



HY11P35

Datasheet

**8-Bit RISC-like Mixed Signal Microcontroller
Embedded 4x32 LCD Driver
Low Noise Amplifier
18-Bit $\Sigma\Delta$ ADC**

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1. 特點

- 8 位元加強型精簡指令集，共有 66 個指令
包含硬體乘法指令及查表指令
- 2.2V to 3.6V 工作電壓範圍，-40°C~85°C 工作溫度範圍
- 外部石英震盪器及內部高精度 RC 震盪器，6 種 CPU 工作時脈切換選擇，可讓使用者達到最佳省電規劃
 - 運行模式 300uA@2MHz
 - 待機模式 3uA@32KHz
 - 休眠模式 1uA
- 6KWord OTP (One Time Programmable) Type 程式記憶體，256Byte 資料記憶體
- Brownout and Watch dog Timer，可防止 CPU 進入死機模式
- 18bit 全差動輸入 $\Sigma\Delta$ ADC 類比數位轉換器
 - 內置 PGA (Programmable Gain Amplifier) 及可有 1/4、1/2、1、.....128 倍 10 種輸入信號放大倍率選擇
 - 內置輸入零點調整，可針對不同應用增加其量測範圍
 - 內置絕對溫度感測器
- 超低輸入雜訊(<1uVpp)運算放大器，可提供高輸出阻抗小訊號的放大及小電流的電壓轉換
- 1.0V 的內部類比電路共地電壓源，具有 Push-Pull 驅動能力，可提供傳感器驅動電壓
- LVD 低電壓檢測功能具 14 段檢測電壓設置與外部輸入電壓檢測功能
- 類比電壓源 VDDA 可選擇 4 種不同輸出電壓，具 10mA 穩壓電壓源輸出能力
- 4x32 LCD 液晶驅動器
 - 1/3 Bias · 1/4 Duty
 - 內建 Charge Pump 穩壓線路，可提供 4 種 LCD 偏壓
- 8-bit Timer A
- 16-bit Timer B 模組具 Capture/Compare 功能
- 8-bit Timer C 模組具 PWM/PFD 波形產生功能
- Build-In EPROM
- Support 6 stack level

2. 引腳定義

2.1 LQFP100 引腳圖

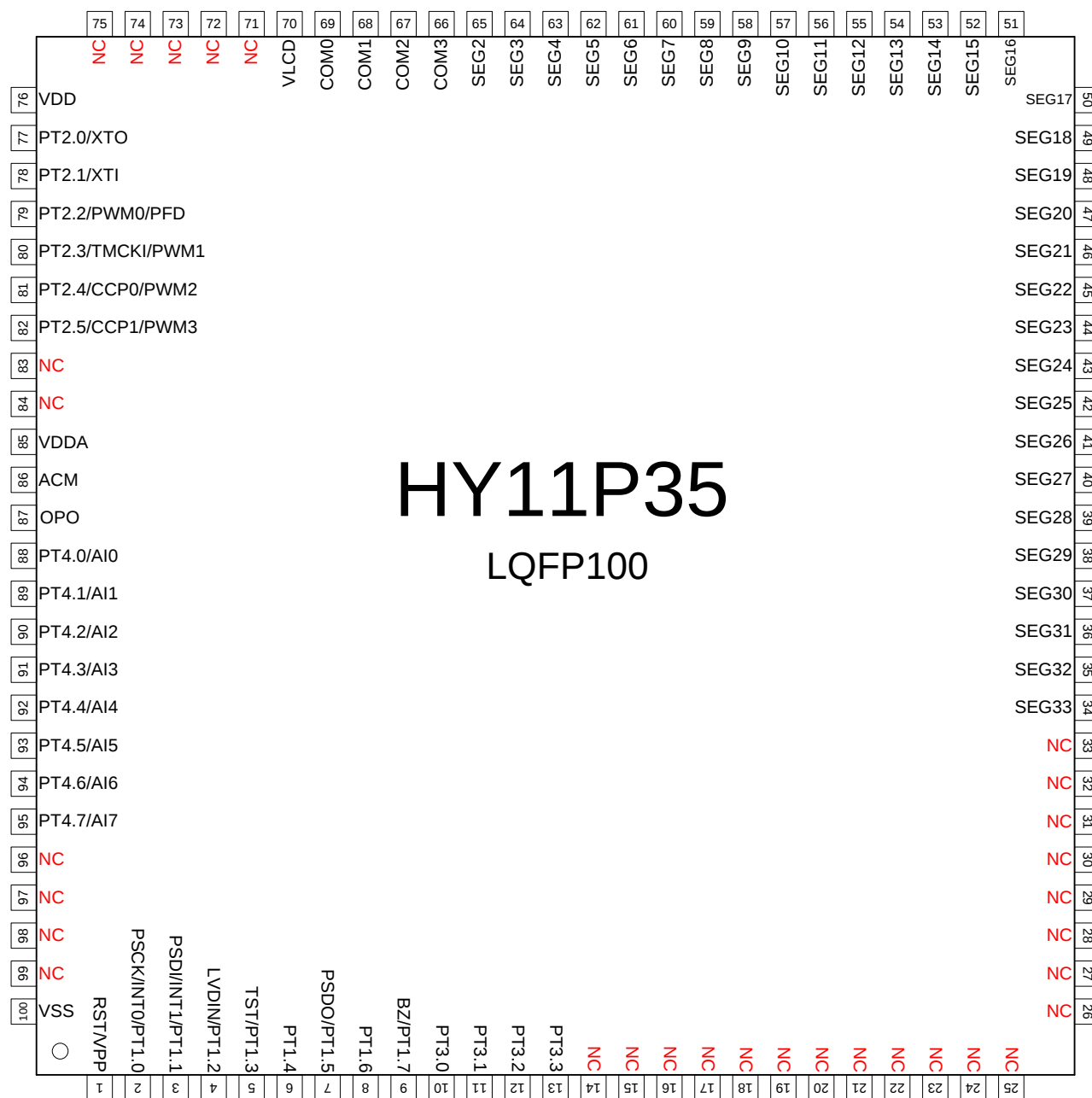


圖 2-1 HY11P35 LQFP100 引腳圖

註 1：VPP 與 RST 復用同一接口，非燒錄 EPROM 時禁止輸入電壓超過 5.8V

註 2：TST 與 PT1.3 復用同一接口，操作時禁止輸入電壓超過 VDD+0.3V

註 3：若不將 PT1.3 設定成外部引腳按鍵，可以提升抗干擾能力

2.2 I/O 引腳定義

“I/O”輸入/輸出, “I”輸入, “O”輸出, “S”史密特觸發, “C”CMOS 特性兼容輸出與輸入, “P”電壓源, “A”類比通道

編號	引腳名稱	引腳特性		功能說明
		格式	緩衝	
1	RST/VPP RST VPP	I P	S P	復位晶片 EPROM 讀/寫時的電壓源
2	PT1.0/INT0/PSCK PT1.0 INT0 PSCK	I I I	S S S	數位輸入 中斷源 INT0 OTP 讀/寫介面 SCK 接口
3	PT1.1/INT1/PSDI PT1.1 INT1 PSDI	I I I	S S S	數位輸入 中斷源 INT1 OTP 讀/寫介面 SDI 接口
4	PT1.2/LVDIN PT1.2 LVDIN	I A	S A	數位輸入 LVD 外部信號輸入接口
5	PT1.3/TST PT1.3 TST	I I	S S	數位輸入 測試模式致能輸入 (未開放)
6	PT1.4	I/O	S	數位輸入/輸出
7	PT1.5/PSDO PT1.5 PSDO	I/O O	S C	數位輸入/輸出 OTP 讀/寫介面 SDO 接口
8	PT1.6	I/O	S	數位輸入/輸出
9	PT1.7/BZ PT1.7 BZ	I/O O	S C	數位輸入/輸出 蜂鳴器輸出端
10	PT3.0	I/O	C	數位輸入/輸出
11	PT3.1	I/O	C	數位輸入/輸出
12	PT3.2	I/O	C	數位輸入/輸出
13	PT3.3	I/O	C	數位輸入/輸出
14	NC	-	-	未使用
15	NC	-	-	未使用
16	NC	-	-	未使用

17	NC	-	-	未使用
18	NC	-	-	未使用
19	NC	-	-	未使用
20	NC	-	-	未使用
21	NC	-	-	未使用
22	NC	-	-	未使用
23	NC	-	-	未使用
24	NC	-	-	未使用
25	NC	-	-	未使用
26	NC	-	-	未使用
27	NC	-	-	未使用
28	NC	-	-	未使用
29	NC	-	-	未使用
30	NC	-	-	未使用
31	NC	-	-	未使用
32	NC	-	-	未使用
33	NC	-	-	未使用
34	SEG33	O	A	LCD 的 Segment 輸出
35	SEG32	O	A	LCD 的 Segment 輸出
36	SEG31	O	A	LCD 的 Segment 輸出
37	SEG30	O	A	LCD 的 Segment 輸出
38	SEG29	O	A	LCD 的 Segment 輸出
39	SEG28	O	A	LCD 的 Segment 輸出
40	SEG27	O	A	LCD 的 Segment 輸出
41	SEG26	O	A	LCD 的 Segment 輸出
42	SEG25	O	A	LCD 的 Segment 輸出
43	SEG24	O	A	LCD 的 Segment 輸出
44	SEG23	O	A	LCD 的 Segment 輸出
45	SEG22	O	A	LCD 的 Segment 輸出
46	SEG21	O	A	LCD 的 Segment 輸出
47	SEG20	O	A	LCD 的 Segment 輸出
48	SEG19	O	A	LCD 的 Segment 輸出
49	SEG18	O	A	LCD 的 Segment 輸出
50	SEG17	O	A	LCD 的 Segment 輸出
51	SEG16	O	A	LCD 的 Segment 輸出
52	SEG15	O	A	LCD 的 Segment 輸出
53	SEG14	O	A	LCD 的 Segment 輸出

54	SEG13	O	A	LCD 的 Segment 輸出
55	SEG12	O	A	LCD 的 Segment 輸出
56	SEG11	O	A	LCD 的 Segment 輸出
57	SEG10	O	A	LCD 的 Segment 輸出
58	SEG9	O	A	LCD 的 Segment 輸出
59	SEG8	O	A	LCD 的 Segment 輸出
60	SEG7	O	A	LCD 的 Segment 輸出
61	SEG6	O	A	LCD 的 Segment 輸出
62	SEG5	O	A	LCD 的 Segment 輸出
63	SEG4	O	A	LCD 的 Segment 輸出
64	SEG3	O	A	LCD 的 Segment 輸出
65	SEG2	O	A	LCD 的 Segment 輸出
66	COM3	O	A	LCD 的 COM 輸出
67	COM2	O	A	LCD 的 COM 輸出
68	COM1	O	A	LCD 的 COM 輸出
69	COM0	O	A	LCD 的 COM 輸出
70	VLCD	P	P	LCD 的電壓源
71	NC	-	-	未使用
72	NC	-	-	未使用
73	NC	-	-	未使用
74	NC	-	-	未使用
75	NC	-	-	未使用
76	VDD	P	P	晶片工作電壓源
77	PT2.0/XTO PT2.0 XTO	I/O A	S A	數位輸入/輸出 外接振盪器輸出端
78	PT2.1/XTI PT2.1 XTI	I/O A	S A	數位輸入/輸出 外接振盪器輸入端
79	PT2.2/PWM0/PFD PT2.2 PWM0 PFD	I/O O O	C C C	數位輸入/輸出 PWM0 輸出接口 PFD 輸出接口
80	PT2.3/TMCKI/PWM1 PT2.3 TMCKI PWM1	I/O I O	S S C	數位輸入/輸出 TIMERC 時脈源輸入接口 PWM1 輸出接口

81	PT2.4/CCP0/PWM2	PT2.4 CCP0 PWM2	I/O I O	S S C	數位輸入/輸出 捕捉/比較模式信號接口 PWM2 輸出接口
82	PT2.5/CCP1/PWM3	PT2.5 CCP1 PWM3	I/O I O	S S C	數位輸入/輸出 捕捉/比較模式信號接口 PWM3 輸出接口
83	NC		-	-	未使用
84	NC		-	-	未使用
85	VDDA		P	P	穩壓器輸出，類比電路電壓源
86	ACM		P	P	內部類比電路共地引腳
87	OPO		A	A	運算放大器輸出
88	PT4.0/AI0	PT4.0 AI0	I A	C A	數位輸入 類比輸入通道
89	PT4.1/AI1	PT4.1 AI1	I A	C A	數位輸入 類比輸入通道
90	PT4.2/AI2	PT4.2 AI2	I A	C A	數位輸入 類比輸入通道
91	PT4.3/AI3	PT4.3 AI3	I A	C A	數位輸入 類比輸入通道
92	PT4.4/AI4	PT4.4 AI4	I A	C A	數位輸入 類比輸入通道
93	PT4.5/AI5	PT4.5 AI5	I A	C A	數位輸入 類比輸入通道
94	PT4.6/AI6	PT4.6 AI6	I A	C A	數位輸入 類比輸入通道
95	PT4.7/AI7	PT4.7 AI7	I A	C A	數位輸入 類比輸入通道
96	NC		-	-	未使用

HY11P35

Embedded 18-Bit $\Sigma\Delta$ ADC

8-Bit RISC-like Mixed Signal Microcontroller



97	NC	-	-	未使用
98	NC	-	-	未使用
99	NC	-	-	未使用
100	VSS	P	P	晶片工作電壓源接地端

表 2-1 引腳定義與功能說明

3. 應用電路

3.1 橋式感測器 I

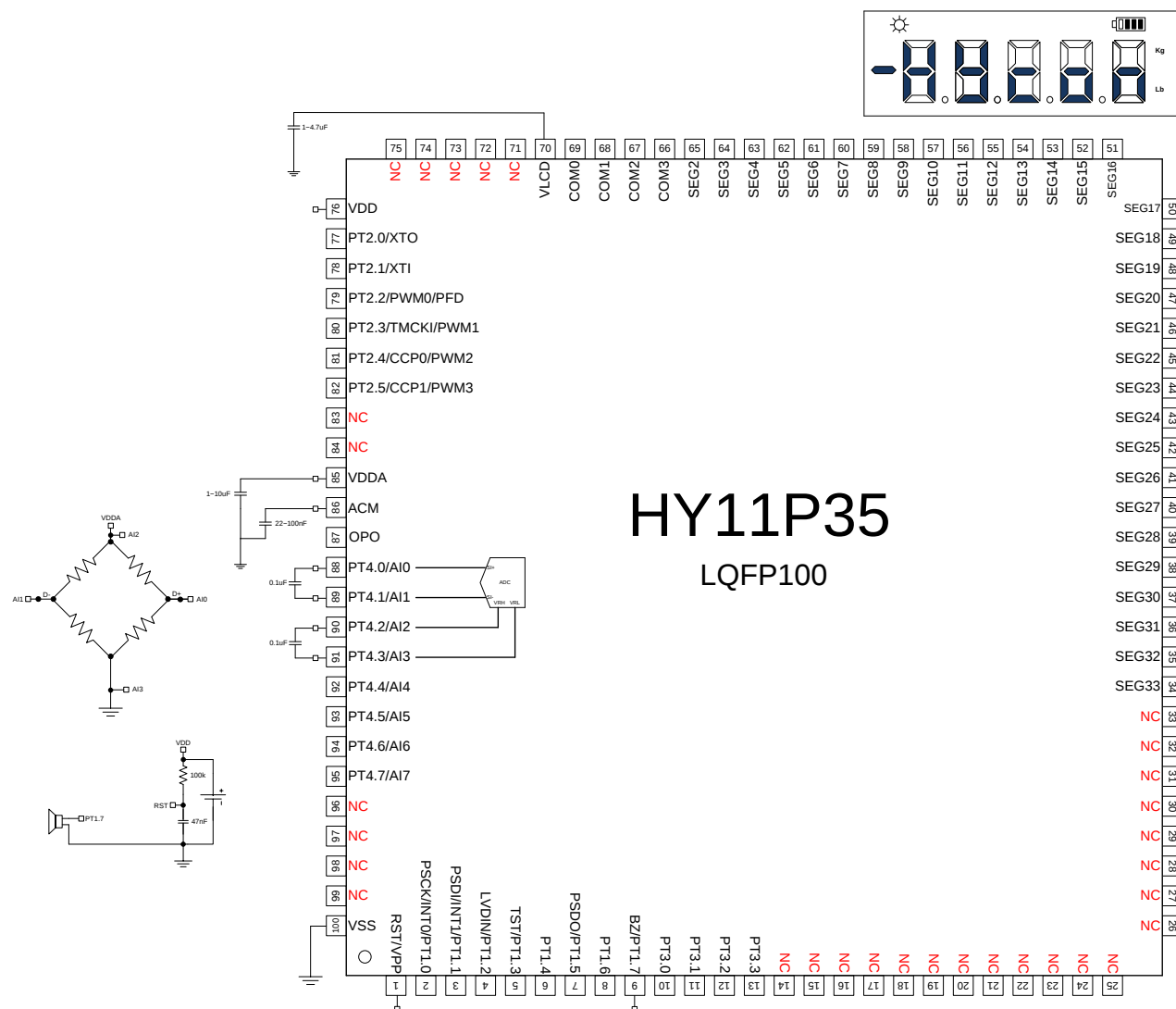
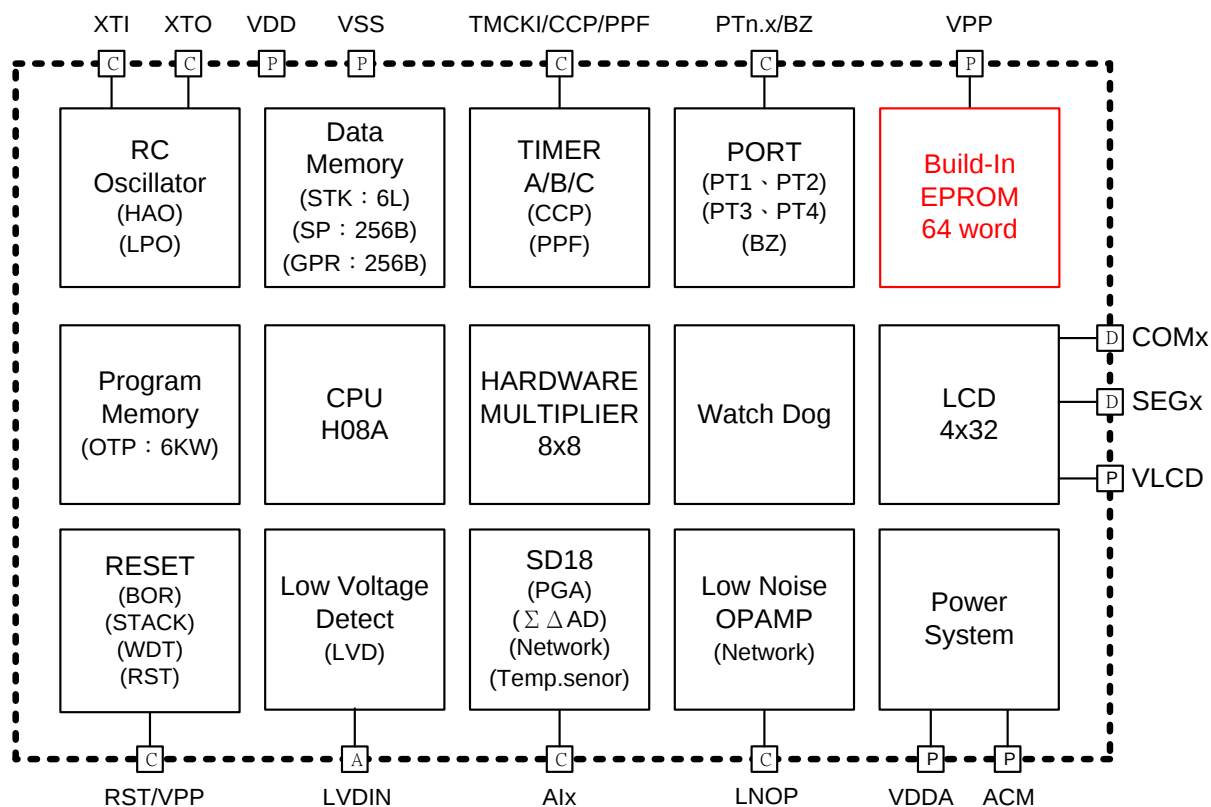


圖 3-1 橋式感測器應用電路

註：Load Cell 零點電壓位置可透過 DCSET[2:0]進行偏壓調整

4. 功能概述

4.1 内部方块图



P Power Pad
 D Digital Pad
 A Analog Pad
 C Common I/O Pad

圖 4-1 HY11P35 内部方块图

4.2 相關說明與支援文件

晶片功能相關使用說明書

DS-HY11P35-Vxx HY11P35 說明書

UG-HY11S14-Vxx HY11Pxx 系列使用說明書

APD-CORE002-Vxx H08A 指令說明書

開發工具相關使用說明書

APD-HYIDE006-Vxx HY11xxx 系列開發工具軟體使用說明書

APD-HYIDE005-Vxx HY11xxx 系列開發工具硬體使用說明書

APD-OTP001-Vxx OTP 產品燒錄引腳說明書

產品生產相關使用說明書

APD-HYIDE004-Vxx HY1xxxx 系列生產線專用燒錄器說明書

BDI-HY11P35-Vxx HY11P35 個別產品的裸片打線資訊

4.3 SD18 Network

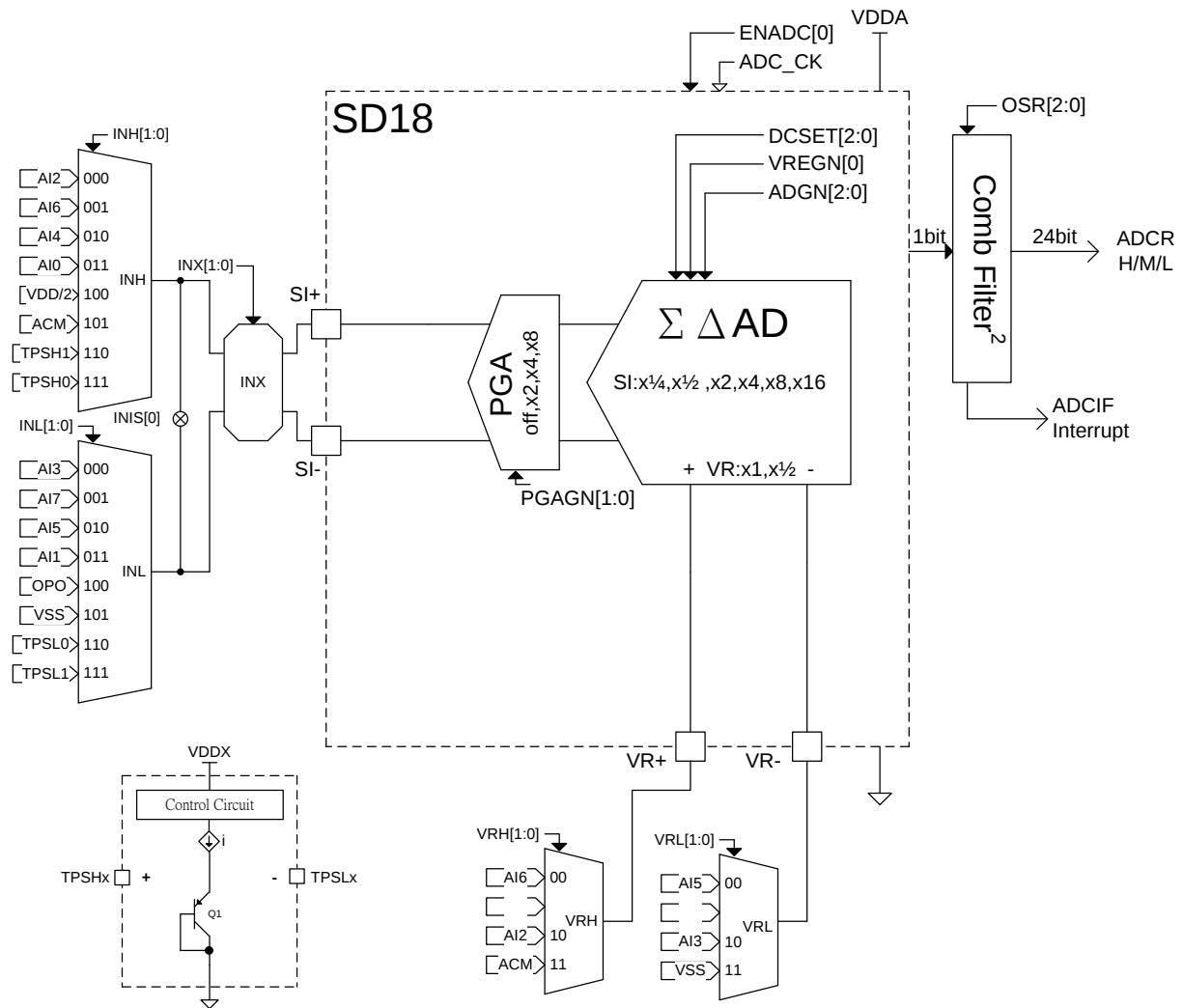


圖 4-2 SD18 Network

5. 暫存器列表

Register File Summary for H08A

“-”no use,“-”read/write,“w”write,“r”read,“r0”only read 0,“r1”only read 1,“w0”only write 0,“w1”only write 1 “.”unimplemented bit,“x”unknown,“u”unchanged,“d”depends on condition												
Address	File Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	A-RESET	i-RESET	R/W
00H	INDF0	Contents of FSR0 to address data memory -value of FSR0 not changed								N/A	N/A	*****
01H	POINC0	Contents of FSR0 to address data memory -value of FSR0 post-incremented								N/A	N/A	*****
02H	PODEC0	Contents of FSR0 to address data memory -value of FSR0 post-decremented								N/A	N/A	*****
03H	PRINC0	Contents of FSR0 to address data memory -value of FSR0 pre-incremented								N/A	N/A	*****
04H	PLUSW0	Contents of FSR0 to address data memory -value of FSR0 offset by W								N/A	N/A	*****
05H	INDF1	Contents of FSR1 to address data memory -value of FSR0 not changed								N/A	N/A	*****
06H	POINC1	Contents of FSR1 to address data memory -value of FSR0 post-incremented								N/A	N/A	*****
07H	PODEC1	Contents of FSR1 to address data memory -value of FSR0 post-decremented								N/A	N/A	*****
08H	PRINC1	Contents of FSR1 to address data memory -value of FSR0 pre-incremented								N/A	N/A	*****
09H	PLUSW1	Contents of FSR1 to address data memory -value of FSR0 offset by W								N/A	N/A	*****
0FH	FSR0H							FSR0[9]	FSR0[8]	xx	uu	-,-,-,-,-,*
10H	FSR0L	Indirect Data Memory Address Pointer 0 Low Byte,FSR0[7:0]								xxxx xxxx	uuuu uuuu	*****
11H	FSR1H							FSR1[9]	FSR1[8]	xx	uu	-,-,-,-,-,*
12H	FSR1L	Indirect Data Memory Address Pointer 1 Low Byte,FSR1[7:0]								xxxx xxxx	uuuu uuuu	*****
16H	TOSH			TOS[13]	TOS[12]	TOS[11]	TOS[10]	TOS[9]	TOS[8]	..00 0000	..00 0000	-,-,-,-,-,*
17H	TOSL	Top-of-Stack Low Byte (TOS<7:0>)								0000 0000	0000 0000	*****
18H	STKPTR	STKFL	STKUN	STKOV			STKPRT[2]	STKPRT[1]	STKPRT[0]	000..000	000..000	r,rw0,rw0,-,-,r,r,r
1AH	PCLATH			PC[13]	PC[12]	PC[11]	PC[10]	PC[9]	PC[8]	..00 0000	..00 0000	-,-,-,-,-,*
1BH	PCLATL	PC Low Byte for PC<7:0>								0000 0000	0000 0000	*****
1DH	TBLPTRH			TBLPTR[13]	TBLPTR[12]	TBLPTR[11]	TBLPTR[10]	TBLPTR[9]	TBLPTR[8]	..00 0000	..00 0000	-,-,-,-,-,*
1EH	TBLPTL	Program Memory Table Pointer Low Byte (TBLPTR<7:0>)								0000 0000	0000 0000	*****
1FH	TBLDH	Program Memory Table Latch High Byte								0000 0000	0000 0000	*****
20H	TBLDL	Program Memory Table Latch Low Byte								0000 0000	0000 0000	*****
21H	PRODH	Product Register of Multiply High Byte								xxxx xxxx	uuuu uuuu	r,r,r,r,r,r,r,r
22H	PRODL	Product Register of Multiply Low Byte								xxxx xxxx	uuuu uuuu	r,r,r,r,r,r,r,r
23H	INTE1	GIE	ADCIE	TMCIE	TMBIE	TMAIE	WDTIE	E1IE	E0IE	0000 0000	0000 0000	*****
24H	INTE2							CCP1IE	CCP0IE	00	00	-,-,-,-,-,*
26H	INTF1		ADCIF	TMCIF	TMBIF	TMAIF	WDTIF	E1IF	E0IF	..00 0000	..00 0000	-,-,-,-,-,*
27H	INTF2							CCP1IF	CCP0IF	00	00	-,-,-,-,-,*
29H	WREG	Working Register								xxxx xxxx	uuuu uuuu	*****
2AH	BSRCN								BSR[0]	0	0	-,-,-,-,-,*
2BH	STATUS				C	DC	N	OV	Z	...x xxxx	...u uuuu	-,-,-,-,-,*
2CH	PSTATUS	PD	TO	IDLEB	BOR		SKERR			000d ..0	uduu d..	rw0,rw0,rw0,rw0,-,rw0,-,-
2DH	LVDCN		LVDFG	LVD	LVDON		VLDX[3:0]			..00 0000	..00 uuuu	-,-,r,r,r,*,*,*
30H	PWRCN	ENVDDA	VDDAX[1:0]		ENACM					0000	0000	*****
31H	MCKCN1		ADCS[2:0]		ADCCK	XTHSP	XTSP	ENXT	ENHAO	0000 0001	0000 0001	*****
32H	MCKCN2			LSCK	HSCK	HSS[1:0]		CPUCK[1:0]		..00 0000	..00 0000	-,-,*,*,*,*,*
33H	MCKCN3		LCDS[2:0]				PERCK	BZS[2:0]		000..0000	000..0000	***-*****
37H	OPCN1	ENOP	OPM[1:0]		OPP[1:0]		OPN[2:0]			0000 0000	0000 0000	*****
39H	ADCRH	ADC conversion memory HighByte								xxxx xxxx	uuuu uuuu	r,r,r,r,r,r,r,r
3AH	ADCRM	ADC conversion memory Middle Byte								xxxx xxxx	uuuu uuuu	r,r,r,r,r,r,r,r
3BH	ADCRL	ADC conversion memory Low Byte								xxxx xxxx	uuuu uuuu	r,r,r,r,r,r,r,r
3CH	ADCCN1	ENADC		ENCHP	PGAGN[1:0]		ADGN[2:0]			0000 0000	0000 0000	*****
3DH	ADCCN2			INBUF=0	VRBUF=0	VREGN	DCSET[2:0]			..00 0000	..00 0000	-,-,r0,r0,*,*,*
3EH	ADCCN3		OSR[2:0]							000..	000..	***,-,-,-,-,-
3FH	AINET1		INH[2:0]		INL[2:0]			INIS	OPIS	0000 0000	0000 0000	*****
40H	AINET2		VRH[1:0]		INX[1:0]		VRL[1:0]			..000 0000	..000 0000	-,-,-,-,-,*
41H	TMACN	ENTMA	TMACK	TMAS[1:0]		ENWDT	WDTS[2:0]			0000 0000	0000 0000	*** w1,***
42H	TMAR	TimerA data register								xxxx xxxx	uuuu uuuu	r,r,r,r,r,r,r,r
43H	TMBCN	ENTMB	TMACK	TMBS[1:0]		TMBSYC	TMBR2R			0000 00..	0000 00..	*****,-
44H	TMBRH	TimerB High Byte data register								xxxx xxxx	uuuu uuuu	*****
45H	TMBRL	TimerB Low Byte data register								xxxx xxxx	uuuu uuuu	*****
46H	TMCCN	ENTMC	TMCK[1:0]		TMCS[2:0]		TMCS0[1:0]			0000 0000	0000 0000	*****
47H	PRC	TimerC programmable register								1111 1111	1111 1111	*****
48H	TMCR	TimerC register								0000 0000	0000 0000	r,r,r,r,r,r,r,r
49H	CCPCN		CCP1M[3:0]			CCP0M[3:0]				0000 0000	0000 0000	*****
4AH	CCP0RH	CCP0 High Byte data register								xxxx xxxx	uuuu uuuu	*****
4BH	CCP0RL	CCP0 Low Byte data register								xxxx xxxx	uuuu uuuu	*****
4CH	CCP1RH	CCP1 High Byte data register								xxxx xxxx	uuuu uuuu	*****
4DH	CCP1RL	CCP1 Low Byte data register								xxxx xxxx	uuuu uuuu	*****
4EH	PASC	PASF		PASCF[1:0]		PSSCN0[1:0]		PSSCN1[1:0]		0.00 0000	0.00 0000	-,-,*,*,*,*,*
4FH	PWMCN	ENPWM	ENPFD	PWMRL[1:0]		PWMCG[1:0]		PWMM[1:0]		0000 0000	0000 0000	*****
50H	PDBD	ENPRS DBDC[6:0]								0000 0000	0000 0000	*****
51H	PWMR	PWM MSB Byte register								xxxx xxxx	uuuu uuuu	*****

表 5-1(a) HY11P35 暫存器列表

HY11P35

Embedded 18-Bit Σ ADC

8-Bit RISC-like Mixed Signal Microcontroller

Register File Summary for H08A

“-”no use, “r”read/write, “w”write, “r”read, “r0”only read 0, “r1”only read 1, “w0”only write 0, “w1”only write 1 “.”unimplemented bit, “x”unknown, “u”unchanged, “d”depends on condition												
Address	File Name	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0	A-RESET	i-RESET	R/W
52H	LCDCN1	ENLCD	LC DPR	VLCDX[1:0]		LCDBF	LCDBI[1:0]=10			0000 010.	0000 010.	*****,r1,r0,-
53H	LCDCN2	LCDBL	LCDBMX[1:0]=11							011.	011.	*,r1,r1,-,-,-,-
54H	LCD0	Segment SEG2@[3:0] and SEG3@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
55H	LCD1	Segment SEG4@[3:0] and SEG5@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
56H	LCD2	Segment SEG6@[3:0] and SEG7@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
57H	LCD3	Segment SEG8@[3:0] and SEG9@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
58H	LCD4	Segment SEG10@[3:0] and SEG11@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
59H	LCD5	Segment SEG12@[3:0] and SEG13@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
5AH	LCD6	Segment SEG14@[3:0] and SEG15@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
5BH	LCD7	Segment SEG16@[3:0] and SEG17@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
5CH	LCD8	Segment SEG18@[3:0] and SEG19@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
5DH	LCD9	Segment SEG20@[3:0] and SEG21@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
6AH	PT4	PT4.7	PT4.6	PT4.5	PT4.4	PT4.3	PT4.2	PT4.1	PT4.0	xxxx xxxx	uuuu uuuu	r,r,r,r,r,r,r,r
6BH	PT4DA	DA4.7	DA4.6	DA4.5	DA4.4	DA4.3	DA4.2	DA4.1	DA4.0	1111 1111	1111 1111	*****
6CH	PT4PU	PU4.7	PU4.6	PU4.5	PU4.4	PU4.3	PU4.2	PU4.1	PU4.0	0000 0000	0000 0000	*****
6DH	PT1	PT1.7	PT1.6	PT1.5	PT1.4	PT1.3	PT1.2	PT1.1	PT1.0	xxxx xxxx	uuuu uuuu	*****,r,r,r,r
6EH	TRISC1	TC1.7	TC1.6	TC1.5	TC1.4					0000	0000	***-,-,-,-
6FH	PT1DA						DA1.2			 0..	 0..	-,-,-,-,*-,-,-
70H	PT1PU	PU1.7	PU1.6	PU1.5	PU1.4	PU1.3	PU1.2	PU1.1	PU1.0	0000 0000	0000 0000	*****
71H	PT1M1					INTEG1[1:0]		INTEG0[1:0]		 0000	 0000	-,-,-,-,****
72H	PT1M2		PM1.7[0]							.0.	.0.	-,*-,-,-,-,-
74H	PT2			PT2.5	PT2.4	PT2.3	PT2.2	PT2.1	PT2.0	..xx xxxx	..uu uuuu	-,-,*****
75H	TRISC2			TC2.5	TC2.4	TC2.3	TC2.2	TC2.1	TC2.0	..00 0000	..00 0000	-,-,*****
77H	PT2PU			PU2.5	PU2.4	PU2.3	PU2.2	PU2.1	PU2.0	..00 0000	..00 0000	-,-,*****
78H	PT2M1		PM2.3[0]	PM2.2[1]	PM2.2[0]					.000	.000	-,*-,-,-,-
79H	PT2M2	PWMTR[1]	PWMTR[0]			PM2.5[1]	PM2.5[0]	PM2.4[1]	PM2.4[0]	00.. 0000	00.. 0000	*-,-,-,*****
7AH	PT3					PT3.3	PT3.2	PT3.1	PT3.0	 xxxx	 uuuu	-,-,-,-,*-,-,-
7BH	TRISC3					TC3.3	TC3.2	TC3.1	TC3.0	 0000	 0000	-,-,-,-,****
7DH	PT3PU					PU3.3	PU3.2	PU3.1	PU3.0	 0000	 0000	-,-,-,-,*-,-,-
80H ~ FFH	GPR0	General Purpose Register as 128Byte								xxxx xxxx	uuuu uuuu	*****
100H~17FH	GPR1	General Purpose Register as 128Byte								xxxx xxxx	uuuu uuuu	*****
180H	LCD10	Segment SEG22@[3:0] and SEG23@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
181H	LCD11	Segment SEG24@[3:0] and SEG25@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
182H	LCD12	Segment SEG26@[3:0] and SEG27@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
183H	LCD13	Segment SEG28@[3:0] and SEG29@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
184H	LCD14	Segment SEG30@[3:0] and SEG31@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
185H	LCD15	Segment SEG32@[3:0] and SEG33@[7:4] data register of LCD								xxxx xxxx	uuuu uuuu	*****
195H	BICTRL					VPP_HIGH		BIEWR	BIERD	1000 d000	1000 d000	-,-,-,-,*r0,*
197H	BIEPTRL	0	0	BIE_ADDR[5:0]						0000 0000	0000 0000	w0,w0,*****
198H	BIEDH	BIE_DATA[15:8]								xxxx xxxx	xxxx xxxx	*****
199H	BIEDL	BIE_DATA[7:0]								xxxx xxxx	xxxx xxxx	*****

圖 5-1(b) HY11P35 暫存器列表(續)

6. 電氣特性

Absolute maximum ratings over operating free-air temperature (unless otherwise noted)

Voltage applied at V_{DD} to V_{SS}	−0.2 V to 4.0 V
Voltage applied to any pin	−0.2 V to $V_{DD} + 0.3$ V
Voltage applied to RST/VPP pin	−0.2 V to 6.9 V
Voltage applied to TST/PT1.3 pin	−0.2 V to $V_{DD} + 1$ V
Diode current at any device terminal	±2 mA
Storage temperature, Tstg: (unprogrammed device)	−55°C to 150°C
(programmed device)	−40°C to 85°C
Total power dissipation.	0.5W
Maximum output current sink by any PORT1 to PORT3 I/O pin.	.25mA

6.1 Recommended operating conditions

$T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$, unless otherwise noted

Sym.	Parameter		Test Conditions		Min.	Typ.	Max.	unit
V _{DD}	Supply Voltage		All digital peripherals and CPU		2.2		3.6	V
			Analog peripherals		2.4		3.6	
V _{SS}	Supply Voltage				0		0	
XT	External	Watch crystal	V _{DD} = 2.2V, ENXT[0]=1	XTSP[0]=0, XTHSP[0]=0	32.768K		Hz	
	Oscillator	Ceramic resonator		XTSP[0]=1, XTHSP[0]=0	450K	8M		
	Frequency	Crystal		XTSP[0]=1, XTHSP[0]=0	1M	8M		

6.2 Internal RC Oscillator

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions	Min.	Typ.	Max.	unit
HAO	High Speed Oscillator frequency	ENHAO[0]=1	1.8	2.0	2.2	MHz
LPO	Low Power Oscillator frequency	V_{DD} supply voltage be enable LPO	22	28	35	KHz

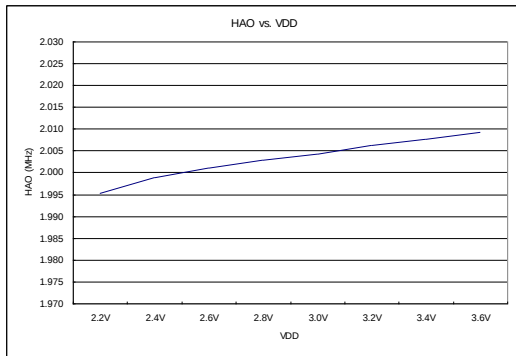


Figure 6.2-1 HAO vs. VDD

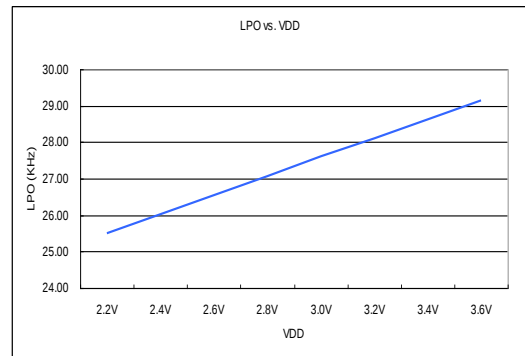


Figure 6.2-2 LPO vs. VDD

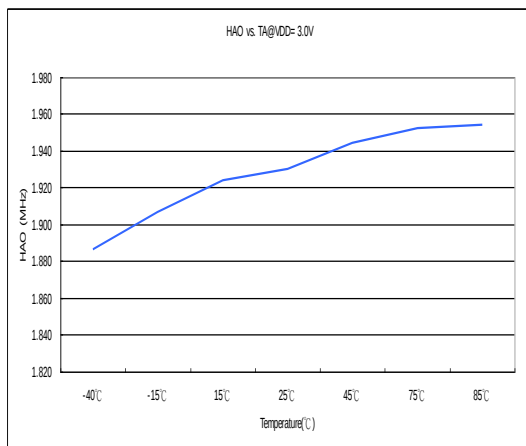


Figure 6.2-3 HAO vs. Temperature

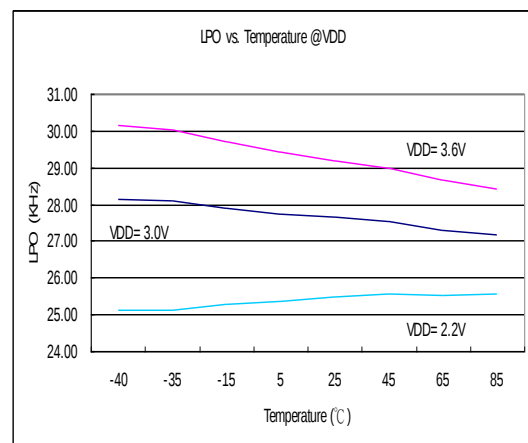


Figure 6.2-4 LPO vs. Temperature

6.3 Supply current into VDD excluding peripherals current

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $\text{OSC_LPO} = 28\text{KHz}$, unless otherwise noted

Sym.	Parameter	Test Conditions	Min.	Typ.	Max.	unit
I_{AM1}	Active mode 1	$\text{OSC_CY} = 8\text{MHz}$, $\text{OSC_HAO} = \text{off}$, $\text{CPU_CK} = 8\text{MHz}$		1.34	2	mA
I_{AM2}	Active mode 2	$\text{OSC_CY} = \text{off}$, $\text{OSC_HAO} = 2\text{MHz}$, $\text{CPU_CK} = 2\text{MHz}$		0.36	0.55	mA
I_{AM3}	Active mode 3	$\text{OSC_CY} = \text{off}$, $\text{OSC_HAO} = 2\text{MHz}$, $\text{CPU_CK} = 1\text{MHz}$		0.2	0.3	mA
I_{LP1}	Low Power 1	$\text{OSC_CY} = 32768\text{Hz}$, $\text{OSC_HAO} = \text{off}$, $\text{CPU_CK} = 16384\text{Hz}$		7	12	μA
I_{LP2}	Low Power 2	$\text{OSC_CY} = \text{off}$, $\text{OSC_HAO} = \text{off}$, $\text{CPU_CK} = \text{LPO}$, Idle state		1.65	3	μA
I_{LP3}	Low Power 3	$\text{OSC_CY} = \text{off}$, $\text{OSC_HAO} = \text{off}$, $\text{CPU_CK} = \text{off}$, Sleep state		0.65	1.2	μA

OSC_CY : External Oscillator frequency.

OSC_HAO : Internal High Accuracy Oscillator frequency.

CPU_CK : CPU core work frequency.

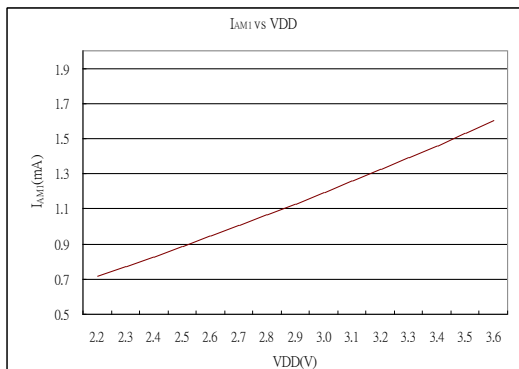


Figure 6.3-1 I_{AM1} vs. VDD

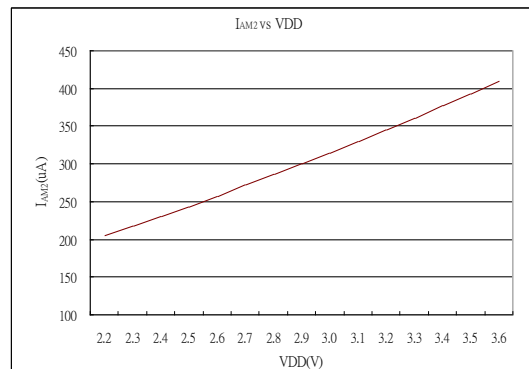


Figure 6.3-2 I_{AM2} vs. VDD

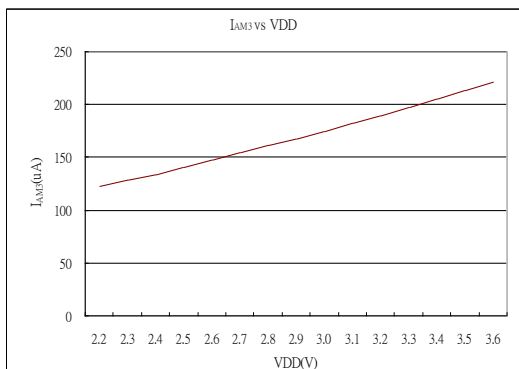


Figure 6.3-3 I_{AM3} vs. VDD

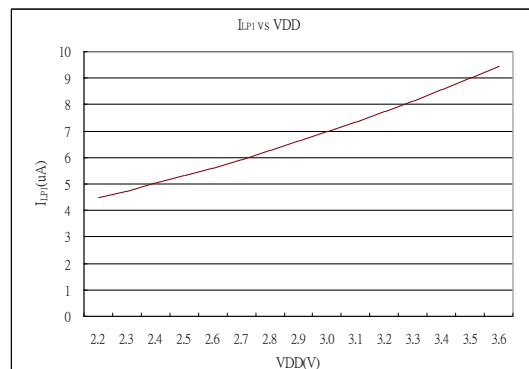


Figure 6.3-4 I_{LP1} vs. VDD

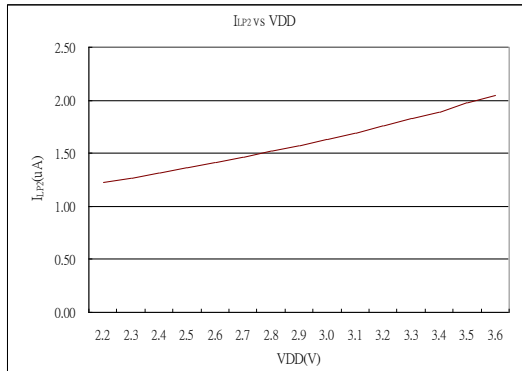


Figure 6.3-5 I_{LP2} vs. VDD

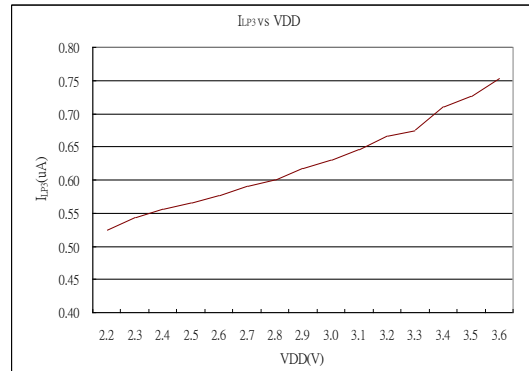


Figure 6.3-6 I_{LP3} vs. VDD

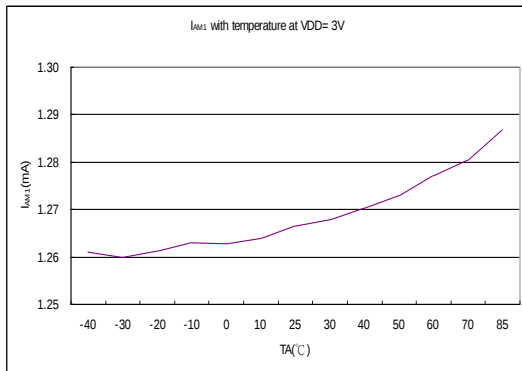


Figure 6.3-7 I_{AM1} vs. Temperature

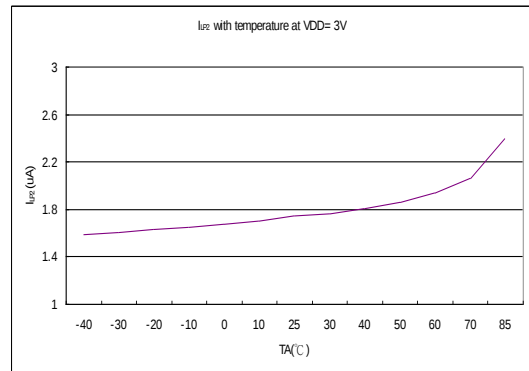


Figure 6.3-8 I_{LP2} vs. Temperature

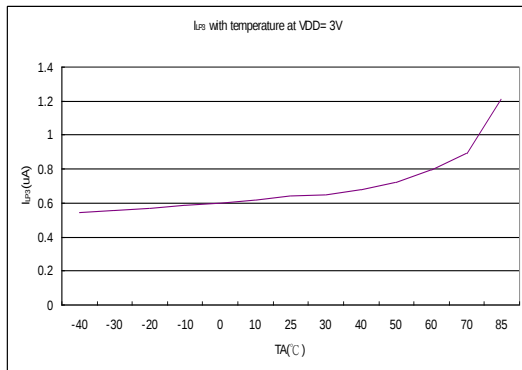
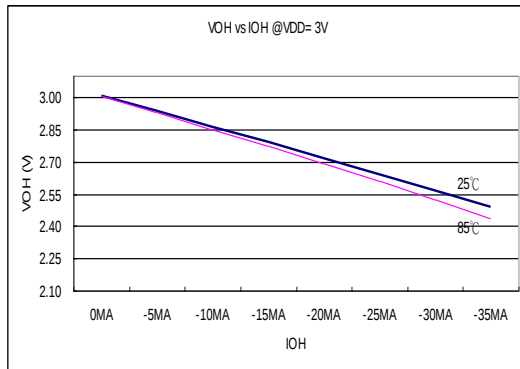
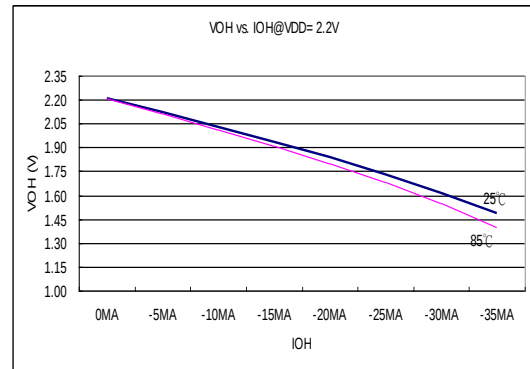
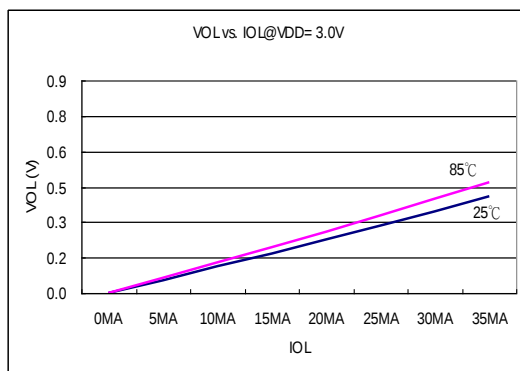
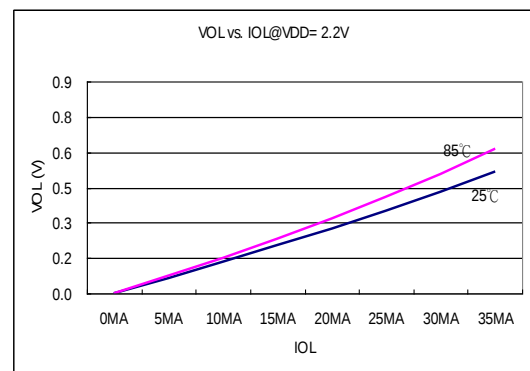


Figure 6.3-9 I_{LP3} vs. Temperature

6.4 Port1~4

 $T_A = 25^\circ\text{C}, V_{DD} = 3.0\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions	Min.	Typ.	Max.	unit
Input voltage and Schmitt trigger and leakage current and timing						
V_{IH}	High-Level input voltage				2.1	V
V_{IL}	Low-Level input voltage		0.9			
V_{hys}	Input Voltage hysteresis($V_{IH} - V_{IL}$)			0.8		V
I_{LKG}	Leakage Current				0.1	μA
R_{PU}	Port pull high resistance			180		$\text{k}\Omega$
Output voltage and current and frequency						
V_{OH}	High-level output voltage	$I_{OH}=10\text{mA}$	$V_{DD} - 0.3$			V
V_{OL}	Low-level output voltage	$I_{OL}=-10\text{mA}$			$V_{SS} + 0.3$	

Figure 6.4-1 V_{OH} vs. I_{OH} @ $V_{DD}=3.0\text{V}$ Figure 6.4-2 V_{OH} vs. I_{OH} @ $V_{DD}=2.2\text{V}$ Figure 6.4-3 V_{OL} vs. I_{OL} @ $V_{DD}=3.0\text{V}$ Figure 6.4-4 V_{OL} vs. I_{OL} @ $V_{DD}=2.2\text{V}$

6.5 Reset(Brownout, External RST pin, Low Voltage Detect)

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions	Min.	Typ.	Max.	unit
BOR	Pulse length needed to accepted reset internally, t_{d-LVR}		2			us
	V_{DD} Start Voltage to accepted reset internally (L→H), V_{LVR}		1.6	1.85	2.1	V
	Hysteresis, $V_{HYS-LVR}$			70		mV
RST	Pulse length needed as RST/VPP pin to accepted reset internally, t_{d-RST}		2			us
	Input Voltage to accepted reset internally		0.9			V
	Hysteresis, $V_{HYS-RST}$			0.8		V
LVD	Operation current, I_{LVD}			10	15	uA
	External input voltage to compare reference voltage			1.2		V
	Compare reference voltage temperature drift	$T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$		100		ppm/ $^\circ\text{C}$
	Detect V_{DD} voltage error			2		%
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=1110b$			3.3		V
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=1101b$			3.2		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=1100b$			3.1		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=1011b$			3.0		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=1010b$			2.9		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=1001b$			2.8		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=1000b$			2.7		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=0111b$			2.6		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=0110b$			2.5		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=0101b$			2.4		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=0100b$			2.3		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=0011b$			2.2		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=0010b$			2.1		
	Detect V_{DD} voltage rang by user option, $V_{SVS} VLDx[3:0]=0001b$			2.0		

BOR : Brownout Reset

LVR : Low Voltage Reset of BOR

LVD : Low Voltage Detect

RST : External Reset pin

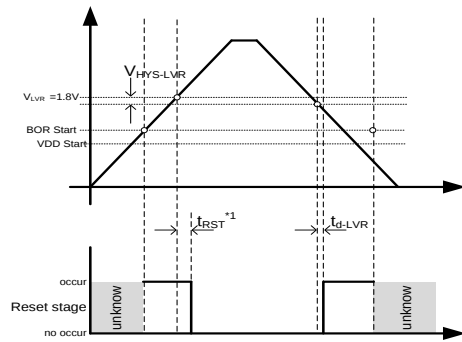


Figure 6.5-1 BOR reset diagram

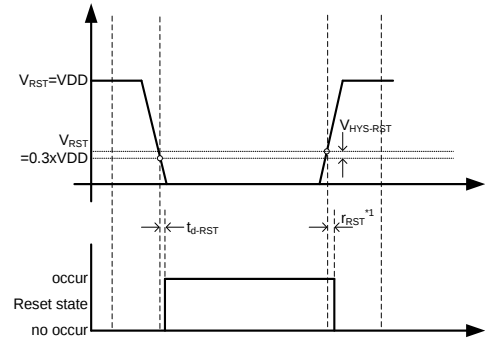


Figure 6.5-2 RST reset diagram

*1 t_{RST} : Please see BOR Introduce of HY11Pxx series User's Guide (UG-HY11S14-Vxx).

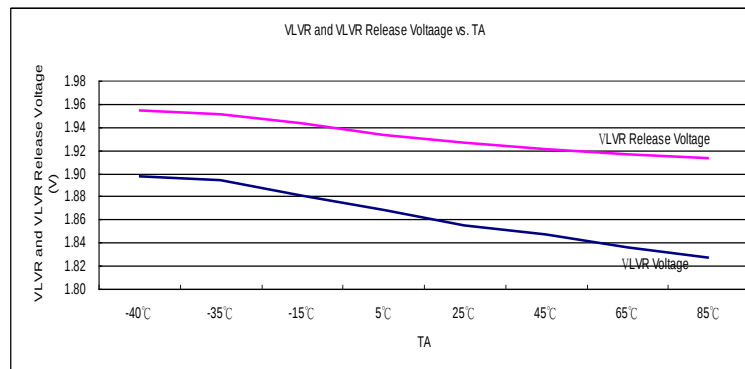


Figure 6.5-3 LVR vs. Temperature

6.6 Power System

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions		Min	Typ.	Max.	unit
				.			
VDDA	VDDA operation current, I _{VDDA}	I _L = 0mA	VDDAX[1:0]=00b	22			uA
	Select VDDA output voltage	I _L = 0.1mA, VDD≥ VDDA+0.2V	VDDAX[1:0]=00b	3.3			V
			VDDAX[1:0]=01b	2.9			V
			VDDAX[1:0]=10b	2.6			V
			VDDAX[1:0]=11b	2.4			V
	Dropout voltage	I _L = 10mA	VDDAX[1:0]=00b	135			mV
			VDDAX[1:0]=01b	150			mV
			VDDAX[1:0]=10b	165			mV
			VDDAX[1:0]=11b	180			mV
	Temperature drift	VDDX[1:0]=11b	T _A =-40°C~85°C	50			ppm/°C
V _{DD} Voltage drift	I _L = 0.1mA		V _{DD} =2.5V~3.6V	±0.2			%/V
ACM	ACM operation current, I _{ACM}	I _L = 0mA		20			uA
	Output voltage ,V _{ACM}	ENACM[0]=1	I _L = 0uA	1.0			V
	Output voltage with Load		I _L = ±200uA	0.98	1.02	V _{ACM}	
	Temperature drift	ENACM[0]=1,	T _A =-40°C~85°C	50			ppm/°C
	VDDA Voltage drift	I _L = 10uA		100			uV/V
VDDA : Adjust Voltage Regulator							
ACM : Analog Common Voltage							

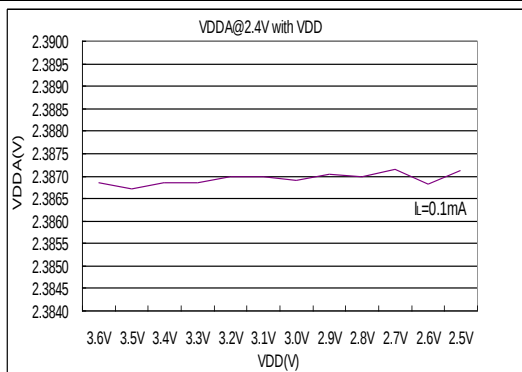


Figure6.6-1 VDDA $I_L=0.1\text{mA}$ vs. VDD

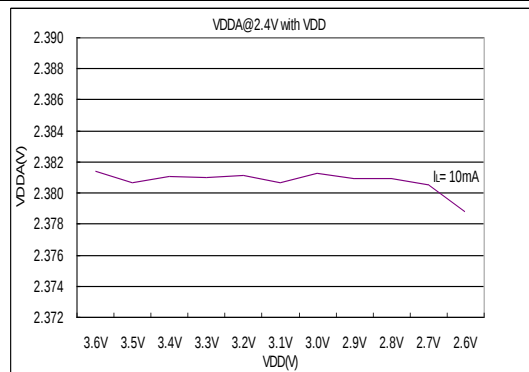


Figure6.6-2 VDDA $I_L=10\text{mA}$ vs. VDD

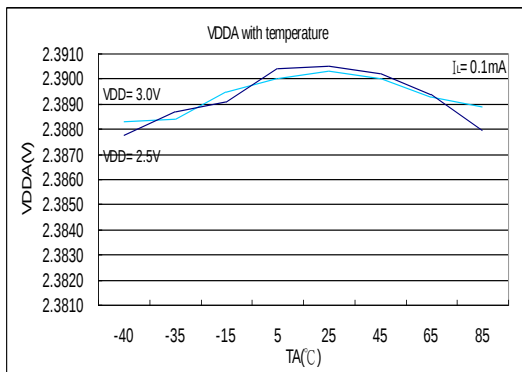


Figure 6.6-3 VDDA $I_L=0.1\text{mA}$ vs. VDD

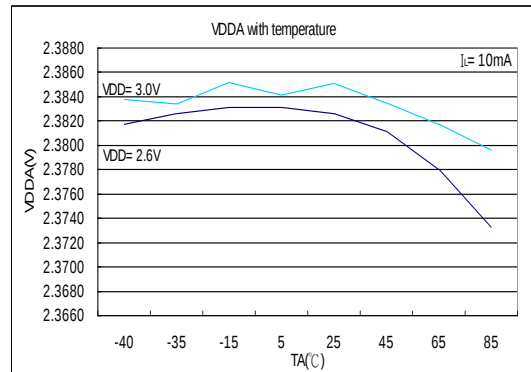


Figure 6.6-4 VDDA $I_L=0.1\text{mA}$ vs. VDD

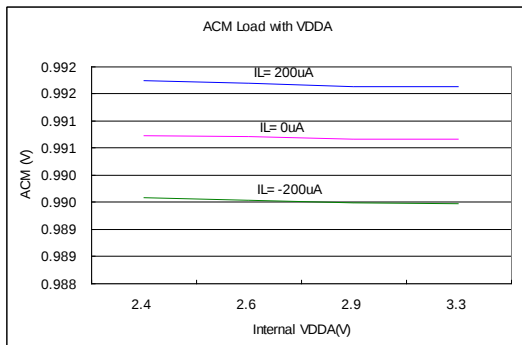


Figure 6.6-5 ACM Load vs. VDDA

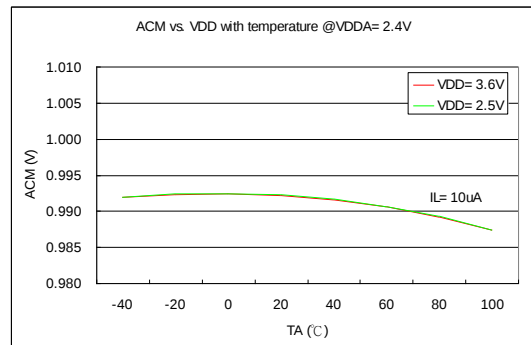


Figure 6.6-6 ACM vs. Temperature

6.7 LCD

 $T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $C_{VLCD} = 4.7\mu\text{F}$, unless otherwise noted.

Sym.	Parameter	Test Conditions		Min.	Typ.	Max.	unit
I_{LCD}	Operation supply current without output buffer.(all segment turn on)	LCDPR[0]=1	$V_{DD} = 2.2\text{V}$	20			μA
			$V_{DD} = 3.0\text{V}$				
VLCD	Supply Voltage at VLCD pin	LCDPR[0]=0		2.2		3.6	V
	Embedded Charge Pump output voltage at VLCD pin	$V_{DD} = 2.2\text{V}$, LCDPR[0]=1, $C_{VLCD} = 4.7\mu\text{F}$	VLCDX[1:0]=11b	2.295	2.55	2.805	V
			VLCDX[1:0]=10b	2.52	2.8	3.08	
			VLCDX[1:0]=01b	2.745	3.05	3.355	
			VLCDX[1:0]=00b	2.97	3.3	3.63	
Z_{LCD}	Output impedance with LCD buffer	$f_{LCD} = 128\text{Hz}$, VLCD=3.05V		10			$\text{k}\Omega$

曲線圖：

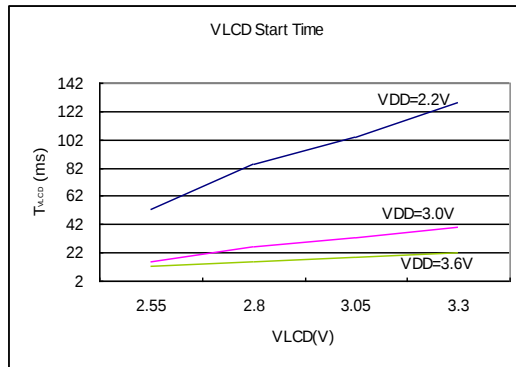


Figure6.7-1 LCD start time

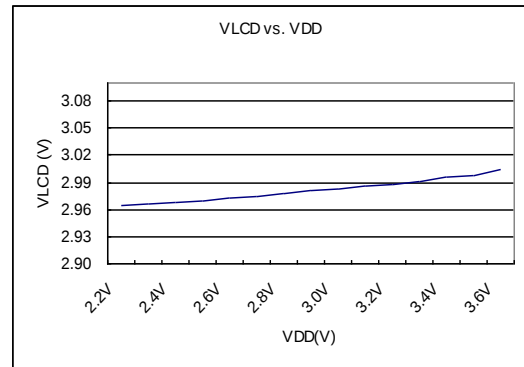
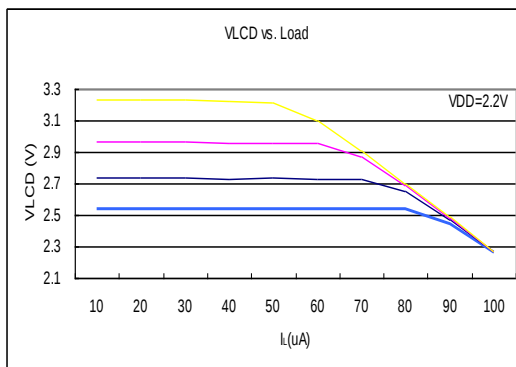
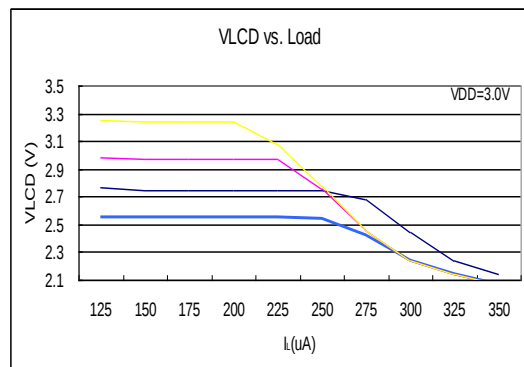


Figure6.7-2 VLCD vs. VDD

Figure6.7-3 VLCD vs. I_L @VDD=2.2VFigure6.7-4 VLCD vs. I_L @VDD=3.0V

6.8 Low Noise OPAMP

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $V_{DDA} = 2.4\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions		Min.	Typ.	Max.	unit
V_{LNO}	Supply voltage at V_{DDA}	ENVDDA[0]=0		2.4		3.6	V
I_{LNO}	Operation supply current		OPM[1:0]=xxb		200		μA
V_{OS-OP}	Input offset voltage without chopper.		OPM[1:0]=1xb	-2		2	mV
	Input offset voltage with chopper		OPM[1:0]=0xb		20		μV
	Input offset voltage temperature drift.	OPM[1:0]=00b	$T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$		0.1		$\mu\text{V}/^\circ\text{C}$
		OPM[1:0]=10			2		
V_{OLR}	Unit gain load regulation	$V_O = 1.2\text{V}$, $V_{DDA} = 2.4\text{V}$	$I_L = +1\text{mA}$		0.1		% V_O
			$I_L = -1\text{mA}$				
CMVR	Common-mode voltage input range		OPM[1:0]=xxb	0.1		$V_{DDA} - 1.1$	V
CMRR	Common-mode rejection ratio		OPM[1:0]=xxb		90		dB

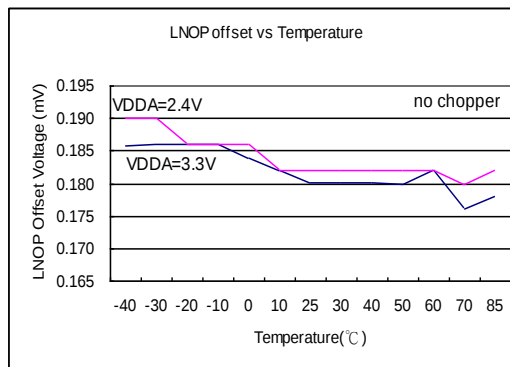


Figure 6.8-1 LNOP Offset Temperature

6.9 SD18, Power Supply and recommended operating conditions

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $V_{DDA} = 2.4\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions		Min.	Typ.	Max.	unit
V_{SD18}	Supply Voltage at VDDA	ENVDDA[0]=0		2.4		3.6	V
f_{SD18}	Modulator sample frequency, ADC_CK			25	250	300	KHz
	Over Sample Ratio, OSR			256		32768	
I_{SD18}	Operation supply current without PGA	ENADC[0]=1	GAIN =4, ADC_CK=250KHz		120		μA

6.9.1 PGA, Power Supply and recommended operating conditions

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $V_{DDA} = 2.4\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions		Min.	Typ.	Max.	unit
V_{PGA}	Supply Voltage at VDDA	ENVDDA[0]=0		2.4		3.6	V
I_{PGA}	Operation supply current	PGAGN[1:0]=<01> or <1x>			320		μA
G_{PGA}	Gain temperature drift	$T_A = -40^\circ\text{C} \sim 85^\circ\text{C}$	GAIN=2 ~ 8		5		ppm/ $^\circ\text{C}$

6.9.2 SD18, performance II ($f_{SD18}=250\text{KHz}$)

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $V_{DDA} = 2.9\text{V}$, $V_{VR} = 1.0\text{V}$, GAIN=1 without PGA, unless otherwise noted

Sym.	Parameter	Test Conditions		Min.	Typ.	Max.	unit
INL	Integral Nonlinearity(INL)	VDDA=2.4V,V _{VR} =1.0V,ΔSI=±200mV		±0.003		±0.01	%FSR
		VDDA=2.4V,V _{VR} =1.0V,ΔSI=±450mV					
	No Missing Codes ³	ADC_CK=250KHz,OSR[2:0]=010b		23			Bits
G _{SD18}	Temperature drift Gain 1~x16		T _A = -40°C~ 85°C	2			ppm/°C
E _{OS}	Offset error of Full Scale Rang input voltage range with Chopper without PGA	ΔAI=0V ΔVR=0.9V	Gain=2	1			%FSR
	Offset error temperature drift with chopper without PGA	DCSET[2:0]=<000> *ΔAI is external short	GAIN=1	2		μV/°C	
			GAIN=2	1			
			GAIN=4	0.5			
			GAIN=16	0.15			
	Offset temperature drift with chopper		GAIN=128	0.02			
CM _{SD18}	Common-mode rejection	V _{CM} =0.7V to 1.7V,	V _{SI} =0V,	90			dB

		$V_{VR}=1.0V$, without PGA	GAIN=1		
		$V_{CM}=0.7V$ to $1.7V$, $V_{VR}=1.0V$, without PGA	$V_{SI}=0V$, GAIN=16	75	
PSRR	DC power supply rejection	$V_{DDA}=3.0V$, $\Delta V_{DDA}=\pm 100m$ V , $V_{VR}=1.0V$, $V_{SI}=1.2V$, $V_{SI}=1.2V$,	GAIN=1 PGA=off GAIN=16 PGA=8	75	dB

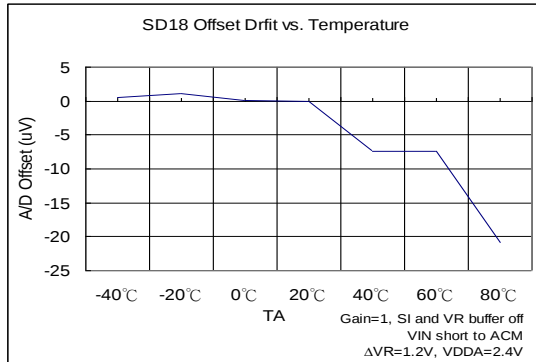


Figure 6.9-1(a) SD18 Offset Temperature drift

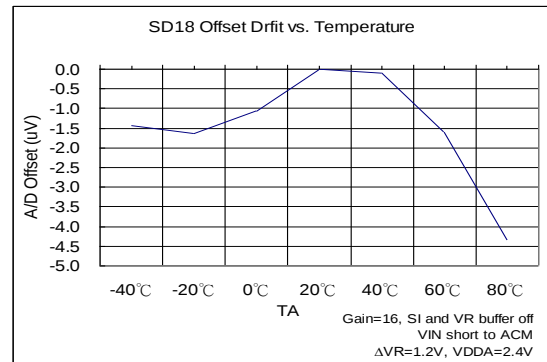


Figure 6.9-1(b) SD18 Offset Temperature drift

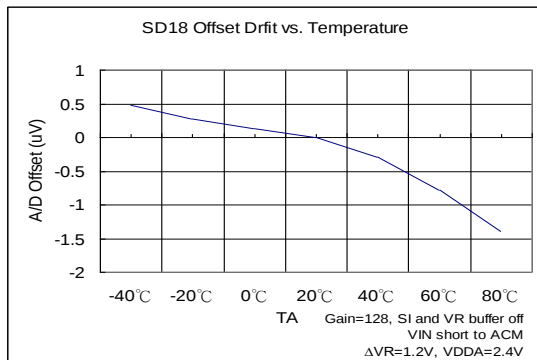


Figure 6.9-1(c) SD18 Offset Temperature drift

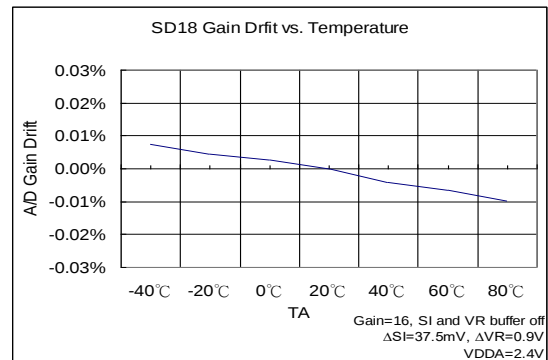


Figure 6.9-2(b) SD18 Gain drift with temperature

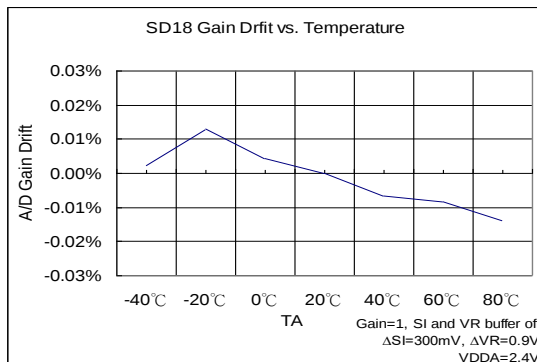


Figure 6.9-2(a) SD18 Gain drift with temperature

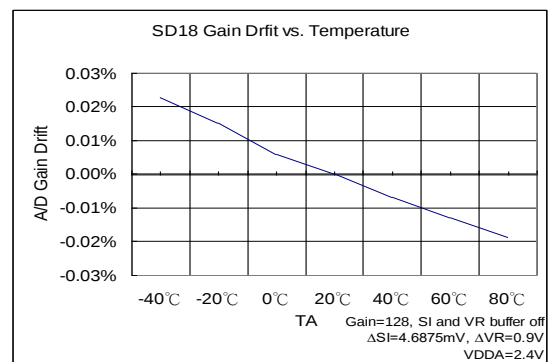


Figure 6.9-2(c) SD18 Gain drift with temperature

6.9.3 SD18, Temperature sensor

 $T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $V_{DDA} = 2.4\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions	Min.	Typ.	Max.	unit
TC _S	Sensor temperature drift			178		$\mu\text{V}/^\circ\text{C}$
KT	Absolute Temperature Scale 0°K			-289		$^\circ\text{C}$
TC _{ERR}	One point calibrate error temperature	Calibration at 25°C of $-40^\circ\text{C} \sim 85^\circ\text{C}$		± 2		$^\circ\text{C}$

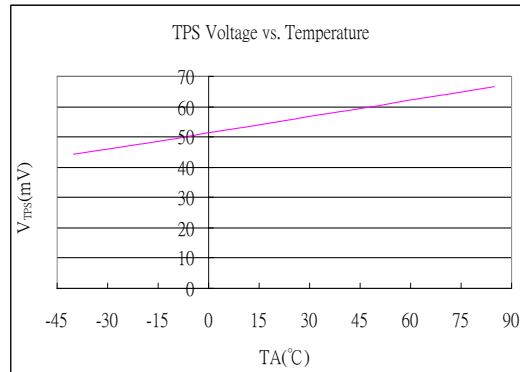


Figure 6.9-3 TPS output voltage vs. temperature drift

6.9.4 SD18 Noise Performance

 $T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, $V_{DDA} = 2.4\text{V}$, unless otherwise noted

HY11P35 針對 SD18 提供了重要的輸入雜訊規格。Table6.9-4(a), Table6.9-4(b) 列出典型的雜訊規格表與 Gain, Output rate, 及單端最大輸入電壓等關係。測試條件設定在外部輸入訊號短路，參考電壓為 1.2V，取樣 1024 筆資料。

ENOB(RMS) with OSR/GAIN at A/D Clock=250Khz, VDDA=2.4V, VREF=1.2V													
Max. Vin(mV) =0.9*VREF ⁽¹⁾	OSR					256	512	1024	2048	4096	8192	16384	32768
	Output rate(HZ)					977	488	244	122	61	31	15	8
	Gain	=	PGA	x	ADGN								
±2400	0.25	=	1	x	0.25	16.3	17.4	17.9	18.5	19.0	19.5	20.0	20.4
±2160	0.5	=	1	x	0.5	16.3	17.3	17.9	18.4	18.9	19.4	19.8	20.2
±1080	1	=	1	x	1	16.2	17.2	17.8	18.3	18.8	19.3	19.7	20.1
±540	2	=	1	x	2	16.1	17.1	17.6	18.2	18.7	19.2	19.6	20.0
±270	4	=	1	x	4	16.0	16.9	17.5	18.0	18.5	18.9	19.4	19.8
±135	8	=	1	x	8	15.9	16.6	17.2	17.7	18.2	18.7	19.2	19.6
±68	16	=	1	x	16	15.6	16.3	16.8	17.3	17.7	18.3	18.8	19.3
±34	32	=	2	x	16	14.8	15.3	15.9	16.4	16.9	17.4	17.8	18.3
±17	64	=	4	x	16	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0
±8	128	=	8	x	16	14.0	14.6	15.1	15.6	16.0	16.6	17.0	17.5

(1) Max.Vin (mV) is the max. input voltage of single end to ground (VSS).

Table6.9-4(a) SD18 ENOB Table

RMS Noise(uV) with OSR/GAIN at A/D Clock=250Khz, VDDA=2.4V, VREF=1.2V													
Max. Vin(mV) =0.9*VREF	OSR					256	512	1024	2048	4096	8192	16384	32768
	Output rate(HZ)					977	488	244	122	61	31	15	8
	Gain	=	PGA	x	ADGN								
±2400	0.25	=	1	x	0.25	121.08	57.40	38.74	26.66	18.39	13.21	9.49	6.98
±2160	0.5	=	1	x	0.5	61.63	29.23	19.21	13.51	9.78	7.02	5.12	3.91
±1080	1	=	1	x	1	32.21	15.70	10.25	7.31	5.19	3.77	2.80	2.13
±540	2	=	1	x	2	16.59	8.54	5.91	4.06	2.86	2.06	1.48	1.12
±270	4	=	1	x	4	9.00	4.84	3.33	2.37	1.67	1.19	0.87	0.65
±135	8	=	1	x	8	5.04	2.97	2.02	1.44	1.01	0.73	0.51	0.39
±68	16	=	1	x	16	3.03	1.84	1.29	0.92	0.70	0.46	0.33	0.24
±34	32	=	2	x	16	2.61	1.81	1.27	0.89	0.62	0.45	0.32	0.23
±17	64	=	4	x	16	1.66	1.13	0.80	0.56	0.41	0.29	0.20	0.14
±8	128	=	8	x	16	1.13	0.77	0.55	0.38	0.28	0.19	0.14	0.10

Table6.9-4(b) SD18 RMS Noise Table

The RMS noise are referred to the input. The Effective Number of Bits (ENOB(RMS Bit)) is defined as:

$$\text{ENOB(RMS)} = \frac{\ln\left(\frac{\text{FSR}}{\text{RMS Noise}}\right)}{\ln(2)}$$

$$\text{RMS Noise} = \frac{\left(2 \times \text{VREF} \times \sqrt{\sum_{k=1}^{1024} (\text{ADO}[k] - \text{Average})^2}\right)}{2^{23}}$$

Where FSR (Full- Scale Range)= $2 \times \text{VREF}/\text{Gain}$.

$$\text{Average} = \frac{\sum_{k=1}^{1024} (\text{ADO}[k])}{1024}$$

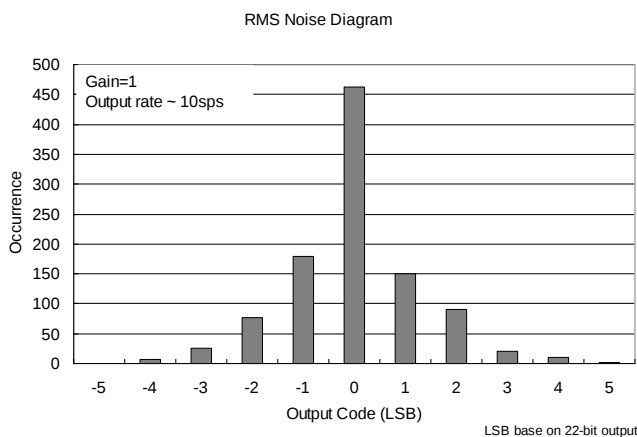


Figure6.9-4(a) RMS Noise Diagram

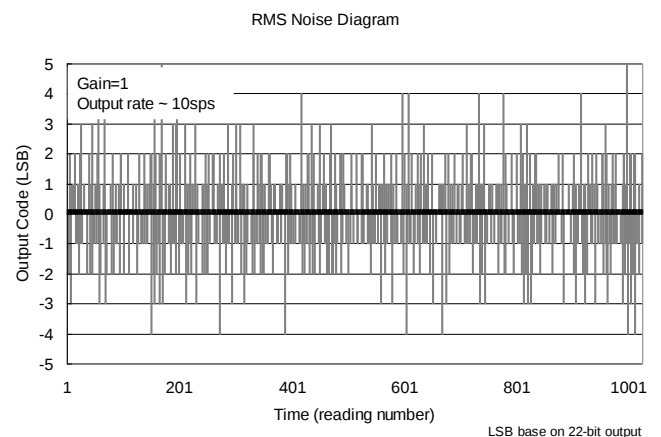


Figure6.9-4(b) Output Code Diagram

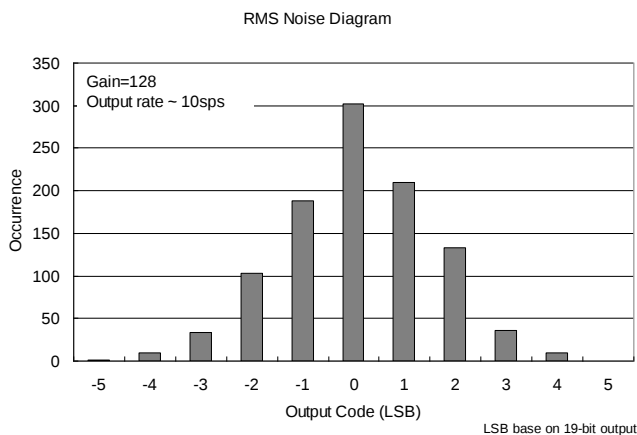


Figure6.9-4(c) RMS Noise Diagram

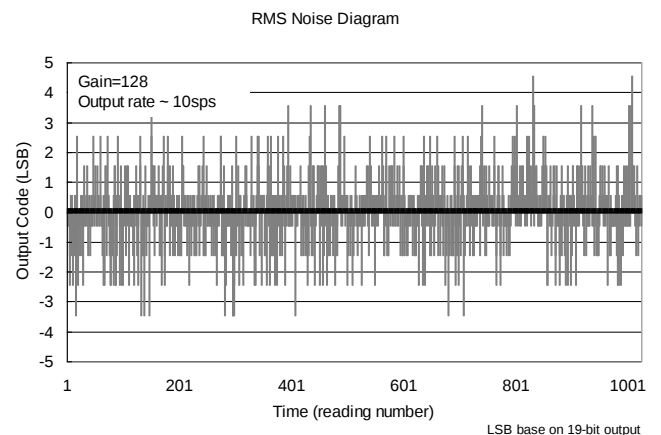


Figure6.9-4(d) Output Code Diagram

6.10 Build-In EPROM(BIE)

$T_A = 25^\circ\text{C}$, $V_{DD} = 3.0\text{V}$, unless otherwise noted

Sym.	Parameter	Test Conditions	Min.	Typ.	Max.	unit
V_{BIE}	Supply Voltage			6.0	6.5	V
I_{BIE}	Operation supply current			5		mA
V_{SS}	Supply Voltage			0		V

7. 訂貨資訊

下單品名 ¹	封裝型式	引腳數	封裝型式 描述方式		程式碼 編號 ²	出貨包裝 形式	個裝 數量	材料 組成	MSL ³
HY11P35-D000	Die	-	D	000	000	-	100	Green ⁴	-
HY11P35-L100	LQFP	100	L	100	000	Tray	90	Green ⁴	MSL-3

¹ 產品名稱 – 封裝型式描述方式 – 程式碼編號 (空白片 / 標準品 / 代客燒錄碼)

例如：您的代客燒錄服務申請的程式碼編號為 008，且需要的產品是裸片出貨。則

下單品名為 HY11P35-D000-008

例如：您的需求是不帶程式碼的空白片且需要的產品是裸片出貨。則下單品名為

HY11P35-D000

例如：您的需求是不帶程式碼的空白片且需要的產品是封裝片 LQFP100 出貨，則

下單品名為 HY11P35-L100，且需以 Tray 出貨，則除下單品名外，請特別註明出貨包裝形式為 Tray

例如：您的代客燒錄服務申請的程式碼編號為 009，而需求的產品是封裝片

LQFP100 出貨，則下單品名為 HY11P35-L100-009，且需以 Tray 出貨，則除下單品名外，請特別註明出貨包裝形式為 Tray

² 程式碼編號

“001”~“999” 為標準品或代客燒錄申請的程式碼編號，而空白晶片不帶此碼。

³ MSL:

濕度敏感性等級係依據 IPC/JEDEC J-STD-020 的規範加以試驗分級，並參考

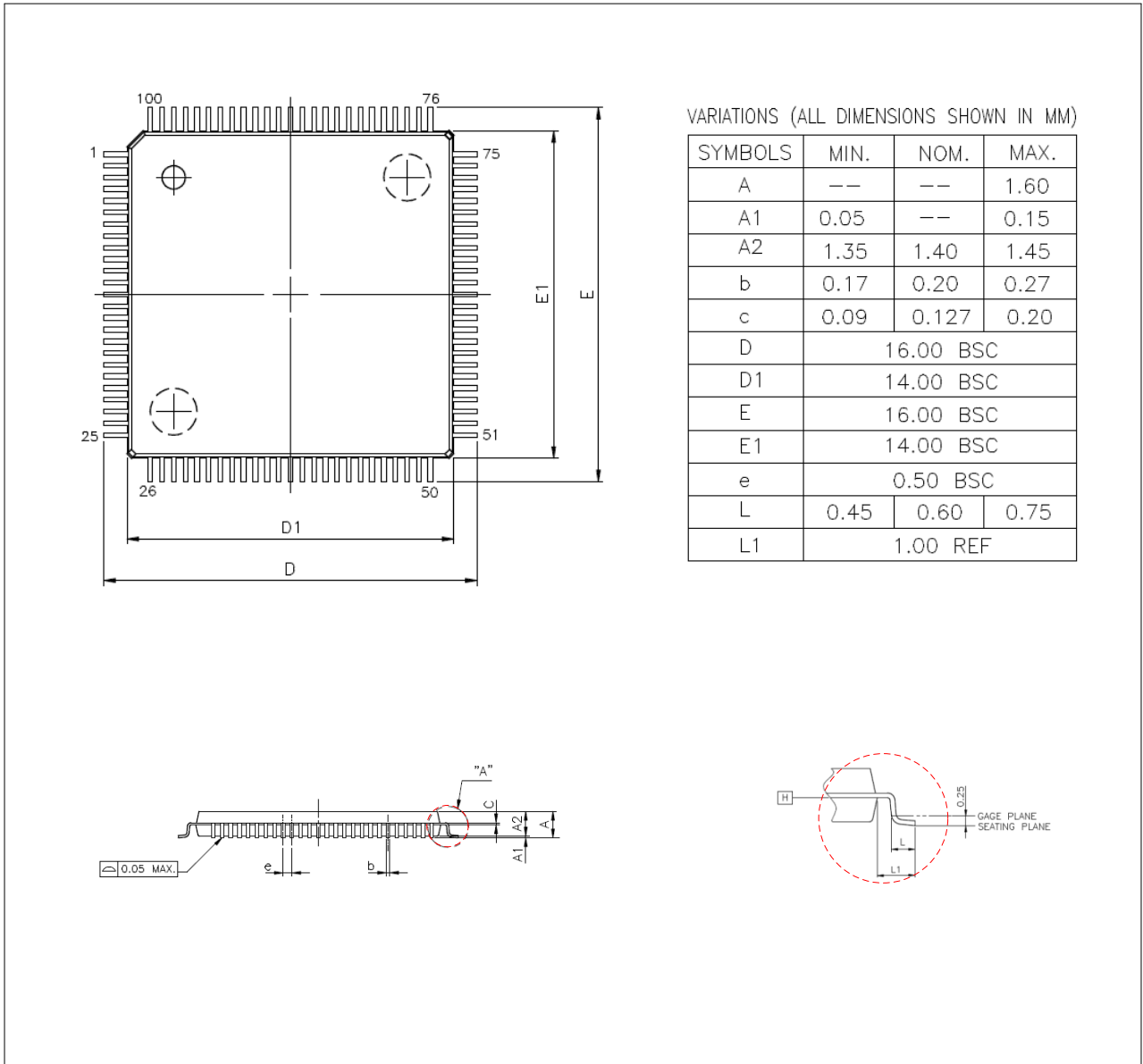
IPC/JEDEC J-STD-033 的標準處理、包裝、運輸與使用。

⁴ Green (RoHS & no Cl/Br):

HYCON 產品皆為 Green Product，符合 RoHS 指令以及無鹵素規定(Br/Cl<0.1%)

8. 封裝型式資訊

8.1 LQFP100(L100)



JEDEC MS-026 compliant

9. 修訂記錄

以下描述本文件差異較大的地方，而標點符號與字形的改變不在此描述範圍。

版本	頁次	變更摘要
V01	ALL	初版發行
V02	4	修訂特點內容
	10	修訂應用電路圖
V03	5	增加註 3 內容說明
	11	修訂應用電路圖
V04	13	增加 SD18 Network 章節
	23	修訂 Power System 溫飄規格
	29~30	增加 SD18 Noise Performance 章節
V05	4	修改 1.特點內容
	16	修改 6.電氣特性內容
	31	修改 RMS Noise Diagram
V06	12	修改開發工具相關使用說明書編號
	33	增加訂貨資訊內容
V07	14	增加 Low Noise OPAMP Network
V08	13	更新 SD18 Network
	All	更新 INBUF/VRBUF 描述