

Hall Effect Measurement System

Model : NoHMS5300/5000/AMP55T

Variable temperature system : 80K ~ 350K.



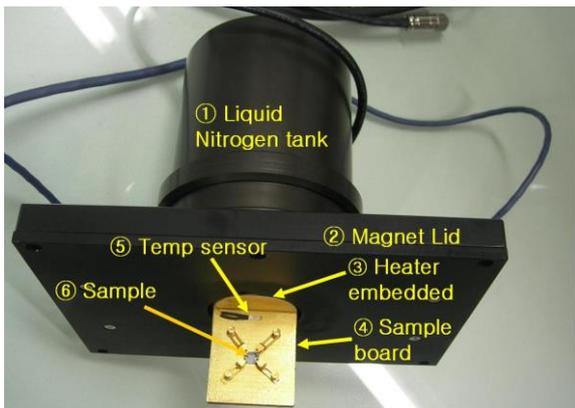
1. 基本構成

1) 本体.

- ・非常にコンパクトな構造で安定性に優れた電流電源を使用
- ・Van der Pauw方法による測定

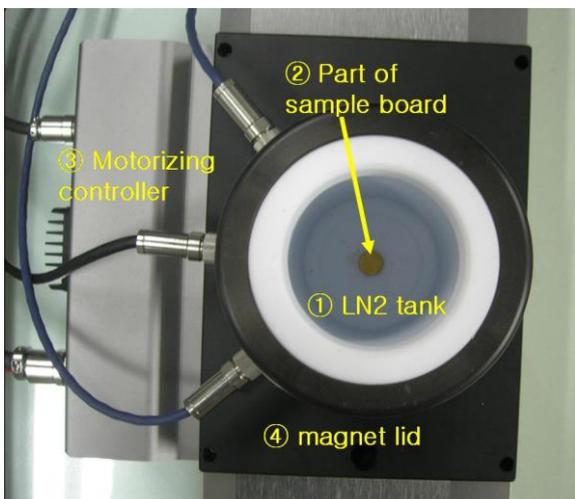
2) 0.51Tesla 永久磁石 Kit (Model No: AMP55T)

- ・0.51Tesla 永久磁石
- ・permanent magnet.
- ・Phosphorous 銅 サンプルボード
- ・サンプルボードにヒーター内蔵
- ・LN2 タンク (筒状 LN2 タンク、スクウェアLN2 タンク)
- ・温度センサー



Sample mounting kit 構成

- ・ Model No: SH80350K
- ・筒状 LN2 タンク
- ・サンプルボード,
- ・温度センサー
- ・ヒーター
- ・磁石の蓋
- ・ケーブル

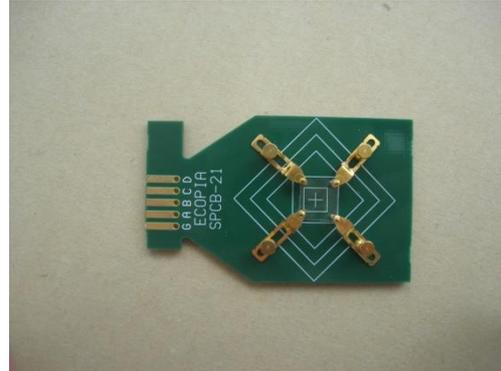
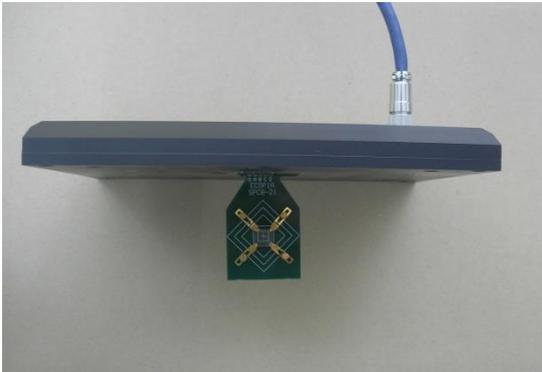


AMP Magnet kit 上部.

- ・永久磁石駆動コントローラー
- ・筒状LN2 タンク
- ・磁石の蓋
- ・ケーブル

3) RT, 77K (LN2 temp)測定専用サンプルボード、永久磁石部分のふた

- Model No: RTSK-5000
- オプションアクセサリ (HMS5000フルセットには含まれていません)



- RT と 77K のみで測定の場合は, AMP55T(magnet kit of HMS5000)に (Model# SH80350K)からこの上記オプションアクセサリに変更して測定をします。

4) SW プログラム

ECOPIA Hall Effect Measurement System - [Hall]

Hall Effect Measurement System

INPUT VALUE

Date: 2013-07-26 22:58:44 User Name: eco pia
Magnet Module: AMP55 Sample Name: GaIn

Temperature: Mode: VARIABLE Temp Delay[sec]: 5 Initial[K]: 00 Interval[K]: 20 Step: 14
Source Current: D(T): 0.55 D(um): 5.000 Initial Current: 1.000 [mA] Interval: 1.000 Step: 1
First: 340[K] First I: [mA]

MEASUREMENT DATA

AB[mV]	BC[mV]	AC[mV]	MA[mV]	MB[mV]
-5.3349	-57.4843	58.1396	57.8970	58.8871
5.8678	57.4478	-56.5435	-58.7797	-58.7101
CD[mV]	DA[mV]	DB[mV]	MD[mV]	MD[mV]
-5.8801	-64.7877	58.7873	58.2425	58.2272
6.3436	64.7813	-58.4087	-58.8748	-57.9756

Electrical Parameters

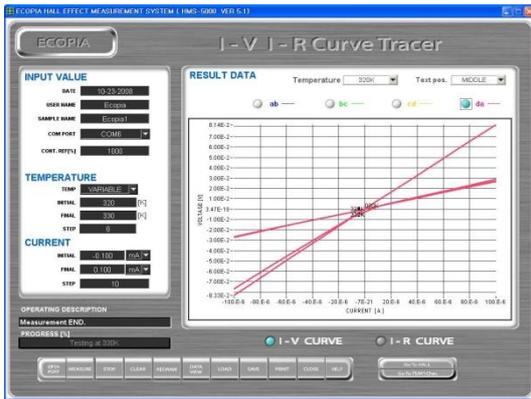
Bulk Concentration:	-1.3935E+18	[/cm ³]	Mobility:	7.7232E+01	[cm ² /Vs]
Sheet Concentration:	6.9675E+14	[/cm ²]	Average Hall Coefficient:	4.4795E+00	[cm ³ /C]
Sheet Resistance:	1.6088E+02	[/cm]	A-B Hall Coefficient:	-4.4301E+00	[cm ³ /C]
Resistivity:	5.7956E-02	[Ω cm]	B-D Hall Coefficient:	-4.5290E+00	[cm ³ /C]
Conductivity:	1.7255E+01	[1/Ω cm]	Ratio of Vertical/Horizontal:	9.5323E-02	
Magneto-Resistance:	4.9812E-01	[Ω]			

RESULT DATA

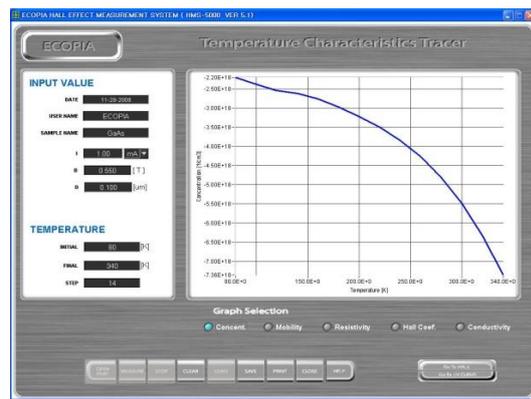
No	Temp (SV)	Temp (PV)	Current[A]	Bulk Con.	Sheet Con.	Sheet Resistance	Resistivity	Conductivity	MagnetoRes	Mobility	Avg. Hall	AC Hall	BD Hall	R
1	80.0	80.0	1.0000E-01	-1.4658E+18	-7.3325E+14	2.3000E+02	7.9850E-02	1.2523E+01	4.7333E-01	5.3306E+01	-4.2565	-4.2579	-4.2557	7.6
2	100.0	100.0	1.0000E-01	-1.3586E+18	-6.7323E+14	2.2154E+02	7.7381E-02	1.2937E+01	5.5023E-01	5.9439E+01	-4.3946	-2.8863	-5.3824	7.6
3	120.0	120.0	1.0000E-01	-1.4307E+18	-7.1300E+14	2.0268E+02	7.1430E-02	1.3999E+01	4.0246E-01	6.0753E+01	-4.3387	-4.4402	-4.2202	8.0
4	140.0	140.0	1.0000E-01	-1.4148E+18	-7.0740E+14	1.9260E+02	6.8210E-02	1.4659E+01	4.9063E-01	6.4676E+01	-4.4121	-4.3482	-4.4759	8.0
5	160.0	160.0	1.0000E-01	-1.3953E+18	-6.9964E+14	1.8318E+02	6.5177E-02	1.5343E+01	4.9506E-01	6.8444E+01	-4.4611	-4.3285	-4.5335	8.0
6	180.0	180.0	1.0000E-01	-1.3975E+18	-6.9876E+14	1.7480E+02	6.2458E-02	1.6011E+01	4.9669E-01	7.1514E+01	-4.4666	-4.3161	-4.6171	9.0
7	200.0	200.0	1.0000E-01	-1.3915E+18	-6.9575E+14	1.6740E+02	6.0057E-02	1.6651E+01	4.9984E-01	7.4695E+01	-4.4859	-4.3961	-4.5758	9.0
8	220.0	220.0	1.0000E-01	-1.3935E+18	-6.9675E+14	1.6088E+02	5.7956E-02	1.7255E+01	4.9812E-01	7.7232E+01	-4.4795	-4.4301	-4.5290	9.0

Result Data Hall Curve Temp Curve

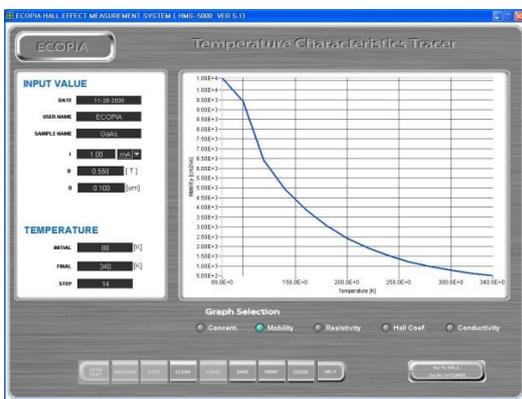
< HMS5000 model's test main page >



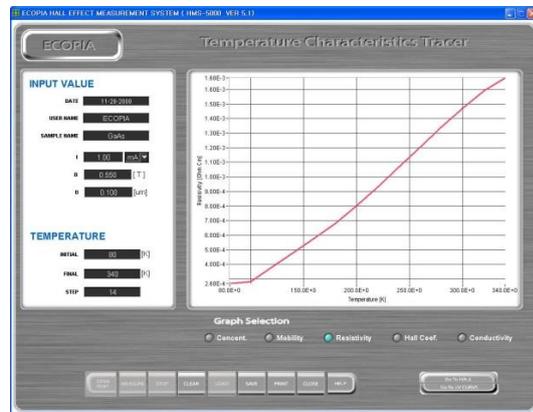
< I-V, I-R graph as per temp variation >



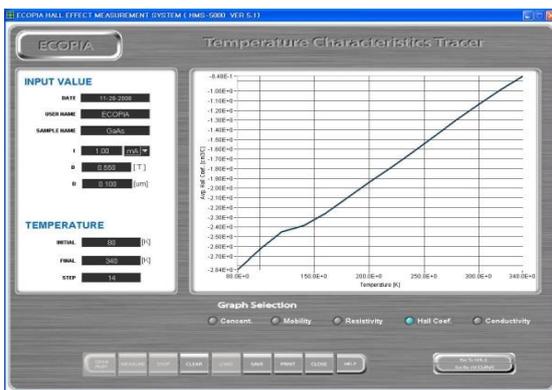
< Carrier concentration vs temp variation >



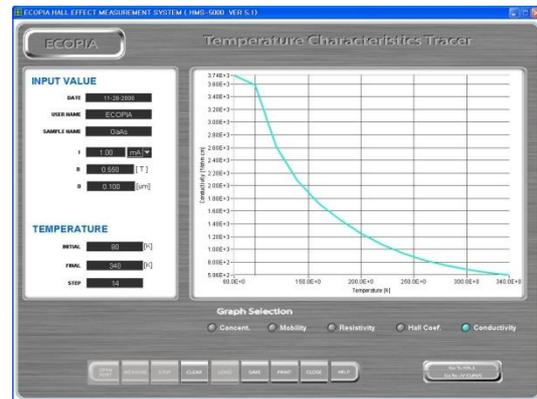
< Carrier mobility vs temp variation >



< Resistivity vs temp variation >



< Hall Coefficient vs temp variation >



< Conductivity vs temp variation >

2. 機器仕様

1) 一般的仕様

NO	HMS5300 Main body	Description	NO	Magnet kit (AMP55T)	Description
1	Size	44 x 42 x 14cm (W x D x H)	1	size	68 x 22 x 11cm (W x D x H)
2	Weight	8.5kg	2	Weight	16kg
3	Carrier density	10e7~10e21(cm-3)	3	Temp	80K~350K
4	Resistivity	10e-4 ~ 10e7 (ohm.cm)	4	Magnet flux density	0.51Tesla (+/-0.03T)
5	Mobility	1~10e7 (cm ² /Vs)	5	Temp Uniformity	+/- 0.5dC.
6	Input current range	1nA ~ 20mA (DC type)	6	Sample size	5mm x 5mm ~ 20mm x 20mm
7	Output voltage	12V	7	Sample holding kit (SH80350R) weight	3 kg
8	Software	Win XP, Vista, Win7, Win8, Win10			
9	Others in s/w	IV, IR graph plot. Hall coefficient, MR.			

2) SW 動作環境

Windows XP / VISTA / Win7 / Win8 / Win10

3) データインデックス

- N / P type decision.
- Bulk, Sheet Carrier Concentration
- Resistivity
- Mobility, Hall Coefficient
- Magneto resistance
- The ratio of Vertical/Horizontal resistance value)

4) 測定対象サンプル

Si, SiGe, SiC, GaAs, InGaAs, InP, GaN, TCO(including ITO), AlZnO, FeCdTe, ZnO and all of semiconductors.

3. 成績証明書

CE Mark 取得: HMS5000's CE markを既に取得済み



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