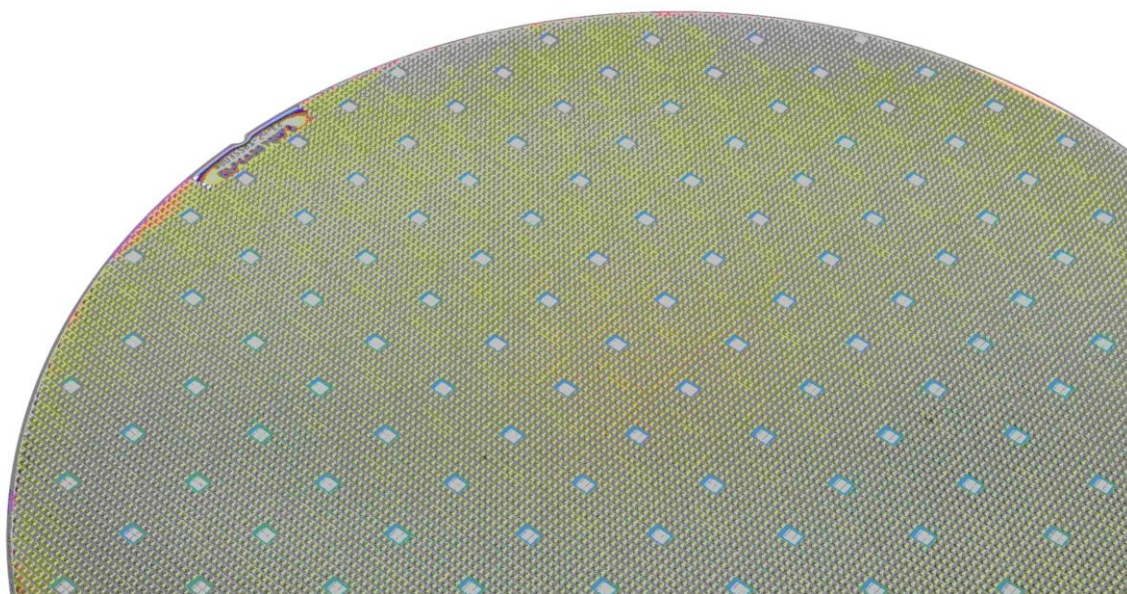


NMV2D

Passive UHF RFID 915MHz, EPC Gen2v2 and ISO/IEC 29167-10 with I²C Interface and Temperature Sensor



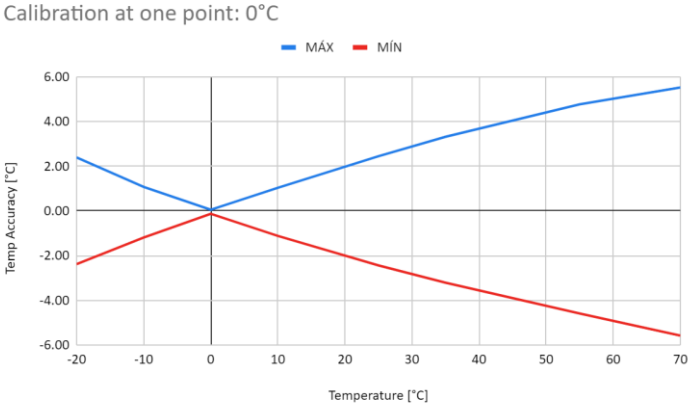
SEMICONDUCTOR DEVICE FOR RFID APPLICATIONS, WITH SECURITY AND TEMPERATURE SENSOR FEATURES

NMV2D is a semiconductor device compatible with EPCglobal® Gen2v2 – the most recent industry international standard for RFID applications with security features, oriented to goods, identification, tracking and authentication.

The cryptographic operations embedded in the Gen2v2 protocol allow product authentication according to ISO/IEC 29167-10 standard, which is based on AES-128 cryptography. In addition, this integrated circuit complies with the Brazil-ID program for Brazilian market, as it has two custom commands (ReadSec and WriteSec) for secure data read and write with authentication of reader and data confidentiality.

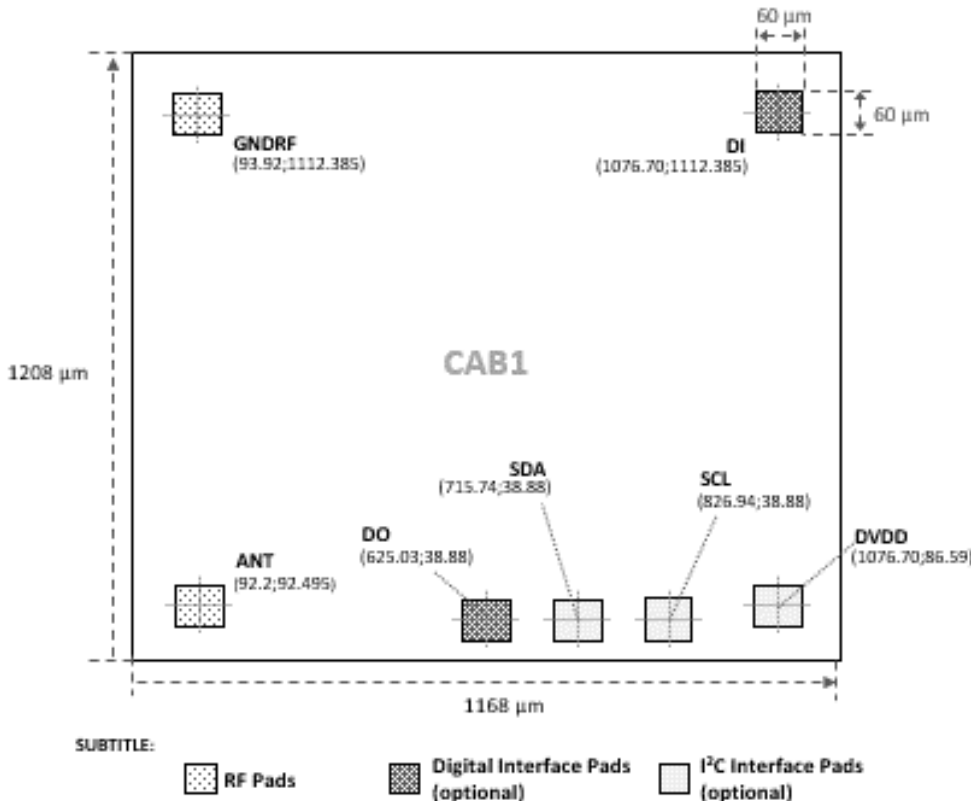
To establish a wired communication with other electronic devices, it has also available the I²C interface. This communication channel is used following secured standards.



NMV2D INFORMATION		
GENERAL DESCRIPTION		Passive UHF semiconductor device compatible with RAIN RFID and EPCglobal® Gen2v2. The cryptographic operations allow the authentication of items according to the ISO/IEC 29167-10 standard, which is based on encryption using the AES-128 algorithm (ECB, CBC and CMAC).
MEMORY CHARACTERISTICS		
DATA RETENTION (minimum)		10 years
WRITE ENDURANCE (minimum)		10.000 write cycles
MEMORY BANKS (according to Gen2 protocol)		<ul style="list-style-type: none"> • EPC with 192-bit: one CRC 16-bit word, one PC 16-bit word, 128-bit Electronic Product Code (EPC), one XPC_W1 16-bit word and one reserved 16-bit word; • TID with 112-bit: 48-bit manufacturer data and 64-bit serial number; • USER with 512-bit for File_0; • RESERVED with 112-bit: for Kill password, access password and three special read-only words for the general interface through the I/O pins; • Secure Segment with 512-bit: 256-bit for keys and 256-bit for data of custom secure protocol.
RF CHARACTERISTICS		
IMPEDANCE (at minimum read sensitivity, 921MHz and 25°C, ANT and GND pads)		R_p 3.1729k // C_p 657.8fF $Re + Im$: 21.62 – j260.93
CARRIER FREQUENCY		860MHz to 960MHz
INPUT SIGNAL	MODULATION	DSB-ASK, SSB-ASK or PR-ASK
	DATA ENCODING	Pulse Interval Encoding (PIE)
OUTPUT SIGNAL	MODULATION	ASK
	DATA ENCODING	FM0 or MILLER
TURN-ON POWER (at 915MHz)		-16dBm
GEN2V2 COMMANDS		<i>Select, Query, QueryAdjust, QueryRep, ACK, NAK, Req_RN, Read, Write, Kill, Lock, Authenticate, TAM1, TAM2, ReadBuffer and Untraceable.</i>
CUSTOM COMMANDS*		<i>ReadSec and WriteSec</i>
OPERATION CHARACTERISTICS		
TEMPERATURE	OPERATION	-25°C to +75°C
	STORAGE	-30°C to +85°C
TEMPERATURE SENSOR CHARACTERISTICS		
RANGE	-25°C to +75°C	<p>Calibration at one point: 0°C</p> 
ACCURACY (at calibration temperature)	± 0.2°C	

* For more details about custom commands, contact us.



NMV2D WAFER INFORMATION		
DIE PIN DESCRIPTION		
#1	ANT	Antenna interface
#2	DO	Digital Output, special function
#3	SDA	I ² C interface, data exchange function
#4	SCL	I ² C interface, clock synchronization function
#5	DVDD	Power input, typical 2.5V to 3.3V
#6	DI	Digital input, special function
#7	GNDRF	Ground connection
WAFER/DIE PREPARATION		
DIE SIZE AFTER DICING	1.116 x 1.063 mm	
TARGET THICKNESS	0.150 mm	
DIE PADS		
 <p style="text-align: center;">1208 μm</p> <p style="text-align: center;">1168 μm</p> <p style="text-align: center;">SUBTITLE:</p> <p style="text-align: center;"> RF Pads Digital Interface Pads (optional) I²C Interface Pads (optional) </p>		



CONTACT INFORMATION

www.vonbraunlabs.com
contact@vonbraunlabs.com

Campinas, São Paulo, Brazil

(Headquarters/Labs)

Av. Alice de C. Pupo Nogueira Mattosinho, 301
Alphaville, 13098-392
Phone: +55 (19) 3756-5454

São Carlos, São Paulo, Brazil

(Labs)

R. Dom Pedro II, 2085 – offices 21, 22, 23, 24 and 25
Jd. Macareno, 13560-320
Phone: +55 (16) 3307-8305

NOTICES

Copyright Notice

© 2021 CPA Wernher von Braun. All rights reserved.

All rights reserved. Reproduction, modification, copying, publication, dissemination, and / or unauthorized use of this document (in whole or in part) is expressly prohibited. Any reproduction, modification, copying, publication, dissemination, and / or use of this document (wholly or in part) is subject to the confidentiality terms of the CPA Wernher von Braun. CPA Wernher von Braun retains the right to make changes to this document at any time, without notice.

Legal Disclaimer

While every effort has been made to ensure that this document and the information contained therein is accurate, CPA Wernher von Braun states that it is provided "as is" with no warranties whatsoever, including any warranty of noninfringement, fitness for particular purpose, or any warranty arising out of this document. CPA Wernher von Braun disclaims all liability for any damages arising from use or misuse of this document, whether special, indirect, consequential, or compensatory damages, and including liability for infringement of any intellectual property rights, relating to use of information in or reliance upon this document.

