



# HADRON™ 640R INTEGRATION GUIDE

August 2023 | ver. 1.12



# CAMERA SPECIFICATIONS



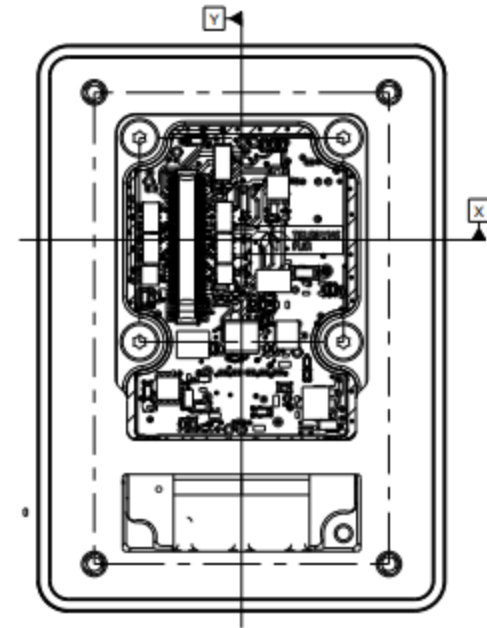
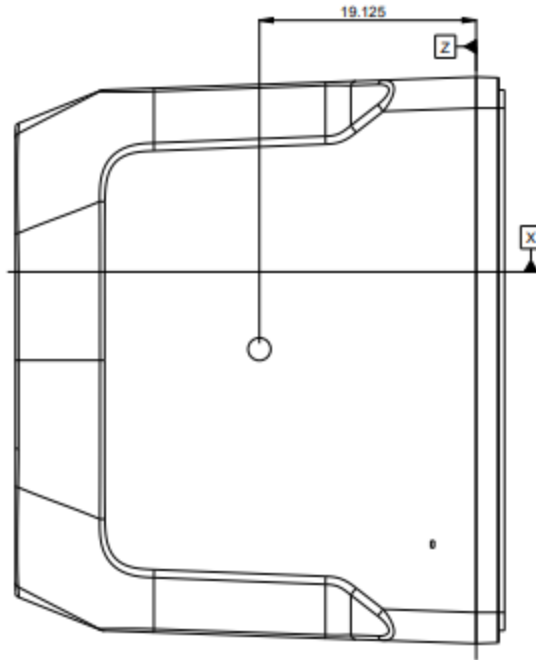
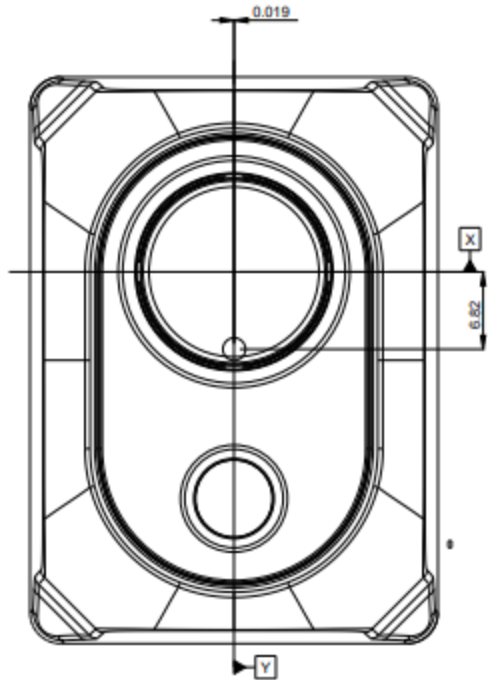
	Thermal Camera	Visible Camera
<b>Core</b>	Boson®	OMNIVISION™
<b>Resolution</b>	640 x 512 (VGA)	64MP
<b>HFOV</b>	32°	67°
<b>Input</b>	MIPI, I2C, USB 3.0	MIPI, I2C
<b>Output</b>	MIPI (2-lane), USB 3.0	MIPI (4-lane)
<b>Other</b>	Radiometric	Configurable to Low Light

# MECHANICAL & ELECTRICAL SPECIFICATIONS

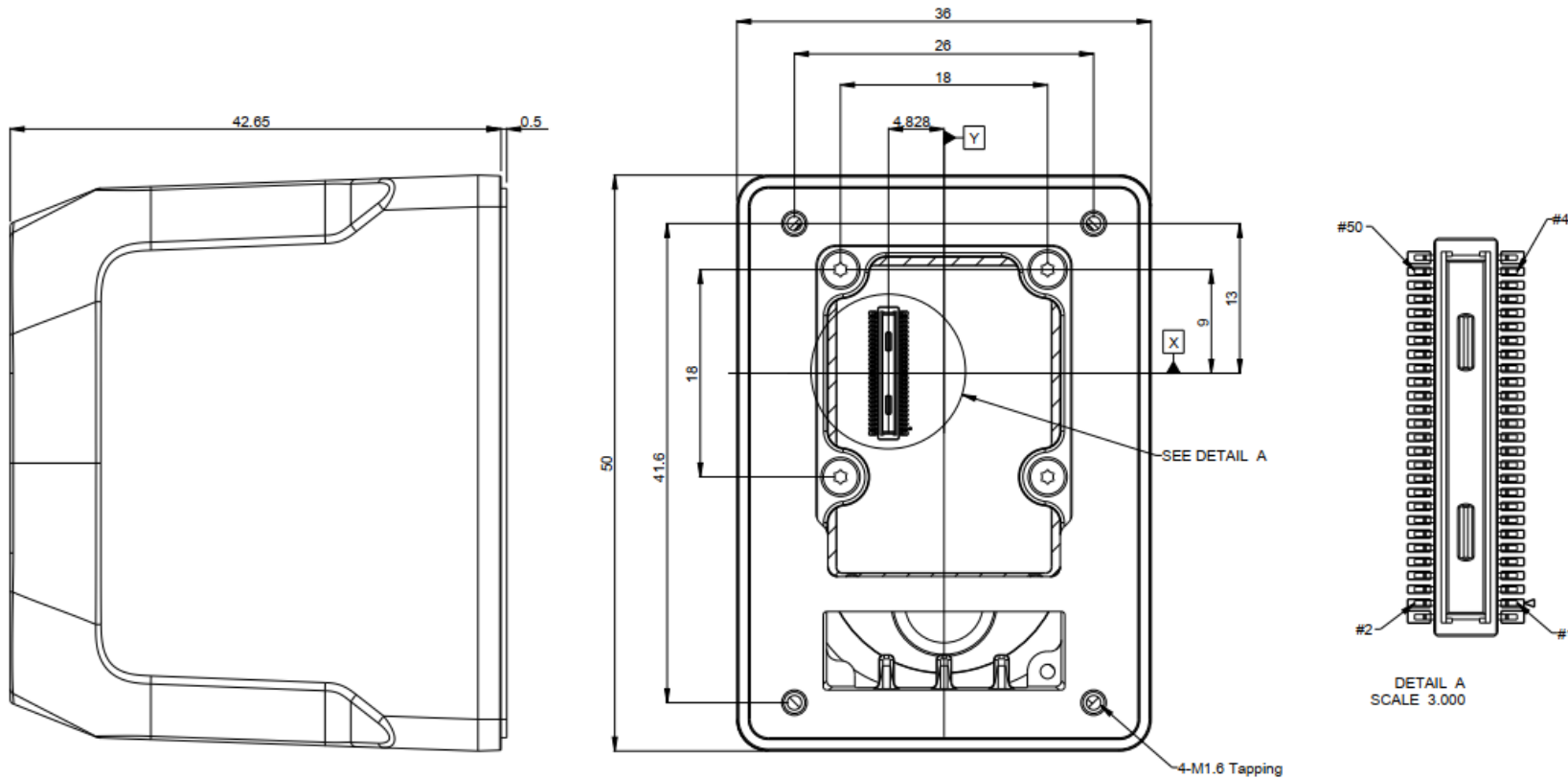


<b>Weight</b>	56 grams
<b>Size</b>	36 mm (x) x 50 mm (y) x 43 mm (z)
<b>Ingress Protection</b>	IP54
<b>Certifications</b>	RoHS, REACH
<b>Maximum Power Draw</b>	3.0W
<b>Typical Power Draw</b>	1.8W

# CENTER OF GRAVITY DIMENSIONS



# DIMENSIONS & PIN OUT ASSIGNMENT

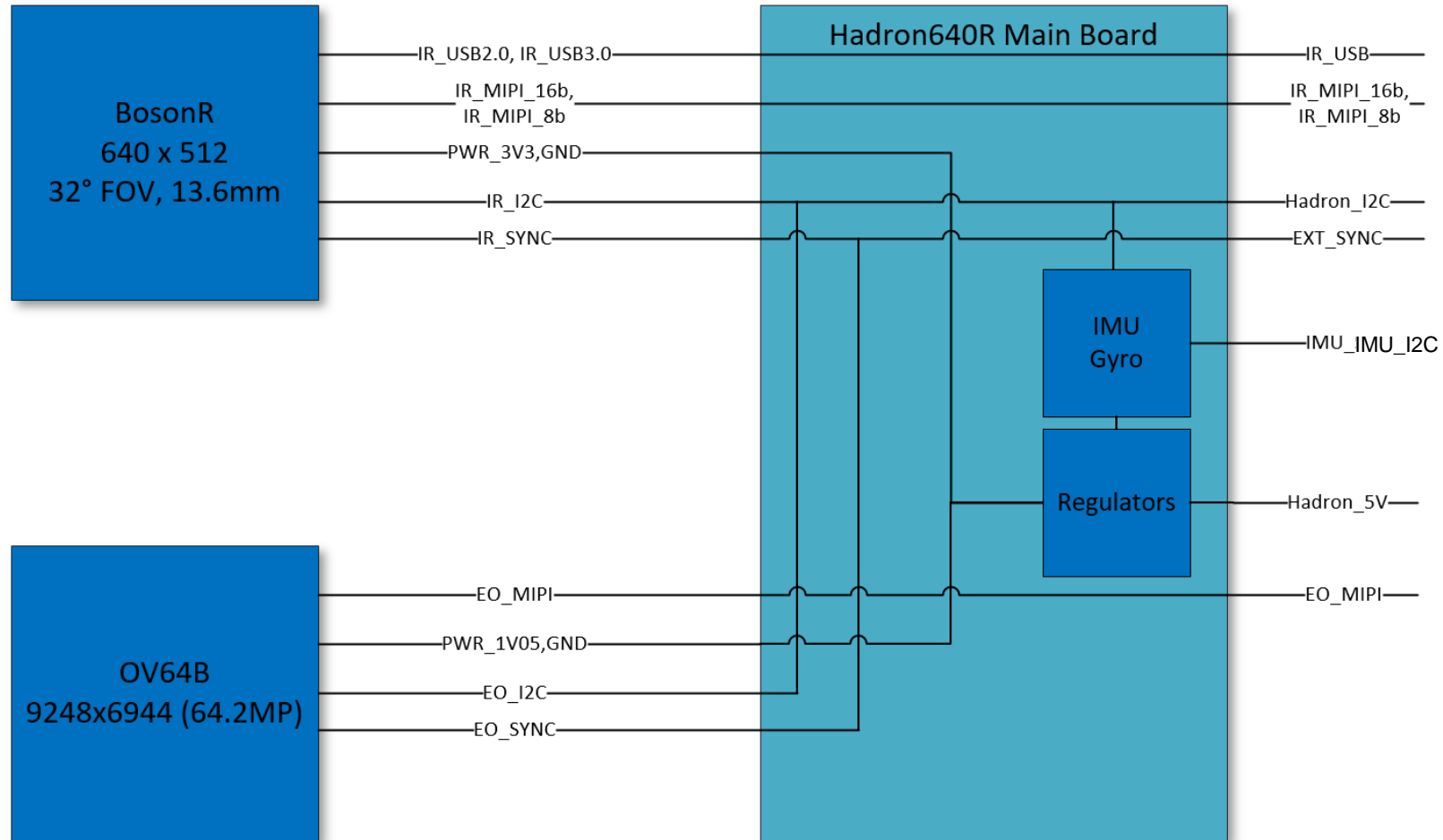


CONNECTOR:  
HIROSE DF40C-50DP-0.4V(51)  
MATING CONNECTOR

PIN ASSIGNMENT:

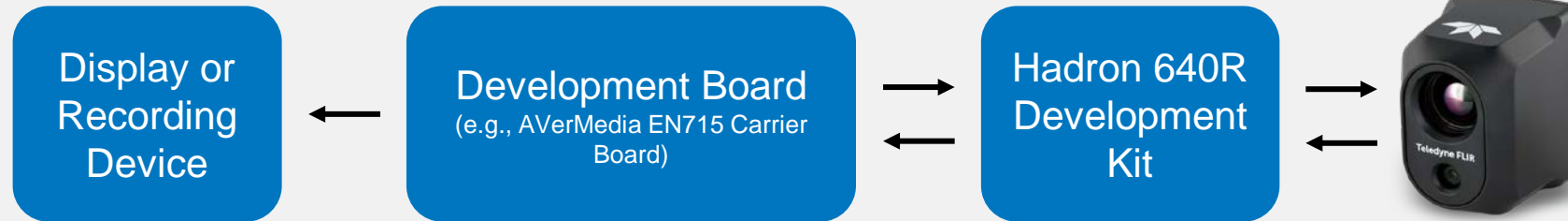
Pin #	Description	Pin #	Description
1	HADRON_USB_VBUS	2	HADRON_5V
3	HADRON_USB_ID	4	HADRON_5V
5	GND	6	HADRON_5V
7	HADRON_USB_D_N	8	HADRON_5V
9	HADRON_USB_D_P	10	HADRON_RST
11	GND	12	GND
13	HADRON_USB_TX_N	14	MD3_P
15	HADRON_USB_TX_P	16	MD3_N
17	GND	18	GND
19	HADRON_USB_RX_N	20	MD1_P
21	HADRON_USB_RX_P	22	MD1_N
23	GND	24	GND
25	HADRON_TC_MIPI_D1_N	26	MC_P
27	HADRON_TC_MIPI_D1_P	28	MC_N
29	GND	30	GND
31	HADRON_TC_MIPI_D0_N	32	MD0_P
33	HADRON_TC_MIPI_D0_P	34	MD0_N
35	GND	36	GND
37	HADRON_TC_MIPI_C_N	38	MD2_P
39	HADRON_TC_MIPI_C_P	40	MD2_N
41	GND	42	GND
43	EXT_VSYNC	44	HADRON_IMU_CS
45	HADRON_IMU_INT	46	HADRON_IMU_SCK_SCL
47	HADRON_CAM_SCL	48	HADRON_IMU_MOSI_SDA
49	HADRON_CAM_SDA	50	HADRON_IMU_MISO

# BLOCK DIAGRAM

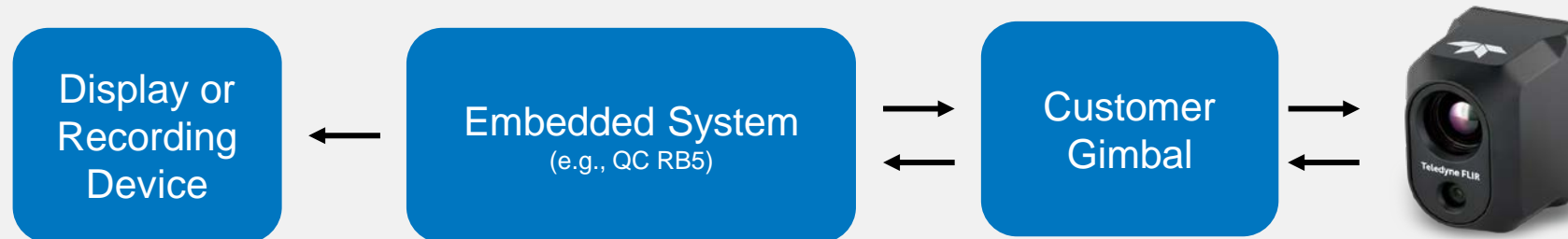


# ECOSYSTEM DEFINITIONS

## DEVELOPMENT ECOSYSTEM:



## COMMERCIAL ECOSYSTEM:



# HADRON 640R DEVELOPMENT KITS



Embedded System	NVIDIA® Jetson Nano™	Qualcomm® Snapdragon 865	Qualcomm Robotics RB5
Operating System	Linux	Android	Linux
Hadron 640R Development Kit	FLIR PN 421-0095-00	FLIR PN 421-0094-00	FLIR PN 421-0096-00
Development Board (Sold Separately)	AVerMedia® EN715 Carrier Board	Lantronix® Open-Q 865XR SOM Development Kit	Qualcomm Robotics RB5 Vision Kit
Reference Driver Status	Reference Driver Complete Customers can use as a reference to create drivers for other Jetson Processors or hire Teledyne FLIR recommended third parties to do so.	Reference Driver Complete 865 has an Android operating system. Customers will need to develop apps to fully integrate the Hadron 640 functions with their host device.	Reference Driver Complete Open Embedded LE. Ubuntu LU

Approved for public release: Teledyne FLIR approved [FLIRGTC-SBA-010].



# NVIDIA JETSON NANO DEVELOPER KIT



---

**Part #:**  
**421-0095-00 NVIDIA Nano Test Kit for Hadron 640R**

---

4244272 - QC RB5/NVIDIA Nano Interface Board for Hadron 640R

---

244850 - ISP Board

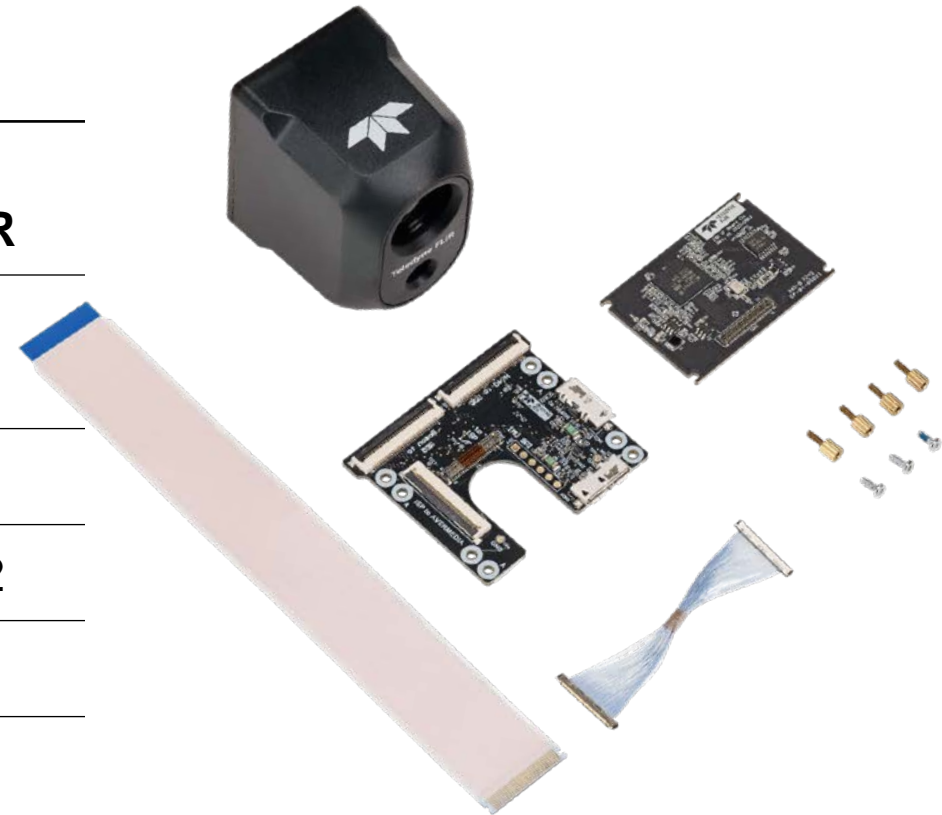
---

4244852 - Cable Assembly, Univ IF FFC-20220512

---

4244853 - Cable Assembly, Univ IF-20220517

---



# QUALCOMM SNAPDRAGON 865 DEVELOPER KIT



---

**Part #:**

**421-0094-00 QC 865 Open Q Test Kit for Hadron 640R**

---

4244271 - 865 Open Q Interface Board for Hadron 640R

---

4244273 - Test Board for Hadron 640R

---

4244851 - Cable Assembly, JAE JF08R0R041020UA

---

# QUALCOMM RB5 DEVELOPER KIT



---

**Part #:**  
**421-0096-00 QC RB5 Test Kit for Hadron 640R**

---

4244272 - QC RB5/NVIDIA Nano Interface Board for Hadron 640R

---

4244273 - Test Board for Hadron 640R

---

4246592 - FPC cables (2)

---

# REFERENCE DRIVER INTRODUCTION



	NVIDIA Jetson Nano	Qualcomm Snapdragon 865	Qualcomm RB5
<b>Development Environment</b>	Jetpack 4.3 (R32.3.1)	Android 10.0.0	Open Embedded LE Ubuntu LU
<b>Maximal Resolution</b>	16MP	64MP	64MP
<b>White Balance (Defined Presets)</b>	Yes	Yes	Yes
<b>White Balance (Granular)</b>	Yes	Yes	Yes
<b>Resolution Change</b>	Yes	Yes	Yes
<b>Sensitivity (ISO)</b>	Yes	Yes	Yes
<b>Zoom</b>	Yes	Yes	Yes
<b>Image Capture to JPEG</b>	Yes	Yes	Yes
<b>RAW Image Capture</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Brightness</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Horizontal &amp; Vertical Flip</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Sharpness</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Shutter Speed</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Gain (Granular)</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Auto Exposure Control</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Binning for Low Light</b>	Default Bin to 16MP	Qualcomm / Android Restricted	Yes
<b>Sensor Crop Zones</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Reading Sensor Temperature</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Contrast</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Saturation</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Hue</b>	Yes	Qualcomm / Android Restricted	Yes
<b>WDR</b>	Yes	Qualcomm / Android Restricted	Yes
<b>Denoise</b>	Yes	Qualcomm / Android Restricted	Feature Requires Image Tuning
<b>Sensor HDR Utilization</b>	No - ISP Does Not Support	Qualcomm / Android Restricted	Feature Requires Image Tuning

Approved for public release: Teledyne FLIR approved [FLIRGTC-SBA-010].



**TELEDYNE  
FLIR**

# FOR MORE INFORMATION

[www.flir.com/hadron640r](http://www.flir.com/hadron640r)



Approved for public release: Teledyne FLIR approved [FLIRGTC-SBA-010].

**WARNING:** Information contained herein is classified as EAR99 under the U.S. Export Administration Regulations. Export, reexport or diversion contrary to U.S. law is prohibited.