

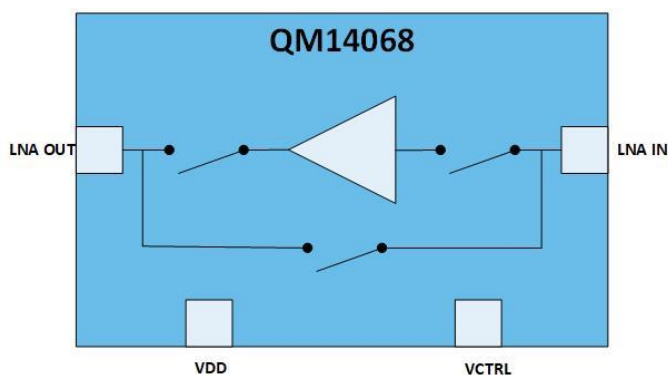


## QM14068 UWB LNA and Switch

### Product Description

The QM14068 is a bypass switch and LNA to support wireless technology in the 6.2-8.3GHz frequency range. (UWB Channel 5 and 9.) Control is via a single bit GPIO pin.

### Functional Block Diagram



1mm\*1.2mm\*0.54mm

### Feature Overview

- Typical NF of 1.8 dB across frequency range
- Typical Gain 15 dB
- Rx gain flatness in LNA mode -1.0 to +1.0dB over max BW (500MHz)
- 1.8V typical supply voltage
- Internal DC blocking on input and output pins
- Bypass to High Gain Switching Speed 400nS

### Applications

- 6.2 to 8.3 GHz Wireless Technology

### Ordering Information

PART NO.	DESCRIPTION
QM14068SB	5-pc Sample Bag
QM14068SR	100-pc, 7" Reel
QM14068TR13	10,000-pc, 13" Reel
QM14068EVB	Fully Assembled EVB + Sample Bag with 5 pieces

## Absolute Maximum Ratings

PARAMETER	CONDITIONS	RATING	UNITS
Storage Temperature		-40 to 150	°C
VDD		2.2	V
Absolute max input power	HG Mode, 6:1 VSWR	9	dBm
Absolute max input power	Bypass Mode, 90°C, 50 Ohms	22	dBm
Max DC voltage on RF pins		2.6	V

## Recommended Operating Conditions

PARAMETER	MIN	TYP	MAX	UNITS
Supply voltage VDD	1.62	1.8	1.98	V
Control voltage High	0.75 x VDD		1.98	V
Control voltage Low		0	0.4	V
Temperature	-40	25	85	°C

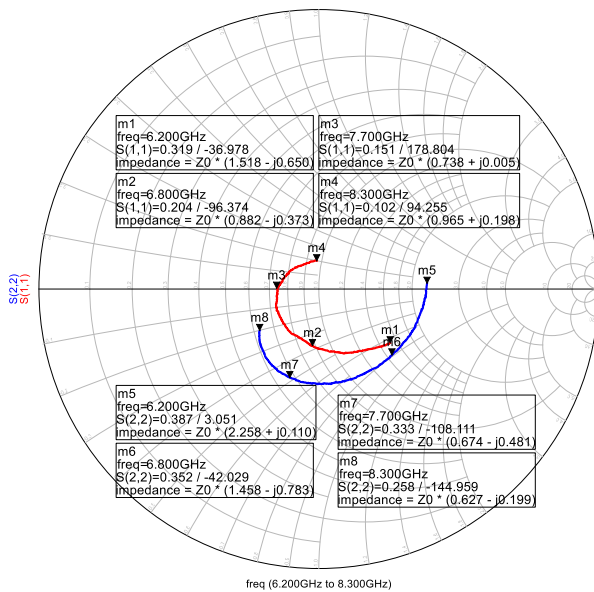
## Electrical Specs

Test conditions unless otherwise stated: Input and Output = 50Ω, T = 25 °C  
V<sub>DD</sub> = 1.8 V / 0 V.

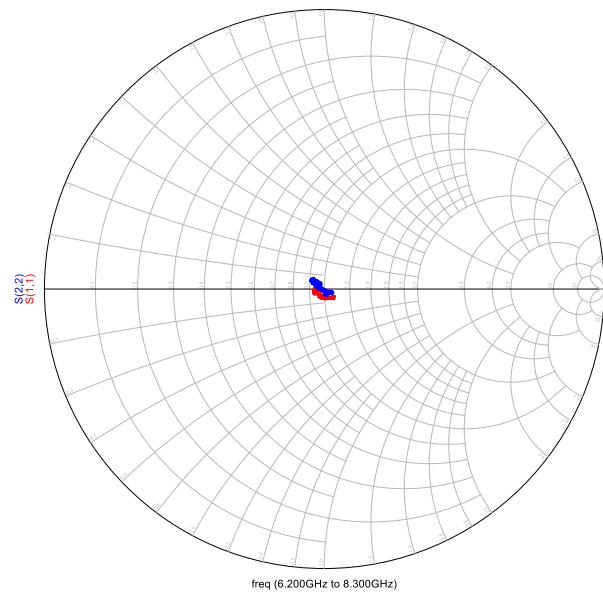
FREQUENCY RANGE: 6200MHz TO 6800MHz					
PARAMETER	MODE	MIN	TYP	MAX	UNITS
Gain	HG		15.0		dB
	Bypass		-0.86		dB
Gain Flatness	HG		0.0		dB
Noise Figure	HG		1.85		dB
Input Return Loss	HG		12.3		dB
	Bypass		18.2		dB
Output Return Loss	HG		8.5		dB
	Bypass		19.7		dB
Vdd Current	HG		10.4		mA
	Bypass		6		nA
HG → Bypass switching time (10-90%)	HG		128		ns
Bypass → HG switching time (10-90%)	Bypass		255		ns
Input P1dB	HG		-9		dBm

FREQUENCY RANGE: 7700MHz TO 8300MHz					
PARAMETER	MODE	MIN	TYP	MAX	UNITS
Gain	HG		15.3		dB
	Bypass		-0.9		dB
Gain Flatness	HG		0.0		dB
Noise Figure	HG		1.7		dB
Input Return Loss	HG		19.7		dB
	Bypass		27		dB
Output Return Loss	HG		11.7		dB
	Bypass		24.5		dB
VDD Current	HG		10.6		mA
	Bypass		6		nA
HG → Bypass switching time (10-90%)	HG		123		ns
Bypass → HG switching time (10-90%)	Bypass		321		ns
Input P1dB	HG		-11		dBm

Input/output return loss LNA (HG) mode



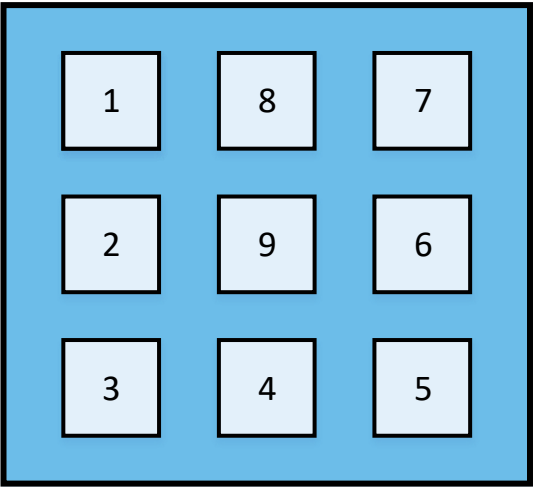
Input/output return loss bypass (LG) mode



Truth Table

VDD	VCTRL	DESCRIPTION	PARAMETERS
High	1	HG Mode	LNA On
High	0	Bypass Mode	LNA Off

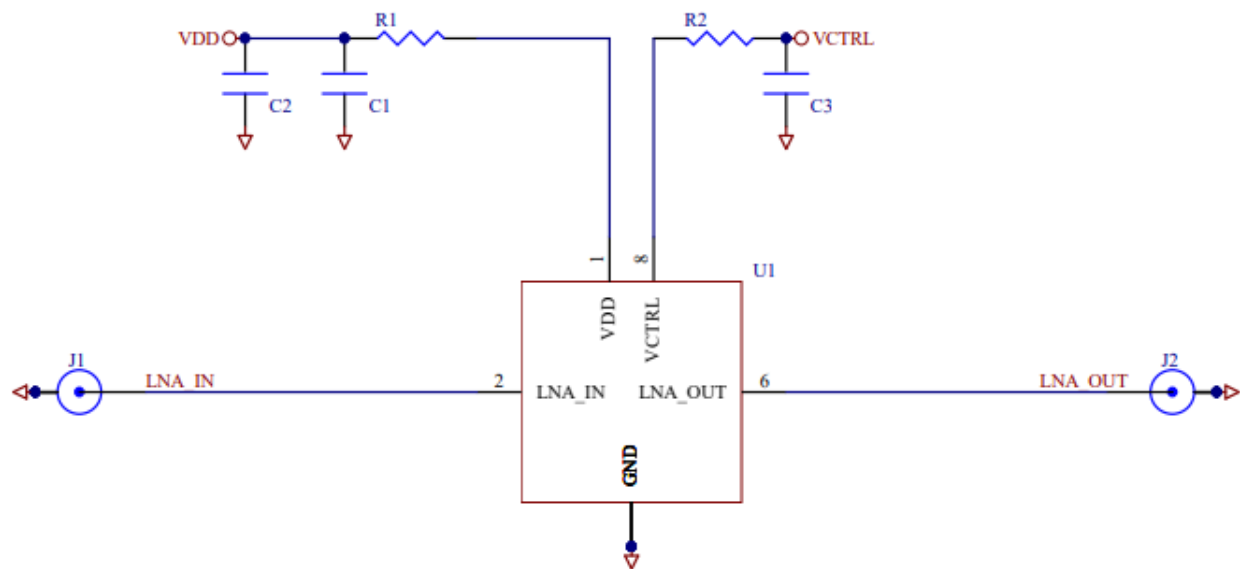
Pin Configuration and Description



Top View

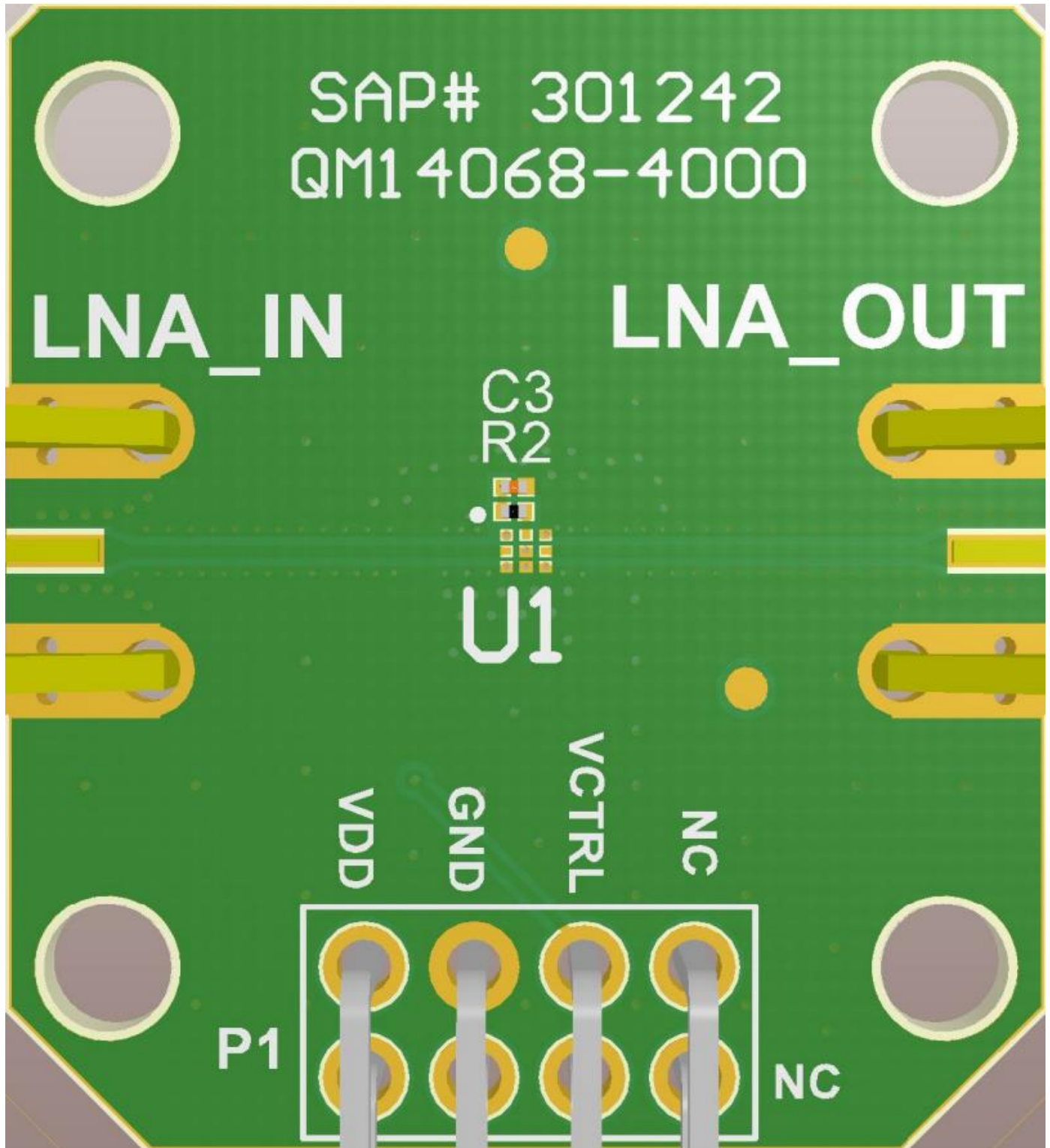
PIN NO.	LABEL	DESCRIPTION	PIN NO.	LABEL	DESCRIPTION
1	VDD	Voltage Supply	6	LNA OUT	LNA Output
2	LNA IN	LNA Input	7	GND	Ground
3	GND	Ground	8	VCTRL	GPIO Control Line
4	GND	Ground	9	GND	Ground
5	GND	Ground			

Schematic Diagram



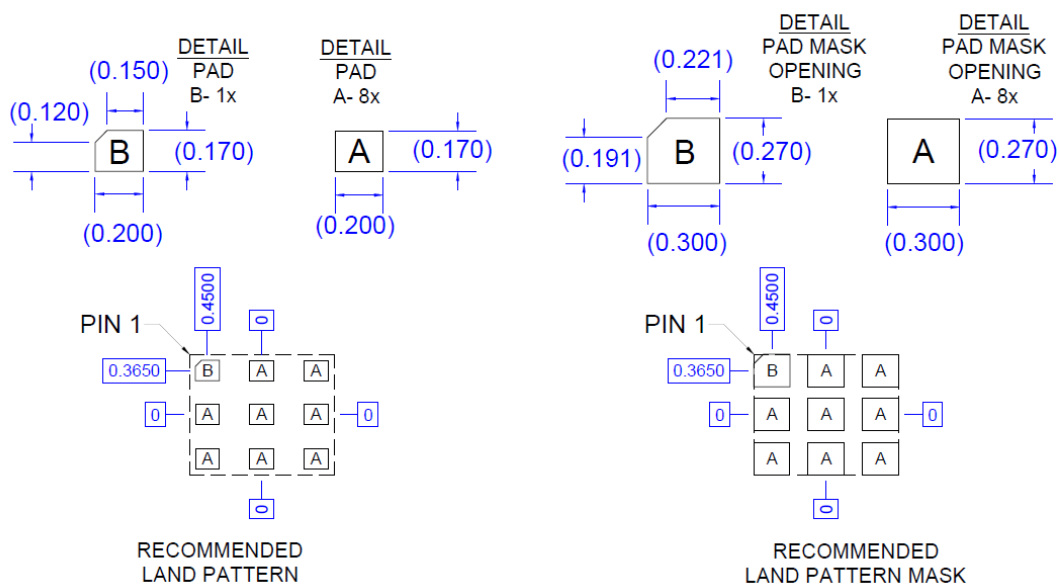
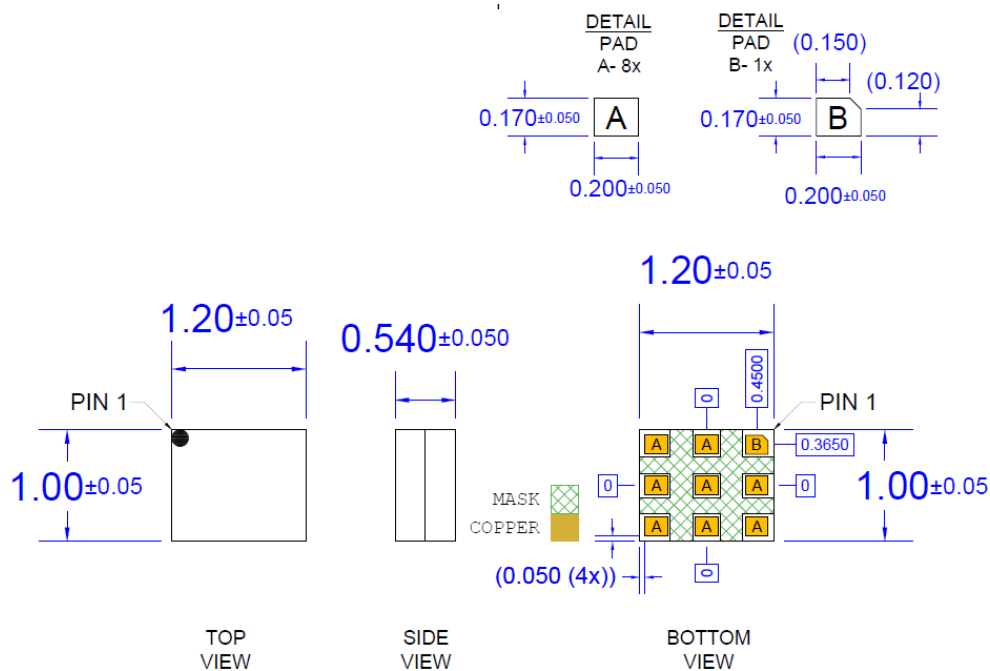
DESCRIPTION	DESIGNATOR	FOOTPRINT
CAP, 250pF, +/-0.25pF, 25V, C0G, 0201	C1	0201_C
CAP, 1µF 5%, 25V, C0G, 0201	C2	0201_C
RES, 0 OHM 1%, 1/20W, 0201	R1,R2	0201_R

## Evaluation Board details

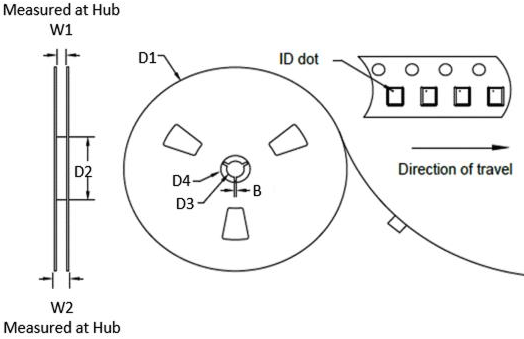
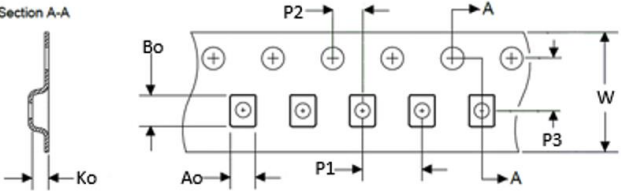


## Mechanical Information

### Package Drawing

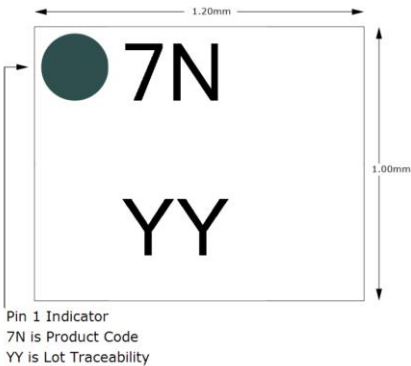


Tape and Reel Information

							
Feature	Measure	Symbol	Size (mm)	Feature	Measure	Symbol	Size (mm)
Flange	Diameter	D1	330.0	Cavity	Length	Ao	1.17
	Thickness	W2	14.2		Width	Bo	1.40
	Space Between Flange	W1	8.8		Depth	Ko	0.65
Hub	Outer Diameter	D2	102.0		Pitch	P1	4.0
	Arbor Hole Diameter	D3	13.0	Centerline Distance	Cavity to Perforation (Length)	P2	2.0
	Key Slit Width	B	2.0		Cavity to Perforation (Width)	P3	3.5
	Key Slit Diameter	D4	20.2	Carrier Tape	Width	W	8.0

(Unless otherwise specified, all dimension tolerances per EIA-481)

Marking Diagram



## Handling Precaution

PARAMETER	RATING	STANDARD
ESD – Human Body Model (HBM)	Class 1C	ANSI/ESD/JEDEC JS-001
ESD – Charged Device Model (CDM)	Class C3	ANSI/ESDA/JEDEC JS-002
MSL – Moisture Sensitivity Level	Level 3	IPC/JEDEC J-STD-020



Caution!  
ESD sensitive device

## Solderability

Compatible with both lead-free (260 °C max. reflow temperature) and tin/lead (245 °C max. reflow temperature) soldering processes.

Package lead plating: Electrolytic plated Au over Ni

## RoHS Compliance

This part is compliant with the 2011/65/EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment), as amended by Directive 2015/863/EU.

This product also has the following attributes:

- Lead free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C<sub>15</sub>H<sub>12</sub>Br<sub>4</sub>O<sub>2</sub>) Free
- SVHC Free

## Revision History

Data sheet Revision Code	Comments
A	Initial Release
B	Update Mechanical Drawing
C	Electrical Performance update
D	Updated Package Dimensions
E	Updated ESD rating, pin labelling
F	Updated MSL to Level 3 and pin number update
G	Updated Control Voltages and Ordering Information
H	Updated AMR, Electrical Specs, and EVB Information
I	Updated AMR, Operating Conditions, and Handling Precautions
J	Added Tape and Reel Information
K	Removed "Preliminary" Watermark and updated AMR

## Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations:

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