GT23SC55160 Datasheet

1 Introduction

GT23SC55160 is a high security, high performance enhanced 8051 smart card chip which is targeting at contact smart card applications such as SIM/PIM/UIM, EMV, PBOC and others.

GT23SC55160 offers 256 bytes internal RAM, 2048 bytes XRAM and 160 Kbytes FLASH (including 2K bytes for boot loader), which can be used as both data and program memory. The non-volatile memory consists of high reliability cells to guarantee data integrity. To minimize the overall power consumption, GT23SC4464 also offers two kinds of sleeping mode for low power applications.

GT23SC55160 conforms to ISO7816 standards and GSM11.11/GSM11.12 standards. In conclusion, GT23SC55160 integrates outstanding and configurable memory sizes, additional co-processors for CRC generation and DES/TDES operation, enough measurement in term of security, sufficient peripherals in combination with enhanced performance and optimized power consumption on a most competitive die size to match the requirement of today's IC card application.

2 Features

2.1 Basic

o 0.18um advanced FLASH technology

o ISO7816-2 compliant 8-contact module

o ISO7816-3 serial interface compliant

o 8-bit low power Turbo 8051 CPU core

o ESD protection greater than 6KV (HBM)

o On-chip two Timers/Counters

o Extra three GPIOs for special application

o 30 MHz Internal Oscillator with divider by 1, 2, 4 and 8

o ISP (In-System Programming) using standard Vcc Power supply

2.2 Memory

o 160K bytes FLASH (including 2K bytes boot loader)

o 256 bytes SRAM, and 2K bytes XRAM

o FLASH data retention minimum 10 years

o FLASH minimum program cycles: 100,000

2.3 Security feature

o Flash address scramble

o Under/Over Voltage detection

o Triple DES

o True random number generator

o Software configurable FLASH lock blocks

o Memory data encryption without performance penalty

3 Pin assignment

No.	Pin Name	Function	Special Note
C1	Vcc	Power used by Card 3V~5V (± 10%)	
C2	Reset	Reset, Low active	
C3	CLK	Clock input	
C4	GPIO_1	General I/O pin	Can used as hardware 7816 IO port
C5	GND	Ground	
C6	GPIO_2	General I/O pin	
C7	IO	7816 Input/Output	
C8	GPIO_3	General I/O pin	

4 Characteristics

PARAMETER	CONDITIONS	MIN.	TYP.	MAX
Supply Voltage		2.7V		5.5V
Operating temperature		-25	25	85
Supply current 3V				6mA
Supply current 5V			6mA	10mA
Idle current	Clock stop		70uA	100uA
External clock frequency		1MHz		5MHz
Internal OSC frequency			30MHz	
IO H Output Voltage	-20uA<I_{OH}<0, Vcc=min	0.7xVcc		Vcc
IO L Output Voltage	0<I_{OL}<1.0mA, Vcc=min	0		0.4V
GPIO H Output Voltage	-1.0mA<I_{OH}<0,Vcc=min	0.7xVcc		Vcc
GPIO L Output Voltage	0<I_{OL}<1.6mA, Vcc=min	0		0.4V
ESD	HBM	6 kV		
	MM	300V		
FLASH byte write time			20us	
FLASH data retention	55	10 years		
FLASH write endurance		100,000 cycles		