

SBS 1.1-COMPLIANT GAS GAUGE and PROTECTION ENABLED WITH IMPEDANCE TRACK™

FEATURES

- **Next Generation Patented Impedance Track™ Technology Accurately Measures Available Charge in Li-Ion and Li-Polymer Batteries**
 - Better Than 1% Error Over Lifetime of the Battery
- **Supports the Smart Battery Specification SBS V1.1**
- **Flexible Configuration for 2 to 4 Series Li-Ion and Li-Polymer Cells**
- **Powerful 8-Bit RISC CPU With Ultra-Low Power Modes**
- **Full Array of Programmable Protection Features**
 - Voltage, Current, and Temperature
- **Supports SHA-1 Authentication**
- **Complete Battery Protection and Gas Gauge Solution in one Package**
- **Small 44-Pin TSSOP (DBT) package**

APPLICATIONS

- **Notebook PCs**
- **Medical and Test Equipment**
- **Portable Instrumentation**

DESCRIPTION

The bq20z95 SBS-compliant gas gauge and protection IC is a single IC solution designed for battery-pack or in-system installation. The bq20z95 measures and maintains an accurate record of available charge in Li-ion or Li-polymer batteries using its integrated high-performance analog peripherals, monitors capacity change, battery impedance, open-circuit voltage, and other critical parameters of the battery pack as well and reports the information to the system host controller over a serial-communication bus. Together with the integrated analog front-end (AFE) short-circuit and overload protection, the bq20z95 maximizes functionality and safety while minimizing external component count, cost, and size in smart battery circuits.

The implemented Impedance Track™ gas gauging technology continuously analyzes the battery impedance, resulting in superior gas-gauging accuracy. This enables remaining capacity to be calculated with discharge rate, temperature, and cell aging all accounted for during each stage of every cycle with high accuracy.

AVAILABLE OPTIONS

T_A	PACKAGE ⁽¹⁾	
	44-PIN TSSOP (DBT) Tube	44-PIN TSSOP (DBT) Tape and Reel
–40°C to 85°C	bq20z95DBT ⁽²⁾	bq20z95DBTR ⁽³⁾

- (1) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.
- (2) A single tube quantity is 50 units.
- (3) A single reel quantity is 2000 units



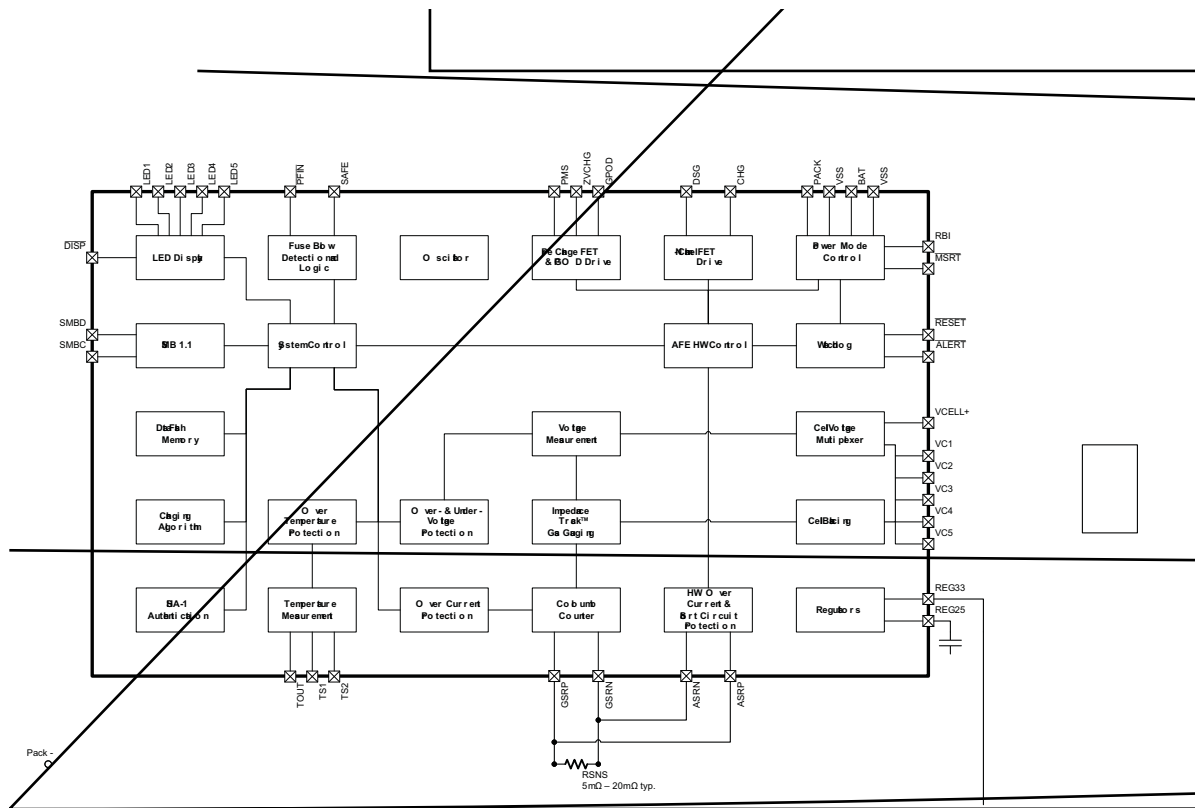
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Impedance Track is a trademark of Texas Instruments.



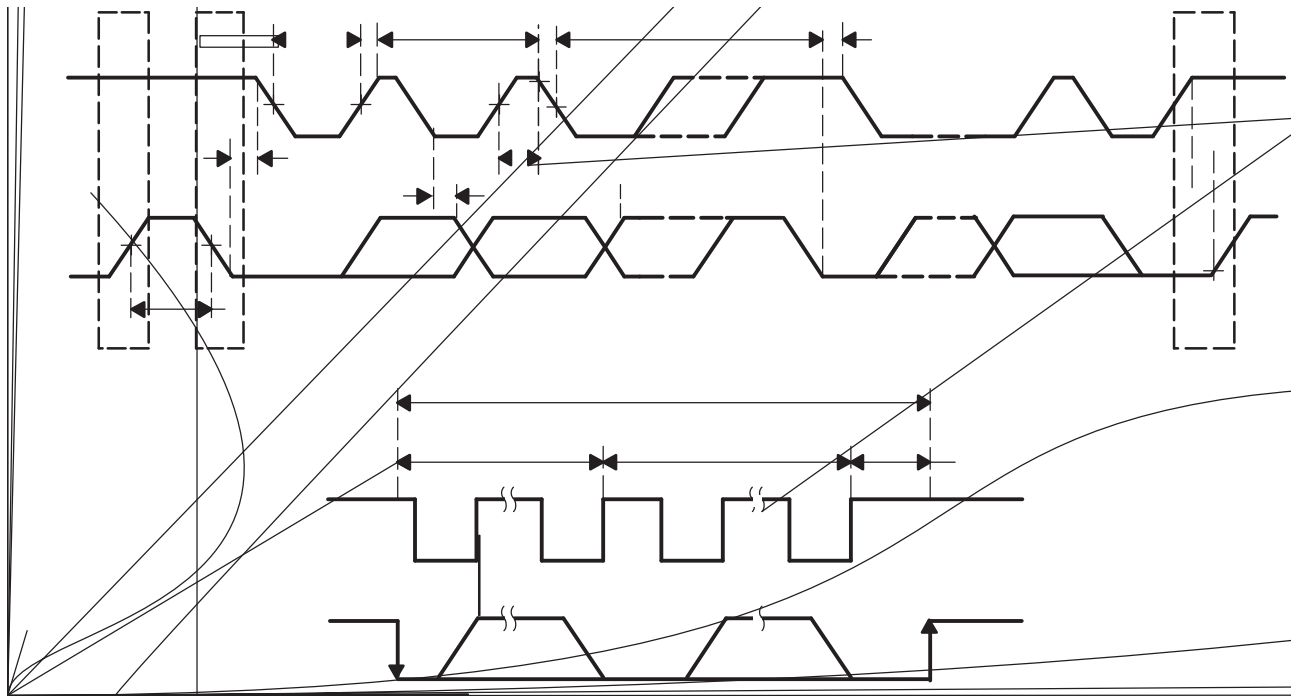
These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

SYSTEM PARTITIONING DIAGRAM



**bq20z95
DBT Package
(TOP VIEW)**

DSG	1	44	CHG
PACK	2	43	BAT
VCC	3	42	VC1
ZVCHG	4	41	VC2
GPOD	5	40	VC3
PMS	6	39	VC4
VSS	7	38	VC5
REG33	8	37	ASRP
TOUT	9	36	ASRN
VCELL+	10	35	RESET
ALERT	11	34	VSS
NC	12	33	RBI
TS1	13	32	REG25
TS2	14	31	VSS
PRES	15	30	MRST
PFIN	16	29	GSRN
SAFE	17	28	GSRP
SMBD	18	27	LED5
NC	19	26	LED4
SMBC	20	25	LED3
DISP	21	24	LED2
VSS	22	23	LED1



A. SCLKACK is the acknowledge-related clock pulse generated by the master.

Figure 1. SMBus Timing Diagram

FEATURE SET

Primary (1st Level) Safety Features

The bq20z95 supports a wide range of battery and system protection features that can easily be configured. The primary safety features include:

- Cell over/under voltage protection
- Charge and Discharge over current
- Short Circuit
- Charge and Discharge Over temperature
- AFE Watchdog

Secondary (2nd Level) Safety Features

The secondary safety features of the bq20z95 can be used to indicate more serious faults via the SAFESAFE

Charge Control Features

Gas Gauging

Authentication

Application Schematic



PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
BQ20Z95DBT	ACTIVE	TSSOP	DBT	44	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
BQ20Z95DBTG4	ACTIVE	TSSOP	DBT	44	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
BQ20Z95DBTR	ACTIVE	TSSOP	DBT	44	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
BQ20Z95DBTRG4	ACTIVE	TSSOP	DBT	44	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD:

PACKAGE MATERIALS INFORMATION

www.ti.com

14-Jul-2012

TAPE AND REEL INFORMATION

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
BQ20Z95DBTR	TSSOP	DBT	44	2000	330.0	24.4	6.8	11.7	1.6	12.0	24.0	Q1

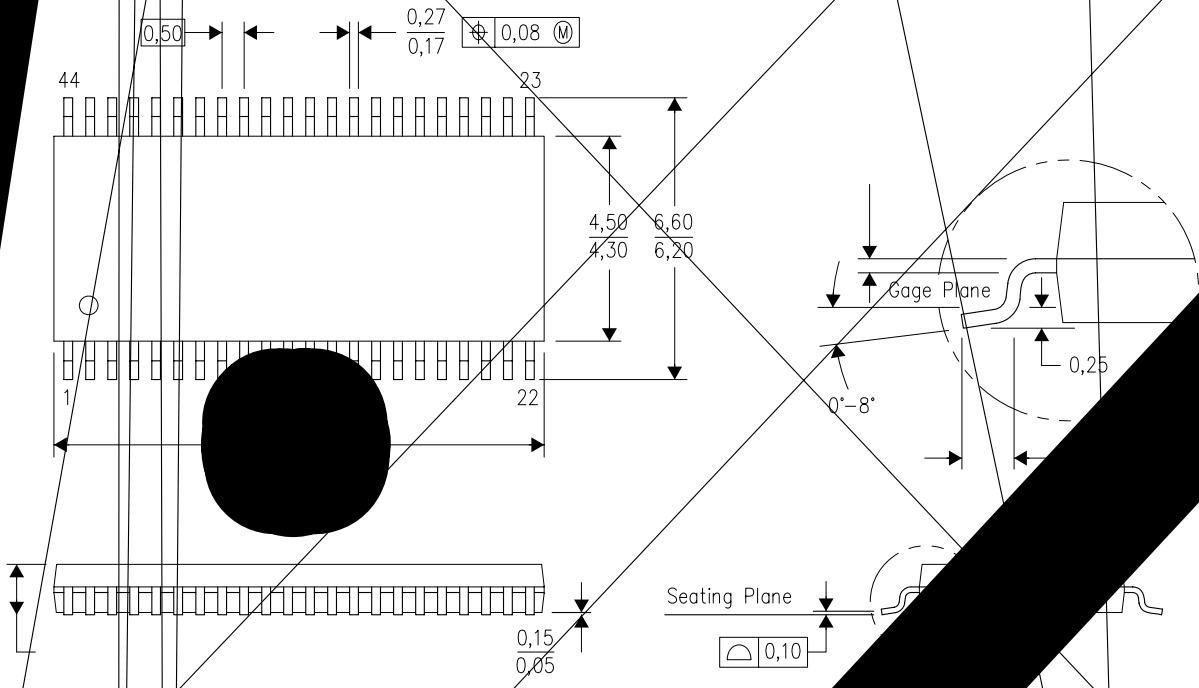
PACKAGE MATERIALS INFORMATION

*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
BQ20Z95DBTR	TSSOP	DBT	44	2000	367.0	367.0	45.0

-PDSO-G44)

PLASTIC SMALL OUTLINE



IMPORTANT NOTICE

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