Features and Benefits

- **Precise sensitivity and temperature compensation**
- **Wide Operating Voltage Range:** Supply Voltage 3.0~12V
- **Sensitivity:**1.35mV/Gauss (typical)
- **Specified Operating Temperature Range:** From -40℃~150℃
- **Lead Free Package** Flat TO-92, SOT-89B, SOT-23
- **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

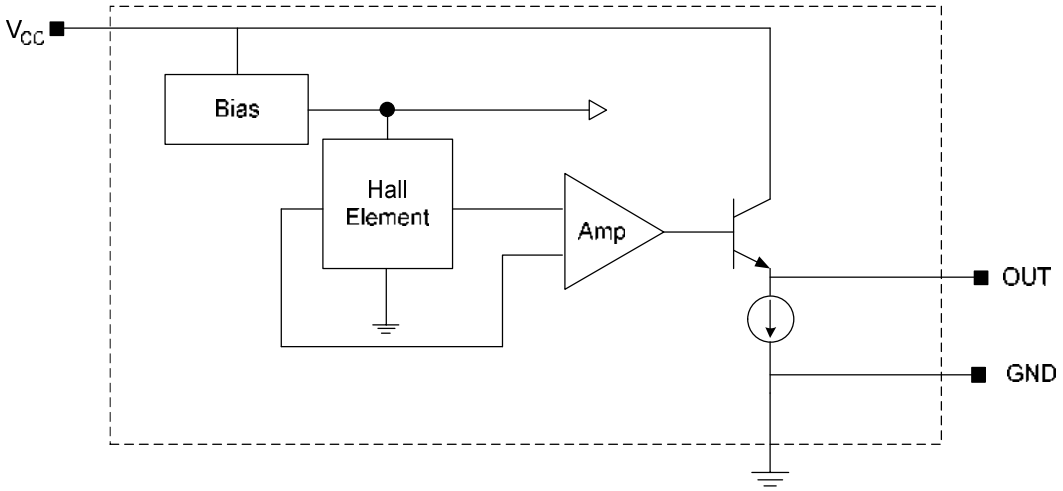
Part number	Description
MT4501A	Flat TO-92 package, bulk packaging (1000pcs/bag)
MT4501A-T	Flat TO-92 package, radial lead, bulk packaging (1000pcs/bag)
MT4501AT	SOT-23 package, tape and reel packaging (3000pcs/bag)
MT4501BT	SOT-89B package, tape and reel packaging (1000pcs/bag)
MT4501ET	SOT-23(thin outline)package, tape and reel packaging (3000pcs/bag)

General Description

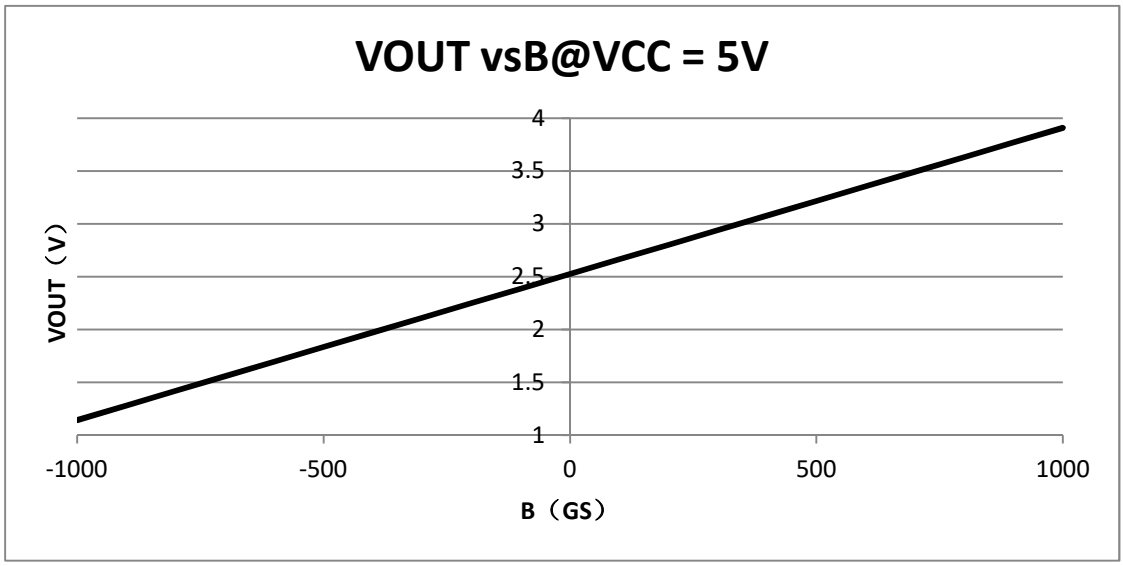
The MT4501 family, produced with Bipolar technology, it is high performance small versatile linear Hall-effect devices which are operated by the magnetic field from a permanent magnet or an electromagnet. The linear sourcing output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field. The MT4501 family has a quiescent output voltage that is 50% of the supply voltage and output sensitivity is 1.35mV/Gauss.

The integrated circuitry provides increased temperature stability and sensitivity. The MT4501 provides high accuracy and temperature compensation. The linear hall sensors have an operating temperature range from -40 to +150, for home appliances, industrial and automotive environments. They respond to either South or North pole.

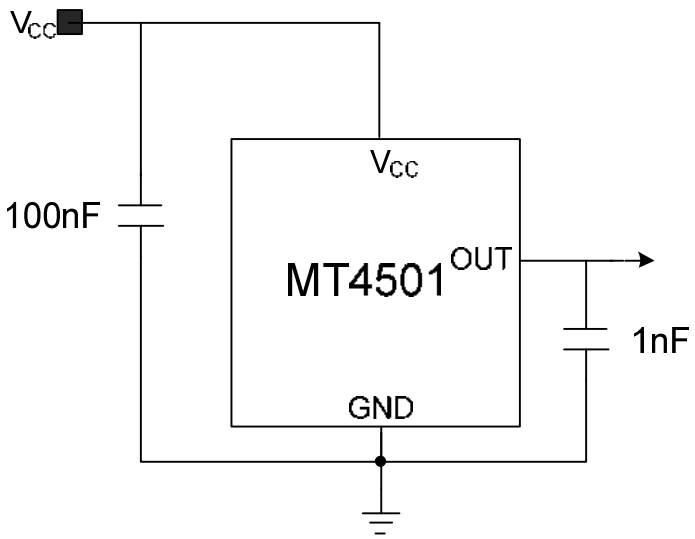
Functional Block Diagram



Transfer Characteristics



Typical Application Circuit



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.

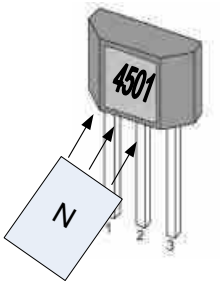
Absolute maximum ratings: all voltages listed are referenced to GND.

Parameters	Symbol	Notes	Rating	Units
Supply Voltage	V_{CC}	Additional Current draw and linearity distortion may be observed at voltages above the maximum voltage	15	V
Output Voltage	V_{OUT}	--	15	V
Reverse Supply Voltage	V_{RCC}	--	-0.2	V
Reverse Output Voltage	V_{ROUT}	--	-0.2	V
Output Current	I_{OUT}	--	5	mA
Operating ambient Temperature	T_A	--	-40~150	℃
Maximum Junction Temperature	T_J	--	165	℃
Storage Temperature	T_{STG}	--	-65~170	℃

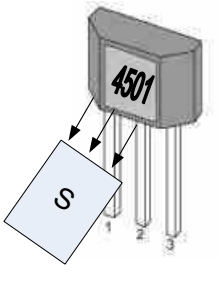
MT4501 Series Specifications

1) Electrical Characteristics；V_{CC}=5V, over operating temperature range, unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Supply Voltage	V_{CC}	T_J<165℃	3.0	5	12	V
Supply Current	I_{CC}	B=0	--	7	10	mA
Quiescent Voltage	V_{NULL}	B=0,T_A=25℃	2.25	2.5	2.75	V
Output Voltage	V_H	B=+1500 Gs	--	4.20	--	V
	V_L	B=-1500 Gs	--	0.8	--	V
Output Load Resistance	R_L	T_A=25℃, $\|\Delta V_{OUT}\|$<15mV	500	--	--	KOhm
Output Type	Linear，Sourcing					
2) Magnetic Characteristics; V_{CC}=5V, over operating temperature range, unless otherwise noted						
Sensitivity	S_{ENS}	T_A=25℃	1.1	1.35	1.8	mV/Gs
Magnetic Range	B+	T_A=25℃	--	1000	--	Gauss
	B-	T_A=25℃	--	-1000	--	Gauss
Linearity	L_{IN}	--	--	--	±15	%
Delta V_{NULL} vs temperature	V_{NULL}(T)	--	--	--	±15	%
Ratiometry, V_{NULL}	V_{NULL}(V	--	--	--	±10	%
Delta S_{ENS} vs temperature	S_{ENS}(T)	--	--	--	±10	%



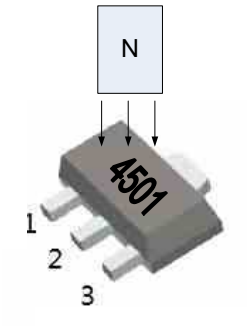
OUT=0.8~2.5V



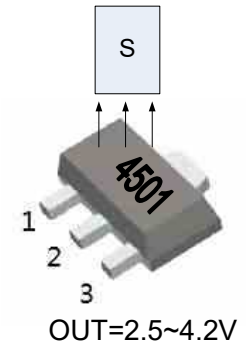
OUT=2.5~4.2V

Package: A and A-T

Motion

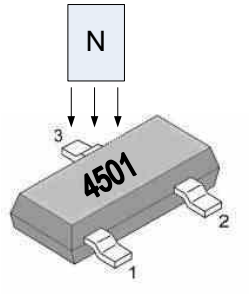


OUT=0.8~2.5V

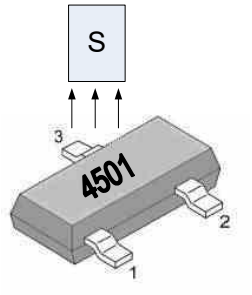


OUT=2.5~4.2V

Package: BT



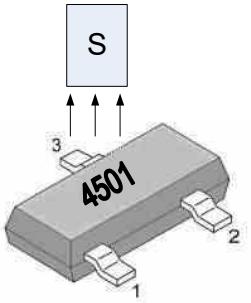
OUT=2.5~4.2V



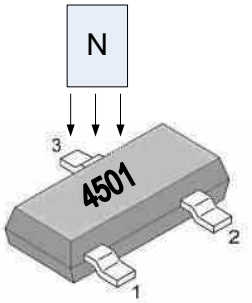
OUT=0.8~2.5V

Package: AT

Motion



OUT=2.5~4.2V



OUT=0.8~2.5V

Package: ET

Pin Description

MT4501A (MT4501A-T)

Name	Number	Description
V_{CC}	1	Power
GND	2	Ground
OUT	3	Output

MT4501BT

Name	Number	Description
V_{CC}	1	Power
GND	2	Ground
OUT	3	Output

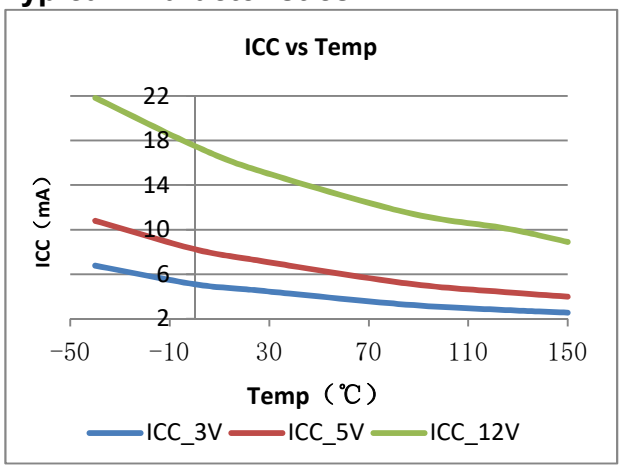
MT4501AT

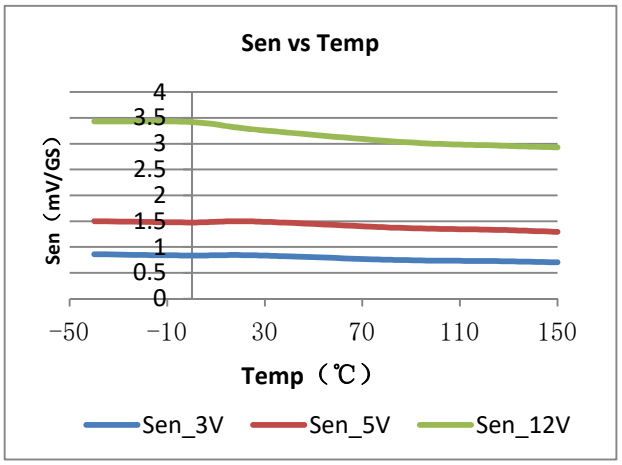
Name	Number	Description
V_{CC}	1	Power
OUT	2	Output
GND	3	Ground

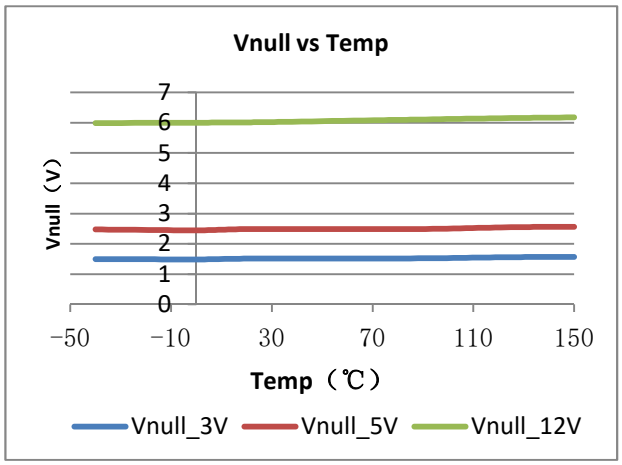
MT4501ET

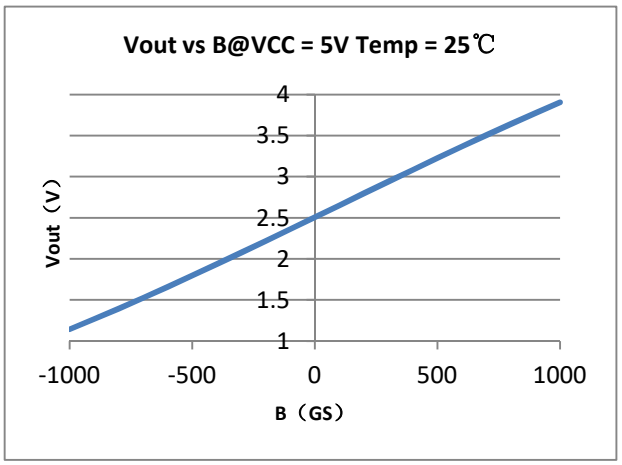
Name	Number	Description
V_{CC}	1	Power
OUT	2	Output
GND	3	Ground

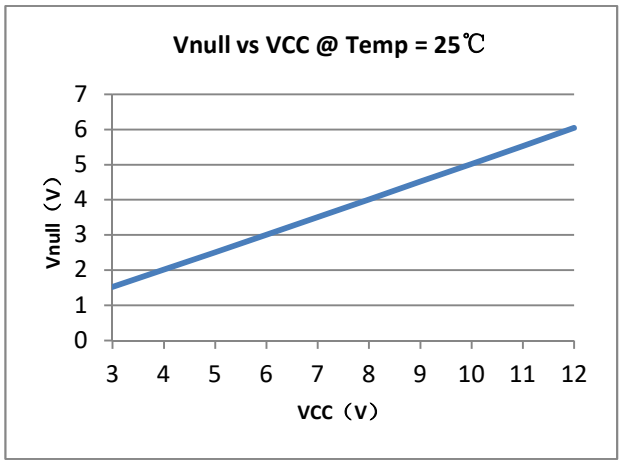
Typical Characteristics

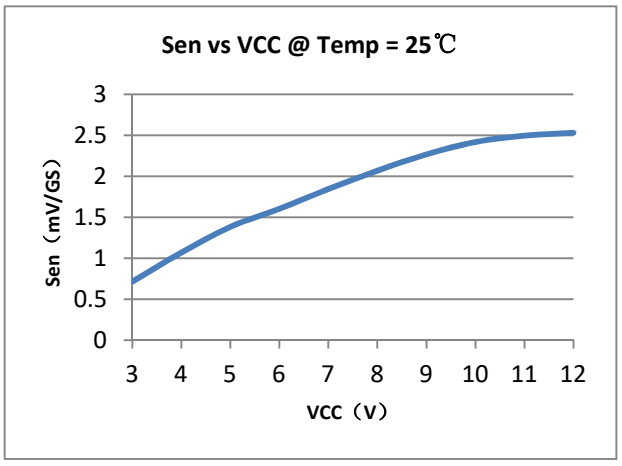




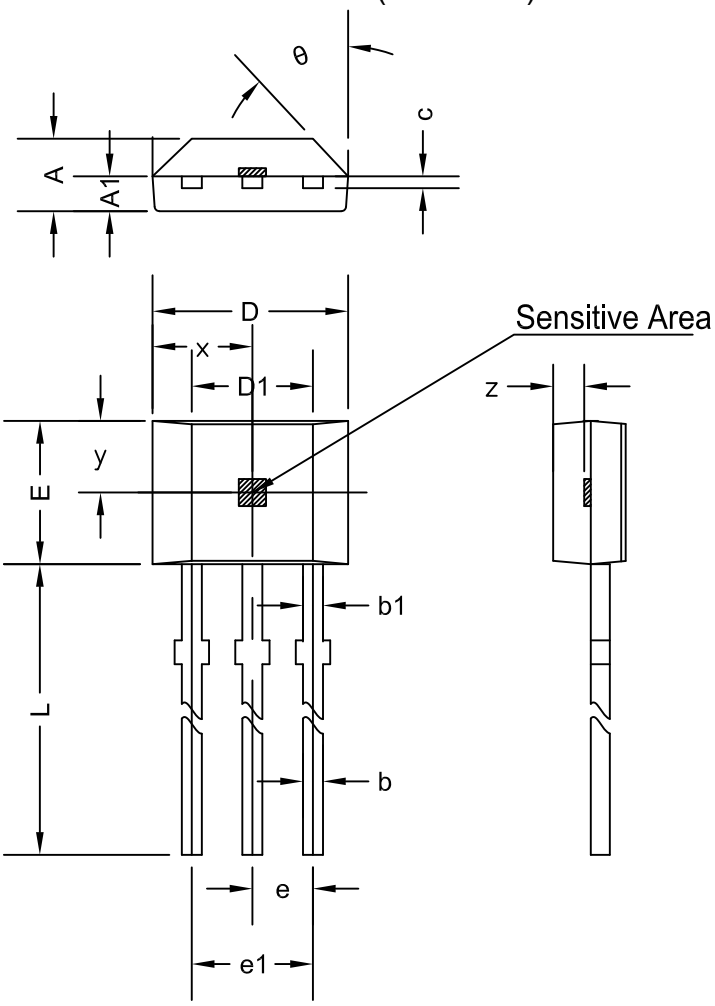


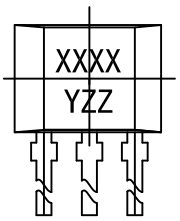






PACKAGE DESIGNATOR
(MT4501A) Flat TO-92





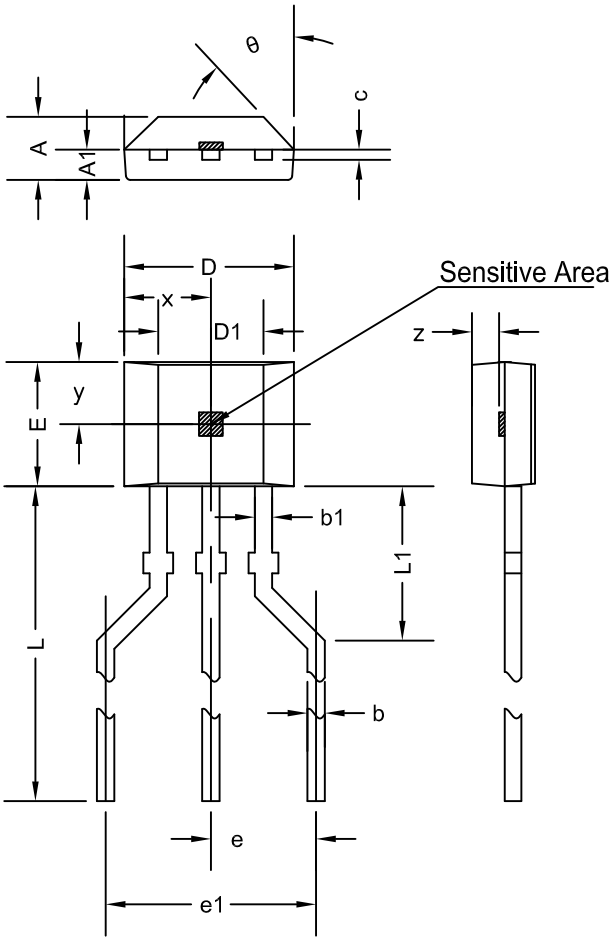
XXXX — Product ID
YZZ

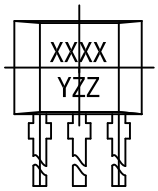
DateCode: Y ZZ
year week
(0~9) (01~55)

Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.420	1.670	0.056	0.066
A1	0.660	0.860	0.026	0.034
b	0.350	0.560	0.014	0.022
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	2.900	3.280	0.114	0.129
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	13.500	15.500	0.531	0.610
x	2.025TYP		0.080TYP	
y	1.545TYP		0.061TYP	
z	0.500TYP		0.020TYP	
θ	45˚TYP		45˚TYP	

PACKAGE DESIGNATOR

(MT4501A-T) Flat TO-92 Radial Lead



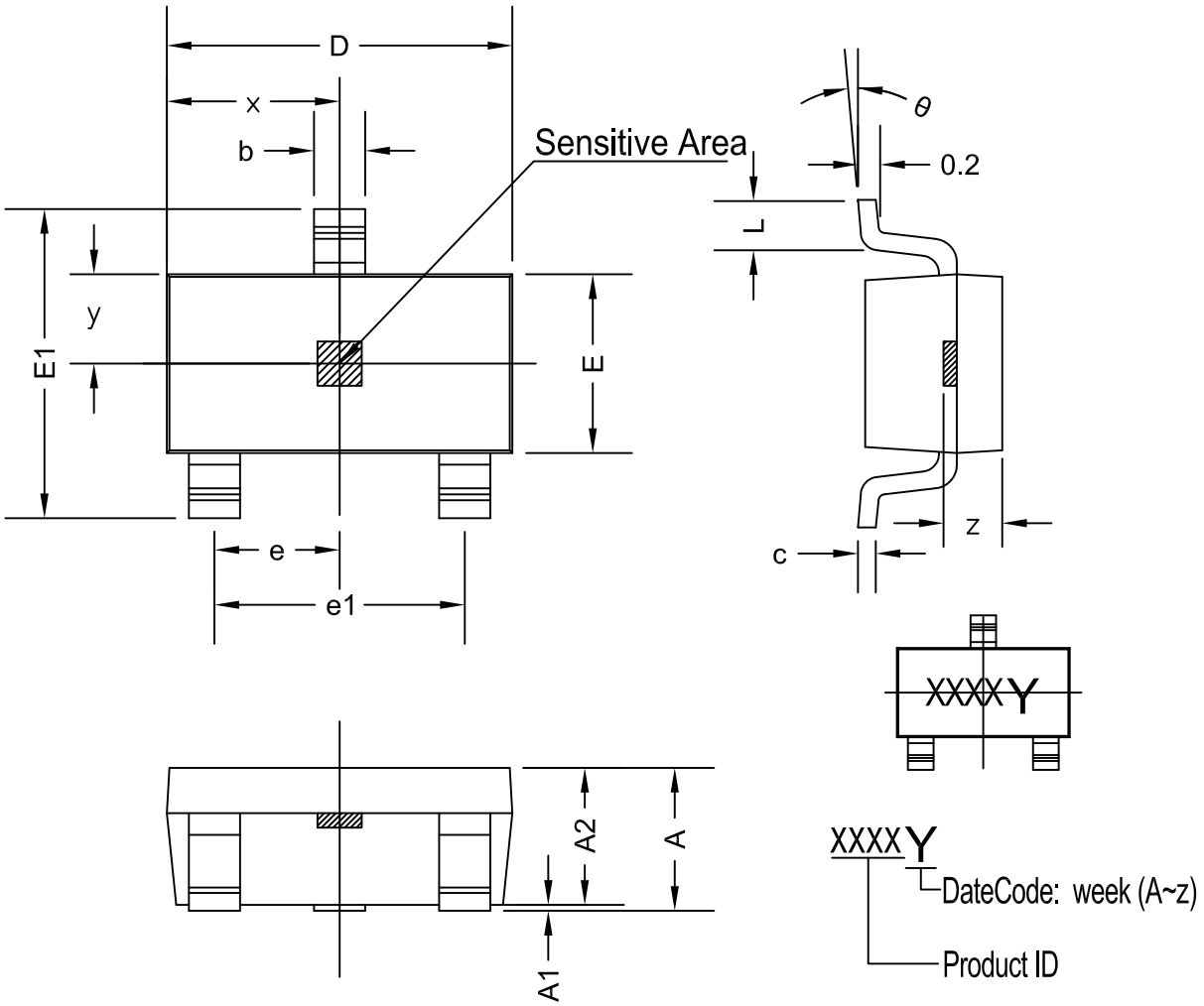


XXXX — Product ID

YZZ — DateCode: Y (year, 0~9) ZZ (week, 01~55)

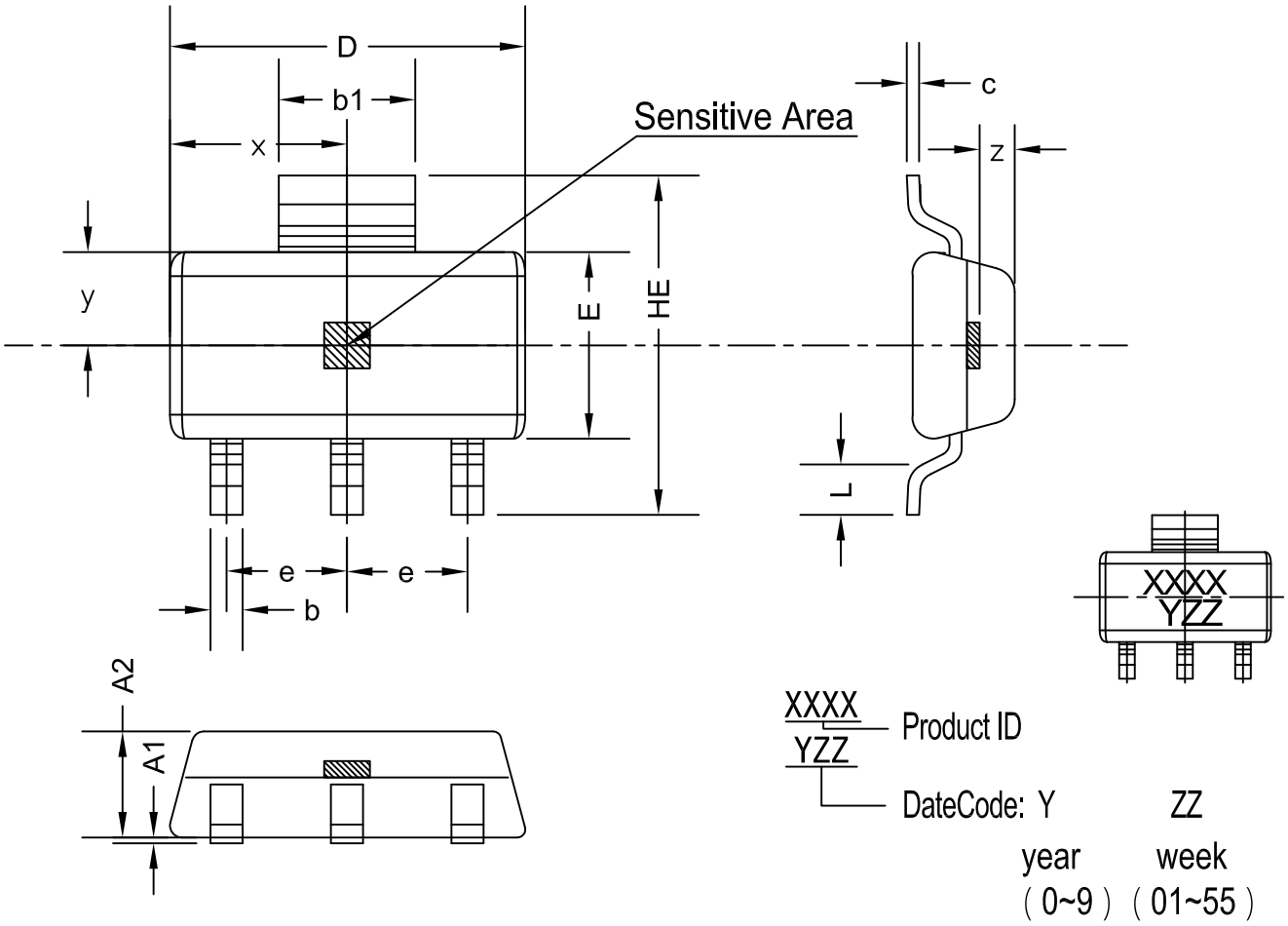
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.420	1.670	0.056	0.066
A1	0.660	0.860	0.026	0.034
b	0.350	0.560	0.014	0.022
b1	0.400	0.550	0.016	0.022
c	0.360	0.510	0.014	0.020
D	3.900	4.200	0.154	0.165
D1	2.970	3.270	0.117	0.129
E	2.900	3.280	0.114	0.129
e	2.540TYP		0.100TYP	
e1	5.080TYP		0.200TYP	
L	14.300REF		0.563REF	
L1	2.150REF		0.085REF	
x	2.025TYP		0.080TYP	
y	1.545TYP		0.061TYP	
z	0.500TYP		0.020TYP	
θ	45°TYP		45°TYP	

PACKAGE DESIGNATOR
(MT4501AT) SOT-23



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0. 100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
x	1.460TYP		0.057TYP	
y	0.800TYP		0.032TYP	
z	0.600TYP		0.024TYP	
θ	0˚	8˚	0˚	8˚

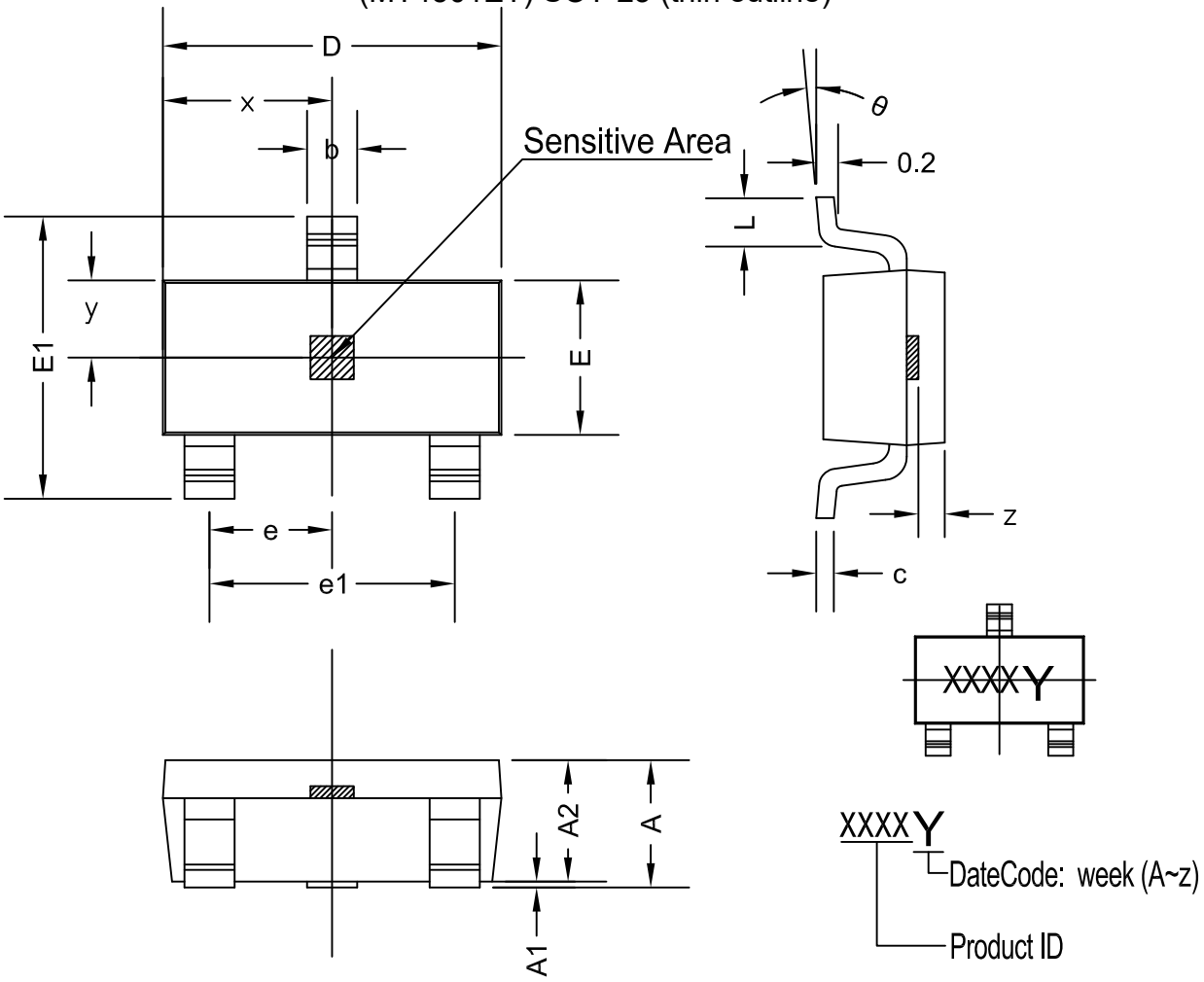
PACKAGE DESIGNATOR
(MT4501BT) SOT-89B



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
x	2.250TYP		0.089TYP	
y	1.250TYP		0.049TYP	
z	0.300TYP		0.012TYP	

PACKAGE DESIGNATOR

(MT4501ET) SOT-23 (thin outline)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0. 080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
x	1.460TYP		0.057TYP	
y	0.650TYP		0.026 TYP	
z	0.500TYP		0.020TYP	
θ	0°	8°	0°	8°