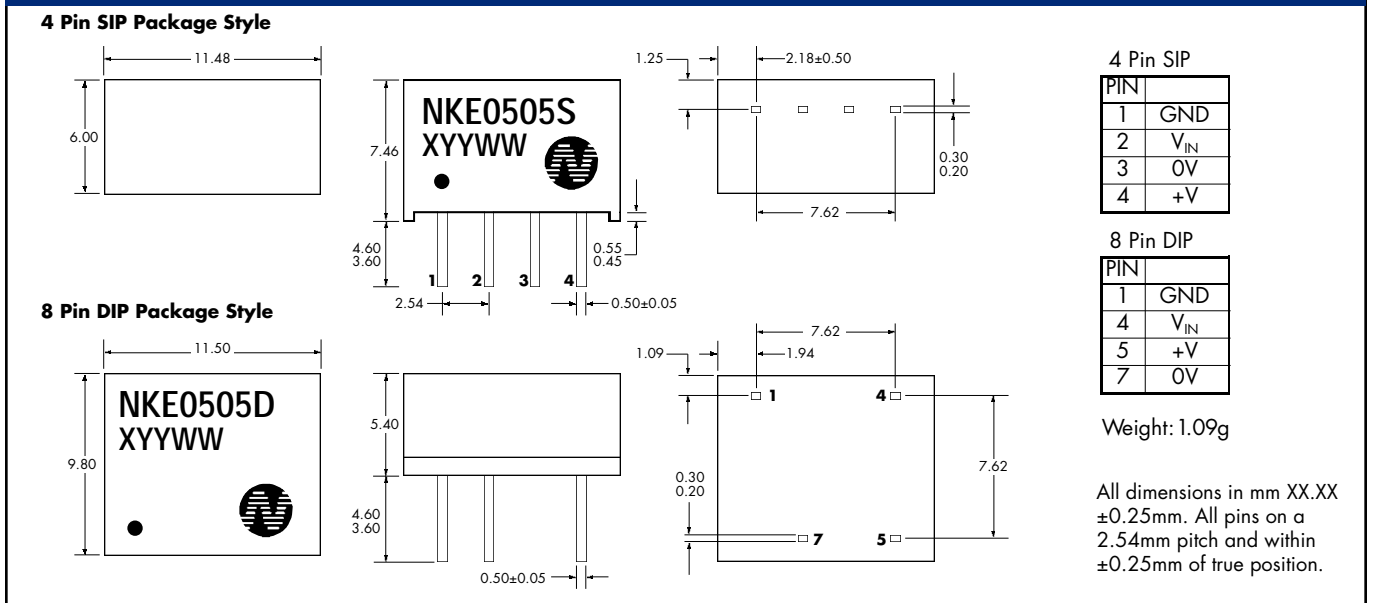
### PERFORMANCE CHARACTERISTICS



### TEMPERATURE CHARACTERISTICS



### MECHANICAL DIMENSIONS



C&D Technologies (NCL) Limited reserve the right to alter or improve the specification, internal design or manufacturing process at any time, without notice. Please check with your supplier or visit our web site to ensure that you have the current and complete specification for your product before use.

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**C&D TECHNOLOGIES**  
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