

Features and Benefits

- **Single current sinking or current sourcing output**
- **Ratiometric rail to rail linear output**
- **Precise sensitivity and temperature compensation**
- **Wide Operating Voltage Range:**
Supply Voltage 3.0~15V
- **Sensitivity:** 2.5 mV/Gauss
- **Specified Operating Temperature Range:**
From -40°C~150°C
- **Lead Free Package**
Flat TO-92, SOT-89B
- **High ESD protection**
- **RoHS Compliant**
2011/65/EU

Applications

- Automotive, Home appliances, Industrial
- Speed Detection
- Position Detection
- Magnetic Encoder
- Solid-State Switch
- Ferrous metal sensing
- Vibration sensing
- Weight sensing

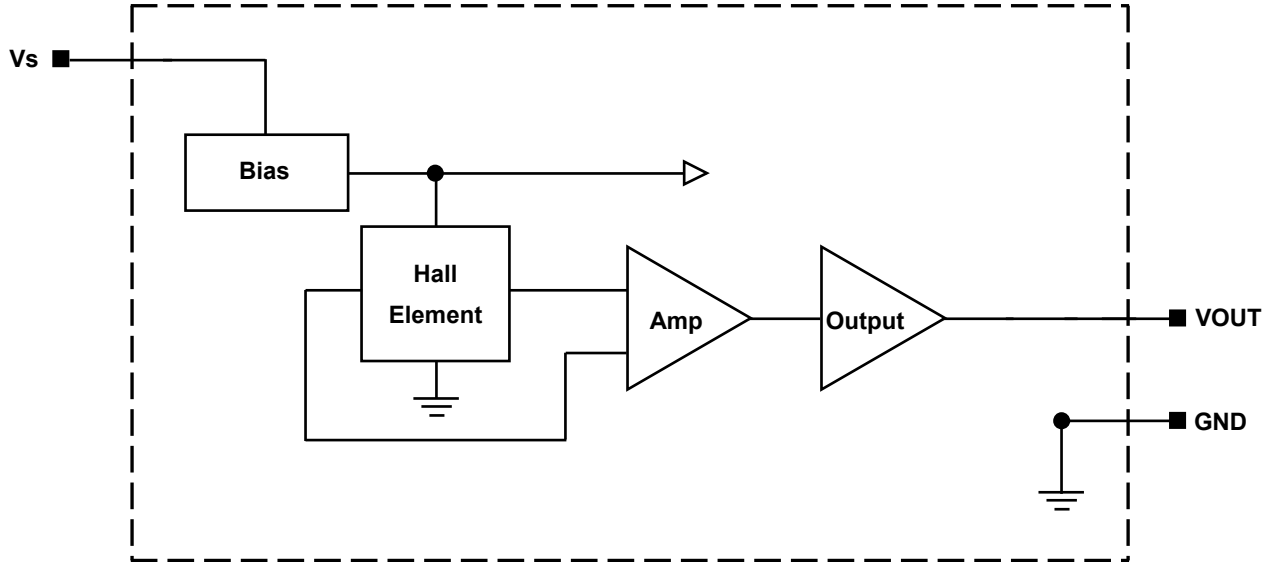
Family Members

Part number	Description
MT4505A	Flat TO-92 package, bulk packaging (1000pcs/bag)
MT4505A-T	Flat TO-92 package, Radial lead, bulk packaging (1000pcs/bag)
MT4505BT	SOT-89B package, tape and reel packaging (1000pcs/bag)

General Description

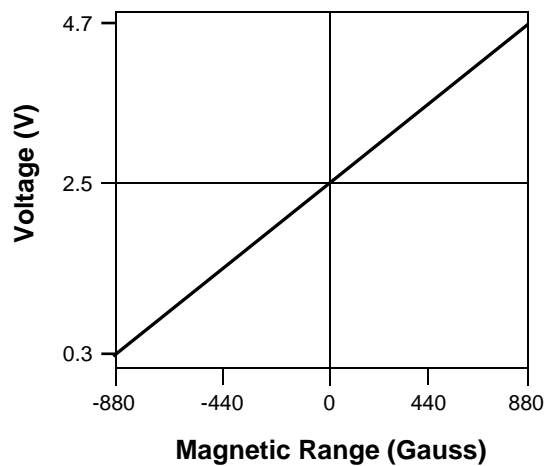
The MT4505 family, produced with Bipolar technology, It is high performance small versatile linear Hall—effect devices which are operated by the magnetic field from a permanent magnet or an electromagnet. The ratiometric output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field. The MT4505 family has a quiescent output voltage that is 50% of the supply voltage and output sensitivity is 2.5mV/Gauss under typical conditon.

The integrated circuitry provides increased temperature stability and sensitivity. The MT4505 provide high accuracy and temperature compensation. The linear hall sensors have an operating temperature range of -40 to +150, appropriate for home appliances, industrial and automotive environments. They respond to either South or North pole.



Functional Block Diagram

Transfer Characteristics ($V_s=5$ Vdc)



Electrical and Magnetic Characteristics

Absolute Maximum Ratings

Absolute maximum ratings are limiting values to be applied individually, and beyond which the serviceability of the circuit may be impaired. Functional operability is not necessarily implied. Exposure to absolute maximum rating conditions for an extended period of time may affect device reliability.

Absolute maximum ratings: all voltages listed are referenced to GND.

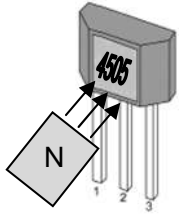
Characteristic	Symbol	Notes	Rating	Units
Supply Voltage	Vcc	Additional Current draw and linearity distortion may be observed at voltages above the maximum voltage	20	V
Output Voltage	Vout		20	V
Reverse Supply Voltage	Vrcc		-0.2	V
Reverse Output Voltage	Vrout		-0.2	V
Output Sink Current	Iout		5	mA
Operating Ambient Temperature	Ta		-40--150	°C
Maximum Junction Temperature	Tj		160	°C
Storage Temperature	Tstg		150	°C

MT4505 Series Specifications

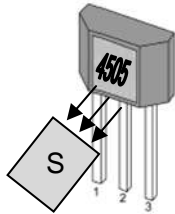
Electrical Characteristics; Vcc=5V, unless otherwise noted						
Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Supply Voltage	Vcc(op)	Tj<165°C	3.0	5	15	V
Supply Current	Icc	B=0	--	7	--	mA
Quiescent Voltage	Vnull	B=0; Ta=25°C	2.425	2.5	2.575	V
Output Voltage	Vh	B=+1000 Gs	4.7	--	--	V
	VI	B= -1000 Gs	--	--	0.3	V
Output Source Current Limit	Iout(LMT)	B-->0	--	-2	--	mA
Magnetic Characteristics; Vcc=5V, over operating temperature range, unless otherwise noted						
Sensitivity	Sens	Ta=25°C	--	2.5	--	mV/Gs
Magnetic Range	B+	Ta=25°C	--	880	--	Gauss
	B-	Ta=25°C	--	-880	--	Gauss
Linearity	Lin	--	--	--	±5	%
Delta Vnull as temperature	Vnull(T)	--	--	--	±5	%
Ratiometry, Vnull	Vnull(V)	--	--	--	±5	%
Delta Sens as temperature	Sens(T)	--	--	--	±10	%

Application Note:

Condition: $V_s=5V$

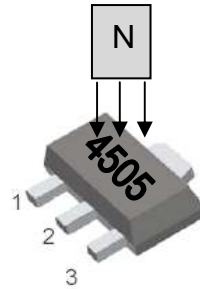


OUT=0.3~2.5V

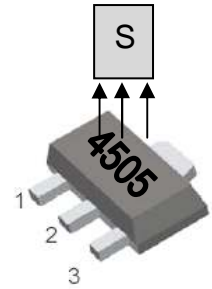


OUT=2.5~4.7V

Package: A and A-T



OUT=0.3~2.5V



OUT=2.5~4.7V

Package: BT

Pin Description

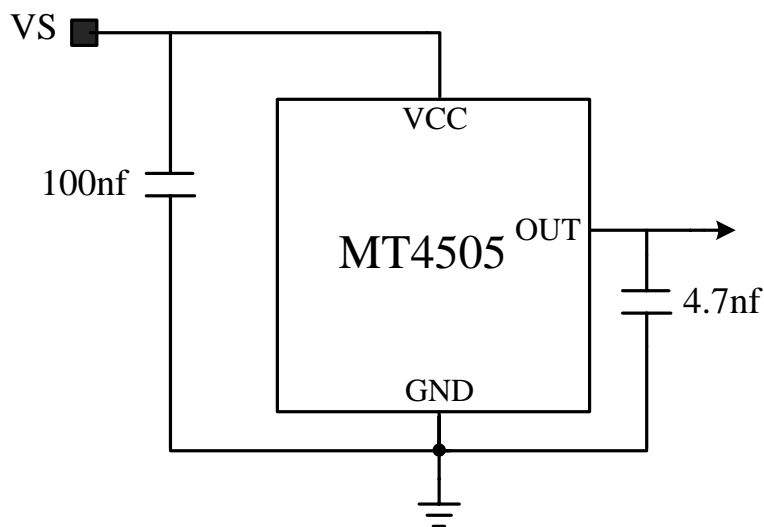
MT4505A (MT4505A-T)

Name	Number	Description
V_s	1	Power
GND	2	Ground
Output	3	Output

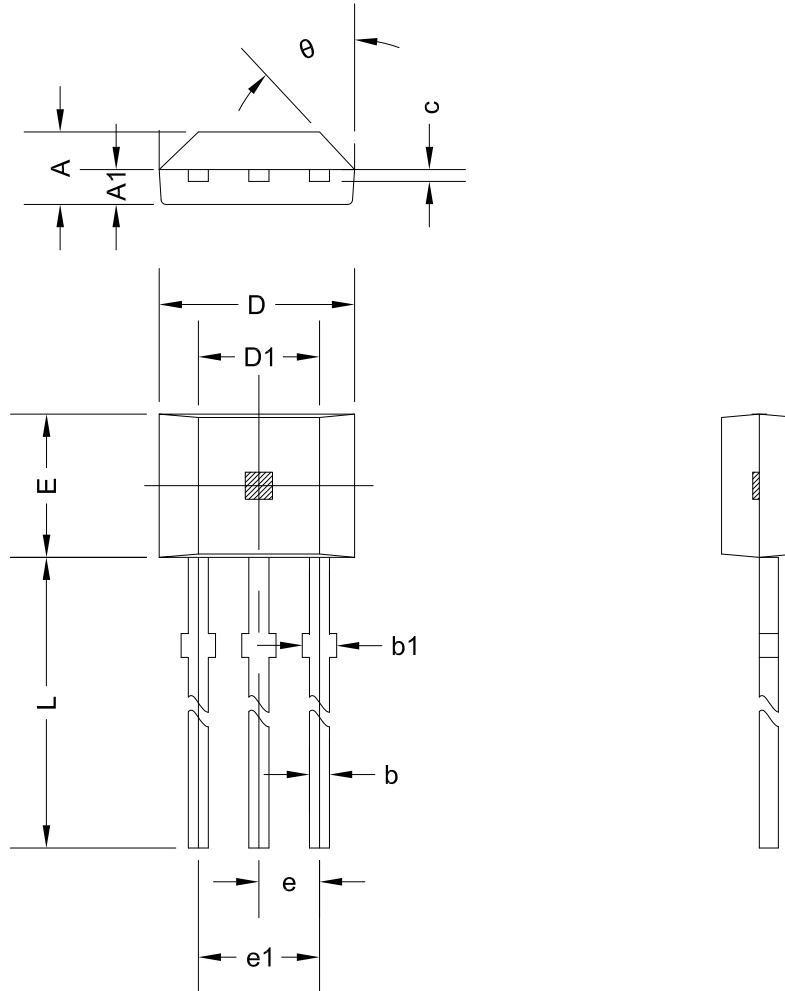
MT4505BT

Name	Number	Description
V_s	1	Power
GND	2	Ground
Output	3	Output

Typical Application Circuit

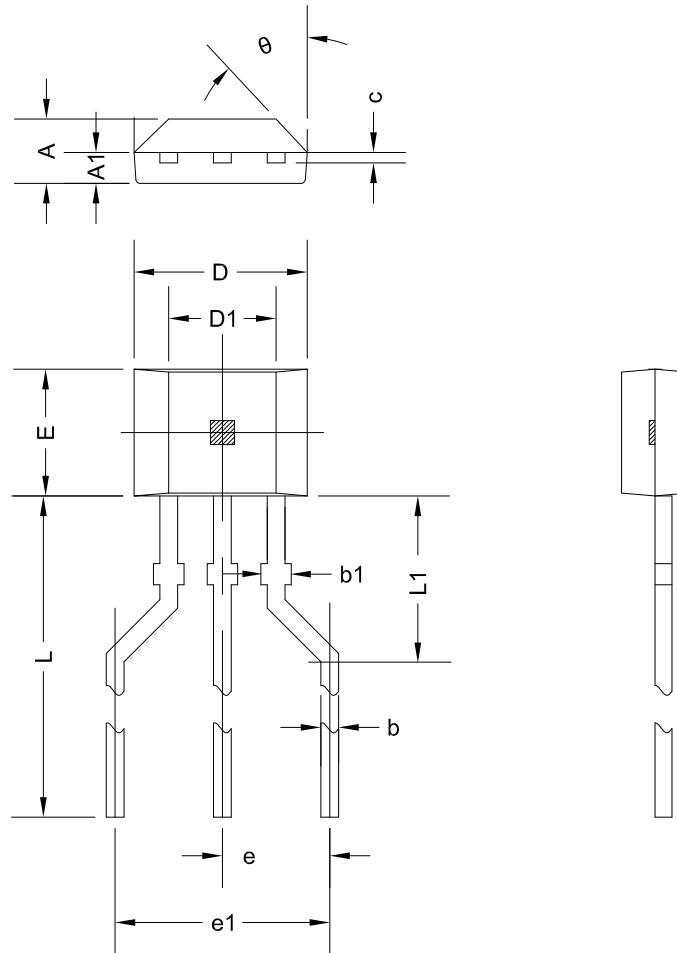


PACKAGE DESIGNATOR (MT4505A) TO-92 Flat



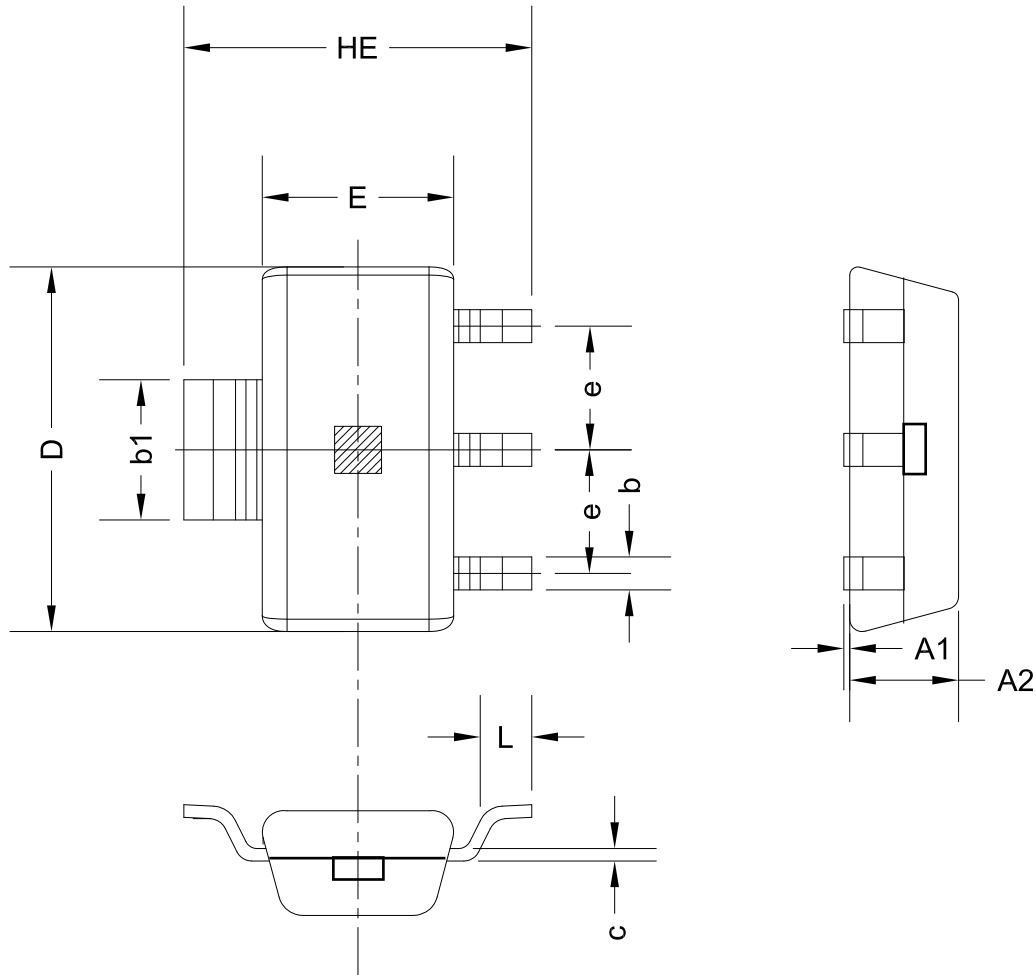
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.350	0.480	0.014	0.019
b1	0.400	0.550	0.016	0.022
C	0.360	0.510	0.014	0.020
D	3.900	4.200	0.154	0.165
D1	2.970	3.270	0.117	0.129
E	2.870	3.124	0.113	0.123
e	1.270 TYP.		0.050 TYP.	
e1	2.440	2.640	0.096	0.104
L	13.600	15.500	0.535	0.610
theta	45° TYP.		45° TYP.	

PACKAGE DESIGNATOR (MT4505A-T) Flat TO-92 Radial lead



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.350	0.480	0.014	0.019
b1	0.400	0.550	0.016	0.022
C	0.360	0.510	0.014	0.020
D	3.900	4.200	0.154	0.165
D1	2.970	3.270	0.117	0.129
E	2.870	3.124	0.113	0.123
e	2.540 TYP.		0.100 TYP.	
e1	5.080 TYP.		0.200 TYP.	
L	14.300 REF.		0.563 REF.	
L1	2.630 REF.		0.104 REF.	
θ	45° TYP.		45° TYP.	

PACKAGE DESIGNATOR (MT4505BT) SOT-89B



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	1.220	1.420	0.048	0.056
b	0.300	0.500	0.012	0.020
b1	1.600	1.800	0.063	0.070
D	4.400	4.600	0.173	0.181
c	1.152 REF.		0.045 REF.	
E	2.400	2.600	0.094	0.102
HE	4.000	4.400	0.157	0.173
e	1.500 TYP.		0.060 TYP.	
L	0.350	0.550	0.014	0.022