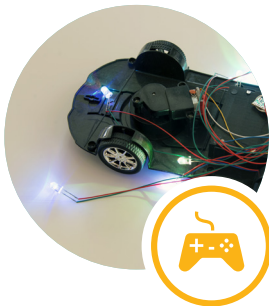NXP®
NTAG 5 switch

NXP NTAG® 5 switch: NFC Forum Compliant PWM and GPIO Bridge

Designed as an MCU replacement in various gaming and lighting applications, this NFC tag adds connectivity and increases flexibility while saving energy and lowering the bill of materials.

Gaming
Verify authenticity, use a cloud connection to enable new features, or power and configure a motor or LED

Lighting
Verify authenticity, calibrate the reference current without an MCU, or control and dim LEDs

Pre-Calibration
Calibrate devices via NFC during the manufacturing process

KEY BENEFITS

‣ Reading distance >60 cm (>25 inches)

‣ Flexible operation with PWM/GPIO interface

‣ Energy-efficient design with reduced bill of materials

‣ Flexible split between three open and/or protected memory areas

‣ Ensured authenticity of product through value chain

KEY FEATURES

‣ NFC Forum compliant Type 5 tag

‣ ISO/IEC 15693 compliant

‣ 512 bytes user memory

‣ Configurable wired interfaces: PWM, GPIO, NFC field detection

‣ Energy harvesting with configurable output up to 30 mW

‣ Scalable security: 32-/64-bit password protection, 3 configurable user memory areas, ECC-based reprogrammable originality signature

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- Low power consumption: <6 µA standby, <0.25 µA hard power-down
- Wide temp range: -40 to +85 °C

NXP's NTAG 5 switch lets designers eliminate the MCU in selected gaming and lighting applications and other cost-sensitive designs, for added functionality, connectivity, and efficiency at a lower cost. Operating at 13.56 MHz, it is an NFC Forum compliant contactless tag that can be read by any NFC-enabled device at close range and by an ISO/IEC 15693-enabled industrial reader over a longer range. Easy configuration supports a range of control functions, and the integrated originality check lets the user verify an end product's authenticity.

MCU REPLACEMENT

In some lighting and gaming applications, NTAG 5 switch enables simple and cost-effective designs without a microcontroller. It implements multiplexed pins, offering general-purpose I/O (GPIO) and pulse width modulation (PWM) as well as NFC field detection. The characteristics of the PWM or GPIO signal can be configured through the NFC interface. These features can be used to switch on/off and control motor speed or LED brightness.

READ RANGE DUALITY

Support for ISO/IEC 15693 lets the NTAG 5 switch communicate securely in two ways—with powerful industrial readers, at a range of up to 60 cm and with NFC-enabled devices within proximity range. This duality makes it possible for the device to be calibrated and parameterized automatically while in the factory and then, when put to use in the field, safely communicate with contactless devices such as NFC-enabled smartphones.

INDEPENDENTLY PROTECTED MEMORY AREAS

The tag's 512 bytes of memory can be divided into three areas, and each area can use a different protection level, varying from no protection to 32-/64-bit, password-protected read/write access. Different parties in the value chain can have their own dedicated memory areas for storing access data.

NTAG 5 switch comes with pre-programmed proof-of-origin functionality to verify authenticity. The reprogrammable elliptic curve cryptography (ECC) originality signature can be locked or reprogrammed by the customer.

ENERGY HARVESTING

The NTAG 5 is a robust source of power, harvesting the energy from an NFC Reader, it can operate without a battery. Better yet, with its configurable output voltage, it can power a circuit, a sensor network and even charge a super capacitor wireless.

NTAG 5 FAMILY SELECTION GUIDE

			NTAG 5 switch	NTAG 5 link	NTAG 5 boost
Contactless Interface	Pure passive ISO/IEC 15693		yes	yes	yes
	Active load modulation		no	no	yes
Wired Interfaces	PWM		yes	yes	yes
	GPIO		yes	yes	yes
	I²C	Slave	no	yes	yes
		Transparent master	no	yes*	yes
Power	Energy harvesting with regulated V_{OUT}		yes, up to 30 mW	yes, up to 30 mW	only for passive
	Stand-by current typical at RT		<6 µA @ RT	<6 µA @ RT	<10 µA @ RT
	Hard power down current typical at RT		<0.25 µA @ RT	<0.25 µA @ RT	<0.25 µA @ RT
Security	32-/64-bit password		yes	yes	yes
	128-bit AES mutual authentication		no	yes*	yes
	Reprogrammable ECC originality signature		yes	yes	yes

*not available for NTP5312

NTAG 5 SWITCH ORDERING INFORMATION

Product Type ID	12NC	Package	Packing	MOQ
NTP52101G0JT • 3.6 × 6.2 × 1.35 mm, external leads, wave solder compatible	9353 549 01431	SO8	Reel 13"	2500
NTP52101G0JTT • 4.4 × 5.0 × 1.1 mm, external leads, wave solder compatible	9353 624 09431	TSSOP16	Reel 13"	2500
NTP52101G0JHK • 1.8 × 2.6 × 0.5 mm, leadless	9353 547 31115	XQFN16	Reel 7"	4000
NTP52101G0JUA	9353 859 92005	FFC	Bare die on wafer	1 Wafer

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