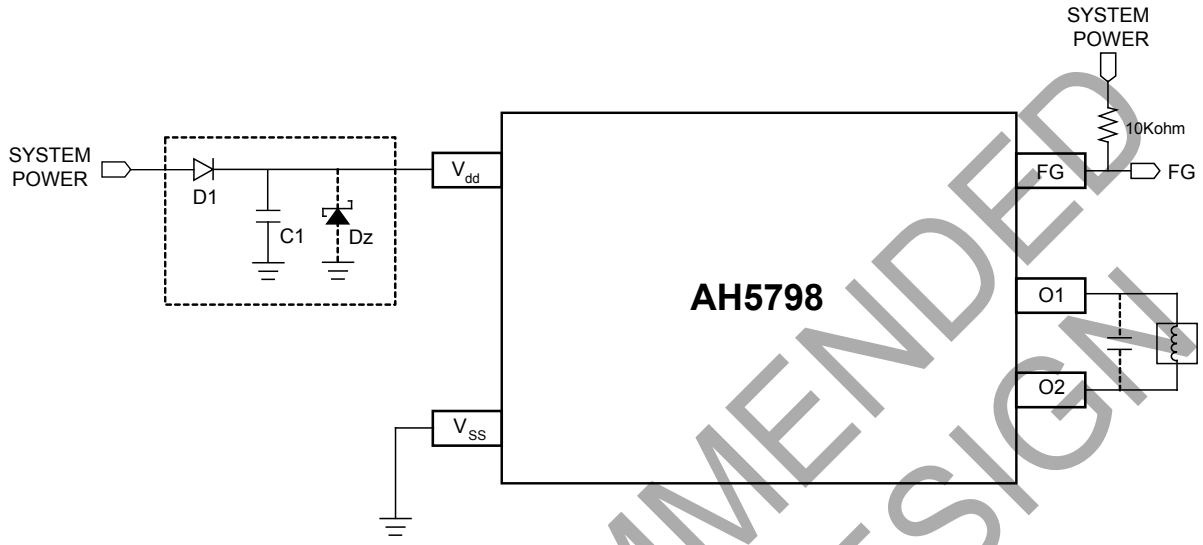
Typical Application Circuit



* Reverse connection of power supply may damage the device. To prevent reverse power damage, a protection (reverse blocking) Diode D1 is needed between power supply and Vdd terminal. If a reverse power protection diode D1 is used, there is no current return path to power supply, so it is necessary to follow measures such as below.
  - Connect Dz (Zener diode) between Vdd and Vss terminal, to prevent voltage exceeding the absolute maximum rating of the device.
  - Connect a capacitor C1 between Vdd and Vss terminal, to complete the current return path to power supply.

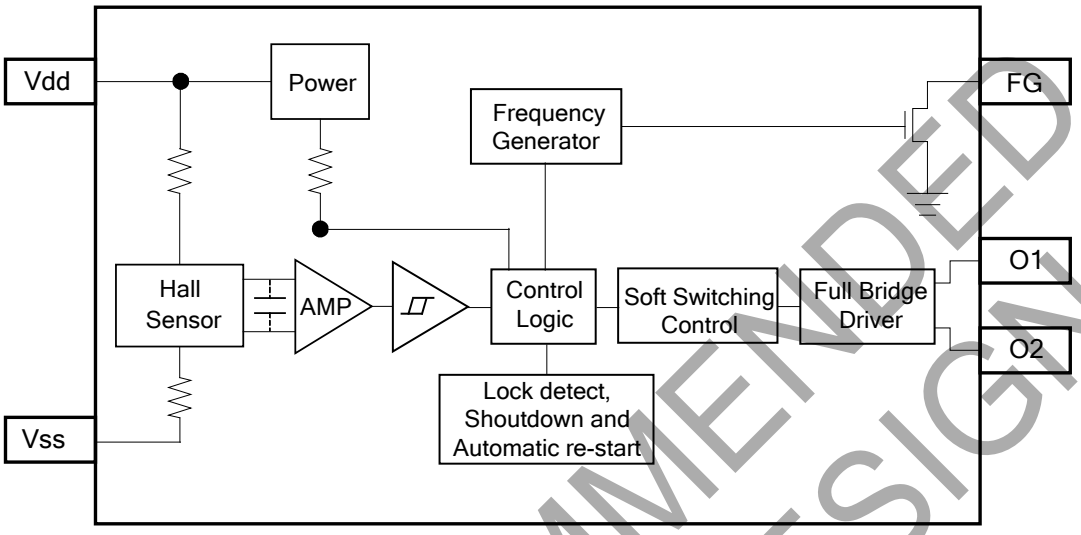
The AH5798 has an open-drain tachometer FG output that follows the magnetic change frequency. Typically, a pull-up resistor of 10kΩ is recommended from FG pin to the supply voltage.

Pin Descriptions

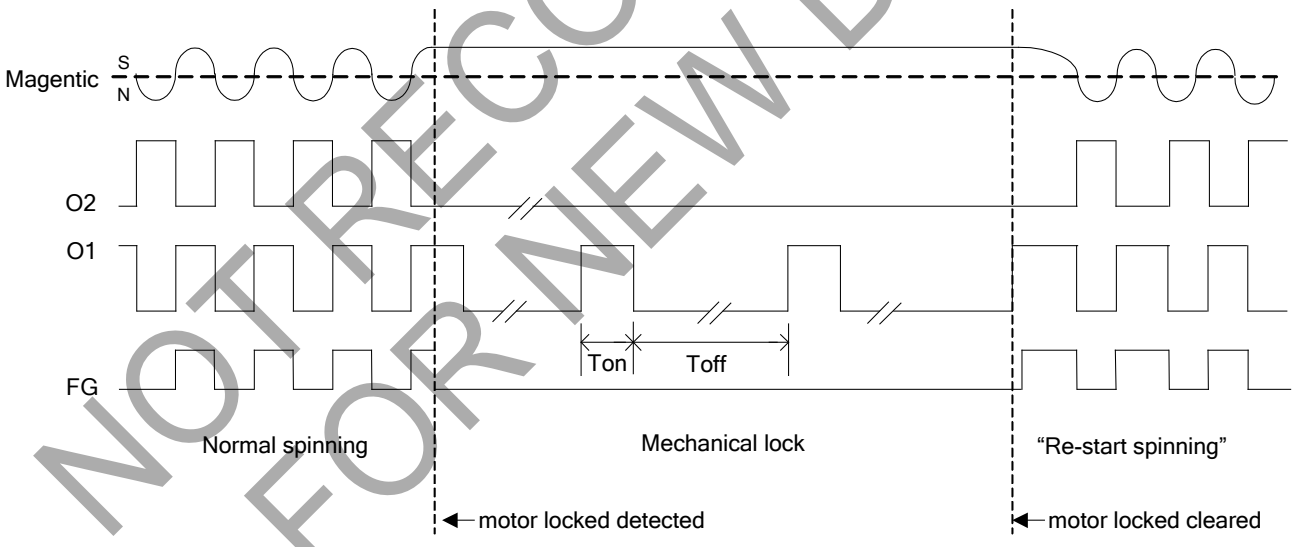
Pin Name	Description
Vdd	Power Supply Pin
Vss	Ground Pin
O1	Output Driving & Sinking Pin 1
O2	Output Driving & Sinking Pin 2
NC	No Connection
FG	Frequency Generator (Note 1)

Notes: 1. The FG is the same as the magnetic change frequency.

Functional Block Diagram



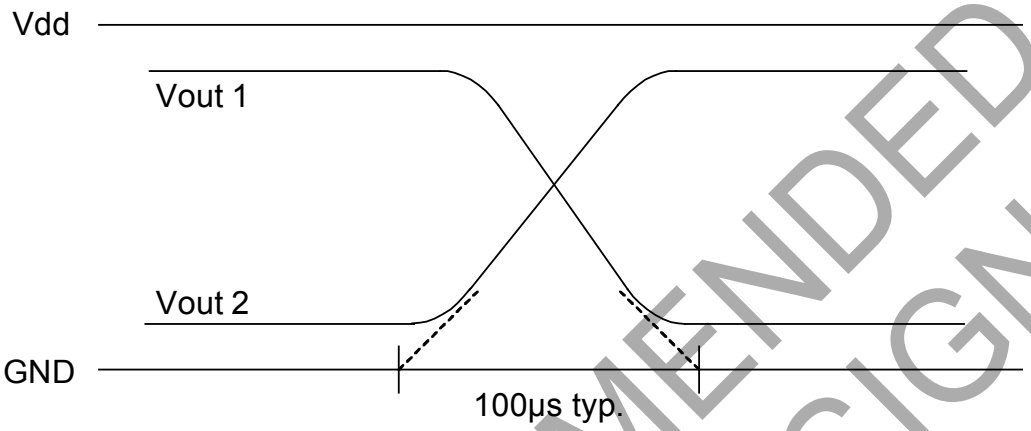
Operating



Notes:
2. In "Normal spinning", the FG changes its state at each rising edge of O1.
3. When the motor locks with South pole at the Hall element, O2 is kept on "L" and O1 is a clock with Ton/Toff ratio. When motor locks with North pole at the Hall element, O1 is kept on "L", O2 is a clock with Ton/Toff ratio.
4. When "Re-start spinning" occurs, the motor speed ramps up to the "Normal Spinning" speed from zero. Speed ramp-up profile depends on motor characteristics.

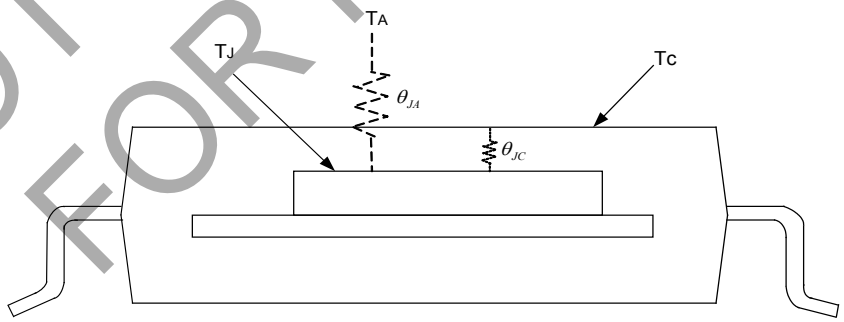
Soft Switching

AH5798 employs soft switching of output drive at commutation to reduce audible noise and EMI for low noise applications.



Absolute Maximum Ratings (T_A = 25°C, unless otherwise noted)

Symbol	Parameter		Rating	Unit
Vdd	Supply voltage		6	V
$I_{O(PEAK)}$	Maximum Output Current (Peak)		800	mA
P_D	Power Dissipation	SOT89-5L	800	mW
		TSOT25	520	mW
T_{ST}	Storage Temperature Range		-65 ~ 150	°C
θ_{JA}	Thermal Resistance Junction-to-Ambient (Note 5)	SOT89-5L	156	°C/W
		TSOT25	240	°C/W



Notes: 5. θ_{JA} should be confirmed with heat sink thermal resistance. If there is no heat sink contact, θ_{JA} will almost be the same as θ_{JC}.

Recommended Operating Conditions (T_A = 25°C)

Symbol	Parameter	Conditions	Min	Max	Unit
Vdd	Supply Voltage	Operating	1.8	5.5	°C
T_A	Operating Ambient Temperature Range	Operating	-40	105	V

Electrical Characteristics (T_A = 25°C, Vdd = 5V)

Symbol	Parameter	Test Conditions	Min	Typ.	Max	Unit
Idd	Supply Current	No Load	-	5	-	mA
V_{OH}	Output Voltage High	I_{OUT} = 300mA	4.4	4.65	-	V
V_{OL}	Output Voltage Low	I_{OUT} = 300mA	-	0.35	0.6	V
T_{SW}	Output Switching Slope Duration	50Ω load on out1/out2	-	100	-	μs
I_{LEAK}	FG Output Leakage Current		-	-	5	μA
V_{FGOL}	FG Output Voltage Low	I_{FG} = 5mA	-	-	0.4	V
T_{ON}	On Time		350	500	650	ms
R_{DR}	Duty Ratio	T_{OFF} / T_{ON}	-	10	-	

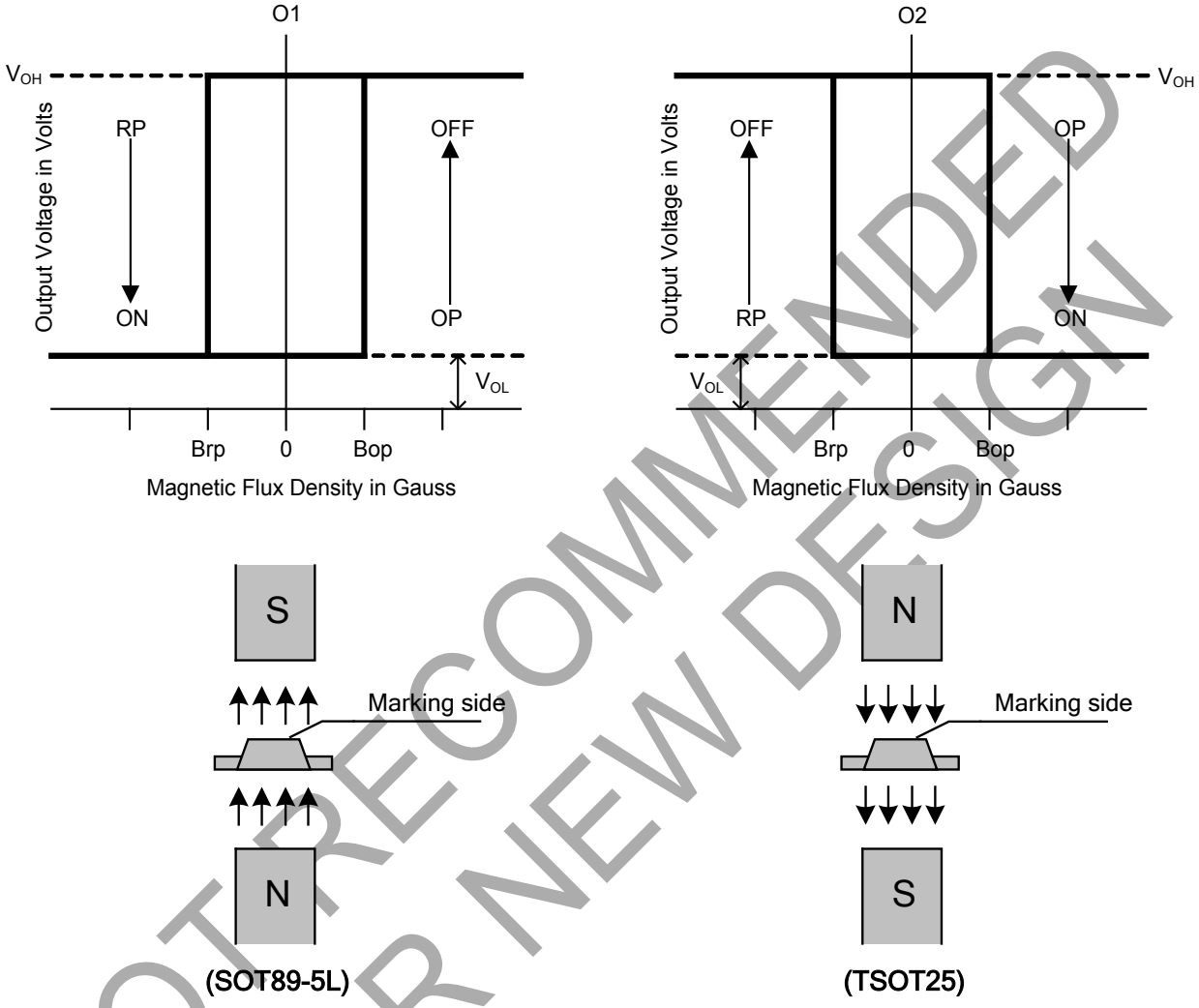
Magnetic Characteristics (T_A = 25°C, Vdd = 1.8V~5V, Note 6)

(1mT = 10 G)

Symbol	Parameter	Min	Typ.	Max	Unit
B_{op}	Operate Point	10	25	50	G
Brp	Release Point	-50	-25	-10	G
B_{hy}	Hysteresis	-	50	-	G

Notes: 6. The magnetic characteristics may vary with supply voltage, operating temperature and after soldering.

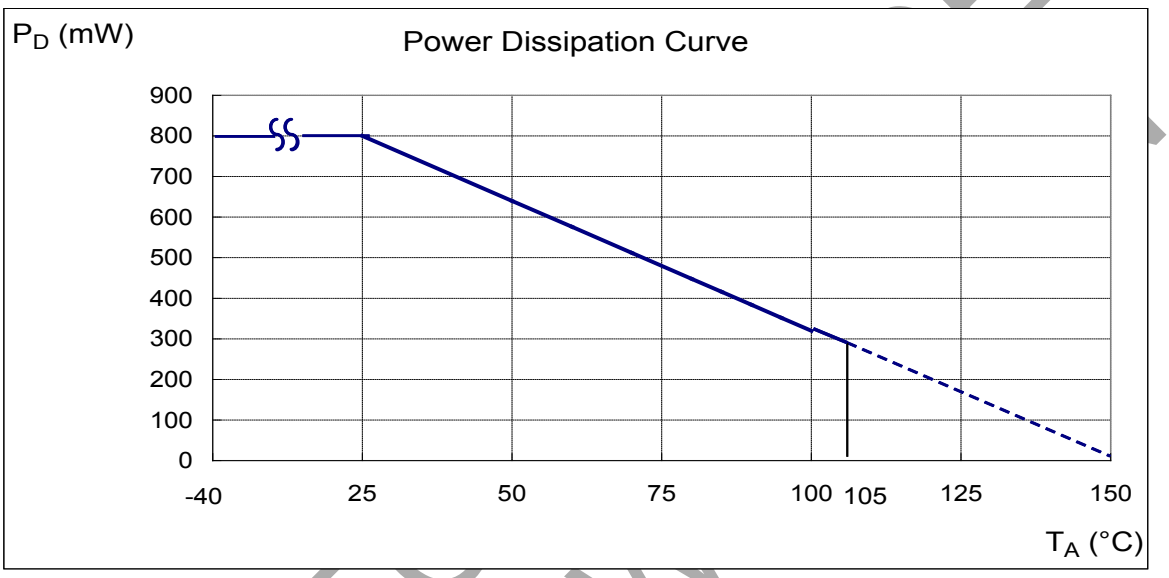
Operating Characteristics



Performance Characteristics

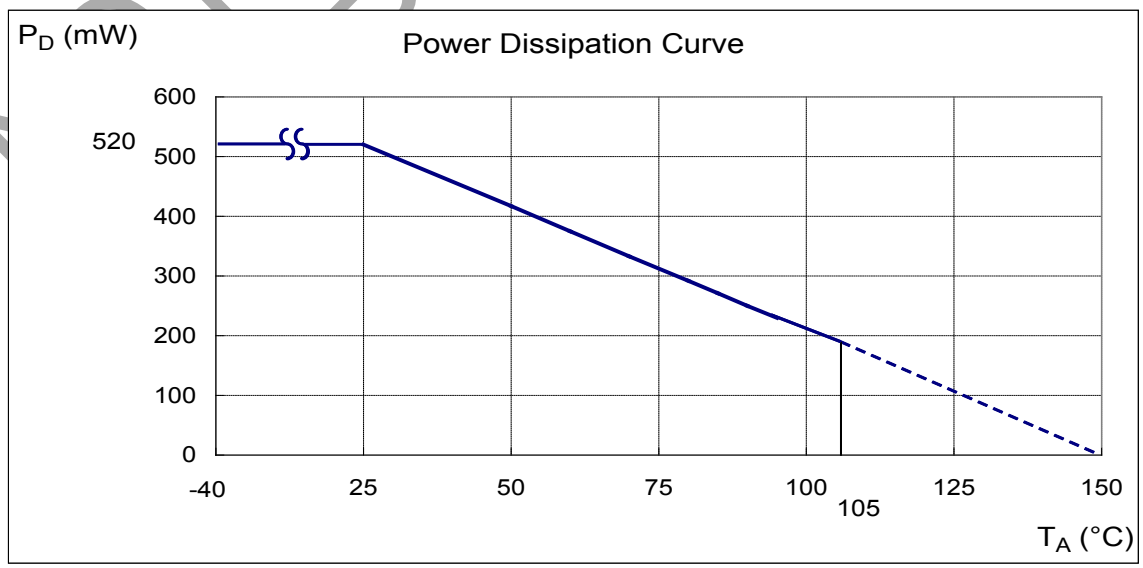
(1) SOT89-5L

T_A (°C)	25	50	60	70	75	80	85	90	95	100
P_D (mW)	800	640	576	512	480	448	416	384	352	320
T_A (°C)	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**	**150**
P_D (mW)	288	256	224	192	160	128	96	64	32	0



(2) TSOT25

T_A (°C)	25	50	60	70	75	80	85	90	95	100
P_D (mW)	520	417	375	333	313	292	271	250	230	208
T_A (°C)	**105**	**110**	**115**	**120**	**125**	**130**	**135**	**140**	**145**	**150**
P_D (mW)	188	167	146	125	104	83	63	42	21	0



Ordering Information

AH 5798 - XX G - X

Package	Green	Packing
Y : SOT89-5L WT : TSOT25	G : Green	7/13 : Tape & Reel

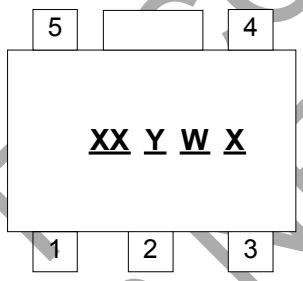
Device	Package Code	Packaging (Note 7 & 8)	7"/13" Tape and Reel	
			Quantity	Part Number Suffix
AH5798-YG-13	Y	SOT89-5L	2500/Tape & Reel	-13
AH5798-WTG-7	WT	TSOT25	3000/Tape & Reel	-7

Notes: 7. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf
8. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied. Please visit our website at http://www.diodes.com/products/lead_free.html

Marking Information

(1) SOT89-5L

(Top View)

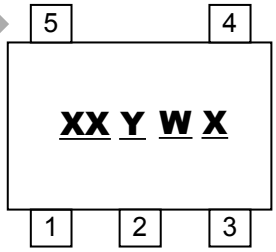


XX : Identification code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week;
z represents 52 and 53 week
X : Internal code
A~Z : Green

Part Number	Package	Identification Code
AH5798-YG	SOT89-5L	K4

(2) TSOT25

(Top View)

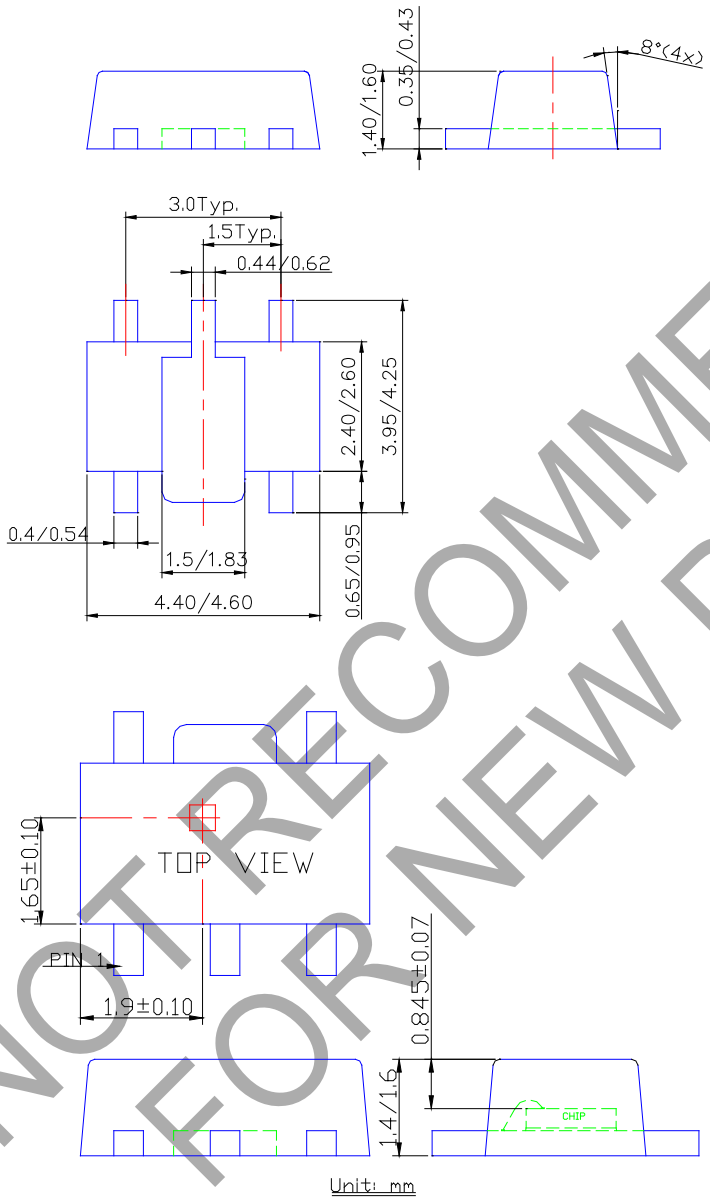


XX : Identification code
Y : Year 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week;
z represents 52 and 53 week
X : A~Z : Green

Part Number	Package	Identification Code
AH5798-WTG	TSOT25	K4

Package Outline Dimensions (All Dimensions in mm)

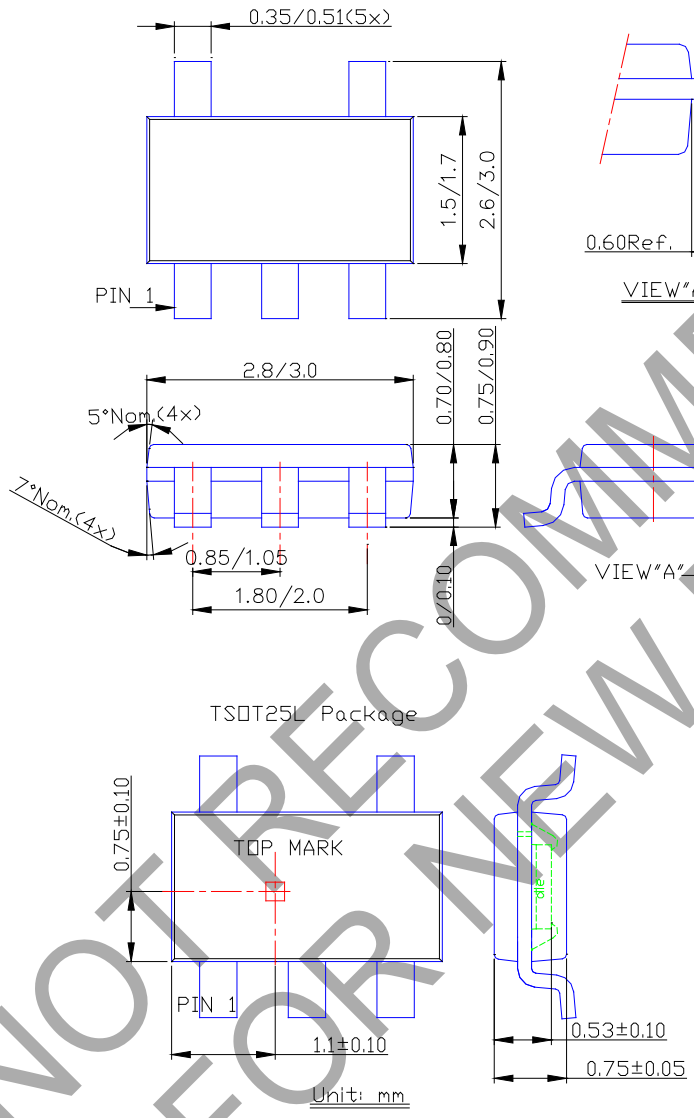
(1) Package type: SOT89-5L



Sensor Location

Package Outline Dimensions (Continued)

(2) Package type: TSOT25



Sensor Location

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