

HIGH VOLTAGE HALL EFFECT LATCH**AH266****General Description**

The AH266 is an integrated Hall sensor with output driver designed for electronic commutation of brushless DC motor applications. The device includes an on-chip Hall sensor for magnetic sensing, an amplifier that amplifies the Hall voltage, a Schmitt trigger to provide switching hysteresis for noise rejection and two complementary darlington open-collector drivers for sinking large load current. It also includes an internal band-gap regulator which is used to provide bias voltage for internal circuits and allows a wide operating supply voltage ranges.

Placing the device in a variable magnetic field, if the magnetic flux density is larger than threshold B_{OP} , the pin DO will be turned low (on) and pin DOB will be turned high (off). This output state is held until the magnetic flux density reverses and falls below B_{RP} , then causes DO to be turned high (off) and DOB turned low (on).

AH266 is available in TO-94 (SIP-4L) package.

Features

- On-Chip Hall Sensor
- 4V to 30V Supply Voltage
- 400mA (avg) Output Sink Current
- Build in Protection Diode for Reverse Power Connecting
- -20°C to 85°C Operating Temperature
- Low Profile TO-94 (SIP-4L) Package
- Build in Over Temperature Protection Function
- ESD Rating: 300V (Machine Model)

Applications

- 12V/24V Dual-Coil Brushless DC Motor/Fan
- Power Supply and Switchboard
- Communications Facilities
- Industrial Equipment



Figure 1. Package Type of AH266

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Pin Configuration

Z4 Package
(TO-94)



Figure 2. Pin Configuration of AH266 (Front View)

Pin Description

Pin Number	Pin Name	Function
1	V _{CC}	Supply voltage
2	DO	Output 1
3	DOB	Output 2
4	GND	Ground

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Functional Block Diagram

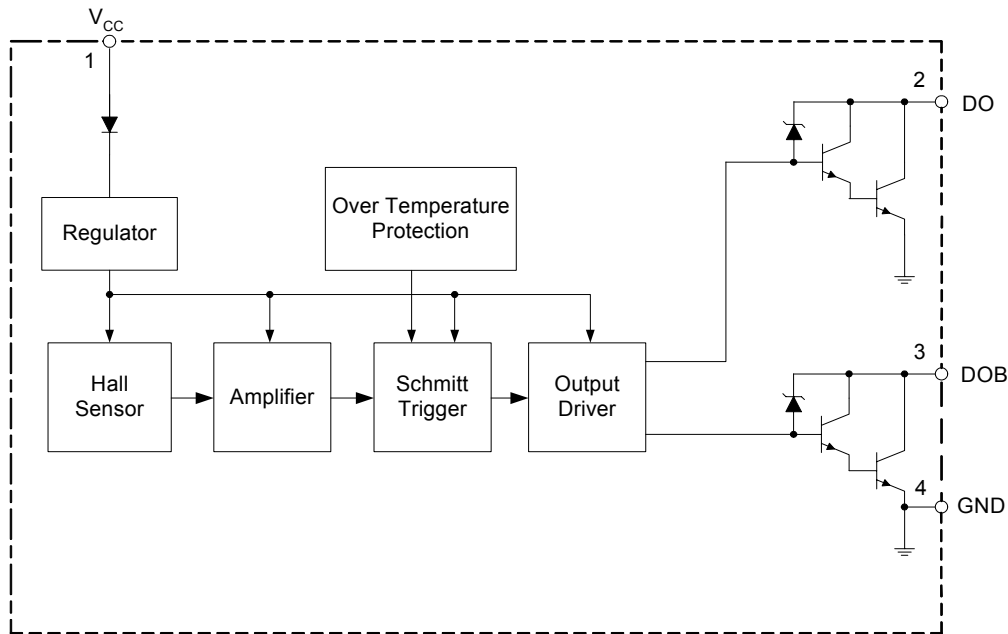
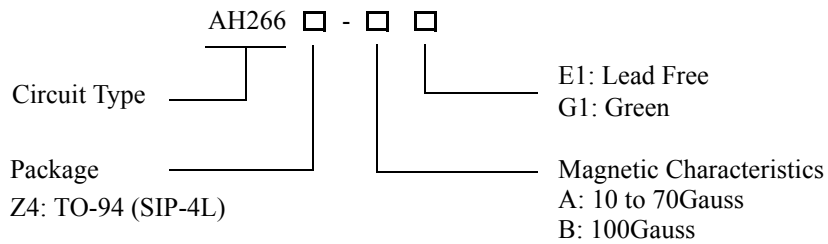


Figure 3. Functional Block Diagram of AH266

Ordering Information



Package	Temperature Range	Part Number		Marking ID		Packing Type
		Lead Free	Green	Lead Free	Green	
TO-94	-20 to 85 °C	AH266Z4-AE1	AH266Z4-AG1	AH266Z4-E1	AH266Z4-G1	Bulk
		AH266Z4-BE1	AH266Z4-BG1	AH266Z4-E1	AH266Z4-G1	Bulk

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant. Products with "G1" suffix are available in green package.

**HIGH VOLTAGE HALL EFFECT LATCH****AH266****Absolute Maximum Ratings (Note 1)** $(T_A=25^{\circ}\text{C})$

Parameter		Symbol	Value	Unit
Supply Voltage		V_{CC}	30	V
Reverse Protection Voltage		V_{RCC}	-30	V
Magnetic Flux Density		B	Unlimited	Gauss
Output Current	Continuous	I_O	400 (Note 2)	mA
	Hold		600	mA
	Peak (Start up)		800	mA
Power Dissipation		P_D	550	mW
Thermal Resistance	Die to atmosphere	θ_{JA}	227	$^{\circ}\text{C}/\text{W}$
	Die to package case	θ_{JC}	49	$^{\circ}\text{C}/\text{W}$
Storage Temperature		T_{STG}	-50 to 150	$^{\circ}\text{C}$
Junction Temperature		T_J	150	$^{\circ}\text{C}$
ESD (Machine Model)			300	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. "Absolute Maximum Ratings" for extended period may affect device reliability.

Note 2: Continuous output current is 200mA at 85 $^{\circ}\text{C}$.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	5	28	V
Operating Ambient Temperature	T_A	-20	85	$^{\circ}\text{C}$



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Electrical Characteristics

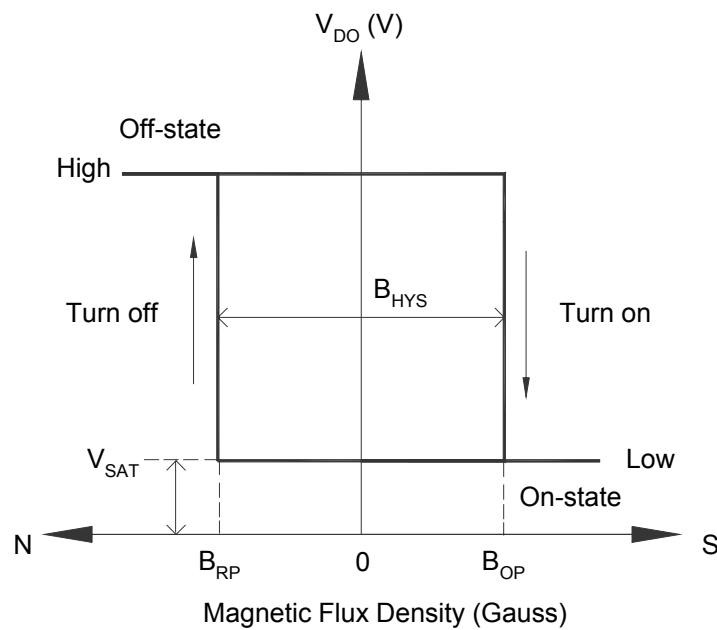
($T_A=25^{\circ}\text{C}$, $V_{CC}=24\text{V}$, unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Low Supply Voltage	V_{CE}	$V_{CC}=5\text{V}$, $I_O=100\text{mA}$		0.8	1.1	V
Output Saturation Voltage	V_{SAT1}	$I_O=500\text{mA}$		1.1	1.5	V
Output Saturation Voltage	V_{SAT2}	$I_O=300\text{mA}$		0.9	1.25	V
Output Leakage Current	I_{OL}	V_{DO} , $V_{DOB}=24\text{V}$		0.1	10	μA
Supply Current	I_{CC}	$V_{CC}=24\text{V}$, Output Open		3.5	6	mA
Output Rise Time	tr	$R_L=820\Omega$, $C_L=20\text{pF}$		3.0	10	μs
Output Fall Time	tf	$R_L=820\Omega$, $C_L=20\text{pF}$		0.3	1.5	μs
Switch Time Differential	Δt	$R_L=820\Omega$, $C_L=20\text{pF}$		3.0	10	μs
Output Zener Breakdown Voltage	V_{ZO}			61		V

Magnetic Characteristics

($T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Grade	Min	Typ	Max	Unit
Operating Point	B_{OP}	A	10		70	Gauss
		B			100	Gauss
Releasing Point	B_{RP}	A	-70		-10	Gauss
		B	-100			Gauss
Hysteresis	B_{HYS}			80		Gauss



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Magnetic Characteristics (Continued)

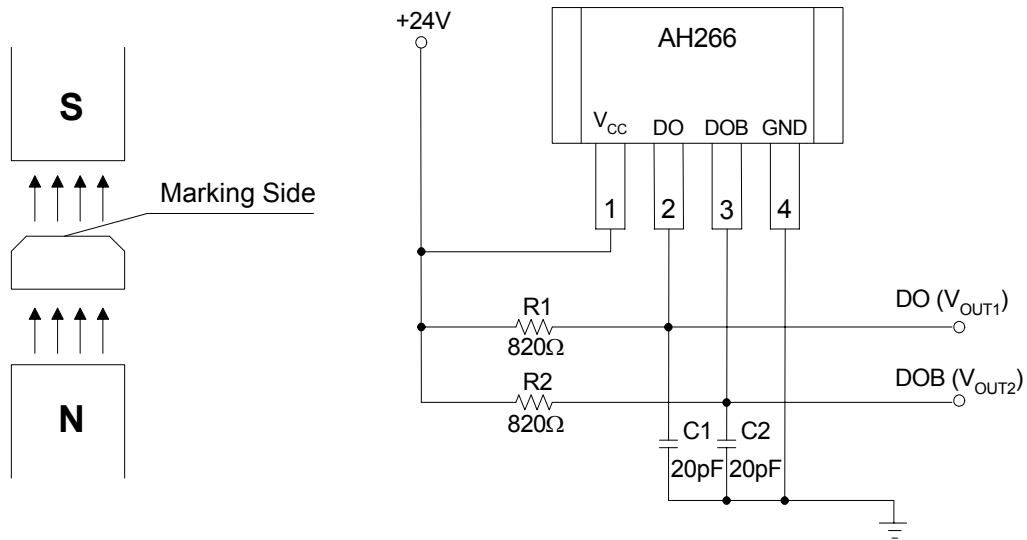


Figure 4. Basic Test Circuit

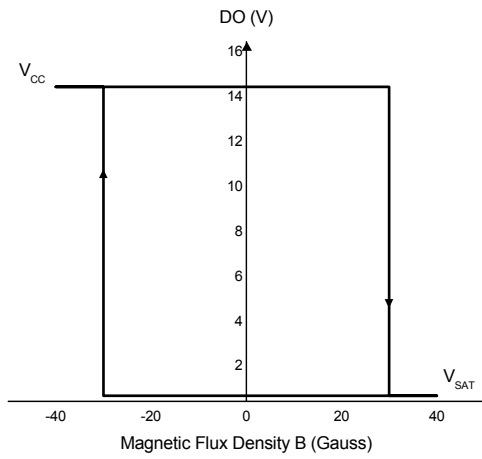


Figure 5. V_{DO} vs. Magnetic Flux Density

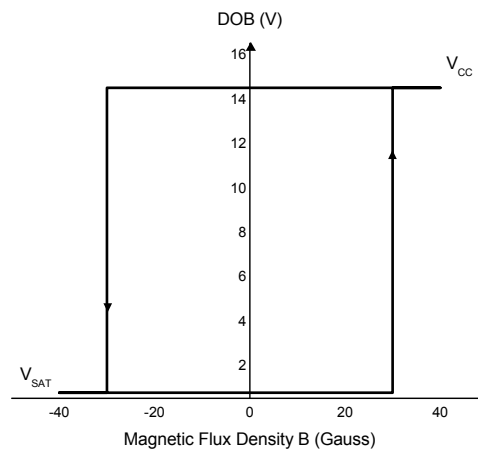


Figure 6. V_{DOB} vs. Magnetic Flux Density



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Typical Performance Characteristics

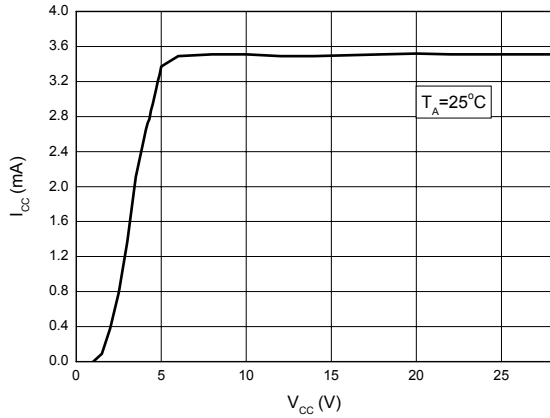


Figure 7. I_{CC} vs. V_{CC}

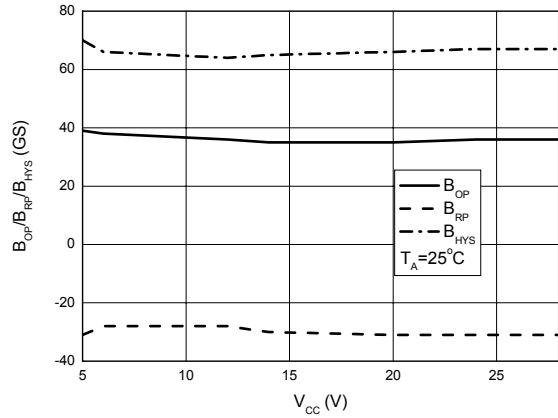


Figure 8. $B_{OP}/B_{RP}/B_{HYS}$ vs. V_{CC}

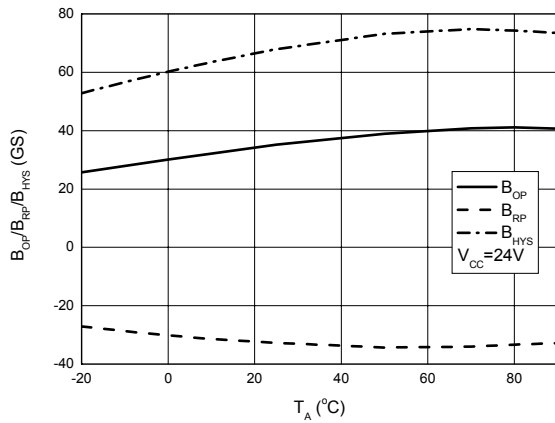


Figure 9. $B_{OP}/B_{RP}/B_{HYS}$ vs. Ambient Temperature

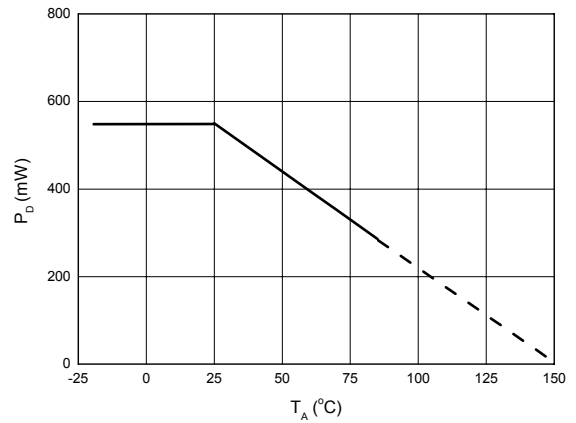


Figure 10. P_D vs. Ambient Temperature



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Typical Performance Characteristics (Continued)

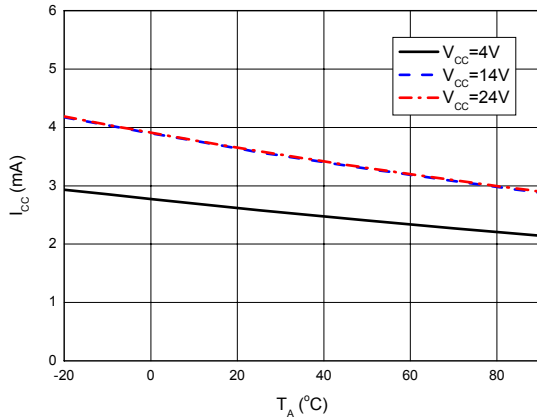


Figure 11. I_{CC} vs. Ambient Temperature

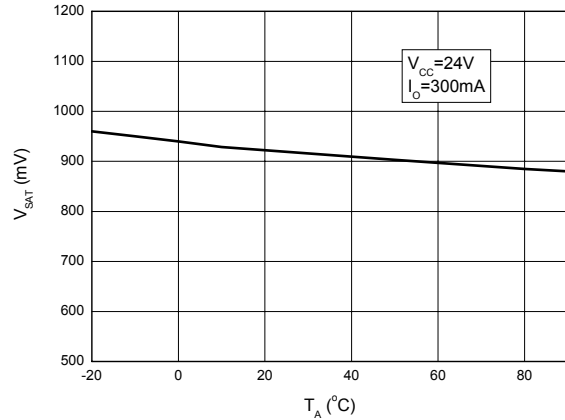


Figure 12. V_{SAT} vs. Ambient Temperature

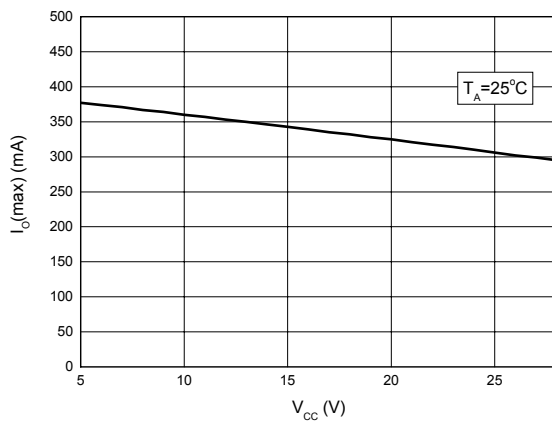
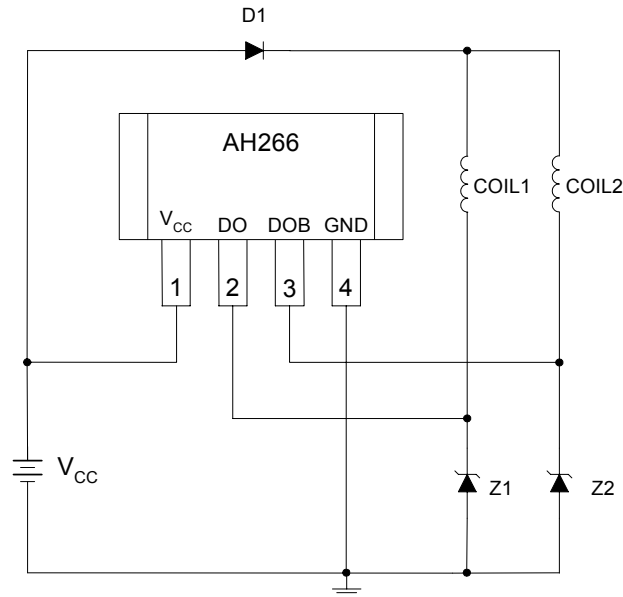


Figure 13. I_{O(max)} vs. V_{CC}

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Typical Applications



Z1, Z2: Zener diode, $2 \cdot V_{CC} \leq V_Z \leq 60V$

Figure 14. Typical Application Circuit with D1



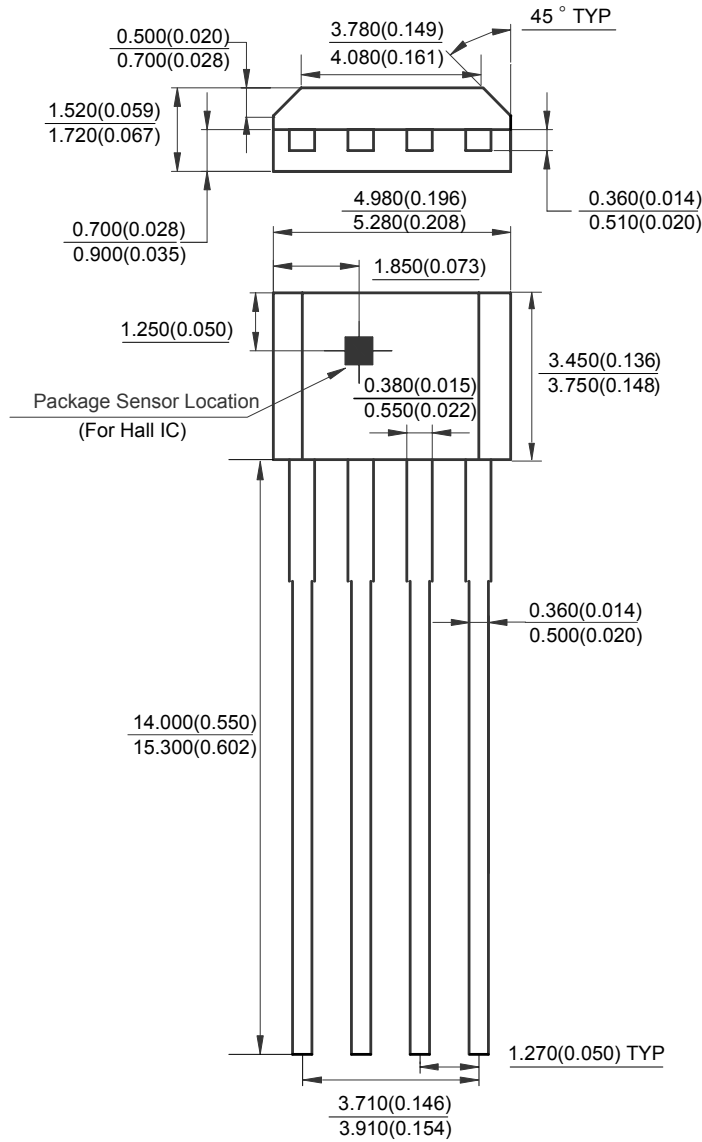
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Mechanical Dimensions

TO-94

Unit: mm(inch)





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MAIN SITE

- Headquarters

BCD Semiconductor Manufacturing Limited

No. 1600, Zi Xing Road, Shanghai Zizhu Science-based Industrial Park, 200241, China
Tel: +86-21-24162266, Fax: +86-21-24162277

- Wafer Fab

Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd.

800 Yi Shan Road, Shanghai 200233, China
Tel: +86-21-6485 1491, Fax: +86-21-5450 0008

REGIONAL SALES OFFICE

Shenzhen Office

Shanghai SIM-BCD Semiconductor Manufacturing Co., Ltd., Shenzhen Office
Room E, 5F, Noble Center, No.1006, 3rd Fuzhong Road, Futian District, Shenzhen,
518026, China
Tel: +86-755-8826 7951
Fax: +86-755-8826 7865

Taiwan Office

BCD Semiconductor (Taiwan) Company Limited
4F, 298-1, Rui Guang Road, Nei-Hu District, Taipei,
Taiwan
Tel: +886-2-2656 2808
Fax: +886-2-2656 2806

USA Office

BCD Semiconductor Corp.
30920 Huntwood Ave. Hayward,
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Tel : +1-510-324-2988
Fax: +1-510-324-2788

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