QUANRAY ELECTRONICS CO.,LTD

Qstar-7U

UHF Low-Cost Tag Chip

Qstar-7U Chip

Qstar-7U is an Internet of things (IOT) RFID chip that conforms to EPC global Gen 2 protocol. The RFID chip is highly cost-effective and has excellent read and write sensitivity. It can be connected or embedded into almost any product to achieve quick inventory counting, self-checking and verification, anti-counterfeiting traceability and other functions. The chip has 144 bits of EPC memory and 128 bits of user memory. Applicable to the Item Level Tagging, supply chain management and e-commerce logistics.

Features

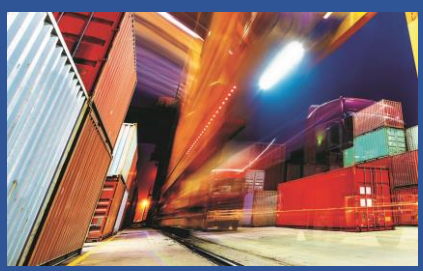
- Read sensitivity up to -24dBm
- Write sensitivity up to -21dBm
- Storage temperature range: -55℃ ~ +125℃
- Operating temperature (Toper): -40℃ to +85℃
- EPC global Gen 2V2 and ISO 18000-6C
- EPC Bank: 144 bits
- TID Bank: 96 bits
- Reserved Bank: 64 bits
- User: 128 bits (Bigger capacity than same type chip)
- Block write （1 word or 2 word）
- Block erase （1 word or 2 word）
- TID high efficiency reading

Key Applications

- Item Level Tagging (Apparel tagging)
- Logistics/supply chain management
- Retailing tagging
- Pallet/Case tracking
- Anti-counterfeit
- Asset Management
- Medical Health
- Library Management

Cost-effective Excellent R/W sensitivity
helps to track the whole process of apparel management

E-commerce logistics
visual management of low-cost and efficient logistics



Supply chain management
production, storage, transportation, sales and consumption are clear and controllable

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Operating Conditions & Electrical Characteristics

Parameters	Conditions	Min	Typ	Max	Unit
Air Interface Characteristics					
Operating Frequency	Supported Frequency Range	840	-	960	MHz
Read Sensitivity	Normal Read	-	-24[1]	-	dBm
Write Sensitivity	Normal Write, Block Write	-	-21[1]	-	dBm
Maximum operating power	The max power that the chip receives, under which the chip could work properly.	-	-	20	dBm
Equivalent input parallel resistance	At minimum input power	-	3100	-	Ω
Equivalent input parallel capacitance	At minimum input power	-	1.27	-	pF
Memory Characteristics					
Data retention	Temperature 27℃	-	50	-	year
Endurance		-	100,000	-	cycle

[1] with 2dB dipole antenna

Memory Map

Bank	Address	Description	Memory	Bits
TID	00h-5Fh	TID	ROM-NVM	96
EPC	00h-0Fh	CRC-16	RAM	16
	10h-1Fh	PC	NVM	16
	20h-9Fh	EPC	NVM	128
Reserved	00h-1Fh	Kill password	NVM	32
	20h-3Fh	Access password	NVM	32
USER	00h-7Fh	USER bank	NVM	128

Product family overview

Ordering Number	USER(bits)	EPC[1](bits)	TID(bits)	RSV(bits)	Gold bumpedWafer	DFN2L	WLCSP
Qstar-7UGB	128	144	96	64	√	-	-

[1] EPC is including CRC(16bits) and PC(16bits).

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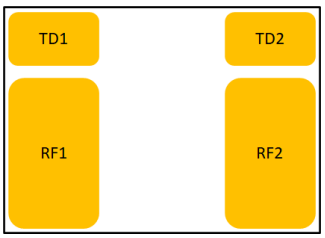
Pad Description

PAD No.	PAD Size	Pad Purpose
RF1	104*196 um	Antenna Pad
RF2	104*196 um	Antenna Pad
TD1	104*29 um	Dummy Pad
TD2	104*29 um	Dummy Pad



Pad location for Qstar-7U series

- Chip Size (without scribe lane): 378 x 270 um
- Bumping Pad: 4

Bump Specification

Parameters	Target Value	Tolerance
Bump material	> 99.9% pure Au	N/A
Bump type	Electroplated Au	N/A
PI thickness	10 um	+/- 1 um
Bump height	5 um	+/- 1.5um
Bump size	A1/A2: 104 x 196 um A3/A4: 104 x 29 um	N/A
Bump Co-Planarity	< 5um within wafer < 2um within die	N/A
Roughness	< 2um within Bump	N/A
Hardness	50 HV	+/- 20 HV
Shear force	≥ 5g/mil^2	N/A
Under bump metallization UBM	Sputtered TiW	N/A

Functional Description

Qstar-7U tag chip supports the following optional commands.

- Access
- Block Write (1~2 words)
- Block Erase (1~2 words)

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