

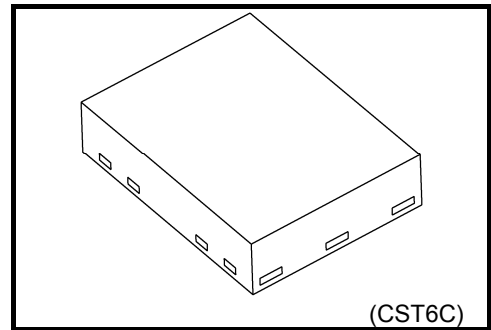
TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

TCS30DPC

Digital Output Magnetic Sensor

TCS30DPC is a CMOS Digital Output Magnetic Sensor with Push-Pull output, featuring low voltage operation and low current consumption. The detection type is South-Pole and North-Pole (Double detection)

TCS30DPC is offered in ultra thin and compact CST6C (1.15 mm × 1.50 mm × 0.38 mm). Thus, this device is ideal for portable applications that require high-density board assembly such as cellular phones.

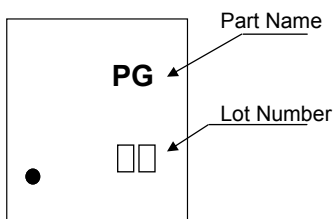


Weight: 2.0 mg (typ.)

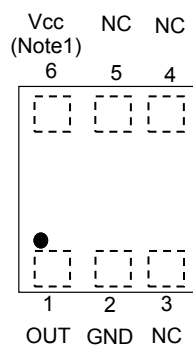
Features

- Low voltage operation : $V_{CC} = 1.6$ to 3.6 V
- Low current consumption : $I_{CC} = 4.6 \mu A$ (typ.) at $V_{CC} = 1.6$ V
- South-Pole and North-Pole Detections (Double detection)
- Push-pull output structure
- Ultra thin and small package CST6C (1.15 mm × 1.50 mm × 0.38 mm)

Marking



Pin Assignment (top view)



Function Table

Magnetic Flux Density	Output
$\geq B_{ON}$	L
$\leq B_{OFF}$	H

Note 1: A 0.47 μF capacitor should be connected near the device. This condition will not guarantee successful operation. Check the performance through evaluation using the actual application to set the condition.

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply Voltage	V _{CC}	-0.5 to 6.0	V
Output Voltage	V _{OUT}	-0.5 to 6.0	V
Output Diode Current	I _{OK}	± 10	mA
Output Current	I _{OUT}	± 5	mA
V _{CC} /GND Current	I _{CC}	± 10	mA
Power Dissipation	P _D	100 (Note 2)	mW
Storage Temperature Range	T _{stg}	-65 to 150	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 2: FR4 in board implementation (25.4mm x 25.4mm x 1.6mm, Cu Pad: 0.4mm²)

Operating Ranges

Characteristics	Symbol	Rating	Unit
Supply Voltage	V _{CC}	1.6 to 3.6	V
Output Voltage	V _{OUT}	0 to V _{CC}	V
Output Current	I _{OH} / I _{OL}	± 1.0	mA
Operating Temperature	T _{opr}	-40 to 85	°C

DC Characteristics (Ta = 25°C)

Characteristics		Symbol	Condition	V _{CC} (V)	Min.	Typ.	Max.	Unit
Output Voltage	High- Level	V _{OH}	I _{OH} = -0.5 mA	1.6	1.4	—	—	V
			I _{OH} = -1.0 mA	2.5	2.2	—	—	
				3.3	2.9	—	—	
	Low- Level	V _{OL}	I _{OL} = 0.5mA	1.6	—	—	0.16	
			I _{OL} = 1.0mA	2.5	—	—	0.25	
				3.3	—	—	0.33	
Supply Current	Average Current	I _{CC}	Current at pulse driving (Note 3, Fig. A)	1.6	—	4.6	9.0	μA
				2.5	—	8.4	—	
				3.3	—	12	—	
	Operating Current	I _{CCON}	Peak current (Note 3, Fig. A)	1.6	—	0.4	0.9	mA
				2.5	—	0.7	—	
				3.3	—	0.9	—	
Operating Frequency		f _{opr}	(Fig. A)	1.6 to 3.6	—	25	—	Hz

Note 3: Supply current is pulsed periodically by internal circuit.

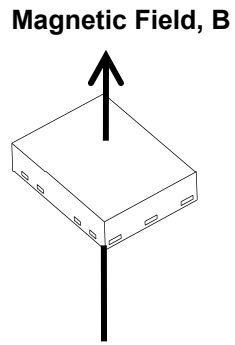
Magnetic Characteristics (Ta = 25°C)

Characteristics		Symbol	Condition (Note 4, Fig. B)	V _{CC} (V)	Min.	Typ.	Max.	Unit
Magnetic Flux Density	Operating Point	B _{ONS} B _{ONN}	When output logic turns High to Low	1.6 to 3.6	—	3.2	4.4	mT*
	Releasing Point	B _{OFFS} B _{OFFN}	When output logic turns Low to High	1.6 to 3.6	0.5	1.5	—	
	Hysteresis	B _H	B _{ON} - B _{OFF}	1.6 to 3.6	—	1.7	—	

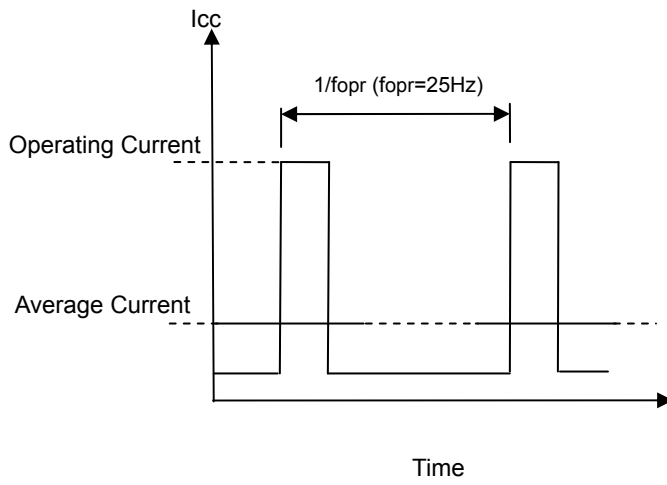
*1mT =10Gauss

Note 4: Uniform magnetic field perpendicularly to the magnetic sensor.

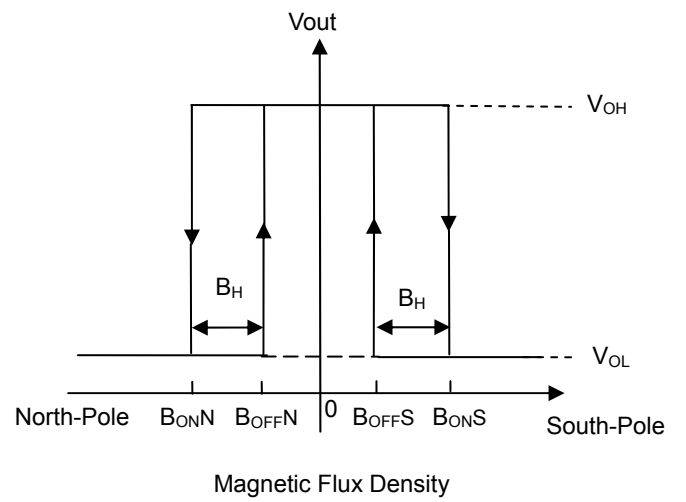
Note: Direction of Magnetic field



(Fig. A): Icc Characteristics

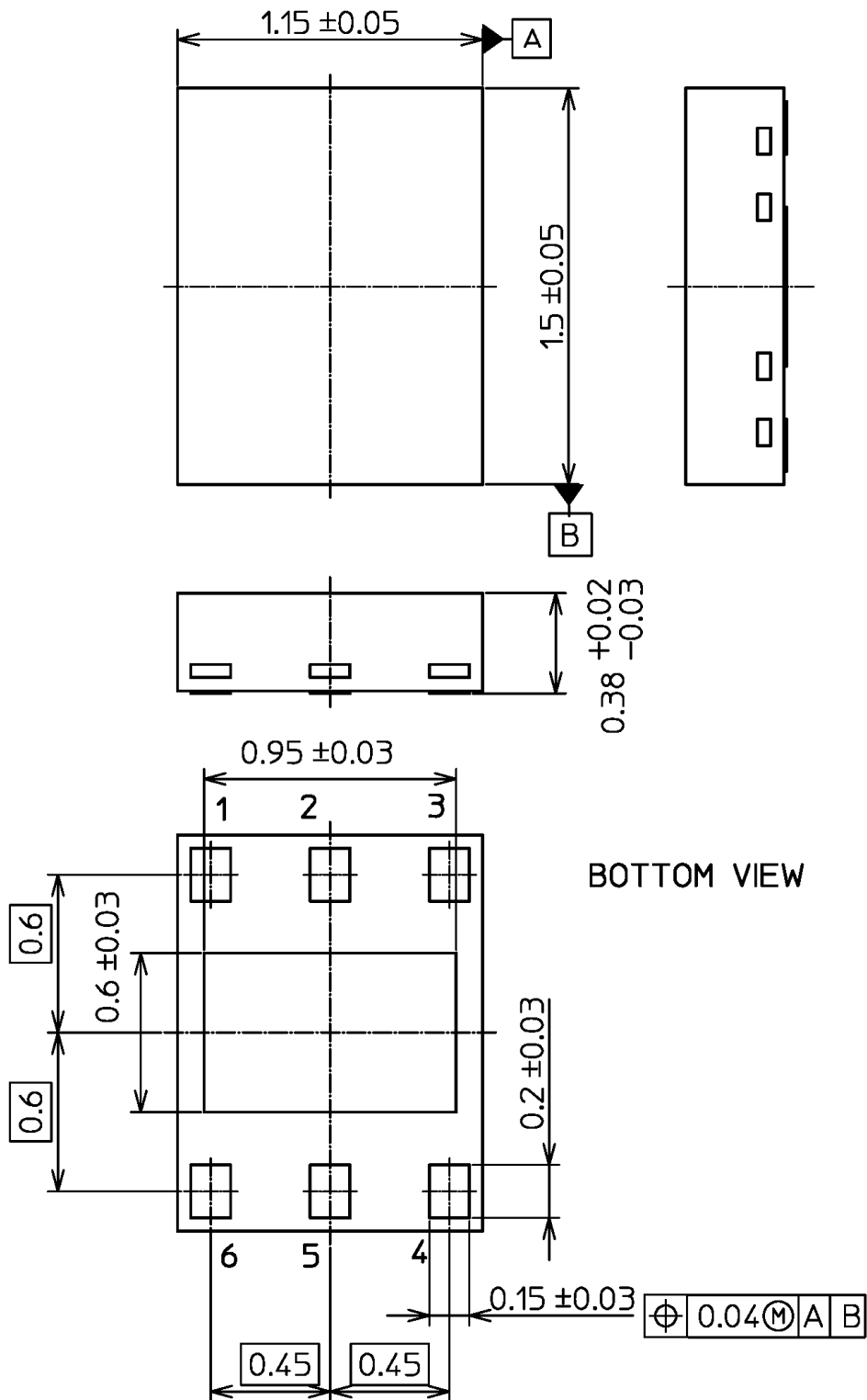


(Fig. B): Operating Characteristics



Package Dimension

Unit: mm



Weight: 2.0 mg (Typ.)

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