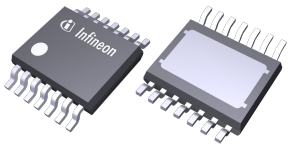
MOTIX™ integrated full-bridge IC BTM9020/BTM9021



RoHS

AEC Qualified

Features

- Path resistance of typ. 84 mΩ at 25°C
- Pulse current:
  - 8.8 A for t_{pulse} ≤ 1 s at 85°C
  - 6.9 A for t_{pulse} ≤ 10 s at 85°C
- Supply voltage range from 7 V to 18 V
- Extended supply voltage range from 4.5 V to 40 V
- Current limitation of min. 20 A
- Slew rate selection
- Protection and diagnostics: overcurrent, undervoltage, overtemperature, open load detection, current sense, cross current protection
- Status flag diagnosis with feedback of current sense
- SPI interface in BTM9021
- Half-bridge mode
- Green product (RoHS compliant)

Potential applications

- Automotive unidirectional and bidirectional brushed DC motors
- Door modules
- Mirror modules
- Body control modules
- Other inductive or resistive loads in the automotive field

Product validation

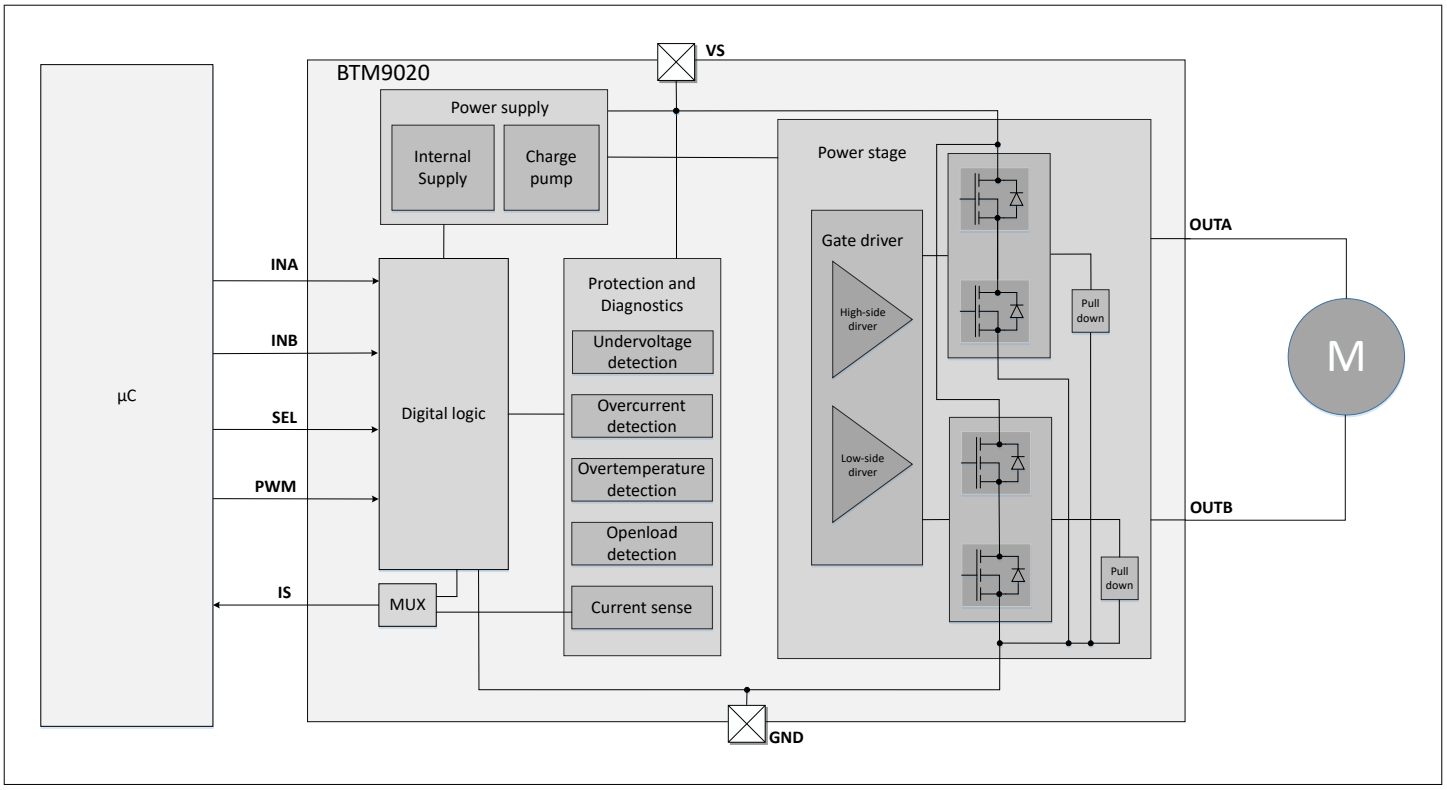
- Qualified for automotive applications
- Product validation according to AEC-Q100

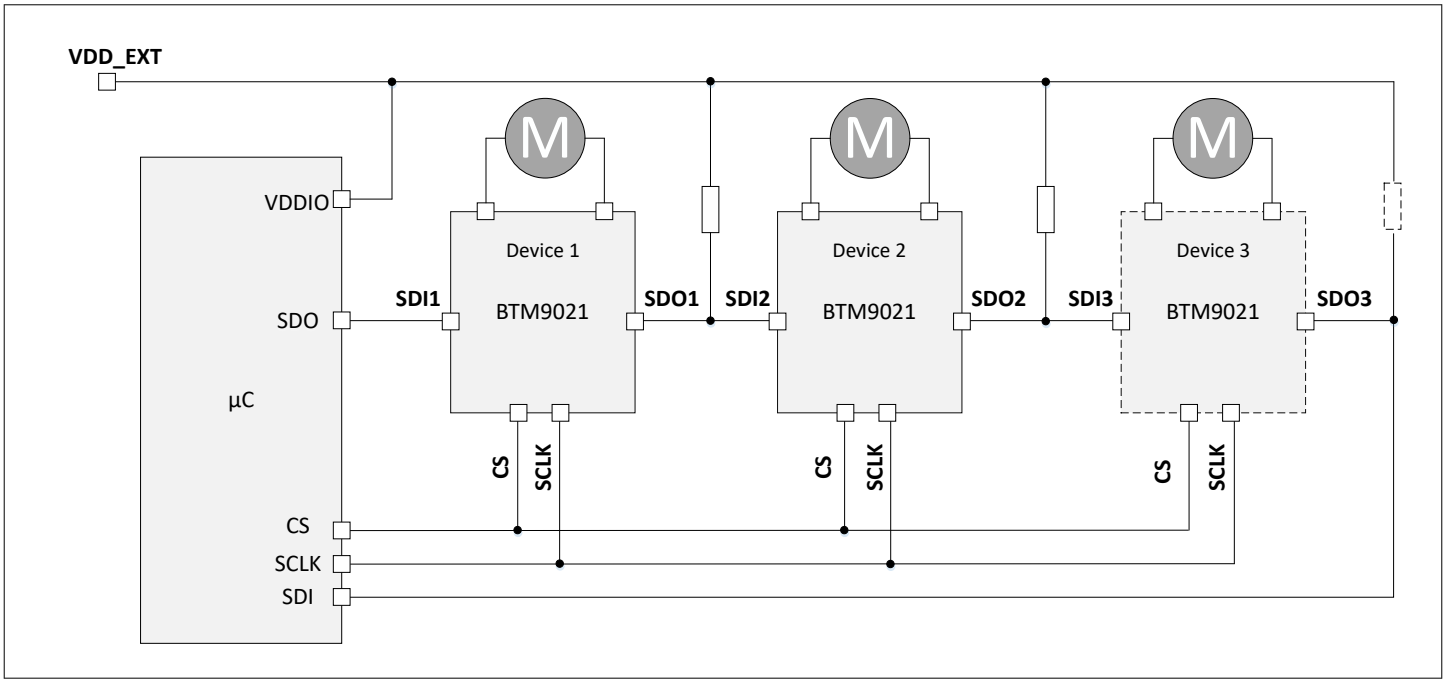
Description

The BTM9020/BTM9021 is an integrated H-bridge for automotive motor drive applications. This monolithic device is implemented in BCD technology, and assembled in PG-TSDSO-14 which has an exposed pad to ensure better thermal performance.

The device provides intelligent protection features against overtemperature, undervoltage, overcurrent, short circuit and crosscurrent. Moreover, the device also provides current sense and open load diagnostic as diagnosis features. The information of the output current and the error flag is presented at IS pin.

Description





Type	Package	Marking
BTM9020	PG-TSDSO-14	BTM9020
BTM9021	PG-TSDSO-14	BTM9021

Table of contents

1 Absolute maximum ratings

Stress above the absolute maximum ratings listed in this chapter may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Table 1 Absolute maximum rating

T_j = -40°C to 150°C; all voltages with respect to ground, positive current flowing into pin (unless otherwise specified)

Parameter	Symbol	Values			Unit	Note or condition	P-Number
		Min.	Typ.	Max.			
Voltages							
Supply voltage	V_S	-0.3	–	40	V	–	P_GPC_01_1
Output voltage	V_{OUTX}	-0.3	–	V_S + 0.3	V	–	P_GPC_01_02
Voltage of logic pins	V_{INA} / V_{SDI}, V_{INB} / V_{SCKL}, V_{SEL} / V_{CS}, V_{PWM} / V_{SDO}	-0.3	–	V_S + 6	V	–	P_GPC_01_03
Current sense pin	V_{IS}	-0.3	–	40	V	–	P_GPC_01_15
Voltage between VS and IS pin	V_{SIS}	-0.3	–	40	V	–	P_GPC_01_04
Temperatures							
Junction temperature	T_j	-40	–	150	°C	–	P_GPC_01_09
Storage Temperature	T_{stg}	-55	–	150	°C	–	P_GPC_01_10
ESD susceptibility							
ESD susceptibility all pins (HBM)	$V_{ESD(HBM, local)}$	-2	–	2	kV	HBM[1)]	P_GPC_01_11
ESD susceptibility OUT vs GND, VS vs GND (HBM)	$V_{ESD(HBM, global)}$	-4	–	4	kV	HBM[1)]	P_GPC_01_12
ESD susceptibility all pins (CDM)	$V_{ESD(CDM)}$	-500	–	500	V	CDM[2)]	P_GPC_01_13
ESD susceptibility corner pins (CDM)	$V_{ESD(CDM, corner)}$	-750	–	750	V	CDM[2)]	P_GPC_01_14

1) ESD susceptibility, human body model (HBM), according to AEC Q100-002 (1.5 kΩ, 100 pF).
2) ESD susceptibility, charged device model (CDM), according to AEC Q100-011.

2 Package

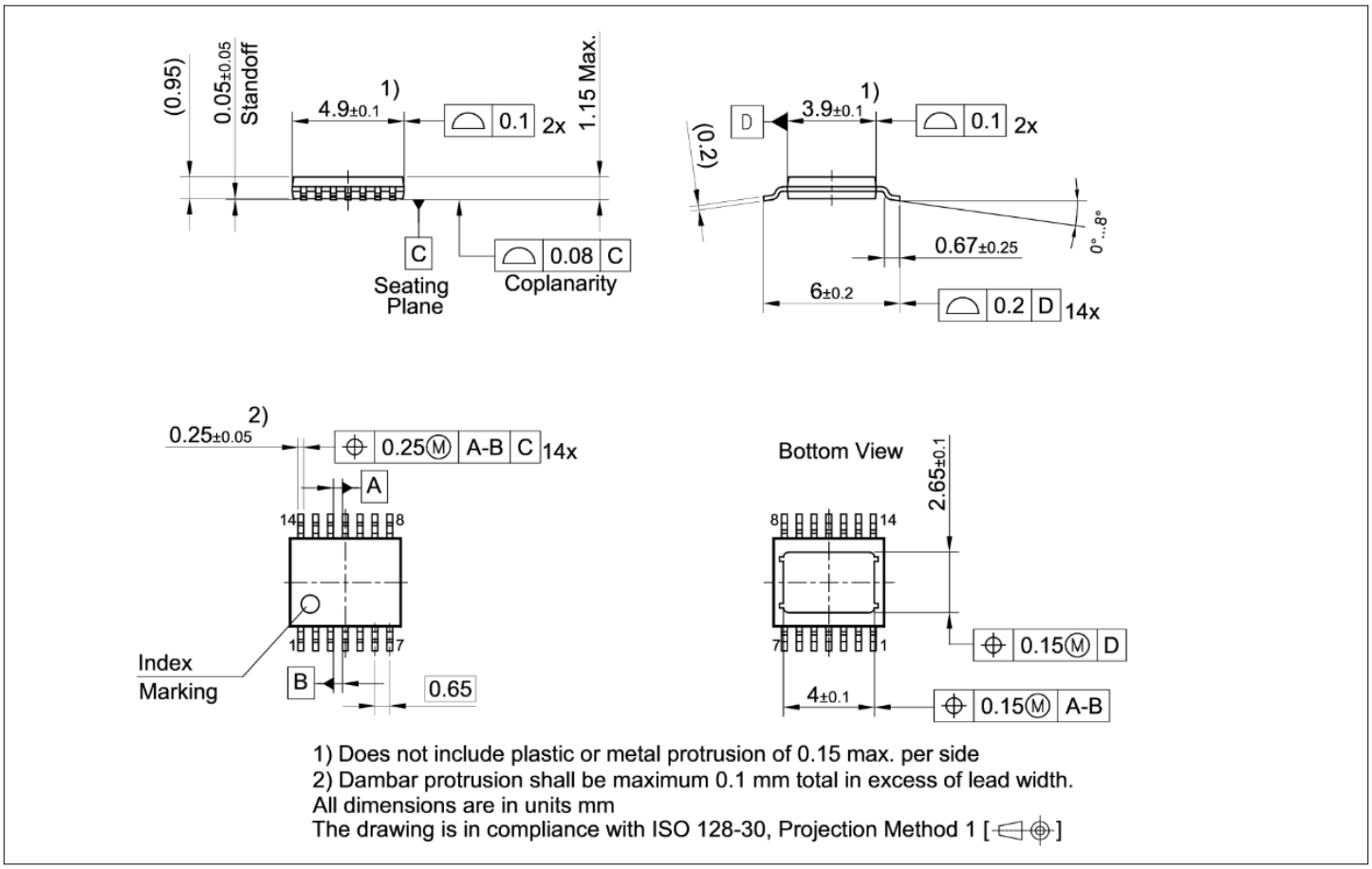


Figure 1

Revision history

Document version	Date of release	Description of changes
1.0	2024-06-04	Initial release

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