



# Smart ticketing

Using ASK field proven technology of a printed antenna and flip chip process,

**C.ticket®** combines the efficiency of contactless smart card technology with the low cost of a paper ticket.

When it comes to build or upgrade a ticketing system for 25 years, operators have to take into account the field-proven experience of their supplier to ensure reliability of the system in the long term.

Now, with tens of million in use since 2000,

**C.ticket®** has become the natural solution to fully replace the traditional tickets for occasional users.

## C.ticket® Range

Get in with the generation of intelligent ticketing

### Main features

- Environment-friendly paper-based solution
- Highly-reliable silver-ink based antenna
- ISO14443 A&B electrical characteristics
- ISO15457 TFC.1 size
- Antenna and tickets 100% manufactured and tested at ASK

### Benefits

- Reduced cost of ownership
- User-convenience: ergonomy and transfers automation
- System reliability: no contact for less maintenance
- Security: cashless system and no ticket counterfeiting
- Increased statistics and system upgradability

### Applications

- Single-use ticket
- Multiple-use ticket (book of tickets)
- Pass with expiring date
- Store value
- Pre-paid voucher





	CTS-512-B / CTM-512-B	CTS-512-A Mifare® UL	CTS-SRI 512 / CTS-SRT 512	CTM1568A Mifare® UL C	CTM-8k-A Mifare® 1k	CTS-MYDM	CTS-SRI2K
RF Interface	ISO 14443 B	ISO14443 A	ISO 14443 B	ISO 14443 A	ISO14443 A	ISO14443 A / ISO18092	ISO14443 B
Compatibility	Calypso	Mifare®	Calypso	Ultra Light	Mifare®	Mifare UL / NFC	Calypso
Total/User memory	512 bits	512 bits	512 bits	1536 bits	8196 bits	1216 / 1024 bits	2048 / 2048
<b>Security</b>							
Unique S/N	64 bits	56 bits	64 bits	56 bits	32 bits	2 x 32 bits	64 bits
OTP area	up to 128 bits / variable	32 bits	5 x 32 bits / -	-	Variable	32 bits	160 bits
Memory write protection	Yes per sector	Yes per sector or block	Yes per 32 bits	Yes	Yes per sector	Yes per block	Yes per block
Authentication	Static / Dynamic	Simple static	-	3 DES	Mutual dynamic	-	-
Key length	- / 80 bits diversified	-	-	112 bits	48 bits	-	-
Other features	- / One way counter		2 x 32 bits, binary counter	16 bits counter	Random generator	16 bit counter / password access	2 counters of 32 bits
SAM	Optional / Yes	Optional	-	Yes	MFRC500	Optional	Optional
<b>Miscellaneous</b>							
Anticollision	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Typical transaction time	< 100 ms / < 200 ms	< 100 ms	< 100 ms	< 200 ms	< 200 ms	100 ms	< 100 ms
Typical communication distance	10 cm	10 cm	10 cm	10 cm	10 cm	10 cm	10 cm
Write endurance	100 000 cycles	10 000 cycles	1 million	10 000 cycles	100 000 cycles	10 000 cycles	1 000 000 cycles

## Security

- Unique serial number (write protected at production stage)
- OTP (One-Time Programmable) bits to avoid fraudulent reloading
- Write protection by system/lock bits for the application zones
- Possibility to generate a cryptographic certificate with a Security Access Module (SAM) in the vending equipment, using private DESx key. This certificate can guarantee the authenticity of all information stored on the C.ticket®
- Dynamic authentication option with enciphering and maximum security made by TDES

## Personalization options

- Electrical pre-personalization at manufacturing
- Pre-printed customer colour artwork
- Thermosensitive paper overlay (1 side)
- Ink jet post-printing

## RF interface

- Compliant with ISO14443 RF interface
- Operating frequency: 13,56MHz
- Baud Rate: 106 Kbits/s

## Solutions to ease system development

- Security Access Module (SAM) to encipher data and make certificates
- Distribution and printing solutions
- Personalization solutions

## Size

Format	Size	thickness
TFC.1 (ISO15457)	86mmx54mm	360 +/-40µm

Over thickness of chip - Custom form-factor on demand

## Packaging options

- Die cut Tickets
- Fanfolder
- Roll stack

