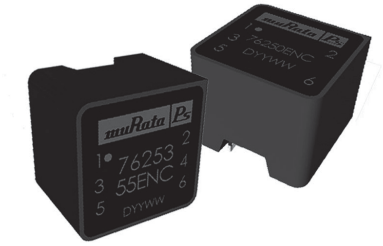
Murata Power Solutions

# 76250ENC, 76253/XXENC

EN Approved MAX250/251/253 Compatible Converter Transformers



## FEATURES

- RoHS compliant
- Maxim MAX250/MAX251/MAX253 compatible
- EN62368-1 TUV certificate of compliance
- Isolation to 6kVDC
- Toroidal construction
- Industry-standard pinout
- UL 94 V-0 package materials
- Fully encapsulated
- Compatible with RoHS soldering systems
- Backward compatible with Sn/Pb soldering systems

## DESCRIPTION

The 76250ENC converter transformer is specifically designed for use with Maxim chipsets to provide isolated RS232 interfaces. A carefully controlled turns ratio ensures consistent performance whilst a toroidal construction minimises EMI.

The 76253/XXENC converter transformers are specifically designed for use with the MAX253 chip set to provide isolated power supplies. The 5V version can supply 1W and the 3.3V version can supply 500mW. A centre tapped secondary winding allows for full bridge, half bridge or voltage doubling.

## SELECTION GUIDE

| Order Code | Input Voltage | Output Voltage | Max. Output Current | Isolation Voltage | Turns Ratio |
|---|---|---|---|---|---|
| | V | V | mA | VDC | |
| **76250ENC** | - | - | - | 6000 | 1CT:1 |
| **76253/35ENC** | 3.3 | 5.0 | 100 | 6000 | 1:√5 |
| **76253/55ENC** | 5.0 | 5.0 | 200 | 6000 | 1:1.33 |

## 76250ENC CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Primary Inductance, $L_P$ (1&5) | 10kHz, 100mV | 1.0 | 2.0 | 2.9 | mH |
| Leakage Inductance, $L_L$ (1&5)[2] | 100kHz, 100mV | | 35 | 40 | µH |
| Interwinding Capacitance, $C_{WW}$ (1&2) | 100kHz, 100mV | | 1.5 | 3.0 | pF |
| D.C. Resistance, $R_{DC}$ (1&5) | <0.1VDC | | 1.0 | 2.0 | Ω |
| Volt-time Product, $E_T$ (1&5) | | 50 | | | Vµs |

## 76253/35ENC CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Primary Inductance, $L_P$ (1&5) | 100kHz, 250mV | 140 | 200 | | µH |
| Secondary Inductance, $L_S$ (2&6) | 100kHz, 250mV | 700 | 1000 | | µH |
| Leakage Inductance, $L_L$ (1&5)[2] | 100kHz, 250mV | | 5.0 | 7.0 | µH |
| Interwinding Capacitance, $C_{WW}$ (1&2) | 100kHz, 250mV | | 2.7 | 3.5 | pF |
| D.C. Resistance, $R_{DC}$ (1&5) | <0.1VDC | | 0.4 | 0.8 | Ω |
| Volt-time Product, $E_T$ (1&5) | | 25 | 35 | | Vµs |

## 76253/55ENC CHARACTERISTICS

| Parameter | Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Primary Inductance, $L_P$ (1&5) | 100kHz, 250mV | 80 | | 150 | µH |
| Secondary Inductance, $L_S$ (2&6) | 100kHz, 250mV | 142 | | 267 | µH |
| Leakage Inductance, $L_L$ (1&5)[2] | 100kHz, 250mV | | 7.0 | 10.0 | µH |
| Interwinding Capacitance, $C_{WW}$ (1&2) | 100kHz, 250mV | | 2.7 | 3.5 | pF |
| D.C. Resistance, $R_{DC}$ (1&5) | <0.1VDC | | 0.5 | 0.9 | Ω |
| Volt-time Product, $E_T$ (1&5) | | 30 | 40 | | Vµs |

## ABSOLUTE MAXIMUM RATINGS

| | |
|---|---|
| Operating free air temperature range 76250ENC | 0°C to 70°C |
| Operating free air temperature range 76253/XXENC | -40°C to 85°C |
| Storage temperature range | -50°C to 125°C |
| Lead temperature 1.5mm from case for 10 seconds | 300°C |
| Peak current, $I_{PK}$ 76250ENC | 300mA |
| Peak current, $I_{PK}$ 76253/XXENC | 400mA |
| Isolation voltage (flash tested for 1 second) | 6000VDC |

## SOLDERING INFORMATION[3]

| | |
|---|---|
| Peak wave solder temperature | 300°C for 10 seconds |
| Pin finish | Matte tin |

All specifications typical at $T_A$=25°C

1 Refer to mechanical dimensions for pin locations shown in brackets.

2 With pins 2 & 6 short circuited.

3 For further information, please visit https://www.murata.com/en-global/products/power/rohs

RoHS COMPLIANT

For full details go to https://www.murata.com/en-global/products/power/rohs

## TECHNICAL NOTES

### ISOLATION VOLTAGE

'Hi Pot Test', 'Flash Tested', 'Withstand Voltage', 'Proof Voltage', 'Dielectric Withstand Voltage' & 'Isolation Test Voltage' are all terms that relate to the same thing, a test voltage, applied for a specified time, across a component designed to provide electrical isolation, to verify the integrity of that isolation.

All products in this series are 100% production tested at their stated isolation voltage.

This series is certified by TUV to EN62368-1 with a working voltage of 300Vrms for Reinforced Insulation systems.

### REPEATED HIGH-VOLTAGE ISOLATION TESTING

It is well known that repeated high-voltage isolation testing of a barrier component can actually degrade isolation capability, to a lesser or greater degree depending on materials, construction and environment. We therefore strongly advise against repeated high voltage isolation testing, but if it is absolutely required, that the voltage be reduced by 20% from the specified test voltage.

## SAFETY APPROVAL

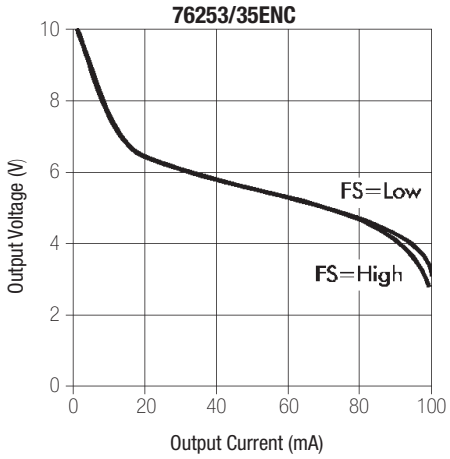
### EN62368-1

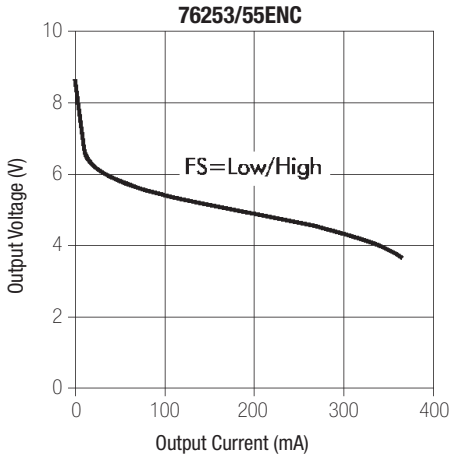
The7625xENC series has been certified by TUV to EN62368-1 for reinforced insulation to a working voltage of 300Vrms, 2500Vpk and a working frequency of 30kHz. Operation above 30kHz would need evaluation during system level evaluation.

Working altitude OVC II 5000m.
Creepage and clearance is 9.3mm.

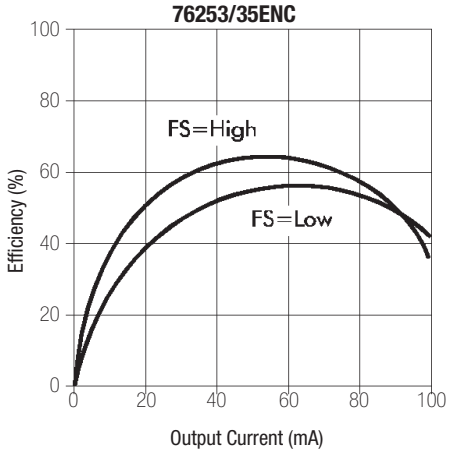
## TYPICAL CHARACTERISTICS (VOLTAGE CURVES)

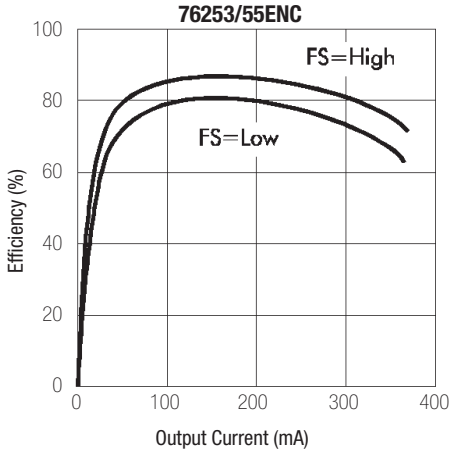
### VOLTAGE CURVES



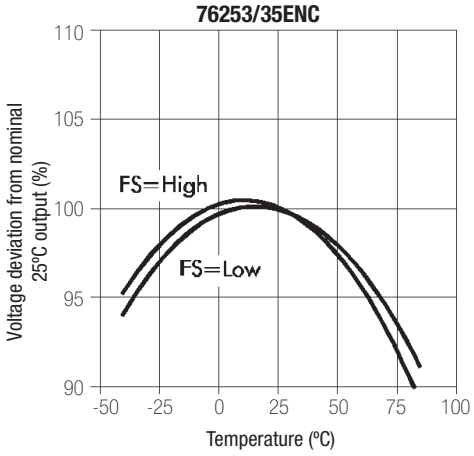



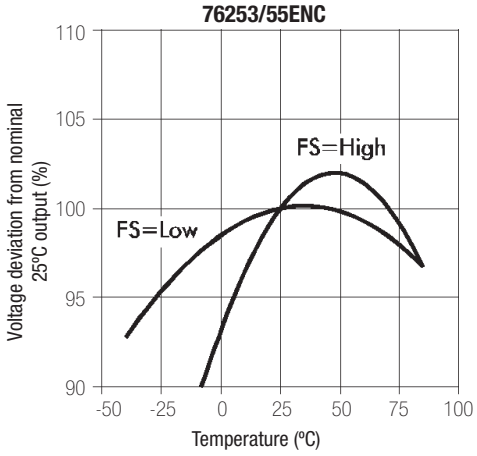

### EFFICIENCY CURVES




### VOLTAGE DEVIATION

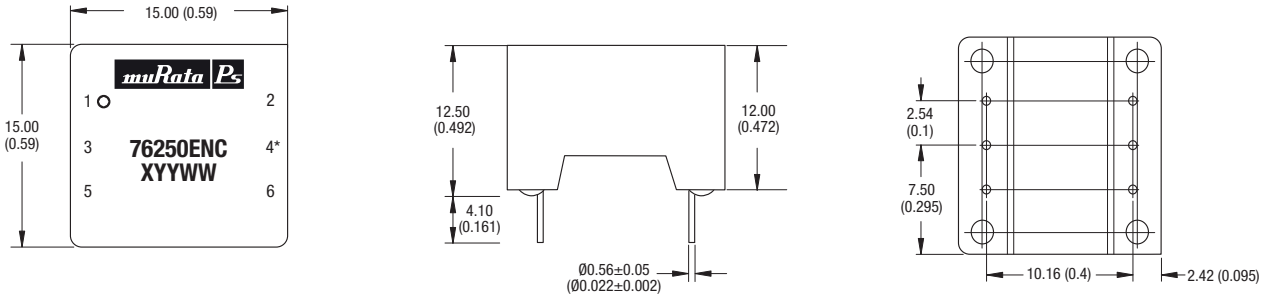


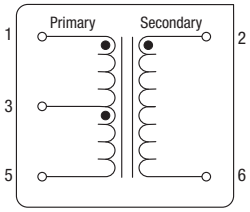

All curves are derived from testing with the Maxim MAX235 IC using the circuit shown in application note MPAN-03.

## PACKAGE SPECIFICATIONS

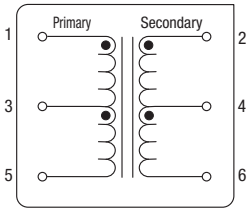
### MECHANICAL DIMENSIONS




Pin Connections 76250ENC (Top View)

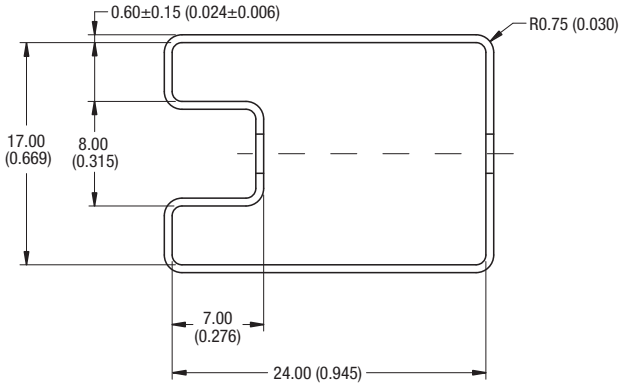



Pin Connections 76253/XXENC (Top View)



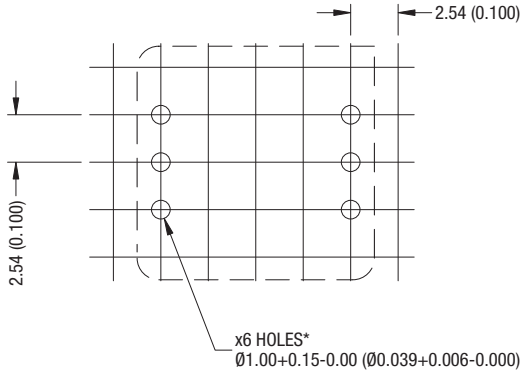

* 76250ENC Pin not fitted.
Unless otherwise stated all dimensions in mm (inches) ±0.25mm (±0.01).
All pins on a 2.54mm (0.1") pitch and within ±0.25mm (0.01") of true position.

### TUBE DIMENSIONS




Tube length: 480±2.00mm (18.90±0.079"). Tube quantity: 30
Tube material: Antistatic coated clear pvc.
Unless otherwise stated all dimensions in mm (inches) -0.00 +0.50 (-0.00 +0.020).

### RECOMMENDED FOOTPRINT DETAILS




Holes may be omitted for variants with fewer than 6 pins.
Unless otherwise stated all dimensions in mm (inches) ±0.25 (0.01).
All pins on a 2.54 (0.1) pitch and within ±0.25 (0.01) of true position.

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- Traffic signal equipment
- Disaster prevention / crime prevention equipment
- Data Processing equipment

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