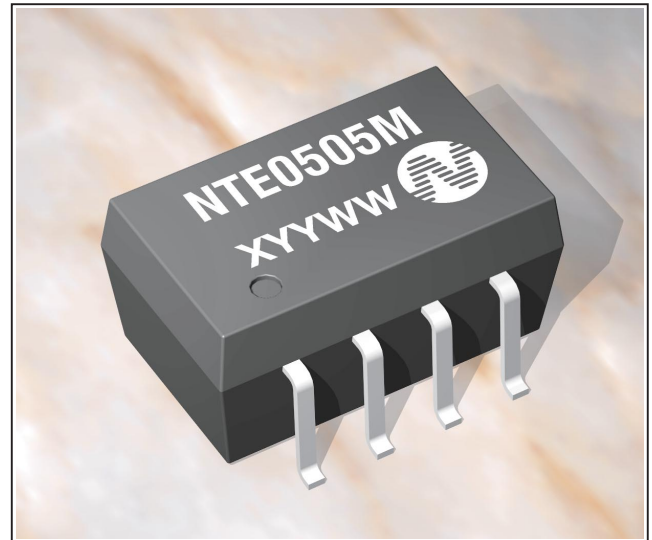


features

- Wide Temperature Performance at Full 1 Watt Load, -40°C to 85°C
- Lead Frame Technology
- CECC00802 Reflow (280°C)
- Single Isolated Output
- 1kVDC Isolation
- Efficiency to 78%
- Power Density $1.8\text{W}/\text{cm}^3$
- 5V & 12V Input
- 5V, 9V, 12V and 15V Output
- Footprint Over Pins 1.64cm^2
- UL 94V-0 Package Material
- No Heatsink Required
- Internal SMD Construction
- Toroidal Magnetics
- Plastic Encapsulated
- MTF up to 2.9 Million Hours
- Custom Solutions Available
- Multi Layer Ceramic Capacitors

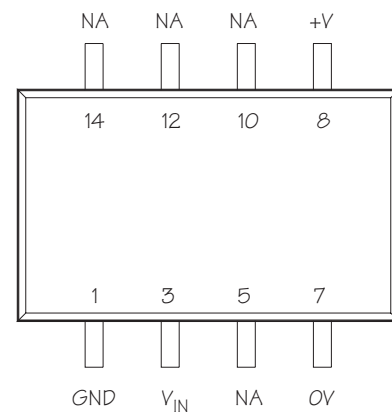
description

The NTE series of miniature surface mounted DC-DC Converters employ leadframe technology and transfer moulding techniques to bring all of the benefits of IC style packaging to hybrid circuitry. The devices are fully compatible with CECC00802 to 280°C which allows them to be placed and reflowed with IC's, thus reducing time and cost in production. The co-planarity of the pin positions is based upon IEC 191-6:1990. The devices are suitable for all applications where high volume production is envisaged



pin connections

14 Pin SMD (top view)



NA - Not available for electrical connection

PRELIMINARY

Notice : This is not a final specification.
Some parametric limits may be subject to change.

NTE SERIES

Isolated 1W Single Output SM DC-DC Converters

absolute maximum ratings

Short circuit duration ¹ · · · · ·	1 second
Internal power dissipation at rated current and 85°C · · · · ·	600mW
Lead temperature 1.5mm from case for 10 seconds · · · · ·	300°C
Input Voltage V_{IN} , NTE05 types · · · · ·	7V
Input voltage V_{IN} , NTE12 types · · · · ·	15V

electrical specifications

Specifications typical at $T_A=25^\circ\text{C}$, nominal input voltage and rated output current unless otherwise specified

Order Code	Nominal Input Voltage	Output Voltage	Output Current	Input Current at Rated Load	Efficiency	Isolation Capacitance
	(V)	(V)	(mA)	(mA)	(%)	(pF)
NTE0505M	5	5	200	294	68	35
NTE0509M	5	9	111	267	75	43
NTE0512M	5	12	83	260	77	42
NTE0515M	5	15	66	256	78	44
NTE1205M	12	5	200	124	67	47
NTE1209M	12	9	111	114	73	77
NTE1212M	12	12	83	113	74	88
NTE1215M	12	15	66	111	75	95

- i When operated **without** additional external load capacitance, the output voltage of the NTE 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.

¹ Supply voltage must be discontinued at the end of the short circuit.

NTE SERIES

Isolated 1W Single Output SM DC-DC Converters

family characteristics - input

Specifications typical at $T_A=25^{\circ}\text{C}$, nominal input voltage and rated output current unless otherwise specified

Parameter	Conditions	MIN	NOM	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			30	47	mA p-p

family characteristics - output

Specifications typical at $T_A=25^{\circ}\text{C}$, nominal input voltage and rated output current unless otherwise specified

Parameter	Conditions	MIN	NOM	MAX	Units
Rated Power ¹	$T_A = -40^{\circ}\text{C}$ to 85°C			1.0	W
Voltage Set Point Accuracy	See tolerance envelope				
Line regulation	High V_{IN} to low V_{IN}		1.0	1.2	%/%
Load Regulation ²	10% load to rated load, 5V output types		12.8	15	%
	10% load to rated load, 9V output types		8.3	9.0	
	10% load to rated load, 12V output types		6.8	7.5	
	10% load to rated load, 15V output types		6.3	7.0	
Ripple and Noise	BW=DC to 20MHz, 5V output types		62	85	mV p-p
	BW=DC to 20MHz, 9V output types		49	75	
	BW=DC to 20MHz, 12V output types		39	65	
	BW=DC to 20MHz, 15V output types		38	76	

family characteristics - isolation

Specifications typical at $T_A=25^{\circ}\text{C}$, nominal input voltage and rated output current unless otherwise specified

Parameter	Conditions	MIN	NOM	MAX	Units
Isolation Voltage	Flash tested for 1 second	1000			VDC
Test Voltage	50Hz, 10 seconds	1000			V _{pk}
Resistance	$V_{iso}=1000\text{V}$	10			G Ω

¹ See derating curve on page .

² 12V input parts have typically 3% less load regulation change.

NTE SERIES

Isolated 1W Single Output SM DC-DC Converters

family characteristics - general

Specifications typical at $T_A=25^{\circ}\text{C}$, nominal input voltage and rated output current unless otherwise specified

Parameter	Conditions	MIN	NOM	MAX	Units
Switching Frequency	V_{IN} 5V types		110		kHz
	V_{IN} 12V types		110		
Package Weight			1.21		g

family characteristics - temperature

Specifications typical at $T_A=25^{\circ}\text{C}$, nominal input voltage and rated output current unless otherwise specified

Parameter	Conditions	MIN	NOM	MAX	Units
Specification	All output types	-40		85	$^{\circ}\text{C}$
Storage		-55		125	$^{\circ}\text{C}$
Case Temperature above Ambient	5V output types		53		$^{\circ}\text{C}$
	All other output types		40		

family characteristics - mean time to failure (MTTF)¹

Part Number	-40 $^{\circ}\text{C}$	25 $^{\circ}\text{C}$	85 $^{\circ}\text{C}$	Units
NTE0505M	2938	2418	1968	kHrs
NTE0509M	1416	1174	976	
NTE0512M	762	634	531	
NTE0515M	433	360	303	
NTE1205M	748	621	519	kHrs
NTE1209M	587	488	409	
NTE1212M	433	360	303	
NTE1215M	302	252	212	

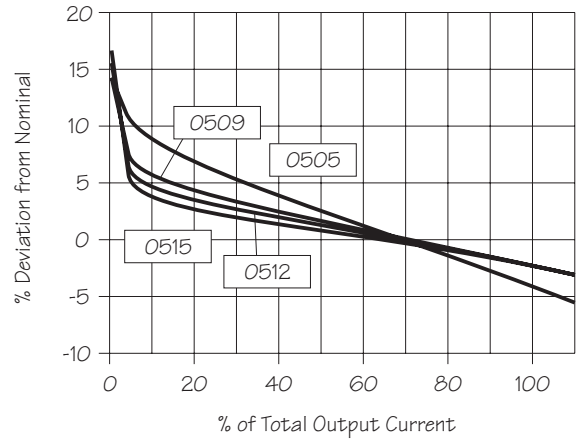
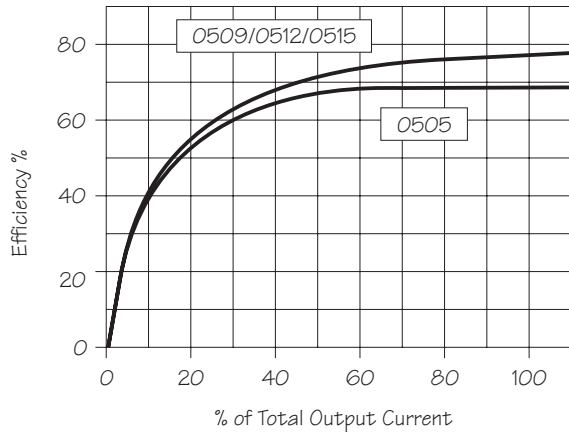
¹ Calculated using MIL-HDBK-217F with nominal input voltage at full load.

NTE SERIES

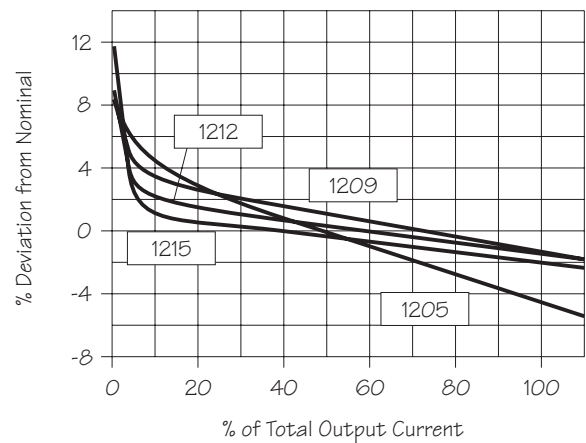
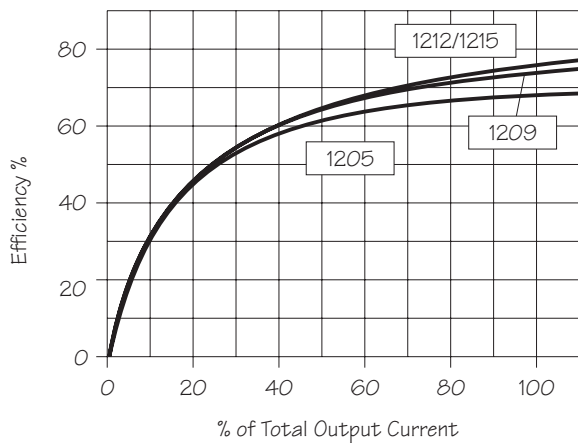
Isolated 1W Single Output SM DC-DC Converters

typical characteristics¹

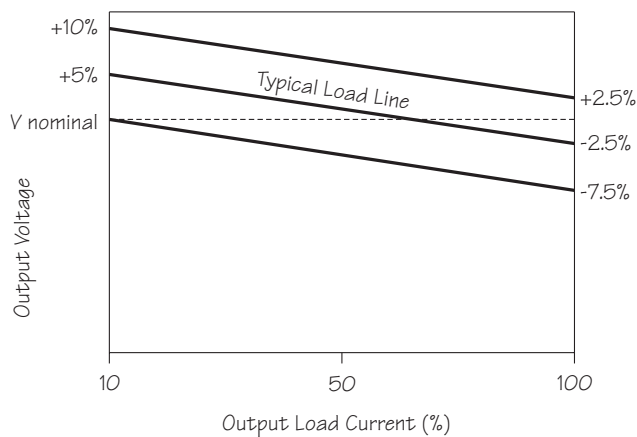
NTE05 series



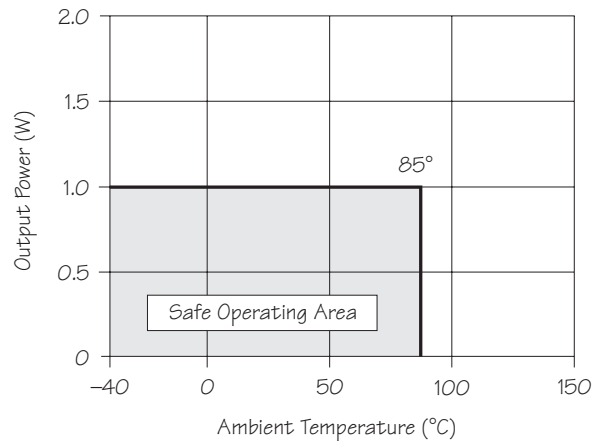
NTE12 series



tolerance envelope



temperature derating graph



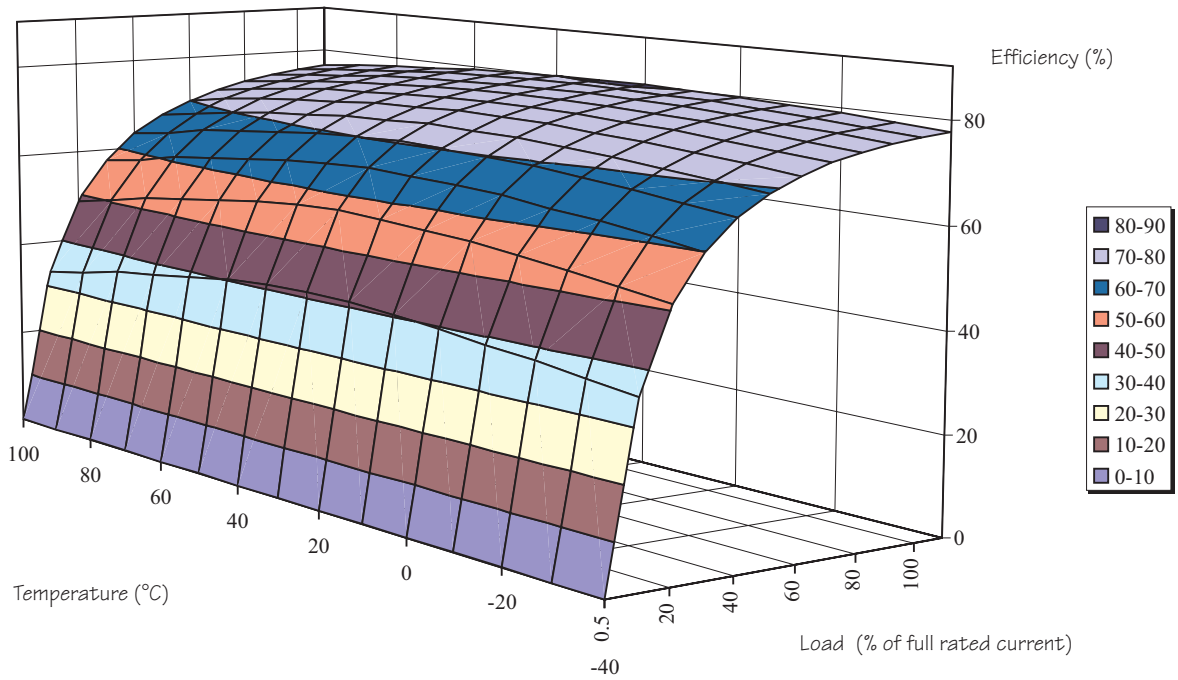
¹ All data taken at $T_A=25^\circ\text{C}$.

NTE SERIES

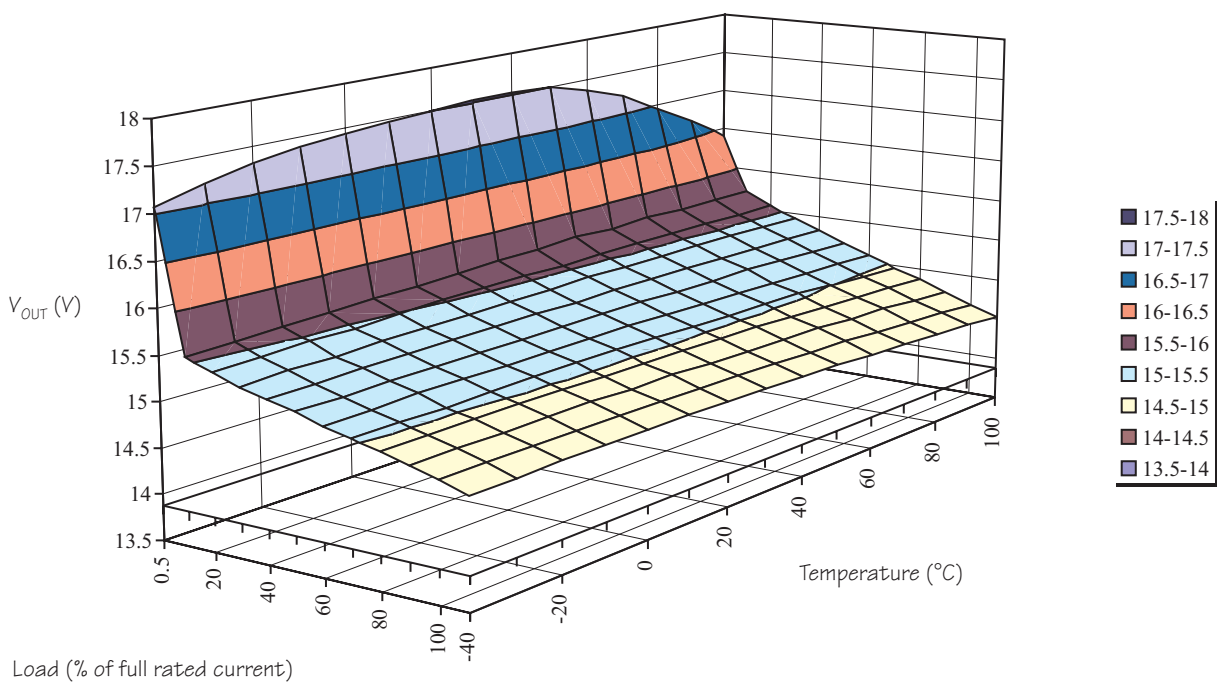
Isolated 1W Single Output SM DC-DC Converters

typical characteristics

efficiency versus load - temperature surface

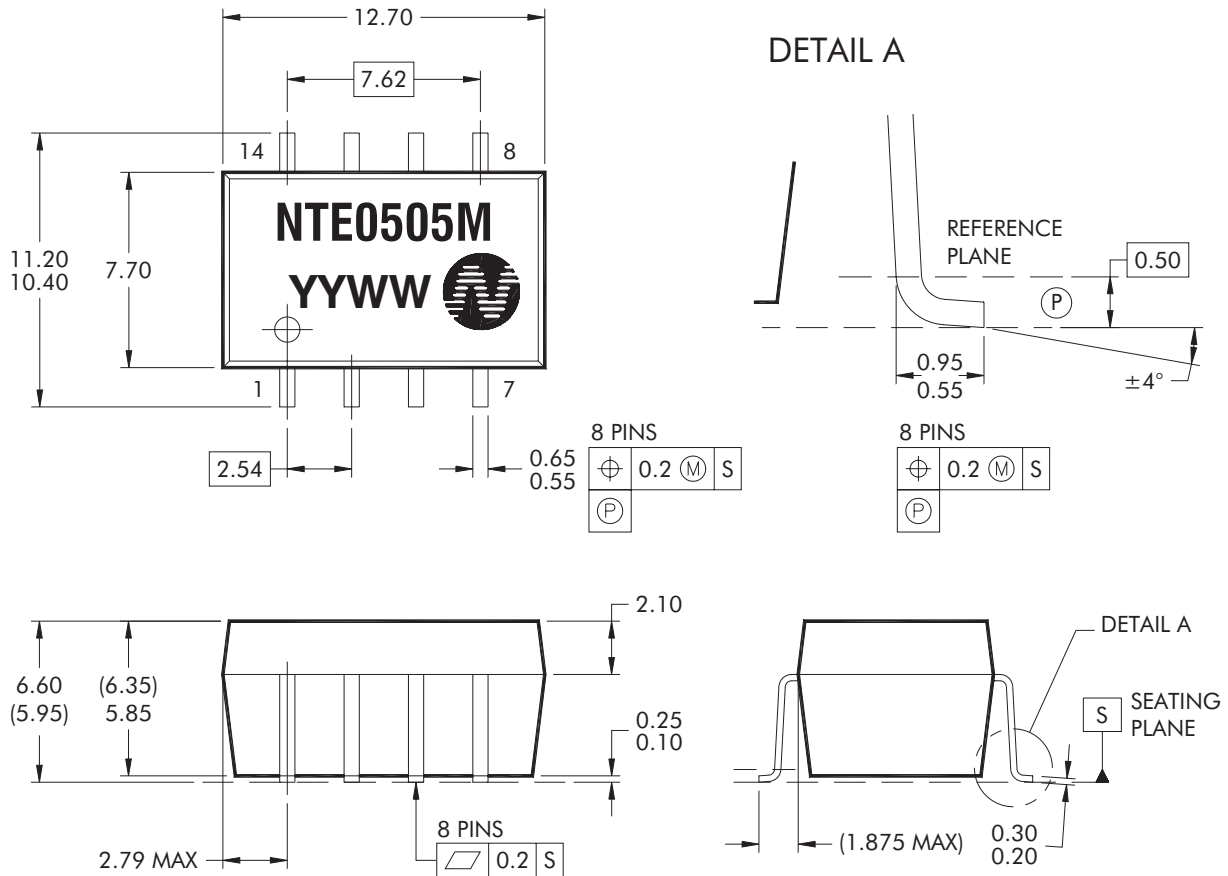


output voltage versus load - temperature surface

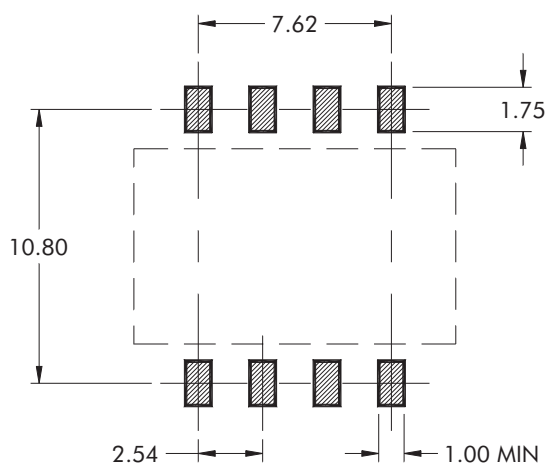


outline dimensions¹

14 Pin SMD package style



recommended footprint details



¹ All pins on a 2.54mm pitch.
All dimensions in mm XX.XX \pm 0.25mm.