MH4952ESV product is a low-voltage low-power linear Hall effect sensor chip that can be customized by the user for wake-up/sleep mode. The chip can work at an ultra-low operating voltage of 1.7V~3.6V. In addition, by making $\overline{SLEEP}$<VINL, the chip enters the sleep mode, and the consumed current is only 50uA. At this time, the chip output enters the "high resistance state", and does not respond to the change of external magnetic field; By making $\overline{SLEEP}$>VINH, the chip enters the normal operating mode, consumes 2mA of current, and provides a voltage signal whose output is proportional to the induced magnetic field.

MH4952ESV product users can switch sleep and working modes by themselves through $\overline{SLEEP}$ pin, which indicates that users can further reduce the overall power consumption, so it is very suitable for many battery powered applications. In the sleep mode, since the output enters the "high impedance state", multiple MH4952 chip outputs are allowed to share an ADC interface.

The output of MH4952 product is based on the proportional output of VREF pin. When there is no magnetic field, VOUT=50% VREF, so it has nothing to do with power supply.

Features and Benefits
- CMOS process
- Working voltage: 1.7~3.6V
- Operating temperature: - 20~85 ℃
- Low consumption current
- $\overline{SLEEP}$<VINL, ICC=50uA
- $\overline{SLEEP}$>VINH, ICC=2mA
- Sensitivity: 2.50mV/Gs (VCC=VREF=VCCN)
- The user can customize the sleep mode. High impedance output is available in the sleep mode
- The output voltage is proportional to the reference voltage (VREF pin)
- Package form: DFN-2030
- RoHS compliant: (EU) 2015/863

Applications
- Position detection
- Application of magnetic tape
- AR/VR handle trigger
- Game handle remote lever
- Headphone position detection
- Portable battery powered equipment.

Product Overview

Item No	Description
MH4952ESV	DFN-2030 tape rolling type (3000pcs/package)

Functional block diagram
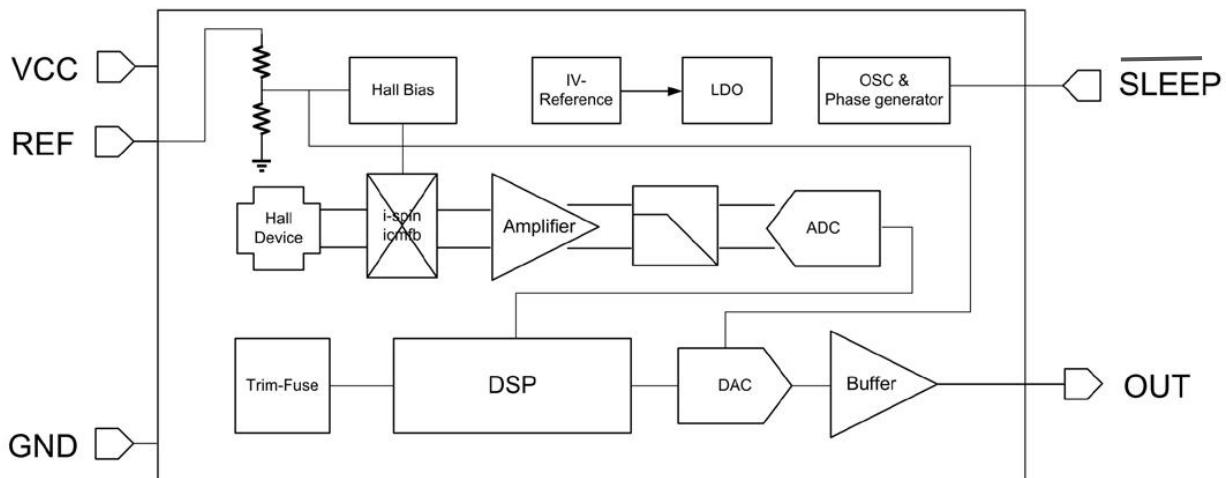
Electrical magnetic characteristics

Absolute maximum rating

The absolute maximum rating is the limit value for independent application, and exceeding this value may damage the usability of the circuit. The impact on the functionality may not be obvious after the damage, but the reliability of the device may be affected if the device is under the condition of absolute maximum rating for a long time.

Parameters	Description	Min	Max	Unit
VCC	Supply voltage	-	6	V
VRCC	Power supply reverse voltage	-0.1	-	V
VREF	Reference voltage input	-	6	V
VRREF	Reference reverse voltage	-0.1	-	V
VSLEEP	Sleep pin voltage	-	6	V
VRSLEEP	Sleep pin reverse voltage	0.1	-	V
VOUT	Output voltage	-	VCC+0.1	V
IOUT	Continuous output current	-	10	mA
TA	Operating ambient temperature	-20	85	°C
TS	Storage temperature	-50	150	°C
TJ	Junction temperature	-	150	°C

Electrical Code

TA=- 20~85 °C, Vcc=1.7V~3.6V, CBYPASS=0.1uF (Note: 1) VREF<=VCC)

| Parameters	Description	Test conditions	Min	Typ	Max	Unit
VCC[1])	Supply voltage	-	1.7	-	3.6	V
VCCN	Nominal supply voltage	-	-	3.0	-	V
VREF[1])	Proportional reference voltage		1.8	-	VCC	V
VINH	Wake up threshold voltage	Used in wake-up mode	-	0.45 x VCC	-	V
VINL	Sleep threshold voltage	For sleep mode	-	0.20 x VCC	-	V
RREF	Proportional reference pin input resistance	TA=25℃	250	-	-	kΩ
ICC	Current consumption	VSLEEP>VINH, VCC=VCCN ，TA=25℃	-	2	-	mA
		VSLEEP<VINL，VCC=VCCN ，TA=25℃	-	50	-	uA
TPON	Power on time	TA=25℃	-	60	100	us
TPOFF	Power off time	TA=25℃	-	1	-	us
BW	Bandwidth	-3dB, CL=1nF, VCC=VCCN	-	10	-	KHz
TRESP	Response time	TA=25°C, B=B(max) VCC=VREF=VCCN	-	36	-	us
TR	Rising edge time	TA=25°C,B=(max) VCC=VREF=VCCN	-	18	-	us
TPD	Propagation delay time	TA=25°C, B=(max) VCC=VREF=VCCN	-	18.6	-	us
ROUT	Output impedance	IOUT<1.5mA,VCC=VCCN VSLEEP>VINH, B=0Gs	-	5	10	Ω
		IOUT<1.5mA,VCC=VCCN VSLEEP<VINH, B=0Gs	4	-	-	MΩ
RL	Output resistance load	Drop down to GND	4.7	-	-	KΩ
		Pull up to VCC	4.7	-	-	KΩ
CL	Output load capacitance	OUT to GND	-	-	10	nF
VOL[1])	Linear output low voltage	VCC=VCCN, RL>=4.7KΩ	-	-	0.1	V
VOH[1])	Linear output high voltage	VCC=VCCN, RL>=4.7KΩ	VREF-0.1	-	-	V
ELIN	Nonlinear error	TA=25°C, VOUT= 0.1V~VREF-0.1V	-1.5	-	1.5	%
VOQ	Zero field output voltage	TA=25°C, B=0Gs	-	0.5 x VREF	-	V

VOE	Zero field output Voltage error	TA=25°C, B=0Gs VCC=VREF=VCCN	1.47	1.5	1.53	V
SNST	Magnetic sensitivity	TA=25°C, VCC=VREF=VCCN	2.375	2.5	2.625	mV/Gs
VOQ_TC	Zero field voltage output drift in temperature range	-	-2	-	2	%
SNST_TC	Within temperature range Magnetic sensitivity drift	-	-	11000	-	ppm/°C
ERAT_VOQ	Zero field output Voltage proportional error	TA=25°C, VREF=1.7~1.9V	-1.5	-	1.5	%
		TA=25°C, VREF=2.7~3.3V	-1.5	-	1.5	%
ERAT_SNST	Magnetic sensitivity Proportional error	TA=25°C, VREF=1.7~1.9V	-2	-	2	%
		TA=25°C, VREF=2.7~3.3V	-2	-	2	%
VN	Noise	-	-	18	-	mVpp

1）VREF<=VCC

Typical application circuit

Non-Sleep Application Circuits

Sleep Application Circuits
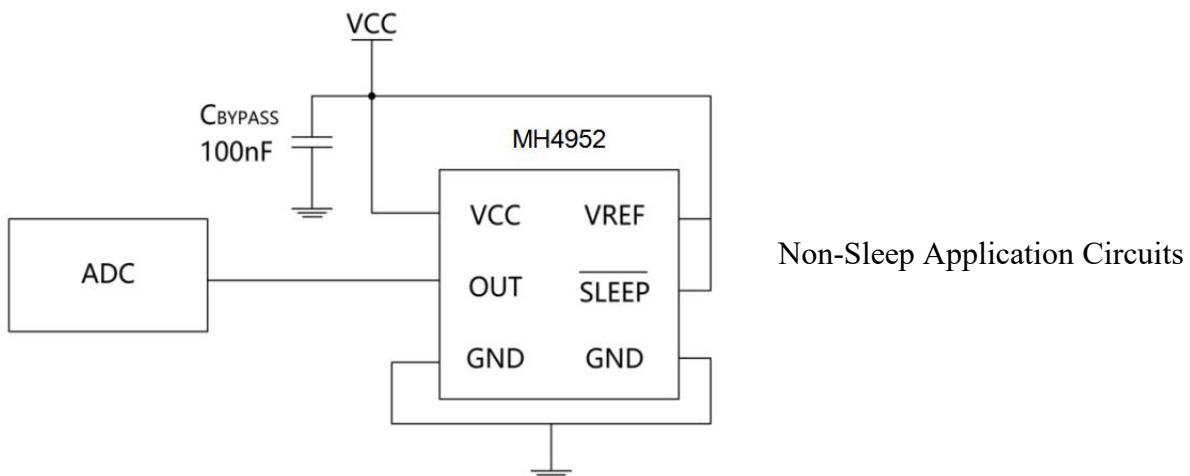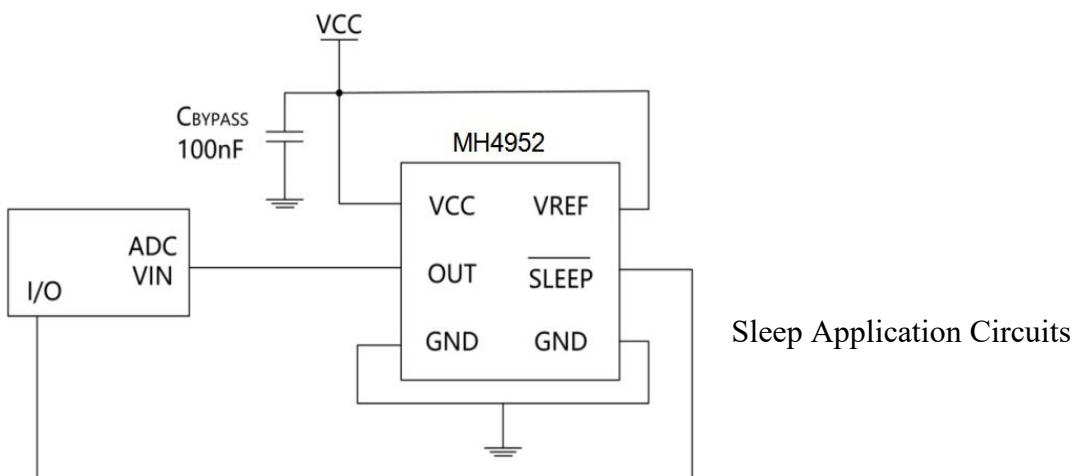
Package Information

Marking specification.
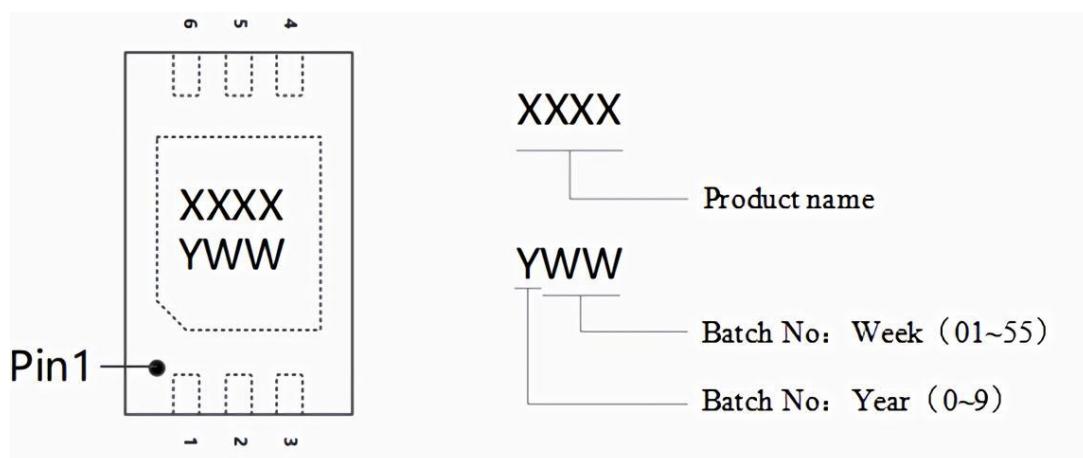
Pin configuration and function

No.	Name	Description
1	VCC	Power supply
2	OUT	Analog voltage output
3	GND	Signal ground
4	GND	Signal ground
5	$\overline{\text{SLEEP}}$	Switch sleep mode
6	VREF	Proportional reference voltage input
7	GND	Signal ground

DFN-2030

Package drawing

Top View

Bottom View

Side View
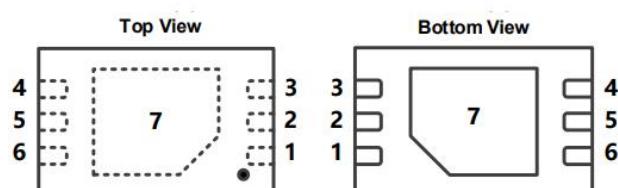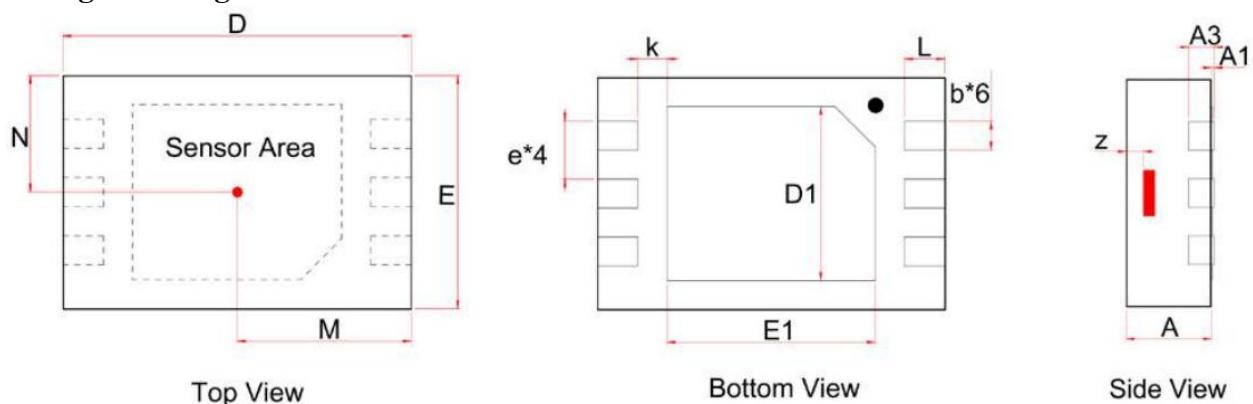
Parameters	Dimensions in mm		Dimensions in inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.203 REF		0.008 REF	
D	2.950	3.050	0.116	0.120
E	1.950	2.050	0.077	0.081
D1	1.400	1.600	0.055	0.063
E1	1.600	1.800	0.063	0.071
b	0.200	0.300	0.008	0.012
e	0.500 TYP		0.020 TYP	
k	0.200 MIN		0.008 MIN	
L	0.300	0.400	0.012	0.016
M	1.500 TYP		0.060 TYP	
N	1.000 TYP		0.040 TYP	