CA7025
Data Sheet

Version: V0.1

Features

- 2.5V to 26V DC Operation Voltage
- Temperature Compensation
- Wide Operating Voltage Range
- Open-Drain Pre-Driver
- 25mA Maximum Sinking Output Current
- Packages: SOT23-3L, SIP-3L(TO-92S)

List of Contents

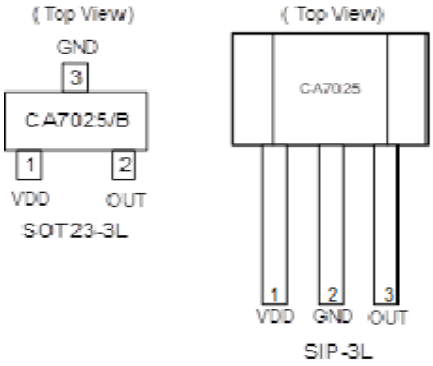
1 Description

CA7025 is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device is using HV BCD process includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density larger than threshold Bop, OUT is turned on(low). The output state is held until a magnetic flux density reversal falls below Brp causing OUT to be turned off (high).

2 Pin Configuration

The packages of CA7025 and the pin assignment are given by:



Name	Description
VDD	Supply Voltage
OUT	Output
GND	Ground

3 Order / Marking Information

Order Information	Top Marking (SIP-3L)
CA7025XXX X Package Type: P3: SIP3-L, A: SOT23-3L Packing: Blank: Bag, A: Taping	7025 → Part number YYWWX → ID code:internal WW:01~52 Year:19=2019
	Top Marking (SOT23-3L)
	X X Y W X → ID Code: Internal Week: 01~26(A~Z) 27~52(a~z) Year : 9 = 2019 HZ=CA7025

4 Characteristics Absolute Maximum Ratings(at TA=25°C)

Characteristics		Symbol	Rating	Unit
Supply Voltage		VDD	28	V
Reverse VDD Polarity Voltage		VRDD	-30	V
OUT Pin Voltage		VOUT	28	V
Magnetic Flux Density		B	Unlimited	Gauss
Output Current	Continuous	IO	25	mA
Magnetic Signal Input Frequency (Note1)		fsw	0~10	KHz
Junction Temperature		TJ	150	°C
Operating Temperature		TO	-40 to 125	°C
Storage Temperature Range		TSTG	-65 to 150	°C
Thermal Resistance from Junction to Ambient	SIP-3L	θJA	227	°C/W
	SOT23-3L		313	
Power Dissipation	SIP-3L	PD	550	mW
	SOT23-3L		400	

Note1: Not subject to production test, verified by design/characterization.

5 Electrical Characteristics

(VDD = 12V, TA = +25°C, unless otherwise noted.)

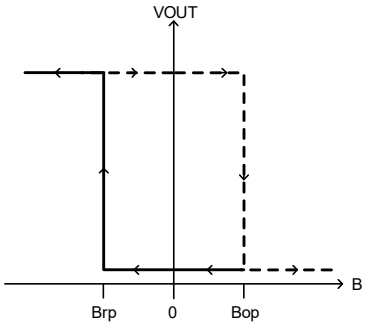
Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	VDD	Operating	2.5	-	26	V
Supply Current	IDD	Operating	-	2.0	4.0	mA
Output Leakage Current	IOFF	VOUT=12V	-	< 0.1	10	μA
Output Saturation Voltage	Vds(sat)	IOUT=20mA	-	0.3	-	V
Power On Settling Time	tSET			12	24	μs
Chopper Frequency (Note2)	fosc			50		kHz
Magnetic		(1mT=10 Gauss)				
Operate Point	BOP		5	20	40	Gauss
Release Point	BRP		-40	-20	-5	Gauss
Hysteresis	BHYS		-	40	-	Gauss

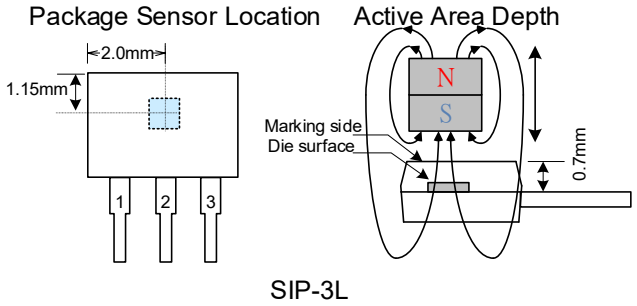
Note2: Not subject to production test, verified by design/characterization.

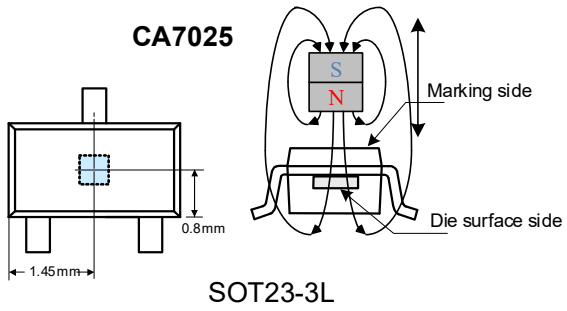
6 Driver output vs. magnetic pole (CA7025)

Characteristics	Test Conditions	OUT
North pole	B < Brp	High
South pole	B > Bop	Low

Note3: The magnetic pole is applied facing to the die surface side.
Note4: For the SIP-3L packages, the marking surface and the die surface are in the same direction, but for the SOT23-3L packages, the marking surface and the die surface are in the opposite direction.

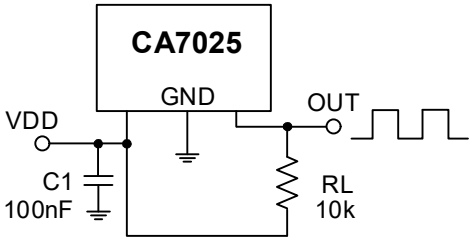






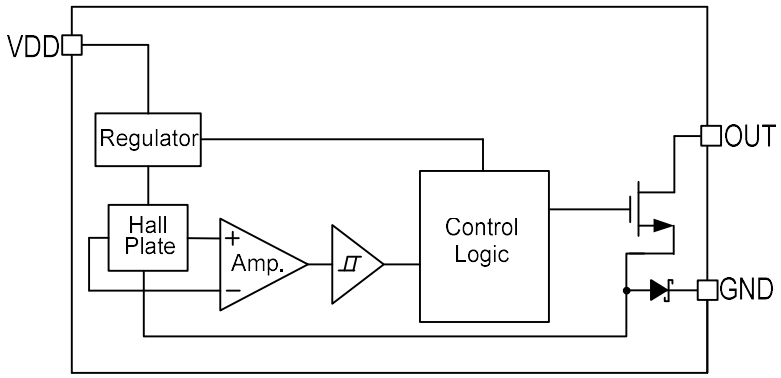
SOT23-3L

7 Test Circuit



Note: C1 is for power stabilization and to strengthen the noise immunity. RL is the pull-up resistor.

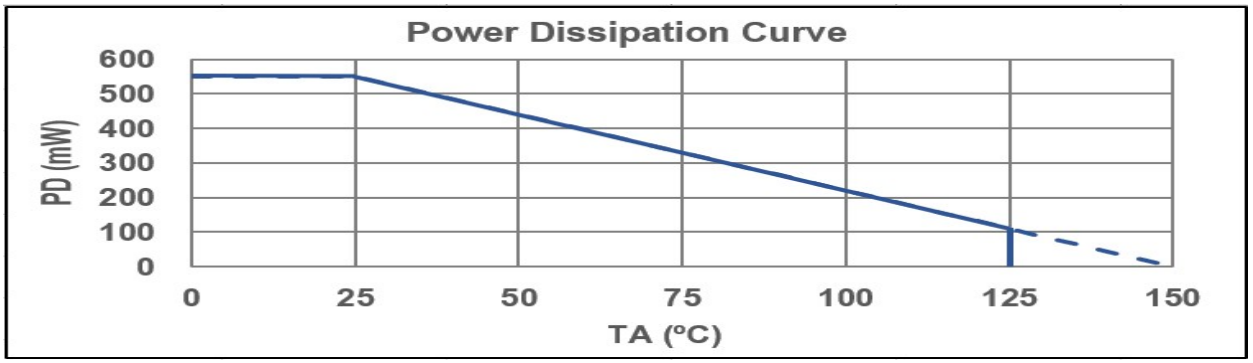
8 Block Diagram



9 Performance Characteristics

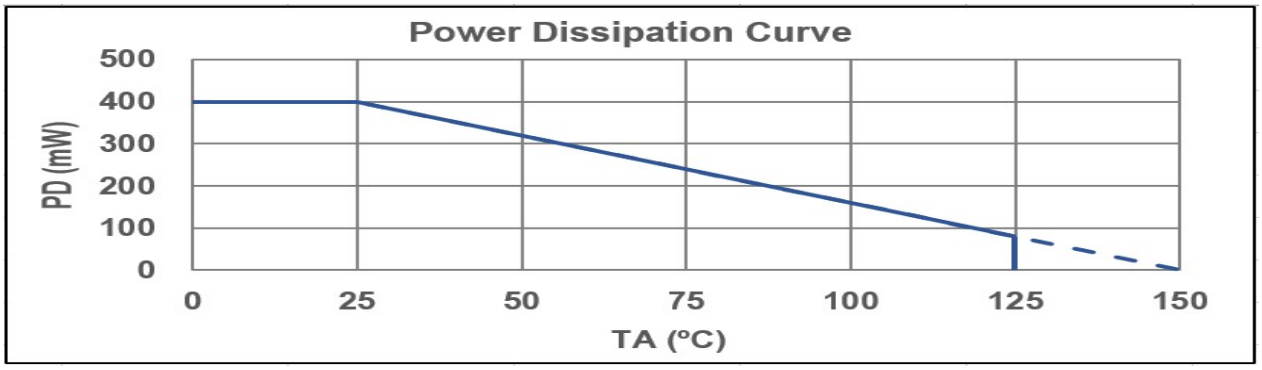
9.1 SIP-3L

TA (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	551	441	396	352	308	286	264	242	220
TA (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	198	176	154	132	110	88	66	44	0

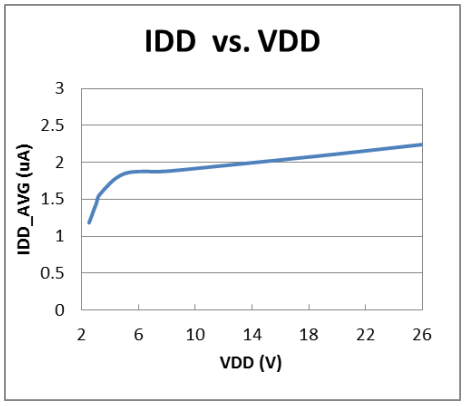


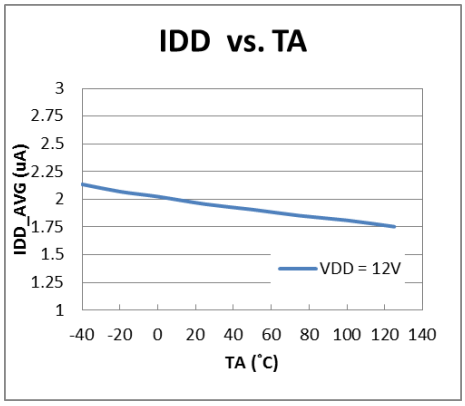
9.2 SOT23-3L

TA (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	399	319	288	256	224	208	192	176	160
TA (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	144	128	112	96	80	64	48	32	0

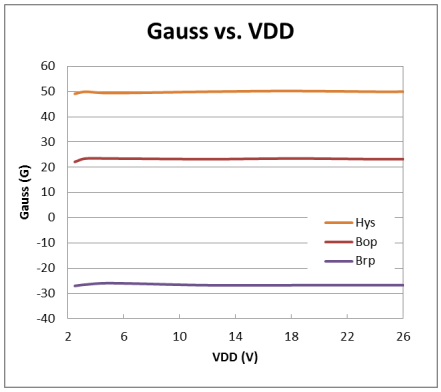


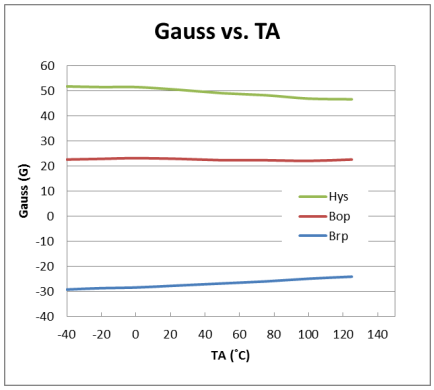
10 Typical Characteristics

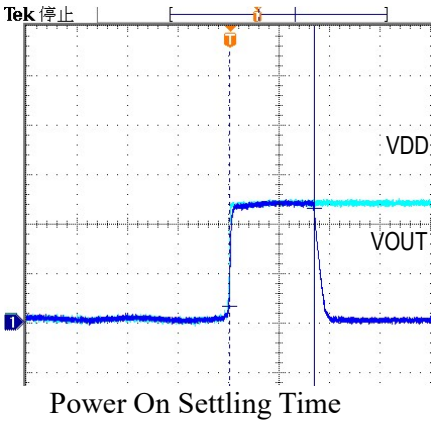




11 Typical Characteristics (Cont.)



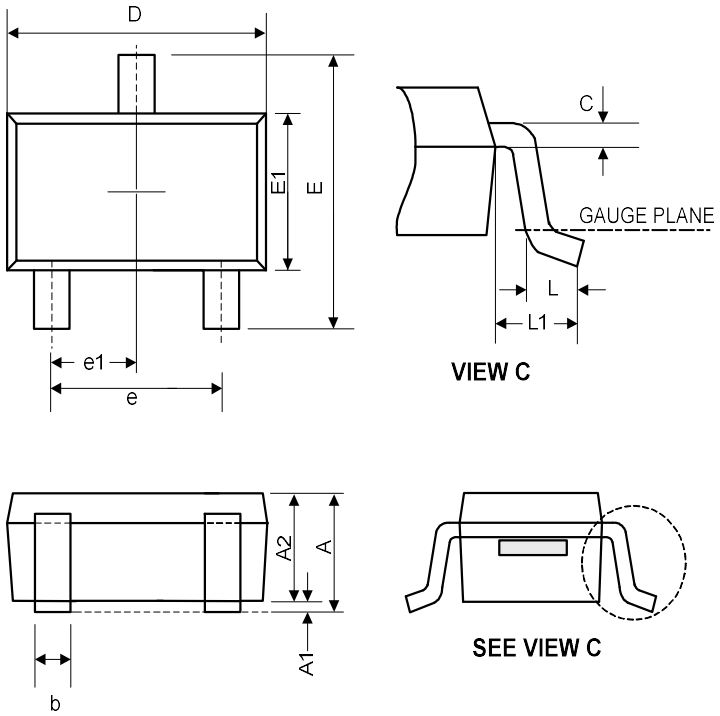




Power On Settling Time

12 Package Outlines

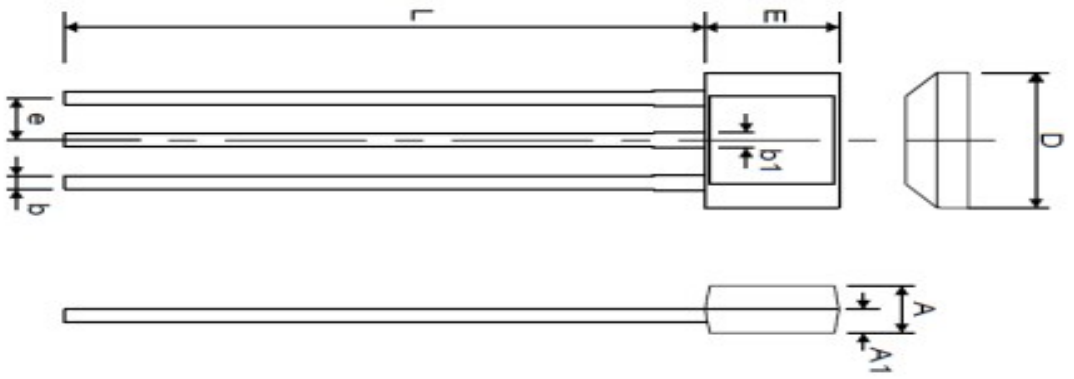
12.1 SOT23-3L Package Dimension



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.3	-	-	0.051
A1	0	0.08	0.15	0	0.003	0.006
A2	0.9	1.1	1.2	0.035	0.043	0.047
b	0.3	0.4	0.5	0.012	0.016	0.02
C	0.08	0.15	0.22	0.003	0.006	0.009
D	2.7	2.9	3.1	0.106	0.114	0.122
E	2.6	2.8	3	0.102	0.11	0.118
E1	1.4	1.6	1.8	0.055	0.063	0.071
L	0.3	0.45	0.6	0.012	0.018	0.024
L1	0.5	0.6	0.7	0.02	0.024	0.028
e	1.9 BSC			0.075 BSC		
e1	0.95 BSC			0.037 BSC		

JEDEC outline: NA

12.2 SIP-3L Package Dimension



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.20	1.48	1.76	0.047	0.058	0.069
A1		0.75 REF.			0.030 REF.	
b	0.33	0.38	0.43	0.013	0.015	0.017
b1	0.40	0.45	0.50	0.016	0.018	0.020
D	3.90	4.10	4.30	0.154	0.161	0.169
e		1.27 BSC			0.050 BSC	
E	2.80	3.00	3.20	0.110	0.118	0.126
L	13.60	14.60	15.60	0.535	0.575	0.614