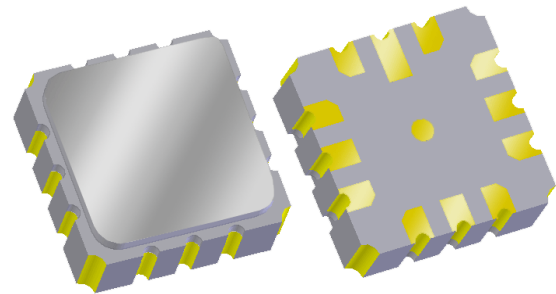


# 856908


## 836.5/881.5 MHz SAW Duplexer

### Applications

- General purpose wireless
- Femtocells
- Repeaters
- Data cards and dongles

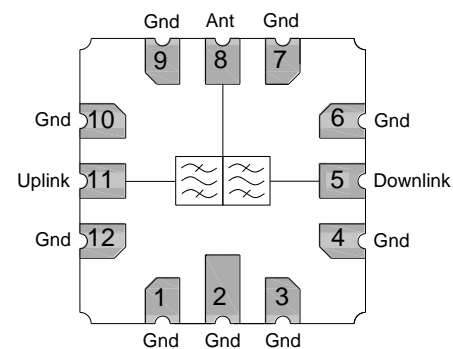


### Product Features

- Usable bandwidth 25 MHz
- No matching required for operation at 50Ω
- Excellent rejection for Bluetooth and GPS operation
- Suitable for Automotive applications - Compliant to the AEC-Q200 reliability standard. Manufacturing facilities are certified with ISO/TS 16949:2002
- High Isolation
- High Rejection
- Ceramic Surface Mount Package (SMP)
- Small Size : 3.8 x 3.8 x 1.47 mm
- Hermetic **RoHS** compliant, **Pb-free** 

### Functional Block Diagram

Top view



### General Description

856908 is a Band V duplexer in a compact size for use in Femtocells, coverage enhancement repeaters, data cards, and other wireless data applications. Designed for rejection of unwanted Bluetooth and GPS signals, this SAW duplexer also has excellent power handling capability for low power transmitters.

Housed in a 3.8 x 3.8 mm hermetic package, this device allows for a compact and cost effective duplexer solution for Band V applications.

No matching components are required, making the PCB design and implementation easy.

### Pin Configuration

Pin # SE	Description
5	Downlink
8	Antenna
11	Uplink
1,2,3,4,6	Case Ground
7,9,10,12	Case Ground

### Ordering Information

Part No.	Description
856908	packaged part
856908-EVB	evaluation board

Standard T/R size =4000 units/reel.

## Specifications

### Electrical Specifications <sup>(1)</sup>

 Specified Temperature Range: <sup>(2)</sup> -30 to +85 °C

Uplink Specifications					
Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Center Frequency		-	836.5	-	MHz
Maximum Insertion Loss	824 – 849 MHz	-	2.0	2.5	dB
Amplitude Ripple	824 – 849 MHz	-	0.25	1.0	dB p-p
Absolute Attenuation	869 – 894 MHz	42.5	44.7	-	dB
	1574 – 1577 MHz	38	42.4	-	dB
	1648 – 1698 MHz	35	45	-	dB
	1850 – 2170 MHz	27	35.7	-	dB
	2472 – 2547 MHz	15	22.6	-	dB
Return Loss at Uplink Terminal <sup>(5)</sup>	824 – 849 MHz	9.5	12	-	dB
Input Power <sup>(6)</sup>	824 – 849 MHz			+27	dBm

Downlink Specifications					
Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Center Frequency		-	881.5	-	MHz
Maximum Insertion Loss	869 – 894 MHz	-	2.5	3.5	dB
Amplitude Ripple	869 – 894 MHz	-	0.4	2.2	dB p-p
Absolute Attenuation	824 – 849 MHz	50	55.3	-	dB
	1570 – 1580 MHz	40	56.0	-	dB
	1850 – 2170 MHz	33	41.0	-	dB
	2400 – 2484 MHz	15	23.4	-	dB
Return Loss at Downlink Terminal <sup>(5)</sup>	869 – 894 MHz	9.5	10.8	-	dB
Input Power <sup>(6)</sup>	869 – 894 MHz			+24	dBm

Uplink-Downlink Specifications					
Parameter <sup>(3)</sup>	Conditions	Min	Typical <sup>(4)</sup>	Max	Units
Uplink-Downlink Isolation	824 – 849 MHz	50	56.9	-	dB
	849 – 869 MHz	34	38.4	-	dB
	869 – 894 MHz	45	46.4	-	dB
Source/Load Impedance (single-ended) <sup>(7)</sup>		-	50	-	Ω

Notes:

- All specifications are based on the TriQuint schematics for the reference designs shown on page 4
- In production, devices will be tested at room temperature to a guardbanded specification to ensure electrical compliance over temperature
- Electrical margin has been built into the design to account for the variations due to temperature drift and manufacturing tolerances
- Typical values are based on average measurements at room temperature on pcb
- Excluding losses due to PCB
- CW signal at 55°C for 10,000 hours
- This is the optimum impedance in order to achieve the performance shown

### Absolute Maximum Ratings

Parameter	Rating
Operable Temperature	-40 to +85 °C
Storage Temperature	-40 to +85 °C

Operation of this device outside the parameter ranges given above may cause permanent damage.

## Specifications

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Source/Load Impedance (single-ended) <sup>(7)</sup>		-	50	-	Ω

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### Absolute Maximum Ratings

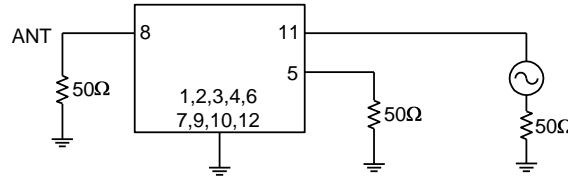
Parameter	Rating
Operable Temperature	-40 to +85 °C
Storage Temperature	-40 to +85 °C

Operation of this device outside the parameter ranges given above may cause permanent damage.

### Reference Design – 50Ω SE Input, 50Ω SE Output

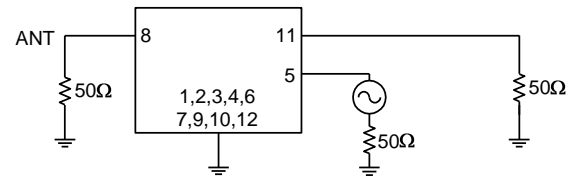
#### Schematic

**Uplink**  
50 Ω  
Single-ended  
Input



50 Ω  
Single-ended  
Output

**Downlink**  
50 Ω  
Single-ended  
Input

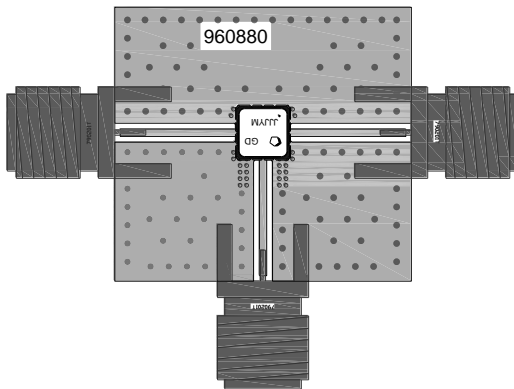


50 Ω  
Single-ended  
Output

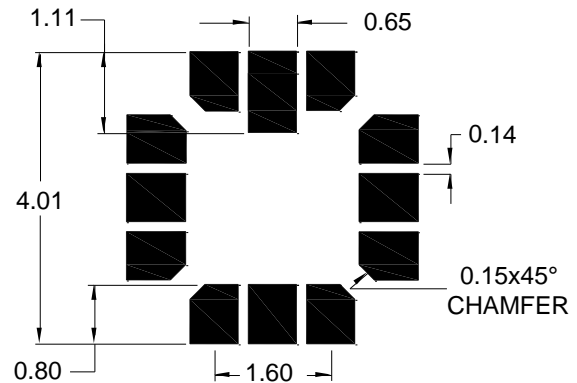
**Notes:**

1. No impedance matching required
2. Actual matching values may vary due to PCB layout and parasitic

#### PC Board



#### Mounting Configuration



**Notes:**

Top, middle & bottom layers: 1 oz copper  
Substrates: FR4 dielectric, .031" thick  
Finish plating: Nickel: 3-8μm thick, Gold: .03-.2μm thick  
Hole plating: Copper min .0008μm thick

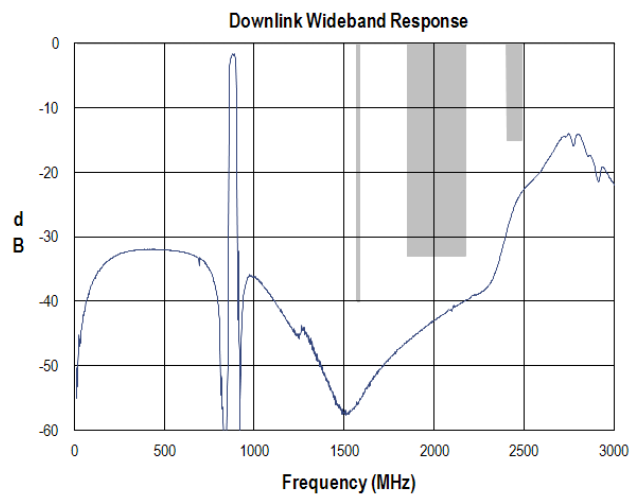
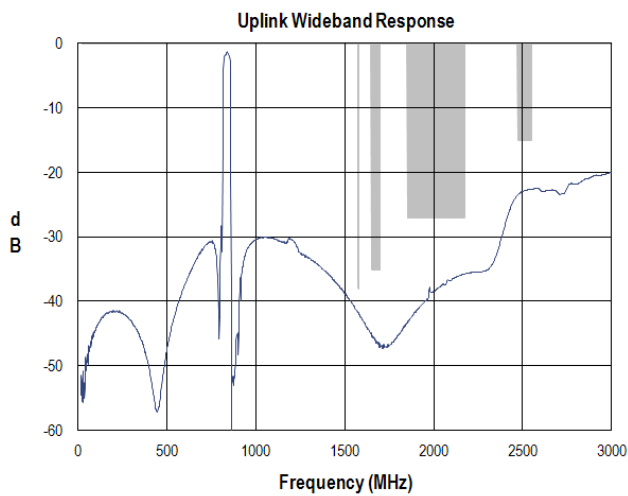
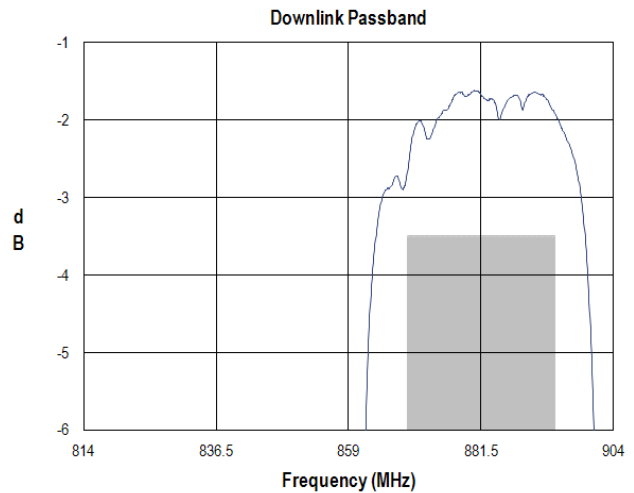
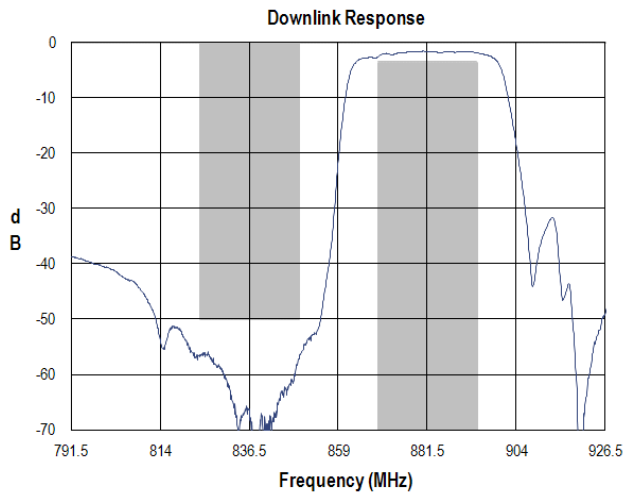
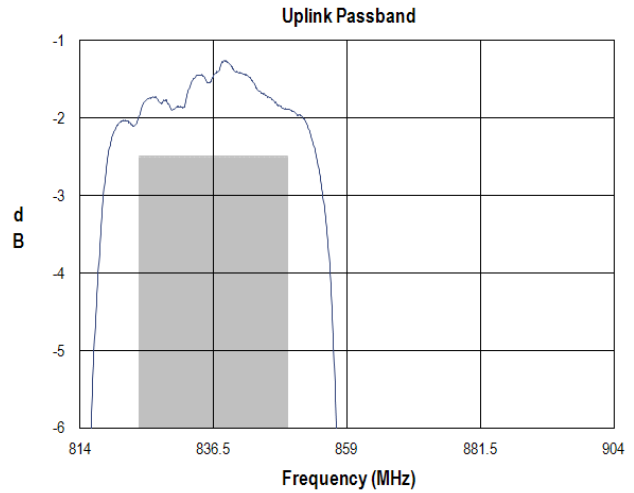
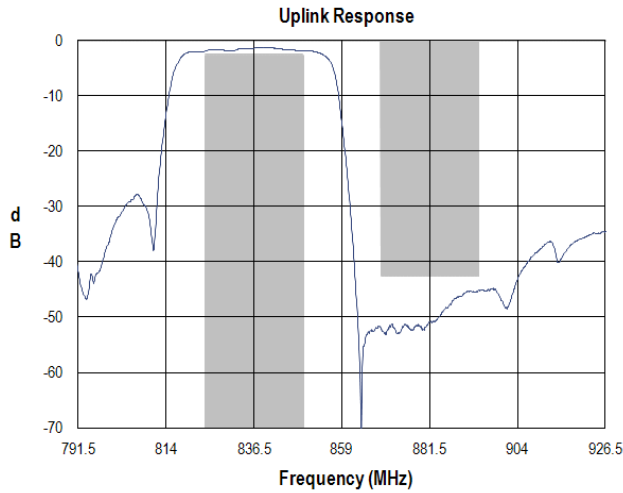
**Notes:**

1. All dimensions are in millimeters.
2. This footprint represents a recommendation only.

#### Bill of Material

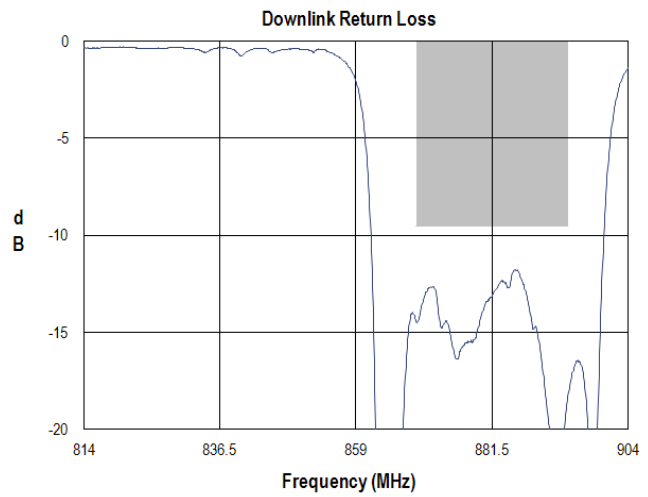
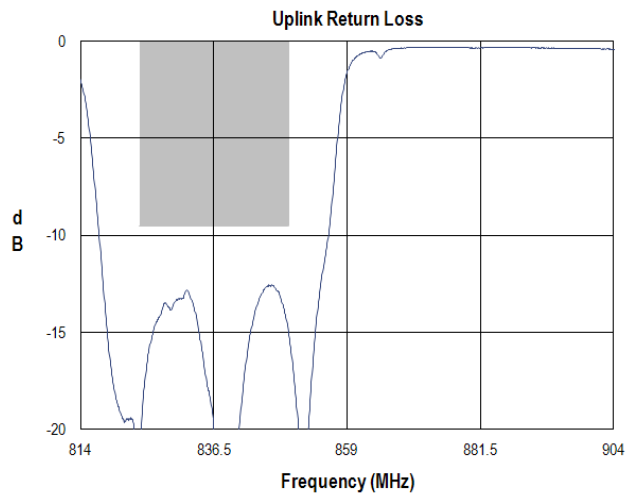
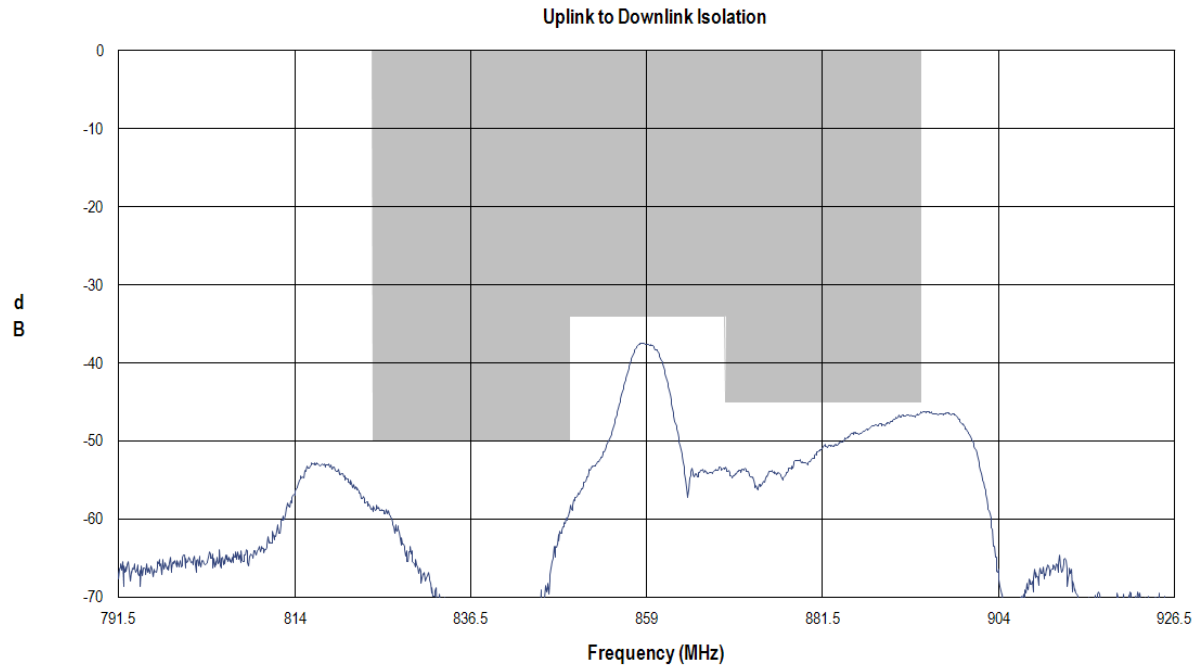
Reference Desg.	Value	Description	Manufacturer	Part Number
SMA	N/A	SMA connector	Radiall USA Inc.	9602-1111-018
PCB	N/A	3-layer	multiple	960880

### Typical Performance (at room temperature)



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## 836.5/881.5 MHz SAW Duplexer

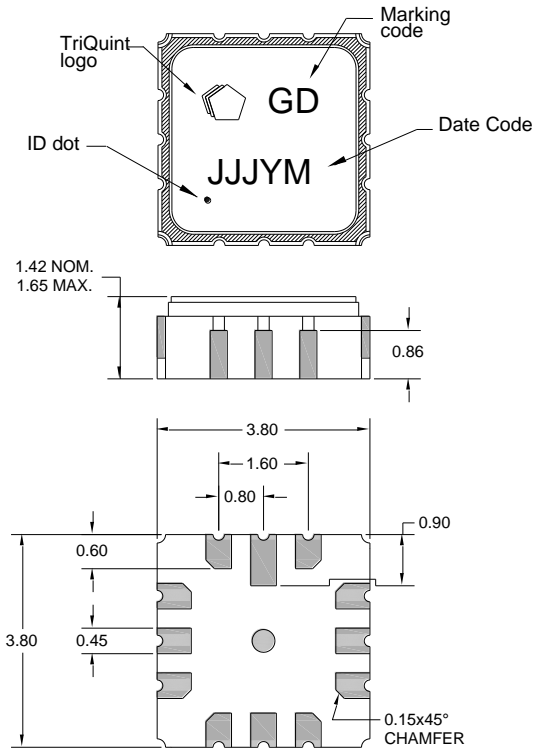


# 856908

## 836.5/881.5 MHz SAW Duplexer

### Mechanical Information

#### Package Information, Dimensions and Marking



Package Style: SMP-15N  
Dimensions: 3.8 x 3.8 x 1.42 mm

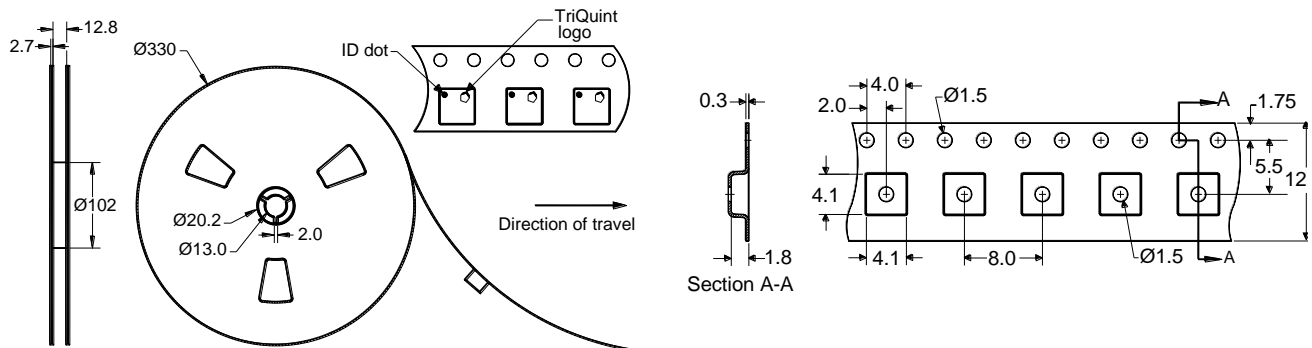
Body:  $Al_2O_3$  ceramic  
Lid: Kovar, Ni plated  
Terminations: Au plating 0.5 - 1.0 $\mu$ m, over a 2-6 $\mu$ m Ni plating

All dimensions shown are nominal in millimeters  
All tolerances are  $\pm 0.15$ mm except overall length and width  $\pm 0.10$ mm

The date code consists of: day of the current year (Julian, 3 digits), Y = last digit of the year, and M = manufacturing site code

### Tape and Reel Information

Standard T/R size = 4000 units/reel. All dimensions are in millimeters



# 856908

## 836.5/881.5 MHz SAW Duplexer

### Product Compliance Information

#### ESD Information



**Caution! ESD-Sensitive Device**

ESD Rating: 1A

Value: Passes  $\geq 300$  V min.  
Test: Human Body Model (HBM)  
Standard: JEDEC Standard JESD22-A114

ESD Rating: B

Value: Passes  $\geq 200$  V min.  
Test: Machine Model (MM)  
Standard: JEDEC Standard JESD22-A115

#### MSL Rating

Devices are Hermetic, therefore MSL is not applicable

#### Solderability

Compatible with the latest version of J-STD-020, lead free solder, 260°C

Refer to [Soldering Profile](#) for recommended guidelines.

This part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

This product also has the following attributes:

- 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
- PFOS Free
- SVHC Free

### Contact Information

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

Web: [www.triquint.com](http://www.triquint.com)  
Email: [info-sales@tqs.com](mailto:info-sales@tqs.com)

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Fax: +1.407.886.7061

For technical questions and application information:

Email: [flapplication.engineering@tqs.com](mailto:flapplication.engineering@tqs.com)

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