BMIC(Battery Management IC)

1 Battery Management IC Overview

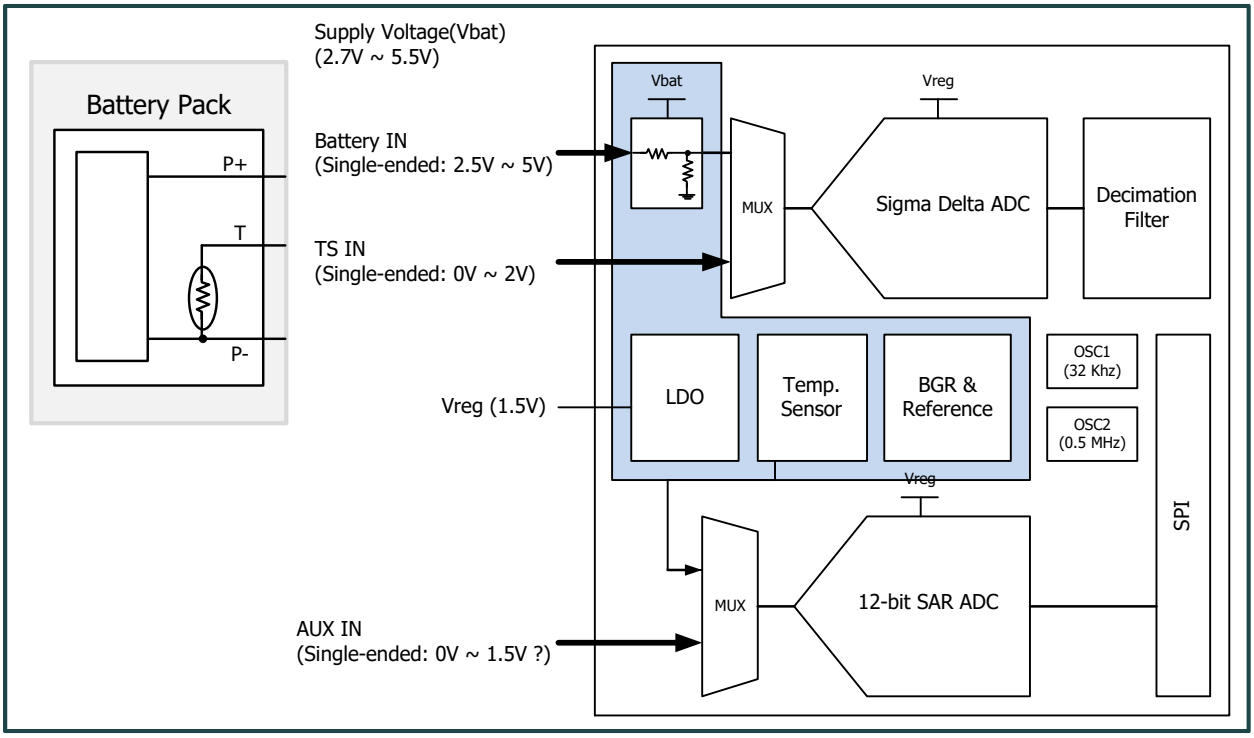


Figure 1 Block Diagram of BMIC AFE(Analog Front-End)

1.1 Electrical Parameters

Table 1. Absolute Maximum Rating

Symbol	Description	Specification			Unit
		Min	Typ.	Max	
Vbat	Battery Supply Voltage			5.5	[V]
T_{STG}	Storage Temperature	-65		150	[℃]
T_{JMAX}	Junction Temperature			150	[℃]

Table 2. Recommended Operating Condition

Symbol	Description	Specification			Unit
		Min	Typ.	Max	
Vbat	Battery Supply Voltage	2.75	5	5.5	[V]
V_{REG}	Analog Regulated Supply Voltage		1.5		[V]
T_{OP}	Operating Temperature	-40		85	[℃]

Table 3. Sigma Delta ADC Electrical Characteristics

(V_{REG} = 1.5 V, T_A = Typ. 25°C)

Symbol	Description	Specification			Unit
		Min	Typ.	Max	
V_{BAT}	Battery Input Voltage Range (ADC Ch.1)	2.75		5.5	[V]
V_{TEMP}	External Thermistor Input Range (ADC Ch.2)	0		2.0	[V]
f_{S_ADC}	ADC Sampling Rate		8		[Hz]
Eff_Res	Effective Resolution of ADC		14		[bit]
V_{offset}	Input Offset		1		[mV]
Z_{ADC1}	V_{BAT}(Ch.1) Equivalent Input Impedance		100(T.B.D.)		[kΩ]
Z_{ADC1}	V_{TS}(Ch.2) Equivalent Input Impedance		8(T.B.D.)		[MΩ]]
I_{ADC_OP}	Operating Current of ADC		300		[uA]
I_{ADC_PD}	Power Down Current of ADC			1	[uA]

Table 4 SAR ADC Electrical Characteristics

(V_{REG} = 1.5 V, T_A = Typ. 25°C)

Symbol	Description	Specification			Unit
		Min	Typ.	Max	
V_{REG}	Analog Supply		1.5		[V]
I_{SAR}	Operating Current		130		[uA]
V_{REF}	Reference Voltage		0.9		[V]
	ADC Resolution		12		[bit]
ENOB	Effective Number of Bit		10		[bit]
DNL	Differential Nonlinearity			±2	LSB
INL	Integral Nonlinearity			±3	LSB
OS_{ERR}	Offset Error			±3	LSB
G_{ERR}	Gain Error			±4	LSB
	Total Unadjusted Error			±7	LSB
F_{SAR}	ADC Clock		0.32		[MHz]
t_{CONV}	Conversion Time		50		[us]
V_{IN_AUX}	AUXIN input range	0		1.5	[V]

1.2 Package

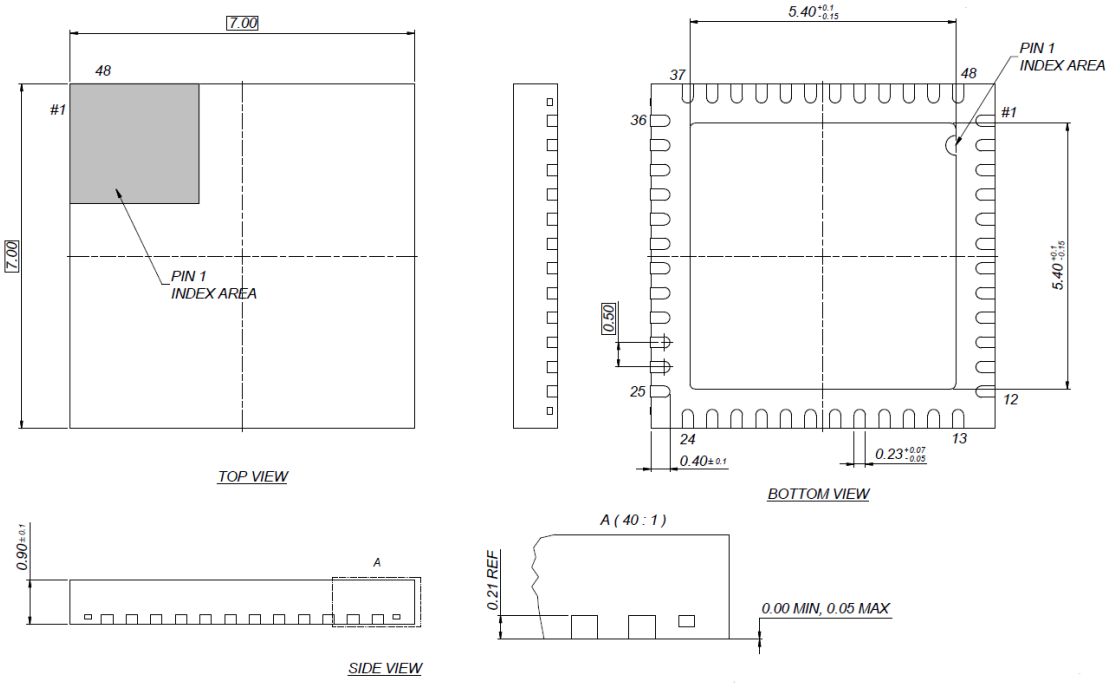
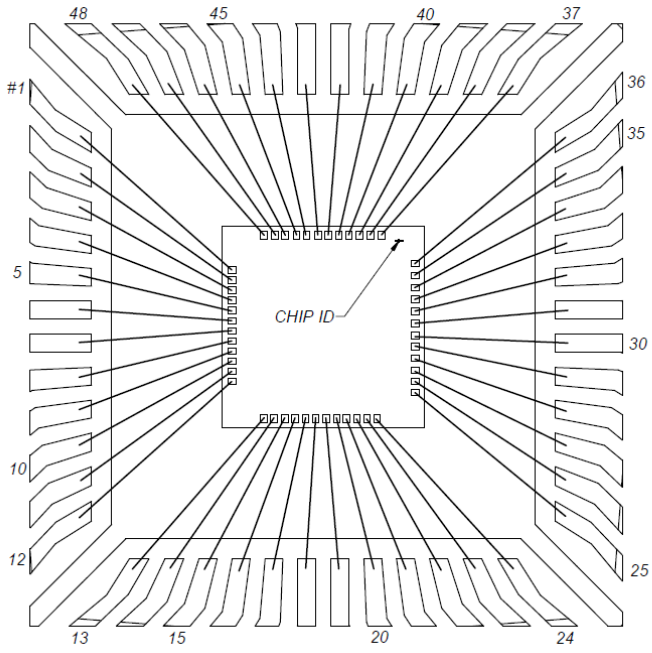


Figure 2. 48-QFN-0707 Outline



NOTE

1. DIE SIZE (X/Y/Z) : 2000x2000 (W.O S/L) um
2. CHIP THICKNESS : 8 mil (200 um)
3. ADHESIVE : Ag-EPOXY
4. L/F PAD SIZE : SUBCON STANDARD
5. WIRE SIZE : 0.8 mil Au/Cu
6. BOND PAD OPEN SIZE/PITCH(Min) : 65 x 80 um / 99 um(min)
7. CAP'Y TYPE :
8. LOOP HEIGHT : MAX um
9. WIRE LENGTH(LONG/SHOT) : mil/ mil
10. PACKAGE TYPE : 48-TQFP-0707
11. LEAD FRAME MATERIAL : COPPER

Figure 3 48-QFN Bonding Diagram

1.3 Evaluation Board

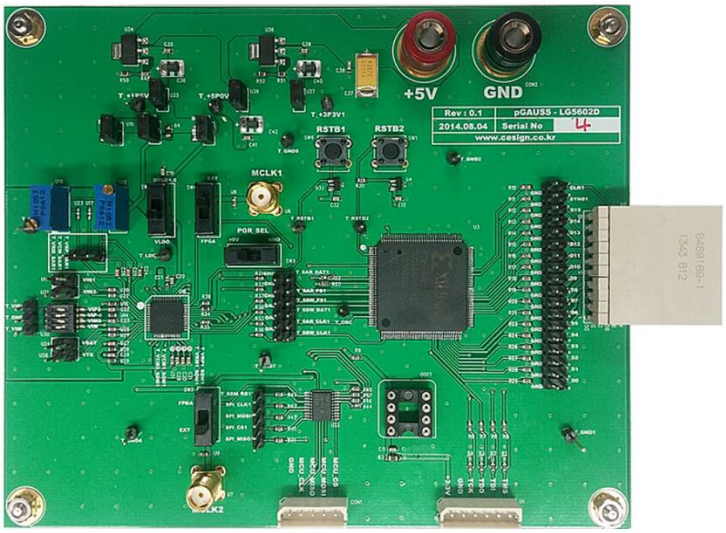


Figure 4. Evaluation Board