



ACT88760

Advanced PMIC with 7 Bucks, 6 LDOs

ACT88760 Datasheet Brief

Please refer to the [ACT88760 Product Page](#) for more information. Click [here](#) for a link to request the full datasheet.

BENEFITS and FEATURES

- **Wide input voltage range**
 - $V_{in} = 2.7V$ to $5.5V$
- **Complete integrated power solution**
 - 3x 4A DC/DC Step-Down (Buck) Regulators
 - 2x 3A DC/DC Step-Down (Buck) Regulators
 - 2x 2A DC/DC Step-Down (Buck) Regulators
 - Parallelable Bucks for higher current
 - 2x 800mA High PSRR LDOs
 - 4x 400mA General Purpose LDOs
 - LDO Load Switch Mode
- **Space Savings**
 - Fully integrated
 - High $F_{sw} = 1.125MHz$ to $2.25MHz$
 - Optimized for $0.47\mu H$ Inductor
 - Integrated sequencing
 - Integrated Constant Current LED Sinks
- **Easy system level design**
 - Configurable Sequencing
 - Multiple Wake up Triggers with GPIOs
 - Seamless Sequencing of External Supplies
 - 11 Programmable GPIOs
- **Highly configurable**
 - μP interface for status reporting and controllability
 - Programmable Reset and Power Good GPIO's
 - Flexible Sequencing Options
 - Multiple Sleep Modes
 - Integrated DVS
- **I²C Interface – 1MHz**

APPLICATIONS

- Video processor and core supply voltage.
- Computer Vision.
- AR / VR Applications.
- Connected Home Applications.
- Portable devices.

GENERAL DESCRIPTION

The ACT88760 PMIC is an integrated ActiveCiPS™ power management integrated circuit. It powers a wide range of processors, including, video processors, FPGA's, wearables, peripherals, and microcontrollers. The ACT88760 is highly flexible and can be reconfigured via I²C for multiple applications without the need for PCB changes. The low external component count and high configurability significantly speeds time to market. Examples of configurable options include output voltage, startup time, slew rate, system level sequencing, switching frequency, sleep modes, operating modes etc. ACT88760 is programmed at the factory with a default configuration. These settings can be optimized for a specific design through the I²C interface. The ACT88760 is available in several default configurations. Contact the factory for specific default configurations.

The ACT88760 integrates seven high efficiency switching regulators, six linear regulators, and eleven GPIOs. Two LDOs can be configured as load switches. The eleven GPIOs pins are configurable and used for a variety of system functions.

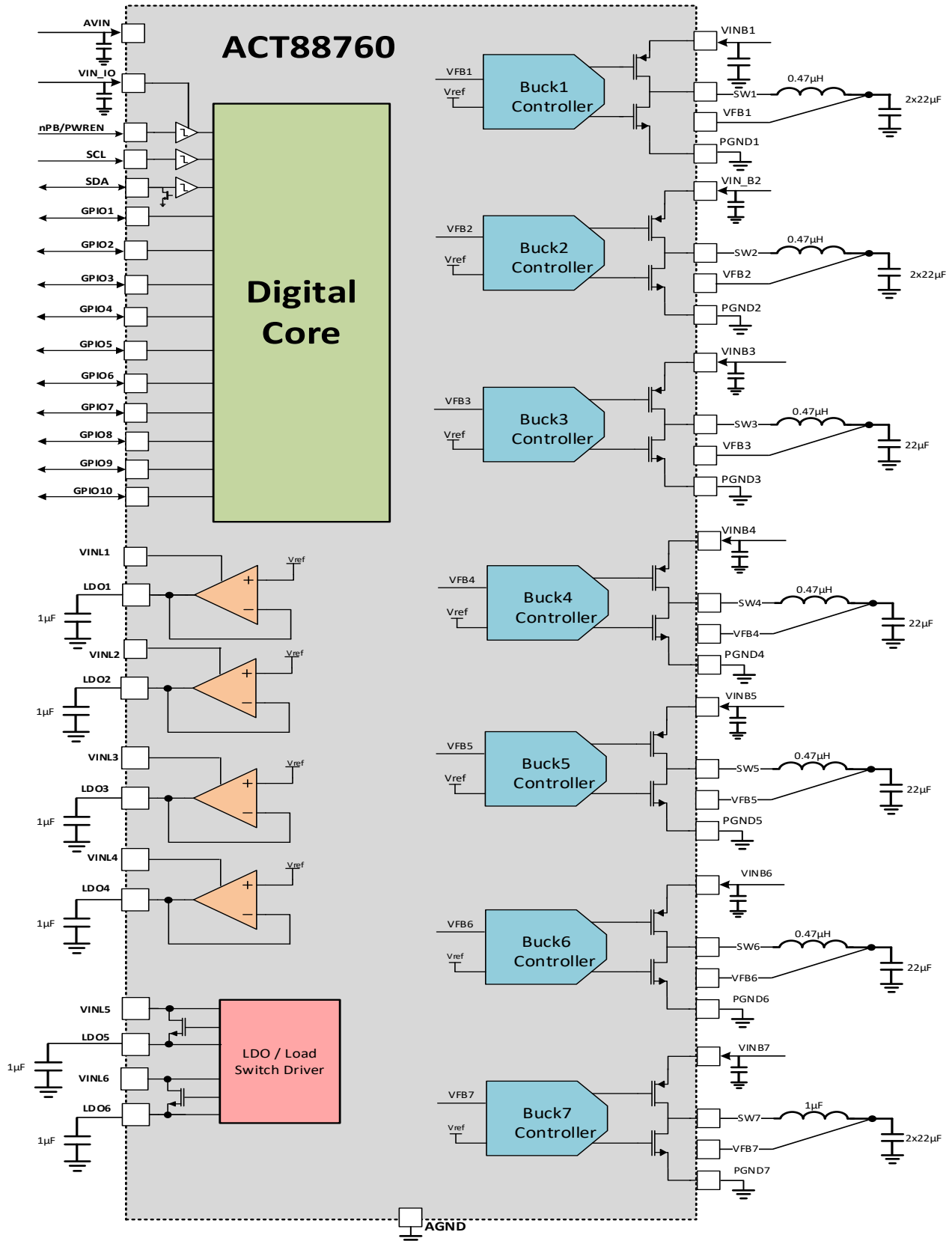
The ACT88760 is designed to work with a single lithium ion or lithium polymer batteries with an input voltage up to $5.5V$. It works with input voltages as low as $2.6V$.

The seven switching converters are peak current mode, fixed frequency DC-DC step down converters. Buck1/2 and Buck3/4 can be paralleled for 8A or 6A of output current. The high switching frequencies allow small inductors which reduce solution size and optimize load transient response. The converters are internally compensated for small ceramic output capacitors.

Two LDOs are high PSRR with $> 70dB$. The other four are general purpose LDOs. LDO5/6 can be configured as load switches with less than $25m\Omega$ $R_{DS(on)}$.

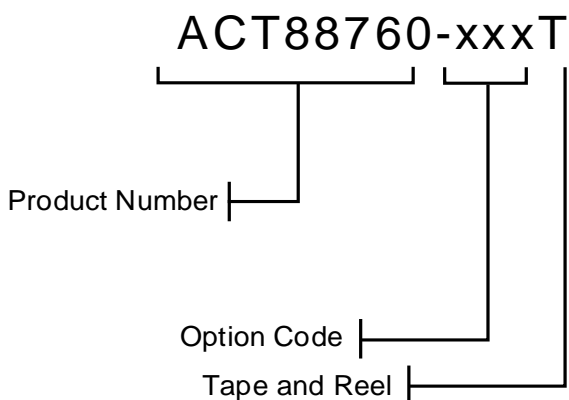
The ACT88760 PMIC is available in a $3.85mm \times 3.85mm$ 81 ball WLCSP package.

FUNCTIONAL BLOCK DIAGRAM



ORDERING INFORMATION

PART NUMBER	VIN	VBuck1/2 Dual Phase		VBuck3	VBuck4	VBuck5	VBuck6	VBuck7
ACT88760-101T		0.8V		0.8V	1.2V	1.1V	3.3V	0.8V
	VLDO1	VLDO2	VLDO3	VLDO4	VLDO5	VLDO6		
	0.8V	0.6V	1.8V	3.0V	LSW	LSW		
ACT88760-102.E2T	VIN	VBuck1/2 Dual Phase		VBuck3	VBuck4	VBuck5	VBuck6	VBuck7
	3.3-5V	0.8V		1.0V	1.8V	1.2V	3.3V	3.3V
	VLDO1	VLDO2	VLDO3	VLDO4	VLDO5	VLDO6		
	1.8V	1.2V	3.3V	3.3V	LSW	LSW		
ACT88760-104T	VIN	VBuck1/2 Dual Phase		VBuck3	VBuck4	VBuck5	VBuck6	VBuck7
	5V	0.8V		1.8V	1.1V	1.2V	1.2V	3.3V
	VLDO1	VLDO2	VLDO3	VLDO4	VLDO5	VLDO6		
	0.8V	1.8V	2.8V	2.8V	2.8V	1.8V		



Note 1: Standard product options are identified in this table. Contact factory for custom options, minimum order quantity required.

Note 2: "xxx" represents the CMI (Code Matrix Index) option. The CMI identifies the IC's default register settings.

PIN CONFIGURATION – WLCSP - 81

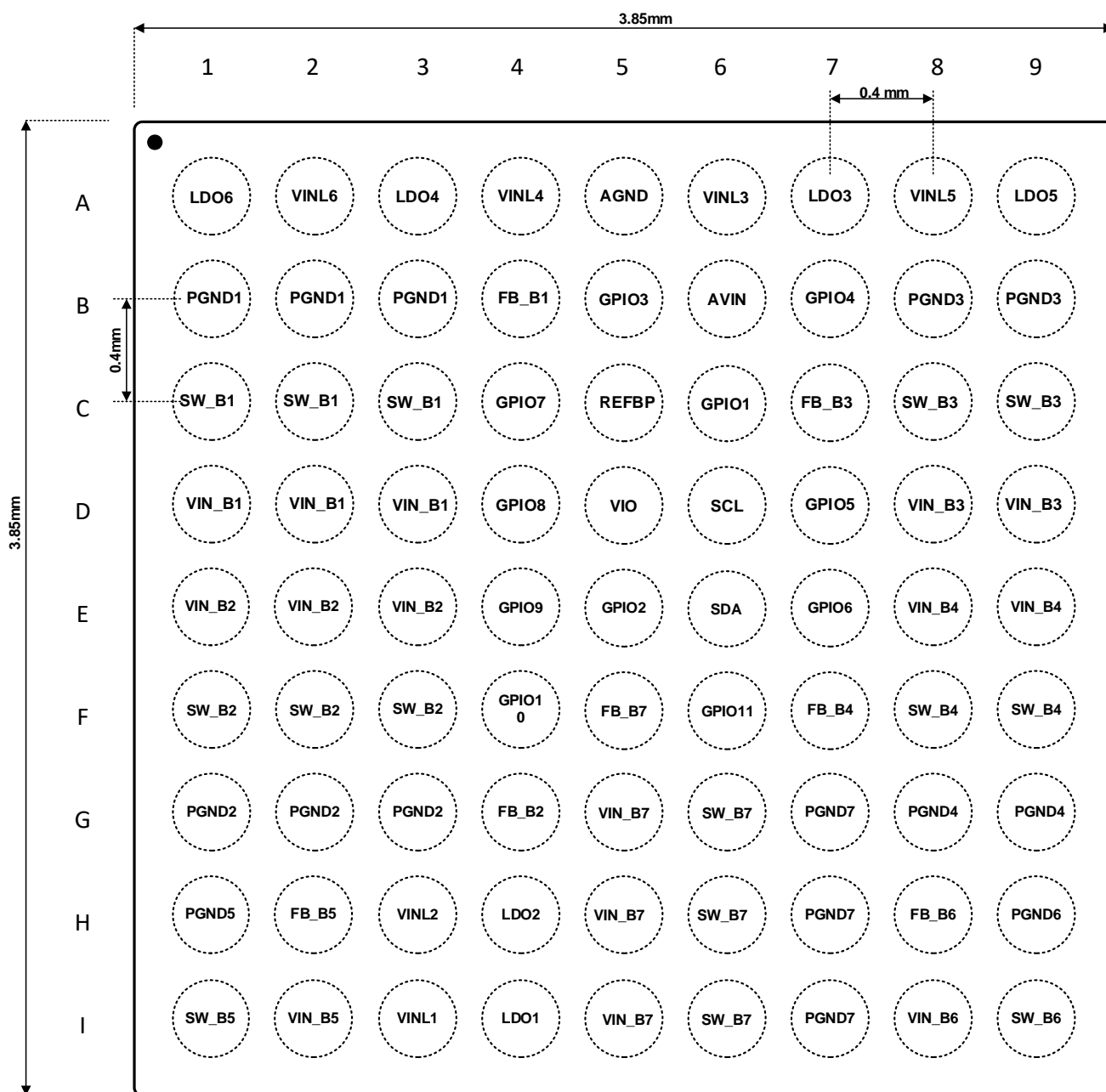


Figure 1: Pin Configuration – Top View (bumps down) – WLCSP- 81

PIN DESCRIPTIONS

Ball (CSP)	NAME	DESCRIPTION
A1	LDO6	Output of LDO6 / LSW6
A2	VINL6	Input to LDO6 / LSW6
A3	LDO4	Output of LDO4
A4	VINL4	Input to LDO4
A5	AGND	Analog Ground. Kelvin connect to the other ground pins on the IC.
A6	VINL3	Input to LDO3
A7	LDO3	Output of LDO3
A8	VINL5	Input to LDO5 / LSW5
A9	LDO5	Output of LDO5 / LSW5
B1, B2, B3	PGND1	Power GND for Buck1
B4	FB_B1	Feedback for Buck1. Connect to the Buck1 output capacitor.
B5	GPIO3	GPIO3
B6	AVIN	Analog Power Input Pin – Main Power Input to the PMIC.
B7	GPIO4	GPIO4 Pin
B8, B9	PGND3	Dedicated Power GND for Buck3
C1, C2, C3	SW_B1	Switch Pin for Buck1 (connect to inductor)
C4	GPIO7	GPIO7 Pin (Can Configure as PWREN, PWRON or nPB Input Pins)
C5	REFBYP	Reference Bypass Pin. Must connect a 100nF between REFBYP and AGND.
C6	GPIO1	GPIO1
C7	FB_B3	Feedback for Buck3. Connect to the Buck3 output capacitor.
C8, C9	SW_B3	Switch Pin for Buck1 (connect to inductor)
D1, D2, D3	VIN_B1	Dedicated Input Voltage to Buck1
D4	GPIO8	GPIO8
D5	VIO	Input / Output Voltage Reference Level for GPIOs
D6	SCL	I ² C Clock Pin
D7	GPIO5	GPIO5
D8, D9	VIN_B3	Dedicated Input Voltage to Buck3
E1, E2, E3	VIN_B2	Dedicated Input Voltage to Buck2
E4	GPIO9	GPIO9 Pin
E5	GPIO2	GPIO2 Pin
E6	SDA	I ² C Data Pin
E7	GPIO6	GPIO6 Pin (Can Configure as PWREN, PWRON or nPB Input Pins)
E8, E9	VIN_B4	Dedicated Input Voltage to Buck4
F1, F2, F3	SW_B2	Switch Pin for Buck2 (connect to inductor)
F4	GPIO10	GPIO10 Pin
F5	FB_B7	Feedback for Buck7. Connect to the Buck7 output capacitor.
F6	GPIO11	GPIO11 (Can Configure as PWREN or PWRON Input Pins)
F7	FB_B4	Feedback for Buck4. Connect to the Buck4 output capacitor.
F8, F9	SW_B4	Switch Pin for Buck4 (connect to inductor)
G1, G2, G3	PGND2	Dedicated Power GND for Buck2
G4	FB_B2	Feedback for Buck2. Connect to the Buck2 output capacitor.
G5, H5, I5	VIN_B7	Dedicated Input Voltage to Buck7

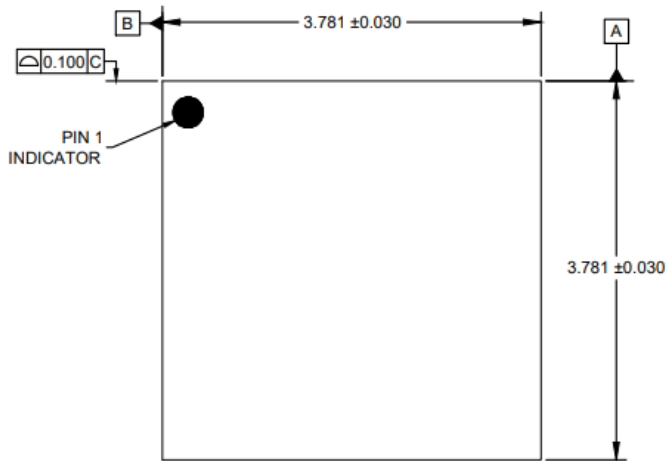


ACT88760

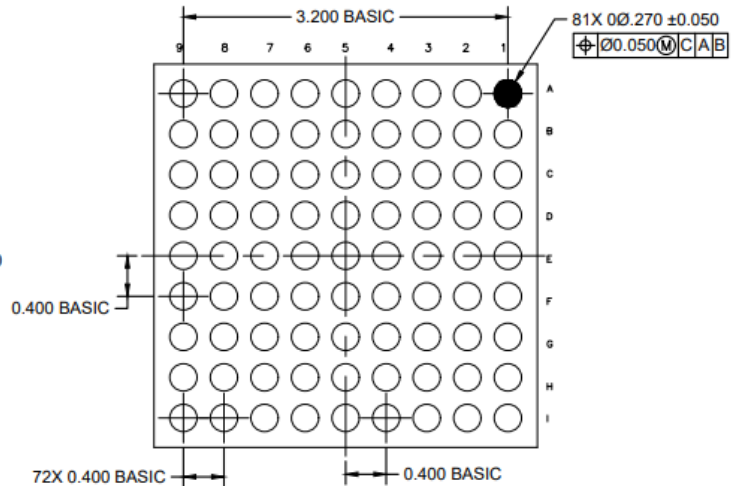
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G6, H6, I6	SW_B7	Switch Pin for Buck7 (connect to inductor)
G7, H7, I7	PGND7	Dedicated Power GND for Buck7
G8, G9	PGND4	Dedicated Power GND for Buck4
H1	PGND5	Dedicated Power GND for Buck5
H2	FB_B5	Feedback for Buck5. Connect to the Buck5 output capacitor.
H3	VINL2	Input to LDO2
H4	LDO2	Output of LDO2
H8	FB_B6	Feedback for Buck6. Connect to the Buck6 output capacitor.
H9	PGND6	Dedicated Power GND for Buck6
I1	SW_B5	Switch Pin for Buck5 (connect to inductor)
I2	VIN_B5	Dedicated Input Voltage to Buck5
I3	VINL1	Dedicated Input Voltage to LDO1
I4	LDO1	Output of LDO1
I8	VIN_B6	Dedicated Input Voltage to Buck6
I9	SW_B6	Switch Pin for Buck6 (connect to inductor)

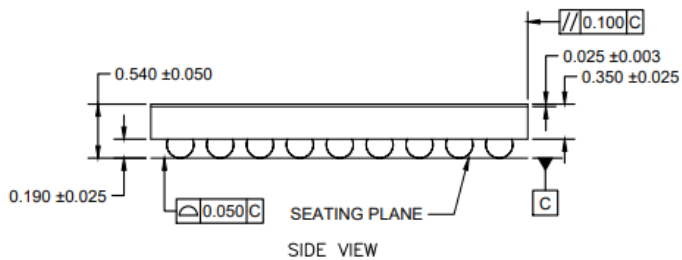
PACKAGE OUTLINE AND DIMENSIONS



TOP VIEW (BUMPS DOWN)



BOTTOM VIEW (BUMPS UP)



SIDE VIEW

Product Compliance

This part complies with RoHS directive 2011/65/EU as amended by (EU) 2015/863.

This part also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C₁₅H₁₂Br₄O₂) Free
- PFOS Free
- SVHC Free



Contact Information

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

Web: www.qorvo.com

Tel: 1-844-890-8163

Email: customer.support@qorvo.com

For technical questions and application information:

Email: appsupport@qorvo.com

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