

## SAFETY DATA SHEET

Australian statement of hazardous nature: Classified as hazardous according to criteria of Safe Work Australia

## Section 1 - Identification

Product Name Cyclohexane

**CAS No** 110-82-7

**Synonyms** Hexahydrobenzene; Benzene hexahydride; Hexamethylene.

Product Code C/8920/PB08, C/8920/PB17, C/8920/17, C/8920/21, C/8920/25, C/8920/21RSS,

C/8920/24RSS, C/8920/25RSS, C/8920/34RSS, C/8920/27RSS, C/8920/21S, C/8920/27

Address ThermoFisher Scientific Australia Pty Ltd

5 Caribbean Drive, Scoresby VICTORIA 3179, Australia

Emergency Tel. CHEMTREC®

03 9757 4559 or +613 9757 4559

Telephone / Fax Numbers Tel: 1300 735 292

Fax: 1800 067 639

E-mail address ANZinfo@thermofisher.com

Recommended Use Laboratory chemicals.

Uses advised against

This product does not contain any substance(s) on the Illicit Drug Precursors/Reagents list.

This product does not contain any substance(s) subject to Prohibition, Authorization or Restriction. This product does not contain any substance(s) listed on the voluntary National

Code of Practice for Chemicals of Security Concern.

## Section 2 - Hazard(s) Identification

## Classification under Safe Work Australia

Classified as hazardous according to criteria of Safe Work Australia

Physical hazards

Flammable liquids Category 2

**Health hazards** 

Aspiration Toxicity
Skin Corrosion/Irritation
Specific target organ toxicity - (single exposure)
Category 2
Category 3

**Environmental hazards** 

Acute aquatic toxicity
Category 1
Category 1

Label Elements

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**Danger** 





Signal Word

#### **Hazard Statements**

H225 - Highly flammable liquid and vapor

H304 - May be fatal if swallowed and enters airways

H315 - Causes skin irritation

H336 - May cause drowsiness or dizziness

H410 - Very toxic to aquatic life with long lasting effects

## **Precautionary Statements**

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

P233 - Keep container tightly closed

P240 - Ground and bond container and receiving equipment

P241 - Use explosion-proof electrical/ ventilating/ lighting equipment

P242 - Use non-sparking tools

P243 - Take action to prevent static discharges

P264 - Wash face, hands and any exposed skin thoroughly after handling

P271 - Use only outdoors or in a well-ventilated area

P280 - Wear protective gloves/protective clothing/eye protection/face protection

P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor

P303 + P361 + P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

P312 - Call a POISON CENTER or doctor if you feel unwell

P331 - Do NOT induce vomiting

P363 - Wash contaminated clothing before reuse

P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

P501 - Dispose of contents/ container to an approved waste disposal plant

#### Other information

Toxic to terrestrial vertebrates

## Section 3 - Composition and Information on Ingredients

Component	CAS No	Weight %		
Cyclohexane	110-82-7	>95		

## Section 4 - First Aid Measures

### Inhalation

Remove to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Aspiration into lungs can produce severe lung damage. Get medical attention immediately if symptoms occur.

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Ingestion

immediately.

**Skin Contact** Wash off immediately with soap and plenty of water for at least 15 minutes. Get medical

attention.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get

medical attention.

Self-Protection of the First Aider Ensure that medical personnel are aware of the material(s) involved, take precautions to

protect themselves and prevent spread of contamination.

First Aid Facilities Eyewash, safety shower and washroom.

Most important symptoms and

effects

Difficulty in breathing. Symptoms of overexposure may be headache, dizziness, tiredness,

Do NOT induce vomiting. Aspiration hazard. Call a physician or poison control center

nausea and vomiting

Notes to Physician Treat symptomatically. Symptoms may be delayed.

## Section 5 - Fire Fighting Measures

## **Suitable Extinguishing Media**

CO<sub>2</sub>, dry chemical, dry sand, alcohol-resistant foam. Water mist may be used to cool closed containers.

### Extinguishing media which must not be used for safety reasons

Do not use a solid water stream as it may scatter and spread fire.

### **Hazardous Decomposition Products**

Carbon monoxide (CO), Carbon dioxide (CO2).

## **Specific Hazards Arising from the Chemical**

Flammable. Risk of ignition. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Do not allow run-off from fire-fighting to enter drains or water courses.

## Special protective equipment and precautions for fire fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

## Section 6 - Accidental Release Measures

## **Emergency procedures**

Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static discharges.

## **Environmental Precautions**

Avoid release to the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional Ecological Information.

### Methods for Containment and Clean Up

## Clean-up methods - small spillage

Remove all sources of ignition. Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

### Clean-up methods - large spillage

Typically only supplied is small quantiites as packaged goods.

If extremely toxic or used in larger quantities ensure a spillage action plan is in place. Evacuate area. Control the source and/or contain the spill if safe and able to do so. Use temporary diking, sand bags, dry sand, earth or proprietary booms/absorbent pads if available. Obtain advice on containment, neutralisation and clean-up from local emergency responders.

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### **Reference to Other Sections**

Refer to protective measures listed in Sections 8 and 13.

## Section 7 - Handling and Storage

### **Precautions for Safe Handling**

Wear personal protective equipment/face protection. Ensure adequate ventilation. Do not breathe mist/vapors/spray. Avoid contact with skin, eyes or clothing. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use spark-proof tools and explosion-proof equipment. Take precautionary measures against static discharges.

## Conditions for Safe Storage, Including any Incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks and flame. Flammables area.

AS/NZS 2243.10:2004, Safety in laboratories - Storage of chemicals AS 1940-2004 - The storage and handling of flammable and combustible liquids

## Section 8 - Exposure Controls and Personal Protection

### **Exposure limits**

AUS - Exposure Standards for Atmospheric Contaminants in the Occupational Environment - Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008(1995)] Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)] updated in August, 2005. Safe Work Australia ACGIH - Threshold Limit Values - Ceiling (TLV-C) guidelines by the American Conference of Governmental Industrial Hygienists (ACGIH) for controlling worker exposure to airborne chemical concentrations in the workplace. UK - EH40/2005 Work Exposure Limits, Fourth edition. Published 2020. DE - MAK and BAT values of Hazardous Chemical Compounds in the Work Area. Published by German Research Foundation on July 1, 2011

Component	Australia	New Zealand WEL	ACGIH TLV	The United Kingdom	Germany
Cyclohexane	STEL: 300 ppm	TWA: 100 ppm	TWA: 100 ppm	STEL: 300 ppm 15 min	TWA: 200 ppm (8
	STEL: 1050 mg/m <sup>3</sup>	TWA: 350 mg/m <sup>3</sup>		STEL: 1050 mg/m <sup>3</sup> 15	Stunden). AGW -
	TWA: 100 ppm	STEL: 300 ppm		min	exposure factor 4
	TWA: 350 mg/m <sup>3</sup>	STEL: 1050 mg/m <sup>3</sup>		TWA: 100 ppm 8 hr	TWA: 700 mg/m³ (8
		_		TWA: 350 mg/m <sup>3</sup> 8 hr	Stunden). AGW -
					exposure factor 4
					TWA: 200 ppm (8
					Stunden). MAK
					TWA: 700 mg/m³ (8
					Stunden). MAK
					Höhepunkt: 800 ppm
					Höhepunkt: 2800 mg/m <sup>3</sup>

#### **Biological limit values**

This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies

Component	Australia	New Zealand	European Union	United Kingdom	Germany
Cyclohexane					total
					1,2-Cyclohexanediol
					(after hydrolysis): 150
					mg/g Creatinine urine
					(end of shift)
					total
					1,2-Cyclohexanediol
					(after hydrolysis): 150
					mg/g Creatinine urine
					(for long-term
					exposures: at the end o
					the shift after several
					shifts)

**Exposure Controls Engineering Measures** 

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Ensure that eyewash stations and safety showers are close to the workstation location. Use explosion-proof electrical/ventilating/lighting equipment. Ensure adequate ventilation, especially in confined areas.

Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source

Personal protective equipment

Eye Protection Wear safety glasses with side shields (or goggles) (Australian/New Zealand Standard

AS/NZS 1337 - Eye protectors for Industrial applications)

Hand Protection Protective gloves

Glove material	Breakthrough time	Glove thickness	AUS/NZ Standard	Glove comments
Nitrile rubber	> 480 minutes	0.38 - 0.56 mm	AS/NZS 2161	As tested under EN374-3 Determination of
Viton (R)	> 480 minutes	0.7 mm		Resistance to Permeation by Chemicals
Neoprene gloves	< 240 minutes	0.45 mm		

Inspect gloves before use.

Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure

Repiratory Protection Use an AS/NZS 1716 approved respirator if exposure limits are exceeded or if irritation or

other symptoms are experienced. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained in line with AS/NZS 1715 on the use

and maintenance of repiratory protective devices

**Recommended Filter type:** Organic gases and vapours filter Type A Brown conforming to EN14387 (or AUS/NZ

equivalent)

Recommended half mask:- Valve filtering: EN405 or Half mask: EN140 plus filter, EN 141 (or AUS/NZ equivalent)

When RPE is used a face piece Fit Test should be conducted

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls Prevent product from entering drains. Do not allow material to contaminate ground water

system. Local authorities should be advised if significant spillages cannot be contained.

## Section 9 - Physical and Chemical Properties

### Information on basic physical and chemical properties

Appearance Colorless Physical State Liquid

Odor sweet

Odor Threshold No data available No information available

Melting Point/Range 6.5 °C / 43.7 °F Softening Point No data available Boiling Point/Range 81 °C / 177.8 °F Stack Point

Flash Point -18 °C / -0.4 °F Method - CC (closed cup)
Evaporation Rate 6.1 (Butyl Acetate = 1.0)

Evaporation Rate 6.1 (Butyl Acetate = 1. Flammability (solid,gas) Not applicable Liquid

Explosion Limits Lower 1.2 vol%

**Upper** 8.4 vol% 104 mbar @ 20 °C

Vapor Density 2.90 (Air = 1.0)

Specific Gravity / Density 0.770

**Vapor Pressure** 

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Vapors may form explosive mixtures with air

Bulk DensityNot applicableLiquidWater Solubilitypractically insoluble0.052 g/l

Solubility in other solvents No information available

Partition Coefficient (n-octanol/water)

Componentlog PowCyclohexane3.44

Autoignition Temperature 260 °C / 500 °F Decomposition Temperature Niscosity 260 °C / 500 °F No data available 0.94 mPa.s @ 20 °C

Explosive Properties

Oxidizing Properties No information available

Other information

Molecular FormulaC6 H12Molecular Weight84.15

## Section 10 - Stability and Reactivity

Reactivity None known, based on information available

**Stability** Stable under normal conditions.

Conditions to Avoid Incompatible products, Excess heat, Keep away from open flames, hot surfaces and

sources of ignition.

Incompatible Materials Strong oxidizing agents.

Hazardous Decomposition Products Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>).

Hazardous Polymerization Hazardous polymerization does not occur.

## Section 11 - Toxicological Information

## **Information on Toxicological Effects**

### **Product Information**

(a) acute toxicity;

OralBased on available data, the classification criteria are not metDermalBased on available data, the classification criteria are not metInhalationBased on available data, the classification criteria are not met

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation			
Cyclohexane	> 5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	LC50 > 32880 mg/m <sup>3</sup> (Rat) 4 h			

(b) skin corrosion/irritation; Category 2

(c) serious eye damage/irritation; Based on available data, the classification criteria are not met

(d) respiratory or skin sensitization;

**Respiratory**Skin
Based on available data, the classification criteria are not met
Based on available data, the classification criteria are not met

(e) germ cell mutagenicity; Based on available data, the classification criteria are not met

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(f) carcinogenicity; Based on available data, the classification criteria are not met

There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; Based on available data, the classification criteria are not met

(h) STOT-single exposure; Category 3

Results / Target organs Central nervous system (CNS)

(i) STOT-repeated exposure; Based on available data, the classification criteria are not met

Target Organs None known.

(j) aspiration hazard; Category 1

Symptoms / effects,both acute and Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting delayed

## Section 12 - Ecological Information

**Ecotoxicity effects** 

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Fish	Water Flea	Freshwater Algae	Microtox
Cyclohexane	LC50: 48.87 - 68.76	EC50 = 0.9 mg/l/48h	EC50 >500 mg/L/72h	EC50 = 85.5 mg/L 5 min
·	mg/L, 96h static	_		EC50 = 93 mg/L 10 min
	(Poecilia reticulata)			
	LC50: 24.99 - 44.69			
	mg/L, 96h static			
	(Lepomis macrochirus)			
	LC50: 23.03 - 42.07			
	mg/L, 96h static			
	(Pimephales promelas)			
	LC50: 3.96 - 5.18 mg/L,			
	96h flow-through			
	(Pimephales promelas)			

Persistence and Degradability R

Readily biodegradable

Persistence Persistence is unlikely, based on information available.

Component	Degradability
Cyclohexane	77% (28d)
110-82-7 ( >95 )	

Degradation in sewage treatment plant Bioaccumulative Potential

Contains substances known to be hazardous to the environment or not degradable in waste

water treatment plants. Bioaccumulation is unlikely

Component	log Pow	Bioconcentration factor (BCF)
Cyclohexane	3.44	83.15

Mobility

The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces. Will likely be mobile in the environment due to its volatility Disperses rapidly in

aır

Endocrine Disruptor Information Persistent Organic Pollutant Ozone Depletion Potential This product does not contain any known or suspected endocrine disruptors This product does not contain any known or suspected substance This product does not contain any known or suspected substance

## Section 13 - Disposal Considerations

Waste from Residues/Unused Products

Do not allow into drains or watercourses or dispose of where ground or surface waters may be affected. Wastes, including emptied containers, are controlled wastes and should be disposed of in accordance with all federal, E.P.A., state and local regulations. Assure

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conformity with all applicable regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point. Empty containers

retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and

empty container away from heat and sources of ignition.

Other Information Chemical wastes should be disposed through a licensed commercial waste collection

service. Do not flush to sewer. Waste codes should be assigned by the user based on the application for which the product was used. Can be landfilled or incinerated, when in compliance with local regulations. Do not let this chemical enter the environment. Do not

empty into drains.

## Section 14 - Transport Information

### IMDG/IMO

UN-No UN1145
Proper Shipping Name Cyclohexane

Hazard Class 3 Packing Group II

**ADG** 

UN-No UN1145
Proper Shipping Name Cyclohexane

Hazard Class 3
Packing Group ||

Component	Hazchem Code
Cyclohexane	3YE
110-82-7 ( >95 )	

### IATA

UN-No UN1145
Proper Shipping Name Cyclohexane

Hazard Class 3
Packing Group 1

**Environmental hazards** Dangerous for the environment

Product is a marine pollutant according to the criteria set by IMDG/IMO

Special Precautions No special precautions required

Additional information None known

## Section 15 - Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

National Regulations Australia

See section 8 for national exposure control parameters.

Standard for the Uniform Scheduling of Medicines and Poisons

No poison schedule number allocated.

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## **Australian Industrial Chemicals Introduction Scheme (AICIS)**

Component	Australian Industrial Chemicals Introduction Scheme (AICIS)	Additional information
Cyclohexane - 110-82-7	Present	-

### Australian - Illicit Drug Precursors/Reagents Substance List

This product does not contain any substance(s) on the Illicit Drug Precursors/Reagents list.

### **Chemicals of Security Concern**

This product does not contain any substance(s) listed on the voluntary National Code of Practice for Chemicals of Security Concern

## National pollutant inventory Subject to reporting requirements

Component	National pollutant inventory
Cyclohexane - 110-82-7	10 tonne/yr. Threshold category 1

### Prohibition or notification/licensing requirements

Shown below are details of specific prohibition/notifications or licencing requirements when they apply.

This product does not contain any substance(s) subject to Prohibition, Authorization or Restriction.

### **International Inventories**

	Component	AICS	NZIoC	EINECS	ELINCS	TSCA	DSL	NDSL	PICCS	<b>ENCS</b>	ISHL	IECSC	KECL
Γ	Cyclohexane	Х	Х	203-806-2	-	X	Х	-	Х	Х	Х	Х	KE-18562

Legend: X - Listed. '-' - Not Listed. KECL - NIER number or KE number (http://ncis.nier.go.kr/en/main.do)

### **International Regulations**

Ozone Depletion Potential This product does not contain any known or suspected substance

Persistent Organic Pollutant This product does not contain any known or suspected substance

Rotterdam Convention (PIC) Not applicable

## Basel convention on the control of transboundary movements of hazardous wastes and their dispoal Not applicable.

Component	CAS No	OECD HPV	Restriction of Hazardous Substances (RoHS)	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Major Accident Notification	Seveso III Directive (2012/18/EC) - Qualifying Quantities for Safety Report Requirements
Cyclohexane	110-82-7	Listed	Not applicable	Not applicable	Not applicable

## Authorisation/Restrictions according to EU REACH

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Component	REACH (1907/2006) - Annex XIV - Substances Subject to Authorization	REACH (1907/2006) - Annex XVII - Restrictions on Certain Dangerous Substances	, i
Cyclohexane	-	Use restricted. See item 57. (see link for restriction details) Use restricted. See item 75. (see link for restriction details)	-

https://echa.europa.eu/substances-restricted-under-reach

## Section 16 - Other Information

## Legend

AICS - Australian Inventory of Chemical Substances

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory

**DSL/NDSL** - Canadian Domestic Substances List/Non-Domestic Substances List

**IECSC** - Chinese Inventory of Existing Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TWA - Time Weighted Average

IARC - International Agency for Research on Cancer

ICAO/IATA - International Civil Aviation Organization/International Air Transport Association

MARPOL - International Convention for the Prevention of Pollution from Ships

NZS 5433:2012 - Transport of Dangerous Goods on Land

LD50 - Lethal Dose 50%

EC50 - Effective Concentration 50% WEL - Workplace Exposure Limit DNEL - Derived No Effect Level

POW - Partition coefficient Octanol:Water

vPvB - very Persistent, very Bioaccumulative

VOC - (Volatile Organic Compound)

NZIoC - New Zealand Inventory of Chemicals

**EINECS/ELINCS** - European Inventory of Existing Commercial Chemical

Substances/EU List of Notified Chemical Substances ENCS - Japanese Existing and New Chemical Substances

**KECL** - Korean Existing and Evaluated Chemical Substances

**CAS** - Chemical Abstracts Service

**ACGIH** - American Conference of Governmental Industrial Hygienists

Predicted No Effect Concentration (PNEC)

**IMO/IMDG** - International Maritime Organization/International Maritime Dangerous Goods Code

ADG Australian Code for the Transport of Dangerous Goods by Road and Rail

**OECD** - Organisation for Economic Co-operation and Development

LC50 - Lethal Concentration 50% ATE - Acute Toxicity Estimate

RPE - Respiratory Protective Equipment
NOEC - No Observed Effect Concentration

**BCF** - Bioconcentration factor

PBT - Persistent, Bioaccumulative, Toxic

## Key literature references and sources for data

https://echa.europa.eu/information-on-chemicals

Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

## **Training Advice**

Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.

Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.

First aid for chemical exposure, including the use of eye wash and safety showers.

Fire prevention and fighting, identifying hazards and risks, static electricity, explosive atmospheres posed by vapours and dusts.

Revision Date 18-Nov-2022 Revision Summary Not applicable.

This Safety Data Sheet (SDS) is prepared in accordance to and complies with the requirements of Safe Work Australia - Work Health and Safety Regulations (WHS Regulations).

## **Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

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# **End of Safety Data Sheet**

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