

Transponder Units.

TS3304/00 and /01.

Preliminary



Description.

The TS3304 transponder is a lightweight and compact model in the TS3300 series of transponders. It features full read/write capabilities, full AES 128 bit security, 4k bytes protected user data memory and an extremely flexible command structure, which facilitates its application in an interoperable environment. It is designed for a variety of road charging systems including high speed open road tolling, lane based ETC and HOT lanes. TS3304 is compliant with emerging IEEE 802.11p and 1609 standards for WAVE and ETC. The TS3304 features driver feedback capability by using a buzzer that may be activated from the Roadside System in a number of configurable ways. In addition the TS3304/01 variant also features the capability to declare the number of passengers riding in the car by pressing the push button and toggling the status of the LEDs. A variety of casing colors and operator defined tampon printing on casing facilitates branding. The TS3304 is powered by an internal Lithium battery, which has a lifetime in excess of six years under normal operating conditions. The mounting bracket makes

installation straightforward and retains the Transponder securely while still allowing transfer to other vehicles. The TS3304 also features an in-bracket detection switch.

Features.

- Compatible with IEEE 802.11p specifications
- Compatible with 1609-0, -2, -3, -4 and -11 specifications
- Mutual AES 128 bit authentication to resist spoofing
- Self declaration using push button and LEDs
- User feedback via configurable buzzer tunes
- Six years of battery life



Transponder TS3304/00

Technical Specification:

WAVE communication	IEEE 802.11p IEEE 1609-0, -2, -3, -4 and -11
Power Supply	Built-in 3V Lithium battery 6 years of battery life
User Memory	4 k bytes Access protected by AES-128 bit security
MMI	Buzzer >55 dBA @ 1 m TS3304/01 has a button and four LEDs for self-declaration)
Casing	Bi-colored PC/ABS
Dimensions	70 mm x 45 mm x 25 mm (2.75 in x 1.77 in x 0.98 in)
Weight	45 g (0.10 lb)
Accessories	Bracket incl. surface cleaner
Temp range, storage	-15°F to 185°F (IEC 60721-2-1, including solar radiation)
Temp range, operating	-15°F to 185°F (IEC 60721-2-1, including solar radiation)
Humidity	Max 95% relative humidity, non condensing (IEC 60721-3-5, Class 5K2)
Vibration	Random 1 m/s ² : 10-200 Hz 0,3 m/s ² : 200-500 Hz (IEC 60721-3-5, Class 5M2)
Shock	300m/s ² , half sine 6 ms, ±3 axes x 3 shocks (IEC 60721-3-5, Class 5M2)
Free fall	1000 mm, (39.37 in) each face
Enclosure	IP40 (IEC 607529)
Electrostatic discharge	4 kVp (direct) 8 kVp (indirect) (IEC 301489-1, -3)
Electromagnetic immunity	AM 1 kHz: 3V/m, 80-1000 MHz (IEC 301489-1, -3)
Electromagnetic emission	30-230-1000 MHz, 40-40/47-47 dBµV/m (IEC 301489-1, -3)
Type approval	FCC approved UL recognized



Transponder TS3304/01