




SPECIFICATION

MODEL : HED57XXU12

www.DataSheet4U.com

Low Power Hall-Effect Switch

DRAWN	CHECKED	APPROVED
		
S.W. PARK	S.W. KIM	H.C. JOUNG
2006.9.19	2006.9.19	2006.9.19

SAMSUNG ELECTRO-MECHANICS CO.,LTD.
314, Maetan 3-Dong, Yeongtong-Gu, Suwon,
Kyunggi-Do, KOREA, 443-743

Revision history
(Model : HED57XXU12)

Date	Rev. No	Contents revised	Design	Approval
2006.9.19	0	Establishment	S.W.Park	H.C.Joung

www.DataSheet4U.com

1. Description

The HED57XXU12 Omnipolar Hall effect sensor IC is fabricated on mixed signal CMOS technology. It incorporates advanced dynamic offset cancellation techniques to provide accurate and stable magnetic switch points. The circuit design provides an internally controlled clocking mechanism to cycle power to the Hall element and analog signal processing circuits.

This serves to place the high current-consuming portions of the circuit into a sleep mode. Periodically the device is awakened by this internal logic and the magnetic flux from the Hall element is evaluated against the predefined thresholds. If the flux density is above or below the B_{OP}/B_{RP} thresholds then the output transistor is driven to change states accordingly.

While in the sleep cycle the output transistor is latched in its previous state. The design has been optimized for service in applications requiring extended operating lifetime in battery powered systems.

The output transistor of the HED57XXU12 is switched on (B_{OP}) in the presence of a sufficiently strong South or North magnetic field. The output is switched off (B_{RP}) in the absence of a magnetic field.

2. Specification

2.1 Absolute Maximum Ratings

Supply Voltage, V_{DD} : 5V

Output Voltage, V_{OUT} : 5V

Output Current, I_{OUT} : 10mA

Operating Temperature range (T_A) : -40 to 85

Storage Temperature range (T_S) : -55 to +150

ESD Sensitivity : MM 500V, HBM 5000V

Exceeding the absolute maximum ratings may cause fatal damage.

2.2 HED57XXU12 Electrical Specification

[Operating conditions $T_a=25^\circ\text{C}$, $V_{DD}=2.5\text{V}$ to 3.5V]

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Supply Voltage	V_{DD}	Operating	2.5	2.75	3.5	V
Supply Current	I_{DD}	Awake, $V_{DD}=3.5\text{V}$	-	3.0	5.0	mA
	I_{SL}	Sleep, $V_{DD}=3.5\text{V}$	-	3.5	6.0	μA
	I_{AVG}	Average, $V_{DD}=3.5\text{V}$	-	6.5	10.0	μA
LOW Level Output Voltage	V_{LOW}	$B > B_{OP}$, $I_{OUT}=1\text{mA}$	0.0	0.25	0.4	V
Output Leakage Current	I_{LEAK}	$B < B_{RP}$, $V_{DD}=3.5\text{V}$	-	-	1.0	μA
Awake mode time	T_{AWK}	Operating	-	50	120	μs
Sleep mode time	T_{SL}	Operating	-	40	60	ms

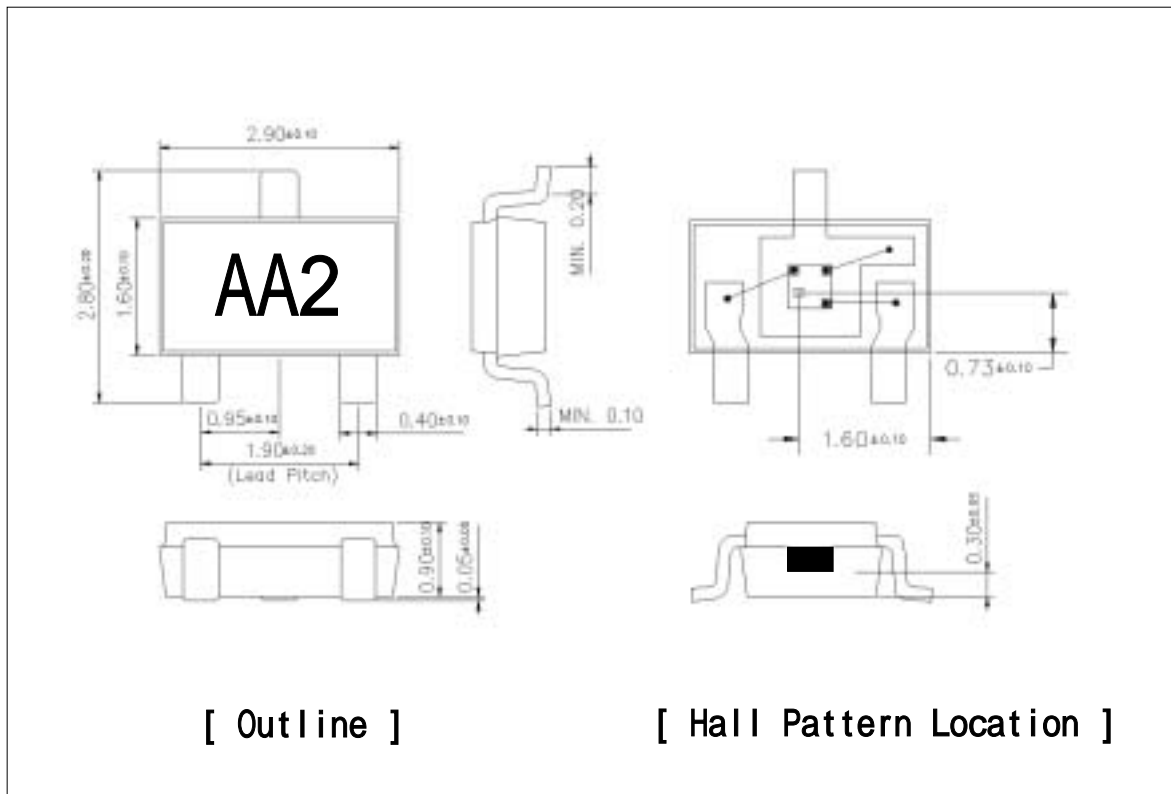
2.3 HED57XXU12 Magnetic Specifications

[Operating conditions Ta=25°C, V_{DD}=2.5V to 3.5V]

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Units
Operate Point	B _{OP}	Operating	-	±38	±55	G
Release Point	B _{RP}	Operating	±10	±28	-	G
Hysteresis	B _{HYS}	B _{OP} - B _{RP}	3	10	23	G

www.DataSheet4U.com

3. Package Dimensions [Unit : mm , Tolerance : ±0.10mm]



HED57XXU12

HED52XXU12

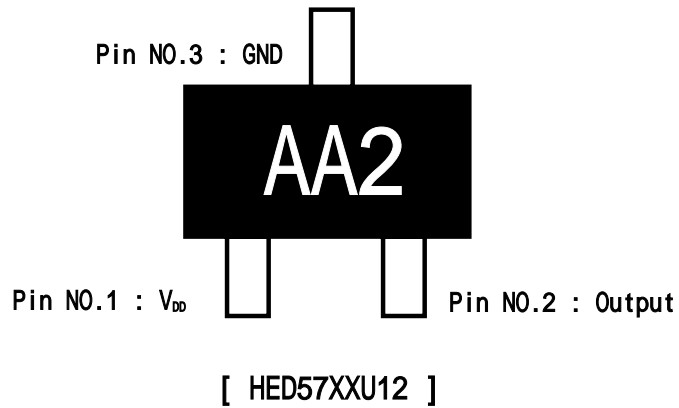
HED56XXU11

HED58XXU12



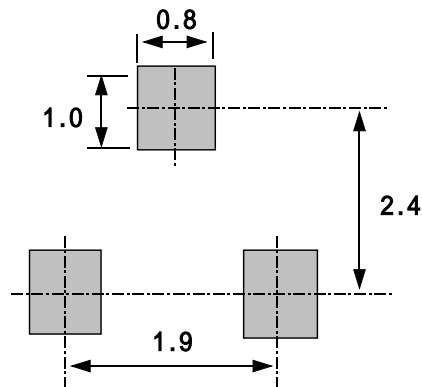
4. Pinning

Pinning is shown viewed from **marked side**

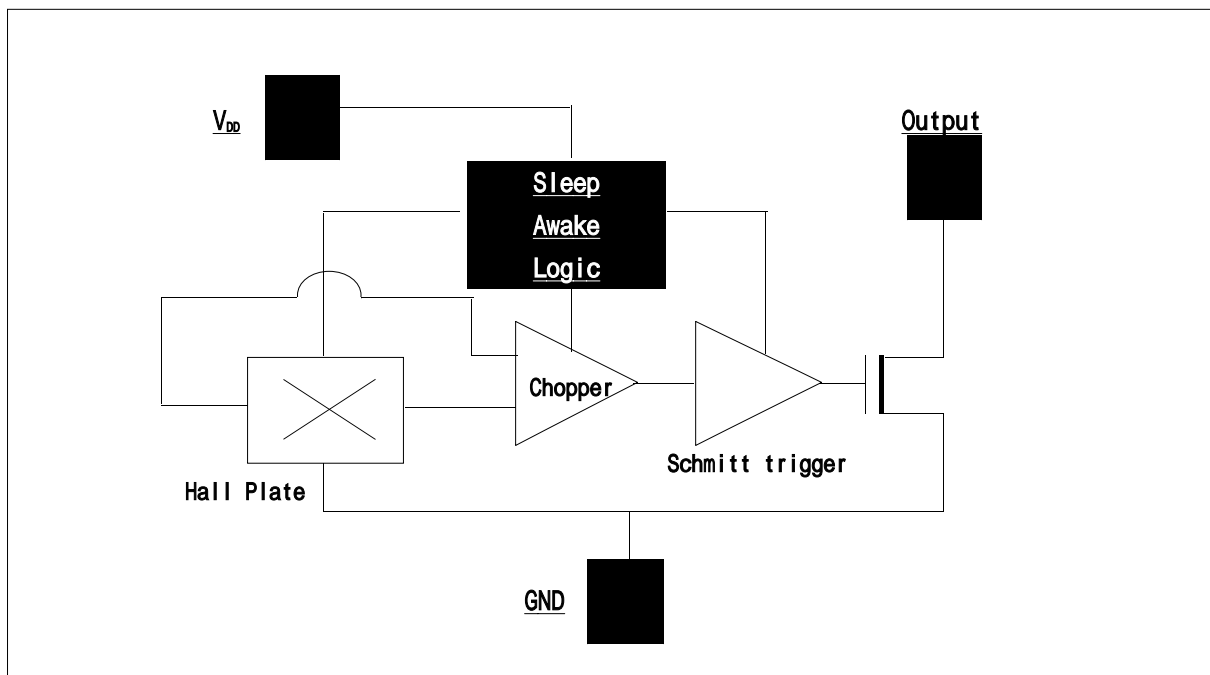


www.DataSheet4U.com

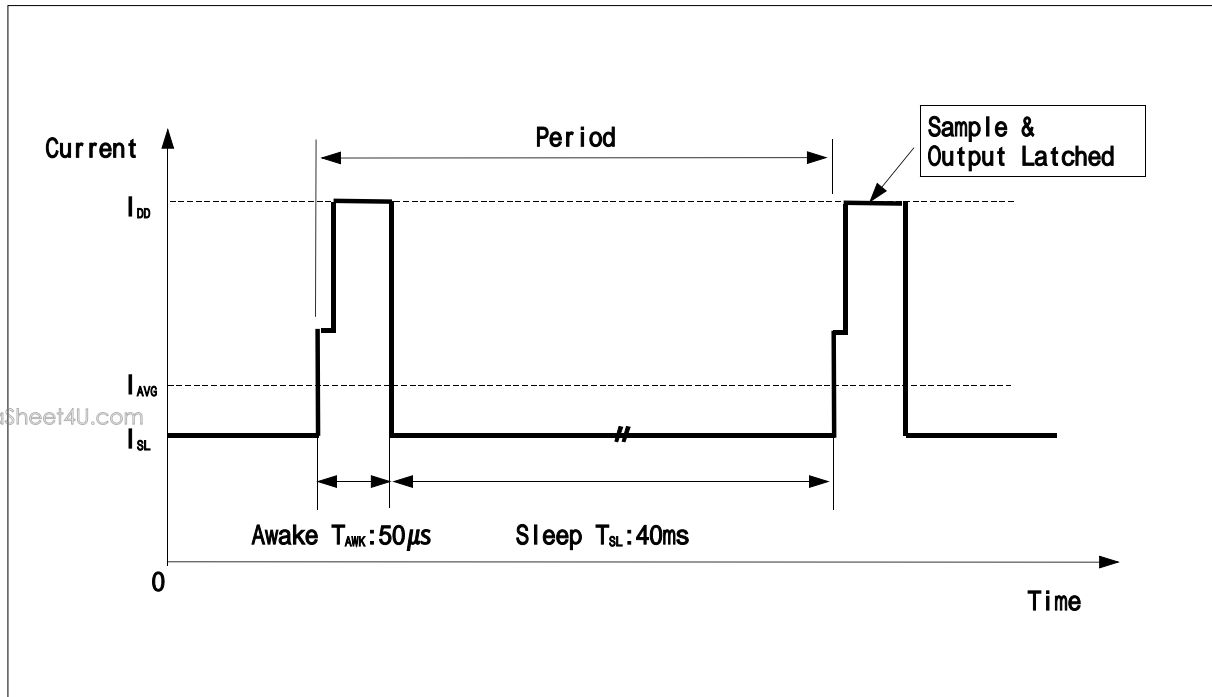
5. Recommended Land Pattern [Unit : mm]



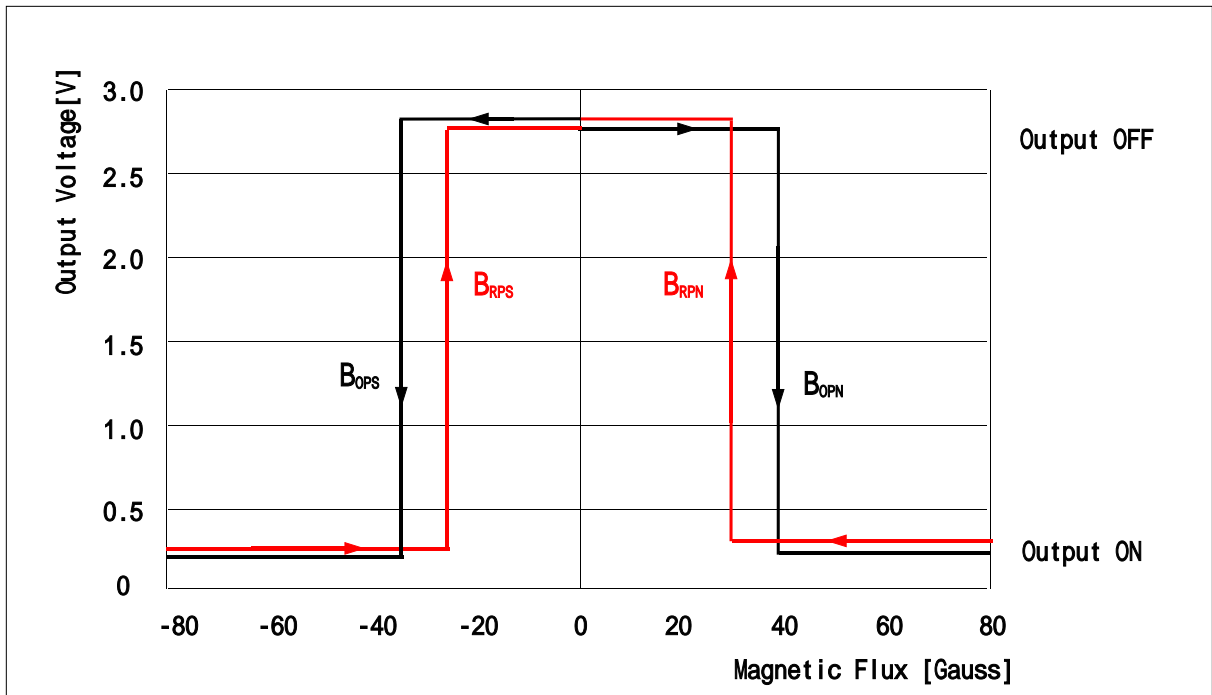
6. Functional Diagram



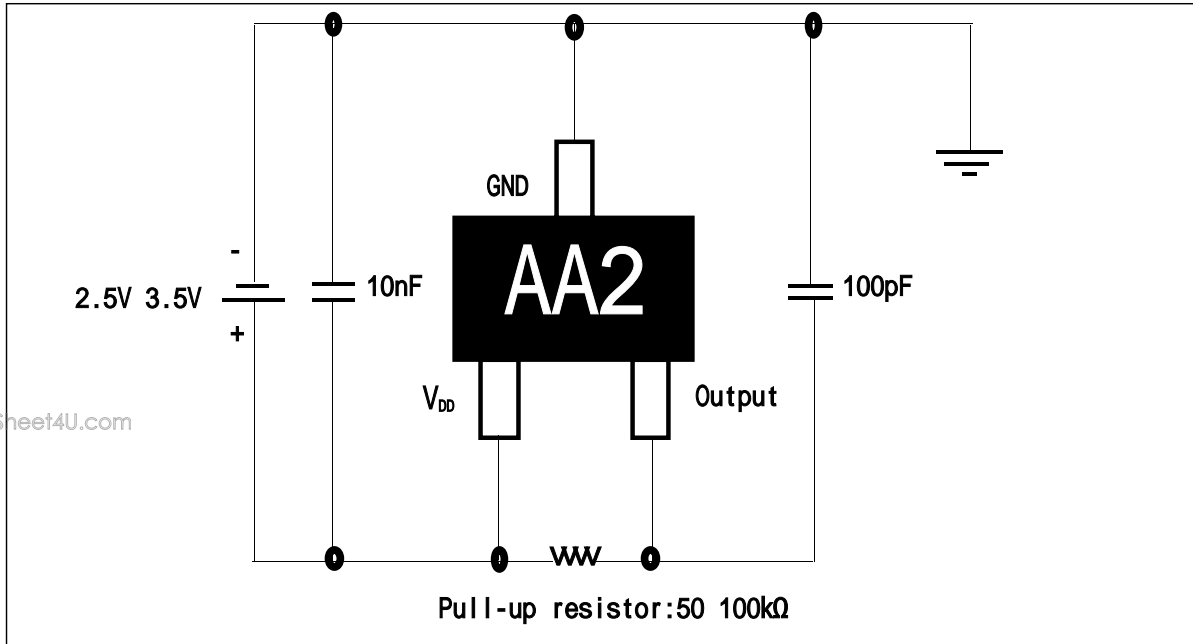
7. Internal Timing Circuit



8. Output Switching Characteristics



9. Typical Application



10. Endurance test specification

-Test Items and Test Conditions

10.1 Environmental Test

NO	Test Item	Test Condition	Test Length	Fail/Samples
1	High Temp. Storage Test	Ta=170	500hrs	0/20
2	Low Temp. Storage Test	Ta=-40	500hrs	0/20
3	High Temp. Operation Test	Ta=150 , V _{DD} =3V	408hrs	0/20
4	High Temp. High Humidity Operation Test	Ta=130 , V _{DD} =3V, 85%RH	50hr	0/20
5	P.C.T.	Ta=121 , 100%RH, 2atm.	96hr	0/20
6	Thermal Shock Test	-65 (30min) 150 (30min)	500cycles	0/20
7	Soldering Heat Resistance Test	Peak Temp = 260±5 , Preheating = 150~180	2times	0/20

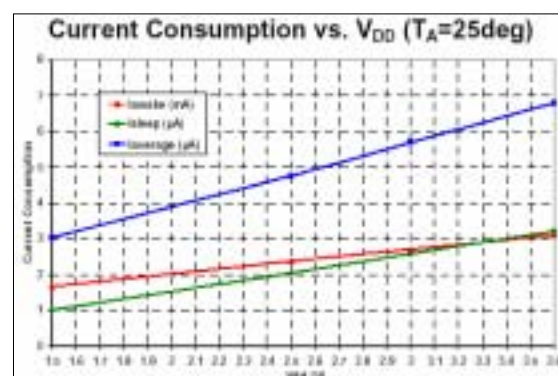
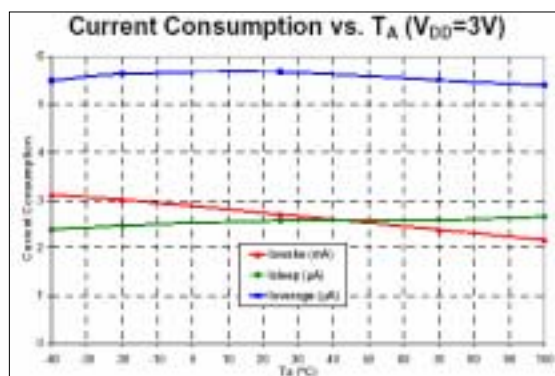
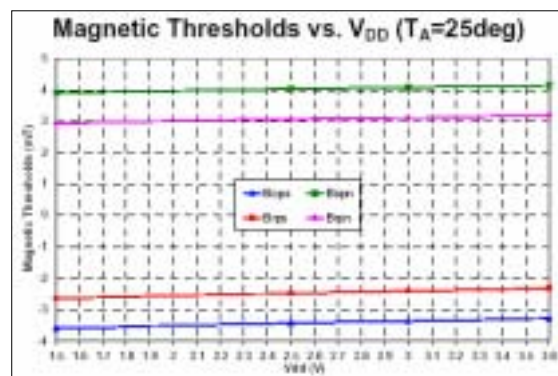
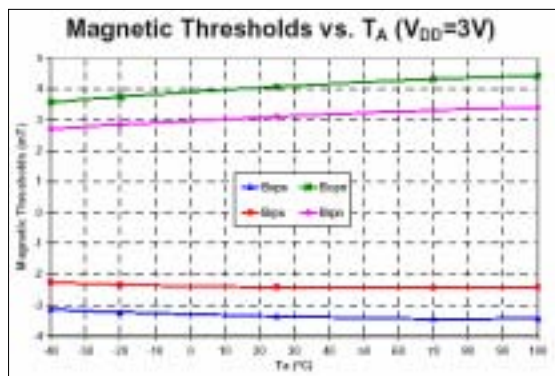
10.2 Mechanical Test

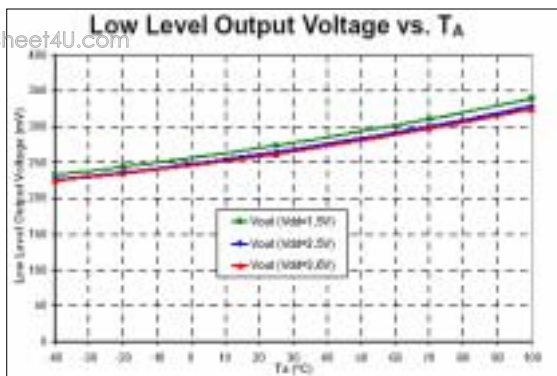
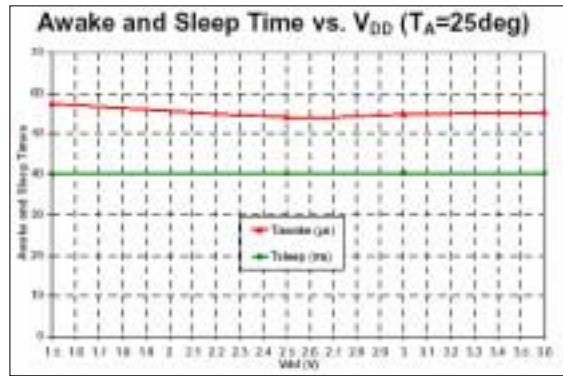
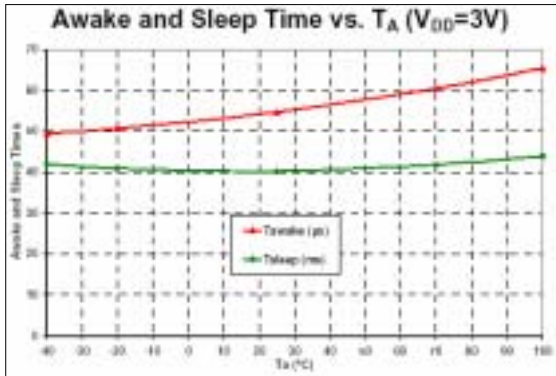
NO	Test Item	Test Condition	Fail/Samples
1	Vibration Test	Freq. : 10~55Hz, Amplitude : 1.5mm, sweep time 1min, 2hrs per axis(X.Y.Z)	0/20
2	Impact Test	3000g's, 0.5mm, Half sine wave pulse, 3 impacts per axis.	0/20

10.3 Electrical Test

NO	Test Item	Test Condition	Test Length	Fail/Samples
1	ESD	HBM : R1=10MΩ, R2=1.5kΩ, C=100pF, 1sec All Leads >6kV	3times	0/20
		MM : R1=10MΩ, R2=0, C=200pF, 1sec All Leads >600V	3times	0/20

11. Performance Graphs



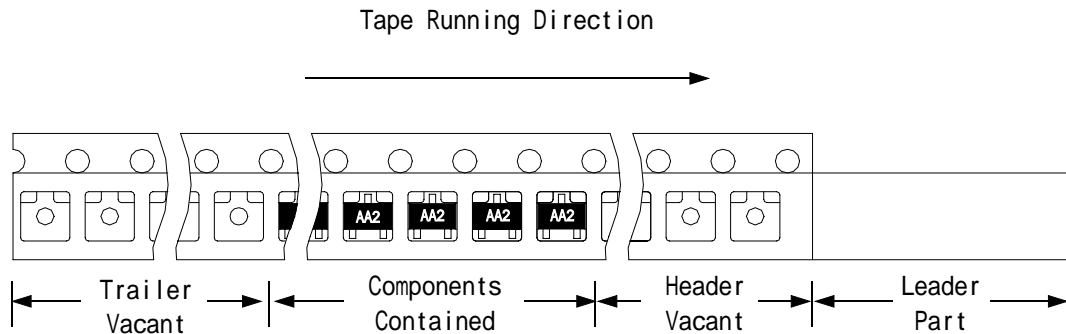


www.DataSheet4U.com

12. Packaging

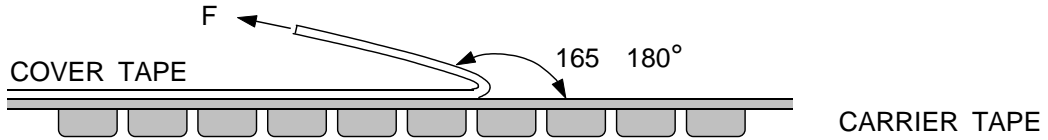
12.1 Taping

HED57XXU12 should be packed, that marking surface shown through cover tape. At least, 20cm vacant parts are made both front and rear side of tape.



12.2 Tape Specifications

Pull Strength(F) = 20 70g



Devices should not run out of a pocket when tape is bent down 15mm curvature.

Devices should not stick to cover tape.

www.DataSheet4U.com Devices should be kept below 40 °C and below RH80% in the shade.

Tape has no joint.

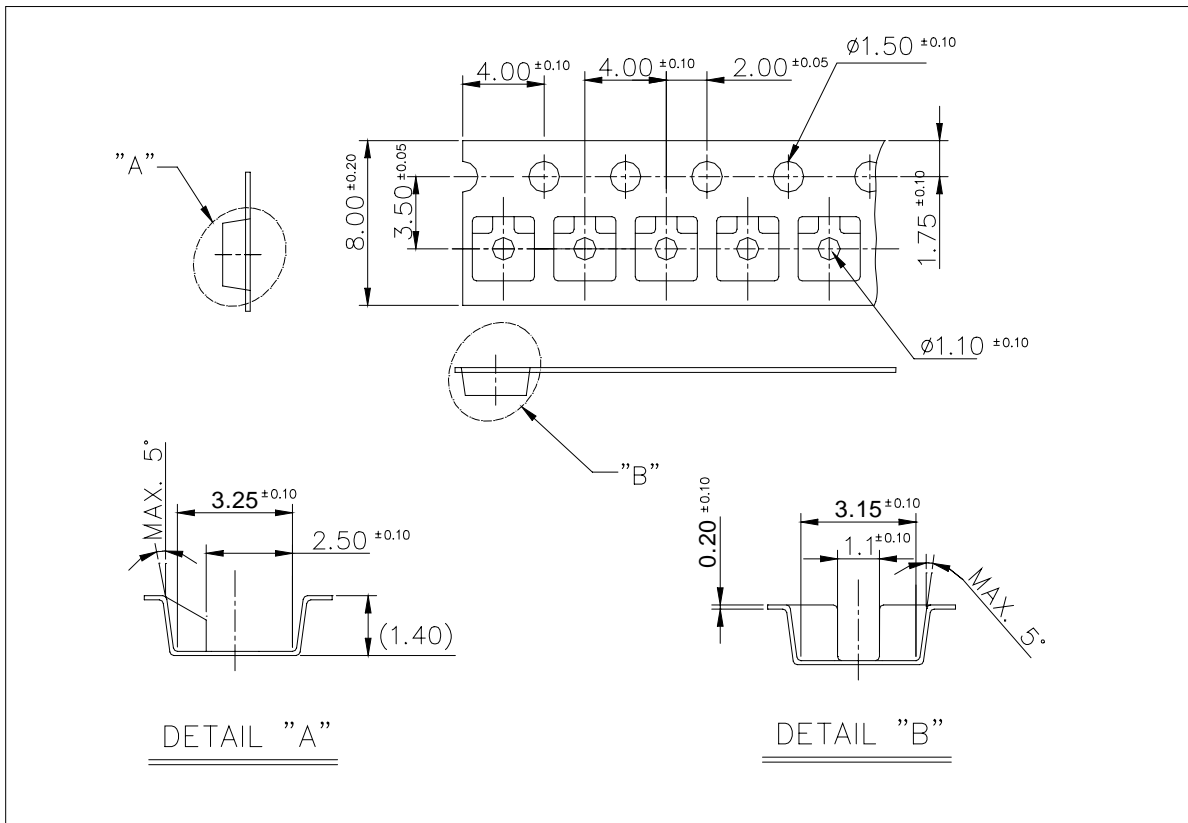
12.3 Packing Unit

3,000pcs of devices are packed in one reel.

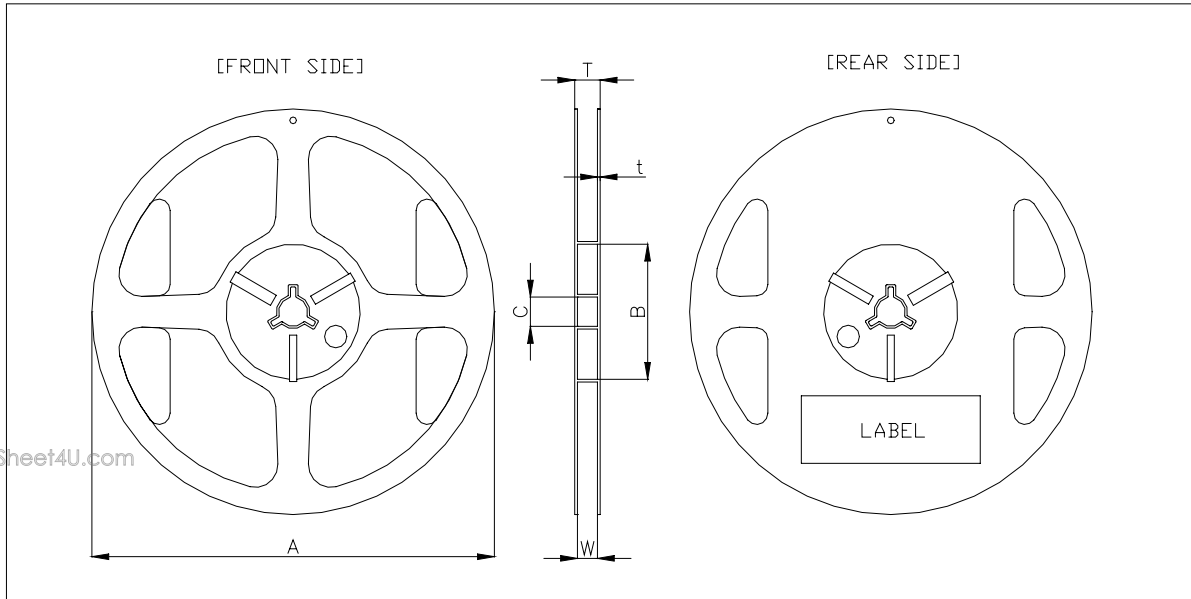
Ten reels(30,000pcs) are packed in one box.

Dummy could be packed for safe dealing.

12.4 Carrier Tape [Unit : mm]



12.5 Reel [Unit : mm]



Symbol	A	B	C	W	T	t
Spec.	$\varnothing 180+0$ -3	$\varnothing 60+1$ -0	$\varnothing 13\pm 0.3$	9 ± 0.3	11.4 ± 1.0	Max. 2.0

This REEL is made of PLASTIC and can be recycled.

12.6 Marking Table

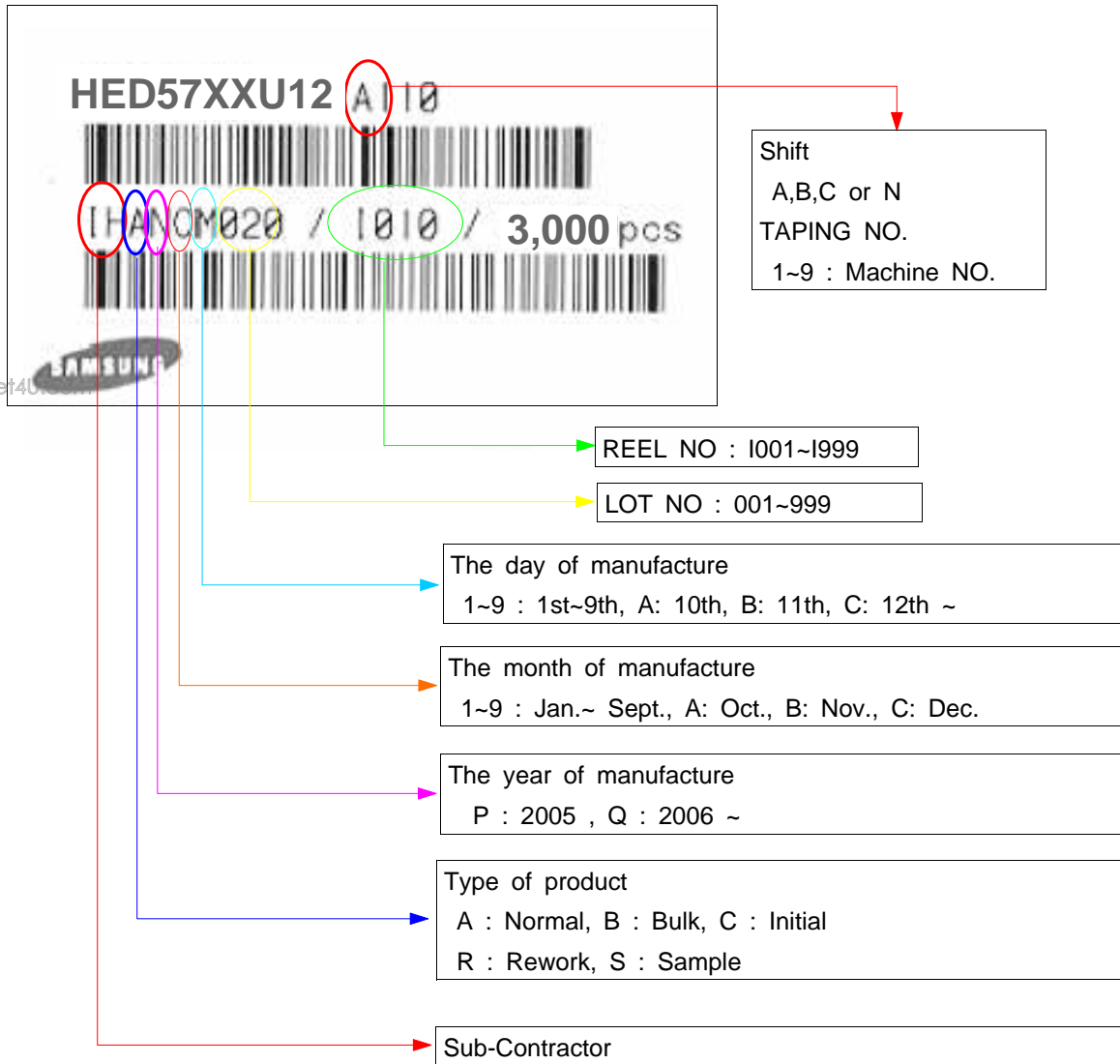
Use Laser Marker

Weekly Mark Table

Week	Mark	Week	Mark	Week	Mark	Week	Mark	Week	Mark	Week	Mark	Week	Mark
06/40	FP2	07/03	GF2	07/19	GV2	07/35	HP2	07/51	IJ2	08/14	JE2	08/30	JU2
06/41	FQ2	07/04	GG2	07/20	GW2	07/36	HQ2	07/52	IK2	08/15	JF2	08/31	JV2
06/42	FR2	07/05	GH2	07/21	GX2	07/37	HR2	07/53	IL2	08/16	JG2	08/32	JW2
06/43	FS2	07/06	GI2	07/22	GY2	07/38	HS2	08/01	IM2	08/17	JH2	08/33	JX2
06/44	FT2	07/07	GJ2	07/23	GZ2	07/39	HT2	08/02	IP2	08/18	JI2	08/34	JY2
06/45	FU2	07/08	GK2	07/24	HA2	07/40	HU2	08/03	IQ2	08/19	JJ2	08/35	JZ2
06/46	FV2	07/09	GL2	07/25	HB2	07/41	HV2	08/04	IR2	08/20	JK2	08/36	KA2
06/47	FW2	07/10	GM2	07/26	HC2	07/42	HW2	08/05	IT2	08/21	JL2	08/37	KB2
06/48	FX2	07/11	GN2	07/27	HD2	07/43	HY2	08/06	IU2	08/22	JM2	08/38	KC2
06/49	FY2	07/12	GO2	07/28	HE2	07/44	IA2	08/07	IV2	08/23	JN2	08/39	KD2
06/50	FZ2	07/13	GP2	07/29	HF2	07/45	IB2	08/08	IW2	08/24	JO2	08/40	KE2
06/51	GA2	07/17	GQ2	07/30	HG2	07/46	IC2	08/09	IY2	08/25	JP2	08/41	KF2
06/52	GB2	07/15	GR2	07/31	HJ2	07/47	ID2	08/10	JA2	08/26	JQ2	08/42	KG2
06/53	GC2	07/16	GS2	07/32	HK2	07/48	IE2	08/11	JB2	08/27	JR2	08/43	KH2
07/01	GD2	07/17	GT2	07/33	HL2	07/49	IF2	08/12	JC2	08/28	JS2	08/44	KI2
07/02	GE2	07/18	GU2	07/34	HM2	07/50	IG2	08/13	JD2	08/29	JT2	08/45	KJ2

12.7 Label Code Numbering

[Reel Label]



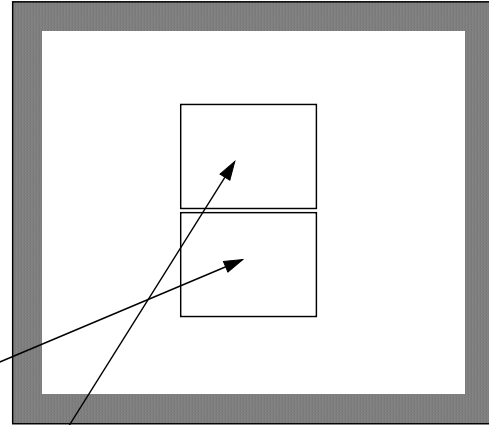
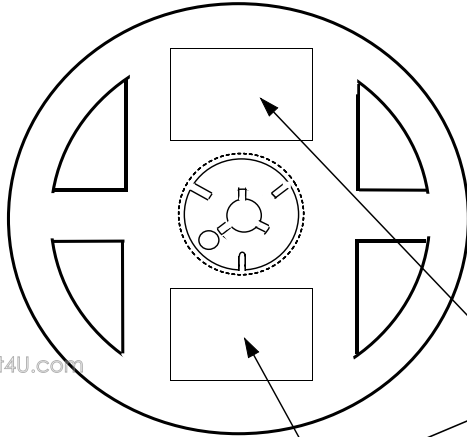
[Box Label]



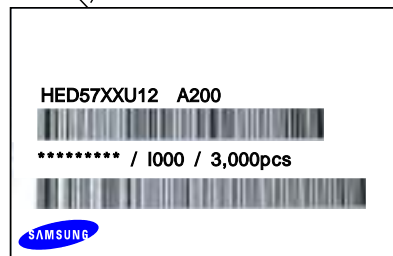
Numbering same method of Reel Label.

[Reel Label]

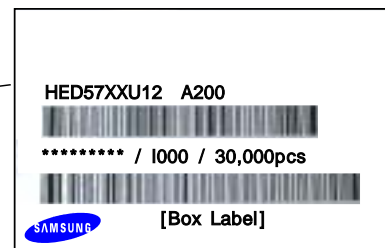
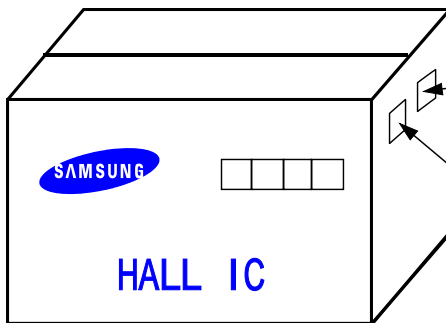
[Aluminium Bag Label]



www.DataSheet4U.com



[Outer Box Label]



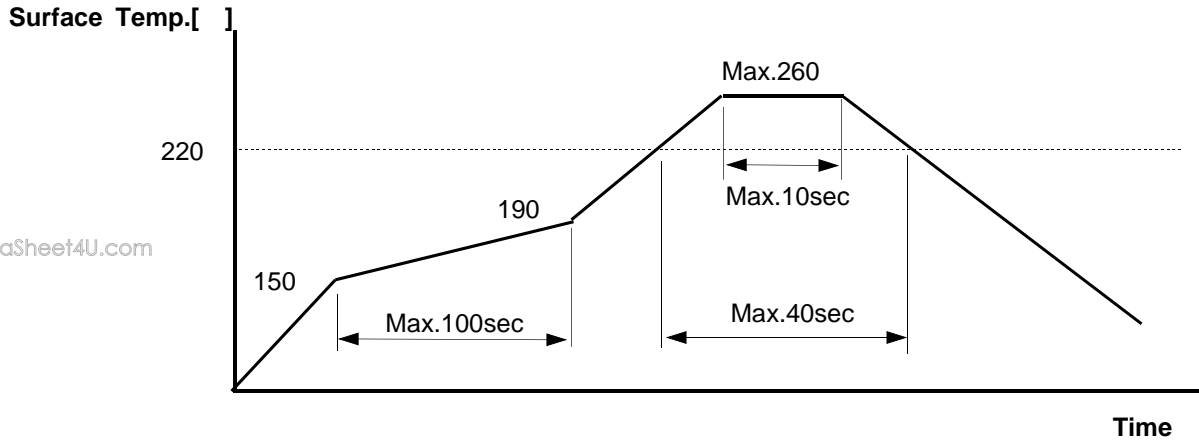
Dimension(mm)		
Width	Length	Height
245	220	142

13. Solder Conditions

13.1 Reflow Conditions(Pb Free)

No Rapid Heating and Cooling.

Reflow Frequency : 2 times max.



www.DataSheet4U.com

13.2 For Manual Soldering

- Not more than 5 seconds Max.300 , under soldering iron.

14. Notes

Confirm pin connection when circuit designs.

Use in magnetic field that is strong enough above Bop.

(Magnetic circuit must have effective air gap)

Hall IC is sensitive to vertical magnetic field. therefore the sensing face of HALL IC is always opposite to magnetic pole (N or S)

15. RoHS Data



Test Report No. F690501/LF-CTSGP06-23819

Date: September 19, 2006

Page 1 of 3

To: SAMSUNG ELECTRO-MECHANICS CO., LTD.
314 Maetan3-dong
Yeongtong-gu
Suwon-city
Gyeonggi-do
Korea

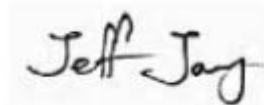
www.DataSheet4U.com

The following merchandise was submitted and identified by the client as :

Commodity : Hall IC SOT-23
SGS File No. : GP06-23819
Received Date : September 12, 2006
Test Performing Date : September 13, 2006
Test Performed : SGS Testing Korea tested the sample(s) selected by applicant with following results
Test Results : For further details, please refer to following page(s)

Jade Jang
Monet Jeong
Jully Oh
Jerry Jung
/Testing Person

SGS Testing Korea Co. Ltd.



Jeff Jang / Chemical Lab Mgr

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.



Test Report No. F690501/LF-CTSGP06-23819

Date: September 19, 2006

Page 2 of 3

Sample No. : GP06-23819.001
 Sample Description : Hall IC SOT-23
 Style/Item No. : N/A
 Comments : Materials are Si and epoxy.

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996), ICP	0,5	N.D.
Lead (Pb)	mg/kg	US EPA 3050B(1996), US EPA 6010B(1996), ICP	5	N.D.
Mercury (Hg)	mg/kg	US EPA 3052(1996), US EPA 6010B(1996), ICP	2	N.D.
Hexavalent Chromium (Cr VI)	mg/kg	US EPA 3060A(1996), US EPA 7196A(1992), UV	1	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromobiphenyl	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Monobromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Dibromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tribromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Octabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.
Decabromodiphenyl ether	mg/kg	US EPA 3540C, GC/MS	5	N.D.

NOTE: (1) N.D. = Not detected,(<MDL)
 (2) ppm = mg/kg
 (3) MDL = Method Detection Limit
 (4) - = No regulation
 (5) ** = Qualitative analysis (No Unit)
 (6) Negative = Undetectable / Positive = Detectable

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.



Test Report No. F690501/LF-CTSGP06-23819

Date: September 19, 2006

Page 3 of 3

Picture of Sample as Received:



*** End ***

- NOTE:
- (1) N.D. = Not detected,(<MDL)
 - (2) ppm = mg/kg
 - (3) MDL = Method Detection Limit
 - (4) - = No regulation
 - (5) ** = Qualitative analysis (No Unit)
 - (6) Negative = Undetectable / Positive = Detectable

This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf. Attention is drawn to the limitations of liability, indemnification and jurisdictional issues defined therein. The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This Test Report cannot be reproduced, except in full, without prior written permission of the Company.